



OFPC Project No. 903-1159

**The University of Texas Rio Grande Valley
SCHOOL OF MEDICINE
TEAM BASED LEARNING CENTER**

CONSTRUCTION DOCUMENTS

November 8, 2018

Volume 1: Division 00 thru Division 21

OFFICE OF FACILITIES PLANNING AND CONSTRUCTION

The University of Texas System
2102 Treasure Hills Boulevard, Suite 3.124
Harlingen, TX 78550
Phone: 956-296-1512

muñoz & company

Architects

PEREZ CONSULTING

ENGINEERS

Civil Engineering

SSP DESIGN

Landscape
Architect

INTELLIGENT

ENGINEERING SERVICES

Structural Engineering

HALFF ASSOCIATES, INC.

Mechanical Engineering
Electrical Engineering
Plumbing Engineering
Fire Protection

COMBS CONSULTING

GROUP

Information
Technology

GARABEDIAN

ASSOCIATES

Code Consulting
Life Safety

PROJECT MANUAL TITLE PAGE

OWNER: The Board of Regents of the University of Texas System
U.T. System Office of Facilities Planning and Construction
702 Colorado, Suite 4.100
Austin, Texas 78701

PROJECT: University of Texas Rio Grande Valley
School of Medicine – Team Based Learning Center
Edinburg, Texas

DATE: **November 8, 2018**

PROJECT NUMBER: OFPC Project Number: 903-1159
A/E Project Number: A17021.00

OWNER'S REPRESENTATIVE: Laura Lara, AIA, Senior Project Manager
Office of Facilities Planning and Construction
The University of Texas System
2102 Treasure Hills Boulevard, Suite 3.124
Harlingen, TX 78550
Phone 956-296-1512, Mobile 210.643.6616

PROJECT ARCHITECT: Geof Edwards, AIA, Principal-in-Charge
Munoz and Company, Inc.
1017 N. Main Avenue, Suite 300
San Antonio, TX 78212
Phone 210-349-1163, Fax 210-525-1038

PROJECT MANUAL CERTIFICATIONS

PROJECT: University of Texas Rio Grande Valley
School of Medicine – Team Based Learning Center
Edinburg, Texas
Project Number: 903-1159

PROJECT ARCHITECT/ENGINEERS/CONSULTANTS:

PROJECT ARCHITECT:

Geof Edwards, AIA
Munoz and Company, Inc.
1017 N. Main Avenue, Suite 300
San Antonio, Texas 78212
Phone 210-349-1163
Fax 210-525-1038



11-08-08

CIVIL ENGINEERS:

Perez Consulting Engineers
808 Dallas Avenue
McAllen, Texas 78501
Phone 956.631.4482



LANDSCAPE ARCHITECTS:

SSP Design
789 E. Washington Street
Brownsville, Texas 78520
Phone 956.547.9788
Fax 956.547.9977



11-08-18

STRUCTURAL ENGINEERS:

Intelligent Engineering Services
200 S. 10th Street, Suite 1204
McAllen, Texas 78501
Phone 956.682.4645
Fax

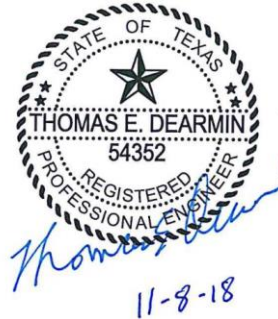


PROJECT MANUAL CERTIFICATIONS

PROJECT: University of Texas Rio Grande Valley
School of Medicine – Team Based Learning Center
Edinburg, Texas
Project Number: 903-1159

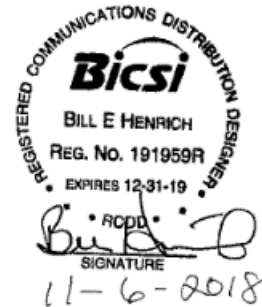
MECHANICAL / ELECTRICAL / PLUMBING/ FIRE PROTECTION ENGINEERS:

Halff Associates, Inc.
5000 West Military, Suite 100
McAllen, Texas 78503
Phone 956-445-5207



INFORMATION TECHNOLOGY & SECURITY CONSULTANTS:

Combs Consulting Group
8200 IH-10 West, Suite 103
San Antonio, Texas 78230
Phone 210-698-7887



CODE CONSULTING/ LIFE SAFETY:

Garabedian Associates
16218 Juan Tabo Way
Helotes, Texas 78023
Phone 210.592.1325

HARDWARE CONSULTANT:

RB Sontag AHC, CDC, FDAI.
Allegion PLC
9330 Corporate Drive, Suite 806
Selma, Texas 78154
(210) 842-7709 (Cell/Preferred)
(210) 541-4370 (Office)
(210) 455-9846 (Fax)

**U.T. RIO GRANDE VALLEY
SCHOOL OF MEDICINE TEAM BASED LEARNING CENTER
TABLE OF CONTENTS
CONSTRUCTION DOCUMENTS**



11-08-08

SPECIFICATIONS

NOTE: The Specifications in this Project Manual are assembled in accordance with THE CONSTRUCTION SPECIFICATIONS INSTITUTE FORMAT

INTRODUCTORY INFORMATION

00001	TITLE PAGE	1
00002	CERTIFICATION PAGE	2
00003	TABLE OF CONTENTS.....	5
00004	LIST OF DRAWINGS (DRAWINGS BOUND SEPARATELY)	4

VOLUME 1

DIVISION 00 BIDDING & CONTRACT CONDITIONS

CSP PROPOSAL FORM	9
GEOTECHNICAL ENGINEERING STUDY - by Raba Kistner, dated March 1, 2018.....	44
STORMWATER POLLUTION PREVENTION PLAN	117
OFPC - UNIFORM GEN AND SUPPLEMENTARY GEN CONDITIONS	49
OFPC - OWNER'S SPECIAL CONDITIONS.....	31
ATTACHMENT "A" PREVAILING WAGE DETERMINATION	
ATTACHMENT "B" PROJECT SIGN LAYOUT & DETAILS	
ATTACHMENT "C" WEATHER DAYS	
00 7316 OFPC - PROJECT INSURANCE (OCIP)	15
00 7400 SPECIAL PROJECT CONDITIONS FOR CIVIL WORK	4

DIVISION 01 OFPC GENERAL REQUIREMENTS

01 3100 OFPC - PROJECT ADMINISTRATION	23
01 3200 OFPC - PROJECT PLANNING AND SCHEDULING	18
01 3523 OFPC - PROJECT SAFETY REQUIREMENTS	58
01 4500 OFPC - PROJECT QUALITY CONTROL	9
01 5723 OFPC - TEMPORARY STORM WATER POLLUTION CONTROL	25
01 7700 OFPC - PROJECT CLOSEOUT PROCEDURES.....	20
01 9100 OFPC - GENERAL COMMISSIONING REQUIREMENTS	19
10 1416.11 OFPC - CAST BRONZE DEDICATORY BUILDING PLAQUE	5

DIVISION 01 - GENERAL REQUIREMENTS

01 2100 ALLOWANCES	1
01 2200 UNIT PRICES	3
01 2300 ALTERNATES	2
01 5639 VEGETATION PROTECTION & RELOCATION	7
01 7419 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL	2
01 9000 FINISH LEGEND	5

DIVISION 02 – EXISTING CONDITIONS

02 4100	DEMOLITION.....	3
---------	-----------------	---

DIVISION 03 - CONCRETE

03 3000	CAST-IN-PLACE CONCRETE (CIVIL).....	1
03 3000	CAST-IN-PLACE CONCRETE (STRUCTURAL).....	33
03 5400	INTEGRAL COLORED CONCRETE	3

DIVISION 04 - MASONRY

04 0523	ADJUSTABLE CONCEALED LINTEL SYSTEM	3
04 2000	UNIT MASONRY	13
04 8500	STONework	4

DIVISION 05 - METALS

05 1200	STRUCTURAL STEEL	13
05 2100	STEEL JOISTS & JOIST GIRDERS.....	6
05 3100	STEEL DECK.....	7
05 4000	COLD FORMED METAL FRAMING.....	8
05 5000	METAL FABRICATIONS	8
05 5113	METAL PAN STAIRS.....	7
05 5150	LADDERS	3
05 5213	EXTERIOR STEEL BAR RAILINGS.....	4

DIVISION 06 - WOOD & PLASTICS

06 1053	MISCELLANEOUS ROUGH CARPENTRY.....	4
06 1600	SHEATHING	3
06 4023	INTERIOR ARCHITECTURAL WOODWORK.....	3
06 4116	PLASTIC LAMINATE FACED ARCHITECTURAL CABINETS	6

DIVISION 07 - THERMAL & MOISTURE PROTECTION

07 1326	SELF-ADHERING SHEET WATERPROOFING	5
07 2100	THERMAL INSULATION	3
07 2726	FLUID-APPLIED MEMBRANE AIR BARRIERS.....	
07 4293	SOFFIT PANELS	5
07 5216	MODIFIED BITUMINOUS MEMBRANE ROOFING (ALTERNATE 1)	9
07 5500	SBS MODIFIED BITUMEN MEMBRANE ROOF-TORCH APPLIED	10
07 6200	FLASHING AND SHEET METAL	8
07 7200	ROOF ACCESSORIES.....	6
07 7233	ROOF HATCHES	3
07 9100	PREFORMED JOINT SEALS	2
07 9200	JOINT SEALANTS.....	6

DIVISION 08 - DOORS & WINDOWS

08 1113	HOLLOW METAL DOOR FRAMES (FOR WOOD DOORS)	3
08 1210	INTERIOR ALUMINUM OFFICE FRONTS	3
08 1416	FLUSH WOOD DOORS	5
08 3113	ACCESS DOORS AND FRAMES	3
08 4113	ALUMINUM FRAMED ENTRANCES AND STOREFRONTS	8
08 4114	ALUMINUM FIXED WINDOWS.....	6

TABLE OF CONTENTS 00003 - 3
U.T. RIO GRANDE VALLEY
SCHOOL OF MEDICINE – TEAM BASED LEARNING CENTER

08 5680	SLIDING SERVICE WINDOW	5
08 7100	FINISH HARDWARE	21
08 8000	GLAZING	6
08 8300	MIRRORS	3
08 9000	ARCHITECTURAL LOUVERS AND DOORS.....	5

DIVISION 09 - FINISHES

09 2116.23	GYPSUM BOARD SHAFT WALL ASSEMBLIES	5
09 2900	GYPSUM DRYWALL ASSEMBLIES	11
09 3013	CERAMIC TILING	8
09 5113	ACOUSTICAL CEILINGS	4
09 5433	WOOD VENEER PANEL CEILINGS.....	5
09 6519	RESILIENT TILE FLOORING	5
09 6813	CARPET TILE	4
09 7700	FIBERGLASS REINFORCED PANELS	2
09 9010	PAINTING	11
09 9110	CONCRETE FLOOR SEALER	6

DIVISION 10 - SPECIALTIES

10 0100	MISCELLANEOUS SPECIALTIES	6
10 1100	VISUAL DISPLAY UNITS	4
10 2113.19	PLASTIC TOILET COMPARTMENTS.....	4
10 7310	PROTECTIVE COVERS.....	2

DIVISION 12 - FURNISHINGS

12 2413	ROLLER WINDOW SHADES.....	7
12 3661	QUARTZ SURFACING COUNTERTOPS	4
12 3661.16	SOLID SURFACING COUNTERTOPS	3

DIVISION 14 - CONVEYING SYSTEMS

14 2400	HYRAULIC ELEVATORS	8
---------	--------------------------	---

VOLUME 2

DIVISION 21 - FIRE PROTECTION

21 0000	BASIC FIRE PROTECTION REQUIREMENTS	21
21 0529	FIRE PROTECTION SUPPORTS AND SLEEVES	9
21 0553	FIRE PROTECTION PIPING AND EQUIPMENT IDENTIFICATION	5
21 0800	COMMISSIONING OF FIRE PROTECTION SYSTEM	3
21 1313	FIRE PROTECTION SYSTEMS.....	12

DIVISION 22 - PLUMBING

22 0000	BASIC PLUMBING REQUIREMENTS	25
22 0513	PLUMBING MOTORS	7
22 0529	PLUMBING SUPPORTS AND SLEEVES	9
22 0548	PLUMBING VIBRATION ISOLATION	5
22 0553	PLUMBING IDENTIFICATION	5
22 0719	PLUMBING INSULATION.....	8
22 0800	CMMISSIONING OF PLUMBING SYSTEMS.....	3
22 1123	PLUMBING EQUIPMENT	6
22 1316	PLUMBING PIPING	12

TABLE OF CONTENTS 00003 - 4
U.T. RIO GRANDE VALLEY
SCHOOL OF MEDICINE – TEAM BASED LEARNING CENTER

22 1317	PLUMBING SPECIALTIES	6
22 2000	PLUMBING PIPING VALVES AND FITTINGS	13
22 4000	PLUMBING FIXTURES	10

DIVISION 23 - MECHANICAL

23 0000	BASIC MECHANICAL REQUIREMENTS	24
23 0100	MECHANICAL/HVAC SUBMITTAL PROCEDURES	10
23 0513	MOTORS	6
23 0516	EXPANSION COMPENSATION.....	6
23 0529	SLEEVES, FLASHINGS, SUPPORTS AND ANCHORS	10
23 0548	VIBRATION ISOLATION	6
23 0553	MECHANICAL IDENTIFICATION.....	4
23 0593	TESTING, ADJUSTING AND BALANCING	10
23 0594	SYSTEM PREPARATION FOR TESTING, ADJUSTING AND BALANCING	5
23 0620	HYDRONIC SPECIALTIES.....	6
23 0713	DUCTWORK INSULATION	5
23 0716	EQUIPMENT INSULATION	5
23 0719	PIPING INSULATION	11
23 0800	COMMISSIONING OF HVAC SYSTEMS.....	5
23 0923	DIRECT DIGITAL CONTROL SYSTEMS.....	41
23 2000	HVAC PUMPS	5
23 2010	PIPING, VALVES AND FITTINGS	11
23 2100	HYDRONIC PIPING.....	6
23 2500	HVAC WATER TREATMENT	10
23 2923	VARIABLE FREQUENCY DRIVES	12
23 3100	DUCTWORK.....	10
23 3300	DUCTWORK ACCESSORIES.....	8
23 3416	FANS	6
23 3600	AIR TERMINAL UNITS (VAV)	8
23 3700	AIR INLETS AND OUTLETS	8
23 4100	FILTERS	7
23 6426	ROTARY-SCREW WATER CHILLERS.....	10
23 7323	AIR HANDLING UNITS.....	10
23 8126	DUCTLESS SPLIT-SYSTEM AIR-CONDITIONER UNITS	3
23 8216	AIR COILS	4
23 8219	TERMINAL HEAT TRANSFER UNITS.....	4

DIVISION 26 - ELECTRICAL

26 0000	BASIC ELECTRICAL REQUIREMENTS.....	14
26 0100	ELECTRICAL SUBMITTAL PROCEDURES	10
26 0500	BASIC ELECTRICAL MATERIAL AND METHOD.....	7
26 0519	CABLE WIRE AND CONNECTORS	7
26 0526	GROUNDING.....	8
26 0529	SECURING AND SUPPORTING METHODS	3
26 0533	RACEWAY CONDUIT AND BOXES	12
26 0544	SLEEVES & SLEEVE SEALS FOR ELECTRICAL RACEWAYS & CABLING ...	3
26 0553	ELECTRICAL IDENTIFICATION	3
26 0573	PROTECTIVE RELAY AND DEVICE COORDINATION.....	7
26 0800	COMMISSIONING OF ELECTRICAL SYSTEMS	3
26 2213	DRY TYPE TRANSFORMERS.....	5
26 2413	SWITCHBOARDS.....	7
26 2416	PANELBOARDS DISTRIBUTION AND BRANCH CIRCUIT	7
26 2726	WIRING DEVICES.....	9
26 2813	FUSES	2
26 2816	DISCONNECT SWITCHES	2

TABLE OF CONTENTS 00003 - 5
U.T. RIO GRANDE VALLEY
SCHOOL OF MEDICINE – TEAM BASED LEARNING CENTER

26 4100	LIGHTNING PROTECTION SYSTEMS	8
26 5100	INTERIOR AND EXTERIOR LIGHTING.....	9

DIVISION 27 - COMMUNICATIONS

27 1000	STRUCTURED CABLING BASE BID.....	27
27 1000	STRUCTURED CABLING ALTERNATE	27
27 4100	AUDIO VISUAL SYSTEMS.....	15

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

28 0800	FIRE ALARM SYSTEM CX	3
28 1300	ACCESS CONTROL SYSTEM.....	16
28 2300	VIDEO SURVEILLANCE	21
28 3100	FIRE ALARM AND SMOKE DETECTION SYSTEM.....	27

DIVISION 31 - EARTHWORK

31 1000	SITE CLEARING.....	1
31 1101	CLEARING AND GRUBBING.....	1
31 2200	GRADING	3
31 2316.10	EXCAVATION – CIVIL.....	2
31 2316.13	TRENCHING.....	2
31 2316.14	TRENCH PROTECTION SYSTEM	6
31 2316.26	ROCK REMOVAL	1
31 3116	TERMITE CONTROL.....	3
31 3700	RIPRAP	1
31 6329	DRILLED PIERS	10

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 1313	CONCRETE PAVING	4
32 1413	UNIT PAVERS	5
32 8000	IRRIGATION	4
32 9000	PLANTING	7
32 9200	LAWNS	5

DIVISION 33 - UTILITIES

33 0110.58	DISINFECTING OF WATER UTILITY DISTRIBUTION	2
33 0513	STORM SEWER APPURTENANCES.....	2
33 0514	FIBERGLASS MANHOLES AND WETWELLS	7
33 1116	WATER TRANSMISSION LINES AND/OR PRESSURE SEWER LINES	8
33 3113	SITE SANITARY SEWERAGE GRAVITY PIPING	2
33 4211	STORMWATER GRAVITY PIPING	2
33 7119	UNDERGROUND DUCT BANKS AND MANHOLES	6

TITLE OF DOCUMENTS BOUND IN PROJECT MANUAL AND ENUMERATION OF DRAWINGS
BOUND SEPARATELY.

CONTRACT CONDITIONS (DIVISION 00)

GENERAL CONSTRUCTION SPECIFICATIONS (DIVISIONS 01 thru 33)

GENERAL

G-001 GENERAL INFORMATION
G-101 ACCESSIBILITY GUIDELINES
G-102 ACCESSIBILITY GUIDELINES

LIFE SAFETY

LS-101 CODE SUMMARY SHEET
LS-201 LIFE SAFETY PLAN – LEVEL 1
LS-202 LIFE SAFETY PLAN – LEVEL 2

CIVIL

C100 OVERALL SITE PLAN
C101 DEMOLITION PLAN
C102 DIMENSIONAL CONTROL PLAN
C103 GRADING AND DRAINAGE PLAN
C104 STORM SEWER PROFILES
C105 WATER/WASTE WATER PLAN
C106 SITE AND LAYDOWN AREA
C107 EROSION AND SEDIMENT CONTROL PLAN
C108 MATERIAL RECEIVING AND STORAGE AREA SITE PLAN
C109 EROSION AND SEDIMENT CONTROL PLAN
C110 TYPICAL DETAILS
C111 TYPICAL DETAILS
C112 TYPICAL DETAILS
C113 TYPICAL DETAILS
C114 TYPICAL DETAILS
C115 TYPICAL DETAILS

LANDSCAPE

L1.00 TREE SURVEY/ RELOCATION PLAN
L1.01 IRRIGATION PLAN
L1.02 IRRIGATION DETAILS
L2.01 LANDSCAPE PLAN BASE BID
L2.02 LANDSCAPE PLAN ALTERNATES
L3.01 LANDSCAPE SCHEDULE AND DETAILS

ARCHITECTURAL

A-101 OVERALL SITE PLAN
A-102 SITE PLAN
A-103 ENLARGED SITE PLANS AND SITE DETAILS
A-104 SITE DETAILS AND SITE ALTERNATES
A-105 SITE DETAILS
A-201 LEVEL ONE FLOOR PLAN
A-202 LEVEL TWO FLOOR PLAN
A-203 ROOF LEVEL FLOOR PLAN
A-204 ENLARGED RESTROOM PLANS AND INTERIOR ELEVATIONS
A-205 ENLARGED PLANS AND INTERIOR ELEVATIONS – ELECTRICAL & DATA COORDINATION
A-206 ENLARGED PLANS AND INTERIOR ELEVATIONS - ELECTRICAL & DATA COORDINATION
A-301 LEVEL ONE REFLECTED CEILING PLAN
A-302 LEVEL TWO REFLECTED CEILING PLAN
A-401 FINISH SCHEDULES
A-402 DOOR SCHEDULES
A-403 WINDOW TYPES
A-404 DOOR AND WINDOW DETAILS
A-405 DOOR AND WINDOW DETAILS

A-406 DOOR AND WINDOW DETAILS
A-407 DOOR AND WINDOW DETAILS INTERIOR
A-408 PLAN DETAILS
A-410 SIGNAGE DETAILS
A-411 SIGNAGE PLANS
A-412 SIGNAGE SCHEDULE
A-501 EXTERIOR ELEVATIONS
A-502 EXTERIOR BUILDING PERSPECTIVES
A-601 BUILDING SECTIONS
A-602 WALL SECTIONS
A-603 WALL SECTIONS
A-604 WALL DETAILS
A-701 ENLARGED STAIR PLANS AND SECTIONS - STAIR 1
A-702 ENLARGED STAIR PLANS AND SECTIONS - STAIR 2
A-703 ENLARGED ELEVATOR PLANS AND SECTIONS
A-704 STAIR/RAIL DETAILS
A-801 INTERIOR ELEVATIONS
A-802 INTERIOR ELEVATIONS
A-803 INTERIOR ELEVATIONS
A-804 INTERIOR ELEVATIONS
A-901 FLOOR PATTERN PLANS

STRUCTURAL

S-001 STRUCTURAL NOTES
S-002 STRUCTURAL NOTES
S-003 ABBREVIATIONS & SYMBOLS LEGEND
S-004 SPECIAL INSPECTIONS
S-005 LIVE LOAD & WIND LOAD PLANS
S-100 PIER LEVEL FRAMING PLAN
S-201 FOUNDATION LEVEL FRAMING PLAN
S-202 SECOND LEVEL FRAMING PLAN
S-203 ROOF LEVEL FRAMING PLAN
S-301 EXTERIOR ELEVATIONS
S-401 CONCRETE TYPICAL DETAILS
S-402 CONCRETE TYPICAL DETAILS
S-403 CONCRETE SECTIONS AND DETAILS
S-404 CONCRETE SECTIONS AND DETAILS
S-405 BASE PLATES
S-501 TYPICAL STEEL DETAILS
S-502 TYPICAL STEEL DETAILS
S-503 TYPICAL STEEL DETAILS
S-504 TYPICAL STEEL DETAILS
S-505 STEEL SECTIONS & DETAILS
S-601 TYPICAL CONCRETE MASONRY DETAILS
S-701 CONCRETE BEAM SCHEDULE
S-801 BRACE SECTIONS & DETAILS

MECHANICAL

M-001 MECHANICAL GENERAL LEGEND
M-201 MECHANICAL HVAC PLAN LEVEL 1
M-202 MECHANICAL HVAC PLAN LEVEL 2
M-203 MECHANICAL HVAC - MECHANICAL ROOM ENLARGEMENTS & SECTIONS
M-204 MECHANICAL HVAC - MECHANICAL ROOM - HYDRONIC
M-205 MECHANICAL HVAC PLAN - ROOF PLAN
M-301 MECHANICAL DETAILS I
M-302 MECHANICAL DETAILS II
M-303 MECHANICAL DETAILS III
M-304 MECHANICAL DETAILS IV
M-401 MECHANICAL CONTROL AND FLOW DIAGRAMS
M-402 MECHANICAL CONTROL AND FLOW DIAGRAM

M-403 MECHANICAL CONTROL INPUT/OUTPUT
M-501 MECHANICAL SCHEDULES I
M-502 MECHANICAL SCHEDULES II

ELECTRICAL

E-001 ELECTRICAL GENERAL LEGEND
E-101 ELECTRICAL SITE PLAN
E-102 ELECTRICAL LIGHTNING PROTECTION SITE PLAN
E-201 ELECTRICAL LIGHTING PLAN LEVEL 1
E-202 ELECTRICAL LIGHTING PLAN LEVEL 2
E-203 ELECTRICAL POWER PLAN LEVEL 1
E-204 ELECTRICAL POWER PLAN LEVEL 2 & ROOF
E-205 MECHANICAL & PLUMBING EQUIPMENT POWER PLAN LEVEL 1
E-206 MECHANICAL & PLUMBING EQUIPMENT POWER PLAN LEVEL 2
E-207 FIRE ALARM PLAN LEVEL 1
E-208 FIRE ALARM PLAN LEVEL 2
E-301 ELECTRICAL DETAILS I
E-302 ELECTRICAL DETAILS II
E-303 ELECTRICAL DETAILS III
E-304 ELECTRICAL DETAILS IV
E-401 ELECTRICAL ONE-LINE DIAGRAM & SCHEDULES
E-402 ELECTRICAL SCHEDULES I
E-403 ELECTRICAL SCHEDULES II
E-404 ELECTRICAL SCHEDULES III

PLUMBING

P-001 PLUMBING GENERAL LEGEND
P-100 PLUMBING SITE PLAN
P-101 PLUMBING UNDERFLOOR PLAN
P-202 PLUMBING PLAN LEVEL 1
P-203 PLUMBING PLAN LEVEL 2
P-204 PLUMBING ROOF PLAN
P-205 PLUMBING ENLARGED PLANS
P-301 PLUMBING RISERS SCHEMATIC DIAGRAMS
P-302 PLUMBING RISERS SCHEMATIC DIAGRAMS
P-303 PLUMBING RISERS SCHEMATIC DIAGRAMS
P-304 PLUMBING DETAILS
P-305 PLUMBING DETAILS
P-401 PLUMBING SCHEDULES

FIRE PROTECTION

FP-101 AUTOMATIC SPRINKLER SYSTEM PERFORMANCE SPECIFICATIONS NOTES
FP-102 CONCEPTUAL FIRE PROTECTION PLAN LEVEL 1 AND LEVEL 2

TECHNOLOGY

T-000 TECHNOLOGY LEGEND AND ABBREVIATIONS
T-101 TECHNOLOGY SITE PLAN
T-102 TECHNOLOGY SITE PLAN
T-201 TECHNOLOGY LEVEL ONE - FLOOR PLAN
T-202 TECHNOLOGY LEVEL TWO - FLOOR PLAN
T-300 TECHNOLOGY ROOM LAYOUTS AND RACK ELEVATIONS
T-400 TECHNOLOGY TYPICAL DETAILS
T-401 TECHNOLOGY TYPICAL DETAILS
T-500 TECHNOLOGY TYPICAL DETAILS & LABELING SCHEME

SECURITY

TS-000 SECURITY SYMBOLS, LEGEND AND ABBREVIATIONS
TS-101 SECURITY SITE PLAN
TS-201 SECURITY LEVEL ONE - FLOOR PLAN
TS-202 SECURITY LEVEL TWO - FLOOR PLAN

TS-203 SECURITY ROOF LEVEL - FLOOR PLAN
TS-400 SECURITY TYPICAL DETAILS
TS-401 SECURITY TYPICAL DETAILS AND SCHEDULES

End of Section

RESPONDENT'S PRICING AND DELIVERY PROPOSAL

RFP No.: **903-1159**

Project Name: ***School of Medicine Team Based Learning Center***

From: Respondent's Name: _____
Mailing Address: _____
City, State, Zip Code: _____
Phone Number: _____

To: Laura Lara, AIA
Senior Project Manager
The University of Texas System
Office of Facilities Planning and Construction
2102 Treasure Hills Blvd., Suite 1.126
Harlingen, Texas 78550

Having carefully examined the Uniform General Conditions for University of Texas System Building Construction Contracts (UGC), the Plans and Specifications and addenda thereto, as prepared by ***Munoz and Company***, the Project Architect/Engineer on this Project, as well as the premises and all the conditions affecting the work, the undersigned proposes to furnish all labor, materials, and equipment necessary to achieve Substantial Completion of the work in accordance with the Contract Documents for the following sum (Amount shall be shown in both written and figure form. In case of discrepancy between the written amount and the figure, the written amount will govern):

1.1 BASE PROPOSAL COST:

_____ DOLLARS (\$_____)

1.1.1 The Base Proposal Cost is to include a ~~\$70,000.00~~ allowance within the cost of work to be done within this contract under the supervision of the General Contractor and/or Subcontractors to provide interior enhancements to interior finish-out at the Coffee Bar. The allowance shall be listed in the Contractor's Contract Price Breakdown as a portion of the total contract amount and will be expended only upon direction of the Owner. Any unused amount will be deducted from the Contract Price by Change Order.

1.1.2 OWNER'S SPECIAL CASH ALLOWANCE: The above Base Proposal Cost does not include Owner's Special Cash Allowance(s) for work to be done within this contract under the supervision of the General Contractor and/or the Subcontractors. Each allowance shall be listed on the Contractor's Contract Price Breakdown as a portion of the total contract amount, and each shall be expended only upon direction of the Owner. This is a lump sum amount from which changes are to be paid in accordance with the Changes section of the Uniform General Conditions for University of Texas System Building Construction Contracts. Any unused amount will be deducted from the Contract Price by Change Order.

1.2 ALTERNATE PROPOSALS: The Owner reserves the right to accept or reject any Alternate Proposals in the order of its choice. The following amounts may be added to, or deducted from, the Base Proposal Cost identified above.

- 1.2.1 ALTERNATE PROPOSAL COST No. 1 - Provide a SBS Modified Bituminous Membrane Roof system per Specification Section 075216 in lieu of "Torch Applied" Specification Section 075500:

DOLLARS (\$_____)

- 1.2.2 ALTERNATE PROPOSAL COST No. 2 - Provide CAT 6A in lieu of CAT 6 cable. Refer to Technology Drawings and Specifications:

DOLLARS (\$_____)

- 1.2.3 ALTERNATE PROPOSAL COST No. 3 - Provide air flow measuring using thermal dispersion on the VAV boxes:

DOLLARS (\$_____)

- 1.2.4 ALTERNATE PROPOSAL COST No. 4 - Provide and install a 100-gallon capacity grease interceptor and associated piping for fully operational unit as indicated on the drawings.

DOLLARS (\$_____)

- 1.2.5 ALTERNATE PROPOSAL COST NO. 5 - Provide 10' x 35' grass paver area at NW corner, as indicated on the drawings. Provide electrical connection for temporary chiller as indicated on drawings.

DOLLARS (\$_____)

- 1.2.6 ALTERNATE PROPOSAL COST NO. 6 - Provide wheelchair accessible ramp at south side of building as indicated on the drawings.

DOLLARS (\$_____)

- 1.2.7 ALTERNATE PROPOSAL COST NO. 7 - Provide landscape materials as per plan L2.02 in lieu of landscape materials for base bid Sheet L2.01

DOLLARS (\$_____)

- 1.2.8 ALTERNATE PROPOSAL COST NO. 8 - Provide card readers as indicated at security plan TS-201, TS-202 and security schedule TS-401.

DOLLARS (\$_____)

- 1.2.9 ALTERNATE PROPOSAL COST NO. 9 - Provide epoxy coated condenser coil as per 23 64 26 rotary screw water chillers.

DOLLARS (\$_____)

- 1.2.10 ALTERNATE PROPOSAL COST NO. 10 - Provide two pole lights at north side of building per Sheet E-101, C-102 and A-102.

DOLLARS (\$_____)

- 1.2.11 ALTERNATE PROPOSAL COST NO. 11 - Provide custom pattern vinyl window film as indicated on Sheet A-801.

DOLLARS (\$_____)

- 1.3 UNIT PRICES FOR GENERAL CONSTRUCTION: The undersigned further agrees that in case additional work or material is authorized from what is shown in the Contract, the following unit prices shall be used in adjusting the Contract Price. The unit prices include overhead, profit, taxes, etc in accordance with the Changes section of the Uniform General Conditions for University of Texas System Building Construction Contracts. Unit prices to be used for adjusting the Contract Price for less work or material will be 75% of these amounts for the net difference of the total quantities for each type of work.

- | | | |
|--------|-------------------------------------|------------------|
| 1.3.1 | General Excavation: Sand, clay: | _____ / cu. yd. |
| 1.3.2 | Trench Excavation: Sand, clay: | _____ / cu. yd. |
| 1.3.3 | Footing Excavation: Sand, clay: | _____ / cu. yd. |
| 1.3.4 | Select Fill, compacted, in place: | _____ / cu. yd. |
| 1.3.5 | 4,500 PSI. Concrete, in place: | _____ / cu. yd. |
| 1.3.6 | Reinforcing Steel, in place: | _____ / pound |
| 1.3.7 | Drilled Piers – 24" Diameter: | _____ / lin. ft. |
| 1.3.8 | Drilled Piers – 30" Diameter: | _____ / lin. ft. |
| 1.3.9 | Drilled Piers – 12" Diameter: | _____ / lin. ft. |
| 1.3.10 | Drilled Pier Casing – 24" Diameter: | _____ / lin. ft. |
| 1.3.11 | Drilled Pier Casing – 30" Diameter: | _____ / lin. ft. |
| 1.3.12 | Drilled Pier Casing – 12" diameter: | _____ / lin. ft. |
| 1.3.13 | Drilling Slurry: | _____ / cu. yd. |

- 1.4 CONSTRUCTION MILESTONE SCHEDULE: The undersigned agrees, if awarded the contract, to achieve Substantial Completion of the Work as described in the UGC, the plans and specifications and addenda thereto.
- 1.4.1 Anticipated Notice to Proceed for Construction January 23, 2019
1.4.2 Anticipated Substantial Completion March 30, 2020
1.4.3 Anticipated Final Completion April 30, 2020
- 1.5 RFP ADDENDA: Receipt is hereby acknowledged of the following addenda issued by the Point-of-Contact to this Request for Proposals - initial if applicable.
- RFP No. 1 ____ RFP No. 2 ____ RFP No. 3 ____ RFP No. 4 ____ RFP No. 5 ____
- 1.6 BID DOCUMENTS ADDENDA: Receipt is hereby acknowledged of the following addenda issued by the Project Architect/Engineer to the Bid Documents (i.e. drawings and specifications) - initial if applicable.
- Bid No. 1 ____ Bid No. 2 ____ Bid No. 3 ____ Bid No. 4 ____ Bid No. 5 ____
- 1.7 LIQUIDATED DAMAGES: The undersigned agrees that, from the compensation otherwise to be paid, the Owner may retain the sum of **\$1,500.00** for each calendar day after the Substantial Completion Date that the work remains incomplete, which sum is agreed upon as the proper measure of liquidated damages which the Owner will sustain per diem by the failure of the Undersigned to complete the work at the time stipulated in the Contract. This sum is not construed in any sense as a penalty.
- 1.8 BID BONDS: The undersigned shall include a Certified Check or Proposal Bond Payable to the Board of Regents, The University of Texas System, in an amount not less than five percent (5%) of the largest possible total proposed cost, including consideration of alternates, accompanying this proposal is left in escrow with the Assistant Vice Chancellor for Facilities Planning and Construction, The University of Texas System; that its amount is the measure of liquidated damages which the Owner will sustain by the failure of the undersigned to execute and deliver the above named Agreement and Bonds, and that if the undersigned defaults in executing that Agreement or in furnishing the Performance and Payment Bonds or insurance certificates within ten (10) calendar days of written notification of the award of the Contract, then the check shall become the property of the Owner, or the Proposal Bond shall become subject to forfeiture to the Owner.
- 1.9 PAYMENT AND PERFORMANCE BONDS: The undersigned agrees to execute the Payment and Performance Bonds within ten (10) calendar days, in the amount of one hundred percent (100%) of the contract price, after notification that the offeror has been identified by the Owner as the Respondent with the "best value" Proposal. The bonds shall be in the full contract amount
- 1.10 AWARD OF CONTRACT AND COMMENCEMENT OF WORK: The Owner reserves the right to accept or reject and all Proposals and to waive proposal irregularities. Proposals shall be valid and not withdrawn for a period of sixty (60) days from the date of opening thereof. The undersigned agrees the contract to execute the Contract within ten (10) calendar days after notification that the offeror has been identified by the Owner as the Respondent with the "best value" Proposal, and to commence work on or before the commencement date stated by the Owner in a Notice to Proceed; such commencement date shall be ten (10) or more calendar days after the date of the Notice to Proceed. In addition, the undersigned agrees to execute and deliver to the Owner a Certification of Franchise Tax Payment and further agrees to obtain from each subcontractor and supplier and hold for redelivery to the Owner if requested a certification of franchise tax status of such subcontractor or supplier.

- 1.11 OWNER'S RIGHT: It is understood that the Owner reserves the right to accept or reject any and all Proposals and to waive proposal irregularities. It is further agreed that this Bid shall be valid and not withdrawn for a period of sixty (60) days from the date of opening thereof.
- 1.12 The Respondent must complete, sign and return this Pricing and Delivery Proposal as part of their submittal response. The Respondent's company official(s) who are authorized to commit to such a submittal must sign submittals. Failure to sign and return this form will subject the submittal to disqualification.

Respondent's Name: _____

Respondent's State of Texas Tax Account No.: _____
(This 11-digit number is mandatory)

If a Corporation:

Respondent's State of Incorporation: _____

Respondent's Charter No: _____

Identify each person who owns at least 25% of the Respondent's business entity by name:

(Name)

(Name)

(Name)

(Name)

Submitted and Certified by:

(Respondent's Name)

(Title)

(Street Address)

(Telephone Number)

(City, State, Zip Code)

(Fax Number)

(Authorized Signature)

(Date)

1.13 RESPONDENT'S EXECUTION OF OFFER
(See additional signature lines at end of this section)

THIS EXECUTION OF OFFER MUST BE COMPLETED, SIGNED, AND RETURNED WITH THE RESPONDENT'S PROPOSALS. FAILURE TO COMPLETE, SIGN AND RETURN THIS EXECUTION OF OFFER WITH THE PROPOSALS WILL RESULT IN REJECTION OF THE PROPOSALS.

SIGNING A FALSE STATEMENT MAY VOID THE SUBMITTED PROPOSALS OR ANY AGREEMENTS OR OTHER CONTRACTUAL ARRANGEMENTS, WHICH MAY RESULT FROM THE SUBMISSION OF RESPONDENT'S PROPOSALS, AND THE RESPONDENT MAY BE REMOVED FROM ALL PROPOSER LISTS. A FALSE CERTIFICATION SHALL BE DEEMED A MATERIAL BREACH OF CONTRACT AND, AT OWNER'S OPTION, MAY RESULT IN TERMINATION OF ANY RESULTING CONTRACT OR PURCHASE ORDER.

- 1.13.1 By signature hereon, Respondent acknowledges and agrees that (1) this Request For Competitive Sealed Proposals is a solicitation for Proposals and is not a contract or an offer to contract; (2) the submission of Proposals by Respondent in response to this Request For Competitive Sealed Proposals will not create a contract between the Owner and Respondent; (3) the Owner has made no representation or warranty, written or oral, that one or more contracts with the Owner will be awarded under this Request For Competitive Sealed Proposals; and (4) Respondent shall bear, as its sole risk and responsibility, any cost which arises from Respondent's preparation of a response to this Request For Competitive Sealed Proposals.
- 1.13.2 By signature hereon, Respondent offers and agrees to furnish to the Owner the products and/or services more particularly described in its Proposals, and to comply with all terms, conditions and requirements set forth in the Request for Competitive Sealed Proposals documents and contained herein.
- 1.13.3 By signature hereon, Respondent affirms that he has not given, nor intends to give at any time hereafter, any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor or service to a public servant in connection with the submitted Proposals.
- 1.13.4 By signature hereon, a corporate Respondent certifies that it is not currently delinquent in the payment of any Franchise Taxes due under Chapter 171, Texas Tax Code, or that the corporate Respondent is exempt from the payment of such taxes, or that the corporate Respondent is an out-of-state corporation that is not subject to the Texas Franchise Tax, whichever is applicable.
- 1.13.5 By signature hereon, the Respondent hereby certifies that neither the Respondent nor the firm, corporation, partnership or Owner represented by the Respondent, or anyone acting for such firm, corporation, or institution has violated the antitrust laws of this state, codified in Section 15.01, et. seq., Texas Business and Commerce Code, or the Federal antitrust laws, nor communicated directly or indirectly the Proposals made to any competitor or any other person engaged in such line of business.
- 1.13.6 By signature hereon, Respondent represents and warrants that:
 - 1.13.6.1 Respondent is a reputable company regularly engaged in providing products and/or services necessary to meet the terms, conditions and requirements of the Request for Competitive Sealed Proposals;

- 1.13.6.2 Respondent has the necessary experience, knowledge, abilities, skills, and resources to satisfactorily perform the terms, conditions and requirements of the Request for Competitive Sealed Proposals;
 - 1.13.6.3 Respondent is aware of, is fully informed about, and is in full compliance with all applicable federal, state and local laws, rules, regulations and ordinances;
 - 1.13.6.4 Respondent understands (i) the requirements and specifications set forth in this Request for Competitive Sealed Proposals and (ii) the terms and conditions set forth in the Contract under which Respondent will be required to operate;
 - 1.13.6.5 Respondent, if selected by the Owner, will maintain insurance as required by the Contract;
 - 1.13.6.6 All statements, information and representations prepared and submitted in response to this Request for Competitive Sealed Proposals are current, complete, true and accurate. Respondent acknowledges that the Owner will rely on such statements, information and representations in selecting the successful Respondent. If selected by the Owner as the successful Respondent, Respondent will notify the Owner immediately of any material change in any matters with regard to which Respondent has made a statement or representation or provided information.
- 1.13.7 By signature hereon, Respondent certifies that the individual signing this document and the documents made part of the Request for Competitive Sealed Proposals is authorized to sign such documents on behalf of the company and to bind the company under any agreements or other contractual arrangements, which may result from the submission of Respondent's Proposals.
- 1.13.8 (Not Used)
- 1.13.9 By signature hereon, Respondent certifies as follows:
- 1.13.9.1 "Under Section 231.006, Texas Family Code, the vendor or applicant certifies that the individual or business entity named in this contract, bid, or application is not ineligible to receive the specified grant, loan, or payment and acknowledges that this contract may be terminated, and payment may be withheld if this certification is inaccurate."
 - 1.13.9.2 "Under Section 2155.004, Texas Government Code, the vendor or applicant certifies that the individual or business entity named in this bid or contract is not ineligible to receive the specified contract and acknowledges that this contract may be terminated, and payment withheld if this certification is inaccurate."
 - 1.13.9.3 "Under Section 2254.004, Texas Government Code, the vendor or applicant certifies that each individual or business entity which is an engineer or architect proposed by Respondent as a member of its team was selected based on demonstrated competence and Proposals only."
- 1.13.10 By signature hereon, Respondent certifies that no relationship, whether by relative, business associate, capital funding agreement or by any other such kinship exist between Respondent and an employee of any member institution of The University of Texas System, or Respondent has not been an employee of any member institution of The University of Texas System within the immediate twelve (12) months prior to your Request For Competitive Sealed Proposals response. All such disclosures will be subject to administrative review and approval prior to the Owner entering into any contract with Respondent.

- 1.13.11 By signature hereon, Respondent affirms that no compensation has been received for participation in the preparation of the specifications for this Request for Competitive Sealed Proposals (reference Section 2155.004 Texas Government Code).
- 1.13.12 Respondent represents and warrants that all articles and services quoted in response to this Request for Competitive Sealed Proposals meet or exceed the safety standards established and promulgated under the Federal Occupational Safety and Health Law (Public Law 91-596) and its regulations in effect or proposed as of the date of this solicitation.
- 1.13.13 By signature hereon, Respondent signifies his compliance with all federal laws and regulations pertaining to Equal Employment Opportunities and Affirmative Action.
- 1.13.14 By signature hereon, Respondent agrees to defend, indemnify, and hold harmless the State of Texas, all of its officers, agents and employees from and against all claims, actions, suits, demands, proceedings, costs, damages, and liabilities, arising out of, connected with, or resulting from any acts or omissions of Respondent or any agent, employee, subcontractor, or supplier of Respondent in the execution or performance of any agreements or other contractual arrangements which may result from the submission of Respondent's Proposals.
- 1.13.15 By signature hereon, Respondent agrees that any payments that may become due under any agreements or other contractual arrangements, which may result from the submission of Respondent's Proposals, will be applied towards any debt including, but not limited to, delinquent taxes and child support that is owed to the State of Texas.
- 1.13.16 By signature hereon, Respondent agrees that this project will utilize the Owner Controlled Insurance Program (OCIP) and the Owner provided Builder's Risk Insurance program and will bind all contractors and subcontractors to participate in the program. The Respondent acknowledges that it has received, and reviewed information required to be provided about the OCIP program at least ten (10) days before entering into this contract and will provide this information to all contractors and subcontractors at least ten (10) days before entering into a contract with them.
- 1.13.17 DISCLOSURE OF INTERESTED PARTIES STATUTE. In its proposal, Respondents must agree to comply with Section 2252.908, Texas Government Code ("Disclosure of Interested Parties Statute") and 1 Texas Administration Code Sections 46.1 through 46.3 ("Disclosure of Interested Parties Regulations") as implemented by the Texas Ethics Commission ("TEC"), including, among other things, providing the TEC and University with the information required by the Disclosure of Interested Parties Statute and the Disclosure of Interested Parties Regulations on the form promulgated by the TEC and set forth in APPENDIX EIGHT. The form will be required to be submitted to Owner prior to the countersigning of the final agreement and not submitted with this RFP.

- 1.13.18 By signature hereon, Respondent certifies that the only member(s) of the Board of Regents of The University of Texas System, or the Executive Officers of The University of Texas System or it's member institutions that has a financial interest, directly or indirectly, in the transaction that is the subject of the contract is identified below. Attach additional pages as necessary.

(Name)

(Firm's Business Title)

(UT System Title)

- 1.13.19 The Respondent must complete, sign and return this Execution of Offer as part of their submittal response. The Respondent's company official(s) who are authorized to commit to such a submittal must sign submittals. Failure to sign and return this form will subject the submittal to disqualification.

(Respondent's Name)

(Title)

(Authorized Signature)

(Date)



GEOTECHNICAL ENGINEERING STUDY

FOR

**PROPOSED SCHOOL OF MEDICINE CLASSROOM AND OFFICE BUILDING
UNIVERSITY OF TEXAS RIO GRANDE VALLEY – EDINBURG CAMPUS
EDINBURG, HIDALGO COUNTY, TEXAS**

Project No. AMA18-007-00
March 1, 2018

Ms. Laura Lara, AIA
Senior Project Manager
The University of Texas System
Office of Facilities, Planning, and Construction (OFPC)
2102 Treasure Hills Boulevard, Suite 3.124
Harlingen, Texas 78550

**Re: Proposal for Geotechnical Engineering Services
University of Texas Rio Grande Valley (UTRGV) – Edinburg Campus
Proposed New School of Medicine Classroom and Office Building
Within the Northwest Portion of the Existing School Campus
1201 West University Drive
Edinburg, Hidalgo County, Texas
OFPC Project No. 903-1159**

Dear Ms. Lara:

RABA KISTNER Consultants Inc. (RKCI) is pleased to submit the report of our Geotechnical Engineering Study for the above-referenced project. This study was performed in accordance with **RKCI** Proposal No. PMA18-007-00, dated January 31, 2018. Written authorization for this study was received by our firm via electronic-mail attachment on Friday, February 9, 2018, by means of the *Technical Service Provider Work Order No. 08-903-1159-06-A*, dated February 9, 2018 to the OFPC Contract No. OFPC 17 GEO 29. The purpose of this study was to drill borings within the project site, to perform laboratory testing to classify and characterize subsurface conditions, and to prepare an engineering report presenting foundation design and construction recommendations for the proposed building addition.

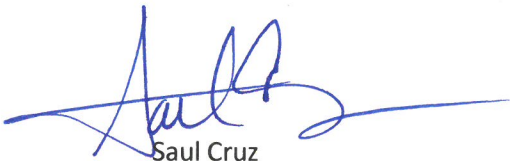
The following report contains our foundation recommendations and considerations based on our current understanding of finished floor elevation, design tolerances and structural loads. If any of these parameters change, then there may be alternatives for value engineering of the foundation system, and **RKCI** recommends that a meeting be held with The University of Texas System OFPC (CLIENT) and design team to evaluate these alternatives.

March 1, 2018

We appreciate the opportunity to be of professional service to you on this project. Should you have any questions about the information presented in this report, please call. We look forward to assisting The University of Texas System OFPC during the construction of the project by conducting the construction materials engineering and testing services (quality assurance program).

Very truly yours,

RABA KISTNER CONSULTANTS, INC.



Saul Cruz
Graduate Engineer

Attachments

SC/KML

Copies Submitted: Above (1)
Intelligent Engineering Services, LLP (1)
Muñoz & Company (1)



Katrin M. Leonard, P.E.
Associate



GEOTECHNICAL ENGINEERING STUDY

For

**PROPOSED SCHOOL OF MEDICINE CLASSROOM AND OFFICE BUILDING
UNIVERSITY OF TEXAS RIO GRANDE VALLEY – EDINBURG CAMPUS
WITHIN THE NORTHWEST PORTION OF THE EXISTING SCHOOL CAMPUS
1201 WEST UNIVERSITY DRIVE
EDINBURG, HIDALGO COUNTY, TEXAS
OFPC PROJECT NO. 903-1159**

Prepared for

THE UNIVERSITY OF TEXAS SYSTEM OFPC
Harlingen, Texas

Prepared by

RABA KISTNER CONSULTANTS, INC.
McAllen, Texas

PROJECT NO. AMA18-007-00
March 1, 2018

TABLE OF CONTENTS

INTRODUCTION	1
PROJECT DESCRIPTION	1
LIMITATIONS	1
BORINGS AND LABORATORY TESTS	2
GENERAL SITE CONDITIONS	4
SITE DESCRIPTION	4
GEOLOGY	4
SEISMIC COEFFICIENTS	4
STRATIGRAPHY	5
CORROSIVITY POTENTIAL	6
GROUNDWATER	6
FOUNDATION ANALYSIS	7
EXPANSIVE SOIL-RELATED MOVEMENTS	7
PVR REDUCTION RECOMMENDATION	7
FOUNDATION RECOMMENDATIONS	9
SITE GRADING	9
DRILLED, STRAIGHT-SHAFT PIERS	9
Pier Shafts	10
Allowable Uplift Resistance	11
Pier Spacing	11
GRADE BEAMS	12
FLOOR SLABS	12
LATERAL RESISTANCE	12
LATERAL EARTH PRESSURES	13
Backfill Compaction	14
Waterproofing	14
AREA FLATWORK	15
FOUNDATION CONSTRUCTION CONSIDERATIONS	15

TABLE OF CONTENTS

SITE DRAINAGE	15
SITE PREPARATION	15
SELECT FILL	16
DRILLED PIERS.....	17
Reinforcement and Concrete Placement	17
Temporary Casing.....	17
EXCAVATION SLOPING AND BENCHING	18
EXCAVATION EQUIPMENT	18
UTILITIES	18
CONSTRUCTION RELATED SERVICES	19
CONSTRUCTION MATERIALS TESTING AND OBSERVATION SERVICES	19
BUDGETING FOR CONSTRUCTION TESTING.....	20

ATTACHMENTS

Boring Location Map
Logs of Borings
Key to Terms and Symbols
Results of Soil Sample Analyses
Consolidation Test Report
Important Information About Your Geotechnical Engineering Report

INTRODUCTION

RABA KISTNER Consultants Inc. (RKCI) has completed the authorized subsurface exploration and foundation analysis for the proposed School of Medicine Classroom and Office building addition to be located within the northwest portion of the existing University of Texas Rio Grande Valley (UTRGV) school campus, situated at 1201 West University Drive in Edinburg, Hidalgo County, Texas. This report briefly describes the procedures utilized during this study and presents our findings along with our recommendations for foundation design and construction considerations.

PROJECT DESCRIPTION

We understand that the proposed project consists of the design and construction of a three-story, rectangle-shaped, steel-framed, about 25,000 ft² (in footprint area), educational building addition to the existing UTRGV school campus in Edinburg, Hidalgo County, Texas. The proposed building will be located within the northwest portion of the existing UTRGV campus, situated at 1201 W. University Drive in Edinburg, Hidalgo County, Texas. The proposed building addition is expected to create relatively moderate to heavy loads to be carried by the foundation system, which is anticipated to consist of a deep foundation. The pavement systems are anticipated to consist of either a flexible (asphalt) and/or rigid (concrete) pavements.

Further, based on the *Geotechnical Engineering Information Request* document, dated January 29, 2018, prepared by Intelligent Engineering Services, LLP, the project's structural engineering firm, and provided to our office via electronic-mail attachment by Ms. Laura Lara, AIA, Senior Project Manager with The University of Texas System Office of Facilities, Planning, and Construction (The University of Texas System OFPC) on Monday, January 29, 2018, we understand that the maximum column loads for the proposed building addition is anticipated to be about 500 kips.

On the basis of Sheet No. C101 of the plans titled "University of Texas Health Science Center at San Antonio – South Texas Medical Academic Building," dated April 8, 2014, and provided to our office via electronic-mail attachment on Monday, February 26, 2018 by Ms. Lara with The University of Texas System OFPC (CLIENT), we understand that the ground surface elevations existing at the time of our study within the building addition footprint area range from about 91.0 ft to 92.0 ft above mean sea level (MSL), and that the finished floor elevation (FFE) of the building addition is planned to be 96.7 ft above MSL. Therefore, it is anticipated that a minimum of about 4.2 ft of suitable, select fill materials will be placed within the building addition footprint area in order to achieve the proposed building's finished grade elevation (FGE) of about 96.2 ft above MSL, considering a 6-inch thick, concrete floor slab.

LIMITATIONS

This engineering report has been prepared in accordance with accepted Geotechnical Engineering practices in the region of South Texas and for the use of The University of Texas System OFPC and its representatives for design purposes. This report may not contain sufficient information for purposes of

other parties or other uses. This report is not intended for use in determining construction means and methods.

The recommendations submitted in this report are based on the data obtained from two borings drilled at this site and our understanding of the project information provided to us by the CLIENT. If the project information described in this report is incorrect, is altered, or if new information is available, we should be retained to review and modify our recommendations.

This report may not reflect the actual variations of the subsurface conditions across the site. The nature and extent of variations across the site may not become evident until construction commences. The construction process itself may also alter subsurface conditions. If variations appear evident at the time of construction, it may be necessary to reevaluate our recommendations after performing on-site observations and tests to establish the engineering impact of the variations.

The scope of our Geotechnical Engineering Study does not include an environmental assessment of the air, soil, rock, or water conditions either on or adjacent to the site. No environmental opinions are presented in this report. **RKCI**'s scope of work does not include the investigation, detection, or design related to the prevention of any biological pollutants. The term "biological pollutants" includes, but is not limited to, mold, fungi, spores, bacteria, and viruses, and the byproduct of any such biological organisms.

If final grade elevations are significantly different from the proposed site grading information provided to us by the CLIENT, our office should be informed about these changes. If needed and/or if desired, we will reexamine our analyses and make supplemental recommendations.

BORINGS AND LABORATORY TESTS

Subsurface conditions at the subject site were evaluated by seven borings drilled within the site, as shown in the following table:

Proposed Structure	Number of Borings	Depth, ft. *	Boring Identification
Educational Building Addition	2	75	B-1 and B-2

* below the ground surface elevations existing at the time of our study.

The borings (designated as "B-") were drilled on February 16, 2018, at the locations shown on the Boring Location Map, Figure 1. The boring locations are approximate and were located in the field by an **RKCI** representative based on the undated and untitled site plan provided to us by the CLIENT via electronic-mail attachment on January 29, 2018. The borings were conducted utilizing straight flight augers in combination with mud rotary drilling techniques and were backfilled with the auger cuttings following completion of the drilling operations. During the drilling activities, the following Split-Spoon (with Standard Penetration Test, SPT) and Shelby-tube (ST) samples were collected.

The SPT and ST samples were obtained in accordance with accepted standard practices and the penetration test results are presented as “blows per foot” on the boring logs. Representative portions of the samples were sealed in containers to reduce moisture loss, labeled, packaged, and transported to our laboratory for subsequent testing and classification.

In the laboratory, each sample was evaluated and visually classified by a member of our Geotechnical Engineering staff in general accordance with the Unified Soil Classification System (USCS). The geotechnical engineering properties of the strata were evaluated by the following laboratory tests: natural moisture content, Atterberg limits, unconfined compressive strength tests, dry unit weight determinations, a consolidation test, a corrosivity test (including electrical resistivity, pH, and chloride and sulfate content determinations), and percent passing a No. 200 sieve determinations.

With the exception of the laboratory consolidation and corrosivity (pH, electrical resistivity, and sulfate and chloride content determinations), the results of the laboratory tests are presented in graphical or numerical form on the boring logs illustrated on Figures 2 and 3. A key to the classification of terms and symbols used on the logs is presented on Figure 4. The results of the laboratory and field testing are also tabulated on Figure 5 for ease of reference.

The corrosion potential of the subsurface soils to concrete and uncoated steel was evaluated by conducting laboratory analyses (pH, electrical resistivity, sulfate content and chloride content) on a single soil sample obtained near Boring B-1, from an approximate depth of 1 ft below the ground surface elevation existing at the time of our study.

Standard penetration test results are noted as “blows per ft” on the boring logs and Figure 5, where “blows per ft” refers to the number of blows by a falling hammer required for 1 ft of penetration into the soil. Where hard materials were encountered, the tests were terminated at 50 blows even if one foot of penetration had not been achieved.

Samples will be retained in our laboratory for 30 days after submittal of this report. Other arrangements may be provided at the request of the CLIENT.

A single one-dimensional incremental consolidation test was performed on one sample to define the compressibility characteristics of the existing subgrade soils. Results of the consolidation test are presented graphically and numerically in Figures 6 through 10 and are also summarized in the following table:

Boring No.	Depth, ft*	Dry Density, pcf	P _o ksf	P _c ksf	OCR	C _{ce}	C _{re}	e _o
B-1	20	102.3	1.29	1.2	0.93	0.09	0.007	0.618

Note: The compression and recompression indices shown are “modified” indices as described by Holtz and Kovacs, 1981. These indices were taken from a strain-log P curve, rather than an e-log P curve.

*Below the ground surface elevation existing at the time of our field study.

GENERAL SITE CONDITIONS

SITE DESCRIPTION

The subject site for the proposed building addition is located within the northwest portion of the existing UTRGV school campus, situated at 1201 West University Drive in Edinburg, Hidalgo County, Texas. At the time of our field activities, the project site can be described as an existing, grass-covered, detention pond. In general, the topography at the subject site can be described as a depressed, detention pond area (sloping downwards from all sides). Surface drainage is estimated to be very poor. The subject site is bounded to the north by W. Schunior Street; to the south by an existing parking lot; to the east by a driveway, followed by parking lots; and to the west the existing school campus building.

GEOLOGY

A cursory review of the Geologic Atlas of Texas, (McAllen-Brownsville Sheet, dated 1976), published by the Bureau of Economic Geology at the University of Texas at Austin, indicates that the subject site appears to be located within Windblown deposits consisting of stabilized sand dune deposits of the Quaternary epoch (Holocene period).

According to the Soil Survey of Hidalgo County, Texas, published by the United States Department of Agriculture - Soil Conservation Service, in cooperation with the Texas Agricultural Experiment Station, the project site appears to be located within the Hidalgo soil association consisting of deep, moderately permeable soils that typically have a dark grayish-brown, sandy clay loam surface layer. The corresponding soil symbol appears to be 31, Hidalgo-Urban land complex, 0 to 1 percent slopes.

SEISMIC COEFFICIENTS

Based upon a review of Section 1613 *Earthquake Loads* of the 2012 International Building Code (IBC), the following information has been summarized for seismic considerations associated with this site.

- Site Class Definition (Chapter 20 of the American Society of Civil Engineers [ASCE] 7): **Class D**. Based on the soil borings conducted for this investigation, the upper 100 feet of soil may be characterized as a stiff soil profile.
- Risk-Targeted Maximum Considered Earthquake Ground Motion Response Accelerations for the Conterminous United States of a 0.2-Second, Spectral Response Acceleration (5% of Critical Damping) (Figure 1613.3.1(1)): **$S_s = 0.043g$** . Note that the value taken from Figure 1613.3.1(1) is based on Site Class B and is adjusted as per 1613.3.3 below.
- Risk-Targeted Maximum Considered Earthquake Ground Motion Response Accelerations for the Conterminous United States of a 1-Second, Spectral Response Acceleration (5% of Critical Damping) (Figure 1613.3.1(2)): **$S_1 = 0.015g$** . Note that the value taken from Figure 1613.3.1(2) is based on Site Class B and is adjusted as per 1613.3.3 below.
- Value of Site Coefficient (Table 1613.3.3 (1)): *from worksheet* **$F_a = 1.6$** .
- Value of Site Coefficient (Table 1613.3.3 (2)): *from worksheet* **$F_v = 2.4$** .

The Maximum Considered Earthquake Spectral Response Accelerations are as follows:

- 0.2 sec., adjusted based on equation 16-37: *from worksheet* $S_{ms} = 0.070g$.
- 1 sec., adjusted based on equation 16-38: *from worksheet* $S_{m1} = 0.035g$.

The Design Spectral Response Acceleration Parameters are as follows:

- 0.2 sec., based on equation 16-39: *from worksheet* $S_{Ds} = 0.046g$.
- 1 sec., based on equation 16-40: *from worksheet* $S_{D1} = 0.024g$.

Based on the parameters listed above, the critical nature of the structure addition, Tables 1613.3.5(1) and 1613.3.5(2), and calculations performed using a Java program titled, "Seismic Hazard Curves and Uniform Hazard Response Spectra" published by the United States Geological Survey (USGS) website, the Seismic Design Category for both short period and 1 second response accelerations is **A**. As part of the assumptions required to complete the calculations, a Risk Category of **III** was selected.

STRATIGRAPHY

The subsurface stratigraphy at this site can be described by two generalized strata. Each stratum has been designated by grouping soils that possess similar physical and engineering characteristics. The boring logs should be consulted for more specific stratigraphic information. The lines designating the interfaces between strata on the boring logs represent approximate boundaries. Transitions between strata may be gradual.

Stratum I consists of dark brown to brown to light brown to light grayish-brown, stiff to hard, lean clay soils with sand, fat clay soils with sand, sandy fat clay soils, and sandy lean clay soils with calcareous nodules and black ferrous stains. This stratum was encountered in the borings from the ground surface elevations existing at the time of our study extending down to a depth of about 70 ft. Moisture contents were measured to range from about 15 to 38 percent. This stratum is classified as plastic to highly plastic, with measured plasticity indices ranging from 27 to 50 percent. Percent passing the No. 200 sieve test demonstrates percent fines ranging from about 37 to 85 percent. Undrained shear strength values of about 1.6 tons per square foot (tsf) each were measured, based on two unconfined compressive strength tests. Two unit dry weight values of about 106 pounds per cubic foot (pcf) and 107 pcf were measured for this layer. SPT N-values ranging from 8 blows to more than 50 blows per foot of penetration were measured for this stratum. These soils are classified as CL soils and/or CH soils in general accordance with the USCS.

Stratum II consists of brown, very dense, clayey sand soils. This stratum was noted in the borings from beneath Stratum I soils extending down to at least the termination depth of these borings. Moisture contents were measured to range from about 19 to 35 percent. This stratum is visually classified as moderately plastic. SPT N-values of more than 50 blows per foot of penetration were measured for this stratum. These soils may be classified as SC soils in general accordance with the USCS.

CORROSIVITY POTENTIAL

The corrosivity characteristics of the upper subsurface soils within the proposed building addition footprint area was preliminarily evaluated using a pH test, electrical resistivity test, sulfate content test, and chloride content test. This test was conducted on a single composite soil specimen obtained near Boring B-1 from the approximate depth presented on the following table. Results are summarized in the following table:

Composite Sample Location	Approximate Depth, ft *	Electrical Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (mg/kg)
Near Boring B-1	1	206	8.45	Higher than 8,000	400

*below the ground surface elevations existing at the time of our study

The result of the laboratory electrical resistivity test conducted on the composite soil sample indicates an extremely corrosive potential for corrosion to buried metals. Laboratory chloride content test results indicated a low corrosive potential for corrosion to buried metals. According to the American Concrete Institute (ACI) document titled "Guide to Durable Concrete" (ACI 201), concrete usually provides protection against rusting of adequately embedded steel because of the highly alkaline environment of the Portland cement paste. The adequacy of that protection is dependent upon the amount of the concrete cover, the quality of the concrete, the details of the construction, and the degree of exposure to chlorides from concrete-making components and external sources. It is recommended that no chloride-containing admixtures be utilized in the concrete mixes for this project. Consideration should also be given to implementing corrosion protection measures for buried metals in direct contact with the soil, such as coating metal structural elements, pipings, and/or fittings. The pH laboratory test results indicate that the surficial native soils are strongly alkaline. On the basis of the laboratory sulfate content test results, the subsurface soils appear to result in an extreme exposure of concrete to corrosion. According to these laboratory test results, the native soils result in a Class 2 severity of potential exposure of concrete to corrosion. The ACI 201 Guide indicates C 150 Type V cementitious material requirements for sulfate resistance for a Class 2 exposure. Alternatively, Type I/II concrete may be used after being mixed with 20% Class F, Fly Ash.

GROUNDWATER

Groundwater was observed in the borings conducted for this project as tabulated on the following table:

Boring Number	Approximate Depth of Groundwater Encountered During the Drilling Operations (ft)*
B-1	24.5
B-2	25.0

* below the ground surface elevations existing at the time of our study.

The boreholes were left open for the duration of the field exploration phase to allow monitoring of water levels. However, it is possible for groundwater to exist beneath this site at shallower depths on a transient basis following periods of precipitation. Fluctuations in groundwater levels occur due to variations in rainfall and surface water run-off. The construction process itself may also cause variations in the groundwater level.

Based on the findings in the borings and on our experience in this region, we believe that groundwater seepage encountered during site earthwork activities and shallow foundation construction may be controlled using temporary earthen berm and conventional sump-and-pump dewatering methods. For deep foundation excavations, this could include the use of slurry drilling and/or temporary casing (including overdrive techniques) to reduce groundwater seepage and sloughing of the subsurface soils.

FOUNDATION ANALYSIS

EXPANSIVE SOIL-RELATED MOVEMENTS

The anticipated ground movements due to swelling of the underlying soils at this site were estimated for slab-on-grade construction using the empirical procedure, Texas Department of Transportation (TxDOT) Tex-124-E, Method for Determining the Potential Vertical Rise (PVR). PVR values on the order of about 1-3/4 inches were estimated for the stratigraphic conditions encountered in the borings. The PVR value was estimated using a surcharge load of 1 pound per square inch (psi) for the concrete slab and dry moisture conditions within the regional zone of seasonal moisture variation.

The TxDOT method of estimating expansive soil-related movements is based on empirical correlations utilizing the measured plasticity indices and assuming typical seasonal fluctuations in moisture content. If desired, other methods of estimating expansive soil-related movements are available, such as estimations based on swell tests and/or soil-suction analyses. However, the performance of these tests and the detailed analysis of expansive soil-related movements were beyond the scope of the current study. It should also be noted that actual movements can exceed the calculated PVR values due to isolated changes in moisture content (such as due to leaks, landscape watering....) or if water seeps into the soils to greater depths than the assumed active zone depth due to deep trenching or excavations.

PVR REDUCTION RECOMMENDATION

As mentioned previously, on the basis of Sheet No. C101 of the plans titled "University of Texas Health Science Center at San Antonio – South Texas Medical Academic Building," dated April 8, 2014, and provided to our office via electronic-mail attachment on Monday, February 26, 2018 by the CLIENT, we understand that the ground surface elevations existing at the time of our study within the building addition footprint area range from about 91.0 ft to 92.0 ft above MSL, and that the FFE of the building addition is planned to be 96.7 ft above MSL. Therefore, it is anticipated that a minimum of about 4.2 ft of suitable, select fill materials will be placed within the building addition footprint area in order to achieve the proposed building's FGE of about 96.2 ft above MSL, considering a 6-inch thick, concrete floor slab.

To reduce expansive, soil-related movements in at-grade construction beneath the building addition footprint area to about 1 inch, we recommend the following site improvement procedure be implemented:

- Remove a minimum of 8 inches of the existing subgrade soils in order to clear the proposed building addition area of all vegetation and/or organic topsoil. The excavation shall extend a minimum of 5 ft beyond the building addition perimeter.
- Proofroll the exposed subgrade as indicated in the *Site Preparation* subsection of the *Foundation Construction Considerations* section of this report.
- Once the proofrolling operations are complete and documented, place properly-compacted, suitable, select fill materials within the proposed building addition's footprint area up to its FGE of about 96.2 ft above MSL, in 6-inch compacted lifts. Each lift should be compacted, tested, and documented as indicated in the *Select Fill* subsection of the *Foundation Construction Considerations* section of this report.

Keep in mind that the estimated PVR values are computed based on the recommendations for the selection and placement of suitable, select fill materials which are addressed in the *Foundation Construction Considerations* section of the report.

Drainage Considerations When overexcavation and select fill replacement is selected as a method to reduce the potential for expansive, soil-related movements at any site, considerations of surface and subsurface drainage may be crucial to construction and adequate foundation performance of the soil-supported structure. Filling an excavation in relatively impervious plastic clays with relatively pervious select fill material creates a “bathtub” beneath the building addition, which can result in ponding or trapped water within the fill unless good surface and subsurface drainage is provided.

Water entering the fill surfaces during construction or entering the fill exposed beyond the building addition lines after construction may create problems with fill moisture control during compaction and increased access for moisture to the underlying expansive clays both during and after construction.

Several surface and subsurface drainage design features and construction precautions can be used to limit problems associated with fill moisture. These features and precautions may include, but are not limited to, the following:

- Installing berms or swales on the uphill side of the construction area to divert surface runoff away from the excavation/fill area during construction;
- Sloping of the top of the subgrade with a minimum downward slope of 1.5 percent out to the base of a dewatering trench located beyond the building addition's perimeter;
- Sloping the surface of the fill during construction to promote runoff of rain water to drainage features until the final lift is placed;
- Sloping of a final, well-maintained, impervious clay or pavement surface (downward away from the proposed building addition) over the select fill material and any perimeter drain extending beyond the building addition lines, with a minimum gradient of 6 in. in 5 ft;

- Constructing final surface drainage patterns to prevent ponding and limit surface water infiltration at and around the building addition's perimeter;
- Locating the water-bearing utilities, roof drainage outlets, and irrigation spray heads outside of the select fill and perimeter drain boundaries; and
- Raising the elevation of the ground level floor slab.

Details relative to the extent and implementation of these considerations must be evaluated on a project-specific basis by all members of the project design team. Many variables that influence fill drainage considerations may depend on factors that are not fully developed in the early stages of design. For this reason, drainage of the fill should be given consideration at the earliest possible stages of the project.

FOUNDATION RECOMMENDATIONS

SITE GRADING

Site grading plans can result in changes in almost all aspects of foundation recommendations. We have prepared the foundation recommendations based on the site grading information provided to us by the CLIENT and the stratigraphic conditions encountered at the time of our study. If site grading plans differ from the information provided to us, we must be retained to review the site grading plans prior to bidding the project for construction. If needed and/or if desired, we will reexamine our analyses and make supplemental recommendations.

DRILLED, STRAIGHT-SHAFT PIERS

Drilled, straight-shaft piers should be considered to support the column loads of the proposed building addition structure. We recommend that piers extend to a minimum depth of 20 ft (EL. 71.0 ft) below the ground surface elevations existing at the time of our study or below final grade, whichever is greater, provided that sufficient strength is developed to support the anticipated column loads of up to 500 kips. Pier depths should be increased as required to develop sufficient resistance to support the anticipated structural loads. Allowable unit capacities have been calculated for different depths of drilled, straight-shaft piers supporting the proposed educational building addition. These unit capacities are based on the results of the field and laboratory tests conducted on soil samples obtained from the borings drilled within the site. The piers may be designed as both end bearing units and as friction units utilizing the maximum allowable end-bearing pressures and the allowable side shear resistance values tabulated in the following tables.

Approximate Depth Range (ft) *	Maximum Allowable End-Bearing Pressure (ksf)
20 to 34	12.0
35 to 39	9.5
40 to 65	18.0

*below the ground surface elevations existing at the time of our study.

Approximate Depth Range (ft) *	Allowable Side Shear Resistance (ksf)
0 to 8	0
8 to 15	0.40
15 to 25	0.75
25 to 35	0.90
35 to 40	0.75
40 to 65	1.25

*below the ground surface elevations existing at the time of our study.

The side shear resistance values presented above should be used for the portion of the shaft extending below a depth of 8 ft. If the drilled, straight-shaft piers are designed as both end bearing units and as friction units, the side shear resistance value should be neglected along the portion of the shaft located one shaft diameter from the bottom of the pier, in order to proportion the drilled piers for axial compression. The allowable values for end bearing and side shear resistance were evaluated using factors of safety of 3 and 2, respectively, with respect to the measured soil shear strength. Based on the 75-ft maximum depth of exploration, pier depths should not exceed a depth of 65-ft below the ground surface elevations existing at the time of our study.

Due to the presence of hard clays, high-powered, high-torque drilling equipment may be anticipated for drilled pier construction for piers deeper than about 30 ft. In addition, due to the presence of groundwater, the use of slurry drilling techniques and/or temporary casing should be anticipated for the construction of the drilled piers. Consequently, slightly deeper piers may be required to accommodate for the casing procedures.

Pier Shafts

The pier shafts will be subjected to potential uplift forces if the surrounding expansive soils within the active zone are subjected to alternate drying and wetting conditions. The maximum potential uplift force acting on the shafts may be estimated by:

$$F_u = 19 D$$

Where: F_u = uplift force in kips; and
 D = diameter of the shaft in feet.

It is recommended that the pier shafts be a minimum of 24 inches in diameter to facilitate reinforcing steel placement and shaft observation prior to placing concrete.

Allowable Uplift Resistance

Resistance to uplift forces exerted on the drilled, straight-shaft piers will be provided by the sustained compressive axial force (dead load) plus the allowable uplift resistance provided by the soil. The resistance provided by the soil depends on the shear strength of the soils adjacent to the pier shaft and below the depth of the active zone. The allowable uplift resistance values provided by the soils at this site are tabulated on the following table. These values were evaluated using a factor of safety of 2.

Approximate Depth Range* (ft)	Allowable Uplift Resistance (ksf)
0 to 8	0
8 to 15	0.25
15 to 25	0.50
25 to 35	0.60
35 to 40	0.50
40 to 65	0.85

*below the ground surface elevations existing at the time of our study.

Reinforcing steel will be required in each pier shaft to withstand a net force equal to the uplift force minus the uplift resistive force and the sustained compressive load carried by the pier. We recommend that each pier be reinforced to withstand this net force or an amount equal to 1 percent of the cross-sectional area of the shaft, whichever is greater.

Pier Spacing

Where possible, we recommend that the piers be spaced at a center-to-center distance of at least three shaft diameters. Such spacing will not require a reduction in the load carrying capacity of the individual piers.

If design and/or construction restraints require that piers be spaced closer than the recommended three shaft diameters, **RKCI** must re-evaluate the allowable bearing capacities presented above for the individual piers. Reductions in load carrying capacities may be required depending upon individual loading and spacing conditions.

GRADE BEAMS

For the structure addition being considered, we recommend that the grade beams interconnecting the piers be ground-supported on properly-compacted, suitable select fill materials, but designed to span the piers.

FLOOR SLABS

For the structure addition being considered, the floor slabs may be ground supported on properly-compacted, suitable, select fill materials, provided that the anticipated movements discussed under the *Expansive Soil-Related Movements* section of this report will not impair the performance of the floor, frame, or roof systems.

LATERAL RESISTANCE

Resistance to lateral loads and the expected pier behavior under the applied loading conditions will depend not only on the subsurface conditions, but also on the loading conditions, the pier type and size(s), and the engineering properties of the pier. Once the structural loadings are known, as well as the pier sizes and properties, the piers should be analyzed to determine the resulting lateral deflections, maximum bending moments, and ultimate bending moments. This type of analysis is typically performed utilizing a computer analysis program and usually requires a trial and error procedure to appropriately size the piers and meet project tolerances.

To assist the design engineer in this procedure, we are providing the soil parameters tabulated in the table shown below for use in analysis. These parameters are in accordance with the input requirements of one of the more commonly used computer programs for laterally-loaded piles, the "L-Pile Plus" program. If a different program is used for analysis, different parameters may be required and different limitations may be required than what was assumed in selecting the parameters given on the table tabulated below. Thus, if a program other than "L-Pile Plus" is used, **RKCI** must be notified of the analysis method and the required soil parameters, so that we can review and revise our recommendations, if required.

The soil-related parameters required for input into the "L-Pile Plus" program are summarized in the following table:

Soil Type	Approximate Depth Range (ft) *	c, tsf	ϕ (°)	ϵ_{50}	k_s , (pci)	k_c , (pci)	γ , (pcf)
Clay Soils (Above the Groundwater Table)	0 to 15	0.6	--	0.007	500	200	120
Clay Soils (Above the Groundwater Table)	15 to 25	1.5	--	0.005	1,000	400	125
Clay Soils (Below the Groundwater Table)	25 to 35	2.0	--	0.005	1,000	400	63
Clay Soils (Below the Groundwater Table)	35 to 40	1.5	--	0.005	1,000	400	57
Clay Soils (Below the Groundwater Table)	60 to 65	2.0	--	0.004	2,000	800	67

* Below the ground surface elevation existing at the time of our study.

Where:

c = undrained shear strength

ϕ = angle of internal friction

ϵ_{50} = strain at 50 percent

k_s = horizontal modulus of subgrade reaction (static)

k_c = horizontal modulus of subgrade reaction (cyclic)

γ = density (effective unit weight)

The values presented on the previous table for subgrade modulus are based on recommended values for the "L-Pile Plus" computer program for the strength of the subsurface conditions encountered in the borings, and are not necessarily based on laboratory test results.

The parameters presented previously **do not** include factors of safety. Consequently, it is recommended that a factor of safety of at least 2 be introduced to the analysis by doubling the applied lateral loads and moments.

LATERAL EARTH PRESSURES

Equivalent fluid density values for computation of lateral soil pressures acting on the retaining wall structures were evaluated for various types of backfill materials that may be placed behind the retaining wall structures. The table below presents at-rest, active, and passive earth pressure coefficients for various backfill soils. The at-rest pressures are recommended for cases where the wall unit will experience little yield.

Soil Type	Estimated Total Unit Weight (pcf)	Lateral Earth Pressure Coefficients			Equivalent Fluid Unit Weight (pcf)			Internal Friction Angle, Φ (°)
		At-Rest (K_0)	Active (K_a)	Passive (K_p)	At-Rest	Active	Passive	
Washed Gravel	135	0.45	0.29	3.40	60	40	460	33
Crushed Limestone	145	0.38	0.24	4.20	55	35	610	38
Clean Sand	120	0.50	0.33	3.00	60	40	360	30
Pit Run Clayey Gravel or Sands	135	0.48	0.32	3.12	65	45	425	31
Clays	120	0.74	0.59	1.70	90	70	205	15

The values tabulated above under “Active Condition” pertain to flexible retaining walls free to tilt outward as a result of lateral earth pressures. For rigid, non-yielding walls the values under “At-Rest Condition” should be used. The “Passive Condition” would pertain to a condition where the wall is gradually pushed into the soil mass.

Backfill Compaction

Placement and compaction of backfill behind the below-grade walls will be critical, particularly at locations where deep backfill will support adjacent near-grade foundations and/or flatwork. If the backfill is not properly compacted in these areas, the adjacent foundations/flatwork can be subject to settlement.

To reduce potential settlement of adjacent foundations/flatwork, the backfill materials should be placed and compacted as recommended in the *Select Fill* subsection of the *Foundation Construction Considerations* section of this report. Each lift or layer of the backfill should be tested during the backfilling operations to document the degree of compaction. Within at least a 5-ft zone of the walls, we recommend that compaction be accomplished using hand-guided compaction equipment capable of achieving the maximum dry density in a series of 3 to 5 passes.

Waterproofing

Consideration may also be given to applying waterproofing coatings to any subfloor walls. Waterproofing of the subfloor walls for capillary moisture is often accomplished by painting the wall exteriors with a bituminous material. For greater seepage protection, membrane waterproofing would be required. Based on our observations of groundwater conditions at this site, it appears that application of a bituminous material will provide adequate waterproofing for the below-grade walls.

AREA FLATWORK

It should be noted that ground-supported flatwork such as walkways, sidewalks, driveways, courtyards, etc., will be subject to the same magnitude of potential soil-related movements as discussed previously (see the *Foundation Analyses* section of the report). Thus, where these types of elements abut rigid structure foundations, differential movements should be anticipated. As a minimum, we recommend that flexible joints be provided where such elements abut the main structure to allow for differential movement at these locations. Where the potential for differential movement is objectionable, it may be beneficial to consider methods of reducing anticipated movements to match the adjacent structure's performance.

FOUNDATION CONSTRUCTION CONSIDERATIONS

SITE DRAINAGE

Drainage is an important key to the successful performance of any foundation. Good surface drainage should be established prior to and maintained after construction to help prevent water from ponding within or adjacent to the building addition's foundation and to facilitate rapid drainage away from the building addition's foundation. Failure to provide positive drainage away from the structure addition can result in localized differential vertical movements in soil supported foundations and floor slabs (which can in turn result in cracking in the sheetrock partition walls, and shifting of ceiling tiles, as well as improper operation of windows and doors).

Current ordinances, in compliance with the Americans with Disabilities Act (ADA), may dictate maximum slopes for walks and drives around and into new buildings. These slope requirements can result in drainage problems for buildings supported on expansive soils. We recommend that, on all sides of the building addition, the maximum permissible slope be provided away from the building addition.

Also to help control drainage in the vicinity of the structure addition, we recommend that roof/gutter downspouts and landscaping irrigation systems not be located adjacent to the building addition's foundation. Where a select fill overbuild is provided outside of the floor slab/foundation footprint, the surface should be sealed with an impermeable layer (pavement or clay cap) to reduce infiltration of both irrigation and surface waters. Careful consideration should also be given to the location of water bearing utilities, as well as to provisions for drainage in the event of leaks in water bearing utilities. All leaks should be immediately repaired.

Other drainage and subsurface drainage issues are discussed in the *Expansive Soil-Related Movements* section of this report.

SITE PREPARATION

The proposed building addition structure area and all areas to support select fill should be stripped of all vegetation and/or organic topsoil down to a minimum depth of 8 inches and extending a minimum of 5 ft

beyond the footprint of the proposed building addition. Further, as discussed in a previous section of this report, we recommend that the PVR reduction option be utilized to reduce expansive, soil-related movements to about 1 inch.

Beyond the building pad footprint, existing utilities and trenches that are not removed should be properly abandoned. This would include grouting abandoned pipes and sealing off granular fill in trenches to prevent the migration and seepage of water into the foundation areas of the new buildings.

Exposed subgrades should be thoroughly proofrolled in order to locate and densify any weak, compressible zones. A minimum of 5 passes of a fully-loaded dump truck or a similar heavily-loaded piece of construction equipment should be used for planning purposes. Proofrolling operations should be observed by the Geotechnical Engineer or his representative to document subgrade condition and preparation. Weak or soft areas identified during proofrolling should be removed and replaced with suitable, compacted on-site clays, free of organics, oversized materials, and degradable or deleterious materials.

Upon completion of the proofrolling operations and just prior to fill placement or slab construction, the exposed subgrade should be moisture conditioned by scarifying to a minimum depth of 6 in. and recompacting to a minimum of 98 percent of the maximum density determined from the American Society for Testing and Materials (ASTM) D698, Compaction Test. The moisture content of the subgrade should be maintained within the range of the optimum moisture content to three percentage points above the optimum moisture content until the final lift of fill is permanently covered.

SELECT FILL

Materials used as select fill for final site grading preferably should be crushed stone or gravel aggregate. We recommend that materials specified for use as select fill meet the TxDOT 2014 Standard Specification for Construction and Maintenance of Highways, Streets, and Bridges, Item 247, Flexible Base, Type A through Type E, Grades 1, 2, 3, and 5.

Alternatively, the following soils, as classified according to the USCS, may be considered satisfactory for use as select fill materials at this site: CL, SC, GC and combinations of these soils. In addition to the USCS classification, alternative select fill materials shall have a maximum liquid limit of 40 percent, a plasticity index between 7 and 18 percent, and a maximum particle size not exceeding 4 inches or one-half the loose lift thickness, whichever is smaller. In addition, if these materials are utilized, grain size analyses and Atterberg Limits must be performed during placement at a minimum rate of one test each per 5,000 cubic yards of material due to the high degree of variability associated with pit-run materials.

If the above listed alternative materials are being considered for bidding purposes, the materials should be submitted to the Geotechnical Engineer for pre-approval a minimum of 10 working days or more prior to the bid date. Failure to do so will be the responsibility of the General Contractor. The General Contractor will also be responsible for ensuring that the properties of all delivered alternate select fill materials are similar to those of the pre-approved submittal. It should also be noted that when using alternative fill materials, difficulties may be experienced with respect to moisture control during and subsequent to fill

placement, as well as with erosion, particularly when exposed to inclement weather. This may result in sloughing of beam trenches and/or pumping of the fill materials.

Soils classified as CH, CL, MH, ML, SM, GM, OH, OL, and Pt under the USCS and not meeting the alternative select fill material requirements, are **not** considered suitable for use as select fill materials at this site. The native soils at this site are **not** considered suitable for use as select fill materials.

Select fill should be placed in loose lifts **not** exceeding 8 in. in thickness and compacted to at least 98 percent of the maximum dry density as determined by ASTM D698. The moisture content of the fill should be maintained within the range of two percentage points below the optimum moisture content to two percentage points above the optimum moisture content until the final lift of fill is permanently covered.

The select fill should be properly compacted in accordance with these recommendations and tested by **RKCI** personnel for compaction as specified.

DRILLED PIERS

Drilled pier excavations must be examined by an **RKCI** representative who is familiar with the geotechnical aspects of the subsurface stratigraphy, the structural configuration, foundation design details, and assumptions prior to placing concrete. This is to observe that:

- The shaft has been excavated to the specified dimensions at the correct depth established by the previously mentioned criteria;
- The shaft has been drilled plumb within specified tolerances along its total length; and
- Excessive cuttings, buildup and soft, compressible materials have been removed from the bottom of the excavation.

Drilled pier excavation observations should be scheduled with the Geotechnical Engineer a minimum of 48 hours prior to pier drilling. Failure to do so will be the responsibility of the General Contractor.

Reinforcement and Concrete Placement

Reinforcing steel should be checked for size and placement prior to concrete placement. Placement of concrete should be accomplished as soon as possible after excavation to reduce changes in the moisture content or the state of stress of the foundation materials. Concrete should not be placed in the pier excavations without the approval of the Engineer. No foundation element should be left open overnight without concreting.

Temporary Casing

Groundwater was observed in the borings drilled within the proposed building addition footprint area at the time of our drilling operations at depths ranging from about 24.5 ft to 25.0 ft below the ground surface elevations existing at the time of our study. Groundwater seepage and/or side sloughing will be

encountered at the time of construction, depending on climatic conditions prevalent at the time of construction. Therefore, we recommend that the bid documents require the foundation contractor to specify unit costs for different lengths of casing and/or slurry drilling techniques which will be required.

EXCAVATION SLOPING AND BENCHING

Excavations that extend to or below a depth of 5 ft below construction grade shall require the General Contractor to develop a trench safety plan to protect personnel entering the trench or trench vicinity. The collection of specific geotechnical data and the development of such a plan, which could include designs for sloping and benching or various types of temporary shoring, is beyond the scope of the current study. Any such designs and safety plans shall be developed in accordance with current Occupational Safety and Health Administration (OSHA) guidelines and other applicable industry standards.

EXCAVATION EQUIPMENT

SPT N-values in excess of 50 blows per foot were recorded at this site as shallow as 30 ft below the ground surface elevations existing at the time of our study. Thus, hard subsurface conditions should be anticipated during deep foundation construction activities at the site. The boring logs are not intended for use in determining construction means and methods and may therefore be misleading if used for that purpose. We recommend that earthwork and utility contractors interested in bidding on the work perform their own tests in the form of test pits and/or test piers to determine the quantities of the different materials to be excavated, as well as the preferred excavation methods and equipment for the site.

UTILITIES

Utilities which project through slab-on-grade, slab-on-fill, or any other rigid unit should be designed with either some degree of flexibility or with sleeves. Such design features will help reduce the risk of damage to the utility lines as vertical movements occur. These types of slabs will generally be constructed as monolithic, grid type beam and slab foundations.

Our experience indicates that significant settlement of backfill can occur in utility trenches, particularly when trenches are deep, when backfill materials are placed in thick lifts with insufficient compaction, and when water can access and infiltrate the trench backfill materials. The potential for water to access the backfill is increased where water can infiltrate flexible base materials due to insufficient penetration of curbs, and at sites where geological features can influence water migration into utility trenches (such as fractures within a rock mass or at contacts between rock and clay formations). It is our belief that another factor which can significantly impact settlement is the migration of fines within the backfill into the open voids in the underlying free-draining bedding material.

To reduce the potential for settlement in utility trenches, we recommend that consideration be given to the following:

- All backfill materials should be placed and compacted in controlled lifts appropriate for the type of backfill and the type of compaction equipment being utilized and all backfilling procedures should be tested and documented;
- Consideration should be given to wrapping free-draining bedding gravels with a geotextile fabric (similar to Mirafi 140N) to reduce the infiltration and loss of fines from backfill material into the interstitial voids in bedding materials; and
- Locating the water-bearing utilities, roof drainage outlets and irrigation spray heads outside of the select fill and perimeter drain boundaries.

CONSTRUCTION RELATED SERVICES

CONSTRUCTION MATERIALS TESTING AND OBSERVATION SERVICES

As presented in the attachment to this report, *Important Information About Your Geotechnical Engineering Report*, subsurface conditions can vary across a project site. The conditions described in this report are based on interpolations derived from a limited number of data points. Variations will be encountered during construction, and only the geotechnical design engineer will be able to determine if these conditions are different than those assumed for design.

Construction problems resulting from variations or anomalies in subsurface conditions are among the most prevalent on construction projects and often lead to delays, changes, cost overruns, and disputes. These variations and anomalies can best be addressed if the geotechnical engineer of record, **RKCI** is retained to perform construction observation and testing services during the construction of the project. This is because:

- **RKCI** has an intimate understanding of the geotechnical engineering report's findings and recommendations. **RKCI** understands how the report should be interpreted and can provide such interpretations on site, on the client's behalf.
- **RKCI** knows what subsurface conditions are anticipated at the site.
- **RKCI** is familiar with the goals of the owner and project design professionals, having worked with them in the development of the geotechnical workscope. This enables **RKCI** to suggest remedial measures (when needed) which help meet the owner's and the design teams' requirements.
- **RKCI** has a vested interest in client satisfaction, and thus assigns qualified personnel whose principal concern is client satisfaction. This concern is exhibited by the manner in which contractors' work is tested, evaluated and reported, and in selection of alternative approaches when such may become necessary.
- **RKCI** cannot be held accountable for problems which result due to misinterpretation of our findings or recommendations when we are not on hand to provide the interpretation which is required.

BUDGETING FOR CONSTRUCTION TESTING

Appropriate budgets need to be developed for the required construction testing and observation activities. At the appropriate time before construction, we advise that **RKCI** and the project designers meet and jointly develop the testing budgets, as well as review the testing specifications as it pertains to this project.

Once the construction testing budget and scope of work are finalized, we encourage a preconstruction meeting with the selected contractor to review the scope of work to make sure it is consistent with the construction means and methods proposed by the contractor. **RKCI** looks forward to the opportunity to provide continued support on this project, and would welcome the opportunity to meet with the Project Team to develop both a scope and budget for these services.

* * * * *

The following figures are attached and complete this report:

Figure 1	Boring Location Map
Figures 2 and 3	Logs of Borings
Figure 4	Key to Terms and Symbols
Figure 5	Results of Soil Analyses
Figures 6 through 10	Consolidation Test Report

ATTACHMENTS

O:\Active Projects\McAllen\2018\AMA18\AMA18-007-00 Prop. UTRGV Medical Bldg Add - Edinburg Drawings\Figure 1 - 11x17.dwg





Engineering • Testing • Environmental
Facilities • Infrastructure

800 E. Hackberry Avenue
McAllen, Texas 78501
(956)682-5332 TEL
(956)682-5487 FAX
www.rkci.com
TBPE Firm F-3257

BORING LOCATION MAP

**SCHOOL OF MEDICINE CLASSROOM
AND OFFICE BUILDING ADDITION**

THE UNIVERSITY OF TEXAS AT RIO GRANDE VALLEY
EDINBURG, HIDALGO COUNTY, TEXAS

REVISIONS:		
No.	DATE	DESCRIPTION
PROJECT No.: AMA18-007-00		
ISSUE DATE:	02-28-18	
DRAWN BY:	DV	
CHECKED BY:	SC	
REVIEWED BY:	KML	

FIGURE
1

LOG OF BORING NO. B-1

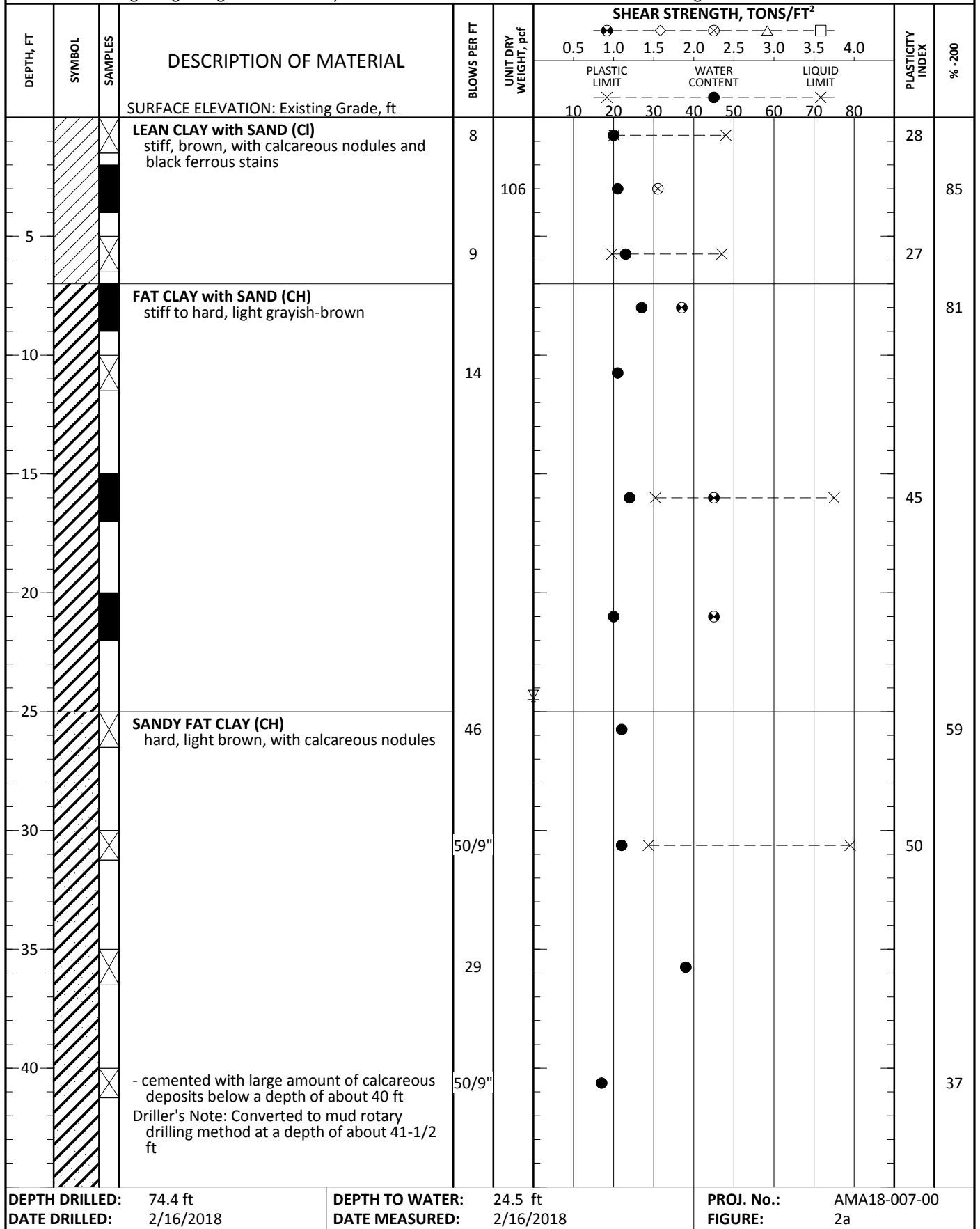
School of Medicine Classroom and Office Building Addition
The University of Texas at Rio Grande Valley
Edinburg, Hidalgo County, Texas



DRILLING

METHOD: Straight Flight Auger & Mud Rotary

LOCATION: See Figure 1



NOTE: THESE LOGS SHOULD NOT BE USED SEPARATELY FROM THE PROJECT REPORT

DEPTH DRILLED: 74.4 ft	DEPTH TO WATER: 24.5 ft	PROJ. No.: AMA18-007-00
DATE DRILLED: 2/16/2018	DATE MEASURED: 2/16/2018	FIGURE: 2a

LOG OF BORING NO. B-1

School of Medicine Classroom and Office Building Addition
The University of Texas at Rio Grande Valley
Edinburg, Hidalgo County, Texas



DRILLING

METHOD: Straight Flight Auger & Mud Rotary

LOCATION: See Figure 1

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WEIGHT, pcf	SHEAR STRENGTH, TONS/FT ²										PLASTICITY INDEX	% -200
						0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0											
						PLASTIC LIMIT WATER CONTENT LIQUID LIMIT											
SURFACE ELEVATION: Existing Grade, ft						10 20 30 40 50 60 70 80											
			SANDY FAT CLAY (CH) hard, light brown, with calcareous nodules <i>(continued)</i>	50/9"													
50				50/5"													
55				50/4"													
60				50/4"													
65				42													
70			CLAYEY SAND (SC) very dense, brown	REF/ 4"													
75				50/5"													
75			Boring terminated at a depth of about 74.4 ft.														
80			NOTES: During the drilling operations, groundwater was encountered at a depth of about 24.5 ft.														
85																	
DEPTH DRILLED: 74.4 ft			DEPTH TO WATER: 24.5 ft			PROJ. No.: AMA18-007-00											
DATE DRILLED: 2/16/2018			DATE MEASURED: 2/16/2018			FIGURE: 2b											

×

×

NOTE: THESE LOGS SHOULD NOT BE USED SEPARATELY FROM THE PROJECT REPORT

LOG OF BORING NO. B-2

School of Medicine Classroom and Office Building Addition
The University of Texas at Rio Grande Valley
Edinburg, Hidalgo County, Texas



DRILLING

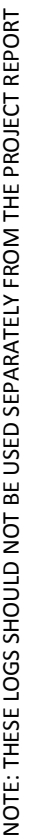
METHOD: Straight Flight Auger & Mud Rotary

LOCATION: See Figure 1

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WEIGHT, pcf	SHEAR STRENGTH, TONS/FT ²										PLASTICITY INDEX	% -200			
						0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0														
						PLASTIC LIMIT WATER CONTENT LIQUID LIMIT														
SURFACE ELEVATION: Existing Grade, ft						10 20 30 40 50 60 70 80														
5			SANDY LEAN CLAY (CL) stiff, dark brown to brown, with black ferrous stains	8	107												58			
				13												30				
			FAT CLAY with SAND (CH) very stiff, brown, with calcareous nodules																81	
				19													36			
			SANDY FAT CLAY (CH) hard, brown, with calcareous nodules																	69
20																				
25																				
30																				
35																				
40																				
- cemented with large amount of calcareous deposits below a depth of about 40 ft Driller's Note: Converted to mud rotary drilling method at a depth of about 41-1/2 ft			50/9"																	
DEPTH DRILLED: 74.5 ft DATE DRILLED: 2/16/2018			DEPTH TO WATER: 25 ft DATE MEASURED: 2/16/2018			PROJ. No.: AMA18-007-00 FIGURE: 3a														

NOTE: THESE LOGS SHOULD NOT BE USED SEPARATELY FROM THE PROJECT REPORT

School of Medicine Classroom and Office Building Addition
The University of Texas at Rio Grande Valley
Edinburg, Hidalgo County, Texas

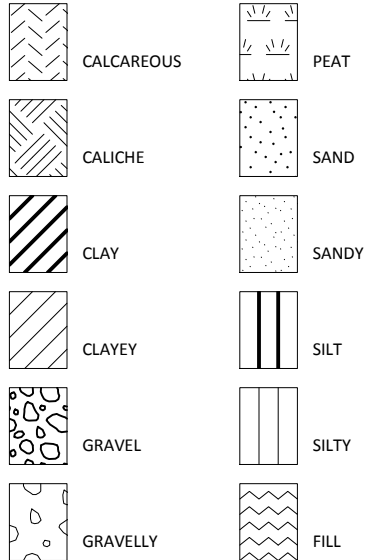


PROJ. No.:	AMA18-007-00
FIGURE:	3b

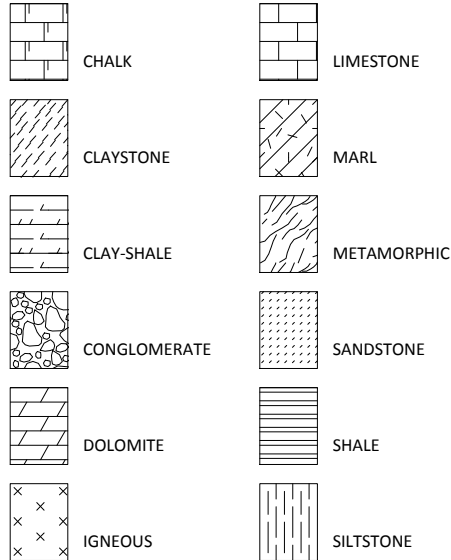
KEY TO TERMS AND SYMBOLS

MATERIAL TYPES

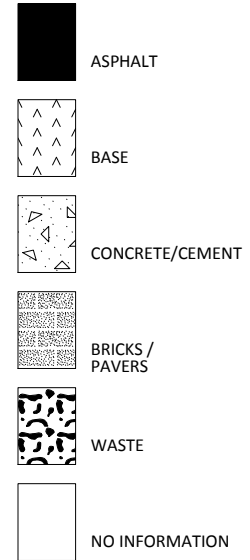
SOIL TERMS



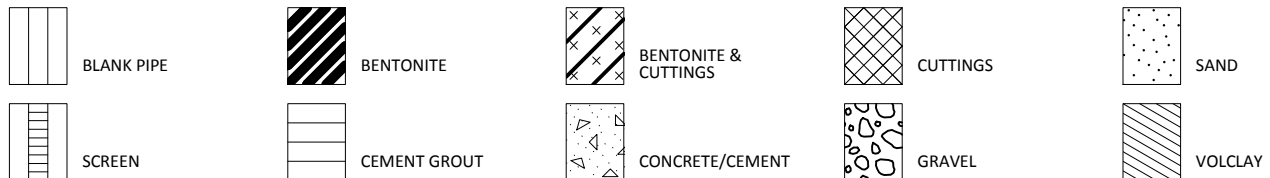
ROCK TERMS



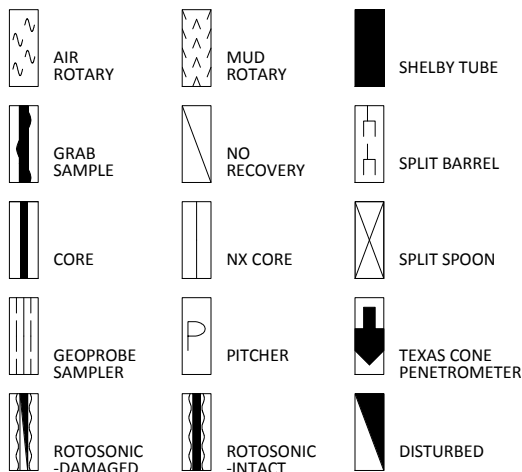
OTHER



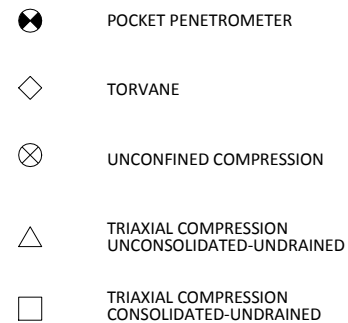
WELL CONSTRUCTION AND PLUGGING MATERIALS



SAMPLE TYPES



STRENGTH TEST TYPES



NOTE: VALUES SYMBOLIZED ON BORING LOGS REPRESENT SHEAR STRENGTHS UNLESS OTHERWISE NOTED

PROJECT NO. AMA18-007-00

KEY TO TERMS AND SYMBOLS (CONT'D)

TERMINOLOGY

Terms used in this report to describe soils with regard to their consistency or conditions are in general accordance with the discussion presented in Article 45 of SOILS MECHANICS IN ENGINEERING PRACTICE, Terzaghi and Peck, John Wiley & Sons, Inc., 1967, using the most reliable information available from the field and laboratory investigations. Terms used for describing soils according to their texture or grain size distribution are in accordance with the UNIFIED SOIL CLASSIFICATION SYSTEM, as described in American Society for Testing and Materials D2487-06 and D2488-00, Volume 04.08, Soil and Rock; Dimension Stone; Geosynthetics; 2005.

The depths shown on the boring logs are not exact, and have been estimated to the nearest half-foot. Depth measurements may be presented in a manner that implies greater precision in depth measurement, i.e 6.71 meters. The reader should understand and interpret this information only within the stated half-foot tolerance on depth measurements.

RELATIVE DENSITY

COHESIVE STRENGTH

PLASTICITY

<u>Penetration Resistance Blows per ft</u>	<u>Relative Density</u>	<u>Resistance Blows per ft</u>	<u>Consistency</u>	<u>Cohesion TSF</u>	<u>Plasticity Index</u>	<u>Degree of Plasticity</u>
0 - 4	Very Loose	0 - 2	Very Soft	0 - 0.125	0 - 5	None
4 - 10	Loose	2 - 4	Soft	0.125 - 0.25	5 - 10	Low
10 - 30	Medium Dense	4 - 8	Firm	0.25 - 0.5	10 - 20	Moderate
30 - 50	Dense	8 - 15	Stiff	0.5 - 1.0	20 - 40	Plastic
> 50	Very Dense	15 - 30	Very Stiff	1.0 - 2.0	> 40	Highly Plastic
		> 30	Hard	> 2.0		

ABBREVIATIONS

B = Benzene	Qam, Qas, Qal = Quaternary Alluvium	Kef = Eagle Ford Shale
T = Toluene	Qat = Low Terrace Deposits	Kbu = Buda Limestone
E = Ethylbenzene	Qbc = Beaumont Formation	Kdr = Del Rio Clay
X = Total Xylenes	Qt = Fluvial Terrace Deposits	Kft = Fort Terrett Member
BTEX = Total BTEX	Qao = Seymour Formation	Kgt = Georgetown Formation
TPH = Total Petroleum Hydrocarbons	Qle = Leona Formation	Kep = Person Formation
ND = Not Detected	Q-Tu = Uvalde Gravel	Kek = Kainer Formation
NA = Not Analyzed	Ewi = Wilcox Formation	Kes = Escondido Formation
NR = Not Recorded/No Recovery	Emi = Midway Group	Kew = Walnut Formation
OVA = Organic Vapor Analyzer	Mc = Catahoula Formation	Kgr = Glen Rose Formation
ppm = Parts Per Million	EI = Laredo Formation	Kgru = Upper Glen Rose Formation
	Kknm = Navarro Group and Marlbrook Marl	Kgrl = Lower Glen Rose Formation
	Kpg = Pecan Gap Chalk	Kh = Hensell Sand
	Kau = Austin Chalk	

PROJECT NO. AMA18-007-00

KEY TO TERMS AND SYMBOLS (CONT'D)

TERMINOLOGY

SOIL STRUCTURE

Slickensided	Having planes of weakness that appear slick and glossy.
Fissured	Containing shrinkage or relief cracks, often filled with fine sand or silt; usually more or less vertical.
Pocket	Inclusion of material of different texture that is smaller than the diameter of the sample.
Parting	Inclusion less than 1/8 inch thick extending through the sample.
Seam	Inclusion 1/8 inch to 3 inches thick extending through the sample.
Layer	Inclusion greater than 3 inches thick extending through the sample.
Laminated	Soil sample composed of alternating partings or seams of different soil type.
Interlayered	Soil sample composed of alternating layers of different soil type.
Intermixed	Soil sample composed of pockets of different soil type and layered or laminated structure is not evident.
Calcareous	Having appreciable quantities of carbonate.
Carbonate	Having more than 50% carbonate content.

SAMPLING METHODS

RELATIVELY UNDISTURBED SAMPLING

Cohesive soil samples are to be collected using three-inch thin-walled tubes in general accordance with the Standard Practice for Thin-Walled Tube Sampling of Soils (ASTM D1587) and granular soil samples are to be collected using two-inch split-barrel samplers in general accordance with the Standard Method for Penetration Test and Split-Barrel Sampling of Soils (ASTM D1586). Cohesive soil samples may be extruded on-site when appropriate handling and storage techniques maintain sample integrity and moisture content.

STANDARD PENETRATION TEST (SPT)

A 2-in.-OD, 1-3/8-in.-ID split spoon sampler is driven 1.5 ft into undisturbed soil with a 140-pound hammer free falling 30 in. After the sampler is seated 6 in. into undisturbed soil, the number of blows required to drive the sampler the last 12 in. is the Standard Penetration Resistance or "N" value, which is recorded as blows per foot as described below.

SPLIT-BARREL SAMPLER DRIVING RECORD

Blows Per Foot	Description
25	25 blows drove sampler 12 inches, after initial 6 inches of seating.
50/7"	50 blows drove sampler 7 inches, after initial 6 inches of seating.
Ref/3"	50 blows drove sampler 3 inches during initial 6-inch seating interval.

NOTE: To avoid damage to sampling tools, driving is limited to 50 blows during or after seating interval.

PROJECT NO. AMA18-007-00

RABAKISTNER

RESULTS OF SOIL SAMPLE ANALYSES

PROJECT NAME: School of Medicine Classroom and Office Building Addition
The University of Texas at Rio Grande Valley
Edinburg, Hidalgo County, Texas

FILE NAME: AMA18-007-00.GPJ

2/28/2018

Boring No.	Sample Depth (ft)	Blows per ft	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	USCS	Dry Unit Weight (pcf)	% -200 Sieve	Shear Strength (tsf)	Strength Test
B-1	0.0 to 1.5	8	20	48	20	28	CL	106	85	1.55	UC
	2.0 to 4.0		21								
	5.0 to 6.5	9	23	47	20	27	CL				
	7.0 to 9.0		27								
	10.0 to 11.5	14	21					59	81	1.85	PP
	15.0 to 17.0		24	75	30	45	CH				
	20.0 to 22.0		20								
	25.0 to 26.5	46	22								
	30.0 to 31.3	50/9"	22	79	29	50	CH	37			
	35.0 to 36.5	29	38								
	40.0 to 41.3	50/9"	17								
	45.0 to 46.3	50/9"	29								
	50.0 to 50.9	50/5"	21								
	55.0 to 55.8	50/4"	20								
	60.0 to 60.8	50/4"	16								
	65.0 to 66.5	42	17								
	70.0 to 70.3	REF/ 4"	19					58			
	73.5 to 74.4	50/5"	35								
B-2	0.0 to 1.5	8	21					107	81	1.57	UC
	2.5 to 4.0	13	21	49	19	30	CL				
	5.0 to 7.0		20								
	7.5 to 9.0	19	22	57	21	36	CH				
	10.0 to 12.0		21					69		1.40	PP
	15.0 to 16.5	35	21								
	20.0 to 22.0		21	61	23	38	CH				
	25.0 to 26.5	43	29					63			
	30.0 to 31.3	50/ 10"	29								
	35.0 to 36.5	25	38								
	40.0 to 41.3	50/9"	23								
	45.0 to 46.2	50/8"	18	75	28	47	CH				
	50.0 to 51.4	50/ 11"	29								
	55.0 to 55.3	REF/ 3"	21								
	60.0 to 61.0	50/6"	17								
	65.0 to 66.5	49	15								
	70.0 to 70.2	REF/ 2"	21								
	73.5 to 74.5	50/6"	28								

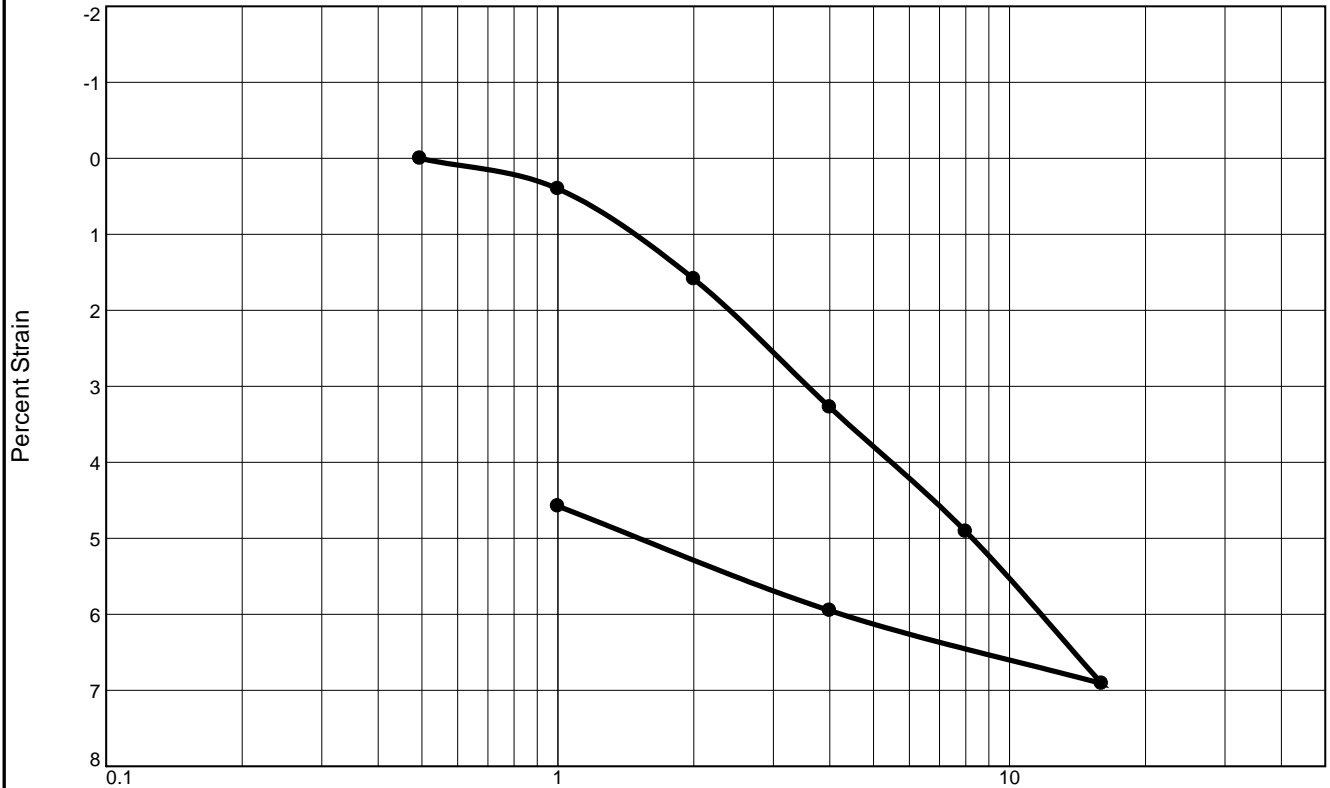
PP = Pocket Penetrometer TV = Torvane UC = Unconfined Compression FV = Field Vane UU = Unconsolidated Undrained Triaxial

CU = Consolidated Undrained Triaxial CNBD = Could Not Be Determined NP = Non-Plastic PROJECT NO. AMA18-007-00

RABAKISTNER

FIGURE 5

CONSOLIDATION TEST REPORT



Coefficients of Consolidation and Secondary Consolidation											
No.	Load (tsf)	C_v (ft.2/day)	C_α	No.	Load (tsf)	C_v (ft.2/day)	C_α	No.	Load (tsf)	C_v (ft.2/day)	C_α
2	1.00	1.713									
3	2.00	3.173									
4	4.00	1.697									
5	8.00	0.810									
6	16.00	0.357									
7	4.00	0.320									
8	1.00	0.053									

Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	Initial Void Ratio
Saturation	Moisture								
85.2 %	19.9 %	102.3	N/A	N/A	2.65	1.29	1.2	0.09	0.618

MATERIAL DESCRIPTION								USCS	AASHTO
Light Brown, Fat Clay								CH	

Project No. AMA18-007-00 **Client:** University of Texas System OFPC

Project: UTRGV Medicine Bldg. Addition

Location: Boring B-1

Depth: 20 ft

Sample Number: 7

Remarks:

ASTM D2435
estimated specific gravity
weight added to prevent swell after
inundation=0.495tsf

RABA KISTNER CONSULTANTS, INC.

Figure 6

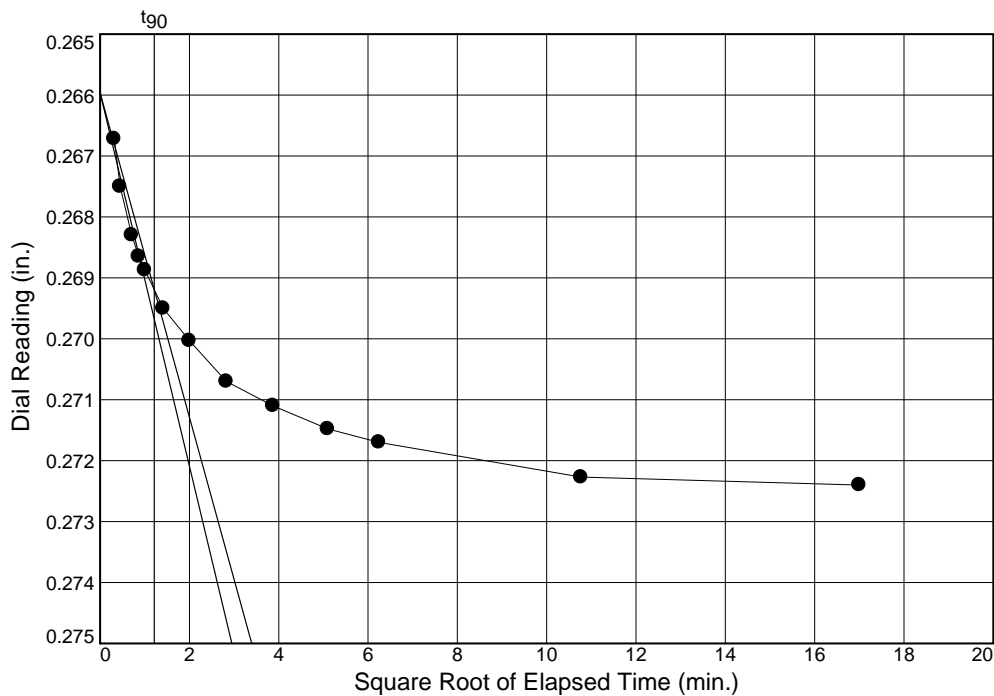
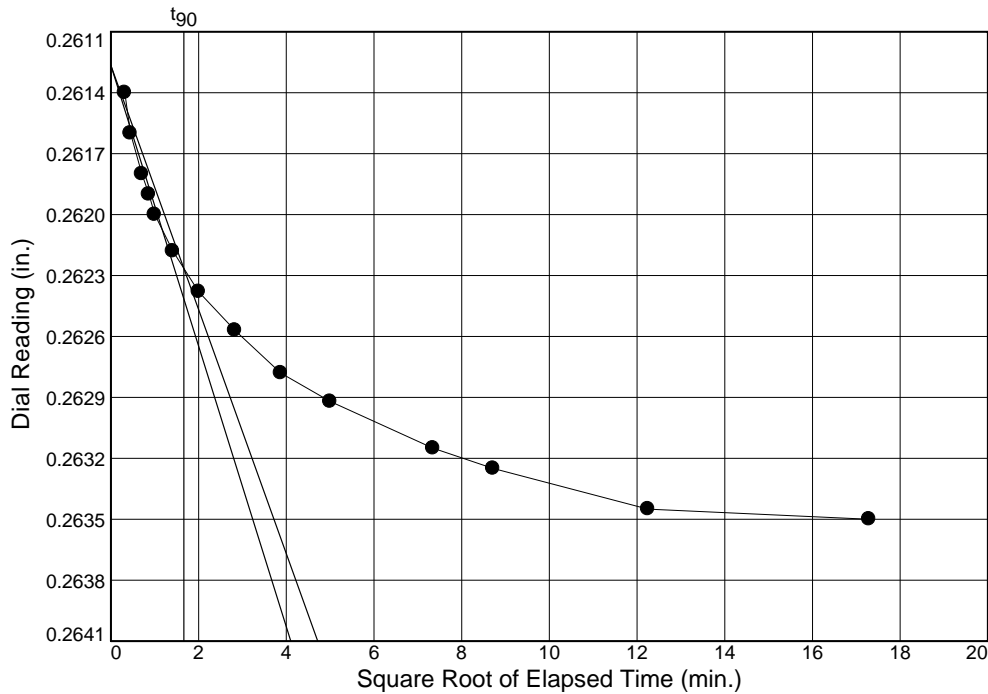
Dial Reading vs. Time

Project No.: AMA18-007
Project: UTRGV Medicine Bldg. Addition

Location: Boring 1 Sample 7 20-22ft

Depth: 20-22ft

Sample Number: 7



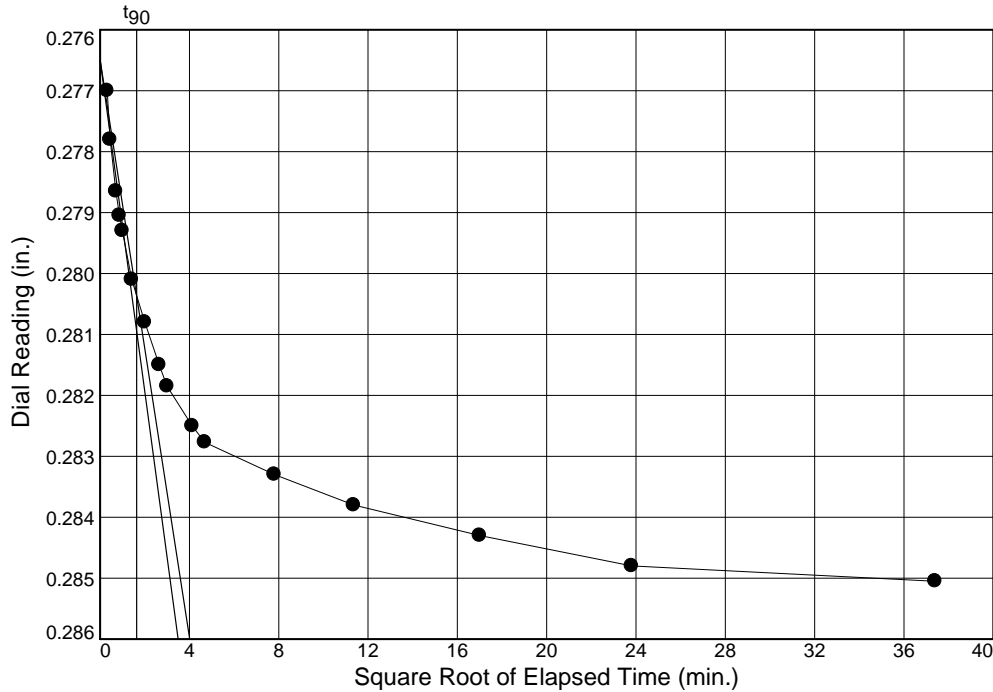
Dial Reading vs. Time

Project No.: AMA18-007
Project: UTRGV Medicine Bldg. Addition

Location: Boring 1 Sample 7 20-22ft

Depth: 20-22ft

Sample Number: 7



Load No.= 4

Load= 4.00 tsf

$D_0 = 0.2765$

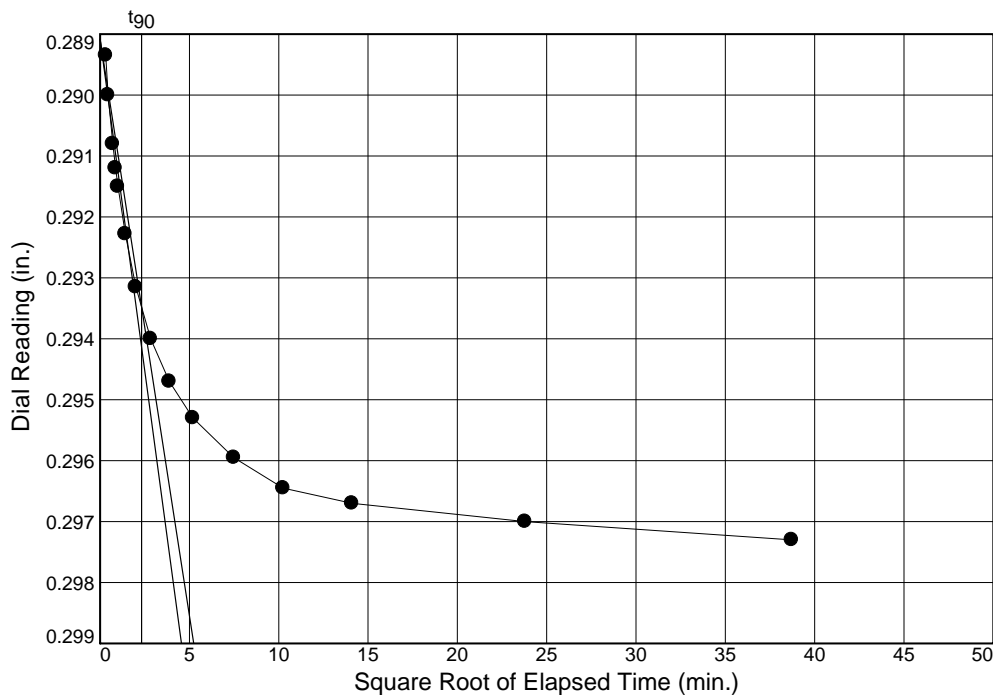
$D_{90} = 0.2804$

$D_{100} = 0.2808$

$T_{90} = 2.67 \text{ min.}$

$C_v @ T_{90}$

1.697 ft.²/day



Load No.= 5

Load= 8.00 tsf

$D_0 = 0.2891$

$D_{90} = 0.2935$

$D_{100} = 0.2940$

$T_{90} = 5.41 \text{ min.}$

$C_v @ T_{90}$

0.810 ft.²/day

Dial Reading vs. Time

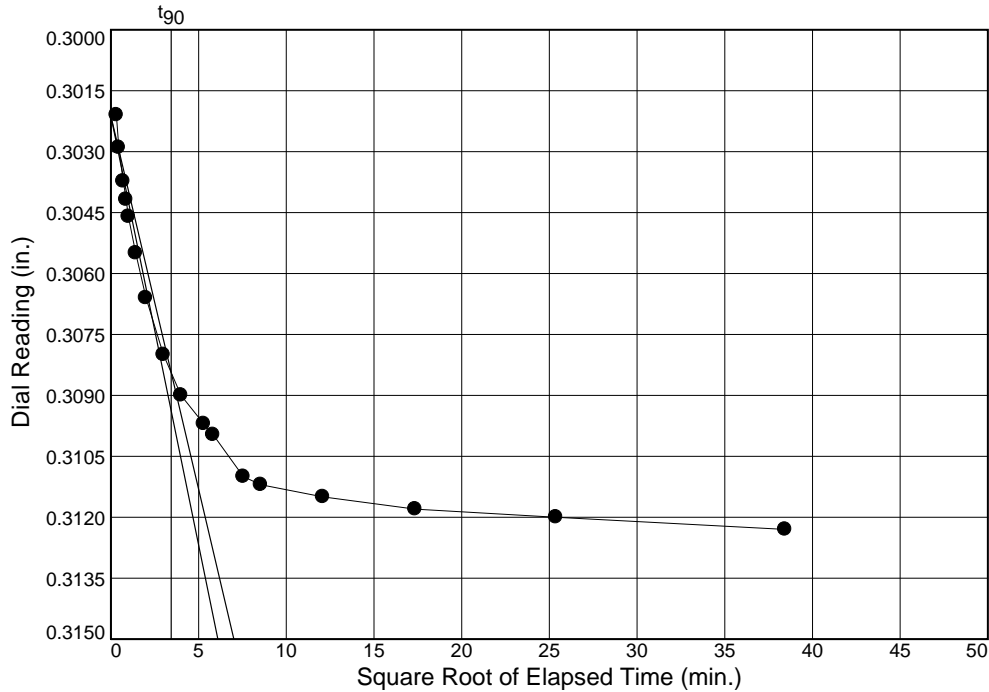
Project No.: AMA18-007

Project: UTRGV Medicine Bldg. Addition

Location: Boring 1 Sample 7 20-22ft

Depth: 20-22ft

Sample Number: 7



Load No.= 6

Load= 16.00 tsf

$D_0 = 0.3021$

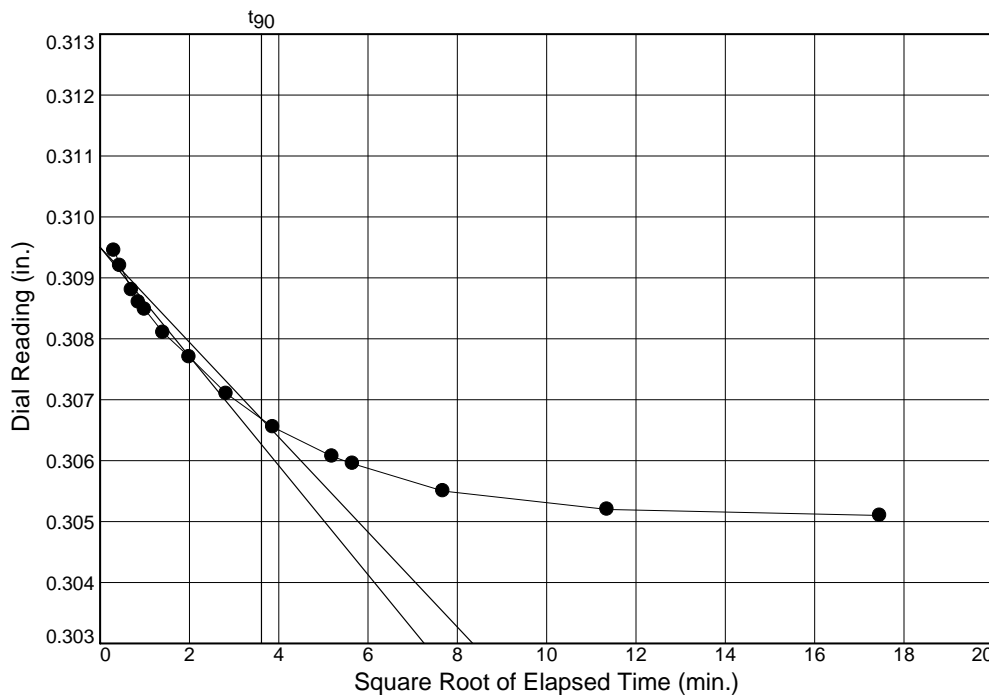
$D_{90} = 0.3084$

$D_{100} = 0.3091$

$T_{90} = 11.82$ min.

$C_v @ T_{90}$

0.357 ft.²/day



Load No.= 7

Load= 4.00 tsf

$D_0 = 0.3095$

$D_{90} = 0.3067$

$D_{100} = 0.3064$

$T_{90} = 13.05$ min.

$C_v @ T_{90}$

0.320 ft.²/day

Dial Reading vs. Time

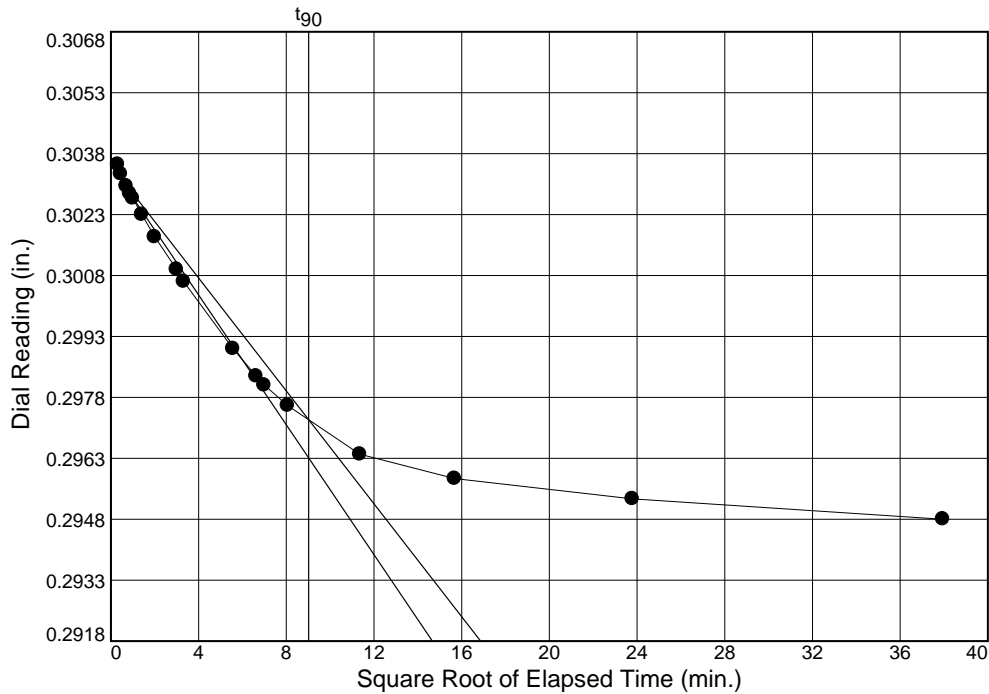
Project No.: AMA18-007

Project: UTRGV Medicine Bldg. Addition

Location: Boring 1 Sample 7 20-22ft

Depth: 20-22ft

Sample Number: 7



Load No.= 8

Load= 1.00 tsf

$D_0 = 0.3035$

$D_{90} = 0.2973$

$D_{100} = 0.2966$

$T_{90} = 81.31 \text{ min.}$

$C_v @ T_{90}$

0.053 ft.²/day

Important Information about This Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply this report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an

assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by:* the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help

others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold-prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical-engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.



8811 Colesville Road/Suite G106, Silver Spring, MD 20910

Telephone: 301/565-2733 Facsimile: 301/589-2017

e-mail: info@geoprofessional.org www.geoprofessional.org

Copyright 2015 by Geoprofessional Business Association (GBA). Duplication, reproduction, or copying of this document, or its contents, in whole or in part, by any means whatsoever, is strictly prohibited, except with GBA's specific written permission. Excerpting, quoting, or otherwise extracting wording from this document is permitted only with the express written permission of GBA, and only for purposes of scholarly research or book review. Only members of GBA may use this document as a complement to or as an element of a geotechnical-engineering report. Any other firm, individual, or other entity that so uses this document without being a GBA member could be committing negligent or intentional (fraudulent) misrepresentation.

CONSULTANTS • ENVIRONMENTAL • FACILITIES • INFRASTRUCTURE

► San Antonio, TX

Austin, TX

Dallas , TX

McAllen, TX

Brownsville, TX

El Paso, TX

Mexico

Corpus Christi , TX

Houston, TX

Salt Lake City, UT

Storm Water Pollution Prevention Plan

for

University of Texas Rio Grande Valley

School of Medicine

Team Based Learning Center

Edinburg Campus

OFPC Project # 903-1159



The University of Texas
Rio Grande Valley

Located in
Edinburg, Hidalgo County, Texas

September 2018

PREPARED BY:



Perez Consulting Engineers
McAllen, Texas
Firm Registration No. F-2158

UTRGV School of Medicine Team Based Learning Center
OFPC Project # 903-1159
Storm Water Pollution Prevention Plan

TABLE OF CONTENTS

SECTION 1 –	TCEQ Construction Site Notice (CSN) for Small Sites OFPC Notice of Termination (NOT) for Small Sites
SECTION 2 –	Shared SWPPP Acceptance Certification for CSN Delegation of Authority Letters Project Startup Form
SECTION 3 –	Site Description
SECTION 4 –	General Permit Requirements Copy of TPDES Construction General Permit TXR150000, March 5, 2018
SECTION 5 –	Erosion and Sedimentation Controls
SECTION 6 –	Maintenance
SECTION 7 –	Spill Prevention
SECTION 8 –	Inspections
SECTION 9 –	Non-Storm Water Discharges
SECTION 10 –	Temporary Storm Water Pollution Control – Specification Section 01 57 23
EXHIBIT 1 –	Site and Lay down Area - Sheet C106 Erosion and Sediment Control Details - Sheet C107 Material Receiving and Storage Area Site Plan - Sheet C108 Erosion and Sediment Control Details - Sheet C109

SECTION 1

TCEQ Construction Site Notice (CSN) for Small Sites

OFPC Notice of Termination (NOT) for Small Sites



SMALL CONSTRUCTION SITE NOTICE

FOR THE
Texas Commission on Environmental Quality (TCEQ)
Stormwater Program
TPDES GENERAL PERMIT TXR150000

The following information is posted in compliance with **Part II.E.2.** of the TCEQ General Permit Number TXR150000 for discharges of stormwater runoff from small construction sites. Additional information regarding the TCEQ stormwater permit program may be found on the internet at:

http://www.tceq.state.tx.us/nav/permits/wq_construction.html

Operator Name:	
Contact Name and Phone Number:	
Project Description: <i>Physical address or description of the site's location, estimated start date and projected end date, or date that disturbed soils will be stabilized</i>	
Location of Stormwater Pollution Prevention Plan:	

For Small Construction Activities Authorized Under Part II.E.2. (Obtaining Authorization to Discharge) the following certification must be completed:

I _____ (Typed or Printed Name Person Completing This Certification) certify under penalty of law that I have read and understand the eligibility requirements for claiming an authorization under Part II.E.2. of TPDES General Permit TXR150000 and agree to comply with the terms of this permit. A stormwater pollution prevention plan has been developed and will be implemented prior to construction, according to permit requirements. A copy of this signed notice is supplied to the operator of the MS4 if discharges enter an MS4. I am aware there are significant penalties for providing false information or for conducting unauthorized discharges, including the possibility of fine and imprisonment for knowing violations.

Signature and Title _____ Date _____

_____ Date Notice Removed

_____ MS4 operator notified per Part II.F.3.

**THE UNIVERSITY OF TEXAS SYSTEM
OFFICE OF FACILITIES PLANNING AND CONSTRUCTION (OFPC)
NOTICE OF TERMINATION (NOT)
FOR SMALL CONSTRUCTION SITES
1 TO LESS THAN 5 ACRES**

This NOT form is to be completed by the Contractor after final stabilization is achieved at the construction site. Additionally, this NOT form is to be used for small construction sites of one to less than five acres.

Permit No.: TCEQ TPDES Permit Number TXR150000 - Small Construction Activity Automatic Authorization

Construction Site Operator

Company Name: _____

Mailing Address: _____

City, State & Zip Code: _____

Phone Number: _____

Project / Site Information

Project Name: UTRGV School of Medicine Team Based Learning Cener

Institution Name: University of Texas Rio Grande Valley

OFPC Project No.: 903-1159

Site Address: 1201 West University Dr.; Edinburg, Texas 78541

Certification

I certify that authorization under the TPDES Construction General Permit (TXR150000) is no longer necessary based on the provisions of the general permit. I understand that by submitting this NOT, I am no longer authorized to discharge storm water associated with construction activities at the project site identified above. I also understand that the submittal of this NOT does not release an operator from liability from violations of this permit or the Clean Water Act.

Typed /Printed Name: _____

Title: _____

(Must be Corporate Officer)

Signature: _____

(In Blue Ink)

Date: _____

OFPC Approvals

Project Manager/Resident Construction Manager _____

Date

OFPC Project Specialist II (SDI) _____

Date

OFPC Engineering Manager, Bldg. Envelope _____

Date

SECTION 2

Shared SWPPP Acceptance Certification for CSN

Delegation of Authority Letters

Project Startup Form

Shared SWPPP Acceptance Certification- CSN

University of Texas System-Office of Facilities Planning & Construction

I acknowledge acceptance of the Storm Water Pollution Plan for:

Project Number 903-1159 **Project Name** UTRGV School of Medicine Team Based Learning Center

Date Small Construction Site Notice signed _____

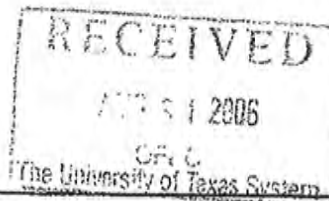
Owner's Representative Signature (RCM)

Date

Contractor's Representative Signature

Date

Executive Vice Chancellor
for Business Affairs



MEMORANDUM

Scott C. Kelley
(512) 499-4560



August 14, 2006

TO: Office of Facilities Planning and Construction
Resident Construction Managers
Project Managers

FROM: Executive Vice Chancellor for Business Affairs - Scott C. Kelley *Scott C. Kelley*

SUBJECT: Delegation of Authority to Certify Stormwater Compliance Reports and Supply
Required Information for Construction Activities on Lands Owned or Controlled by
the Board of Regents

By an instrument dated August 14, 2006, I authorized the Associate Vice Chancellor for Facilities Planning and Construction to affix my signature to Texas Commission on Environmental Quality (TCEQ) Notices of Intent, Notices of Change, Construction Site Notices, Waiver Certifications and Notices of Termination for Storm Water Discharges Associated with Construction Activity Under a TCEQ General Permit.

Pursuant to the authority granted to me in Regents' Rules and Regulations, Series 10501, Section 4.1, I hereby delegate to the Resident Construction Manager assigned to each project subject to a TCEQ General Permit, the authority to sign reports for that project required under the Permit, including without limitation inspection reports, and to supply other information related to that project that may be requested by the Texas Commission on Environmental Quality.

In the event the Resident Construction Manager for the project is unavailable or unable to supply the requested information, or in the event that construction management responsibilities for a particular project are assigned to a Project Manager in lieu of a Resident Construction Manager, I hereby delegate to the Project Manager for the project, the authority to sign the reports and supply the requested information for that project.

No further delegation of the authority granted pursuant to this memorandum is authorized. Please ensure that you comply with the Regents' Rules and Regulations, laws, special instructions, guidelines and procedures relevant to this delegation of authority.

This memorandum supersedes the delegation memorandum dated July 28, 2005.

SCK:lm1

cc: Dana Hollingsworth
Jim Phillips

**Contractor's Delegation of Authority Letter
to be Inserted Here.**

Remove this sheet when letter is inserted.

The University of Texas System

*Office of Facilities Planning and Construction
702 Colorado Street, Suite 4.100 Austin, Texas 78701
(512) 499-4600 FAX (512) 499-4604*

SWPPP Project Start-up

Contractors must meet 4 TPDES requirements before soil-disturbing activities can commence on OFPC construction projects. This form provides the Contractor and Owner an acceptance of compliance with initial BMPs and required paperwork for commencement of work on the project site.

The Contractor is to initial items that are certified as complete and then review for concurrence with the Owner's Designated Representative.

- 1** BMPs applicable to this project have been inspected to ensure correct placement in accordance with the SWPPP and for proper installation according to specifications.

Initial by Contractor

Initial by OFPC CI

- 2** The SWPPP is approved and on site.

Initial by Contractor

Initial by OFPC CI

- 3** The TCEQ NOI and OFPC Posting Notice forms (and permits if received) or the TCEQ CSNs are complete and posted for all permittees at the main entrance to the project site.

Initial by Contractor

Initial by OFPC CI

- 4** Inspector qualifications and letter of delegation of authority are inserted in the SWPPP.

Initial by Contractor

Initial by OFPC CI

Having met the above requirements and in recognition of prior receipt of Notice to Proceed, the Contractor is authorized to commence work on site.

Contractor

OFPC Project #_ 903-1159

OFPC Resident Construction Manager

Date: _

SECTION 3

Site Description

SECTION 3 - SITE DESCRIPTION

A. Existing Site Description

The University of Texas Rio Grande Valley (UTRGV) is proposing to construct a 2-story building for the School of Medicine (SOM) on the UTRGV Edinburg Campus. The site is located 0.20 miles east of the intersection of Sugar Road and Schunior Street, north of parking lot E29, east of the existing SOM building and west of parking lot E27. The existing site is currently a grass-covered, emergency storm water overflow detention pond and has an existing average elevation of **93.0'** above Mean Sea Level (MSL) at the top bank of the dry overflow pond.

As a support site to aid with storage of equipment and materials due to space restrictions at the proposed SOM building location, a space north of parking lot E33, approximately 1000 feet north of the future SOM building, has been designated as material receiving and storage area (lay-down area). The proposed lay-down area has been employed by UTRGV in previous construction projects for the same use, it has an approximate surface area of 2.0 acres.

According to the Federal Emergency Management Agency (FEMA), letter of map revision (LOMR) with effective date of May 14, 2001, case number 01-06-1095P, revision to panel 480338 0015 E, the property where the new construction is to take place lies within Zone X, defined by FEMA as areas of 500-year flood; areas of 100-year flood with average depths of less than 1 square mile; and areas protected by levees from 100-year flood.

B. Soil Description:

The Geologic Atlas of Texas, McAllen-Brownsville Sheet, dated 1976, indicates that the subject site is located within Windblown deposits consisting of stabilized sand dune deposits of the Quaternary epoch (Holocene period). According to the Soil Survey of Hidalgo County, Texas, published by the United States Department of Agriculture- Soil Conservation Service, the project site appears to be located within on predominant soil association, named the Hidalgo soil association, which consists of deep, moderate permeability soils that typically have a dark grayish-brown sandy clay surface layer. The corresponding soil symbol is 31, Hidalgo-Urban land complex with 0-1 percent slopes.

C. Description of Construction Activity:

The SOM proposed improvements include, construction of a new Office Building on the UTRGV Edinburg Campus with approximately 13,844 square feet gross. Construction also includes sidewalks, underground utilities for the building, site grading and paving, and demolition of existing structures in conflict with the new building.

Lay-down area is composed of caliche base material with surface loose aggregate to provide a stable and rideable foundation for its intended use.

D. Latitude and Longitude of Project Site

SOM Building

Latitude: 26° 18' 35" N

Longitude: 98° 10' 26" W

Lay-Down Area

Latitude: 26° 18' 48" N

Longitude: 98° 10' 25" W

E. Sequence of Major Activities:

The general sequence of major work activities generally includes, but is not limited to, the following activities:

- Submit and obtain the necessary approvals on all of the required plans and permits
- Obtain the Notice to Proceed
- Install BMP's as required.
- Commence Mobilization
- Perform Demolition
- Perform excavation and embankment operations
- Construct New building
- Perform Site restoration and final stabilization
- Perform Final inspection and project closeout requirements
- Demobilize
- Remove BMP's after stabilization is established and after approval from OFPC; then submit Notice of Termination

F. Estimated Total Site, Disturbed Area

The total number of acres of the entire campus is approximately 238 acres and the project site covers approximately 0.64 acres. The total estimated disturbed area within the construction limits is 2.5 acres. It includes the offsite lay down area, located north of parking lot E33, but excludes the staging area, consisting of parking lot E29, due to it being impervious.

G. Runoff Coefficient

The preconstruction runoff coefficient is 0.25 (grassy areas) for the areas where new construction is to take place and 0.90 (impervious areas). The calculated post construction composite weighted runoff coefficient for the building area is 0.7, which will be used for design.

H. Edwards Aquifer and Indian Country Lands.

This site is not located over the Edwards Aquifer contributing zone or the recharge zone and is not located on Indian Country Lands.

I. Name of Receiving Water and Extent of Wetlands

The storm runoff from the proposed site will surface flow into field inlets that connect to the existing UTRGV underground storm sewer management network along south and east sides of the site. UTRGV's system connects/outfalls into the City of Edinburg storm sewer system along Schunior Street that discharges into the Hidalgo County Drainage District (HCDD) Network that discharges into the Arroyo Colorado Above Tidal located in the Nueces-Rio Grande Coastal Basin Segment 2202 ultimately out falling into the Laguna Madre at the Gulf of Mexico.

The site does not contain wetlands.

J. Industrial Activity Other Than Construction

There will be no anticipated storm water drainage associated with an industrial activity other than construction at the project site.

K. General Location Map or Vicinity Map

A General Vicinity map may be found in Figure 1.



Figure 1 - General Vicinity Map

L. SWPPP Site Map

Erosion and Sediment Control drawings and detail drawings can be found in Exhibit 1.

SECTION 4

General Permit Requirements

Copy of TPDES Construction General Permit TXR150000, March 5, 2018

Texas Commission on Environmental Quality

P.O. Box 13087, Austin, Texas 78711-3087



GENERAL PERMIT TO DISCHARGE UNDER THE TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM

under provisions of
Section 402 of the Clean Water Act
and Chapter 26 of the Texas Water Code

This permit supersedes and replaces
TPDES General Permit No. TXR150000, issued March 5, 2013

Construction sites that discharge stormwater associated with construction activity
located in the state of Texas

may discharge to surface water in the state

only according to monitoring requirements and other conditions set forth in this general permit, as well as the rules of the Texas Commission on Environmental Quality (TCEQ or Commission), the laws of the State of Texas, and other orders of the Commission of the TCEQ. The issuance of this general permit does not grant to the permittee the right to use private or public property for conveyance of stormwater and certain non-stormwater discharges along the discharge route. This includes property belonging to but not limited to any individual, partnership, corporation or other entity. Neither does this general permit authorize any invasion of personal rights nor any violation of federal, state, or local laws or regulations. It is the responsibility of the permittee to acquire property rights as may be necessary to use the discharge route.

This general permit and the authorization contained herein shall expire at midnight, five years from the permit effective date.

EFFECTIVE DATE: March 5, 2018

ISSUED DATE: 2-8-18

A handwritten signature in black ink, reading "Bryan W. Shaw".
For the Commission

**TPDES GENERAL PERMIT NUMBER TXR150000 RELATING TO
STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION
ACTIVITIES**

Table of Contents

Part I.	Flow Chart and Definitions	5
Section A.	Flow Chart to Determine Whether Coverage is Required	5
Section B.	Definitions.....	6
Part II.	Permit Applicability and Coverage	13
Section A.	Discharges Eligible for Authorization	13
1.	Stormwater Associated with Construction Activity	13
2.	Discharges of Stormwater Associated with Construction Support Activities	13
3.	Non-Stormwater Discharges	13
4.	Other Permitted Discharges	14
Section B.	Concrete Truck Wash Out.....	14
Section C.	Limitations on Permit Coverage	14
1.	Post Construction Discharges.....	14
2.	Prohibition of Non-Stormwater Discharges	14
3.	Compliance with Water Quality Standards	14
4.	Impaired Receiving Waters and Total Maximum Daily Load (TMDL) Requirements	14
5.	Discharges to the Edwards Aquifer Recharge or Contributing Zone	15
6.	Discharges to Specific Watersheds and Water Quality Areas	16
7.	Protection of Streams and Watersheds by Other Governmental Entities.....	16
8.	Indian Country Lands.....	16
9.	Oil and Gas Production and Transportation	16
10.	Stormwater Discharges from Agricultural Activities.....	16
11.	Endangered Species Act.....	16
12.	Other	17
Section D.	Deadlines for Obtaining Authorization to Discharge	17
1.	Large Construction Activities	17
2.	Small Construction Activities	17
Section E.	Obtaining Authorization to Discharge	17
1.	Automatic Authorization for Small Construction Activities with Low Potential for Erosion:.....	17
2.	Automatic Authorization for Small Construction Activities:	18
3.	Authorization for Large Construction Activities:	19

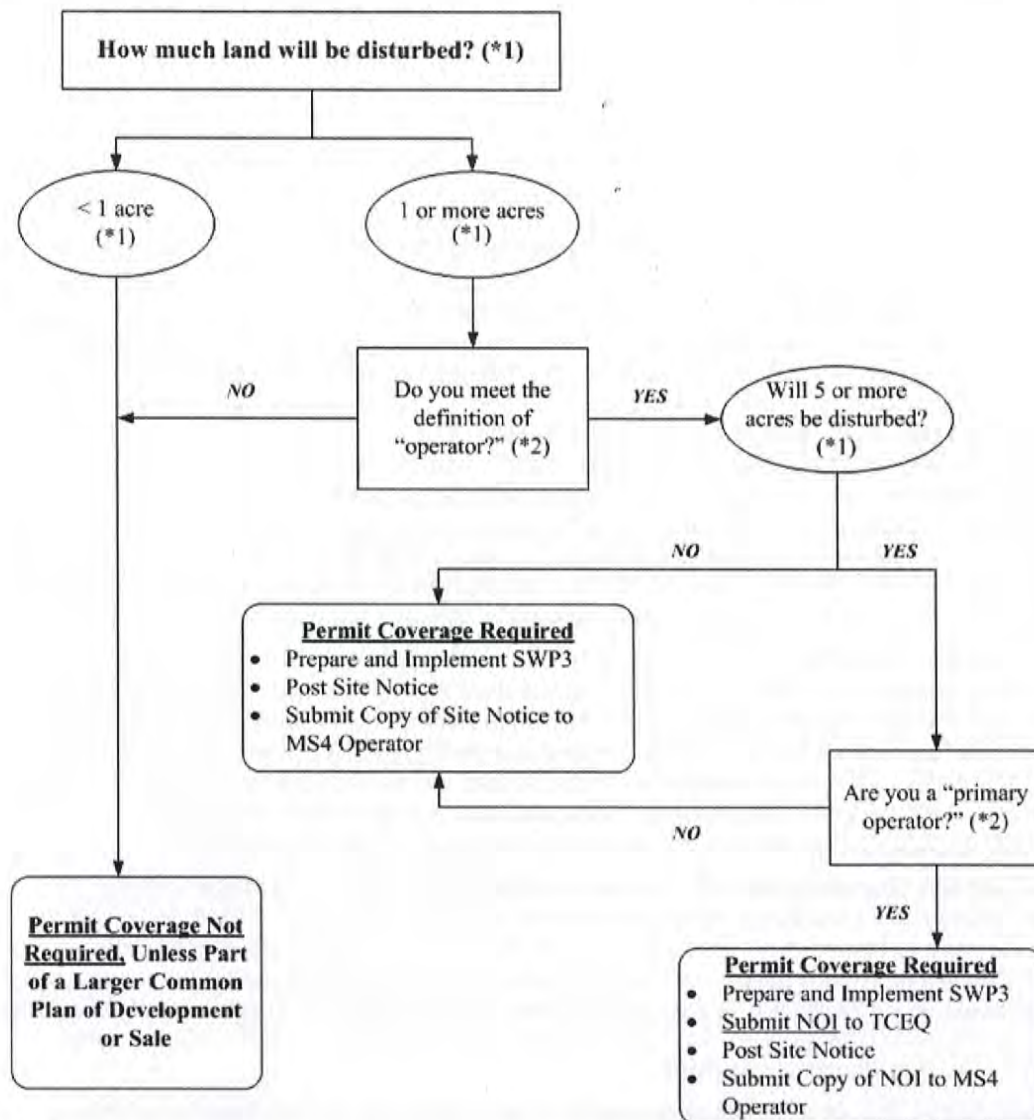
4. Waivers for Small Construction Activities:	20
5. Effective Date of Coverage	20
6. Notice of Change (NOC)	21
7. Signatory Requirement for NOI Forms, Notice of Termination (NOT) Forms, NOC Letters, and Construction Site Notices	22
8. Contents of the NOI	22
Section F. Terminating Coverage	23
1. Notice of Termination (NOT) Required	23
2. Minimum Contents of the NOT	23
3. Termination of Coverage for Small Construction Sites and for Secondary Operators at Large Construction Sites	24
4. Transfer of Day-to-Day Operational Control	24
Section G. Waivers from Coverage	25
1. Waiver Applicability and Coverage	25
2. Steps to Obtaining a Waiver	26
3. Effective Date of a LREW	26
4. Activities Extending Beyond the LREW Period	26
Section H. Alternative TPDES Permit Coverage	27
1. Individual Permit Alternative	27
2. Alternative Authorizations for Certain Discharges	27
3. Individual Permit Required	27
4. Alternative Discharge Authorization	27
Section I. Permit Expiration	27
Part III. Stormwater Pollution Prevention Plans (SWP3)	28
Section A. Shared SWP3 Development	29
Section B. Responsibilities of Operators	29
1. Secondary Operators and Primary Operators with Control Over Construction Plans and Specifications	29
2. Primary Operators with Day-to-Day Operational Control	30
Section C. Deadlines for SWP3 Preparation, Implementation, and Compliance	30
Section D. Plan Review and Making Plans Available	30
Section E. Revisions and Updates to SWP3s	31
Section F. Contents of SWP3	31
Section G. Erosion and Sediment Control Requirements Applicable to All Sites	40
Part IV. Stormwater Runoff from Concrete Batch Plants	42
Section A. Benchmark Sampling Requirements	42
Section B. Best Management Practices (BMPs) and SWP3 Requirements	44

Section C. Prohibition of Wastewater Discharges.....	46
Part V. Concrete Truck Wash Out Requirements	46
Part VI. Retention of Records.....	47
Part VII. Standard Permit Conditions	47
Part VIII. Fees	48
Appendix A: Automatic Authorization	50
Appendix B: Erosivity Index (EI) Zones in Texas	52
Appendix C: Isoerodent Map	53
Appendix D: Erosivity Indices for EI Zones in Texas	54

Part I. Flow Chart and Definitions

Section A. Flow Chart to Determine Whether Coverage is Required

When calculating the acreage of land area disturbed, include the disturbed land-area of all construction and construction support activities.



- (*1) To determine the size of the construction project, use the size of the entire area to be disturbed, and include the size of the larger common plan of development or sale, if the project is part of a larger project (refer to Part I.B., "Definitions," for an explanation of "common plan of development or sale").
- (*2) Refer to the definitions for "operator," "primary operator," and "secondary operator" in Part I., Section B. of this permit.

Section B. Definitions

Arid Areas - Areas with an average annual rainfall of 0 to 10 inches.

Best Management Practices (BMPs) - Schedules of activities, prohibitions of practices, maintenance procedures, structural controls, local ordinances, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures, and practices to control construction site runoff, spills or leaks, waste disposal, or drainage from raw material storage areas.

Commencement of Construction - The initial disturbance of soils associated with clearing, grading, or excavation activities, as well as other construction-related activities (e.g., stockpiling of fill material, demolition).

Common Plan of Development - A construction activity that is completed in separate stages, separate phases, or in combination with other construction activities. A common plan of development (also known as a "common plan of development or sale") is identified by the documentation for the construction project that identifies the scope of the project, and may include plats, blueprints, marketing plans, contracts, building permits, a public notice or hearing, zoning requests, or other similar documentation and activities. A common plan of development does not necessarily include all construction projects within the jurisdiction of a public entity (e.g., a city or university). Construction of roads or buildings in different parts of the jurisdiction would be considered separate "common plans," with only the interconnected parts of a project being considered part of a "common plan" (e.g., a building and its associated parking lot and driveways, airport runway and associated taxiways, a building complex, etc.). Where discrete construction projects occur within a larger common plan of development or sale but are located ¼ mile or more apart, and the area between the projects is not being disturbed, each individual project can be treated as a separate plan of development or sale, provided that any interconnecting road, pipeline or utility project that is part of the same "common plan" is not included in the area to be disturbed.

Construction Activity - Includes soil disturbance activities, including clearing, grading, excavating, construction-related activity (e.g., stockpiling of fill material, demolition), and construction support activity. This does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (e.g., the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities). Regulated construction activity is defined in terms of small and large construction activity.

Construction Support Activity - A construction-related activity that specifically supports construction activity, which can involve earth disturbance or pollutant-generating activities of its own, and can include, but are not limited to, activities associated with concrete or asphalt batch plants, rock crushers, equipment staging or storage areas, chemical storage areas, material storage areas, material borrow areas, and excavated material disposal areas. Construction support activity must only directly support the construction activity authorized under this general permit.

Dewatering - The act of draining rainwater or groundwater from building foundations, vaults, and trenches.

Discharge - For the purposes of this permit, the drainage, release, or disposal of pollutants in stormwater and certain non-stormwater from areas where soil disturbing activities (e.g., clearing, grading, excavation, stockpiling of fill material, and demolition), construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck wash out, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located.

Drought-Stricken Area - For the purposes of this permit, an area in which the National Oceanic and Atmospheric Administration's U.S. Seasonal Drought Outlook indicates for the period during which the construction will occur that any of the following conditions are

likely: (1) "Drought to persist or intensify", (2) "Drought ongoing, some improvement", (3) "Drought likely to improve, impacts ease", or (4) "Drought development likely". See http://www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html.

Edwards Aquifer - As defined under Texas Administrative Code (TAC) § 213.3 of this title (relating to the Edwards Aquifer), that portion of an arcuate belt of porous, water-bearing, predominantly carbonate rocks known as the Edwards and Associated Limestones in the Balcones Fault Zone trending from west to east to northeast in Kinney, Uvalde, Medina, Bexar, Comal, Hays, Travis, and Williamson Counties; and composed of the Salmon Peak Limestone, McKnight Formation, West Nueces Formation, Devil's River Limestone, Person Formation, Kainer Formation, Edwards Formation, and Georgetown Formation. The permeable aquifer units generally overlie the less-permeable Glen Rose Formation to the south, overlie the less-permeable Comanche Peak and Walnut Formations north of the Colorado River, and underlie the less-permeable Del Rio Clay regionally.

Edwards Aquifer Recharge Zone - Generally, that area where the stratigraphic units constituting the Edwards Aquifer crop out, including the outcrops of other geologic formations in proximity to the Edwards Aquifer, where caves, sinkholes, faults, fractures, or other permeable features would create a potential for recharge of surface waters into the Edwards Aquifer. The recharge zone is identified as that area designated as such on official maps located in the offices of the Texas Commission on Environmental Quality (TCEQ) and the appropriate regional office. The Edwards Aquifer Map Viewer, located at http://www.tceq.texas.gov/compliance/field_ops/eapp/mapdisclaimer.html, can be used to determine where the recharge zone is located.

Edwards Aquifer Contributing Zone - The area or watershed where runoff from precipitation flows downgradient to the recharge zone of the Edwards Aquifer. The contributing zone is located upstream (upgradient) and generally north and northwest of the recharge zone for the following counties: all areas within Kinney County, except the area within the watershed draining to Segment No. 2304 of the Rio Grande Basin; all areas within Uvalde, Medina, Bexar, and Comal Counties; all areas within Hays and Travis Counties, except the area within the watersheds draining to the Colorado River above a point 1.3 miles upstream from Tom Miller Dam, Lake Austin at the confluence of Barrow Brook Cove, Segment No. 1403 of the Colorado River Basin; and all areas within Williamson County, except the area within the watersheds draining to the Lampasas River above the dam at Stillhouse Hollow reservoir, Segment No. 1216 of the Brazos River Basin. The contributing zone is illustrated on the Edwards Aquifer map viewer at http://www.tceq.texas.gov/compliance/field_ops/eapp/mapdisclaimer.html.

Effluent Limitations Guideline (ELG) – Defined in 40 Code of Federal Regulations (CFR) § 122.2 as a regulation published by the Administrator under § 304(b) of the Clean Water Act (CWA) to adopt or revise effluent limitations.

Facility or Activity – For the purpose of this permit, referring to a construction site, the location of construction activity, or a construction support activity that is regulated under this general permit, including all contiguous land and fixtures (for example, ponds and materials stockpiles), structures, or appurtenances used at a construction site or industrial site.

Final Stabilization - A construction site status where any of the following conditions are met:

- (a) All soil disturbing activities at the site have been completed and a uniform (that is, evenly distributed, without large bare areas) perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

- (b) For individual lots in a residential construction site by either:
- (1) the homebuilder completing final stabilization as specified in condition (a) above; or
 - (2) the homebuilder establishing temporary stabilization for an individual lot prior to the time of transfer of the ownership of the home to the buyer and after informing the homeowner of the need for, and benefits of, final stabilization. If temporary stabilization is not feasible, then the homebuilder may fulfill this requirement by retaining perimeter controls or BMPs, and informing the homeowner of the need for removal of temporary controls and the establishment of final stabilization. Fulfillment of this requirement must be documented in the homebuilder's stormwater pollution prevention plan (SWP3).
- (c) For construction activities on land used for agricultural purposes (such as pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to surface water and areas that are not being returned to their preconstruction agricultural use must meet the final stabilization conditions of condition (a) above.
- (d) In arid, semi-arid, and drought-stricken areas only, all soil disturbing activities at the site have been completed and both of the following criteria have been met:
- (1) Temporary erosion control measures (for example, degradable rolled erosion control product) are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years without active maintenance by the operator, and
 - (2) The temporary erosion control measures are selected, designed, and installed to achieve 70% of the native background vegetative coverage within three years.

Hyperchlorination of Waterlines – Treatment of potable water lines or tanks with chlorine for disinfection purposes, typically following repair or partial replacement of the waterline or tank, and subsequently flushing the contents.

Impaired Water - A surface water body that is identified as impaired on the latest approved CWA §303(d) List or waters with an EPA-approved or established total maximum daily load (TMDL) that are found on the latest EPA approved *Texas Integrated Report of Surface Water Quality for CWA Sections 305(b) and 303(d)*, which lists the category 4 and 5 water bodies.

Indian Country Land – All land within the limits of any Indian reservation under the jurisdiction of the United States government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation; (2) all dependent Indian communities with the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and (3) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same. (40 CFR §122.2)

Indian Tribe - Any Indian Tribe, band, group, or community recognized by the Secretary of the Interior and exercising governmental authority over a Federal Indian Reservation (40 CFR §122.2).

Infeasible –Not technologically possible, or not economically practicable and achievable in light of best industry practices. (40 CFR §450.11(b)).

Large Construction Activity - Construction activities including clearing, grading, and excavating that result in land disturbance of equal to or greater than five (5) acres of land. Large construction activity also includes the disturbance of less than five (5) acres of total

land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than five (5) acres of land. Large construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (for example, the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities.)

Linear Project – Includes the construction of roads, bridges, conduits, substructures, pipelines, sewer lines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities in a long, narrow area.

Low Rainfall Erosivity Waiver (LREW) - A written submission to the executive director from an operator of a construction site that is considered as small construction activity under the permit, which qualifies for a waiver from the requirements for small construction activities, only during the period of time when the calculated rainfall erosivity factor is less than five (5).

Minimize - To reduce or eliminate to the extent achievable using stormwater controls that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer System (MS4) - A separate storm sewer system owned or operated by the United States, a state, city, town, county, district, association, or other public body (created by or pursuant to state law) having jurisdiction over the disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, that discharges to surface water in the state.

Notice of Change (NOC) – Written notification to the executive director from a discharger authorized under this permit, providing changes to information that was previously provided to the agency in a notice of intent form.

Notice of Intent (NOI) - A written submission to the executive director from an applicant requesting coverage under this general permit.

Notice of Termination (NOT) - A written submission to the executive director from a discharger authorized under this general permit requesting termination of coverage.

Operator - The person or persons associated with a large or small construction activity that is either a primary or secondary operator as defined below:

Primary Operator – the person or persons associated with construction activity that meets either of the following two criteria:

- (a) the person or persons have on-site operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
- (b) the person or persons have day-to-day operational control of those activities at a construction site that are necessary to ensure compliance with a Storm Water Pollution Prevention Plan (SWP3) for the site or other permit conditions (for example, they are authorized to direct workers at a site to carry out activities required by the SWP3 or comply with other permit conditions).

Secondary Operator – The person or entity, often the property owner, whose operational control is limited to:

- (a) the employment of other operators, such as a general contractor, to perform or supervise construction activities; or

- (b) the ability to approve or disapprove changes to construction plans and specifications, but who does not have day-to-day on-site operational control over construction activities at the site.

Secondary operators must either prepare their own SWP3 or participate in a shared SWP3 that covers the areas of the construction site, where they have control over the construction plans and specifications.

If there is not a primary operator at the construction site, then the secondary operator is defined as the primary operator and must comply with the requirements for primary operators.

Outfall - For the purpose of this permit, a point source at the point where stormwater runoff associated with construction activity discharges to surface water in the state and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels, or other conveyances that connect segments of the same stream or other water of the U.S. and are used to convey waters of the U.S.

Permittee - An operator authorized under this general permit. The authorization may be gained through submission of a notice of intent, by waiver, or by meeting the requirements for automatic coverage to discharge stormwater runoff and certain non-stormwater discharges from construction activity.

Point Source - Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are, or may be, discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff (40 CFR §122.2).

Pollutant - Dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, filter backwash, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into any surface water in the state. The term "pollutant" does not include tail water or runoff water from irrigation or rainwater runoff from cultivated or uncultivated rangeland, pastureland, and farmland. For the purpose of this permit, the term "pollutant" includes sediment.

Pollution - The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any surface water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property or to public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose (Texas Water Code (TWC) §26.001(14)).

Rainfall Erosivity Factor (R factor) - the total annual erosive potential that is due to climatic effects, and is part of the Revised Universal Soil Loss Equation (RUSLE).

Receiving Water - A "Water of the United States" as defined in 40 CFR §122.2 or a surface water in the state into which the regulated stormwater discharges.

Semiarid Areas - areas with an average annual rainfall of 10 to 20 inches.

Separate Storm Sewer System - A conveyance or system of conveyances (including roads with drainage systems, streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains), designed or used for collecting or conveying stormwater; that is not a combined sewer, and that is not part of a publicly owned treatment works (POTW).

Small Construction Activity - Construction activities including clearing, grading, and excavating that result in land disturbance of equal to or greater than one (1) acre and less than five (5) acres of land. Small construction activity also includes the disturbance of less than one (1) acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one (1) and

less than five (5) acres of land. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site (for example, the routine grading of existing dirt roads, asphalt overlays of existing roads, the routine clearing of existing right-of-ways, and similar maintenance activities).

Steep Slopes – Where a state, Tribe, local government, or industry technical manual (e.g. stormwater BMP manual) has defined what is to be considered a “steep slope”, this permit’s definition automatically adopts that definition. Where no such definition exists, steep slopes are automatically defined as those that are 15 percent or greater in grade.

Stormwater (or Stormwater Runoff) - Rainfall runoff, snow melt runoff, and surface runoff and drainage.

Stormwater Associated with Construction Activity - Stormwater runoff, as defined above, from a construction activity.

Structural Control (or Practice) - A pollution prevention practice that requires the construction of a device, or the use of a device, to reduce or prevent pollution in stormwater runoff. Structural controls and practices may include but are not limited to: silt fences, earthen dikes, drainage swales, sediment traps, check dams, subsurface drains, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins.

Surface Water in the State - Lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state (from the mean high water mark (MHW) out 10.36 miles into the Gulf), and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or non-navigable, and including the beds and banks of all water-courses and bodies of surface water, that are wholly or partially inside or bordering the state or subject to the jurisdiction of the state; except that waters in treatment systems which are authorized by state or federal law, regulation, or permit, and which are created for the purpose of waste treatment are not considered to be water in the state.

Temporary Stabilization - A condition where exposed soils or disturbed areas are provided a protective cover or other structural control to prevent the migration of pollutants. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either permanent stabilization can be achieved or until further construction activities take place.

Thawing Conditions – for the purposes of this permit, thawing conditions are expected based on the historical likelihood of two or more days with daytime temperatures greater than 32 F. This date can be determined by looking at historical weather data.

Note: The estimation of thawing conditions is for planning purposes only. During construction, the permittee will be required to conduct site inspections based upon actual conditions (i.e., if thawing conditions occur sooner than expected, the permittee will be required to conduct inspections at the regular frequency).

Total Maximum Daily Load (TMDL) - The total amount of a pollutant that a water body can assimilate and still meet the Texas Surface Water Quality Standards.

Turbidity – A condition of water quality characterized by the presence of suspended solids and/or organic material.

Waters of the United States - Waters of the United States or waters of the U.S. means:

- (a) all waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- (b) all interstate waters, including interstate wetlands;

- (c) all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds that the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
 - (1) which are or could be used by interstate or foreign travelers for recreational or other purposes;
 - (2) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - (3) which are used or could be used for industrial purposes by industries in interstate commerce;
- (d) all impoundments of waters otherwise defined as waters of the United States under this definition;
- (e) tributaries of waters identified in paragraphs (a) through (d) of this definition;
- (f) the territorial sea; and
- (g) wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA are not waters of the U.S. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the U.S. (such as disposal area in wetlands) nor resulted from the impoundment of waters of the U.S. Waters of the U.S. do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with EPA.

Part II. Permit Applicability and Coverage

Section A. Discharges Eligible for Authorization

1. Stormwater Associated with Construction Activity

Discharges of stormwater runoff and certain non-stormwater discharges from small and large construction activities may be authorized under this general permit.

2. Discharges of Stormwater Associated with Construction Support Activities

Discharges of stormwater runoff and certain non-stormwater discharges from construction support activities as defined in Part I.B of this general permit may be authorized, provided that the following conditions are met:

- (a) the construction support activities are located within one (1) mile from the boundary of the construction site where the construction activity authorized under the permit is being conducted that requires the support of these activities;
- (b) an SWP3 is developed for the permitted construction site according to the provisions in Part III.F of this general permit, and includes appropriate controls and measures to reduce erosion and the discharge of pollutants in stormwater runoff according to the provisions in Part III.G of this general permit;
- (c) the activities are directly related to the construction site;
- (d) the activities are not a commercial operation, nor serve other unrelated construction projects; and
- (e) the activities do not continue to operate beyond the completion of the construction activity at the project it supports.

Construction support activities that operate outside the terms provided in (a) through (e) above must obtain authorization under a separate Texas Pollutant Discharge Elimination System (TPDES) permit, which may include the TPDES Multi Sector General Permit (MSGP), TXR050000 (related to stormwater discharges associated with industrial activity), an alternative general permit (if available), or an individual water quality permit.

3. Non-Stormwater Discharges

The following non-stormwater discharges from sites authorized under this general permit are also eligible for authorization under this general permit:

- (a) discharges from fire-fighting activities (fire-fighting activities do not include washing of trucks, run-off water from training activities, test water from fire suppression systems, or similar activities);
- (b) uncontaminated fire hydrant flushings (excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life), which include flushings from systems that utilize potable water, surface water, or groundwater that does not contain additional pollutants (uncontaminated fire hydrant flushings do not include systems utilizing reclaimed wastewater as a source water);
- (c) water from the routine external washing of vehicles, the external portion of buildings or structures, and pavement, where detergents and soaps are not used, where spills or leaks of toxic or hazardous materials have not occurred (unless spilled materials have been removed; and if local state, or federal regulations are applicable, the materials are removed according to those regulations), and where the purpose is to remove mud, dirt, or dust;

- (d) uncontaminated water used to control dust;
- (e) potable water sources, including waterline flushings, but excluding discharges of hyperchlorinated water, unless the water is first dechlorinated and discharges are not expected to adversely affect aquatic life;
- (f) uncontaminated air conditioning condensate;
- (g) uncontaminated ground water or spring water, including foundation or footing drains where flows are not contaminated with industrial materials such as solvents; and
- (h) lawn watering and similar irrigation drainage.

4. Other Permitted Discharges

Any discharge authorized under a separate National Pollutant Discharge Elimination System (NPDES), TPDES, or TCEQ permit may be combined with discharges authorized by this general permit, provided those discharges comply with the associated permit.

Section B. Concrete Truck Wash Out

The wash out of concrete trucks at regulated construction sites must be performed in accordance with the requirements of Part V of this general permit.

Section C. Limitations on Permit Coverage

1. Post Construction Discharges

Discharges that occur after construction activities have been completed, and after the construction site and any supporting activity site have undergone final stabilization, are not eligible for coverage under this general permit. Discharges originating from the sites are not authorized under this general permit following the submission of the notice of termination (NOT) or removal of the appropriate site notice, as applicable, for the regulated construction activity.

2. Prohibition of Non-Stormwater Discharges

Except as otherwise provided in Part II.A of this general permit, only discharges that are composed entirely of stormwater associated with construction activity may be authorized under this general permit.

3. Compliance with Water Quality Standards

Discharges to surface water in the state that would cause, have the reasonable potential to cause, or contribute to a violation of water quality standards or that would fail to protect and maintain existing designated uses of surface water in the state are not eligible for coverage under this general permit. The executive director may require an application for an individual permit or alternative general permit (see Parts II.H.2 and 3.) to authorize discharges to surface water in the state if the executive director determines that any activity will cause, has the reasonable potential to cause, or contribute to a violation of water quality standards or is found to cause, has the reasonable potential to cause, or contribute to, the impairment of a designated use. The executive director may also require an application for an individual permit considering factors described in Part II.H.3 of this general permit.

4. Impaired Receiving Waters and Total Maximum Daily Load (TMDL) Requirements

The permittee shall determine whether the authorized discharge is to an impaired water body on the latest EPA-approved CWA Section 303(d) List or waters with an EPA-approved or established TMDL that are found on the latest EPA-approved *Texas*

Integrated Report of Surface Water Quality for CWA Sections 305(b) and 303(d), which lists the category 4 and 5 water bodies.

New sources or new discharges of the pollutants of concern to impaired waters are not authorized by this permit unless otherwise allowable under 30 TAC Chapter 305 and applicable state law. Impaired waters are those that do not meet applicable water quality standard(s) and are listed as category 4 or 5 in the current version of the *Texas Integrated Report of Surface Water Quality*, and waterbodies listed on the CWA § 303(d) list. Pollutants of concern are those for which the water body is listed as impaired.

Discharges of the pollutants of concern to impaired water bodies for which there is a TMDL are not eligible for coverage under this general permit unless they are consistent with the approved TMDL. Permittees must incorporate the conditions and requirements applicable to their discharges into their SWP3, in order to be eligible for coverage under this general permit. For consistency with the construction stormwater-related items in an approved TMDL, the SWP3 must be consistent with any applicable condition, goal, or requirement in the TMDL, TMDL Implementation Plan (I-Plan), or as otherwise directed by the executive director.

5. Discharges to the Edwards Aquifer Recharge or Contributing Zone

Discharges cannot be authorized by this general permit where prohibited by 30 TAC Chapter 213 (relating to Edwards Aquifer). In addition, commencement of construction (i.e., the initial disturbance of soils associated with clearing, grading, or excavating activities, as well as other construction-related activities such as stockpiling of fill material and demolition) at a site regulated under 30 TAC Chapter 213, may not begin until the appropriate Edwards Aquifer Protection Plan (EAPP) has been approved by the TCEQ's Edwards Aquifer Protection Program.

- (a) For new discharges located within the Edwards Aquifer Recharge Zone, or within that area upstream from the recharge zone and defined as the Contributing Zone (CZ), operators must meet all applicable requirements of, and operate according to, 30 TAC Chapter 213 (Edwards Aquifer Rule) in addition to the provisions and requirements of this general permit.
- (b) For existing discharges located within the Edwards Aquifer Recharge Zone, the requirements of the agency-approved Water Pollution Abatement Plan (WPAP) under the Edwards Aquifer Rule is in addition to the requirements of this general permit. BMPs and maintenance schedules for structural stormwater controls, for example, may be required as a provision of the rule. All applicable requirements of the Edwards Aquifer Rule for reductions of suspended solids in stormwater runoff are in addition to the requirements in this general permit for this pollutant.
- (c) For discharges located within ten stream miles upstream of the Edwards Aquifer recharge zone, applicants shall also submit a copy of the NOI to the appropriate TCEQ regional office.

Counties: Comal, Bexar, Medina, Uvalde, and Kinney

Contact: TCEQ Water Program Manager
San Antonio Regional Office
14250 Judson Road
San Antonio, Texas 78233-4480
(210) 490-3096

Counties: Williamson, Travis, and Hays

Contact: TCEQ Water Program Manager
Austin Regional Office
12100 Park 35 Circle

Room 179, Building A
Austin, Texas 78753
(512) 339-2929

6. Discharges to Specific Watersheds and Water Quality Areas

Discharges otherwise eligible for coverage cannot be authorized by this general permit where prohibited by 30 TAC Chapter 311 (relating to Watershed Protection) for water quality areas and watersheds.

7. Protection of Streams and Watersheds by Other Governmental Entities

This general permit does not limit the authority or ability of federal, other state, or local governmental entities from placing additional or more stringent requirements on construction activities or discharges from construction activities. For example, this permit does not limit the authority of a home-rule municipality provided by Texas Local Government Code §401.002.

8. Indian Country Lands

Stormwater runoff from construction activities occurring on Indian Country lands are not under the authority of the TCEQ and are not eligible for coverage under this general permit. If discharges of stormwater require authorization under federal NPDES regulations, authority for these discharges must be obtained from the U.S. Environmental Protection Agency (EPA).

9. Oil and Gas Production and Transportation

Stormwater runoff from construction activities associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline, are not under the authority of the TCEQ and are not eligible for coverage under this general permit. Authorization for stormwater discharges from construction activities that are associated with production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline must be obtained, as required, from the U.S. EPA or the Texas Railroad Commission, as applicable. Discharge of stormwater related to construction activity, from a facility that stores both refined products intended for off-site use and crude oil in aboveground storage tanks, is regulated by the TCEQ and is eligible for coverage under this general permit.

10. Stormwater Discharges from Agricultural Activities

Stormwater discharges from agricultural activities that are not point source discharges of stormwater are not subject to TPDES permit requirements. These activities may include clearing and cultivating ground for crops, construction of fences to contain livestock, construction of stock ponds, and other similar agricultural activities. Discharges of stormwater runoff associated with the construction of facilities that are subject to TPDES regulations, such as the construction of concentrated animal feeding operations, would be point sources regulated under this general permit.

11. Endangered Species Act

Discharges that would adversely affect a listed endangered or threatened aquatic or aquatic-dependent species or its critical habitat are not authorized by this permit, unless the requirements of the Endangered Species Act are satisfied. Federal requirements related to endangered species apply to all TPDES permitted discharges and site-specific controls may be required to ensure that protection of endangered or threatened species is achieved. If a permittee has concerns over potential impacts to listed species, the permittee may contact TCEQ for additional information.

12. Other

Nothing in Part II of the general permit is intended to negate any person's ability to assert *force majeure* (act of God, war, strike, riot, or other catastrophe) defenses found in 30 TAC §70.7.

Section D. Deadlines for Obtaining Authorization to Discharge

1. Large Construction Activities

- (a) New Construction - Discharges from sites where the commencement of construction activity occurs on or after the effective date of this general permit must be authorized, either under this general permit or a separate TPDES permit, prior to the commencement of those construction activities.
- (b) Ongoing Construction - Operators of large construction activities continuing to operate after the effective date of this permit, and authorized under the TPDES Construction General Permit TXR150000 (effective on March 5, 2013), must submit an NOI to renew authorization or a NOT to terminate coverage under this general permit within 90 days of the effective date of this general permit. During this interim or grace period, as a requirement of this TPDES permit, the operator must continue to meet the conditions and requirements of the 2013 TPDES general permit.

2. Small Construction Activities

- (a) New Construction - Discharges from sites where the commencement of construction activity occurs on or after the effective date of this general permit must be authorized, either under this general permit or a separate TPDES permit, prior to the commencement of those construction activities.
- (b) Ongoing Construction - Discharges from ongoing small construction activities that commenced prior to the effective date of this general permit, and that do not meet the conditions to qualify for termination of this permit as described in Part II.F of this general permit, must meet the requirements to be authorized, either under this general permit or a separate TPDES permit, within 90 days of the effective date of this general permit. During this interim period, as a requirement of this TPDES permit, the operator must continue to meet the conditions and requirements of the 2013 TPDES Construction General Permit.

Section E. Obtaining Authorization to Discharge1. Automatic Authorization for Small Construction Activities with Low Potential for Erosion:

Operators of small construction activity, as defined in Part I.B of this general permit, shall not submit an NOI for coverage, unless otherwise required by the executive director.

Operators of small construction activities, which occur in certain counties and during periods of low potential for erosion that do not meet the conditions of the waiver described in Part II.G of this general permit, may be automatically authorized under this general permit if all the following conditions are met.

- (a) the construction activity occurs in a county and during the corresponding date range(s) listed in Appendix A;
- (b) the construction activity is initiated and completed, including either final or temporary stabilization of all disturbed areas, within the time frame identified in Appendix A for the location of the construction site;

- (c) all temporary stabilization is adequately maintained to effectively reduce or prohibit erosion, permanent stabilization activities have been initiated, and a condition of final stabilization is completed no later than 30 days following the end date of the time frame identified in Appendix A for the location of the construction site;
- (d) the permittee signs a completed TCEQ small construction site notice for low potential for erosion, including the certification statement;
- (e) a signed and certified copy of the small construction site notice for low potential for erosion is posted at the construction site in a location where it is readily available for viewing by the general public, local, state, and federal authorities prior to commencing construction activities, and maintained in that location until completion of the construction activity;

NOTE: Posted site notices may have a redacted signature as long as there is an original signed and certified site notice, with a viewable signature, located on-site and available for review by any applicable regulatory authority.

- (f) a copy of the signed and certified small construction site notice for low potential for erosion is provided to the operator of any MS4 receiving the discharge at least two days prior to commencement of construction activities;
- (g) discharges of stormwater runoff or other non-stormwater discharges from any supporting concrete batch plant or asphalt batch plant is separately authorized under an individual TPDES permit, another TPDES general permit, or under an individual TCEQ permit where stormwater and non-stormwater is disposed of by evaporation or irrigation (discharges are adjacent to water in the state); and
- (h) any non-stormwater discharges are either authorized under a separate permit or authorization, are not considered by TCEQ to be a wastewater, or are captured and routed for disposal at a publicly operated treatment works or licensed waste disposal facility.

If all of the conditions in (a) – (h) above are met, then the operator(s) of small construction activities with low potential for erosion are not required to develop a SWP3.

If an operator is conducting small construction activities and any of the above conditions (a) – (h) are not met, the operator cannot declare coverage under the automatic authorization for small construction activities with low potential for erosion and must meet the requirements for automatic authorization (all other) small construction activities, described below in Part II.E.2.

For small construction activities that occur during a period with a low potential for erosion, where automatic authorization under this section is not available, an operator may apply for and obtain a waiver from permitting (Low Rainfall Erosivity Waiver – LREW), as described in Part II.G of this general permit. Waivers from coverage under the LREW do not allow for any discharges of non-stormwater and the operator must ensure that discharges on non-stormwater are either authorized under a separate permit or authorization.

2. Automatic Authorization for Small Construction Activities:

Operators of small construction activities as defined in Part I.B of this general permit shall not submit an NOI for coverage, unless otherwise required by the executive director.

Operators of small construction activities, as defined in Part I.B of this general permit or as defined but who do not meet in the conditions and requirements located in Part II.E.1 above, may be automatically authorized for small construction activities, provided that they meet all of the following conditions:

- (a) develop a SWP3 according to the provisions of this general permit, that covers either the entire site or all portions of the site for which the applicant is the operator, and implement the SWP3 prior to commencing construction activities;
- (b) all operators of regulated small construction activities must post a copy of a signed and certified Small Construction site notice, the notice must be posted at the construction site in a location where it is safely and readily available for viewing by the general public, local, state, and federal authorities, at least two days prior to commencing construction activity, and maintain the notice in that location until completion of the construction activity (for linear construction activities, e.g. pipeline or highway, the site notice must be placed in a publicly accessible location near where construction is actively underway; notice for these linear sites may be relocated, as necessary, along the length of the project, and the notice must be safely and readily available for viewing by the general public; local, state, and federal authorities);
- (c) operators must maintain a posted site notice at the construction site until final stabilization has been achieved; and

NOTE: Posted site notices may have a redacted signature as long as there is an original signed and certified Small Construction site notice, with a viewable signature, located on-site and available for review by an applicable regulatory authority.

- (d) provide a copy of the signed and certified construction site notice to the operator of any municipal separate storm sewer system (MS4) receiving the discharge at least two days prior to commencement of construction activities.

As described in Part I.B of this general permit, large construction activities include those that will disturb less than five (5) acres of land, but that are part of a larger common plan of development or sale that will ultimately disturb five (5) or more acres of land, and must meet the requirements of Part II.E.3. below.

3. Authorization for Large Construction Activities:

Operators of large construction activities that qualify for coverage under this general permit must meet all of the following conditions:

- (a) develop a SWP3 according to the provisions of this general permit that covers either the entire site or all portions of the site where the applicant is the operator. The SWP3 must be developed and implemented prior to obtaining coverage and prior to commencing construction activities;
- (b) primary operators of large construction activities must submit an NOI prior to commencing construction activity at a construction site. A completed NOI must be submitted to TCEQ electronically using the online e-Permits system on TCEQ's website. Operators with an electronic reporting waiver must submit a completed NOI to TCEQ at least seven (7) days prior to prior to commencing construction activity to obtain provisional coverage seven (7) days from the postmark date for delivery to the TCEQ. An authorization is no longer provisional when the executive director finds the NOI is administratively complete and an authorization number is issued to the permittee for the construction site indicated on the NOI.

If an additional primary operator is added after the initial NOI is submitted, the additional primary operator must meet the same requirements for existing primary operator(s), as indicated above.

If the primary operator changes due to responsibility at the site being transferred from one primary operator to another after the initial NOI is submitted, the new primary operator must submit a paper NOI or an electronic NOI at least ten (10)

days prior to assuming operational control of a construction site and commencing construction activity.

Operators that submit NOIs electronically must use the online e-Permits system available through the TCEQ website.

- (c) all operators of large construction activities must post a site notice in accordance with Part III.D.2 of this permit. The site notice must be located where it is safely and readily available for viewing by the general public, local, state, and federal authorities prior to commencing construction activities, and must be maintained in that location until completion of the construction activity (for linear construction activities, e.g. pipeline or highway, the site notice must be placed in a publicly accessible location near where construction is actively underway; notice for these linear sites may be relocated, as necessary, along the length of the project, and the notice must be safely and readily available for viewing by the general public, local, state, and federal authorities);
- (d) two days prior to commencing construction activities, all primary operators must:
 - i. provide a copy of the signed NOI to the operator of any MS4 receiving the discharge and to any secondary construction operator, and
 - ii. list in the SWP3 the names and addresses of all MS4 operators receiving a copy;
- (e) all persons meeting the definition of “secondary operator” in Part I of this permit are hereby notified that they are regulated under this general permit, but are not required to submit an NOI, provided that a primary operator at the site has submitted an NOI, or prior to commencement of construction activities, a primary operator is required to submit an NOI and the secondary operator has provided notification to the operator(s) of the need to obtain coverage (with records of notification available upon request). Any secondary operator notified under this provision may alternatively submit an NOI under this general permit, may seek coverage under an alternative TPDES individual permit, or may seek coverage under an alternative TPDES general permit if available; and
- (f) all secondary operators of large construction activities must post a copy of the signed and certified Secondary Operator construction site notice and provide a copy of the signed and certified site notice to the operator of any MS4 receiving the discharge at least two days prior to the commencement construction activities.

NOTE: Posted site notices may have a redacted signature as long as there is an original signed and certified Secondary Operator construction site notice, with a viewable signature, located on-site and available for review by an applicable regulatory authority.

Effective September 1, 2018, applicants must submit an NOI using the online e-Permits system available through the TCEQ website, or request and obtain a waiver from electronic reporting from the TCEQ. Waivers from electronic reporting are not transferrable and expire on the same date as the authorization to discharge.

4. Waivers for Small Construction Activities:

Operators of certain small construction activities may obtain a waiver from coverage under this general permit, if applicable. The requirements are outlined in Part II.G below.

5. Effective Date of Coverage

- (a) Operators of small construction activities as described in either Part II.E.1 or II.E.2 above are authorized immediately following compliance with the applicable conditions of Part II.E.1 or II.E.2. Secondary operators of large construction

activities as described in Part II.E.3 above are authorized immediately following compliance with the applicable conditions in Part II.E.3. For activities located in areas regulated by 30 TAC Chapter 213, related to the Edwards Aquifer, this authorization to discharge is separate from the requirements of the operator's responsibilities under that rule. Construction may not commence for sites regulated under 30 TAC Chapter 213 until all applicable requirements of that rule are met.

- (b) Primary operators of large construction activities as described in Part II.E.3 above that electronically submit an NOI are authorized immediately following confirmation of receipt of the electronic form by the TCEQ, unless otherwise notified by the executive director. Operators with an electronic reporting waiver are provisionally authorized seven (7) days from the date that a completed paper NOI is postmarked for delivery to the TCEQ, unless otherwise notified by the executive director. An authorization is no longer provisional when the executive director finds the NOI is administratively complete and an authorization number is issued to the permittee for the construction site indicated on the NOI.

For construction activities located in areas regulated by 30 TAC Chapter 213, related to the Edwards Aquifer, this authorization to discharge is separate from the requirements of the operator's responsibilities under that rule. Construction activities may not commence for sites regulated under 30 TAC Chapter 213 until all applicable requirements of that rule are met.

- (c) Operators are not prohibited from submitting late NOIs or posting late notices to obtain authorization under this general permit. The TCEQ reserves the right to take appropriate enforcement action for any unpermitted activities that may have occurred between the time construction commenced and authorization was obtained.
- (d) If operators that submitted NOIs have active authorizations for construction activities that are ongoing when the term of the current general permit expires and a new general permit is issued, a 90-day interim (grace) period is granted to provide coverage that is administratively continued until operators with active authorizations can obtain coverage under the newly issued CGP. The 90-day grace period starts on the effective date of the newly issued CGP. Deadlines for obtaining coverage for operators of small and large construction are provided in Part II.D.1 and 2 above.

6. Notice of Change (NOC)

If relevant information provided in the NOI changes, the operator that has submitted the NOI must submit an NOC to TCEQ at least fourteen (14) days before the change occurs, if possible. Where a 14-day advance notice is not possible, the operator must submit an NOC to TCEQ within 14-days of discovery of the change. If the operator becomes aware that it failed to submit any relevant facts or submitted incorrect information in an NOI, the correct information must be submitted to TCEQ in an NOC within 14 days after discovery. The NOC shall be submitted on a form provided by the executive director, or by letter if an NOC form is not available. A copy of the NOC form or letter must also be placed in the SWP3 and provided to the operator of any MS4 receiving the discharge. A list that includes the names and addresses of all MS4 operators receiving a copy of the NOC (or NOC letter) must be included in the SWP3.

Information on an NOC may include, but is not limited to, the following: a change in the description of the construction project; an increase in the number of acres disturbed (for increases of one or more acres); or the name of the operator (where the name of the operator has changed).

A transfer of operational control from one operator to another, including a transfer of the ownership of a company. Coverage under this general permit is not transferable

from one operator to another or one company to another, and may not be included in an NOC.

A transfer of ownership of a company may include, but is not limited to, the following: changes to the structure of a company, such as changing from a partnership to a corporation or changing corporation types, so that the filing number (or charter number) that is on record with the Texas Secretary of State must be changed.

An NOC is not required for notifying TCEQ of a decrease in the number of acres disturbed. This information must be included in the SWP3 and retained on site.

Effective September 1, 2018, applicants must submit an NOC using the online e-Permits system available through the TCEQ website, or request and obtain a waiver from electronic reporting from the TCEQ. Waivers from electronic reporting are not transferrable and expire on the same date as the authorization to discharge.

7. Signatory Requirement for NOI Forms, Notice of Termination (NOT) Forms, NOC Letters, and Construction Site Notices

NOI forms, NOT forms, NOC letters, and Construction Site Notices that require a signature must be signed according to 30 TAC § 305.44 (relating to Signatories for Applications).

8. Contents of the NOI

The NOI form shall require, at a minimum, the following information:

- (a) the TPDES CGP authorization number for existing authorizations under this general permit, where the operator submits an NOI to renew coverage within 90 days of the effective date of this general permit;
- (b) the name, address, and telephone number of the operator filing the NOI for permit coverage;
- (c) the name (or other identifier), address, county, and latitude/longitude of the construction project or site;
- (d) the number of acres that will be disturbed by the applicant;
- (e) confirmation that the project or site will not be located on Indian Country lands;
- (f) confirmation that a SWP3 has been developed in accordance with this general permit, that it will be implemented prior to commencement of construction activities, and that it is compliant with any applicable local sediment and erosion control plans; for multiple operators who prepare a shared SWP3, the confirmation for an operator may be limited to its obligations under the SWP3 provided all obligations are confirmed by at least one operator;
- (g) name of the receiving water(s);
- (h) the classified segment number for each classified segment that receives discharges from the regulated construction activity (if the discharge is not directly to a classified segment, then the classified segment number of the first classified segment that those discharges reach); and
- (i) the name of all surface waters receiving discharges from the regulated construction activity that are on the latest EPA-approved CWA § 303(d) List of impaired waters or Texas Integrated Report of Surface Water Quality for CWA Sections 305(b) and 303(d) as not meeting applicable state water quality standards.

Section F. Terminating Coverage

1. Notice of Termination (NOT) Required

Each operator that has submitted an NOI for authorization of large construction activities under this general permit must apply to terminate that authorization following the conditions described in this section of the general permit.

Authorization of large construction must be terminated by submitting an NOT on a paper form to TCEQ supplied by the executive director or electronically via the online e-Permits system available through the TCEQ website. Authorization to discharge under this general permit terminates at midnight on the day a paper NOT is postmarked for delivery to the TCEQ or immediately following confirmation of the receipt of the NOT submitted electronically by the TCEQ. Compliance with the conditions and requirements of this permit is required until an NOT is submitted.

Effective September 1, 2018, applicants must submit an NOT using the online e-Permits system available through the TCEQ website, or request and obtain a waiver from electronic reporting from the TCEQ. Waivers from electronic reporting are not transferrable and expire on the same date as the authorization to discharge.

The NOT must be submitted to TCEQ, and a copy of the NOT provided to the operator of any MS4 receiving the discharge (with a list in the SWP3 of the names and addresses of all MS4 operators receiving a copy), within 30 days after any of the following conditions are met:

- (a) final stabilization has been achieved on all portions of the site that are the responsibility of the operator;
- (b) a transfer of operational control has occurred (See Section II.F.4 below); or
- (c) the operator has obtained alternative authorization under an individual TPDES permit or alternative TPDES general permit.

2. Minimum Contents of the NOT

The NOT form shall require, at a minimum, the following information:

- (a) if authorization for construction activity was granted following submission of an NOI, the permittee's site-specific TPDES authorization number for a specific construction site;
- (b) an indication of whether final stabilization has been achieved at the site and a NOT has been submitted or if the permittee is simply no longer an operator at the site;
- (c) the name, address, and telephone number of the permittee submitting the NOT;
- (d) the name (or other identifier), address, county, and location (latitude/longitude) of the construction project or site; and
- (e) a signed certification that either all stormwater discharges requiring authorization under this general permit will no longer occur, or that the applicant is no longer the operator of the facility or construction site, and that all temporary structural erosion controls have either been removed, will be removed on a schedule defined in the SWP3, or have been transferred to a new operator if the new operator has applied for permit coverage. Erosion controls that are designed to remain in place for an indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal.

3. Termination of Coverage for Small Construction Sites and for Secondary Operators at Large Construction Sites
 - (a) Each operator that has obtained automatic authorization for small construction or is a secondary operator for large construction must perform the following when terminating coverage under the permit:
 - i. remove the site notice;
 - ii. complete the applicable portion of the site notice related to removal of the site notice; and
 - iii. submit a copy of the completed site notice to the operator of any MS4 receiving the discharge (or provide alternative notification as allowed by the MS4 operator, with documentation of such notification included in the SWP3).
 - (b) The activities described in Part II.F.3.(a) above must be completed by the operator within 30 days of meeting any of the following conditions:
 - i. final stabilization has been achieved on all portions of the site that are the responsibility of the operator;
 - ii. a transfer of day-to-day operational control over activities necessary to ensure compliance with the SWP3 and other permit conditions has occurred (See Section II.F.4. below); or
 - iii. the operator has obtained alternative authorization under an individual or general TPDES permit.

Authorization to discharge under this general permit terminates immediately upon removal of the applicable site notice. Compliance with the conditions and requirements of this permit is required until the site notice is removed.

4. Transfer of Day-to-Day Operational Control

- (a) When the primary operator of a large construction activity changes or operational control over activities necessary to ensure compliance with the SWP3 and other permit conditions is transferred to another primary operator, the original operator must do the following:
 - i. submit an NOT within ten (10) days prior to the date that responsibility for operations terminates, and the new operator must submit an NOI at least ten (10) days prior to the transfer of operational control, in accordance with condition (c) below; and
 - ii. submit a copy of the NOT from the primary operator terminating its coverage under the permit and its operational control of the construction site and submit a copy of the NOI from the new primary operator to the operator of any MS4 receiving the discharge in accordance with Part II.F.1 above.
- (b) For transfer of operational control, operators of small construction activities and secondary operators of large construction activities who are not required to submit an NOI must do the following:
 - i. the existing operator must remove the original site notice, and the new operator must post the required site notice prior to the transfer of operational control, in accordance with the conditions in Part II.F.4.(c) i or ii below; and
 - ii. a copy of the site notice, which must be completed and provided to the operator of any MS4 receiving the discharge, in accordance with Part II.F.3 above.
- (c) Each operator is responsible for determining its role as an operator as defined in Part I.B and obtaining authorization under the permit, as described above in Part

II.E. 1 – 3. Where authorization has been obtained by submitting an NOI for coverage under this general permit, permit coverage is not transferable from one operator to another. A transfer of operational control can include changes to the structure of a company, such as changing from a partnership to a corporation, or changing to a different corporation type such that a different filing (or charter) number is established with the Texas Secretary of State. A transfer of operational control can also occur when one of the following criteria is met, as applicable:

- i. Another operator has assumed control over all areas of the site that do not meet the definition for final stabilization;
- ii. all silt fences and other temporary erosion controls have either been removed, scheduled for removal as defined in the SWP3, or transferred to a new operator, provided that the original permitted operator has attempted to notify the new operator in writing of the requirement to obtain permit coverage. Records of this notification (or attempt at notification) shall be retained by the operator transferring operational control to another operator in accordance with Part VI of this permit. Erosion controls that are designed to remain in place for an indefinite period, such as mulches and fiber mats, are not required to be removed or scheduled for removal; or
- iii. a homebuilder has purchased one or more lots from an operator who obtained coverage under this general permit for a common plan of development or sale. The homebuilder is considered a new operator and shall comply with the requirements of this permit. Under these circumstances, the homebuilder is only responsible for compliance with the general permit requirements as they apply to the lot(s) it has operational control over in a larger common plan of development, and the original operator remains responsible for common controls or discharges, and must amend its SWP3 to remove the lot(s) transferred to the homebuilder.

Section G. Waivers from Coverage

The executive director may waive the otherwise applicable requirements of this general permit for stormwater discharges from small construction activities under the terms and conditions described in this section.

1. Waiver Applicability and Coverage

Operators of small construction activities may apply for and receive a waiver from the requirements to obtain authorization under this general permit, when the calculated rainfall erosivity (R) factor for the entire period of the construction project is less than five (5).

The operator must submit either a signed paper Low Rainfall Erosivity Waiver (LREW) certification form to the TCEQ, supplied by the executive director, or complete the form electronically via the online e-Permits system available through the TCEQ website. The form is a certification by the operator that the small construction activity will commence and be completed within a period when the value of the calculated R factor is less than five (5).

The paper LREW certification form must be postmarked for delivery to the TCEQ at least seven (7) days before construction activity begins or, if submitted electronically, construction may begin at any time following the receipt of written confirmation from TCEQ that a complete electronic application was submitted and acknowledged.

This waiver from coverage does not apply to any non-stormwater discharges, including what is allowed under this permit. The operator must insure that all non-stormwater discharges are either authorized under a separate permit or authorization, or are captured and routed to an authorized treatment facility for disposal.

Effective September 1, 2018, applicants must submit an LREW using the online e-Permits system available through the TCEQ website, or request and obtain a waiver from electronic reporting from the TCEQ. Waivers from electronic reporting are not transferrable and expire on the same date as the authorization to discharge.

2. Steps to Obtaining a Waiver

The construction site operator may calculate the R factor to request a waiver using the following steps:

- (a) Estimate the construction start date and the construction end date. The construction end date is the date that final stabilization will be achieved.
- (b) Find the appropriate Erosivity Index (EI) zone in Appendix B of this permit.
- (c) Find the EI percentage for the project period by adding the results for each period of the project using the table provided in Appendix D of this permit, in EPA Fact Sheet 2.1, or in USDA Handbook 703, by subtracting the start value from the end value to find the percent EI for the site.
- (d) Refer to the Isoerodent Map (Appendix C of this permit) and interpolate the annual isoerodent value for the proposed construction location.
- (e) Multiply the percent value obtained in Step (c) above by the annual isoerodent value obtained in Step (d). This is the R factor for the proposed project. If the value is less than 5, then a waiver may be obtained. If the value is five (5) or more, then a waiver may not be obtained, and the operator must obtain coverage under Part II.E.2. of this permit.

Alternatively, the operator may calculate a site-specific R factor utilizing the following online calculator: <http://ei.tamu.edu/index.html>, or using another available resource.

A copy of the LREW certification form is not required to be posted at the small construction site.

3. Effective Date of a LREW

Unless otherwise notified by the executive director, operators of small construction activities seeking coverage under a LREW are provisionally waived from the otherwise applicable requirements of this general permit seven (7) days from the date that a completed paper LREW certification form is postmarked for delivery to TCEQ, or immediately upon receiving confirmation of approval of an electronic submittal, made via the online e-Permits system available through the TCEQ website.

Effective September 1, 2018, applicants seeking coverage under a LREW must submit an application for a LREW using the online e-Permits system available through the TCEQ website, or request and obtain a waiver from electronic reporting from the TCEQ. Waivers from electronic reporting are not transferrable and expire on the same date as the authorization to discharge.

4. Activities Extending Beyond the LREW Period

If a construction activity extends beyond the approved waiver period due to circumstances beyond the control of the operator, the operator must either:

- (a) recalculate the R factor using the original start date and a new projected ending date, and if the R factor is still under five (5), submit a new waiver certification form at least two (2) days before the end of the original waiver period; or
- (b) obtain authorization under this general permit according to the requirements for automatic authorization for small construction activities in Part II.E.2 of this permit, prior to the end of the approved LREW period.

Section H. Alternative TPDES Permit Coverage**1. Individual Permit Alternative**

Any discharge eligible for coverage under this general permit may alternatively be authorized under an individual TPDES permit according to 30 TAC §305 (relating to Consolidated Permits). Applications for individual permit coverage must be submitted at least three hundred and thirty (330) days prior to commencement of construction activities to ensure timely authorization. Existing coverage under this general permit should not be terminated until an individual permit is issued and in effect.

2. Alternative Authorizations for Certain Discharges

Certain discharges eligible for authorization under this general permit may alternatively be authorized under a separate general permit according to 30 TAC Chapter 205 (relating to General Permits for Waste Discharges), as applicable.

3. Individual Permit Required

The executive director may require an operator of a construction site, otherwise eligible for authorization under this general permit, to apply for an individual TPDES permit in the following circumstances:

- (a) the conditions of an approved TMDL or TMDL I-Plan on the receiving water;
- (b) the activity being determined to cause, has a reasonable potential to cause, or contribute to a violation of water quality standards or being found to cause, or contribute to, the loss of a designated use of surface water in the state: and
- (c) any other consideration defined in 30 TAC Chapter 205 (relating to General Permits for Waste Discharges) including 30 TAC Chapter 205.4(c)(3)(D), which allows the commission to deny authorization under the general permit and require an individual permit if a discharger has been determined by the executive director to have been out of compliance with any rule, order, or permit of the commission, including non-payment of fees assessed by the executive director.

A discharger with a TCEQ compliance history rating of “unsatisfactory” is ineligible for coverage under this general permit. In that case, 30 TAC § 60.3 requires the executive director to deny or suspend an authorization to discharge under a general permit. However, per TWC § 26.040(h), a discharger is entitled to a hearing before the commission prior to having an authorization denied or suspended for having an “unsatisfactory” compliance history.

Denial of authorization to discharge under this general permit or suspension of a permittee’s authorization under this general permit for reasons other than compliance history shall be done according to commission rules in 30 TAC Chapter 205 (relating to General Permits for Waste Discharges).

4. Alternative Discharge Authorization

Any discharge eligible for authorization under this general permit may alternatively be authorized under a separate general permit according to 30 TAC Chapter 205 (relating to General Permits for Waste Discharges), if applicable.

Section I. Permit Expiration

- 1. This general permit is effective for a term not to exceed five (5) years. All active discharge authorizations expire on the date provided on page one (1) of this permit. Following public notice and comment, as provided by 30 TAC §205.3 (relating to Public Notice, Public Meetings, and Public Comment), the commission may amend,

revoke, cancel, or renew this general permit. All authorizations that are active at the time the permit term expires will be administratively continued as indicated in Part II.I.2 below and in Part II.D.1(b) and D.2(b) of this permit.

2. If the executive director publishes a notice of the intent to renew or amend this general permit before the expiration date, the permit will remain in effect for existing, authorized discharges until the commission takes final action on the permit. Upon issuance of a renewed or amended permit, permittees may be required to submit an NOI within 90 days following the effective date of the renewed or amended permit, unless that permit provides for an alternative method for obtaining authorization.
3. If the commission does not propose to reissue this general permit within 90 days before the expiration date, permittees shall apply for authorization under an individual permit or an alternative general permit. If the application for an individual permit is submitted before the expiration date, authorization under this expiring general permit remains in effect until the issuance or denial of an individual permit. No new NOIs will be accepted nor new authorizations honored under the general permit after the expiration date.

Part III. Stormwater Pollution Prevention Plans (SWP3)

All regulated construction site operators shall prepare an SWP3, prior to submittal of an NOI, to address discharges authorized under Parts II.E.2 and II.E.3 of this general permit that will reach Waters of the U.S. This includes discharges to MS4s and privately owned separate storm sewer systems that drain into surface water in the state or Waters of the U.S.

Individual operators at a site may develop separate SWP3s that cover only their portion of the project, provided reference is made to the other operators at the site. Where there is more than one SWP3 for a site, operators must coordinate to ensure that BMPs and controls are consistent and do not negate or impair the effectiveness of each other. Regardless of whether a single comprehensive SWP3 is developed or separate SWP3s are developed for each operator, it is the responsibility of each operator to ensure compliance with the terms and conditions of this general permit in the areas of the construction site where that operator has control over construction plans and specifications or day-to-day operations.

An SWP3 must describe the implementation of practices that will be used to minimize to the extent practicable the discharge of pollutants in stormwater associated with construction activity and non-stormwater discharges described in Part II.A.3, in compliance with the terms and conditions of this permit.

An SWP3 must also identify any potential sources of pollution that have been determined to cause, have a reasonable potential to cause, or contribute to a violation of water quality standards or have been found to cause or contribute to the loss of a designated use of surface water in the state from discharges of stormwater from construction activities and construction support activities. Where potential sources of these pollutants are present at a construction site, the SWP3 must also contain a description of the management practices that will be used to prevent these pollutants from being discharged into surface water in the state or Waters of the U.S.

NOTE: Construction support activities can also include vehicle repair areas, fueling areas, etc. that are present at a construction site solely for the support construction activities and are only used by operators at the construction site.

The SWP3 is intended to serve as a road map for how the construction operator will comply with the effluent limits and other conditions of this permit and does not establish the effluent limits that apply to the construction site's discharges. These limits are established in Part III.G of the permit.

Section A. Shared SWP3 Development

For more effective coordination of BMPs and opportunities for cost sharing, a cooperative effort by the different operators at a site is encouraged. Operators of small and large construction activities must independently obtain authorization under this permit, but may work together with other regulated operators at the construction site to prepare and implement a single, comprehensive SWP3, which can be shared by some or all operators, for the construction activities that each of the operators are performing at the entire construction site.

1. The SWP3 must include the following:
 - (a) for small construction activities – the name of each operator that participates in the shared SWP3;
 - (b) for large construction activities - the name of each operator that participates in the shared SWP3, the general permit authorization numbers of each operator (or the date that the NOI was submitted to TCEQ by each operator that has not received an authorization number for coverage under this permit); and
 - (c) for large and small construction activities - the signature of each operator participating in the shared SWP3.
2. The SWP3 must clearly indicate which operator is responsible for satisfying each shared requirement of the SWP3. If the responsibility for satisfying a requirement is not described in the plan, then each permittee is entirely responsible for meeting the requirement within the boundaries of the construction site where they perform construction activities. The SWP3 must clearly describe responsibilities for meeting each requirement in shared or common areas.
3. The SWP3 may provide that one operator is responsible for preparation of a SWP3 in compliance with the CGP, and another operator is responsible for implementation of the SWP3 at the project site.

Section B. Responsibilities of Operators

1. Secondary Operators and Primary Operators with Control Over Construction Plans and Specifications

All secondary operators and primary operators with control over construction plans and specifications shall:

- (a) ensure the project specifications allow or provide that adequate BMPs are developed to meet the requirements of Part III of this general permit;
- (b) ensure that the SWP3 indicates the areas of the project where they have control over project specifications, including the ability to make modifications in specifications;
- (c) ensure that all other operators affected by modifications in project specifications are notified in a timely manner so that those operators may modify their BMPs as necessary to remain compliant with the conditions of this general permit; and
- (d) ensure that the SWP3 for portions of the project where they are operators indicates the name and site-specific TPDES authorization number(s) for operators with the day-to-day operational control over those activities necessary to ensure compliance with the SWP3 and other permit conditions. If a primary operator has not been authorized or has abandoned the site, the secondary operator is considered to be the responsible party and must obtain authorization

as a primary operator under the permit, until the authority for day-to-day operational control is transferred to another primary operator. The new primary operator must update or develop a new SWP3 that will reflect the transfer of operational control and include any additional updates to the SWP3 to meet requirements of the permit.

2. Primary Operators with Day-to-Day Operational Control

Primary operators with day-to-day operational control of those activities at a project that are necessary to ensure compliance with an SWP3 and other permit conditions must ensure that the SWP3 accomplishes the following requirements:

- (a) meets the requirements of this general permit for those portions of the project where they are operators;
- (b) identifies the parties responsible for implementation of BMPs described in the SWP3;
- (c) indicates areas of the project where they have operational control over day-to-day activities; and
- (d) the name and site-specific TPDES authorization number of the parties with control over project specifications, including the ability to make modifications in specifications for areas where they have operational control over day-to-day activities.

Section C. Deadlines for SWP3 Preparation, Implementation, and Compliance

The SWP3 must be prepared prior to obtaining authorization under this general permit, and implemented prior to commencing construction activities that result in soil disturbance. The SWP3 must be prepared so that it provides for compliance with the terms and conditions of this general permit.

Section D. Plan Review and Making Plans Available

1. The SWP3 must be retained on-site at the construction site or, if the site is inactive or does not have an on-site location to store the plan, a notice must be posted describing the location of the SWP3. The SWP3 must be made readily available at the time of an on-site inspection to: the executive director; a federal, state, or local agency approving sediment and erosion plans, grading plans, or stormwater management plans; local government officials; and the operator of a municipal separate storm sewer receiving discharges from the site. If the SWP3 is retained off-site, then it shall be made available as soon as reasonably possible. In most instances, it is reasonable that the SWP3 shall be made available within 24 hours of the request.
2. Operators with authorization for construction activity under this general permit must post a TCEQ site notice at the construction site at a place readily available for viewing by the general public, and local, state, and federal authorities.
 - (a) Primary and secondary operators of large construction activities must each post a TCEQ construction site notice, respective to their role as an operator at the construction site, as required above and according to requirements in Part II.E.3 of this general permit.
 - (b) Primary and secondary operators of small construction activities must post the TCEQ site notice as required in Part III.D.2.(a) above and for the specific type of small construction described in Part II.E.1 and 2 of the permit.
 - (c) If the construction project is a linear construction project, such as a pipeline or highway, the notices must be placed in a publicly accessible location near where construction is actively underway. Site notices for small and large construction

activities at these linear construction sites may be located, as necessary, along the length of the project, but must still be readily available for viewing by the general public; local, state, and federal authorities; and contain the following information:

- i. the site-specific TPDES authorization number for the project if assigned;
 - ii. the operator name, contact name, and contact phone number;
 - iii. a brief description of the project; and
 - iv. the location of the SWP3.
3. This permit does not provide the general public with any right to trespass on a construction site for any reason, including inspection of a site; nor does this permit require that permittees allow members of the general public access to a construction site.

Section E. Revisions and Updates to SWP3s

The permittee must revise or update the SWP3 within seven days of when any of the following occurs:

1. a change in design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants and that has not been previously addressed in the SWP3;
2. changing site conditions based on updated plans and specifications, new operators, new areas of responsibility, and changes in BMPs; or
3. results of inspections or investigations by construction site personnel authorized by the permittee, operators of a municipal separate storm sewer system receiving the discharge, authorized TCEQ personnel, or a federal, state or local agency approving sediment and erosion plans indicate the SWP3 is proving ineffective in eliminating or significantly minimizing pollutants in discharges authorized under this general permit.

Section F. Contents of SWP3

The SWP3 must be developed and implemented by primary operators of small and large construction activities and include, at a minimum, the information described in this section and must comply with the construction and development effluent guidelines in Part III, Section G of the general permit.

1. A site or project description, which includes the following information:
 - (a) a description of the nature of the construction activity;
 - (b) a list of potential pollutants and their sources;
 - (c) a description of the intended schedule or sequence of activities that will disturb soils for major portions of the site, including estimated start dates and duration of activities;
 - (d) the total number of acres of the entire property and the total number of acres where construction activities will occur, including areas where construction support activities (defined in Part I.B of this general permit) occur;
 - (e) data describing the soil or the quality of any discharge from the site;
 - (f) a map showing the general location of the site (e.g. a portion of a city or county map);
 - (g) a detailed site map (or maps) indicating the following:

- i. drainage patterns and approximate slopes anticipated after major grading activities;
- ii. areas where soil disturbance will occur;
- iii. locations of all controls and buffers, either planned or in place;
- iv. locations where temporary or permanent stabilization practices are expected to be used;
- v. locations of construction support activities, including those located off-site;
- vi. surface waters (including wetlands) either at, adjacent, or in close proximity to the site, and also indicate whether those waters are impaired;
- vii. locations where stormwater discharges from the site directly to a surface water body or a municipal separate storm sewer system;
- viii. vehicle wash areas; and
- ix. designated points on the site where vehicles will exit onto paved roads (for instance, this applies to construction transition from unstable dirt areas to exterior paved roads).

Where the amount of information required to be included on the map would result in a single map being difficult to read and interpret, the operator shall develop a series of maps that collectively include the required information.

- (h) the location and description of support activities authorized under the permittee's NOI, including asphalt plants, concrete plants, and other activities providing support to the construction site that is authorized under this general permit;
 - (i) the name of receiving waters at or near the site that may be disturbed or that may receive discharges from disturbed areas of the project;
 - (j) a copy of this TPDES general permit;
 - (k) the NOI and the acknowledgement of provisional and non-provisional authorization for primary operators of large construction sites, and the site notice for small construction sites and for secondary operators of large construction sites;
 - (l) stormwater and allowable non-stormwater discharge locations, including storm drain inlets on site and in the immediate vicinity of the construction site where construction support activities will occur; and
 - (m) locations of all pollutant-generating activities at the construction site and where construction support activities will occur, such as the following: Paving operations; concrete, paint and stucco washout and water disposal; solid waste storage and disposal; and dewatering operations.
2. A description of the BMPs that will be used to minimize pollution in runoff.

The description must identify the general timing or sequence for implementation. At a minimum, the description must include the following components:

- (a) General Requirements
 - i. Erosion and sediment controls must be designed to retain sediment on-site to the extent practicable with consideration for local topography, soil type, and rainfall.
 - ii. Control measures must be properly selected, installed, and maintained according to the manufacturer's or designer's specifications.

- iii. Controls must be developed to minimize the offsite transport of litter, construction debris, and construction materials.

(b) Erosion Control and Stabilization Practices

The SWP3 must include a description of temporary and permanent erosion control and stabilization practices for the construction site, where small or large construction activity will occur. The erosion control and stabilization practices selected by the permittee must be compliant with the requirements for sediment and erosion control, located in Part III.G of this permit. The description of the SWP3 must also include a schedule of when the practices will be implemented. Site plans must ensure that existing vegetation at the construction site is preserved where it is possible.

- i. Erosion control and stabilization practices may include but are not limited to: establishment of temporary or permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of existing trees and vegetation, slope texturing, temporary velocity dissipation devices, flow diversion mechanisms, and other similar measures.
- ii. The following records must be maintained and either attached to or referenced in the SWP3, and made readily available upon request to the parties listed in Part III.D.1 of this general permit:
 - (A) the dates when major grading activities occur;
 - (B) the dates when construction activities temporarily or permanently cease on a portion of the site; and
 - (C) the dates when stabilization measures are initiated.
- iii. Erosion control and stabilization measures must be initiated immediately in portions of the site where construction activities have temporarily ceased and will not resume for a period exceeding 14 calendar days. Stabilization measures that provide a protective cover must be initiated immediately in portions of the site where construction activities have permanently ceased. The term "immediately" is used to define the deadline for initiating stabilization measures. In the context of this requirement, "immediately" means as soon as practicable, but no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased. Except as provided in (A) through (D) below, these measures must be completed as soon as practicable, but no more than 14 calendar days after the initiation of soil stabilization measures:
 - (A) Where the immediate initiation of vegetative stabilization measures after construction activity has temporarily or permanently ceased due to frozen conditions, non-vegetative controls must be implemented until thawing conditions (as defined in Part I.B of this general permit) are present, and vegetative stabilization measures can be initiated as soon as practicable.
 - (B) In arid areas, semi-arid areas, or drought-stricken areas, as they are defined in Part I.B of this general permit, where the immediate initiation of vegetative stabilization measures after construction activity has temporarily or permanently ceased or is precluded by arid conditions, other types of erosion control and stabilization measures must be initiated at the site as soon as practicable. Where vegetative controls are infeasible due to arid conditions, and within 14 calendar days of a temporary or permanent cessation of construction activity in any portion of the site, the operator shall immediately install non-

vegetative erosion controls in areas of the construction site where construction activity is complete or has ceased. If non-vegetative controls are infeasible, the operator shall install temporary sediment controls as required in Part III.F.2.(b).iii.(C) below.

- (C) In areas where non-vegetative controls are infeasible, the operator may alternatively utilize temporary perimeter controls. The operator must document in the SWP3 the reason why stabilization measures are not feasible, and must demonstrate that the perimeter controls will retain sediment on site to the extent practicable. The operator must continue to inspect the BMPs at the frequencies established in Part III.F.7.(c) for unstabilized sites.
 - (D) The requirement for permittees to initiate stabilization is triggered as soon as it is known with reasonable certainty that construction activity at the site or in certain areas of the site will be stopped for 14 or more additional calendar days. If the initiation or completion of vegetative stabilization is prevented by circumstances beyond the control of the permittee, the permittee must employ and implement alternative stabilization measures immediately. When conditions at the site changes that would allow for vegetative stabilization, then the permittee must initiate or complete vegetative stabilization as soon as practicable.
- iv. Final stabilization must be achieved prior to termination of permit coverage.
 - v. TCEQ does not expect that temporary or permanent stabilization measures to be applied to areas that are intended to be left un-vegetated or unstabilized following construction (e.g., dirt access roads, utility pole pads, areas being used for storage of vehicles, equipment, or materials).
- (c) Sediment Control Practices

The SWP3 must include a description of any sediment control practices used to remove eroded soils from stormwater runoff, including the general timing or sequence for implementation of controls.

- i. Sites With Drainage Areas of Ten or More Acres

(A) Sedimentation Basin(s)

- (1) A sedimentation basin is required, where feasible, for a common drainage location that serves an area with ten (10) or more acres disturbed at one time. A sedimentation basin may be temporary or permanent, and must provide sufficient storage to contain a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained. When calculating the volume of runoff from a 2-year, 24-hour storm event, it is not required to include the flows from offsite areas and flow from onsite areas that are either undisturbed or have already undergone permanent stabilization, if these flows are diverted around both the disturbed areas of the site and the sediment basin. Capacity calculations shall be included in the SWP3.
- (2) Where rainfall data is not available or a calculation cannot be performed, the sedimentation basin must provide at least 3,600 cubic feet of storage per acre drained until final stabilization of the site.

- (3) If a sedimentation basin is not feasible, then the permittee shall provide equivalent control measures until final stabilization of the site. In determining whether installing a sediment basin is feasible, the permittee may consider factors such as site soils, slope, available area, public safety, precipitation patterns, site geometry, site vegetation, infiltration capacity, geotechnical factors, depth to groundwater, and other similar considerations. The permittee shall document the reason that the sediment basins are not feasible, and shall utilize equivalent control measures, which may include a series of smaller sediment basins.
 - (4) Unless infeasible, when discharging from sedimentation basins and impoundments, the permittee shall utilize outlet structures that withdraw water from the surface.
 - (B) Perimeter Controls: At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area, and for those side slope boundaries deemed appropriate as dictated by individual site conditions.
 - ii. Controls for Sites With Drainage Areas Less than Ten Acres:
 - (A) Sediment traps and sediment basins may be used to control solids in stormwater runoff for drainage locations serving less than ten (10) acres. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area, and for those side slope boundaries deemed appropriate as dictated by individual site conditions.
 - (B) Alternatively, a sediment basin that provides storage for a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained may be utilized. Where rainfall data is not available or a calculation cannot be performed, a temporary or permanent sediment basin providing 3,600 cubic feet of storage per acre drained may be provided. If a calculation is performed, then the calculation shall be included in the SWP3.
 - (C) If sedimentation basins or impoundments are used, the permittee shall comply with the requirements in Part III.G.6 of this general permit.
- 3. Description of Permanent Stormwater Controls

A description of any stormwater control measures that will be installed during the construction process to control pollutants in stormwater discharges that may occur after construction operations have been completed must be included in the SWP3. Permittees are responsible for the installation and maintenance of stormwater management measures, as follows:

 - (a) permittees authorized under the permit for small construction activities are responsible for the installation and maintenance of stormwater control measures prior to final stabilization of the site; or
 - (b) permittees authorized under the permit for large construction activities are responsible for the installation and maintenance of stormwater control measures prior to final stabilization of the site and prior to submission of an NOT.
- 4. Other Required Controls and BMPs

- (a) Permittees shall minimize, to the extent practicable, the off-site vehicle tracking of sediments and the generation of dust. The SWP3 shall include a description of controls utilized to accomplish this requirement.
 - (b) The SWP3 must include a description of construction and waste materials expected to be stored on-site and a description of controls to minimize pollutants from these materials.
 - (c) The SWP3 must include a description of potential pollutant sources in discharges of stormwater from all areas of the construction site where construction activity, including construction support activities, will be located, and a description of controls and measures that will be implemented at those sites to minimize pollutant discharges.
 - (d) Permittees shall place velocity dissipation devices at discharge locations and along the length of any outfall channel (i.e., runoff conveyance) to provide a non-erosive flow velocity from the structure to a water course, so that the natural physical and biological characteristics and functions are maintained and protected.
 - (e) Permittees shall design and utilize appropriate controls to minimize the offsite transport of suspended sediments and other pollutants if it is necessary to pump or channel standing water from the site.
 - (f) Permittees shall ensure that all other required controls and BMPs comply with all of the requirements of Part III.G of this general permit.
 - (g) For demolition of any structure with at least 10,000 square feet of floor space that was built or renovated before January 1, 1980, and the receiving waterbody is impaired for polychlorinated biphenyls (PCBs):
 - i. Implement controls to minimize the exposure of PCB-containing building materials, including paint, caulk, and pre-1980 fluorescent lighting fixtures to precipitation and to stormwater; and
 - ii. Ensure that disposal of such materials is performed in compliance with applicable state, federal, and local laws.
5. Documentation of Compliance with Approved State and Local Plans
- (a) Permittees must ensure that the SWP3 is consistent with requirements specified in applicable sediment and erosion site plans or site permits, or stormwater management site plans or site permits approved by federal, state, or local officials.
 - (b) SWP3s must be updated as necessary to remain consistent with any changes applicable to protecting surface water resources in sediment erosion site plans or site permits, or stormwater management site plans or site permits approved by state or local official for which the permittee receives written notice.
 - (c) If the permittee is required to prepare a separate management plan, including but not limited to a WPAP or Contributing Zone Plan in accordance with 30 TAC Chapter 213 (related to the Edwards Aquifer), then a copy of that plan must be either included in the SWP3 or made readily available upon request to authorized personnel of the TCEQ. The permittee shall maintain a copy of the approval letter for the plan in its SWP3.
6. Maintenance Requirements
- (a) All protective measures identified in the SWP3 must be maintained in effective operating condition. If, through inspections or other means, as soon as the permittee determines that BMPs are not operating effectively, then the permittee shall perform maintenance as necessary to maintain the continued effectiveness

of stormwater controls, and prior to the next rain event if feasible. If maintenance prior to the next anticipated storm event is impracticable, the reason shall be documented in the SWP3 and maintenance must be scheduled and accomplished as soon as practicable. Erosion and sediment controls that have been intentionally disabled, run-over, removed, or otherwise rendered ineffective must be replaced or corrected immediately upon discovery.

- (b) If periodic inspections or other information indicates a control has been used incorrectly, is performing inadequately, or is damaged, then the operator shall replace or modify the control as soon as practicable after making the discovery.
- (c) Sediment must be removed from sediment traps and sedimentation ponds no later than the time that design capacity has been reduced by 50%. For perimeter controls such as silt fences, berms, etc., the trapped sediment must be removed before it reaches 50% of the above-ground height.
- (d) If sediment escapes the site, accumulations must be removed at a frequency that minimizes off-site impacts, and prior to the next rain event, if feasible. If the permittee does not own or operate the off-site conveyance, then the permittee shall work with the owner or operator of the property to remove the sediment.

7. Inspections of Controls

- (a) Personnel provided by the permittee must inspect disturbed areas (cleared, graded, or excavated) of the construction site that do not meet the requirements of final stabilization in this general permit, all locations where stabilization measures have been implemented, areas of construction support activity covered under this permit, stormwater controls (including pollution prevention controls) for evidence of, or the potential for, the discharge of pollutants, areas where stormwater typically flows within the construction site, and points of discharge from the construction site.
 - i. Personnel conducting these inspections must be knowledgeable of this general permit, the construction activities at the site, and the SWP3 for the site.
 - ii. Personnel conducting these inspections are not required to have signatory authority for inspection reports under 30 TAC §305.128.

(b) Requirements for Inspections

- i. Inspect all stormwater controls (including sediment and erosion control measures identified in the SWP3) to ensure that they are installed properly, appear to be operational, and minimizing pollutants in discharges, as intended.
- ii. Identify locations on the construction site where new or modified stormwater controls are necessary.
- iii. Check for signs of visible erosion and sedimentation that can be attributed to the points of discharge where discharges leave the construction site or discharge into any surface water in the state flowing within or adjacent to the construction site.
- iv. Identify any incidents of noncompliance observed during the inspection.
- v. Inspect locations where vehicles enter or exit the site for evidence of off-site sediment tracking.
- vi. If an inspection is performed when discharges from the construction site are occurring: identify all discharge points at the site, observe and document the visual quality of the discharge (i.e., color, odor, floating, settled, or

suspended solids, foam, oil sheen, and other such indicators of pollutants in stormwater).

- vii. Complete any necessary maintenance needed, based on the results of the inspection and in accordance with the requirements listed in Part III.F.6 above.

(c) Inspection frequencies:

- i. Inspections of construction sites must be conducted at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater, unless as otherwise provided below in Part III.F.7.(c).ii – v below.
 - ii. Inspection frequencies must be conducted at least once every month in areas of the construction site that meet final stabilization or have been temporarily stabilized.
 - iii. Inspection frequencies for construction sites, where runoff is unlikely due to the occurrence of frozen conditions at the site, must be conducted at least once every month until thawing conditions begin to occur (See definitions for thawing conditions in Part I.B). The SWP3 must also contain a record of the approximate beginning and ending dates of when frozen conditions occurred at the site, which resulted in inspections being conducted monthly, while those conditions persisted, instead of at the interval of once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.
 - iv. In arid, semi-arid, or drought-stricken areas, inspections must be conducted at least once every month and within 24 hours after the end of a storm event of 0.5 inches or greater. The SWP3 must also contain a record of the total rainfall measured, as well as the approximate beginning and ending dates of when drought conditions occurred at the site, which resulted in inspections being conducted monthly, while those conditions persisted, instead of at the interval of once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.
 - v. As an alternative to the inspection schedule in Part III.F.7.(c).i above, the SWP3 may be developed to require that these inspections will occur at least once every seven (7) calendar days. If this alternative schedule is developed, then the inspection must occur regardless of whether or not there has been a rainfall event since the previous inspection.
 - vi. The inspection procedures described in Part III.F.7.(c).i. – v above can be performed at the frequencies and under the applicable conditions indicated for each schedule option, provided that the SWP3 reflects the current schedule and that any changes to the schedule are made in accordance with the following provisions: the inspection frequency schedule can only be changed a maximum of one time each month; the schedule change must be implemented at the beginning of a calendar month; and the reason for the schedule change documented in the SWP3 (e.g., end of “dry” season and beginning of “wet” season).
- (d) Utility line installation, pipeline construction, and other examples of long, narrow, linear construction activities may provide inspection personnel with limited access to the areas described in Part III.F.7.(a) above.
- i. Inspection of linear construction sites could require the use of vehicles that could compromise areas of temporary or permanent stabilization, cause

additional disturbance of soils, and result in the increase the potential for erosion. In these circumstances, controls must be inspected at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater, but representative inspections may be performed.

- ii. For representative inspections, personnel must inspect controls along the construction site for 0.25 mile above and below each access point where a roadway, undisturbed right-of-way, or other similar feature intersects the construction site and allows access to the areas described in Part III.F.7.(a) above. The conditions of the controls along each inspected 0.25 mile portion may be considered as representative of the condition of controls along that reach extending from the end of the 0.25 mile portion to either the end of the next 0.25 mile inspected portion, or to the end of the project, whichever occurs first.

As an alternative to the inspection schedule described in Part III.F.7.(c).i above, the SWP3 may be developed to require that these inspections will occur at least once every seven (7) calendar days. If this alternative schedule is developed, the inspection must occur regardless of whether or not there has been a rainfall event since the previous inspection.

- iii. The SWP3 for a linear construction site must reflect the current inspection schedule. Any changes to the inspection schedule must be made in accordance with the following provisions:
 - (A) the schedule may be changed a maximum of one time each month;
 - (B) the schedule change must be implemented at the beginning of a calendar month, and
 - (C) the reason for the schedule change must be documented in the SWP3 (e.g., end of "dry" season and beginning of "wet" season).
- (e) In the event of flooding or other uncontrollable situations which prohibit access to the inspection sites, inspections must be conducted as soon as access is practicable.
- (f) Inspection Reports
 - i. A report summarizing the scope of any inspection must be completed within 24-hours following the inspection. The report must also include the date(s) of the inspection and major observations relating to the implementation of the SWP3. Major observations in the report must include: the locations of where erosion and discharges of sediment or other pollutants from the site have occurred; locations of BMPs that need to be maintained; locations of BMPs that failed to operate as designed or proved inadequate for a particular location; and locations where additional BMPs are needed.
 - ii. Actions taken as a result of inspections must be described within, and retained as a part of, the SWP3. Reports must identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the facility or site is in compliance with the SWP3 and this permit. The report must be retained as part of the SWP3 and signed by the person and in the manner required by 30 TAC §305.128 (relating to Signatories to Reports).
 - iii. The names and qualifications of personnel making the inspections for the permittee may be documented once in the SWP3 rather than being included in each report.
- (g) The SWP3 must be modified based on the results of inspections, as necessary, to better control pollutants in runoff. Revisions to the SWP3 must be completed

within seven (7) calendar days following the inspection. If existing BMPs are modified or if additional BMPs are necessary, an implementation schedule must be described in the SWP3 and wherever possible those changes implemented before the next storm event. If implementation before the next anticipated storm event is impracticable, these changes must be implemented as soon as practicable.

8. The SWP3 must identify and ensure the implementation of appropriate pollution prevention measures for all eligible non-stormwater components of the discharge, as listed in Part II.A.3 of this permit.
9. The SWP3 must include the information required in Part III.B of this general permit.
10. The SWP3 must include pollution prevention procedures that comply with Part III.G.4 of this general permit.

Section G. Erosion and Sediment Control Requirements Applicable to All Sites

Except as provided in 40 CFR §§125.30-125.32, any discharge regulated under this general permit, with the exception of sites that obtained waivers based on low rainfall erosivity, must achieve, at a minimum, the following effluent limitations representing the degree of effluent reduction attainable by application of the best practicable control technology currently available (BPT).

1. *Erosion and sediment controls.* Design, install, and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed, and maintained to:
 - (a) Control stormwater volume and velocity within the site to minimize soil erosion in order to minimize pollutant discharges;
 - (b) Control stormwater discharges, including both peak flowrates and total stormwater volume, to minimize channel and streambank erosion and scour in the immediate vicinity of discharge point(s);
 - (c) Minimize the amount of soil exposed during construction activity;
 - (d) Minimize the disturbance of steep slopes;
 - (e) Minimize sediment discharges from the site. The design, installation, and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;
 - (f) If earth disturbance activities are located in close proximity to a surface water in the state, provide and maintain appropriate natural buffers if feasible and as necessary, around surface water in the state, depending on site-specific topography, sensitivity, and proximity to water bodies. Direct stormwater to vegetated areas and maximize stormwater infiltration to reduce pollutant discharges, unless infeasible. If providing buffers is infeasible, the permittee shall document the reason that natural buffers are infeasible and shall implement additional erosion and sediment controls to reduce sediment load;
 - (g) Preserve native topsoil at the site, unless the intended function of a specific area of the site dictates that the topsoil be disturbed or removed, or it is infeasible; and
 - (h) Minimize soil compaction. In areas of the construction site where final vegetative stabilization will occur or where infiltration practices will be installed, either:
 - i. restrict vehicle and equipment use to avoid soil compaction; or

- ii. prior to seeding or planting areas of exposed soil that have been compacted, use techniques that condition the soils to support vegetative growth, if necessary and feasible;

Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted.

- (i) TCEQ does not consider stormwater control features (e.g., stormwater conveyance channels, storm drain inlets, sediment basins) to constitute “surface water” for the purposes of triggering the buffer requirement in Part III.G.1.(f) above.
2. *Soil stabilization.* Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating, or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. In the context of this requirement, “immediately” means as soon as practicable, but no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased. Temporary stabilization must be completed no more than 14 calendar days after initiation of soil stabilization measures, and final stabilization must be achieved prior to termination of permit coverage. In arid, semi-arid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative non-vegetative stabilization measures must be employed as soon as practicable. Refer to Part III.F.2.(b) for complete erosion control and stabilization practice requirements. In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed.
 3. *Dewatering.* Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited, unless managed by appropriate controls.
 4. *Pollution prevention measures.* Design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented, and maintained to:
 - (a) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
 - (b) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, and other materials present on the site to precipitation and to stormwater;
 - (c) Minimize the exposure of waste materials by closing waste container lids at the end of the work day. For waste containers that do not have lids, where the container itself is not sufficiently secure enough to prevent the discharge of pollutants absent a cover and could leak, the permittee must provide either a cover (e.g., a tarp, plastic sheeting, temporary roof) to minimize exposure of wastes to precipitation, or a similarly effective means designed to minimize the discharge of pollutants (e.g., secondary containment); and
 - (d) Minimize the discharge of pollutants from spills and leaks, and implement chemical spill and leak prevention and response procedures.
 5. *Prohibited discharges.* The following discharges are prohibited:

- (a) Wastewater from wash out of concrete, unless managed by an appropriate control;
 - (b) Wastewater from wash out and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
 - (c) Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
 - (d) Soaps or solvents used in vehicle and equipment washing; and
 - (e) Toxic or hazardous substances from a spill or other release.
6. *Surface outlets.* When discharging from basins and impoundments, utilize outlet structures that withdraw water from the surface, unless infeasible.

Part IV. Stormwater Runoff from Concrete Batch Plants

Discharges of stormwater runoff from concrete batch plants present at regulated construction sites and operated as a construction support activity may be authorized under the provisions of this general permit, provided that the following requirements are met for concrete batch plant(s) authorized under this permit. Only the discharges of stormwater runoff and non-stormwater from concrete batch plants that meet the requirements of a construction support activity can be authorized under this permit (see the requirements for “Non-Stormwater Discharges” in Part II.A.3 and “Discharges of Stormwater Associated with Construction Support Activity” in Part II.A.2).

If discharges of stormwater runoff or non-stormwater from concrete batch plants are not authorized under this general permit, then discharges must be authorized under an alternative general permit or individual permit [see the requirement in Part II.A.2.(c)].

This permit does not authorize the discharge or land disposal of any wastewater from concrete batch plants at regulated construction sites. Authorization for these wastes must be obtained under an individual permit or an alternative general permit.

Section A. Benchmark Sampling Requirements

1. Operators of concrete batch plants authorized under this general permit shall sample the stormwater runoff from the concrete batch plants according to the requirements of this section of this general permit, and must conduct evaluations on the effectiveness of the SWP3 based on the following benchmark monitoring values:

Table 1. Benchmark Parameters

Benchmark Parameter	Benchmark Value	Sampling Frequency	Sample Type
Oil and Grease (*1)	15 mg/L	1/quarter (*2) (*3)	Grab (*4)
Total Suspended Solids (*1)	50 mg/L	1/quarter (*2) (*3)	Grab (*4)
pH	6.0 – 9.0 Standard Units	1/quarter (*2) (*3)	Grab (*4)
Total Iron(*1)	1.3 mg/L	1/quarter (*2) (*3)	Grab (*4)

- (*1) All analytical results for these parameters must be obtained from a laboratory that is accredited based on rules located in 30 TAC §25.4 (a) or through the National Environmental Laboratory Accreditation Program (NELAP). Analysis must be performed using sufficiently sensitive methods for analysis that comply with the rules located in 40 CFR §136.1(c) and 40 CFR §122.44(i)(1)(iv).

- (*2) When discharge occurs. Sampling is required within the first 30 minutes of discharge. If it is not practicable to take the sample, or to complete the sampling, within the first 30 minutes, sampling must be completed within the first hour of discharge. If sampling is not completed within the first 30 minutes of discharge, the reason must be documented and attached to all required reports and records of the sampling activity.
- (*3) Sampling must be conducted at least once during each of the following periods. The first sample must be collected during the first full quarter that a stormwater discharge occurs from a concrete batch plant authorized under this general permit.

January through March

April through June

July through September

October through December

For projects lasting less than one full quarter, a minimum of one sample shall be collected, provided that a stormwater discharge occurred at least once following submission of the NOI or following the date that automatic authorization was obtained under Section II.E.2, and prior to terminating coverage.

- (*4) A grab sample shall be collected from the stormwater discharge resulting from a storm event that is at least 0.1 inches of measured precipitation that occurs at least 72 hours from the previously measurable storm event. The sample shall be collected downstream of the concrete batch plant, and where the discharge exits any BMPs utilized to handle the runoff from the batch plant, prior to commingling with any other water authorized under this general permit.
2. The permittee must compare the results of sample analyses to the benchmark values above, and must include this comparison in the overall assessment of the SWP3's effectiveness. Analytical results that exceed a benchmark value are not a violation of this permit, as these values are not numeric effluent limitations. Results of analyses are indicators that modifications of the SWP3 should be assessed and may be necessary to protect water quality. The operator must investigate the cause for each exceedance and must document the results of this investigation in the SWP3 by the end of the quarter following the sampling event.

The operator's investigation must identify the following:

- (a) any additional potential sources of pollution, such as spills that might have occurred;
- (b) necessary revisions to good housekeeping measures that are part of the SWP3;
- (c) additional BMPs, including a schedule to install or implement the BMPs; and
- (d) other parts of the SWP3 that may require revisions in order to meet the goal of the benchmark values.

Background concentrations of specific pollutants may also be considered during the investigation. If the operator is able to relate the cause of the exceedance to background concentrations, then subsequent exceedances of benchmark values for that pollutant may be resolved by referencing earlier findings in the SWP3. Background concentrations may be identified by laboratory analyses of samples of stormwater run-on to the permitted facility, by laboratory analyses of samples of stormwater run-off from adjacent non-industrial areas, or by identifying the pollutant is a naturally occurring material in soils at the site.

Section B. Best Management Practices (BMPs) and SWP3 Requirements

Minimum SWP3 Requirements – The following are required in addition to other SWP3 requirements listed in this general permit, which include, but are not limited to the applicable requirements located in Part III.F.7 of this general permit, as follows:

1. Description of Potential Pollutant Sources - The SWP3 must provide a description of potential sources (activities and materials) that can cause, have a reasonable potential to cause or contribute to a violation of water quality standards or have been found to cause, or contribute to, the loss of a designated use of surface water in the state in stormwater discharges associated with concrete batch plants authorized under this permit. The SWP3 must describe the implementation of practices that will be used to minimize to the extent practicable the discharge of pollutants in stormwater discharges associated with industrial activity and non-stormwater discharges (described in Part II.A.3 of this general permit), in compliance with the terms and conditions of this general permit, including the protection of water quality, and must ensure the implementation of these practices.

The following must be developed, at a minimum, in support of developing this description:

- (a) Drainage – The site map must include the following information:
 - i. the location of all outfalls for stormwater discharges associated with concrete batch plants that are authorized under this permit;
 - ii. a depiction of the drainage area and the direction of flow to the outfall(s);
 - iii. structural controls used within the drainage area(s);
 - iv. the locations of the following areas associated with concrete batch plants that are exposed to precipitation: vehicle and equipment maintenance activities (including fueling, repair, and storage areas for vehicles and equipment scheduled for maintenance); areas used for the treatment, storage, or disposal of wastes; liquid storage tanks; material processing and storage areas; and loading and unloading areas; and
 - v. the locations of the following: any bag house or other dust control device(s); recycle/sedimentation pond, clarifier or other device used for the treatment of facility wastewater (including the areas that drain to the treatment device); areas with significant materials; and areas where major spills or leaks have occurred.
 - (b) Inventory of Exposed Materials – A list of materials handled at the concrete batch plant that may be exposed to stormwater and that have a potential to affect the quality of stormwater discharges associated with concrete batch plants that are authorized under this general permit.
 - (c) Spills and Leaks - A list of significant spills and leaks of toxic or hazardous pollutants that occurred in areas exposed to stormwater and that drain to stormwater outfalls associated with concrete batch plants authorized under this general permit must be developed, maintained, and updated as needed.
 - (d) Sampling Data - A summary of existing stormwater discharge sampling data must be maintained, if available.
2. Measures and Controls - The SWP3 must include a description of management controls to regulate pollutants identified in the SWP3's "Description of Potential Pollutant Sources" from Part IV.B.1 of this permit, and a schedule for implementation of the measures and controls. This must include, at a minimum:

- (a) Good Housekeeping - Good housekeeping measures must be developed and implemented in the area(s) associated with concrete batch plants.
 - i. Operators must prevent or minimize the discharge of spilled cement, aggregate (including sand or gravel), settled dust, or other significant materials from paved portions of the site that are exposed to stormwater. Measures used to minimize the presence of these materials may include regular sweeping or other equivalent practices. These practices must be conducted at a frequency that is determined based on consideration of the amount of industrial activity occurring in the area and frequency of precipitation, and shall occur at least once per week when cement or aggregate is being handled or otherwise processed in the area.
 - ii. Operators must prevent the exposure of fine granular solids, such as cement, to stormwater. Where practicable, these materials must be stored in enclosed silos, hoppers or buildings, in covered areas, or under covering.
- (b) Spill Prevention and Response Procedures - Areas where potential spills that can contribute pollutants to stormwater runoff, and the drainage areas from these locations, must be identified in the SWP3. Where appropriate, the SWP3 must specify material handling procedures, storage requirements, and use of equipment. Procedures for cleaning up spills must be identified in the SWP3 and made available to the appropriate personnel.
- (c) Inspections - Qualified facility personnel (i.e., a person or persons with knowledge of this general permit, the concrete batch plant, and the SWP3 related to the concrete batch plant(s) for the site) must be identified to inspect designated equipment and areas of the facility specified in the SWP3. Personnel conducting these inspections are not required to have signatory authority for inspection reports under 30 TAC §305.128. Inspections of facilities in operation must be performed once every seven days. Inspections of facilities that are not in operation must be performed at a minimum of once per month. The current inspection frequency being implemented at the facility must be recorded in the SWP3. The inspection must take place while the facility is in operation and must, at a minimum, include all areas that are exposed to stormwater at the site, including material handling areas, above ground storage tanks, hoppers or silos, dust collection/containment systems, truck wash down and equipment cleaning areas. Follow-up procedures must be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections must be maintained and be made readily available for inspection upon request.
- (d) Employee Training - An employee training program must be developed to educate personnel responsible for implementing any component of the SWP3, or personnel otherwise responsible for stormwater pollution prevention, with the provisions of the SWP3. The frequency of training must be documented in the SWP3, and at a minimum, must consist of one training prior to the initiation of operation of the concrete batch plant.
- (e) Record Keeping and Internal Reporting Procedures - A description of spills and similar incidents, plus additional information that is obtained regarding the quality and quantity of stormwater discharges, must be included in the SWP3. Inspection and maintenance activities must be documented and records of those inspection and maintenance activities must be incorporated in the SWP3.
- (f) Management of Runoff - The SWP3 shall contain a narrative consideration for reducing the volume of runoff from concrete batch plants by diverting runoff or otherwise managing runoff, including use of infiltration, detention ponds, retention ponds, or reusing of runoff.

3. Comprehensive Compliance Evaluation – At least once per year, one or more qualified personnel (i.e., a person or persons with knowledge of this general permit, the concrete batch plant, and the SWP3 related to the concrete batch plant(s) for the site) shall conduct a compliance evaluation of the plant. The evaluation must include the following.
 - (a) Visual examination of all areas draining stormwater associated with regulated concrete batch plants for evidence of, or the potential for, pollutants entering the drainage system. These include, but are not limited to: cleaning areas, material handling areas, above ground storage tanks, hoppers or silos, dust collection/containment systems, and truck wash down and equipment cleaning areas. Measures implemented to reduce pollutants in runoff (including structural controls and implementation of management practices) must be evaluated to determine if they are effective and if they are implemented in accordance with the terms of this permit and with the permittee's SWP3. The operator shall conduct a visual inspection of equipment needed to implement the SWP3, such as spill response equipment.
 - (b) Based on the results of the evaluation, the following must be revised as appropriate within two weeks of the evaluation: the description of potential pollutant sources identified in the SWP3 (as required in Part IV.B.1, "Description of Potential Pollutant Sources"); and pollution prevention measures and controls identified in the SWP3 (as required in Part IV.B.2, "Measures and Controls"). The revisions may include a schedule for implementing the necessary changes.
 - (c) The permittee shall prepare and include in the SWP3 a report summarizing the scope of the evaluation, the personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the SWP3, and actions taken in response to the findings of the evaluation. The report must identify any incidents of noncompliance. Where the report does not identify incidences of noncompliance, the report must contain a statement that the evaluation did not identify any incidence(s), and the report must be signed according to 30 TAC §305.128, relating to Signatories to Reports.
 - (d) The Comprehensive Compliance Evaluation may substitute for one of the required inspections delineated in Part IV.B.2.(c) of this general permit.

Section C. Prohibition of Wastewater Discharges

Wastewater discharges associated with concrete production including wastewater disposal by land application are not authorized under this general permit. These wastewater discharges must be authorized under an alternative TCEQ water quality permit or otherwise disposed of in an authorized manner. Discharges of concrete truck wash out at construction sites may be authorized if conducted in accordance with the requirements of Part V of this general permit.

Part V. Concrete Truck Wash Out Requirements

This general permit authorizes the land disposal of wash out from concrete trucks at construction sites regulated under this general permit, provided the following requirements are met. Any discharge of concrete production waste water to surface water in the state must be authorized under a separate TCEQ general permit or individual permit.

- A. Discharge of concrete truck wash out water to surface water in the state, including discharge to storm sewers, is prohibited by this general permit.
- B. Concrete truck wash out water shall be disposed in areas at the construction site where structural controls have been established to prevent discharge to surface water

in the state, or to areas that have a minimal slope that allow infiltration and filtering of wash out water to prevent discharge to surface water in the state. Structural controls may consist of temporary berms, temporary shallow pits, temporary storage tanks with slow rate release, or other reasonable measures to prevent runoff from the construction site.

- C. Wash out of concrete trucks during rainfall events shall be minimized. The discharge of concrete truck wash out water is prohibited at all times, and the operator shall insure that its BMPs are sufficient to prevent the discharge of concrete truck wash out as the result of rainfall or stormwater runoff.
- D. The disposal of wash out water from concrete trucks, made under authorization of this general permit must not cause or contribute to groundwater contamination.
- E. If a SWP3 is required to be implemented, the SWP3 shall include concrete wash out areas on the associated site map.

Part VI. Retention of Records

The permittee must retain the following records for a minimum period of three (3) years from the date that a NOT is submitted as required in Part II.F.1 and 2 of this permit. For activities in which an NOT is not required, records shall be retained for a minimum period of three (3) years from the date that the operator terminates coverage under Section II.F.3 of this permit. Records include:

- A. A copy of the SWP3;
- B. All reports and actions required by this permit, including a copy of the construction site notice;
- C. All data used to complete the NOI, if an NOI is required for coverage under this general permit; and
- D. All records of submittal of forms submitted to the operator of any MS4 receiving the discharge and to the secondary operator of a large construction site, if applicable.

Part VII. Standard Permit Conditions

- A. The permittee has a duty to comply with all permit conditions. Failure to comply with any permit condition is a violation of the permit and statutes under which it was issued (CWA and TWC), and is grounds for enforcement action, for terminating, revoking and reissuance, or modification, or denying coverage under this general permit, or for requiring a discharger to apply for and obtain an individual TPDES permit, based on rules located in TWC §23.086, 30 TAC §305.66 and 40 CFR §122.41 (a).
- B. Authorization under this general permit may be modified, suspended, revoked and reissued, terminated or otherwise suspended for cause, based on rules located in TWC §23.086, 30 TAC §305.66 and 40 CFR §122.41(f). Filing a notice of planned changes or anticipated non-compliance by the permittee does not stay any permit condition. The permittee must furnish to the executive director, upon request and within a reasonable time, any information necessary for the executive director to determine whether cause exists for modifying, revoking and reissuing, terminating or, otherwise suspending authorization under this permit, based on rules located in TWC §23.086, 30 TAC §305.66 and 40 CFR §122.41 (h). Additionally, the permittee must provide to the executive director, upon request, copies of all records that the permittee is required to maintain as a condition of this general permit.
- C. It is not a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the permit conditions.

- D.** Inspection and entry shall be allowed under TWC Chapters 26-28, Texas Health and Safety Code §§361.032-361.033 and 361.037, and 40 CFR §122.41(i). The statement in TWC §26.014 that commission entry of a facility shall occur according to an establishment's rules and regulations concerning safety, internal security, and fire protection is not grounds for denial or restriction of entry to any part of the facility or site, but merely describes the commission's duty to observe appropriate rules and regulations during an inspection.
- E.** The discharger is subject to administrative, civil, and criminal penalties, as applicable, under TWC Chapter 7 for violations including but not limited to the following:
1. negligently or knowingly violating the federal CWA §§301, 302, 306, 307, 308, 318, or 405, or any condition or limitation implementing any sections in a permit issued under CWA §402, or any requirement imposed in a pretreatment program approved under CWA §§402(a)(3) or 402(b)(8);
 2. knowingly making any false statement, representation, or certification in any record or other document submitted or required to be maintained under a permit, including monitoring reports or reports of compliance or noncompliance; and
 3. knowingly violating CWA §303 and placing another person in imminent danger of death or serious bodily injury.
- F.** All reports and other information requested by the executive director must be signed by the person and in the manner required by 30 TAC §305.128 (relating to Signatories to Reports).
- G.** Authorization under this general permit does not convey property or water rights of any sort and does not grant any exclusive privilege.
- H.** The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.
- I.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
- J.** The permittee shall comply with the monitoring and reporting requirements in 40 CFR §122.41(j) and (l), as applicable.
- K.** Analysis must be performed using sufficiently sensitive methods for analysis that comply with the rules located in 40 CFR §136.1(c) and 40 CFR §122.44(i)(1)(iv).

Part VIII. Fees

- A.** A fee of must be submitted along with the NOI:
1. \$325 if submitting a paper NOI, or
 2. \$225 if submitting an NOI electronically.
- B.** Fees are due upon submission of the NOI. An NOI will not be declared administratively complete unless the associated fee has been paid in full.
- C.** No separate annual fees will be assessed for this general permit. The Water Quality Annual Fee has been incorporated into the NOI fees as described above.

- D.** Effective September 1, 2018, applicants seeking coverage under an NOI or LREW must submit their application using the online e-Permits system available through the TCEQ website, or request and obtain a waiver from electronic reporting from the TCEQ. Waivers from electronic reporting are not transferrable and expire on the same date as the authorization to discharge.

Appendix A: Automatic Authorization

Periods of Low Erosion Potential by County – Eligible Date Ranges

Andrews: Nov. 15 - Apr. 30	Ector: Nov. 15 - Apr. 30
Archer: Dec. 15 - Feb. 14	Edwards: Dec. 15 - Feb. 14
Armstrong: Nov. 15 - Apr. 30	El Paso: Jan. 1 - Jul. 14, or May 15 - Jul. 31, or Jun. 1 - Aug. 14, or Jun. 15 - Sept. 14, or Jul. 1 - Oct. 14, or Jul. 15 - Oct. 31, or Aug. 1 - Apr. 30, or Aug. 15 - May 14, or Sept. 1 - May 30, or Oct. 1 - Jun. 14, or Nov. 1 - Jun. 30, or Nov. 15 - Jul. 14
Bailey: Nov. 1 - Apr. 30, or Nov. 15 - May 14	Fisher: Dec. 15 - Feb. 14
Baylor: Dec. 15 - Feb. 14	Floyd: Nov. 15 - Apr. 30
Borden: Nov. 15 - Apr. 30	Foard: Dec. 15 - Feb. 14
Brewster: Nov. 15 - Apr. 30	Gaines: Nov. 15 - Apr. 30
Briscoe: Nov. 15 - Apr. 30	Garza: Nov. 15 - Apr. 30
Brown: Dec. 15 - Feb. 14	Glasscock: Nov. 15 - Apr. 30
Callahan: Dec. 15 - Feb. 14	Hale: Nov. 15 - Apr. 30
Carson: Nov. 15 - Apr. 30	Hall: Feb. 1 - Mar. 30
Castro: Nov. 15 - Apr. 30	Hansford: Nov. 15 - Apr. 30
Childress: Dec. 15 - Feb. 14	Hardeman: Dec. 15 - Feb. 14
Cochran: Nov. 1 - Apr. 30, or Nov. 15 - May 14	Hartley: Nov. 15 - Apr. 30
Coke: Dec. 15 - Feb. 14	Haskell: Dec. 15 - Feb. 14
Coleman: Dec. 15 - Feb. 14	Hockley: Nov. 1 - Apr. 14, or Nov. 15 - Apr. 30
Collingsworth: Jan. 1 - Mar. 30, or Dec. 1 - Feb. 28	Howard: Nov. 15 - Apr. 30
Concho: Dec. 15 - Feb. 14	Hudspeth: Nov. 1 - May 14
Cottle: Dec. 15 - Feb. 14	Hutchinson: Nov. 15 - Apr. 30
Crane: Nov. 15 - Apr. 30	Irion: Dec. 15 - Feb. 14
Crockett: Nov. 15 - Jan. 14, or Feb. 1 - Mar. 30	Jeff Davis: Nov. 1 - Apr. 30 or Nov. 15 - May 14
Crosby: Nov. 15 - Apr. 30	Jones: Dec. 15 - Feb. 14
Culberson: Nov. 1 - May 14	Kent: Nov. 15 - Jan. 14 or Feb. 1 - Mar. 30
Dallam: Nov. 1 - Apr. 14, or Nov. 15 - Apr. 30	Kerr: Dec. 15 - Feb. 14
Dawson: Nov. 15 - Apr. 30	Kimble: Dec. 15 - Feb. 14
Deaf Smith: Nov. 15 - Apr. 30	King: Dec. 15 - Feb. 14
Dickens: Nov. 15 - Jan. 14, or Feb. 1 - Mar. 30	Kinney: Dec. 15 - Feb. 14
Dimmit: Dec. 15 - Feb. 14	Knox: Dec. 15 - Feb. 14
Donley: Jan. 1 - Mar. 30, or Dec. 1 - Feb. 28	Lamb: Nov. 1 - Apr. 14, or Nov. 15 - Apr. 30
Eastland: Dec. 15 - Feb. 14	

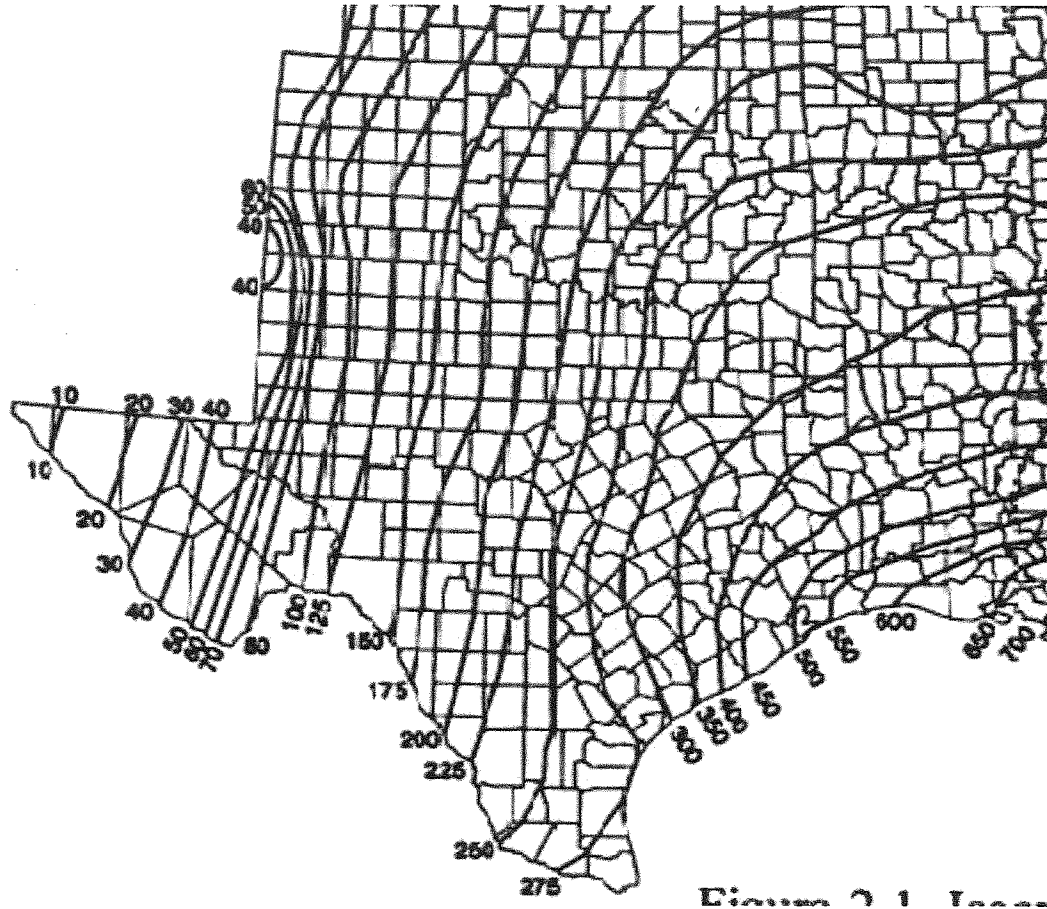
Construction General Permit

TPDES General Permit TXR150000

Loving: Nov. 1 - Apr. 30, or Nov. 15 - May 14
Lubbock: Nov. 15 - Apr. 30
Lynn: Nov. 15 - Apr. 30
Martin: Nov. 15 - Apr. 30
Mason: Dec. 15 - Feb. 14
Maverick: Dec. 15 - Feb. 14
McCulloch: Dec. 15 - Feb. 14
Menard: Dec. 15 - Feb. 14
Midland: Nov. 15 - Apr. 30
Mitchell: Nov. 15 - Apr. 30
Moore: Nov. 15 - Apr. 30
Motley: Nov. 15 - Jan. 14, or Feb. 1 - Mar. 30
Nolan: Dec. 15 - Feb. 14
Oldham: Nov. 15 - Apr. 30
Parmer: Nov. 1 - Apr. 14, or Nov. 15 - Apr. 30
Pecos: Nov. 15 - Apr. 30
Potter: Nov. 15 - Apr. 30
Presidio: Nov. 1 - Apr. 30, or Nov. 15 - May 14
Randall: Nov. 15 - Apr. 30
Reagan: Nov. 15 - Apr. 30
Real: Dec. 15 - Feb. 14
Reeves: Nov. 1 - Apr. 30, or Nov. 15 - May 14
Runnels: Dec. 15 - Feb. 14
Schleicher: Dec. 15 - Feb. 14

Scurry: Nov. 15 - Apr. 30
Shackelford: Dec. 15 - Feb. 14
Sherman: Nov. 15 - Apr. 30
Stephens: Dec. 15 - Feb. 14
Sterling: Nov. 15 - Apr. 30
Stonewall: Dec. 15 - Feb. 14
Sutton: Dec. 15 - Feb. 14
Swisher: Nov. 15 - Apr. 30
Taylor: Dec. 15 - Feb. 14
Terrell: Nov. 15 - Apr. 30
Terry: Nov. 15 - Apr. 30
Throckmorton: Dec. 15 - Feb. 14
Tom Green: Dec. 15 - Feb. 14
Upton: Nov. 15 - Apr. 30
Uvalde: Dec. 15 - Feb. 14
Val Verde: Nov. 15 - Jan. 14, or Feb. 1 - Mar. 30
Ward: Nov. 1 - Apr. 14, or Nov. 15 - Apr. 30
Wichita: Dec. 15 - Feb. 14
Wilbarger: Dec. 15 - Feb. 14
Winkler: Nov. 1 - Apr. 30, or Nov. 15 - May 14
Yoakum: Nov. 1 - Apr. 30, or Nov. 15 - May 14
Young: Dec. 15 - Feb. 14
Wheeler: Jan. 1 - Mar. 30, or Dec. 1 - Feb. 28
Zavala: Dec. 15 - Feb. 14

Page 52

Appendix C: Isoerodent Map

Adapted from Chapter 2 of USDA Agriculture Handbook 703: "Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE)," U.S. Department of Agriculture, Agricultural Research Service

Appendix D: Erosivity Indices for EI Zones in Texas**Periods:**

EI #	1/1	1/16	1/31	2/15	3/1	3/16	3/31	4/15	4/30	5/15	5/30	6/14	6/29	7/14	7/29	8/13	8/28	9/12	9/27	10/12	10/27	11/11	11/26	12/11	12/31
89	0	1	1	2	3	4	7	2	8	27	38	48	55	62	69	76	83	90	94	97	98	99	100	100	100
90	0	1	2	3	4	6	8	13	21	29	37	46	54	60	65	69	74	81	87	92	95	97	98	99	100
91	0	0	0	0	1	1	1	2	6	16	29	39	46	53	60	67	74	81	88	95	99	99	100	100	100
92	0	0	0	0	1	1	1	2	6	16	29	39	46	53	60	67	74	81	88	95	99	99	100	100	100
93	0	1	1	2	3	4	6	8	13	25	40	49	56	62	67	72	76	80	85	91	97	98	99	99	100
94	0	1	2	4	6	8	10	15	21	29	38	47	53	57	61	65	70	76	83	88	91	94	96	98	100
95	0	1	3	5	7	9	11	14	18	27	35	41	46	51	57	62	68	73	79	84	89	93	96	98	100
96	0	2	4	6	9	12	17	23	30	37	43	49	54	58	62	66	70	74	78	82	86	90	94	97	100
97	0	1	3	5	7	10	14	20	28	37	48	56	61	64	68	72	77	81	86	89	92	95	98	99	100
106	0	3	6	9	13	17	21	27	33	38	44	49	55	61	67	71	75	78	81	84	86	90	94	97	100

* Each period begins on the date listed in the table above and lasts until the day before the following period. The final period begins on December 11 and ends on December 31.

Table adapted from Chapter 2 of USDA Agriculture Handbook 703: "Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE)," U.S. Department of Agriculture, Agricultural Research Service

SECTION 5

Erosion and Sedimentation Controls

SECTION 5 – CONTROLS

A. Erosion and Sediment Controls

The erosion and sediment control measures for the list of major activities as shown in Section 3 shall be as per the Erosion and Sediment Control drawing (Exhibit 1), SWPPP plan, TCEQ guidelines and technical specifications which shall be followed by the contractor. The main objective of the controls are to protect water quality in streams and stream-side habitats, to prevent soil erosion caused by storm water runoff during construction activities, to prevent any sediment or construction pollutants from entering the storm sewer system, retain sediment on site to the extent practicable and to return disturbed areas to natural vegetation as quickly as possible following construction.

1. Stabilization Practices

- a. The construction access, staging and parking areas shall be stabilized by the contractor using coarse aggregate as shown on the plans and technical specifications prior to commencing work.
- b. Contractor shall protect trees to remain during construction.

2. Structural Practices

- a. Silt Fencing shall be installed by the contractor initially as shown in Exhibit 1 to prevent sediment from escaping offsite.
- b. Inlet protection shall be placed around all inlets during construction using silt fence or other BMP's as shown in Exhibit 1 to prevent sediment from entering the storm sewer system.

3. Other Controls

- a. Waste materials shall be collected and stored in a securely lidded metal dumpster from a licensed solid waste management company. The dumpster shall meet local and state solid waste management regulations. All trash and construction debris shall be deposited in the dumpster. The dumpster shall then be hauled to an approved landfill. No construction waste materials shall be buried on site.
- b. Hazardous Waste- No hazardous waste is expected to be generated during construction. Shall hazardous waste be encountered, then the contractor shall dispose this material in the manner specified by local or State regulations or by the manufacturer.
- c. Sanitary Waste- The contractor shall provide portable units by a licensed sanitary waste management company which will be collected regularly.

B. Offsite Vehicle Tracking

The Contractor shall be responsible for installing and maintaining construction exits off the existing Streets and any other existing drive as detailed. Contractor shall provide a vehicle wheel washing area and sediment trap to ensure that no offsite vehicle tracking occurs.

SECTION 6

Maintenance

SECTION 6 - MAINTENANCE

The contractor shall follow the TCEQ guidelines in Section 4 pertaining to Maintenance. If site inspections identify that BMP's are not operating effectively, then maintenance shall be conducted before the next anticipated storm event or as necessary to maintain the continued effectiveness of storm water controls. Sediment shall be removed from the upstream side of silt fences and inlet protection devices when it becomes about 1/3 the height of the silt fence. Sediment shall be removed from traps when its capacity becomes about 50% capacity.

The following is a list of erosion and sediment controls to be used on this project.

A. Stabilization Practices

1. Stabilized or paved onsite staging and parking areas.
2. Landscaping of the lawn and planters upon the completion of the utility construction and sidewalk construction.

B. Structural Practices

1. Non-woven reinforced filter fabric fences, as previously discussed in section 5.
2. Inlet Protection as previously discussed in section 5.

C. To Maintain the above practices, the following will be performed:

1. Maintenance and repairs will be conducted before the next anticipated storm event or as necessary to maintain the continued effectiveness of storm water controls
2. Sediment will be removed from the front of inlet protection barriers when it becomes about 1/3 the height of the fence.
3. Sediment shall be removed from traps when its capacity becomes about 50% capacity.

SECTION 7

Spill Prevention

SECTION 7 - SPILL PREVENTION

The general construction site superintendent is responsible for cleaning up and disposition of spills. Spills and releases (of any quantity) shall be reported to the UTRGV Environmental, Health, Safety and Risk Management Department at 956-665-3690, as soon as there is knowledge of the spill. The SWPPP must be modified within 14 days of the spill, to provide a description of the release, the circumstances leading to the release, and the date of the release. Refer to Section 4 pertaining to Spills and Prohibition of Non-Storm Water Discharges.

The following are the management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to storm water runoff. The general construction site superintendent is responsible for cleaning up and disposition of spills.

A. Good Housekeeping

Contractor shall make an effort to store all materials neatly in their appropriate containers in a designated area with the original manufacturer label (preferably under a roof or enclosure). This area should be protected to prevent accidental spills. Substances should not be mixed with one another unless recommended by the manufacturer. Contractor should follow manufacturer's recommendations for storage, use and disposal of materials. The contractor shall secure all sanitary facilities to prevent spills or leaks. All materials on site should be stockpiled separately and neatly to prevent mixing. All materials shall be disposed of properly and the site superintendent will inspect daily to ensure proper use and disposal of materials on site.

The following practices will be followed onsite during the construction project:

1. An effort will be made to store only enough product required to do the job.
2. All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and if possible, under a roof or other enclosure.
3. Products will be kept in their original containers with the original manufacturer's label.
4. Substances will not be mixed with one another unless recommended by the manufacturer.
5. Whenever possible, all of a product will be used up before disposing of the container.
6. Manufacturer's recommendations for proper used and disposal will be followed.
7. Designated areas for equipment maintenance and repair (control of oil, grease and fuel spills) area to be approved by owner.
8. Waste receptacles with regular collection for litter and construction debris.
9. Equipment washdown area onsite with appropriate control of was waters (including

concrete truck washdown).

10. Protected storage areas for chemicals, paints, solvents, fertilizers and other potentially toxic materials.
11. Adequately maintained sanitary facilities.
12. Proper control of raw materials stored onsite (for example, sand, aggregate and cement used in the manufacture of concrete or stockpiles of topsoil).
13. Street and parking lot sweeping or cleaning.
14. Removal of inlet protection barriers during major rainfall events if flooding occurs and verification that reinforced filter fabric fences are in proper condition prior to all rainfall events.
15. The site superintendent will inspect daily to ensure proper use and disposal of materials onsite.

B. Hazardous Products

Hazardous products if used shall be stored and used as per manufacturer's recommendations and original labels and material safety data sheets be readily available per local or state regulations.

If hazardous materials are used, these practices will be used to reduce the risks associated with them:

1. Products will be kept in original containers unless they are not resealable.
2. Original labels and material safety data will be retained.
3. If surplus products must be disposed, manufacturer's or local and state recommended methods for proper disposal will be followed.

C. Product Specific Practices

The product specific practices are to be followed.

D. Spill prevention Practices

Spills and releases of hazardous material of any quantity shall be reported to The University of Texas Environmental, Health, Safety and Risk Director for the institution as soon as there is knowledge of the spill. The EH SRM Director will determine if the spill is a reportable quantity and determine who must be notified. Contractor shall contain the spill until such time campus Environmental Health and Safety can provide direction on cleanup and disposal.

The SWPPP must be modified within 14 days of the spill to show any BMP modifications for spill prevention.

SECTION 8

Inspections

SECTION 8- INSPECTIONS

A. General

1. Each contractor will designate a qualified person or persons to perform the following inspections:
 - a. Disturbed areas and areas used for storage of materials that are exposed to precipitation will be inspected for evidence of, or the potential for, pollutants entering the drainage system.
 - b. Erosion and sediment control measures identified in the plan will be observed to ensure that they are operating correctly.
 - c. Where discharge locations or points are accessible, they will be inspected to ascertain where erosion control measures are effective in preventing significant impacts to receiving waters.
 - d. Locations where vehicles enter or exit the disturbed areas of site will be inspected for evidence of offsite sediment tracking.
2. The inspection will be conducted by the responsible person at least once every seven (7) calendar days. Inspections shall take place on Tuesday of the workweek, allowing sufficient time during the same workweek for necessary maintenance a/or repair of site controls.
3. After a portion of the site is finally stabilized, inspection will be conducted at least once every month
4. Based on the results of the inspection, the site Erosion and Sediment Control Drawing (SWPPP drawing) will be revised as appropriate, but in no case later than 7 calendar days following the inspection.
5. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the SWPPP, and actions taken in accordance with this section will be made and retained as part of the SWPPP for at least three years from the date that the site is finally stabilized. The report will be signed in accordance with 30 TAC 305.128.

Example copied of the form to be used for the Inspection and Maintenance reports are included in this section of the SWPPP.

SWPPP Weekly Inspection Report

University of Texas System - Office of Facilities Planning and Construction

Date of Inspection

Project Name and Number

Contractor

Inspector Name

Signature of Inspector

Inspector Qualifications

Report Prepared by;

1. Are TPDES NOI's, Permits or CSN's posted at the entrance to the site?	Yes	No	NA
2. Is contact information for all permittees posted at the construction entrance?	Yes	No	NA
3. Are copies of inspection reports for all permittees included in both SWPPP binders?	Yes	No	NA
4. Is a copy of the NOI, TPDES Permit and Posting Notice or CSN for all permittees included in the SWPPP binders?	Yes	No	NA
5. Is the Erosion Control Drawing (SWPPP Map) up to date and are all changes noted and dated?	Yes	No	NA
6. Is the major grading and stabilization activities log current?	Yes	No	NA
7. Is the area surrounding the project site clean and free of signs of tracking and discharge?	Yes	No	NA
8. Are all BMP's functioning as intended?	Yes	No	NA
9. Are BMP's in place addressing all areas of concern? If no, explain on reverse side of this form.	Yes	No	NA
10. Are BMP's in good repair, sediment and debris free? If no, explain on reverse side of this form.	Yes	No	NA
11. Are stabilized entrances and exits preventing street contamination? If no, explain on reverse side of this form.	Yes	No	NA

12. Are all hazardous materials being controlled and stored to keep from being exposed to storm water run-off?	Yes	No	NA
13. Has the site been <u>free</u> of hazardous material spills since the last inspection? If no, explain below.	Yes	No	NA
14. Are areas not covered by impervious materials still un-stabilized?	Yes	No	NA
15. Do soil disturbing activities continue to take place?	Yes	No	NA

Note: All items of non-compliance shall be repaired/installed within (7) calendar days of this inspection. Repairs/maintenance/installation shall be completed immediately, if storm conditions are imminent.

Note incidents of non-compliance below. Please notate the number of each item in non-compliance.

Have all previous items of non-compliance been corrected?	Yes	No	NA
---	-----	----	----

Date Corrected

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Project Manager Signature

Printed Name

Title

University of Texas Rio Grande Valley
School of Medicine Team Based Learning Center
OFPC Project # 903-1159
1201 West University Drive
Edinburg, Texas 78541

Storm Water Pollution Prevention Plan
Major Grading and Stabilization Activities Log

Start Date	End Date*	Type and Location of Activity

***End Date does not pertain to stabilization activities**

SECTION 9

Non-Storm Water Discharges

SECTION 9 – NON-STORMWATER DISCHARGES

A. Inventory for SWPPP

The substances listed below are expected to be present onsite during construction:

- Concrete
- Detergents
- Paints
- Cleaning Solvents
- Fuels
- Electrical Equipment and Materials
- Lubricants
- Wood
- Fertilizers
- Asphalt and Asphalt-related Products
- Steel Products
- Soil

B. The following authorized non-stormwater discharges are anticipated during the project:

- Fire hydrant flushing
- Water for vehicle washing or dust control
- Irrigation drainage from watering vegetation
- Pavement wash water (not from toxic or hazardous material spill areas).

These effluents are to be controlled as required to minimize creation of sediment discharge to offsite drainage structures.

SECTION 10

Temporary Storm Water Pollution Control –

Specification Section 01 57 23

SECTION 01 57 23 - TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 - GENERAL

1.1 DEFINITIONS

- 1.1.1 BMP – Best Management Practices
- 1.1.2 CSN –Construction Site Notice- (Large CSN for large sites; Small CSN for small sites)
- 1.1.3 NOI and NOT – Notice of Intent and Notice of Termination for TPDES permits
- 1.1.4 SWPPP – Storm Water Pollution Prevention Plan
- 1.1.5 TCEQ – Texas Commission on Environmental Quality
- 1.1.6 TPDES – Texas Pollutant Discharge Elimination System
- 1.1.7 Large Construction Activities – Construction activities including clearing, grading and excavating that result in land disturbance equal to or greater than 5 acres of land
- 1.1.8 Small Construction Activities - Construction activities including clearing, grading and excavating that result in land disturbance equal to or greater than 1 acre and less than 5 acres of land

1.2 RELATED DOCUMENTS AND APPLICABLE WORK

- 1.2.1 The TCEQ TPDES General Permit No. TXR150000 effective March 5, 2013 and the project SWPPP. This specification requires compliance with all provisions of the TCEQ TPDES permit. The TCEQ requirements currently pertain to large construction activities of 5 acres or more and small construction activities that disturb 1 to less than 5 acres.
- 1.2.2 Information to Respondents, Agreement, Uniform General and Supplementary General Conditions for The University of Texas System Building Construction Contracts (UGC) and Special Conditions shall be read carefully for provisions pertaining to this work. In the event of conflict, the better quality or greater quantity shall prevail.
- 1.2.3 The work described in this section is applicable to any and all sections of the contract documents. Any and all work that would disturb the existing site conditions or present the potential for site runoff shall adhere fully to this specification section.
- 1.2.4 Unless specifically notified to the contrary in writing by the Owner, all aspects of this specification shall apply to this project.

1.3 CONTRACTOR RESPONSIBILITIES

- 1.3.1 This project requires implementation of storm water Best Management Practices for control devices and monitoring by the Contractor to comply with all provisions of the SWPPP developed for the project by the licensed civil engineer. The Contractor must fulfill all TPDES regulatory requirements, including the filing of the NOI and NOT or signing and posting of the CSN.
- 1.3.2 The Contractor shall provide signatures of a Corporate Officer for the NOI, Large CSN, Small CSN, NOT and any other forms or applications as required by the TPDES General Permit TXR150000. The Contractor shall also provide delegated authorization to sign reports per 30 TAC 305.128. Individuals conducting site inspections shall be qualified to the satisfaction of the Owner.
- 1.3.3 When the Contractor receives the approved SWPPP from the Owner, the Contractor signs the NOI or Small CSN (see Sample form in Part 4 of this section) and forwards it to the Owner. Two separate \$325 application fees (one for the Owner and one for the Contractor) must accompany the NOI. The Owner signs his NOI and sends both NOIs and application fees to TCEQ. The Contractor shall insert a copy of the signed NOI or Small CSN into the SWPPP book to be kept at the jobsite. The \$325 application fees are not required for small construction sites.
- 1.3.4 The SWPPP book kept at the jobsite shall also contain the following:
 - 1.3.4.1 A letter delegating signature authority to the field personnel for both the Contractor and the Owner
 - 1.3.4.2 A copy of the TPDES permit when received
 - 1.3.4.3 A copy of the Large or Small CSN
 - 1.3.4.4 A copy of the Shared SWPPP Acceptance Certification form
- 1.3.5 The Contractor shall review the SWPPP and verify existing conditions at the site before determining scope of implementation of site controls. Site survey and site plan drawings shall be used for additional reference. The Contractor shall notify the Owner, in advance, of this site review to allow for Owner participation.
- 1.3.6 The Contractor shall construct a Project SWPPP sign and place it at the main entrance to the project site. This sign shall include the NOI and TPDES permit along with the TCEQ TPDES Large or Small CSN, depending on the size of the construction project. The sign shall be constructed as detailed in the sample SWPPP sign drawing included in Part 4 of this Section.
- 1.3.7 The Contractor shall contact the OFPC Construction Inspector (CI) for review of initial site controls in place prior to commencing site-disturbing activities, to ensure that any unusual circumstances or unforeseen site conditions with regard to erosion

and sedimentation have been addressed. The Contractor shall complete the SWPPP Project Start-up form (see Sample in Part 4 of this Section)) and review it with the Owner before commencing soil disturbing activities. Both parties shall sign this form when the requirements listed in the SWPPP Project Start-up form have been met.

- 1.3.8 The Contractor shall provide all material, labor, equipment and services required to implement, maintain and monitor all erosion and sedimentation controls in compliance with the SWPPP. All controls implemented by the Contractor shall comply with the TPDES regulations as issued by the TCEQ on March 5, 2013. These controls shall remain in operation until project completion and re-establishment of the site or longer as directed by the OFPC Resident Construction Manager (RCM). The work shall include, but not be limited to, the following:
 - 1.3.8.1 All earthwork as required to implement swales, dikes, basins and other excavations for temporary routing of utilities, to protect against erosion or sediment-laden (polluted) storm water runoff.
 - 1.3.8.2 All structural controls as shown or specified, including silt fences, sediment traps, stabilized construction entrance, subsurface drains, pipe slope drains, inlet/outlet protection, reinforced soil retention, gabions, rock berms, etc.
 - 1.3.8.3 All non-structural controls as shown or specified, including temporary or permanent vegetation, mulching, geotextiles, sod stabilization, preservation of vegetative buffer strips, preservation/protection of existing trees and other mature vegetation.
 - 1.3.8.4 All modifications and revisions to SWPPP necessary to meet changing site conditions and to address new sources of storm water discharges, as the work progresses.
 - 1.3.8.5 All maintenance and repair of structural and non-structural controls in place shall continue until final stabilization is achieved or as directed by the RCM.
 - 1.3.8.6 Weekly site inspections, as required by the SWPPP, of pollutant sources, including hazardous sources, structural and non-structural controls, and all monitoring of SWPPP revisions and maintenance of inspection records.
 - 1.3.8.7 Removal of all structural and non-structural controls as necessary upon completion, and only after final stabilization is achieved.
 - 1.3.8.8 Filing of NOT with the RCM within 30 days of final stabilization being achieved and being approved by the Owner, or of another Operator assuming control of the unstabilized portions of the site.
 - 1.3.8.9 Refer to the SWPPP for additional requirements to ensure compliance with TPDES regulations.

1.4 QUALITY ASSURANCE

- 1.4.1 In order to minimize the discharge of pollutants to storm water, the Contractor shall implement all permanent and temporary site controls according to TPDES Guidelines, as set forth by the TCEQ.
- 1.4.2 Implementation of site controls shall be performed by a qualified contractor experienced in the proper installation of such devices in accordance with manufacturers' specifications, and in keeping with recognized Best Management Practices (BMPs), and in keeping with TPDES regulations. Qualification of installing Contractor shall be reviewed with the Owner prior to entering into a contract with them for services.
- 1.4.3 The Contractor shall inspect all BMPs at regular intervals as specified in the Storm Water Pollution Prevention Plan for this project. Use standard Owner Inspection forms (see form at the end of this Section) for each inspection. Record all deficiencies of site controls, and take immediate action to correct any deficiencies recorded. Keep records of inspections current and on file, available for review by EPA, TCEQ, MS4 Operator and Owner.

1.5 SUBMITTALS

- 1.5.1 Submittals of products used in structural and non-structural controls shall be made through established procedures for review and approved by the Owner prior to installation on the site. The Contractor shall make available physical samples and product literature on any material used in structural or non-structural controls during the course of the project prior to its implementation in the field.

PART 2 - PRODUCTS

2.1 MATERIALS

Specific site control devices are identified in the SWPPP. Where such devices are indicated, their material composition shall comply with this section.

- 2.1.1 Materials to be used in structural and non-structural site controls shall include, but not be limited to the following:

- 2.1.1.1 **Area Inlets, Curb Inlets and Silt Fences:** implemented to filter and remove sediment from storm water; they shall be composed of the following materials:

- a. Geotextile fabric – a non-woven, polypropylene, polyethylene, or polyamide fabric with non-raveling edges. It shall be non-biodegradable, inert to most soil chemicals, ultraviolet resistant, unaffected by moisture and other weather conditions, and permeable to water while retaining sediment. Fabric shall be 36 inches wide, with a minimum weight of 4.5 oz./yd.

- b. Wire Backing – a galvanized, 2"x4" welded wire fencing, 12-gauge minimum. Width shall be sufficient to support geotextile fabric 24 inches above adjacent grades. Chain link fences located along the same lines as silt fences may be used to support geotextile fabric. In this circumstance, the geotextile fabric shall be firmly attached to the fence.
 - c. Posts for area inlets and silt fences – steel fence posts shall be made of hot rolled steel, galvanized or painted, a minimum of 4 feet long, with a Y-bar or TEE cross-section of sufficient strength to withstand forces implied.
- 2.1.1.2 **Rock Berms:** shall be composed of the following materials:
- a. Rock – clean open graded rock, with a maximum diameter of 3 inches
 - b. Wire Mesh Support – a galvanized, woven wire sheathing having a maximum opening size of 1 inch, and a minimum wire diameter of 20 gauge
 - c. Ties – metal hog rings or standard wire/cable ties
- 2.1.1.3 **Triangular filter dikes:** for use on surfaces or in locations where standard silt fence cannot be implemented, shall be composed of the following:
- a. Geotextile fabric – a non-woven, polypropylene, polyethylene, or polyamide fabric with non-raveling edges, with a minimum width of 60 inches
 - b. Dike Structure – 6-gauge, 6" x 6" welded wire mesh, 60 inches wide, folded into a triangular form. Each side shall be 18 inches with an overlap of 6 inches
 - c. Ties – metal hog rings or standard wire/cable ties for attachment of wire mesh to itself, and for attachment of geotextile fabric to wire mesh
- 2.1.1.4 **Stabilized construction exit:** a steel grid that allows the safe passage of vehicles while agitating the tires to loosen and remove the soil buildup. The grid or structures shall conform to the following:
- a. It shall consist of pipes or tubes spaced such that there is a minimum clear distance between the pipes or tubes of 4½ inches. It shall be elevated above the ground surface a minimum of 8 inches to allow water, debris and soil to drain.
 - b. Minimum diameter of pipe or tube shall be 3 inches.
 - c. It shall be designed to support any and all vehicles entering and leaving the construction site.
 - d. It shall be firmly placed in the ground at the exit.
 - e. It shall be of sufficient length so that the agitation will remove the soil from the tires, or a minimum of 12 feet.
 - f. At the street side approach of the grid there shall be an impervious surface or it shall consist of 3" to 5" diameter angular crushed stone/rock approximately 5 feet in length, minimum, and 8 inches deep, minimum. On the job site side of the grid, there shall be 3" to 5" diameter angular crushed stone/rock 15 feet in length, a minimum of 8

inches deep. The steel grid will be between the street side approach and the job site crushed stone/rock. All crushed stone/rock shall have filter fabric beneath the stone/rock. See diagram on Exhibit F.

- g. Steel grid area shall be used as the tire wash area. When tire wash is in use (rainy or muddy days), the area shall be manned and the tires shall be washed using a high pressure hose/nozzle.
- h. The area beneath the grid shall be sloped such that debris, soil and water shall be diverted back onto the construction site or to a sediment basin. No water, soil or debris shall leave the construction site. The resulting discharge shall be disposed of properly.

2.1.1.5 **Concrete Truck Washout:** shall be used for containment of fluids from concrete truck washout wastes.

- a. Gravel bags, concrete blocks or open graded rock
- b. 10 mil plastic sheeting

2.1.1.6 **Temporary Storage Tanks:** shall be used for temporary storage of fuels on the construction project site

- a. 2 inches of sand on the bottom of the containment area
- b. 6 mil plastic sheeting
- c. 2 inches of sand on top of the plastic sheeting

2.1.1.7 **Erosion Control Matting:** shall be used on steep slopes, in drainage swales, and in high traffic pedestrian areas of barren soil. It shall include one or more of the following:

- a. Jute Mat – a plain fabric made of jute yarn, woven in a loose and simple manner, with a minimum unit weight of 2.7 pounds per square yard. Width shall be as required for the dimensions of the area to be covered.
- b. Wood Fiber Mat – a mat composed of wood fibers, which are encased in nylon, cotton or other type of netting
- c. Synthetic Webbing Mat – a mat manufactured from polyvinyl chloride or polypropylene monofilaments, which are bonded together into a three-dimensional web to facilitate erosion control and/or re-vegetation.

2.1.1.8 **Organic mulches:** shall be used for covering bare soil, retaining moisture under existing vegetation being preserved, and for absorbing the energy of compaction caused by foot or vehicular traffic. Mulch shall be one or more of the following:

- a. Straw – from broken straw bales that are free of weed and grass seed where the grass from the seed is not desired vegetation for the area to be protected.
- b. Wood Chips – from chipped limbs of cleared trees on site, or delivered in chipped form, in bulk quantities of pine, cedar or cypress. Wood chips of all species shall be partially decomposed to alleviate nitrogen

depletion of the soil in areas where existing vegetation is to be preserved and protected.

- c. Shredded Mulches – from pine, cypress or cedar, mechanically shredded, and capable of forming an interlocking mat following placement, and after sufficient wetting and drying has taken place naturally.

2.1.1.9 Any other materials indicated in the SWPPP.

PART 3 - EXECUTION

3.1 GENERAL

- 3.1.1 The Contractor shall provide a complete installation of all site control devices and measures (BMPs) indicated in the SWPPP book, including the Site Erosion and Sedimentation Control Drawing and as specified herein. These BMPs must be confirmed as fully operational with the Owner before any work that disturbs the site can begin.

As an alternative to the BMPs indicated in the SWPPP book, the Site Erosion and Sediment Control Drawing and as specified herein, the Contractor may propose alternate BMPs that perform the same function as the indicated BMP but may be of a different configuration, material or type for review and approval by OFPC. Installation of alternate BMPs shall not proceed until approved by OFPC.

- 3.1.2 The Contractor shall provide inspection and monitoring of controls in place and shall perform all revisions and updating of SWPPP book. An accurate, chronological record of all Contractor inspections, revisions and additional controls shall be kept on file at the project site, for review, with a copy of the SWPPP book.
- 3.1.3 The Contractor shall submit their NOT to the Owner after all disturbed areas are re-established (stabilized) with vegetative cover following completion of construction. Following acceptance of stabilized areas, all site controls that are no longer necessary shall be removed.

3.2 CONTROL DEVICES

Execution of specific site control devices is described in the following paragraphs. Refer to the SWPPP for applicable devices, extent and location.

3.2.1 AREA INLET DETAIL

- 3.2.1.1 Area inlet fences shall consist of non-woven geotextile fabric attached to wire fabric backing to support the geotextile. The wire fabric should be galvanized 2" x 4" welded wire, 12-gauge minimum. Attach non-woven geotextile fabric to the fence with hog rings or standard cable/wire ties, leaving a toe of fabric at the bottom of the fence of not less than 6 inches. Steel posts as specified shall be driven to a depth of 1 foot minimum and spaced not more than 6 feet

on center. Attach fencing to posts with standard cable/wire ties. Abutting ends of geotextile fabric shall be overlapped a minimum of 12 inches. Wrap grates with non-woven geotextile fabric. See Exhibit A at end of section.

3.2.1.2 Maintain silt fence daily as necessary to repair breaches in geotextile fabric. Maintain steel posts as specified in tilted condition. When siltation has occurred, it shall be removed when it has reached a depth of 6 inches. Silt that has been removed shall be disposed of offsite.

3.2.1.2 Remove area inlet when the disturbed areas have been completely stabilized as specified. Minimize site disturbance while removing area inlet protection and posts.

3.2.2 CURB INLET PROTECTION

3.2.2.1 Cover curb storm inlet with non-woven geotextile fabric covered wire fabric. Wire fabric to be 2"x4" – W1.4 x W1.4. Extend fabric 2 feet beyond inlet opening at each end and 12 inches in front of opening in the gutter. Remove a strip of filter fabric approximately 12 inches high for the length of the protection to act as overflow. Extend fabric over the top of opening to allow placement of gravel bags. Anchor fabric with 20 lb. gravel bags placed 3 feet on center. See Exhibit B at end of section.

3.2.2.2 Maintain inlet protection daily as necessary to repair breaches in geotextile fabric. When siltation has occurred, it shall be removed when it has reached a depth of 2 inches. Silt that has been removed shall be disposed of offsite.

3.2.3 ROCK BERM

3.2.3.1 Rock berm shall consist of rip-rap type rock, secured within a wire sheathing as specified, and installed at the toe of slopes, or at the perimeter of developing or disturbed areas. Height of berm shall be a minimum of 18 inches from top of berm to uphill toe of berm. Top width shall be a minimum of 24 inches, with side slopes of 2:1 or flatter. Uphill toe of berm shall be buried a minimum of 4 inches into existing grade. Rock berm shall have a minimum flow-through rate of 60 gallons per minute per square foot of berm face. See Exhibit C at end of section.

3.2.3.2 Maintain rock berm in a condition that allows the sediment to be removed, when the depth of sediment has reached 1/3 the height of the berm. Berm shall be reshaped as needed, and silt buildup removed, to maintain specified flow through berm.

3.2.3.3 Rock berm shall be removed when the disturbed areas served have been stabilized as specified.

3.2.4 SILT FENCE

- 3.2.4.1 Silt fences shall consist of non-woven geotextile fabric, attached to wire fabric backing to support the geotextile. The wire fabric should be galvanized 2" x 4" welded wire, 12-gauge minimum. Attach non-woven geotextile fabric to fence with hog rings or standard cable/wire ties, leaving a toe of fabric at the bottom of the fence of not less than 6 inches. Steel posts as specified shall be driven to a depth of 1 foot minimum and spaced not more than 6 feet on center. Tilt posts slightly, in an uphill direction for additional strength. Attach fencing to posts with standard cable/wire ties. Dig a 6 inch deep by 6 inch wide trench on the disturbed side of the fence, bury geotextile fabric in trench, backfill and tamp. Abutting ends of geotextile fabric shall be overlapped a minimum of 12 inches. See Exhibit D at end of section.
- 3.2.4.2 Maintain silt fence daily as necessary to repair breaches in geotextile fabric. Maintain steel posts as specified in tilted condition. When siltation has occurred, it shall be removed when it has reached a depth of 6 inches. Silt that has been removed shall be disposed of offsite.
- 3.2.4.3 Remove silt fence when the disturbed areas protected by silt fence have been completely stabilized as specified. Minimize site disturbance while removing silt fence and posts.

3.2.5 TRIANGULAR DIKE

- 3.2.5.1 See Exhibit E for information regarding installation of Triangular Dike

3.2.6 STABILIZED CONSTRUCTION EXIT

- 3.2.6.1 A steel grid that allows the safe passage of vehicles while agitating the tires to loosen and remove the soil buildup. The grid or structures shall conform to the following:
- It shall consist of pipes or tubes spaced such that there is a minimum clear distance between the pipes or tubes of 4½ inches. It shall be elevated above the ground surface a minimum of 8 inches to allow water, debris and soil to drain.
 - Minimum diameter of pipe or tube shall be 3 inches.
 - It shall be designed to support any and all vehicles entering and leaving the construction site.
 - It shall be firmly placed in the ground at the exit.
 - It shall be of sufficient length so that the agitation will remove the soil from the tires or a minimum of 12 feet.
 - At the street side approach of the grid, there shall be an impervious surface or it shall consist of 3" to 5" diameter angular crushed stone/rock approximately 5 feet in length, minimum, and 8 inches deep, minimum. On the job site side of the grid, there shall be 3" to 5" diameter angular crushed stone/rock 15 feet in length, minimum, and 8 inches deep, minimum. The steel grid will be between the street side

approach and the job site crushed stone/rock. All crushed stone/rock shall have filter fabric beneath the stone/rock. See diagram on Exhibit F at end of section.

- g. Steel grid area shall be used as the tire wash area. When tire wash is in use (rainy or muddy days) the area shall be manned and the tires shall be washed using a high pressure hose/nozzle.
- h. The area beneath the grid shall be sloped such that debris, soil and water shall be diverted back on to the construction site or to a sediment basin. No water, soil or debris shall leave the construction site. The resulting discharge shall be disposed of properly.
- i. The stabilized construction exit shall be properly maintained throughout the entire construction process until removal is approved by OFPC.

3.2.7 CONCRETE/PAINT/STUCCO/EQUIPMENT WASHOUT (SELF INSTALLED)

3.2.7.1 Concrete Truck Washout (self installed) shall be constructed so that it will be able to accommodate the maximum number of anticipated concrete trucks that will be cleaned on any given day at any given time using 7 gallons of water for washout per truck or 50 gallons of water to wash out pump trucks. The area utilized to contain the wash water and concrete solids cleaned from the trucks will be a minimum of 10 feet in width. The containment area will be covered with 10 mil plastic sheeting without any holes or tears and the seams shall be sealed according to manufacturer's recommendations. The gravel bags, concrete blocks or open graded rocks shall line the outside perimeter and shall be double wrapped with the 10 mil plastic sheeting to prevent any potential for runoff from the containment area. See Exhibit G at end of section.

3.2.7.2 The concrete truck washout containment area shall be maintained in a condition that will not allow concrete buildup within the containment area to exceed 50% of the storage capacity.

3.2.7.3 The concrete truck washout area will be removed when it is no longer necessary to wash out concrete trucks on the site.

3.2.7.4 Equipment Cleaning: Clean equipment in a manner that does not create any discharge of cleaning agents, paints, oil or solvents to a storm sewer, waterway or onto the ground. Soaps and detergents must never be discharged to the ground. Cement handling equipment must be rinsed in a contained area and there must be no drainage off-site or onto to ground.

3.2.7.5 When rinsing painting equipment/tools outside, rinse water must be contained in a bucket or other container for appropriate disposal. Water based or latex paint rinse water may be discharged to the sanitary sewer only with permission/approval from UT EH&S.

3.2.7.6 Oil based paint wastes, including solvents and thinners, must not be disposed

of in the sanitary sewer; they must be collected and disposed of through the contractor's disposal company in accordance with applicable laws and regulations.

- 3.2.7.7 Discharges from pressure washing using soaps or chemicals must not be allowed to enter a storm sewer. The wastewater will need to be collected with a berm and vacuumed (transported to appropriate disposal site). If the rinse only contains water and dirt (sediment) it may be spread on a grass area or contained/filtered with clean water allowed to enter storm sewer. In some cases it may also be possible to discharge to a sanitary sewer with permission from UT EH&S.

3.2.8 TEMPORARY STORAGE TANKS

- 3.2.8.1 Must be located in a bermed containment area. The berm must be a minimum 3 feet in all directions, and the height of the berm must contain the maximum contents of the largest tank plus 8 inches (approximately 110% of the tank capacity). The containment area is constructed by beginning with a 2-inch sand pad, and then covered with 6-mil plastic or rubber sheeting. The sheeting is then covered with another 2-inch layer of sand. The plastic sheeting is secured to the outer berm.
- 3.2.8.2 Storage tanks are to be placed no closer than 50 feet from a building or property line.
- 3.2.8.3 If using tanks with a gravity feed setup, the containment must be of sufficient size to be able to contain the tank if it should fall over.
- 3.2.8.4 There must be a fusible link at the valve that will shut off the flow to the hose in the event of a fire.
- 3.2.8.5 There must be sufficient cover for the tank and the containment area to prevent potential storm water runoff.
- 3.2.8.6 The area within the containment area is to be kept free and clear of spills; if a spill occurs, the sand is to be removed and replace with a fresh layer of sand.
- 3.2.8.7 The storage tank containment area is to be removed from the site once it has been determined that it will no longer be used on the construction site.

3.2.9 DIVERSION DIKE

- 3.2.9.1 Diversion dikes shall be formed and shaped using compacted fill, and shall not intercept runoff from more than 10 acres. The dike shall have a minimum top width of 24 inches, and a minimum height of 18 inches. Soil shall have side slopes of 3:1 or flatter, and shall be placed in 8-inch lifts. Compact soil to 95% standard proctor density. Where protected slopes exceed 2 percent, the uphill side of diversion dike shall be stabilized with

crushed stone or erosion control matting to a distance of not less than 7 feet from toe of dike. The channel that is formed by the diversion dike must have positive drainage for its entire length to a stabilized outlet, such as a rock berm, sandbag berm, or stone outlet structure. Storm water shall not be allowed to overflow the top of diversion dike at any point other than the stabilized outlet.

3.2.9.2 Maintain the diversion dike in a condition that allows the storm water runoff to be diverted away from exposed slopes. Repair any failures at top of dike and remove sediment as necessary behind the dike to allow positive drainage to a stabilized outlet.

3.2.9.3 Remove diversion dike when the exposed slopes being protected are stabilized with vegetation or other permanent cover.

3.2.10 INTERCEPTOR SWALE

3.2.10.1 An interceptor swale shall be implemented to prevent on or off-site storm water from entering a disturbed area, or prevent sediment-laden runoff from leaving the site or disturbed area. The interceptor swale shall be excavated as required by the SWPPP drawings, with side slopes of 3:1 or flatter. This shall include all labor and equipment associated with the installation and maintenance of the swale as shown on the construction documents. Constructed swale may be v-shaped or trapezoidal with a flat bottom, depending on the volume of water being channeled. Sediment laden runoff from swale shall be directed to a stabilized outlet or sediment-trapping device. Flow line of swale shall have a continuous fall for its entire length and shall not be allowed to overflow at any other points along its length.

3.2.10.2 Maintain interceptor swale in a condition that allows the storm water runoff to be channeled away from disturbed areas. Remove sediment in swale as necessary to maintain positive drainage to a stabilized outlet.

3.2.10.3 Fill in or remove swale after the disturbed area/s being protected is completely stabilized as specified.

3.2.11 EROSION CONTROL MATTING

3.2.11.1 Remove all rocks, debris, dirt clods, roots, and any other obstructions which would prevent the matting from lying in direct contact with the soil. 6 inch by 6 inch anchor trenches shall be dug along the entire perimeter of the installation. Bury matting in trenches, backfill and compact. Fasten matting to the soil using 10-gauge wire staples, 6 inches in length and 1 inch wide. Use a minimum of 1 staple per 4 square feet of matting, and at 12 inches on center along all edges. Install parallel to flow of water and overlap joining strips a minimum of 12 inches.

- 3.2.11.2 Maintain erosion control matting by repairing any bare spots. Missing or loosened matting shall be promptly replaced or re-anchored.
- 3.2.11.3 Remove matting where protection is no longer required. In areas where permanent vegetation is established along with matting, matting can be left in place permanently.

3.2.12 MULCHES

- 3.2.12.1 Apply specified mulches in areas identified on the SWPPP, to a depth of 3 inches or as otherwise specified on the SWPPP drawings.

3.2.13 BPM Details

- 3.2.13.1 Refer to Exhibits for the following BMP details:
 - Exhibit A -- Area Inlet Detail
 - Exhibit B -- Curb Inlet Detail
 - Exhibit C -- Rock Berm Detail
 - Exhibit D -- Silt Fence Detail
 - Exhibit E -- Triangular Dike Detail
 - Exhibit F -- Stabilized Construction Exit
 - Exhibit G -- Concrete Truck Washout

3.3 INSPECTIONS AND RECORD KEEPING

- 3.3.1 Contractor shall inspect all BMPs on 7-day intervals. Coordinate inspections with OFPC CI, who is also required by TPDES to regularly inspect the site. Use standard Owner Inspection forms (see form in Part 4 of this Section) for each inspection. Record all deficiencies of site controls, and take appropriate action to correct any deficiencies recorded. Exception is rock berms located in a streambed. Any rock berm located in a streambed shall be inspected on a daily basis. Keep records of inspections current and on file, available for review by EPA, TCEQ, MS4 Operator Representative and/or Owner's Representative.
- 3.3.2 Contractor shall keep records of all Contractor inspections on file with SWPPP book at project site, and make available for review by Owner's Representative or EPA, TCEQ or MS4 Operator officials requesting review of SWPPP inspection records. One copy of each inspection report shall be delivered to the CI and the RCM office.
- 3.3.3 Contractor shall keep records of all major grading and stabilization activities on file with the SWPPP book at the project site and make available for review by Owner's representative, EPA, TCEQ, or MS4 Operator officials requesting review of the SWPPP.
- 3.3.4 Contractor shall retain copies of all inspection records and the Major Grading and

Stabilization Log along with SWPPP book for 3 years from NOT date per TCEQ regulations.

3.4 MAINTENANCE

- 3.4.1 All erosion and sediment control measures and other protective measures identified in the SWPPP must be maintained in effective operating condition. If through inspections the permittee determines that BMPs are not operating effectively, maintenance must be performed before the next anticipated storm event or as necessary to maintain the continued effectiveness of storm water controls. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable. Erosion and sediment controls that have been intentionally disabled, run over, removed or otherwise rendered ineffective must be replaced or corrected immediately upon discovery.

3.5 Waste Disposal

- 3.5.1 Contractor is responsible for proper disposal of hazardous materials. Hazardous wastes (such as flammable petroleum products and solvents, thinners) and materials contaminated with hazardous wastes are considered regulated wastes, and should be containerized for transport and disposal by a permitted company in accordance with applicable laws and regulations.
- 3.5.2 Any trash or debris must be contained on site and disposed of in a recycling bin or waste receptacle in accordance with applicable laws and regulations to prevent wind or rain from carrying it off-site into a storm drain. Non-hazardous solid wastes such as general construction debris may be recycled or disposed of in the trash container. Never dispose of liquid wastes of any kind in University dumpsters.

PART 4 - SAMPLE FORMS

The following forms or sketches are to be used by the Contractor in the execution of the work in this Section, in compliance with TPDES requirements and the SWPPP.

- UT System OFPC SWPPP Project Start-up
- Major Grading and Stabilization Log
- SWPPP Posting Sign for Main Construction Entrance for large construction site 5 acres or greater
- SWPPP Posting Sign for Main Construction Entrance for small construction site 1 to less than 5 acres

Contact the Owner's representative for electronic copies of these forms to be used in the execution of work in this section:

- TCEQ TPDES Notice of Intent (NOI)

- TCEQ TPDES CSN (Large CSN or Small CSN)
- TCEQ TPDES Notice of Termination (NOT)
- UT System OFPC Notice of Termination (OFPC NOT)
- Shared SWPPP Acceptance Certification form
- UT System OFPC SWPPP Inspection form

END OF SECTION 01 57 23

SWPPP Weekly Inspection Report

University of Texas System - Office of Facilities Planning and Construction

Date of Inspection

Project Name and Number

Contractor

Inspector Name

Signature of Inspector

Inspector Qualifications

Report Prepared by;

1. Are TPDES NOI's, Permits or CSN's posted at the entrance to the site?	Yes	No	NA
2. Is contact information for all permittees posted at the construction entrance?	Yes	No	NA
3. Are copies of inspection reports for all permittees included in both SWPPP binders?	Yes	No	NA
4. Is a copy of the NOI, TPDES Permit and Posting Notice or CSN for all permittees included in the SWPPP binders?	Yes	No	NA
5. Is the Erosion Control Drawing (SWPPP Map) up to date and are all changes noted and dated?	Yes	No	NA
6. Is the major grading and stabilization activities log current?	Yes	No	NA
7. Is the area surrounding the project site clean and free of signs of tracking and discharge?	Yes	No	NA
8. Are all BMP's functioning as intended?	Yes	No	NA
9. Are BMP's in place addressing all areas of concern? If no, explain on reverse side of this form.	Yes	No	NA
10. Are BMP's in good repair, sediment and debris free? If no, explain on reverse side of this form.	Yes	No	NA
11. Are stabilized entrances and exits preventing street contamination? If no, explain on reverse side of this form.	Yes	No	NA

12. Are all hazardous materials being controlled and stored to keep from being exposed to storm water run-off?	Yes	No	NA
13. Has the site been <u>free</u> of hazardous material spills since the last inspection? If no, explain below.	Yes	No	NA
14. Are areas not covered by impervious materials still un-stabilized?	Yes	No	NA
15. Do soil disturbing activities continue to take place?	Yes	No	NA

Note: All items of non-compliance shall be repaired/installed within (7) calendar days of this inspection. Repairs/maintenance/installation shall be completed immediately, if storm conditions are imminent.

Note incidents of non-compliance below. Please notate the number of each item in non-compliance.

Have all previous items of non-compliance been corrected?	Yes	No	NA
---	-----	----	----

Date Corrected

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Project Manager Signature

Printed Name

Title

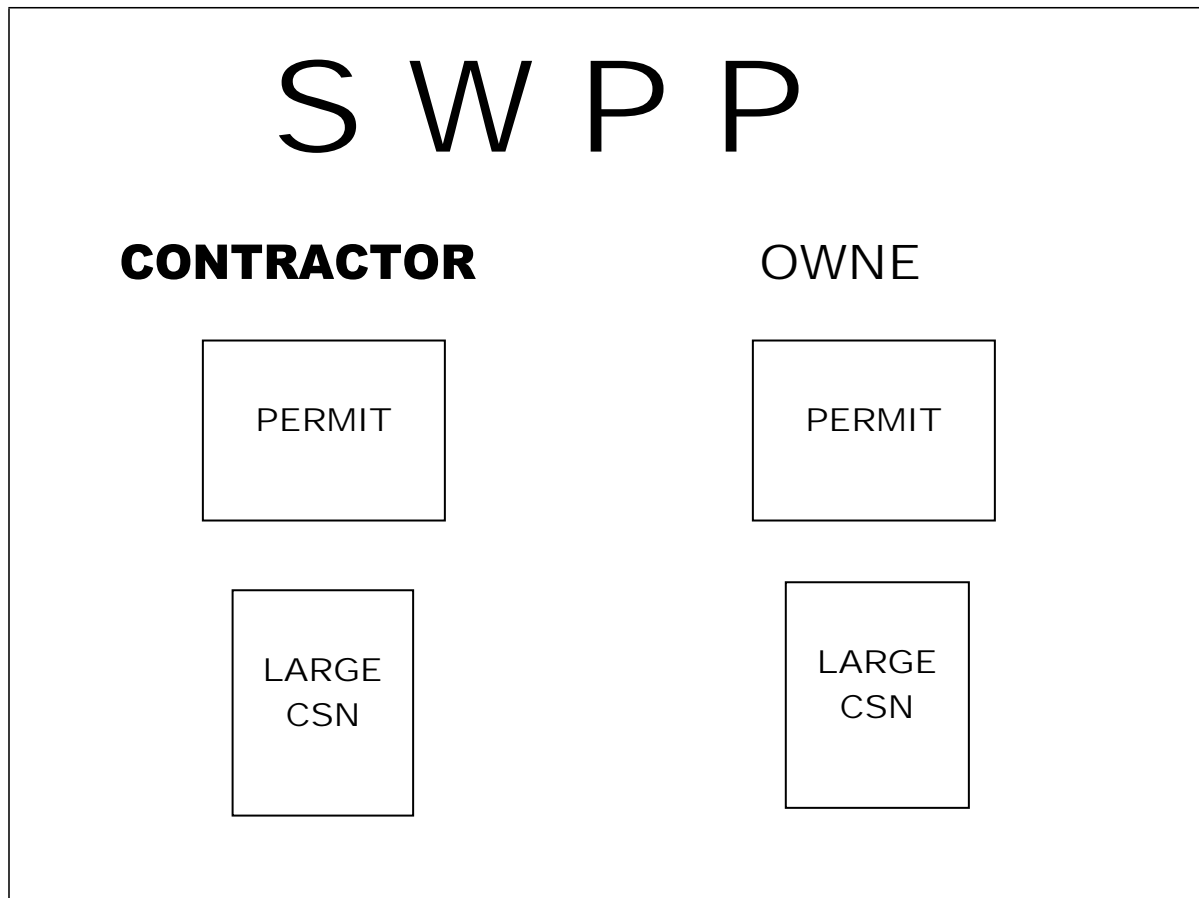
The University of Texas System
Office of Facilities Planning and Construction
702 Colorado Street, Suite 4.100 Austin, TX 78701
(512) 499-4600 FAX (512) 499-4604

Storm Water Pollution Prevention Plan
Major Grading and Stabilization Activities Log

Start Date	End Date*	Type and Location of Activity

***End Date does not pertain to stabilization activities**

Sign for Large Construction Site



MINIMUM SIGN SPECIFICATIONS: 5 Acre or Greater Sites

SIGN - Exterior grade $\frac{3}{4}$ " plywood, cut 4' x 4', with red painted letters, background painted white - **DISPLAY ON CONSTRUCTION FENCE AT MAIN ENTRANCE TO PROJECT SITE.**

S W P P P - 10-inch painted letters, 3 inches from top of sign, centered

CONTRACTOR OWNER - 3 inch painted letters, 4 inches below SWPPP letters, centered on each half of sign

PERMIT, CSN - 8-1/2 X 11 TCEQ forms, laminated beyond edges of documents, stapled to plywood.

Sign for Small Construction Site

S W P P	
CONTRACTOR	OWNE
<div>CSN</div>	<div>CSN</div>

MINIMUM SIGN SPECIFICATIONS: 1 to Less than 5 Acre Sites

SIGN - Exterior grade $\frac{3}{4}$ " plywood, cut 4' x 4', with red painted letters, background painted white - **DISPLAY ON CONSTRUCTION FENCE AT MAIN ENTRANCE TO PROJECT SITE.**

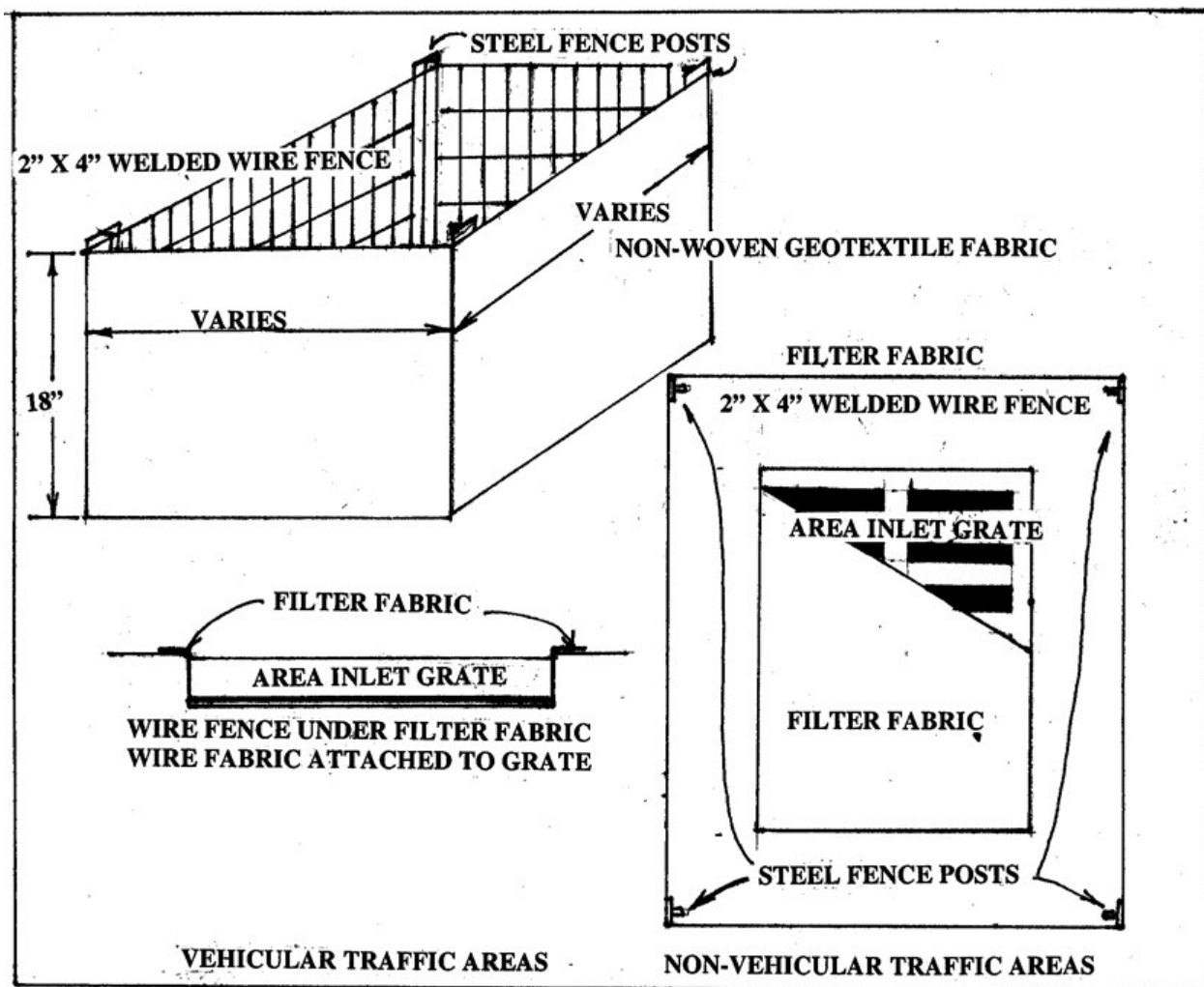
S W P P P - 10-inch painted letters, 3 inches from top of sign, centered

CONTRACTOR OWNER - 3-inch painted letters, 4 inches below SWPPP letters, centered on each half of sign

CONSTRUCTION SITE NOTICE - 8-1/2 X 11 TCEQ forms, laminated beyond edges of documents, stapled to plywood.

EXHIBIT A

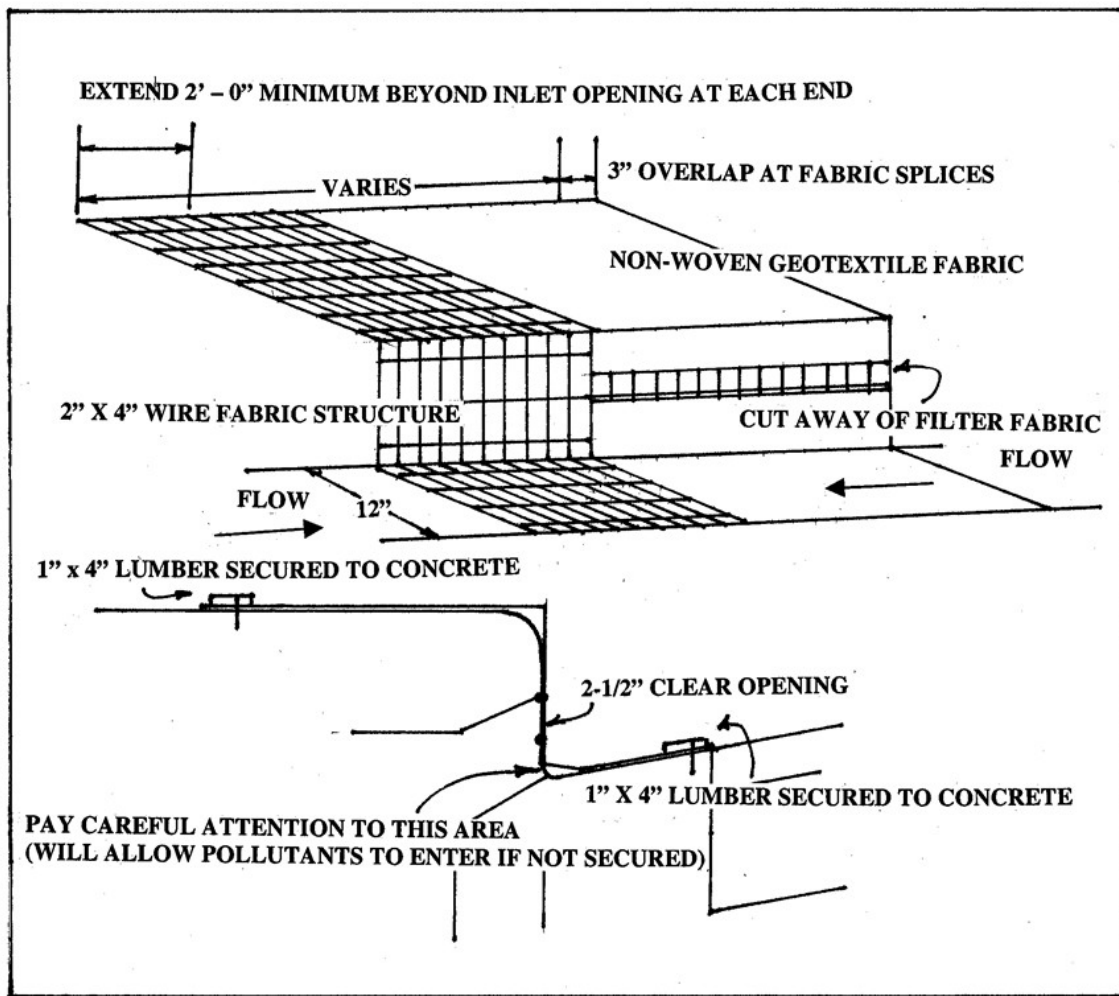
Area Inlet Detail



1. INSTALL STEEL POSTS THAT SUPPORT THE SILT FENCE AT EACH CORNER, AND ALSO BETWEEN CORNERS IF THE DISTANCE IS GREATER THAN 6 FEET BETWEEN CORNER POSTS.
2. USE SILT FENCE DETAIL FOR INSTALLATION OF THE SILT FENCE AROUND THE AREA INLET.
3. LIFT THE METAL AREA INLET GRATE, WRAP THE FILTER FABRIC AROUND IT, AND THEN REPLACE THE GRATE.
4. IN VEHICULAR TRAFFIC AREAS, LIFT THE METAL GRATE OUT AND PLACE WIRE FENCE MATERIAL UNDER IT WITH FILTER FABRIC PLACED BETWEEN THE GRATE AND THE WIRE FENCE. THEN ATTACH THE WIRE FENCE TO THE GRATE.
5. REMOVE ACCUMULATED SILT WHEN THE FILTER FABRIC OVE THE GRATE COMPLETELY COVERS THE GRATE AREA AND THE SILT AROUND THE SILT FENCE REACHES A HEIGHT OF 6 INCHES.
6. REMOVE AREA INLET PROTECTION WHEN THE SITE IS COMPLETELY STABILIZED.

EXHIBIT B

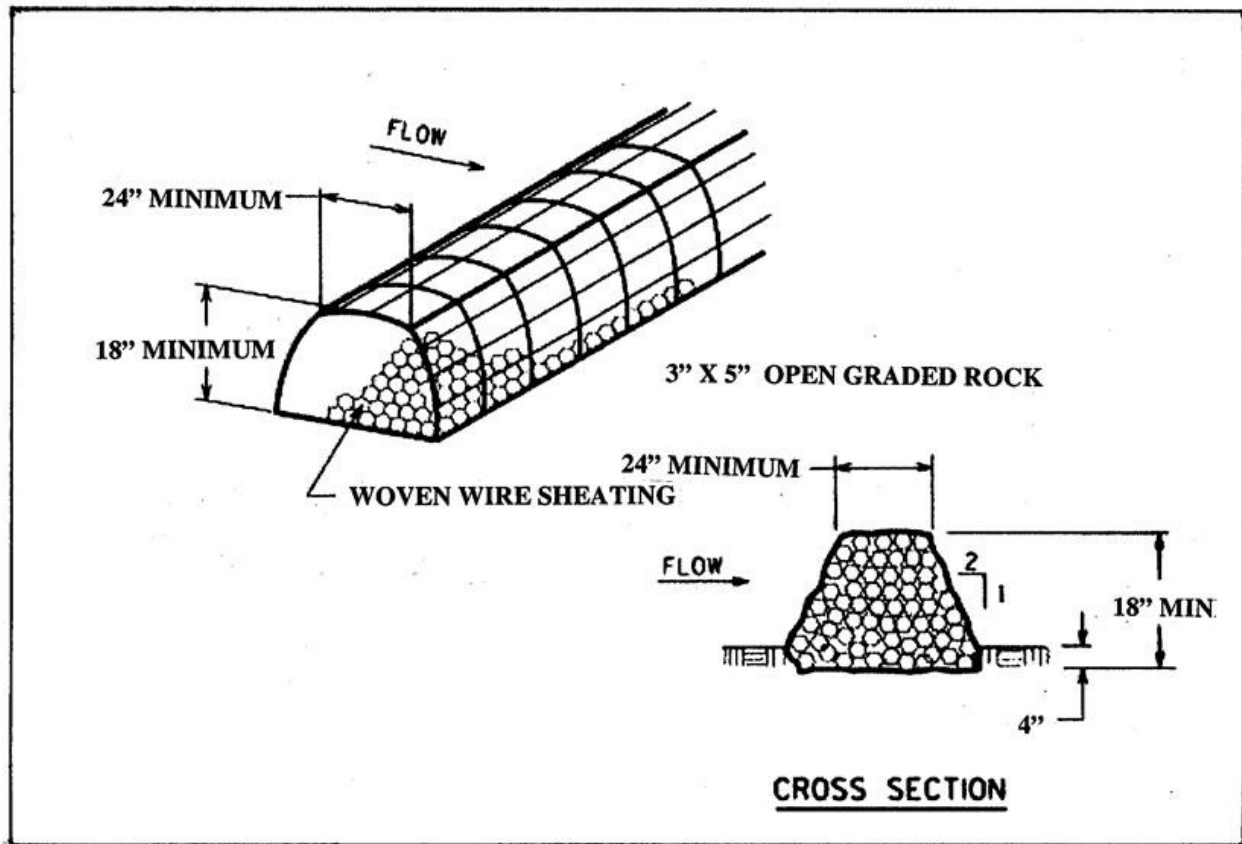
Curb Inlet Detail



1. WHERE MINIMUM CLEARANCES CAUSE TRAFFIC TO DRIVE IN THE GUTTER, USE 1" BY 4" LUMBER SECURED WITH CONCRETE NAILS 3 FEET ON CENTER NAILED INTO THE CONCRETE. IF THERE IS PEDESTRIAN TRAFFIC ONLY, THE USE OF 20# GRAVEL BAGS TO SECURE MATERIAL IS PERMITTED.
2. REMOVE SECTION OF FILTER FABRIC AS SHOWN IN THIS DETAIL. SECURE FABRIC TO WIRE BACKING WITH CLIPS OR HOG RINGS AT THIS LOCATION.
3. INSPECT DAILY AND REMOVE SILT ACCUMULATION WHEN THE DEPTH REACHES 2 INCHES.
4. MONITOR THE PERFORMANCE OF THE INLET PROTECTION DURING EACH RAINFALL EVENT AND REMOVE PROTECTION IMMEDIATELY IF THE STORM WATER BEGINS TO OVERTOP THE CURB.
5. REMOVE ACCUMULATED SILT WHEN THE FILTER FABRIC OVER THE GRATE COMPLETELY COVERS THE GRATE AREA AND THE SILT AROUND THE SILT FENCE REACHES A HEIGHT OF 6 INCHES.
6. REMOVE INLET PROTECTION AS SOON AS THE SOURCE OF SEDIMENT IS STABILIZED.

EXHIBIT C

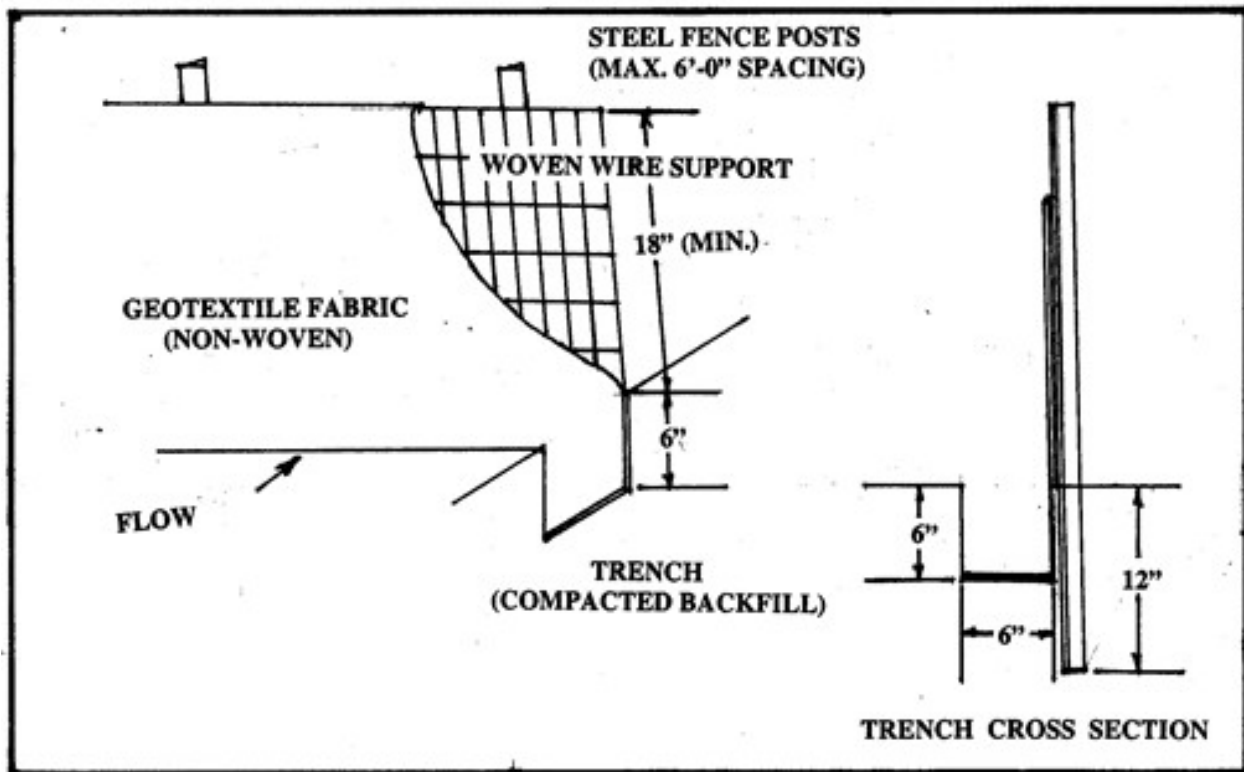
Rock Berm Detail



1. USE ONLY OPEN GRADED 4" X 8" ROCK FOR STREAM FLOW CONDITIONS. USE 3" X 5" OPEN GRADED ROCK FOR OTHER CONDITIONS.
2. SECURE THE ROCK BERM WITH A WOVEN WIRE SHEATHING HAVING A MAXIMUM 1 INCH OPENING AND A MINIMUM 20-GAUGE WIRE DIAMETER. ANCHOR ROCK BERMS IN CHANNEL APPLICATIONS FIRMLY INTO THE SUBSTRATE A MINIMUM OF 6 INCHES WITH TEE POSTS OR WITH #5 OR #6 REBAR WITH A MAXIMUM SPACING OF 48 INCHES ON CENTER.
3. INSPECT THE ROCK BERM WEEKLY. REPLACE THE STONE AND/OR FABRIC CORE-WOVEN SHEATHING WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC, ETC.
4. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD THE HEIGHT OF THE BERM OR 6 INCHES, WHICHEVER IS LESS, REMOVE THE SILT AND DISPOSE OF ON AN APPROVED SITE AND IN A MANNER THAT WILL NOT CREATE A SILTRATION PROBLEM.
5. INSPECT SEVERE SERVICE ROCK BERMS DAILY, AND REMOVE SILT WHEN ACCUMULATION REACHES 6 INCHES.
6. WHEN THE SITE IS COMPLETELY STABILIZED, REMOVE THE ROCK BERM AND ACCUMULATED SILT AND DISPOSE OF IN AN APPROVED MANNER.

EXHIBIT D

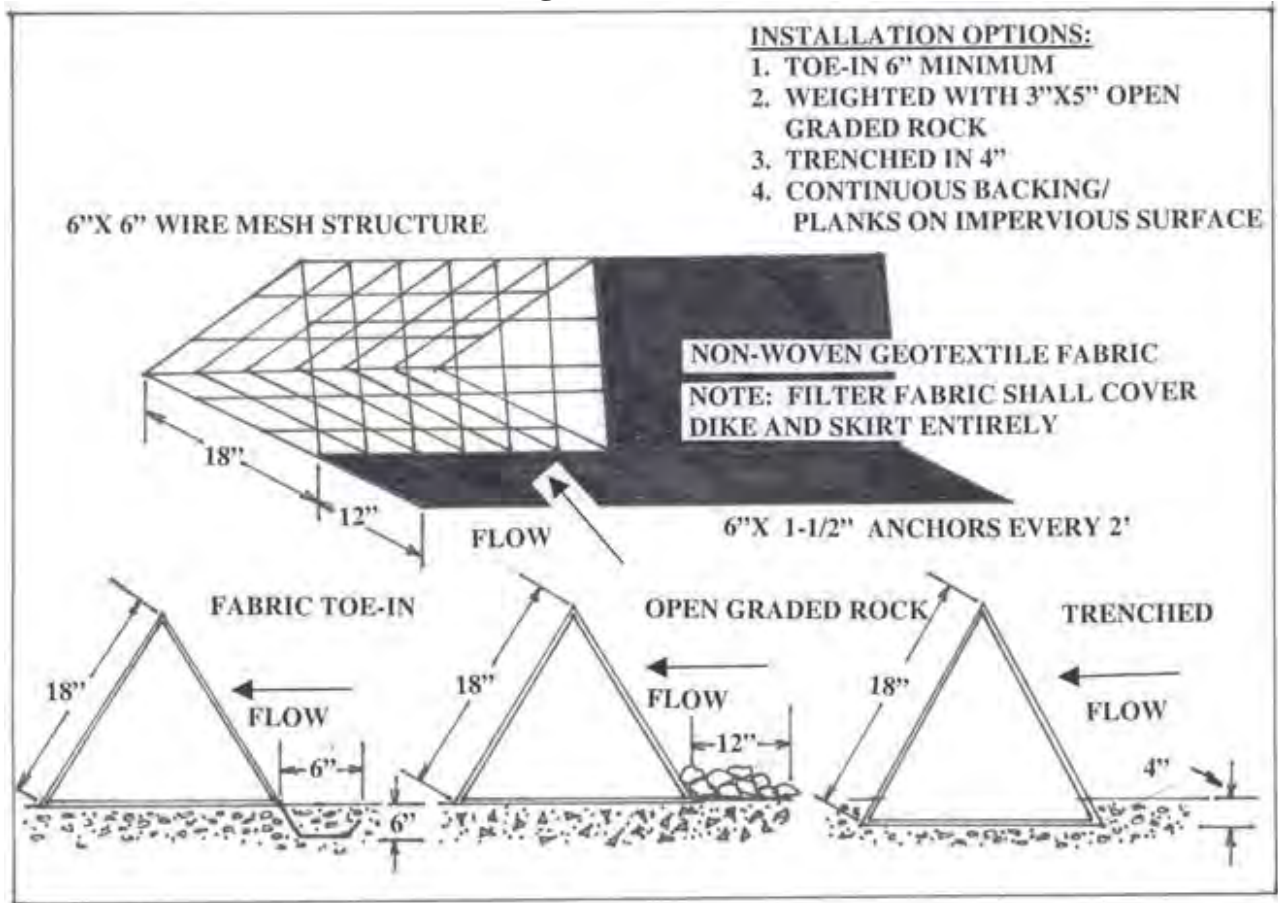
Silt Fence Detail



1. INSTALL STEEL POSTS THAT SUPPORT THE SILT FENCE ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POSTS MUST BE EMBEDDED A MINIMUM OF 12 INCHES.
2. TRENCH IN THE TOE OF THE SILT FENCE WITH A SPADE OR MECHANICAL TRENCHER SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF THE FLOW. WHERE FENCE CAN NOT BE TRENCHED INTO THE SURFACE, (E.G., PAVEMENT), WEIGHT THE FABRIC DOWN WITH ROCK OR 1" X 4" LUMBER SECURELY FASTENED TO THE SURFACE. PLACE ON THE UPSTREAM SIDE TO PREVENT FLOW UNDER THE FENCE.
3. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE FILTER FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. FASTEN THE FILTER FABRIC SECURELY TO THE WOVEN WIRE BACKING, AND IN TURN FASTEN IT SECURELY TO THE STEEL FENCE POST.
5. REMOVE ACCUMULATED SILT WHEN IT REACHES A DEPTH OF 6 INCHES, DISPOSE OF THE SILT ON AN APPROVED SITE AND IN SUCH A MANNER THAT IT WILL NOT CONTRIBUTE TO ADDITIONAL SILTRATION.
6. INSPECT THE SILT FENCE WEEKLY AND REPAIR OR REPLACE PROMPTLY IF NEEDED.
7. WHEN THE SITE IS COMPLETELY STABILIZED, REMOVE THE SILT FENCE.

EXHIBIT E

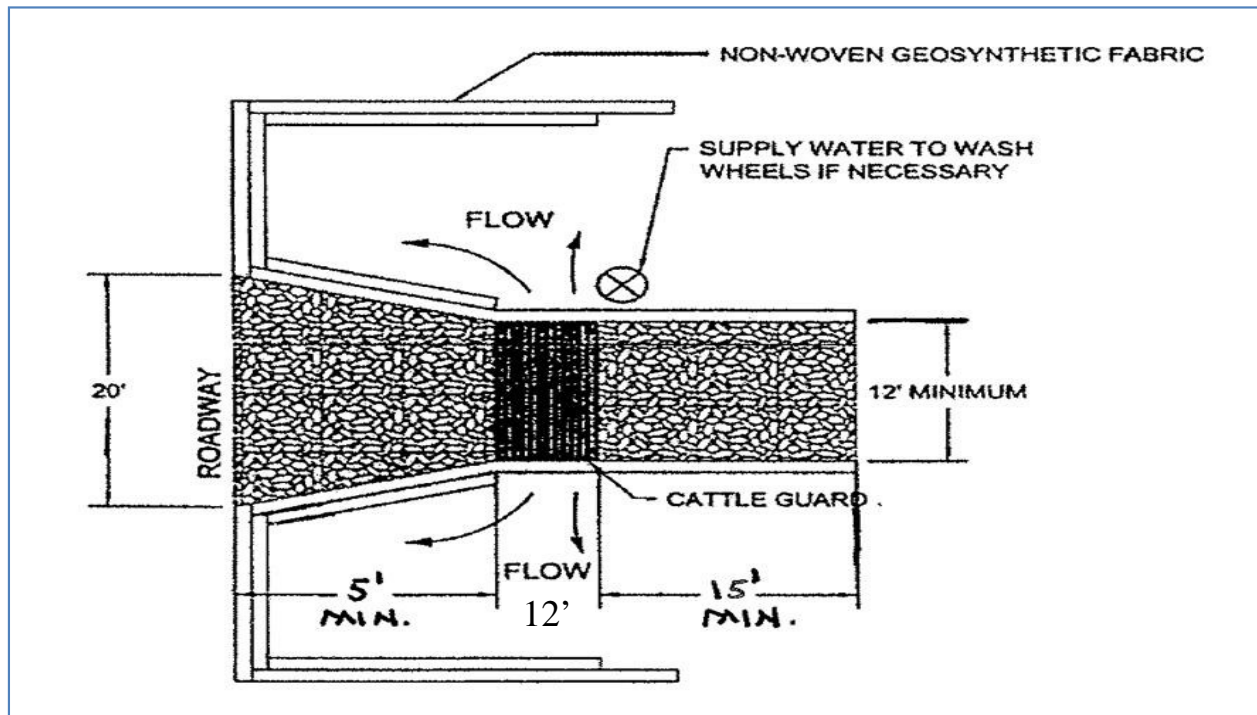
Triangular Dike Detail



1. PLACE DIKES IN A ROW WITH EACH END TIGHTLY ABUTTING THE ADJACENT DIKE.
2. THE FABRIC COVER AND SKIRT SHALL BE A CONTINUOUS WRAPPING OF NON-WOVEN GEOTEXTILE. THE SKIRT SHALL BE A CONTINUOUS EXTENSION OF THE FABRIC ON THE UPSTREAMFACE.
3. WEIGHT THE SKIRT WITH A CONTINUOUS LAYER OF 3" x 5" OPEN GRADED ROCK, 1" x 4" SECURELY FASTENED LUMBER, OR TOED-IN 6 INCHES WITH MECHANICALLY COMPACTED MATERIAL. OTHERWISE, TRENCH IT IN 4 INCHES IN DEPTH.
4. ANCHOR DIKES AND SKIRT SECURELY IN PLACE USING 6 INCH WIRE STAPLES ON 2 FOOT CENTERS ON BOTH EDGES OF SKIRT, OR STAKE USING 3/8 INCH REBAR WITH TEE ENDS.
5. LAP FILTER MATERIAL OVER ENDS 6 INCHES TO COVER DIKE TO DIKE JOINTS. FASTEN JOINTS WITH GALVANIZED HOG RINGS.
6. THE DIKE STRUCTURE SHALL BE 6-GAUGE 6" x 6" WIRE MESH, 18 INCHES ON A SIDE.
7. REMOVE ACCUMULATED SILT WHEN IT REACHES A DEPTH OF 6 INCHES, AND DISPOSE OF IT IN A MANNER THAT WILL NOT CAUSE ADDITIONAL SILTRATION.
8. INSPECT TRIDIKES WEEKLY AND REPAIR OR REPLACE PROMPTLY AS NEEDED.
9. AFTER THE SITE IS COMPLETELY STABILIZED, REMOVE THE DIKES AND ANY REMAINING SILT.

EXHIBIT F

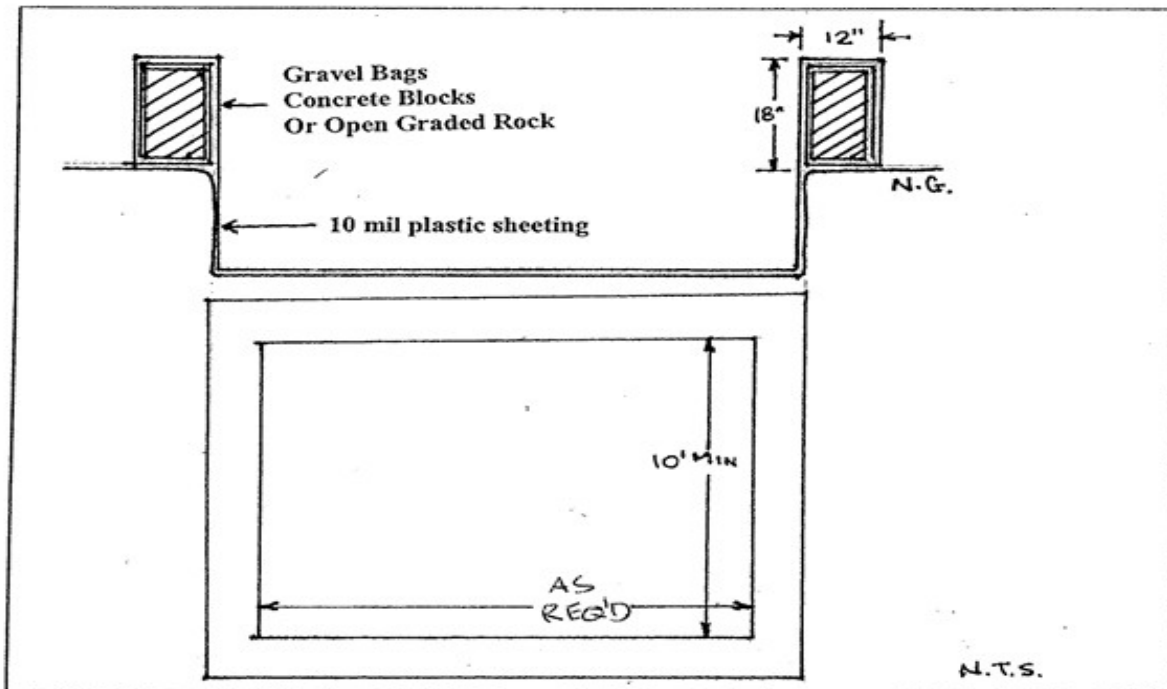
Stabilized Construction Exit



1. THE GRID CONSISTS OF PIPES OR TUBES WITH A MINIMUM DIAMETER OF 3 INCHES, AND SPACED SUCH THAT THERE IS A MINIMUM CLEAR DISTANCE OF 4 1/2 INCHES BETWEEN THEM. ELEVATE THE GRID ABOVE THE GROUND SURFACE A MINIMUM OF 8 INCHES TO ALLOW WATER, DEBRIS AND SOIL TO DRAIN.
2. THE GRID SHALL BE DESIGNED TO SUPPORT THE WEIGHT OF ANY AND ALL VEHICLES ENTERING AND LEAVING THE CONSTRUCTION SITE.
3. THE GRID SHALL BE FIRMLY PLACED IN THE GROUND AT THE EXIT, AND SHALL BE OF SUFFICIENT LENGTH THAT THE AGITATION WILL REMOVE THE SOIL FROM THE TIRES, OR A MINIMUM OF 12 FEET.
4. AT THE STREET SIDE APPROACH OF THE GRID, THERE SHALL BE AN IMPERVIOUS SURFACE OR IT SHALL CONSIST OF 3" x 5" ANGULAR CRUSHED STONE/ROCK 5 FEET IN LENGTH MINIMUM, AND 8 INCHES DEEP, MINIMUM. ON THE JOB SITE SIDE OF THE GRID, THERE SHALL BE 3" x 5" ANGULAR CRUSHED STONE/ROCK 15 FEET IN LENGTH, MINIMUM, 8 INCHES DEEP, MINIMUM. THE STEEL GRID WILL BE BETWEEN THE STREET SIDE APPROACH AND THE JOB SITE CRUSHED STONE/ROCK. ALL CRUSHED STONE/ROCK SHALL HAVE FILTER FABRIC PLACED BENEATH IT.
5. THE STEEL GRID AREA SHALL BE USED AS THE TIRE WASH AREA. WHEN TIRE WASH IS IN USE (RAINY OR MUDDY DAYS), THE AREA SHALL BE MANNED AND THE TIRES SHALL BE WASHED USING A HIGH PRESSURE HOSE/NOZZLE.
6. THE AREA BENEATH THE GRID SHALL BE SLOPED SUCH THAT DEBRIS, SOIL AND WATER SHALL BE DIVERTED BACK ON TO THE CONSTRUCTION SITE OR TO A SEDIMENT BASIN. NO WATER, SOIL OR DEBRIS SHALL LEAVE THE CONSTRUCTION SITE, AND THE RESULTING DISCHARGE SHALL BE DISPOSED OF PROPERLY.

EXHIBIT G

Concrete Truck Washout



1. THE EXCAVATION FOR THE CONCRETE TRUCK WASHOUT SHALL BE A MINIMUM OF 10 FEET WIDE AND OF SUFFICIENT LENGTH AND DEPTH TO ACCOMMODATE 7 GALLONS OF WASHOUT WATER AND CONCRETE PER TRUCK PER DAY AND/OR 50 GALLONS OF WASHOUT WATER AND CONCRETE PER PUMP TRUCK PER DAY.
2. IN THE EVENT THAT THE CONCRETE TRUCK WASHOUT IS CONSTRUCTED ABOVE GROUND, IT SHALL BE 10 FEET WIDE AND 10 FEET LONG, WITH THE SAME REQUIREMENTS FOR CONTAINMENT AS DESCRIBED IN ITEM 1.
3. THE CONTAINMENT AREA SHALL BE LINED WITH 10 MIL PLASTIC SHEETING WITHOUT HOLES OR TEARS. WHERE THERE ARE SEAMS, THESE SHALL BE SECURED ACCORDING TO MANUFACTURERS' DIRECTIONS.
4. THE BERM CONSISTING OF GRAVEL BAGS, CONCRETE BLOCKS OR OPEN GRADED ROCK SHALL BE NO LESS THAN 18 INCHES HIGH AND NO LESS THAN 12 INCHES WIDE.
5. THE PLASTIC SHEETING SHALL BE OF SUFFICIENT SIZE SO THAT IT WILL OVERLAP THE TOP OF THE CONTAINMENT AREA AND BE WRAPPED AROUND THE GRAVEL BAGS, CONCRETE BLOCKS OR OPEN GRADED ROCK AT LEAST 2 TIMES.
6. THE GRAVEL BAGS OR CONCRETE BLOCKS SHALL BE PLACED ABUTTING EACH OTHER TO FORM A CONTINUOUS BERM AROUND THE OUTER PERIMETER OF THE CONTAINMENT AREA.
7. THE WASHOUT MATERIAL IN THE CONTAINMENT AREA SHALL NOT EXCEED 50% OF CAPACITY AT ANY ONE TIME.
8. SOLIDS SHALL BE REMOVED FROM CONTAINMENT AREA AND DISPOSED OF PROPERLY. ANY DAMAGE TO THE PLASTIC SHEETING SHALL BE REPAIRED OR SHEETING REPLACED BEFORE THE NEXT USE.

EXHIBIT 1

Site and Lay down Area - Sheet C106

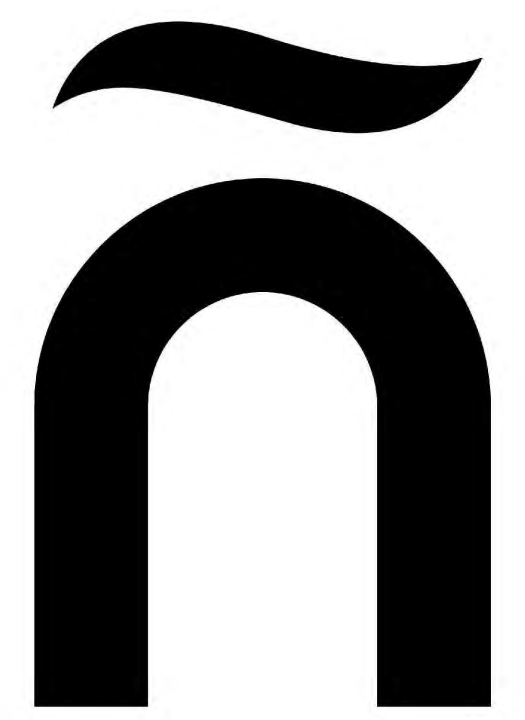
Erosion and Sediment Control Details - Sheet C107

Material Receiving and Storage Area Site Plan - Sheet C108


Erosion and Sediment Control Details - Sheet C109




- NOTES:
1. THE DETAILS ON THE FOLLOWING SHEETS SHALL BE INSTALLED AT EVERY DRAINAGE STRUCTURE INSIDE THE PROJECT LIMITS OR AT LOCATIONS OUTSIDE THE PROJECT LIMITS SHOWN ON THE PLANS AS SPECIFIED ON THIS SHEET.
 2. THE EROSION MEASURES SHOWN ON THIS SHEET SHALL BE USED BY THE CONTRACTOR AS A GUIDE. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED BY THE CONTRACTOR IN ORDER TO COMPLY WITH REGULATIONS AT NO EXTRA PAY.
 3. CLEAN INLET OPENING FROM ALL DEBRIS BEFORE INSTALLATION OF SEDIMENT CONTROL.
 4. EROSION CONTROL DEVICES ARE REQUIRED TO REMAIN IN PLACE UNTIL THE AREA IS FULLY STABILIZED AND MAY BE REMOVED WITH APPROVAL FROM OFPC.
 5. CONTRACTOR SHALL COORDINATE LOCATION OF STABILIZED CONSTRUCTION ENTRANCE/EXIT WITH UTRGV ENVIRONMENTAL HEALTH SAFETY AND RISK MANAGEMENT.
 6. CONTRACTOR SHALL PROVIDE FIBER FILTRATION SOCKS TO STORM SEWER STRUCTURES.
 7. CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING MATERIAL RECEIVING/STORAGE AND STAGING AREA.



muñoz & company
1017 NORTH MAIN SUITE 300
SAN ANTONIO, TEXAS 78212
O. 210.349.1163 F. 210.525.1098
WWW.MUNOZ-CO.COM



PCE
Texas Registered Engineering Firm F-2158
808 Dallas Ave. McAllen, Texas 78501
(956) 631-4482



UTRGV
The University of Texas
Rio Grande Valley

UNIVERSITY OF TEXAS RIO GRANDE VALLEY
SCHOOL OF MEDICINE
TEAM BASED LEARNING CENTER
PROJECT NO:903-1159
EDINBURG, TX
100% CONSTRUCTION DOCUMENTS

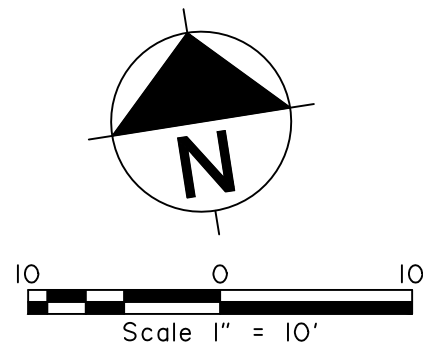
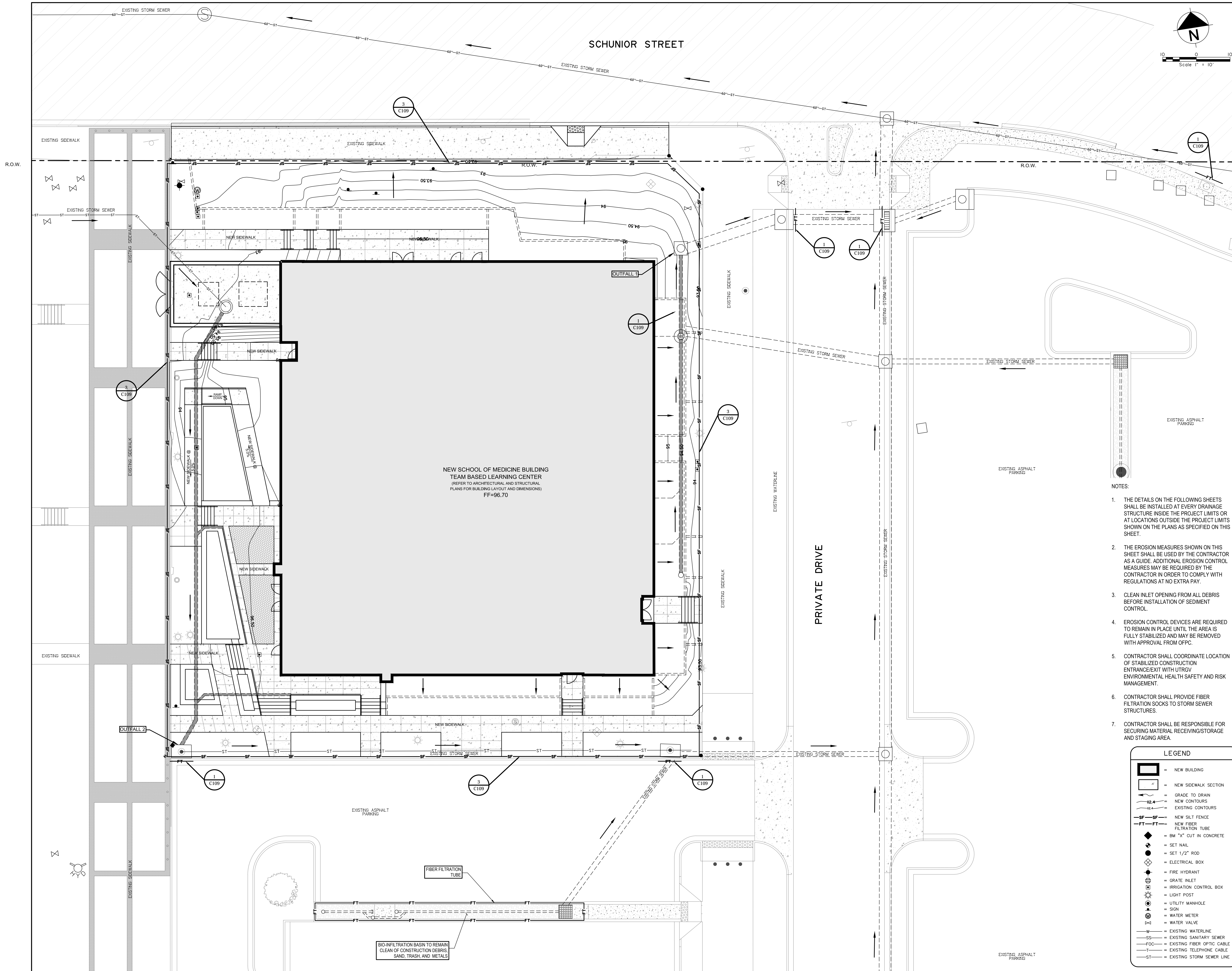
Issue/Revision		
#	DESCRIPTION	DATE

Sheet Title
SITE AND LAYDOWN AREA LOCATION

Date
NOVEMBER 8, 2018

Project Number MUN18103	Drawn By JH	Checked By DP
-----------------------------------	-----------------------	-------------------------

Sheet Number
C106



NOTES:

1. THE DETAILS ON THE FOLLOWING SHEETS SHALL BE INSTALLED AT EVERY DRAINAGE STRUCTURE INSIDE THE PROJECT LIMITS OR AT LOCATIONS OUTSIDE THE PROJECT LIMITS SHOWN ON THE PLANS AS SPECIFIED ON THIS SHEET.
2. THE EROSION MEASURES SHOWN ON THIS SHEET SHALL BE USED BY THE CONTRACTOR AS A GUIDE. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED BY THE CONTRACTOR IN ORDER TO COMPLY WITH REGULATIONS AT NO EXTRA PAY.
3. CLEAN INLET OPENING FROM ALL DEBRIS BEFORE INSTALLATION OF SEDIMENT CONTROL.
4. EROSION CONTROL DEVICES ARE REQUIRED TO REMAIN IN PLACE UNTIL THE AREA IS FULLY STABILIZED AND MAY BE REMOVED WITH APPROVAL FROM OFPC.
5. CONTRACTOR SHALL COORDINATE LOCATION OF STABILIZED CONSTRUCTION ENTRANCE/EXIT WITH UTRGV ENVIRONMENTAL HEALTH SAFETY AND RISK MANAGEMENT.
6. CONTRACTOR SHALL PROVIDE FIBER FILTRATION SOCKS TO STORM SEWER STRUCTURES.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING MATERIAL RECEIVING/STORAGE AND STAGING AREA.

LEGEND

= NEW BUILDING

= NEW SIDEWALK SECTION

= GRADE TO DRAIN

= NEW CONTOURS

= EXISTING CONTOURS

= NEW SILT FENCE

= NEW FIBER FILTRATION TUBE

= BM "X" CUT IN CONCRETE

= SET NAIL

= SET 1/2" ROD

= ELECTRICAL BOX

= FIRE HYDRANT

= GRATE INLET

= IRRIGATION CONTROL BOX

= LIGHT POST

= UTILITY MANHOLE

= SIGN

= WATER METER

= WATER VALVE

= EXISTING WATERLINE

= EXISTING SANITARY SEWER

= EXISTING FIBER OPTIC CABLE

= EXISTING TELEPHONE CABLE

= EXISTING STORM SEWER LINE

muñoz & company
1017 NORTH MAIN SUITE 300
SAN ANTONIO, TEXAS 78212
O. 210.349.1163 F. 210.525.1098
WWW.MUNOZ-CO.COM

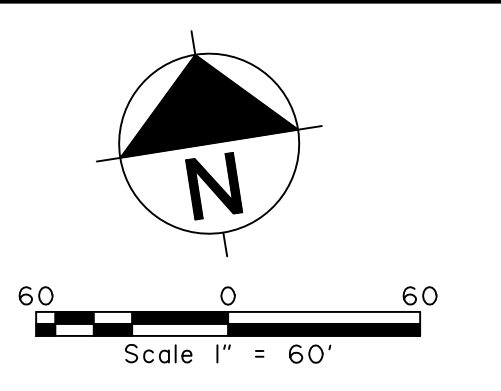
Texas Registered Engineering Firm F-2158
808 Dallas Ave. McAllen, Texas 78501
(956) 631-4482

The University of Texas
Rio Grande Valley

UNIVERSITY OF TEXAS RIO GRANDE VALLEY
SCHOOL OF MEDICINE
TEAM BASED LEARNING CENTER
PROJECT NO.903-1159
EDINBURG, TX
100% CONSTRUCTION DOCUMENTS

Issue/Revision		
#	DESCRIPTION	DATE

Sheet Title EROSION AND SEDIMENT CONTROL PLAN		
Date NOVEMBER 8, 2018		
Project Number MUN18103	Drawn By JH	Checked By DP
Sheet Number C107		



muñoz & company
1017 NORTH MAIN SUITE 300
SAN ANTONIO, TEXAS 78212
O. 210.319.1163 F. 210.525.1098
WWW.MUNOZ-CO.COM

PCE
Texas Registered Engineering Firm F-2158
808 Dallas Ave. McAllen, Texas 78501
(956) 631-4482

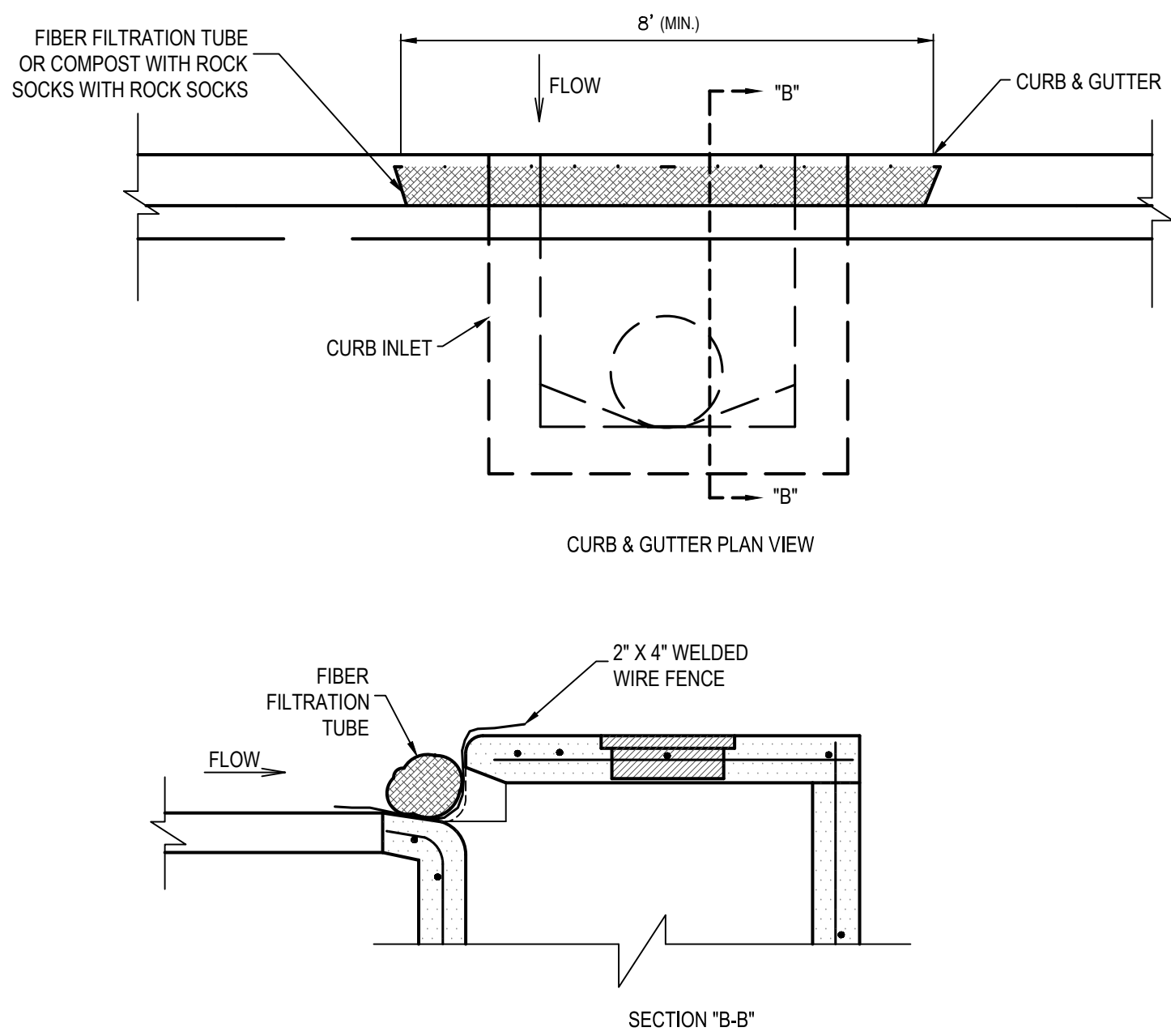
UTRGV
The University of Texas
Rio Grande Valley

UNIVERSITY OF TEXAS RIO GRANDE VALLEY
SCHOOL OF MEDICINE
TEAM BASED LEARNING CENTER
PROJECT NO: 903-1159
EDINBURG, TX
100% CONSTRUCTION DOCUMENTS

NOTES:

1. THE DETAILS ON THE FOLLOWING SHEETS SHALL BE INSTALLED AT EVERY DRAINAGE STRUCTURE INSIDE THE PROJECT LIMITS OR AT LOCATIONS OUTSIDE THE PROJECT LIMITS SHOWN ON THE PLANS AS SPECIFIED ON THIS SHEET.
2. THE EROSION MEASURES SHOWN ON THIS SHEET SHALL BE USED BY THE CONTRACTOR AS A GUIDE. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED BY THE CONTRACTOR IN ORDER TO COMPLY WITH REGULATIONS AT NO EXTRA PAY.
3. CLEAN INLET OPENING FROM ALL DEBRIS BEFORE INSTALLATION OF SEDIMENT CONTROL.
4. EROSION CONTROL DEVICES ARE REQUIRED TO REMAIN IN PLACE UNTIL THE AREA IS FULLY STABILIZED AND MAY BE REMOVED WITH APPROVAL FROM OFPC.
5. CONTRACTOR SHALL COORDINATE LOCATION OF STABILIZED CONSTRUCTION ENTRANCE/EXIT WITH UTRGV ENVIRONMENTAL HEALTH SAFETY AND RISK MANAGEMENT.
6. CONTRACTOR SHALL PROVIDE FIBER FILTRATION SOCKS TO STORM SEWER STRUCTURES.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING MATERIAL RECEIVING/STORAGE AND STAGING AREA.

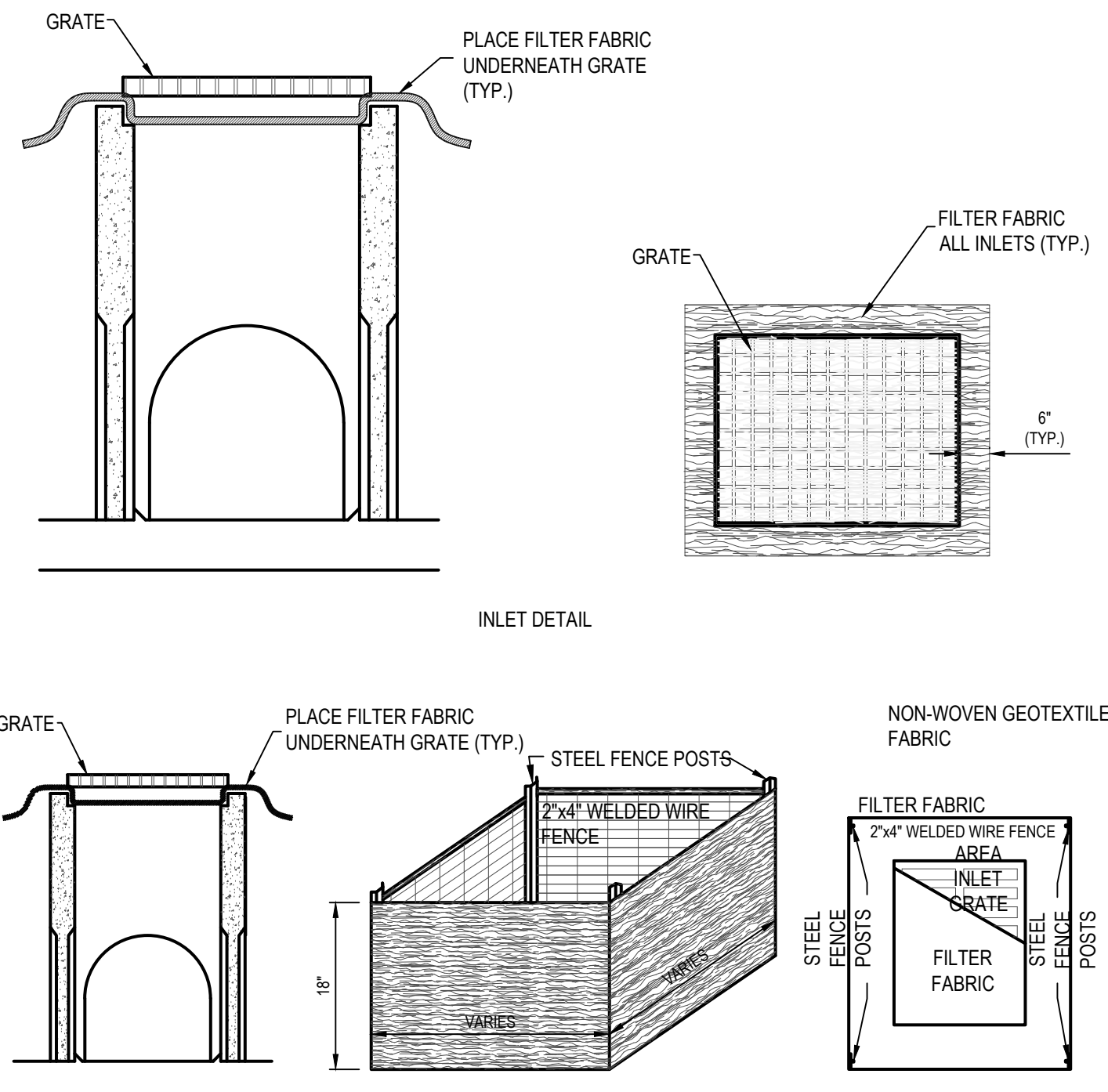
Issue/Revision		
#	DESCRIPTION	DATE
Sheet Title		
MATERIAL RECEIVING AND STORAGE AREA SITE PLAN		
Date		
NOVEMBER 8, 2018		
Project Number	Drawn By	Checked By
MUN18103	JH	DP
Sheet Number		
C108		



CURB INLET PROTECTION NOTES:

- WHERE MINIMUM CLEARANCES CAUSE TRAFFIC TO DRIVE IN THE GUTTER, USE 1" X 4" LUMBER SECURED WITH CONCRETE NAILS 3" O.C. NAILED INTO THE CONCRETE. IF PEDESTRIAN TRAFFIC ONLY, THE USE OF 20# GRAVEL BAGS TO SECURE MATERIAL IS PERMITTED.
- AS SECTION OF FILTER FABRIC SHALL BE REMOVED AS SHOWN IN THIS DETAIL. FABRIC MUST BE SECURED TO WIRE BACKING WITH CLIPS OR HOG RINGS AT THIS LOCATION.
- DAILY INSPECTION SHALL BE MADE AND SILT ACCUMULATION MUST BE REMOVED WHEN DEPTH REACHES 2-INCHES.
- THE PERFORMANCE OF THE INLET PROTECTION SHALL BE MONITORED DURING EACH RAINFALL EVENT AND PROTECTION SHALL BE IMMEDIATELY REMOVED IF THE STORM WATER BEGINS TO OVERTOP THE CURB.
- INLET PROTECTION SHALL BE REMOVED AS SOON AS THE SOURCE OF SEDIMENT IS STABILIZED.

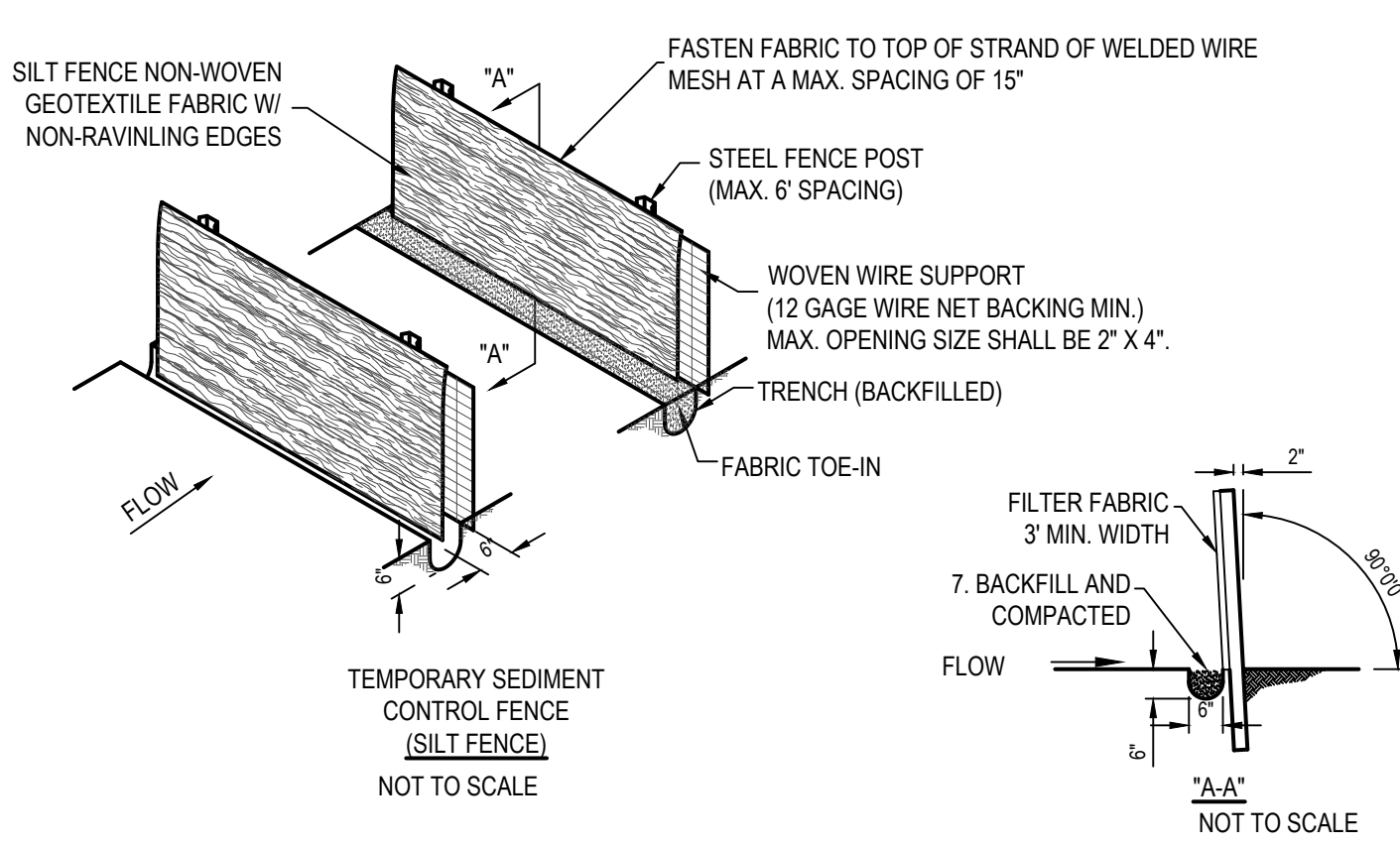
1 TEMPORARY CURB PROTECTION DETAIL
NOT TO SCALE



DETAIL NOTES:

- STEEL POSTS THAT SUPPORT THE SILT FENCE SHALL BE INSTALLED AT EACH CORNER AND IN BETWEEN CORNERS IF THE DISTANCE IS GREATER THAN 6' BETWEEN CORNER POSTS.
- USE SILT FENCE DETAIL FOR INSTALLATION OF THE SILT FENCE AROUND THE EXISTING OR NEW AREA INLET.
- THE METAL AREA INLET GRATE SHALL BE LIFTED AND FILTER FABRIC WRAPPED AROUND THE GRATE AND THE GRATE SHALL BE REPLACED.
- IN VEHICULAR TRAFFIC AREAS METAL GRATE SHALL BE LIFTED OUT AND WIRE FENCE MATERIAL SHALL BE PLACED UNDER IT WITH FILTER FABRIC PLACED BETWEEN THE GRATE AND THE WIRE FENCE. THE WIRE FENCE SHALL THEN BE ATTACHED TO THE GRATE.
- ACCUMULATED SILT SHALL BE REMOVED WHEN THE FILTER FABRIC OVER THE GRATE COMPLETELY COVERS THE GRATE AREA, AND THE SILT AROUND THE SILT FENCE REACHES A HEIGHT OF 6'.
- AREA INLET PROTECTION SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED.

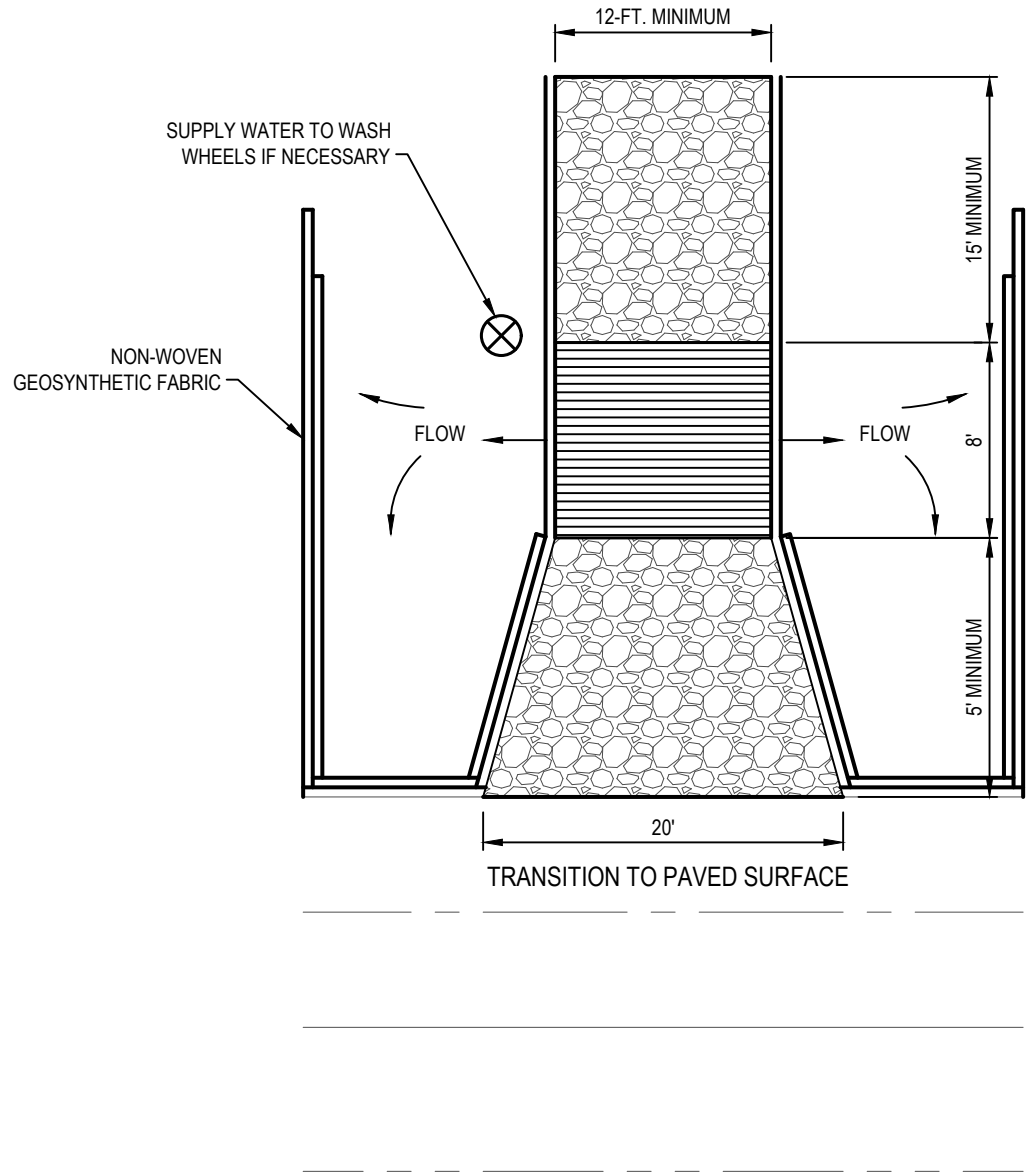
2 TEMPORARY INLET PROTECTION DETAIL
NOT TO SCALE



DETAIL NOTES:

- STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POSTS MUST BE EMBEDDED A MINIMUM OF 12".
- THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF THE FLOW. WHERE FENCE CAN NOT BE TRENCHED INTO THE SURFACE (e.g. PAVEMENT) THE FABRIC SHALL BE WEIGHTED DOWN WITH ROCK OR 1" X 4" LUMBER SECURELY FASTENED TO THE SURFACE, ON THE UPSTREAM SIDE TO PREVENT FLOW UNDER THE FENCE.
- THE TRENCH MUST BE A MINIMUM OF 6" DEEP AND 6" WIDE TO ALLOW FOR THE FILTER FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
- THE FILTER FABRIC SHALL BE SECURELY FASTENED TO THE WOVEN WIRE BACKING, WHICH IN TURN IS SECURELY FASTENED TO THE STEEL FENCE POST.
- ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6". THE SILT SHALL BE DISPOSED OF ON AN APPROVED SITE AND IN SUCH A MANNER THAT IT WILL NOT CONTRIBUTE TO ADDITIONAL FILTRATION.
- INSPECTION SHALL BE MADE WEEKLY AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY, IF NEEDED.
- SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED.

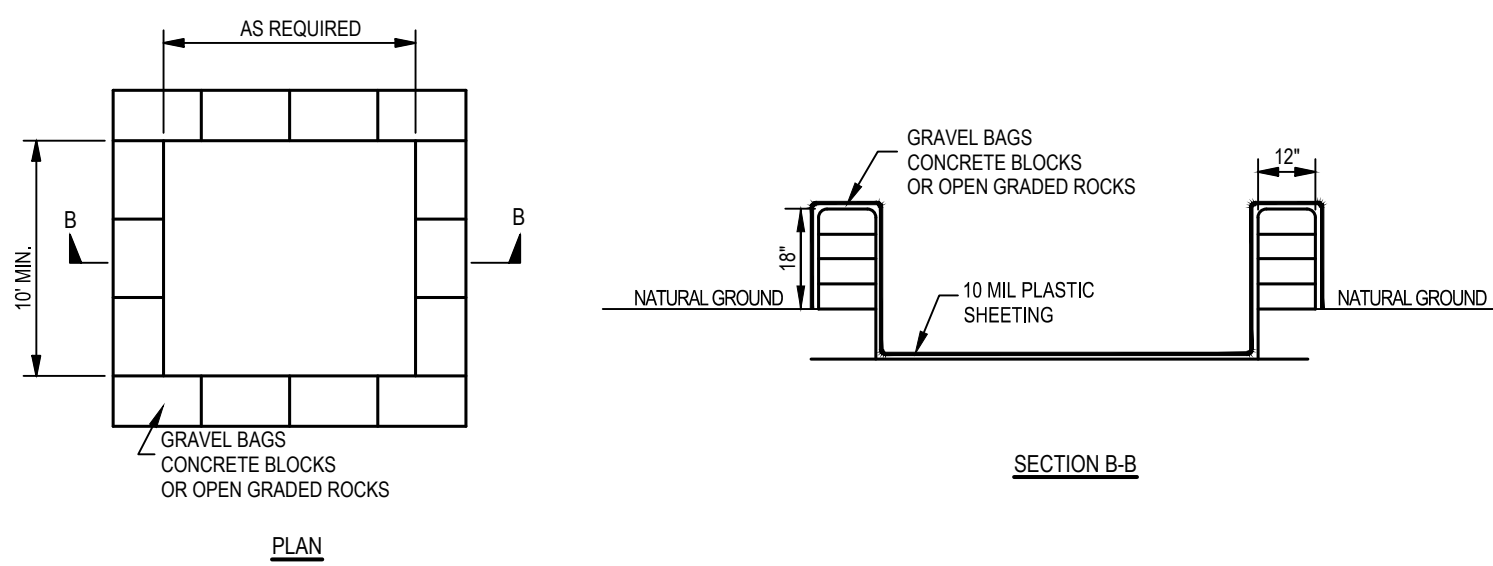
3 TEMPORARY SEDIMENT CONTROL FENCE (SILT FENCE) DETAIL
NOT TO SCALE



DETAIL NOTES:

- A STEEL GRID THAT ALLOWS THE SAFE PASSAGE OF VEHICLES WHILE AGITATING THE TIRES TO LOOSEN AND REMOVE THE SOIL BUILD UP. THE GRID OR STRUCTURES SHALL CONFORM TO THE FOLLOWING:
- IT SHALL CONSIST OF PIPES OR TUBES SPACED SUCH THAT THERE IS A MINIMUM CLEAR DISTANCE BETWEEN THE PIPES OR TUBES OF 4-1/2". IT SHALL BE ELEVATED ABOVE THE GROUND SURFACE A MINIMUM OF 8" TO ALLOW WATER, DEBRIS, AND SOIL TO DRAIN.
 - MINIMUM DIAMETER OF PIPE OR TUBE SHALL BE 3".
 - IT SHALL BE DESIGNED TO SUPPORT ANY AND ALL VEHICLES ENTERING AND LEAVING THE CONSTRUCTION SITE.
 - IT SHALL BE FIRMLY PLACED IN THE GROUND AT THE EXIT.
 - IT SHALL BE OF SUFFICIENT LENGTH SO THAT THE AGITATION WILL REMOVE THE SOIL FROM THE TIRES OR A MINIMUM OF 8'-0".
 - AT THE "STREET SIDE" APPROACH OF THE GRID THERE SHALL BE AN IMPERVIOUS SURFACE OR IT SHALL CONSIST OF 3" TO 5" DIAMETER ANGULAR CRUSHED STONE/ROCK APPROXIMATELY 5'-0" IN LENGTH, MINIMUM, AND 8" DEEP. MINIMUM. ON THE "JOB SITE" SIDE OF THE GRID, THERE SHALL BE 3" TO 5" DIAMETER ANGULAR CRUSHED STONE/ROCK 15'-0" IN LENGTH, MINIMUM, 8" DEEP. MINIMUM. THE STEEL GRID WILL BE BETWEEN THE "STREET SIDE" APPROACH AND THE JOB SITE CRUSHED STONE/ROCK. ALL CRUSHED STONE/ROCK SHALL HAVE FILTER FABRIC BENEATH THE STONE/ROCK.
 - STEEL GRID AREA SHALL BE USED AS THE TIRE WASH AREA. WHEN THE TIRE WASH IS IN USE (RAINY OR MUDDY DAYS) THE AREA SHALL BE MANNED AND THE TIRES SHALL BE WASHED USING A HIGH PRESSURE HOSE/NOZZLE.
 - THE AREA BENEATH THE GRID SHALL BE SLOPED SUCH THAT DEBRIS, SOIL, AND WATER SHALL BE DIVERTED BACK ON TO THE CONSTRUCTION SITE OR TO A SEDIMENT BASIN. NO WATER, SOIL, OR DEBRIS SHALL LEAVE THE CONSTRUCTION SITE. THE RESULTING DISCHARGE SHALL BE DISPOSED OF PROPERLY.

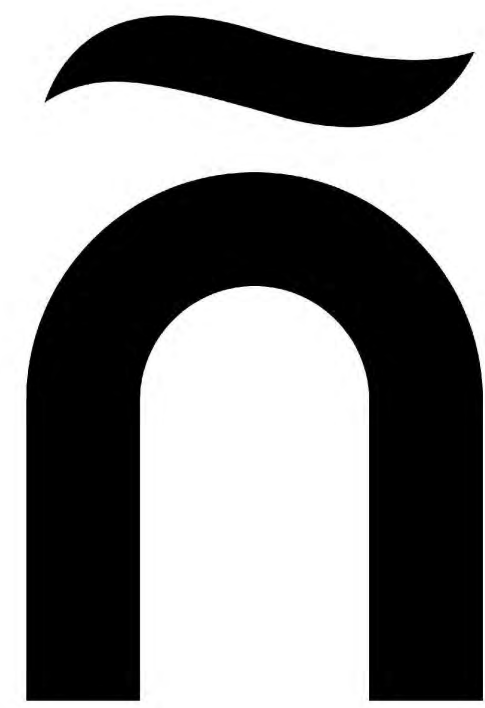
4 STABILIZED CONSTRUCTION ENTRANCE/EXIT
NOT TO SCALE



ALTERNATIVE SELF-INSTALLED CONSTRUCTION SITE CONCRETE TRUCK WASHOUT

- THE EXCAVATION FOR THE CONCRETE/PAINT AND STUCCO TRUCK WASHOUT SHALL BE A MINIMUM OF 10' WIDE AND OF SUFFICIENT LENGTH AND DEPTH TO ACCOMMODATE 7 GALLONS OF WASHOUT WATER AND CONCRETE PER TRUCK PER DAY AND/OR 90 GALLONS OF WASHOUT WATER AND CONCRETE PER PUMP TRUCK PER DAY.
- IN THE EVENT THAT THE SELF-INSTALLED CONCRETE/PAINT AND STUCCO TRUCK WASHOUT IS CONSTRUCTED ABOVE GROUND, IT SHALL BE 10' WIDE AND 10' LONG WITH THE SAME REQUIREMENTS FOR CONTAINMENT AS DESCRIBED IN ITEM 1.
- THE CONTAINMENT AREA SHALL BE LINED WITH 10 MIL PLASTIC SHEETING, WITHOUT HOLES OR TEARS. WHERE THERE ARE SEAMS, THESE SHALL BE SECURED ACCORDING TO THE MANUFACTURERS DIRECTIONS.
- THE PLASTIC SHEETING SHALL BE OF SUFFICIENT SIZE SO THAT IT WILL OVERLAP THE TOP OF THE CONTAINMENT AREA AND BE WRAPPED AROUND THE GRAVEL BAGS, CONCRETE BLOCKS OR OPEN GRADED ROCK AT LEAST 7 TIMES.
- THE GRAVEL BAGS OR CONCRETE BLOCKS SHALL BE PLACED ABUTTING EACH OTHER TO FORM A CONTINUOUS BERM AROUND THE OUTER PERIMETER OF THE CONTAINMENT AREA.
- THE BERM CONSISTING OF GRAVEL BAGS, CONCRETE BLOCKS OR OPEN GRADED ROCK SHALL BE NO LESS THAN 18" HIGH AND NO LESS THAN 12" WIDE.
- THE CONTAINMENT AREA SHALL NO EXCEED 50% OF CAPACITY AT ANY ONE TIME.
- SOLIDS SHALL BE REMOVED FROM CONTAINMENT AREA AND DISPOSED OF PROPERLY AND ANY DAMAGE TO THE PLASTIC SHEETING SHALL BE REPAIRED OR SHEETING REPLACED BEFORE NEXT USE.

5 CONCRETE/PAINT AND STUCCO WASHOUT DETAIL
NOT TO SCALE



muñoz & company
1017 NORTH MAIN SUITE 300
SAN ANTONIO, TEXAS 78212
O. 210.599.1163 F. 210.525.1098
WWW.MUNOZ-CO.COM



Texas Registered Engineering Firm F-2158
809 Dallas Ave. McAllen, Texas 78501
(956) 631-4482

UTRGV
The University of Texas
Rio Grande Valley

UNIVERSITY OF TEXAS RIO GRANDE VALLEY
SCHOOL OF MEDICINE
TEAM BASED LEARNING CENTER
PROJECT NO: 903-1159
EDINBURG, TX
100% CONSTRUCTION DOCUMENTS

Issue/Revision
DESCRIPTION DATE

Sheet Title
EROSION AND SEDIMENT
CONTROL DETAILS

Date
NOVEMBER 8, 2018

Project Number
MUN18103

Drawn By
JH

Checked By
DP

Sheet Number

C109

2013 Uniform General Conditions
for
University of Texas System Building Construction Contracts

For use on all UT System and Institutional Construction Projects executed on or after August 23, 2013

Table of Contents

Article 1.	Definitions
Article 2.	Wage Rates and Other Laws Governing Construction
Article 3.	General Responsibilities of Owner and Contractor
Article 4.	Historically Underutilized Business (HUB) Subcontracting Plan
Article 5.	Bonds and Insurance
Article 6.	Construction Documents, Coordination Documents, and Record Documents
Article 7.	Construction Safety
Article 8.	Quality Control
Article 9.	Construction Schedules
Article 10.	Payments
Article 11.	Changes
Article 12.	Project Completion and Acceptance
Article 13.	Warranty and Guarantee
Article 14.	Suspension and Termination
Article 15.	Dispute Resolution
Article 16.	Certification of No Asbestos Containing Material or Work
Article 17.	Miscellaneous

Article 1. Definitions

Unless the context clearly requires another meaning, the following terms have the meaning assigned herein.

- 1.1 *Application for Payment* means Contractor's monthly partial invoice for payment that includes any portion of the Work that has been completed for which an invoice has not been submitted and performed in accordance with the requirements of the Contract Documents. The Application for Payment accurately reflects the progress of the Work, is itemized based on the Schedule of Values, bears the notarized signature of Contractor, and shall not include subcontracted items for which Contractor does not intend to pay.
- 1.2 *Application for Final Payment* means Contractor's final invoice for payment that includes any portion of the Work that has been completed for which an invoice has not been submitted, amounts owing to adjustments to the final Contract Sum resulting from approved change orders, and release of remaining Contractor's retainage.
- 1.3 *Architect/Engineer (A/E)* means a person registered as an architect pursuant to Tex. Occ. Code Ann., Chapter 1051, as a landscape architect pursuant to Tex. Occ. Code Ann., Chapter 1052, a person licensed as a professional engineer pursuant Tex. Occ. Code Ann., Chapter 1001, and/or a firm employed by Owner or Design-Build Contractor to provide professional architectural or engineering services and to exercise overall responsibility for the design of a Project or a significant portion thereof, and to perform the contract administration responsibilities set forth in the Contract.
- 1.4 *Baseline Schedule* means the initial time schedule prepared by Contractor for Owner's information and acceptance that conveys Contractor's and Subcontractors' activities (including coordination and review activities required in the Contract Documents to be performed by A/E and ODR), durations, and sequence of work related to the entire Project to the extent required by the Contract Documents. The schedule clearly demonstrates the critical path of activities, durations and necessary predecessor conditions that drive the end date of the schedule. The Baseline Schedule shall not exceed the time limit current under the Contract Documents.
- 1.5 *Certificate of Final Completion* means the certificate issued by A/E that documents, to the best of A/E's knowledge and understanding, Contractor's completion of all Contractor's Punchlist items and pre-final Punchlist items, final cleanup and Contractor's provision of Record Documents, operations and maintenance manuals, and all other Close-Out documents required by the Contract Documents.
- 1.6 *Change Order* means a written modification of the Contract between Owner and Contractor, signed by Owner, Contractor and A/E.
- 1.7 *Close-out Documents* mean the product brochures, submittals, product/equipment maintenance and operations instructions, manuals, and other documents/warranties, record documents, affidavit of payment, release of lien and claim, and as may be further defined, identified, and required by the Contract Documents.
- 1.8 *Contract* means the entire agreement between Owner and Contractor, including all of the Contract Documents.
- 1.9 *Contract Date* is the date when the agreement between Owner and Contractor becomes effective.
- 1.10 *Contract Documents* mean those documents identified as a component of the agreement (Contract) between Owner and Contractor. These may include, but are not limited to, Drawings; Specifications; these General Conditions and Owner's Special Conditions; and all pre-bid and/or pre-proposal addenda.
- 1.11 *Contract Sum* means the total compensation payable to Contractor for completion of the Work in accordance with the terms of the Contract.
- 1.12 *Contract Time* means the period between the start date identified in the Notice to Proceed with construction and the Substantial Completion date identified in the Notice to Proceed or as subsequently amended by a Change Order.

- 1.13 *Contractor* means the individual, corporation, limited liability company, partnership, firm, or other entity contracted to perform the Work, regardless of the type of construction contract used, so that the term as used herein includes a Construction Manager-at-Risk or a Design-Build firm as well as a general or prime Contractor. The Contract Documents refer to Contractor as if singular in number.
- 1.14 *Construction Documents* mean the Drawings, Specifications, and other documents issued to build the Project. Construction Documents become part of the Contract Documents when listed in the Contract or any Change Order.
- 1.15 *Construction Manager-at-Risk*, in accordance with Tex. Educ. Code § 51.782, means a sole proprietorship, partnership, corporation, or other legal entity that assumes the risk for construction, rehabilitation, alteration, or repair of a facility at the contracted price as a general contractor and provides consultation to Owner regarding construction during and after the design of the facility.
- 1.16 *Date of Commencement* means the date designated in the Notice to Proceed for Contractor to commence the Work.
- 1.17 *Day* means a calendar day unless otherwise specifically stipulated.
- 1.18 *Design-Build* means a project delivery method in which the detailed design and subsequent construction is provided through a single contract with a Design-Build firm; a team, partnership, or legal entity that includes design professionals and a builder. The Design-Build Project delivery shall be implemented in accordance with Tex. Educ. Code § 51.780.
- 1.19 *Drawings* mean that product of A/E which graphically depicts the Work.
- 1.20 *Final Completion* means the date determined and certified by A/E and Owner on which the Work is fully and satisfactorily complete in accordance with the Contract.
- 1.21 *Final Payment* means the last and final monetary compensation made to Contractor for any portion of the Work that has been completed and accepted for which payment has not been made, amounts owing to adjustments to the final Contract Sum resulting from approved change orders, and release of Contractor's retainage.
- 1.22 *Historically Underutilized Business (HUB)* pursuant to Tex. Gov't Code, Chapter 2161, means a business that is at least 51% owned by an Asian Pacific American, a Black American, a Hispanic American, a Native American and/or an American Woman; is an entity with its principal place of business in Texas; and has an owner residing in Texas with proportionate interest that actively participates in the control, operations, and management of the entity's affairs.
- 1.23 *Notice to Proceed* means written document informing Contractor of the dates beginning Work and the dates anticipated for Substantial Completion.
- 1.24 *Open Item List* means a list of work activities, Punchlist items, changes or other issues that are not expected by Owner and Contractor to be complete prior to Substantial Completion.
- 1.25 *Owner* means the State of Texas, and any agency of the State of Texas, acting through the responsible entity of the State of Texas identified in the Contract as Owner.
- 1.26 *Owner's Designated Representative (ODR)* means the individual assigned by Owner to act on its behalf and to undertake certain activities as specifically outlined in the Contract. ODR is the only party authorized to direct changes to the scope, cost, or time of the Contract.
- 1.27 *Owner's Special Conditions* mean the documents containing terms and conditions which may be unique to the Project. Owner's Special Conditions are a part of the Contract Documents and have

- precedence over the Uniform General Conditions
- 1.28 *Project* means all activities necessary for realization Owner's desired building or other structure including all ancillary and related work. This includes design, contract award(s), execution of the Work itself, work by Owner's forces and/or other contractors and fulfillment of all Contract and warranty obligations.
- 1.29 *Progress Assessment Report (PAR)* means the monthly compliance report to Owner verifying compliance with the HUB subcontracting plan (HSP).
- 1.30 *Proposed Change Order (PCO)* means a document that informs Contractor of a proposed change in the Work and appropriately describes or otherwise documents such change including Contractor's response of pricing for the proposed change.
- 1.31 *Punchlist* means a list of items of Work to be completed or corrected by Contractor before Final Completion. Punchlists indicate items to be finished, remaining Work to be performed, or Work that does not meet quality or quantity requirements as required in the Contract Documents.
- 1.32 *Record Documents* mean the drawing set, Specifications, and other materials maintained by Contractor that documents all addenda, Architect's Supplemental Instructions, Change Orders and postings and markings that record the as-constructed conditions of the Work and all changes made during construction.
- 1.33 *Request for Information (RFI)* means a written request by Contractor directed to A/E or ODR for a clarification of the information provided in the Contract Documents or for direction concerning information necessary to perform the Work that may be omitted from the Contract Documents.
- 1.34 *Samples* mean representative physical examples of materials, equipment, or workmanship used to confirm compliance with requirements and/or to establish standards for use in execution of the Work.
- 1.35 *Schedule of Values* means the detailed breakdown of the cost of the materials, labor, and equipment necessary to accomplish the Work as described in the Contract Documents, submitted by Contractor for approval by Owner and A/E.
- 1.36 *Shop Drawings* mean the drawings, diagrams, illustrations, schedules, performance charts, brochures, and other data prepared by Contractor or its agents which detail a portion of the Work.
- 1.37 *Site* means the geographical area of the location of the Work.
- 1.38 *Specifications* mean the written product of A/E that establishes the quality and/or performance of products utilized in the Work and processes to be used, including testing and verification for producing the Work.
- 1.39 *Subcontractor* means a business entity that enters into an agreement with Contractor to perform part of the Work or to provide services, materials, or equipment for use in the Work.
- 1.40 *Submittal Register* means a list provided by Contractor of all items to be furnished for review and approval by A/E and Owner and as identified in the Contract Documents including anticipated sequence and submittal dates.
- 1.41 *Substantial Completion* means the date determined and certified by Contractor, A/E, and Owner when the Work, or a designated portion thereof, is sufficiently complete, in accordance with the Contract, so as to be operational and fit for the use intended.
- 1.42 *Unit Price Work* means the Work, or a portion of the Work, paid for based on incremental units of measurement.

- 1.43 *Unilateral Change Order (ULCO)* means a Change Order issued by Owner without the complete agreement of Contractor, as to cost and/or time.
- 1.44 *Work* means the administration, procurement, materials, equipment, construction and all services necessary for Contractor, and/or its agents, to fulfill Contractor's obligations under the Contract.
- 1.45 *Work Progress Schedule* means the continually updated time schedule prepared and monitored by Contractor that accurately indicates all necessary appropriate revisions as required by the conditions of the Work and the Project while maintaining a concise comparison to the Baseline Schedule.

Article 2. Wage Rates and Other Laws Governing Construction

- 2.1 Environmental Regulations. Contractor shall conduct activities in compliance with applicable laws and regulations and other requirements of the Contract relating to the environment and its protection at all times. Unless otherwise specifically determined, Owner is responsible for obtaining and maintaining permits related to stormwater run-off. Contractor shall conduct operations consistent with stormwater run-off permit conditions. Contractor is responsible for all items it brings to the Site, including hazardous materials, and all such items brought to the Site by its Subcontractors and suppliers, or by other entities subject to direction of Contractor. Contractor shall not incorporate hazardous materials into the Work without prior approval of Owner, and shall provide an affidavit attesting to such in association with request for Substantial Completion inspection.
- 2.2 Wage Rates. Contractor shall not pay less than the wage scale of the various classes of labor as shown on the prevailing wage schedule provided by Owner in the bid or proposal specifications. The specified wage rates are minimum rates only. Owner is not bound to pay any claims for additional compensation made by any Contractor because the Contractor pays wages in excess of the applicable minimum rate contained in the Contract. The prevailing wage schedule is not a representation that qualified labor adequate to perform the Work is available locally at the prevailing wage rates.
 - 2.2.1 Notification to Workers. Contractor shall post the prevailing wage schedule in a place conspicuous to all workers on the Project Site and shall notify each worker, in writing, of the following as they commence work on the Contract: the worker's job classification, the established minimum wage rate requirement for that classification, as well as the worker's actual wage. The notice must be delivered to and signed in acknowledgement of receipt by the worker and must list both the wages and fringe benefits to be paid or furnished for each classification in which the worker is assigned duties. When requested by Owner, Contractor shall furnish evidence of compliance with the Texas Prevailing Wage Law and the addresses of all workers.
 - 2.2.1.1 Contractor shall submit a copy of each worker's wage-rate notification to ODR with the application for progress payment for the period during which the worker was engaged in activities on behalf of the Project.
 - 2.2.1.2 The prevailing wage schedule is determined by Owner in compliance with Tex. Gov't Code, Chapter 2258. Should Contractor at any time become aware that a particular skill or trade not reflected on Owner's prevailing wage schedule will be or is being employed in the Work, whether by Contractor or by Subcontractor, Contractor shall promptly inform ODR of the proposed wage to be paid for the skill along with a justification for same and ODR shall promptly concur with or reject the proposed wage and classification. Contractor is responsible for determining the most appropriate wage for a particular skill in relation to similar skills or trades identified on the prevailing wage schedule. In no case, shall any worker be paid less than the wage indicated for laborers.
 - 2.2.2 Penalty for Violation. Contractor, and any Subcontractor, will pay to the State a penalty of

sixty dollars (\$60) for each worker employed for each day, or portion thereof, that the worker is paid less than the wage rates stipulated in the prevailing wage schedule.

2.2.3 Complaints of Violations.

2.2.3.1 Owner's Determination of Good Cause. Upon receipt of information concerning a violation, Owner will conduct an investigation in accordance with Tex. Gov't Code, Chapter 2258 and make an initial determination as to whether good cause exists that a violation occurred. Upon making a good cause finding, Owner will retain the full amounts claimed by the claimant or claimants as the difference between wages paid and wages due under the prevailing wage schedule and any supplements thereto, together with the applicable penalties, such amounts being subtracted from successive progress payments pending a final decision on the violation.

2.2.3.2 No Extension of Time. If Owner's determination proves valid that good cause existed to believe a violation had occurred, Contractor is not entitled to an extension of time for any delay arising directly or indirectly from the arbitration procedures.

2.3 Venue for Suits. The venue for any suit arising from the Contract will be in a court of competent jurisdiction in Travis County, Texas, or as may otherwise be designated in the Owner's Special Conditions.

2.4 Licensing of Trades. Contractor shall comply with all applicable provisions of State law related to license requirements for skilled tradesmen, contractors, suppliers and or laborers, as necessary to accomplish the Work. In the event Contractor, or one of its Subcontractors, loses its license during the term of performance of the Contract, Contractor shall promptly hire or contract with a licensed provider of the service at no additional cost to Owner.

2.5 Royalties, Patents, and Copyrights. Contractor shall pay all royalties and license fees, defend suits or claims for infringement of copyrights and patent rights, and shall hold Owner harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by Owner or A/E. However, if Contractor has reason to believe that the required design, process, or product is an infringement of a copyright or a patent, Contractor shall be responsible for such loss unless such information is promptly furnished to A/E.

2.6 State Sales and Use Taxes. Owner qualifies for exemption from certain State and local sales and use taxes pursuant to the provisions of Tex. Tax Code, Chapter 151. Upon request from Contractor, Owner shall furnish evidence of tax exempt status. Contractor may claim exemption from payment of certain applicable State taxes by complying with such procedures as prescribed by the State Comptroller of Public Accounts. Owner acknowledges not all items qualify for exemption. Owner is not obligated to reimburse Contractor for taxes paid on items that qualify for tax exemption.

Article 3. General Responsibilities of Owner and Contractor

3.1 Owner's General Responsibilities. Owner is the entity identified as such in the Contract and referred to throughout the Contract Documents as if singular in number.

3.1.1 Preconstruction Conference. Prior to, or concurrent with, the issuance of Notice to Proceed with construction, a conference will be convened for attendance by Owner, Contractor, A/E and appropriate Subcontractors. The purpose of the conference is to establish a working understanding among the parties as to the Work, the operational conditions at the Project Site, and general administration of the Project. Topics include communications, schedules,

procedures for handling Shop Drawings and other submittals, processing Applications for Payment, maintaining required records and all other matters of importance to the administration of the Project and effective communications between the Project team members.

- 3.1.2 Owner's Designated Representative. Prior to the start of construction, Owner will identify Owner's Designated Representative (ODR), who has the express authority to act and bind Owner to the extent and for the purposes described in the various Articles of the Contract, including responsibilities for general administration of the Contract.
 - 3.1.2.1 Unless otherwise specifically defined elsewhere in the Contract Documents, ODR is the single point of contact between Owner and Contractor. Notice to ODR, unless otherwise noted, constitutes notice to Owner under the Contract.
 - 3.1.2.2 All directives on behalf of Owner will be conveyed to Contractor and A/E by ODR in writing.
 - 3.1.2.3 Owner will furnish or cause to be furnished, free of charge, the number of complete sets of the Drawings, Specifications, and addenda as provided in the Agreement or Owner's Special Conditions.
- 3.1.3 Owner Supplied Materials and Information.
 - 3.1.3.1 Owner will furnish to Contractor those surveys describing the physical characteristics, legal description, limitations of the Site, Site utility locations, and other information used in the preparation of the Contract Documents.
 - 3.1.3.2 Owner will provide information, equipment, or services under Owner's control to Contractor with reasonable promptness.
- 3.1.4 Availability of Lands. Owner will furnish, as indicated in the Contract, all required rights to use the lands upon which the Work occurs. This includes rights-of-way and easements for access and such other lands that are designated for use by Contractor. Contractor shall comply with all Owner identified encumbrances or restrictions specifically related to use of lands so furnished. Owner will obtain and pay for easements for permanent structures or permanent changes in existing facilities, unless otherwise required in the Contract Documents.
- 3.1.5 Limitation on Owner's Duties.
 - 3.1.5.1 Owner will not supervise, direct, control or have authority over or be responsible for Contractor's means, methods, technologies, sequences or procedures of construction or the safety precautions and programs incident thereto. Owner is not responsible for any failure of Contractor to comply with laws and regulations applicable to the Work. Owner is not responsible for the failure of Contractor to perform or furnish the Work in accordance with the Contract Documents. Except as provided in Section 2.5, Owner is not responsible for the acts or omissions of Contractor, or any of its Subcontractors, suppliers or of any other person or organization performing or furnishing any of the Work on behalf of Contractor.
 - 3.1.5.2 Owner will not take any action in contravention of a design decision made by A/E in preparation of the Contract Documents, when such actions are in conflict with statutes under which A/E is licensed for the protection of the public health and safety.
- 3.2 Role of Architect/Engineer. Unless specified otherwise in the Contract between Owner and Contractor, A/E shall provide general administration services for Owner during the construction phase

of the project. Written correspondence, requests for information, and Shop Drawings/submittals shall be directed to A/E for action. A/E has the authority to act on behalf of Owner to the extent provided in the Contract Documents, unless otherwise modified by written instrument, which will be furnished to Contractor by ODR, upon request.

3.2.1 Site Visits.

3.2.1.1 A/E will make visits to the Site at intervals as provided in the A/E's Contract with Owner, to observe the progress and the quality of the various aspects of Contractor's executed Work and report findings to Owner.

3.2.1.2 A/E has the authority to interpret Contract Documents and inspect the Work for compliance and conformance with the Contract. Except as referenced in Paragraph 3.1.5.2, Owner retains the sole authority to accept or reject Work and issue direction for correction, removal, or replacement of Work.

3.2.2 Clarifications and Interpretations. It may be determined that clarifications or interpretations of the Contract Documents are necessary. Upon direction by ODR, such clarifications or interpretations will be provided by A/E consistent with the intent of the Contract Documents. A/E will issue these clarifications with reasonable promptness to Contractor as A/E's supplemental instruction ("ASI") or similar instrument. If Contractor believes that such clarification or interpretation justifies an adjustment in the Contract Sum or the Contract Time, Contractor shall so notify Owner in accordance with the provisions of Article 11.

3.2.3 Limitations on Architect/Engineer Authority. A/E is not responsible for:

3.2.3.1 Contractor's means, methods, techniques, sequences, procedures, safety, or programs incident to the Project, nor will A/E supervise, direct, control or have authority over the same;

3.2.3.2 The failure of Contractor to comply with laws and regulations applicable to the furnishing or performing the Work;

3.2.3.3 Contractor's failure to perform or furnish the Work in accordance with the Contract Documents; or

3.2.3.4 Acts or omissions of Contractor, or of any other person or organization performing or furnishing any of the Work.

3.3 Contractor's General Responsibilities. Contractor is solely responsible for implementing the Work in full compliance with all applicable laws and the Contract Documents and shall supervise and direct the Work using the best skill and attention to assure that each element of the Work conforms to the Contract requirements. Contractor is solely responsible for all construction means, methods, techniques, safety, sequences, coordination and procedures.

Contractor shall visit the Site before commencing the Work and become familiar with local conditions such as the location, accessibility and general character of the Site and/or building.

3.3.1 Project Administration. Contractor shall provide Project administration for all Subcontractors, vendors, suppliers, and others involved in implementing the Work and shall coordinate administration efforts with those of A/E and ODR in accordance with these general conditions, Division 1 of the Specifications and other provisions of the Contract, and as outlined in the pre-construction conference.

3.3.1.1 At the request of Owner and at no additional cost, Contractor shall furnish to the ODR one copy of the current edition of the RSMeans Facilities Construction

Cost Data Book in hard copy format or digital medium as directed by the ODR.

- 3.3.2 Contractor's Management Personnel. Contractor shall employ a competent person or persons who will be present at the Project Site during the progress of the Work to supervise or oversee the work. The competent persons are subject to the approval of ODR. Contractor shall not change approved staff during the course of the project without the written approval of ODR unless the staff member leaves the employment of Contractor. Contractor shall provide additional quality control, safety and other staff as stated in the Contract Documents.
- 3.3.3 Labor. Contractor shall provide competent, suitably qualified personnel to survey, lay-out, and construct the Work as required by the Contract Documents and maintain good discipline and order at the Site at all times.
- 3.3.4 Services, Materials, and Equipment. Unless otherwise specified, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities, incidentals, and services necessary for the construction, performance, testing, start-up, inspection and completion of the Work.
- 3.3.5 Contractor General Responsibility. For Owner furnished equipment or material that will be in the care, custody, and control of Contractor, Contractor is responsible for damage or loss.
- 3.3.6 Non-Compliant Work. Should A/E and/or ODR identify Work as non-compliant with the Contract Documents, A/E and/or ODR shall communicate the finding to Contractor, and Contractor shall correct such Work at no additional cost to the Owner. The approval of Work or the failure to find non-compliant Work by either A/E or ODR does not relieve Contractor from the obligation to comply with all requirements of the Contract Documents.
- 3.3.7 Subcontractors. Contractor shall not employ any Subcontractor, supplier or other person or organization, whether initially or as a substitute, against whom Owner shall have reasonable objection. Owner will communicate such objections in writing within ten (10) days of receipt of Contractor's intent to use such Subcontractor, supplier, or other person or organization. Contractor is not required to employ any Subcontractor, supplier or other person or organization to furnish any of the work to whom Contractor has reasonable objection. Contractor shall not substitute Subcontractors without the acceptance of Owner.
- 3.3.7.1 All Subcontracts and supply contracts shall be consistent with and bind the Subcontractors and suppliers to the terms and conditions of the Contract Documents including provisions of the Contract between Contractor and Owner.
- 3.3.7.2 Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with Contractor. Require all Subcontractors, suppliers and such other persons and organizations performing or furnishing any of the Work to communicate with Owner only through Contractor. Contractor shall furnish to Owner a copy, at Owner's request, of each first-tier subcontract promptly after its execution. Contractor agrees that Owner has no obligation to review or approve the content of such contracts and that providing Owner such copies in no way relieves Contractor of any of the terms and conditions of the Contract, including, without limitation, any provisions of the Contract which require the Subcontractor to be bound to Contractor in the same manner in which Contractor is bound to Owner.
- 3.3.8 Continuing the Work. Contractor shall carry on the Work and adhere to the progress schedule during all disputes, disagreements, or alternative resolution processes with Owner. Contractor

shall not delay or postpone any Work because of pending unresolved disputes, disagreements or alternative resolution processes, except as Owner and Contractor may agree in writing.

- 3.3.9 Cleaning. Contractor shall at all times, keep the Site and the Work clean and free from accumulation of waste materials or rubbish caused by the construction activities under the Contract. Contractor shall ensure that the entire Project is thoroughly cleaned prior to requesting Substantial Completion inspection and, again, upon completion of the Project prior to the final inspection.
 - 3.3.10 Acts and Omissions of Contractor, its Subcontractors and Employees. Contractor shall be responsible for acts and omissions of his employees and all its Subcontractors, their agents and employees. Owner may, in writing, require Contractor to remove from the Project any of Contractor's or its Subcontractor's employees whom ODR finds to be careless, incompetent, unsafe, uncooperative, disruptive, or otherwise objectionable.
 - 3.3.11 Ancillary Areas. Contractor shall operate and maintain operations and associated storage areas at the site of the Work in accordance with the following:
 - 3.3.11.1 All Contractor operations, including storage of materials and employee parking upon the Site of Work, shall be confined to areas designated by Owner.
 - 3.3.11.2 Contractor may erect, at its own expense, temporary buildings that will remain its property. Contractor shall remove such buildings and associated utility service lines upon completion of the Work, unless Contractor requests and Owner provides written consent that it may abandon such buildings and utilities in place.
 - 3.3.11.3 Contractor shall use only established roadways or construct and use such temporary roadways as may be authorized by Owner. Contractor shall not allow load limits of vehicles to exceed the limits prescribed by appropriate regulations or law. Contractor shall provide protection to road surfaces, curbs, sidewalks, trees, shrubbery, sprinkler systems, drainage structures and other like existing improvements to prevent damage and repair any damage thereto at the expense of Contractor.
 - 3.3.11.4 Owner may restrict Contractor's entry to the Site to specifically assigned entrances and routes.
 - 3.3.12 Separate Contracts. Owner reserves the right to award other contracts in connection with the Project under the same or substantially similar contract terms, including those portions related to insurance and waiver of subrogation. Owner reserves the right to perform operations related to the Project with Owner's own forces.
 - 3.3.13 Under a system of separate contracts, the conditions described herein continue to apply except as may be amended by change order.
 - 3.3.14 Contractor shall cooperate with other contractors or forces employed on the Project by Owner, including providing access to Site, integration of activities within Contractor's Work Progress Schedule and Project information as requested.
 - 3.3.15 Owner shall be reimbursed by Contractor for costs incurred by Owner which are payable to a separate contractor because of delays, improperly timed activities, or defective construction by Contractor. Owner will equitably adjust the Contract by Change Order for costs incurred by Contractor because of delays, improperly timed activities, damage to the Work or defective construction by a separate contractor.
- 3.4 Indemnification of Owner.

- 3.4.1 Contractor covenants and agrees to **FULLY INDEMNIFY and HOLD HARMLESS**, Owner and the elected and appointed officials, employees, officers, directors, volunteers, and representatives of Owner, individually or collectively, from and against any and all costs, claims, liens, damages, losses, expenses, fees, fines, penalties, proceedings, actions, demands, causes of action, liability and suits of any kind and nature, including but not limited to, personal or bodily injury, death or property damage, made upon Owner directly or indirectly arising out of, resulting from or related to Contractor's activities under this Contract, including any acts or omissions of Contractor, or any agent, officer, director, representative, employee, consultant or the Subcontractor of Contractor, and their respective officers, agents, employees, directors and representatives while in the exercise of performance of the rights or duties under this Contract. The indemnity provided for in this paragraph does not apply to any liability resulting from the negligence of the Owner, its officers or employees, separate contractors or assigned contractors, in instances where such negligence causes personal injury, death or property damage. **IN THE EVENT CONTRACTOR AND OWNER ARE FOUND JOINTLY LIABLE BY A COURT OF COMPETENT JURISDICTION, LIABILITY WILL BE APPORTIONED COMPARATIVELY IN ACCORDANCE WITH THE LAWS OF THE STATE OF TEXAS, WITHOUT WAIVING ANY GOVERNMENTAL IMMUNITY AVAILABLE TO THE STATE UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW.**
- 3.4.2 Contractor shall protect and indemnify the Owner from and against all claims, damages, judgments and losses arising from infringement or alleged infringement of any United States patent, or copyright that arise out of any of the work performed by the Contractor or the use by Contractor, or by Owner at the direction of Contractor, of any article or material. Upon becoming aware of a suit or threat of suit for patent or copyright infringement, Owner shall promptly notify Contractor and Contractor shall be given full opportunity to negotiate a settlement. Contractor does not warrant against infringement by reason of Owner's or Project Architect's design of articles or their use in combination with other materials or in the operation of any process. In the event of litigation, Owner agrees to cooperate reasonably with Contractor and parties shall be entitled, in connection with any such litigation, to be represented by counsel at their own expense.
- 3.4.3 The provisions of this indemnification are solely for the benefit of the parties hereto and not intended to create or grant any rights, contractual or otherwise, to any other person or entity.
- 3.4.4 Contractor shall promptly advise Owner in writing of any claim or demand against Owner or against Contractor which involves Owner and known to Contractor and related to or arising out of Contractor's activities under this Contract.
- 3.4.5 These indemnity provisions shall survive the termination of this Agreement regardless of the reason for termination.

Article 4. Historically Underutilized Business (HUB) Subcontracting Plan

- 4.1 General Description. The purpose of the Historically Underutilized Business (HUB) program is to promote equal business opportunities for economically disadvantaged persons (as defined by Tex. Gov't Code, Chapter 2161) to contract with the State of Texas in accordance with the goals specified in the State of Texas Disparity Study. The HUB program annual procurement utilization goals are defined in 34 T.A.C. § 20.13(b).
- 4.1.1 State agencies are required by statute to make a good faith effort to assist HUBs in participating in contract awards issued by the State. 34 T.A.C. § 20.13(b) outlines the State's

policy to encourage the utilization of HUBs in State contracting opportunities through race, ethnic and gender neutral means.

- 4.1.2 A Contractor who contracts with the State in an amount of \$100,000 or greater is required to make a good faith effort to award subcontracts to HUBs in accordance with 34 T.A.C. § 20.14(a)(2)(A) by submitting a HUB subcontracting plan within twenty-four (24) hours after the bid or response is due and complying with the HUB subcontracting plan after it is accepted by Owner and during the term of the Contract.
- 4.2 Compliance with Approved HUB Subcontracting Plan. Contractor, having been awarded this Contract in part by complying with the HUB program statute and rules, hereby covenants to continue to comply with the HUB program as follows:
 - 4.2.1 Prior to adding or substituting a Subcontractor, promptly notify Owner in the event a change is required for any reason to the accepted HUB subcontracting plan.
 - 4.2.2 Conduct the good-faith effort activities required and provide Owner with necessary documentation to justify approval of a change to the approved HUB subcontracting plan.
 - 4.2.3 Cooperate in the execution of a Change Order or such other approval of the change in the HUB subcontracting plans as Contractor and Owner may agree to.
 - 4.2.4 Maintain and make available to Owner upon request business records documenting compliance with the accepted HUB subcontracting plan.
 - 4.2.5 Upon receipt of payment for performance of Work, submit to Owner a compliance report, in the format required by Owner that demonstrates Contractor's performance of the HUB subcontracting plan.
 - 4.2.5.1 Progress Assessment Report (PAR): monthly compliance reports to Owner (contracting agency), verifying their compliance with the HUB subcontracting plan, including the use/expenditures they have made to Subcontractors. (The PAR is available at <http://www.window.state.tx.us/procurement/prog/hub/hub-forms/progressassessmentrpt.xls>).
 - 4.2.6 Promptly and accurately explain and provide supplemental information to Owner to assist in Owner's investigation of Contractor's good-faith effort to fulfill the HUB subcontracting plan and the requirements under 34 T.A.C. § 20.14(a)(1).
- 4.3 Failure to Demonstrate Good-Faith Effort. Upon a determination by Owner that Contractor has failed to demonstrate a good-faith effort to fulfill the HUB subcontracting plan or any Contract covenant detailed above, Owner may, in addition to all other remedies available to it, report the failure to perform to the Comptroller of Public Accounts, Texas Procurement and Support Services Division, Historically Underutilized Business Program and may bar Contractor from future contracting opportunities with Owner.

Article 5. Bonds and Insurance

- 5.1 Construction Bonds. Contractor is required to tender to Owner, prior to commencing the Work, performance and payment bonds, as required by Tex. Gov't Code, Chapter 2253. On Construction Manager-at-Risk and Design-Build Projects the Owner shall require a security bond, as described in Subsection 5.1.2 below.
 - 5.1.1 Bond Requirements. Each bond shall be executed by a corporate surety or sureties authorized to do business in the State of Texas and acceptable to Owner, on Owner's form, and in compliance with the relevant provisions of the Texas Insurance Code. If any bond is for more

than ten (10) percent of the surety's capital and surplus, Owner may require certification that the company has reinsured the excess portion with one or more reinsurers authorized to do business in the State. A reinsurer may not reinsure for more than ten (10) percent of its capital and surplus. If a surety upon a bond loses its authority to do business in the State, Contractor shall, within thirty (30) days after such loss, furnish a replacement bond at no added cost to Owner.

5.1.1.1 A Performance bond is required if the Contract Sum is in excess of \$100,000. The performance bond is solely for the protection of Owner. The performance bond is to be for the Contract Sum to guarantee the faithful performance of the Work in accordance with the Contract Documents. The form of the bond shall be approved by the Office of the Attorney General of Texas. The performance bond shall be effective through Contractor's warranty period.

5.1.1.2 A Payment bond is required if the Contract price is in excess of \$25,000. The payment bond is to be for the Contract Sum and is payable to Owner solely for the protection and use of payment bond beneficiaries. The form of the bond shall be approved by the Office of the Attorney General of Texas.

5.1.2 Security Bond. The security bond provides protection to Owner if Contractor presents an acceptable guaranteed maximum price ("GMP") to Owner but is unable to deliver the required payment and performance bonds within the time period stated below.

5.1.3 When Bonds Are Due

5.1.3.1 Security bonds are due before execution of a Construction Manager-at-Risk or Design-Build Contract.

5.1.3.2 Payment and performance bonds are due before execution of a contract on competitively bid or competitively sealed proposal projects or before execution of a GMP proposal on Construction Manager-at-Risk projects or Design-Build projects.

5.1.4 Power of Attorney. Each bond shall be accompanied by a valid power of attorney (issued by the surety company and attached, signed and sealed with the corporate embossed seal, to the bond) authorizing the attorney-in-fact who signs the bond to commit the company to the terms of the bond, and stating any limit in the amount for which the attorney can issue a single bond.

5.1.5 Bond Indemnification. The process of requiring and accepting bonds and making claims thereunder shall be conducted in compliance with Tex. Gov't Code, Chapter 2253. IF FOR ANY REASON A STATUTORY PAYMENT OR PERFORMANCE BOND IS NOT HONORED BY THE SURETY, CONTRACTOR SHALL FULLY INDEMNIFY AND HOLD OWNER HARMLESS OF AND FROM ANY COSTS, LOSSES, OBLIGATIONS OR LIABILITIES IT INCURS AS A RESULT.

5.1.6 Furnishing Bond Information. Owner shall furnish certified copies of the payment bond and the related Contract to any qualified person seeking copies who complies with Tex. Gov't Code § 2253.026.

5.1.7 Claims on Payment Bonds. Claims on payment bonds must be sent directly to Contractor and his surety in accordance with Tex. Gov't Code § 2253.041. All payment bond claimants are cautioned that no lien exists on the funds unpaid to Contractor on such Contract, and that reliance on notices sent to Owner may result in loss of their rights against Contractor and/or his surety. Owner is not responsible in any manner to a claimant for collection of unpaid bills, and accepts no such responsibility because of any representation by any agent or

employee.

- 5.1.8 Payment Claims when Payment Bond not Required. The rights of Subcontractors regarding payment are governed by Tex. Prop. Code §§ 53.231 – 53.239 when the value of the Contract between Owner and Contractor is less than \$25,000.00. These provisions set out the requirements for filing a valid lien on funds unpaid to Contractor as of the time of filing the claim, actions necessary to release the lien and satisfaction of such claim.
- 5.1.9 Sureties. A surety shall be listed on the US Department of the Treasury's Listing of Approved Sureties maintained by the Bureau of Financial Management Service (FMS), www.fms.treas.gov/c570, stating companies holding Certificates of Authority as acceptable sureties on Federal bonds and acceptable reinsuring companies (FMS Circular 570).
- 5.2 Insurance Requirements. Contractor shall carry insurance in the types and amounts indicated in this Article for the duration of the Contract. The required insurance shall include coverage for Owner's property prior to construction, during construction and during the warranty period. The insurance shall be evidenced by delivery to Owner of certificates of insurance executed by the insurer or its authorized agent stating coverages, limits, expiration dates and compliance with all applicable required provisions. Upon request, Owner, and/or its agents, shall be entitled to receive without expense, copies of the policies and all endorsements. Contractor shall update all expired policies prior to submission for monthly payment. Failure to update policies shall be reason for withholding of payment until renewal is provided to Owner.
- 5.2.1 Contractor, consistent with its status as an independent contractor, shall provide and maintain all insurance coverage with the minimum amounts described below until the end of the warranty period unless otherwise stated in Owner's Insurance Specifications ~~Special Conditions~~. Failure to maintain insurance coverage, as required, is grounds for suspension of Work for cause pursuant to Article 14. The Contractor will be notified of the date on which the Builder's Risk insurance policy may be terminated by any means deemed appropriate by Owner.
- 5.2.2 Coverage shall be written on an occurrence basis by companies authorized and admitted to do business in the State of Texas and rated A-, VII or better by A.M. Best Company or similar rating company or otherwise acceptable to Owner.
- 5.2.2.1 Insurance Coverage Required.
- 5.2.2.1.1 Workers' Compensation. Insurance with limits as required by the Texas Workers' Compensation Act and Employer's Liability Insurance with limits of not less than:
- \$1,000,000 each accident;
- \$1,000,000 disease each employee ; and
- \$1,000,000 disease policy limit.
- Policies must include (a) Other States Endorsement to include TEXAS if business is domiciled outside the State of Texas, and (b) a waiver of all rights of subrogation in favor of Owner.
- 5.2.2.1.2 Commercial General Liability Insurance. including premises, operations, independent contractor's liability, products and completed operations and contractual liability, covering, but not limited to, the liability assumed under the indemnification provisions of this Contract, fully insuring Contractor's (or Subcontractor's)

liability for bodily injury (including death) and property damage with a minimum limit of:

\$1,000,000 per occurrence;

\$2,000,000 general aggregate;

\$2,000,000 products and completed operations aggregate; and

Coverage shall be on an “occurrence” basis.

The policy shall include coverage extended to apply to completed operations and explosion, collapse, and underground hazards. The policy shall include endorsement CG2503 Amendment of Aggregate Limits of Insurance (per Project) or its equivalent.

If the Work involves any activities within fifty (50) feet of any railroad, railroad protective insurance as may be required by the affected railroad, written for not less than the limits required by such railroad.

- 5.2.2.1.3 Asbestos Abatement Liability Insurance, including coverage for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos containing materials. *This requirement applies if the Work or the Project includes asbestos containing materials.

The combined single limit for bodily injury and property damage will be a minimum of \$1,000,000 per occurrence.

*Specific requirement for claims-made form: Required period of coverage will be determined by the following formula: continuous coverage for life of the Contract, plus one (1) year (to provide coverage for the warranty period), and an extended discovery period for a minimum of five (5) years which shall begin at the end of the warranty period.

Employer’s liability limits for asbestos abatement will be:

\$1,000,000 each accident;

\$1,000,000 disease each employee; and

\$1,000,000 disease policy limit.

If this Contract is for asbestos abatement only, the All-Risk Builder’s Risk or all-risk installation floater (5.2.2.1.5.e) is not required.

- 5.2.2.1.4 Business Automobile Liability Insurance, covering all owned, hired, and non-owned vehicles, with a minimum combined single limit for bodily injury (including death) and property damage of \$1,000,000 per occurrence. No aggregate shall be permitted for this type of coverage.

Such insurance is to include coverage for loading and unloading

hazards.

Contractor or any subcontractor responsible for transporting asbestos or other hazardous materials defined as asbestos shall provide pollution coverage for any vehicle hauling asbestos containing cargo. The policy must include a MCS 90 endorsement with a \$5,000,000 limit and the CA 9948 Pollution Endorsement, or its equivalent.

- 5.2.2.1.5 All-Risk Builder's Risk Insurance, if applicable (or all-risk installation floater for instances in which the project involves solely the installation of material and/or equipment). Coverage is determined by the Contract Sum, as detailed, below.

BUILDERS RISK REQUIREMENT FOR PROJECTS WITH A CONTRACT SUM <\$20 MILLION

- 5.2.2.1.5.1 Contractor shall purchase and maintain in force builders risk insurance on the entire Work. Such insurance shall be written in the amount of the original contract, plus any subsequent change orders and plus the cost of materials supplied or installed by others, comprising Total Value for the entire Project at the site. The insurance shall apply on a replacement cost basis with no coinsurance provision. A sublimit may be applicable to flood coverage, but sublimit must be at least 20% of the Total Value of the Project. The limit for all other perils, including Named Windstorm, Wind, and Hail, must be equal to the Total Value for the entire Project at the site. (If Installation Floater, limit shall be equal to 100 percent of the contract cost.)
- 5.2.2.1.5.2 This insurance shall name as insureds the Owner, the Contractor, and all subcontractors and sub-subcontractors in the Work.
- 5.2.2.1.5.3 Builders risk insurance shall be on an "all risk" or equivalent policy form and shall include, without limitation, insurance against fire and extended coverage perils, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, boiler and machinery/mechanical breakdown, testing and startup, and terrorism.
- 5.2.2.1.5.4 This insurance shall cover the entire work at the site as required in 5.2.2.1.5.1, including, but not limited to, the following:
- Temporary works including but not limited to scaffolding, form work, fences, shoring, hoarding, falsework and temporary buildings
 - Offsite Storage
 - Portions of the work in transit
 - Debris removal
 - Extra Expense
 - Expediting Expenses
 - Demolition and Increased Cost of Construction
 - Pollutant Clean-Up and Removal
 - Trees, Shrubs, Plants, Lawns and Landscaping (if applicable)
 - Errors & Omissions (applicable to purchase of Builders Risk policy only)
- 5.2.2.1.5.5 This insurance shall not contain an occupancy clause suspending or reducing coverage should the Owner occupy, or begin beneficial occupancy before the Owner has accepted final completion.
- 5.2.2.1.5.6 This insurance shall be specific as to coverage and shall be primary to any permanent insurance or self-insurance that may be maintained on the property by Owner.
- 5.2.2.1.5.7 This insurance shall include a waiver of subrogation in favor of Owner, the Contractor, and all subcontractors and sub-subcontractors in the work.

- 5.2.2.1.5.8 As applicable, Flood deductible shall not exceed \$250,000 for Zone A, \$100,000 for Zone B and \$50,000 for all other Zones. For Tier 1 and Tier 2, Named Windstorm deductible shall not exceed 2% of the project values in place at the time of the loss.
- 5.2.2.1.5.9 Before the commencement of the work, Contractor shall provide to Owner an accurate certificate of insurance that provides specific evidence of all requirements outlined in Section 5.2.2.1.5. A copy of the policy itself shall be provided to Owner within 30 days after Notice to Proceed.
- 5.2.2.1.5.10 Refer to Owner's Insurance Specifications ~~Special Conditions~~ for possible additional Builders Risk insurance requirements.

BUILDERS RISK REQUIREMENT FOR PROJECTS WITH A CONTRACT SUM ≥ \$20 MILLION

- 5.2.2.1.5.1 Contractor shall purchase and maintain in force builders risk insurance on the entire Work. Such insurance shall be written in the amount of the original contract, plus any subsequent change orders and plus the cost of materials supplied or installed by others, comprising Total Value for the entire Project at the site. The insurance shall apply on a replacement cost basis with no coinsurance provision and shall include a margin clause of plus/minus 10% on project value. A sublimit may be applicable to flood coverage, but sublimit must be at least 20% of the Total Value of the Project. A sublimit of \$50 million or the Total Value of the Project, whichever is less, is acceptable for Earthquake. The limit for all other perils, including Named Windstorm, Wind, and Hail, must be equal to the Total Value for the entire Project at the site. (If Installation Floater, limit shall be equal to 100 percent of the contract cost.)
- 5.2.2.1.5.2 This insurance shall name as insureds the Owner, the Contractor, and all subcontractors and sub-subcontractors in the Work.
- 5.2.2.1.5.3 Builders risk insurance shall be on an "all risk" or equivalent policy form and shall include, without limitation, insurance against fire and extended coverage perils, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, boiler and machinery/mechanical breakdown, testing and startup, and terrorism.
- 5.2.2.1.5.4 This insurance shall cover the entire work at the site as required in 5.2.2.1.5.1, including, but not limited to, the following:

Coverage	Minimum Limit Required
Temporary works including but not limited to scaffolding, form work, fences, shoring, hoarding, falsework and temporary buildings	\$1 million
Offsite Storage	Sufficient to cover the anticipated maximum values stored offsite
Portions of the work in Transit	Sufficient to cover the anticipated maximum values in transit
Debris Removal	25% of Physical damage amount subject to maximum of \$5 million or 25% of Total Value of Project whichever is higher
Expediting Expenses	\$1 million
Extra Expense	\$5 million
Demolition and Increased Cost of Construction	\$2 million or 10% of Total Value of Project whichever is higher
Pollutant Clean-Up and Removal	\$250,000
Trees, Shrubs, Plants, Lawns and Landscaping (if applicable)	\$2,500 per item subject to a maximum of \$1 million
Errors & Omissions (applicable to purchase of Builders Risk policy only)	\$2.5 million

- 5.2.2.1.5.5 This insurance shall not contain an occupancy clause suspending or reducing coverage should the Owner occupy, or begin beneficial occupancy before the Owner has accepted final completion.
- 5.2.2.1.5.6 This insurance shall be specific as to coverage and shall be primary to any permanent insurance or self-insurance that may be maintained on the property by Owner.
- 5.2.2.1.5.7 This insurance shall include a waiver of subrogation in favor of Owner, the Contractor, and all subcontractors and sub-subcontractors in the work.
- 5.2.2.1.5.8 As applicable, Flood deductible shall not exceed \$250,000 for Zone A, \$100,000 for Zone B and \$50,000 for all other Zones. For Tier 1 and Tier 2, Named Windstorm deductible shall not exceed 2% of the project values in place at the time of the loss.
- 5.2.2.1.5.9 Before the commencement of the work, Contractor shall provide to Owner an accurate certificate of insurance that provides specific evidence of all requirements outlined in Section 5.2.2.1.5. A copy of the policy itself shall be provided to Owner within 30 days after Notice to Proceed.
- 5.2.2.1.5.10 Refer to Owner's Insurance Specifications ~~Special Conditions~~ for possible additional Builders Risk insurance requirements.

5.2.2.1.6 "Umbrella" Liability Insurance. On Projects that are not insured under the Owner's Rolling Revolving Owner Controlled Insurance Program (ROCIP) or any project requiring demolition services, Contractor shall obtain, pay for and maintain umbrella liability insurance during the Contract term, insuring Contractor (or Subcontractor) that provides coverage at least as broad as and applies in excess and follows form of the primary liability coverages required above. The policy shall provide "drop down" coverage where underlying primary insurance coverage limits are insufficient or exhausted.

5.2.2.1.7 "Umbrella" Liability Insurance coverage shall be in the following amounts:

- If Contract sum is \$1,000,000 or less:
No Umbrella Required
- If Contract Sum is greater than \$1,000,000 up to \$3,000,000:
\$1,000,000 each occurrence and \$2,000,000 annual aggregate
- If Contract Sum is greater than \$3,000,000 up to \$5,000,000:
\$5,000,000 each occurrence and \$5,000,000 annual aggregate
- If Contract Sum is greater than \$5,000,000:
\$10,000,000 each occurrence and \$10,000,000 annual aggregate

5.2.3 All Policies must include the following clauses, as applicable:

- 5.2.3.1 Contractor must provide to Owner immediate notice of cancellation, material change, or non-renewal to any insurance coverages required herein above. This requirement may be satisfied by the Contractor providing a copy of the notice received by the insurer to Owner within two business days of date of receipt or by Endorsement of the policies that require Insurer to provide notice to Owner.
- 5.2.3.2 It is agreed that Contractor's insurance shall be deemed primary with respect to any insurance or self insurance carried by Owner for liability arising out of operations under the Contract with Owner.
- 5.2.3.3 Owner, its officials, directors, employees, representatives, and volunteers are

added as additional insureds as respects operations and activities of, or on behalf of the named insured performed under Contract with Owner. The additional insured status must cover completed operations as well. This is not applicable to workers' compensation policies.

5.2.3.4 A waiver of subrogation in favor of Owner shall be provided in all policies.

5.2.3.5 If Owner is damaged by the failure of Contractor (or Subcontractor) to maintain insurance as required herein and/or as further described in Owner's Insurance Specifications ~~Special Conditions~~, then Contractor shall bear all reasonable costs properly attributable to that failure.

5.2.4 Without limiting any of the other obligations or liabilities of Contractor, Contractor shall require each Subcontractor performing work under the Contract, at Subcontractor's own expense, to maintain during the term of the Contract, the same stipulated minimum insurance including the required provisions and additional policy conditions as shown above. As an alternative, Contractor may include its Subcontractors as additional insureds on its own coverage as prescribed under these requirements. Contractor's certificate of insurance shall note in such event that Subcontractors are included as additional insureds and that Contractor agrees to provide workers' compensation for Subcontractors and their employees. Contractor shall obtain and monitor the certificates of insurance from each Subcontractor in order to assure compliance with the insurance requirements. Contractor must retain the certificates of insurance for the duration of the Contract plus five (5) years and shall have the responsibility of enforcing these insurance requirements among its Subcontractors. Owner shall be entitled, upon request and without expense, to receive copies of these certificates.

5.2.5 Workers' compensation insurance coverage must meet the statutory requirements of Tex. Lab. Code § 401.011(44) and specific to construction projects for public entities as required by Tex. Lab. Code § 406.096.

5.2.5.1 Definitions:

5.2.5.1.1 Certificate of coverage ("certificate")- A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a coverage agreement (DWC-81, DWC-82, DWC-83, or DWC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.

5.2.5.1.2 Duration of the project - includes the time from the beginning of the work on the project until the contractor's/person's work on the project has been completed and accepted by the governmental entity.

5.2.5.1.3 Persons providing services on the project ("subcontractor" in §406.096) – includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the project. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

5.2.5.2 The contractor shall provide coverage, based on proper reporting of classification codes

and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all employees of the contractor providing services on the project, for the duration of the project.

- 5.2.5.3 The Contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.
- 5.2.5.4 If the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project, the contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended.
- 5.2.5.5 The contractor shall obtain from each person providing services on a project, and provide to the governmental entity:
- (1) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project; and
 - (2) no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.
- 5.2.5.6 The contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.
- 5.2.5.7 The contractor shall notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project.
- 5.2.5.8 The contractor shall post on each project site a notice, in the text, form and manner prescribed by the Texas Department of Insurance Division of Workers' Compensation, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.
- 5.2.5.9 The contractor shall contractually require each person with whom it contracts to provide services on a project, to:
- (1) provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all of its employees providing services on the project, for the duration of the project;
 - (2) provide to the contractor, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the project, for the duration of the project;
 - (3) provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;
 - (4) obtain from each other person with whom it contracts, and provide to the contractor:
 - (a) a certificate of coverage, prior to the other person beginning work on the project; and

- (b) a new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;
 - (5) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;
 - (6) notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and
 - (7) contractually require each person with whom it contracts, to perform as required by paragraphs (1) - (7), with the certificates of coverage to be provided to the person for whom they are providing services.
- 5.2.5.10 By signing this contract or providing or causing to be provided a certificate of coverage, the contractor is representing to the governmental entity that all employees of the contractor who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.
- 5.2.5.11 The contractor's failure to comply with any of these provisions is a breach of contract by the contractor which entitles the governmental entity to declare the contract void if the contractor does not remedy the breach within ten days after receipt of notice of breach from the governmental entity.

Article 6. Construction Documents, Coordination Documents, and Record Documents

6.1 Drawings and Specifications.

- 6.1.1 Copies Furnished. Contractor will be furnished, free of charge, the number of complete sets of the Drawings, Specifications, and addenda as provided in the Agreement or the Owner's Special Conditions. Additional complete sets of Drawings and Specifications, if requested, will be furnished at reproduction cost to the entity requesting such additional sets. Electronic copies of such documents will be provided to Contractor without charge.
- 6.1.2 Ownership of Drawings and Specifications. All Drawings, Specifications and copies thereof furnished by A/E are to remain A/E's property. These documents are not to be used on any other project, and with the exception of the Contract record set and electronic versions needed for warranty operations, are to be returned to the A/E, upon request, following completion of the Work.
- 6.1.3 Interrelation of Documents. The Contract Documents as referenced in the Contract between Owner and Contractor are complementary, and what is required by one shall be as binding as if required by all.
- 6.1.4 Resolution of Conflicts in Documents. Where conflicts may exist within the Contract Documents, the documents shall govern in the following order: (a) Change Orders, addenda, and written amendments to the Contract; (b) the Contract; (c) Owner's Special Conditions (d) Drawings; (e) Specifications (but Specifications shall control over Drawings as to quality of

materials and installation); and f) other Contract Documents. Among other categories of documents having the same order of precedence, the term or provision that includes the latest date shall control. Contractor shall notify A/E and ODR for resolution of the issue prior to executing the Work in question.

6.1.5 Contractor's Duty to Review Contract Documents. In order to facilitate its responsibilities for completion of the Work in accordance with and as reasonably inferable from the Contract Documents, prior to commencing the Work, Contractor shall examine and compare the Contract Documents, information furnished by Owner, relevant field measurements made by Contractor and any visible or reasonably anticipated conditions at the Site affecting the Work. This duty extends throughout the construction phase prior to commencing each particular work activity and/or system installation.

6.1.6 Discrepancies and Omissions in Drawings and Specifications.

6.1.6.1 Promptly report to ODR and to A/E the discovery of any apparent error, omission or inconsistency in the Contract Documents prior to execution of the Work.

6.1.6.2 It is recognized that Contractor is not acting in the capacity of a licensed design professional, unless it is performing as a Design-Build firm.

6.1.6.3 It is further recognized that Contractor's examination of Contract Documents is to facilitate construction and does not create an affirmative responsibility to detect errors, omissions or inconsistencies or to ascertain compliance with applicable laws, building codes or regulations, unless it is performing as a Design-Build firm or a Construction Manager-at-Risk.

6.1.6.4 When performing as a Design-Build firm, Contractor has sole responsibility for discrepancies, errors, and omissions in the Drawings and Specifications.

6.1.6.5 When performing as a Construction Manager-at-Risk, Contractor has a shared responsibility with A/E for discovery and resolution of discrepancies, errors, and omissions in the Contract Documents. In such case, Contractor's responsibility pertains to review, coordination, and recommendation of resolution strategies within budget constraints.

6.1.6.6 Contractor has no liability for errors, omissions, or inconsistencies unless Contractor knowingly failed to report a recognized problem to Owner or the Work is executed under a Design-Build or Construction Manager-at-Risk Contract as outlined above. Should Contractor fail to perform the examination and reporting obligations of these provisions, Contractor is responsible for avoidable costs and direct and/or consequential damages.

6.1.6.7 Owner does not warrant or make any representations as to the accuracy, suitability or completeness of any information furnished to Contractor by Owner or its representatives.

6.2 Requirements for Record Documents. Contractor shall:

6.2.1 Maintain at the Site one copy of all Drawings, Specifications, addenda, approved submittals, Contract modifications, and all Project correspondence. Keep current and maintain Drawings and Specifications in good order with postings and markings to record actual conditions of Work and show and reference all changes made during construction. Provide Owner and A/E access to these documents.

6.2.2 Maintain the Record Documents which reflect the actual field conditions and representations

of the Work performed, whether it be directed by addendum, Change Order or otherwise. Make available the Record Documents and all records prescribed herein for reference and examination by Owner and its representatives and agents.

- 6.2.3 Update the Record Documents at least monthly prior to submission of periodic partial pay estimates. Failure to maintain current Record Documents constitutes cause for denial of a progress payment otherwise due.
- 6.2.4 Prior to requesting Substantial Completion inspection Contractor shall furnish a copy of its marked-up Record Documents and a preliminary copy of each instructional manual, maintenance and operating manual, parts catalog, wiring diagrams, spare parts, specified written warranties and like publications, or parts for all installed equipment, systems, and like items and as described in the Contract Documents.
- 6.2.5 Once determined acceptable by ODR with input from A/E, provide one (1) reproducible copy and one (1) electronic media copy in a format acceptable to the ODR of all Record Documents, unless otherwise required by the Owner's Special Conditions.
- 6.2.6 Contractor shall be responsible for updating the Record Documents for all Contractor initiated documents and changes to the Contract Documents due to coordination and actual field conditions, including RFIs.
- 6.2.7 A/E shall be responsible for updating the Record Documents for any addenda, Change Orders, A/E supplemental instructions and any other alterations to the Contract Documents generated by A/E or Owner.

Article 7. Construction Safety

- 7.1 General. It is the duty and responsibility of Contractor and all of its Subcontractors to be familiar with, enforce and comply with all requirements of Public Law No. 91-596, 29 U.S.C. § 651 et. seq., the Occupational Safety and Health Act of 1970, (OSHA) and all amendments thereto. Contractor shall prepare a safety plan specific to the Project and submit it to ODR and A/E prior to commencing Work. In addition, Contractor and all of its Subcontractors shall comply with all applicable laws and regulations of any public body having jurisdiction for safety of persons or property to protect them from damage, injury or loss and erect and maintain all necessary safeguards for such safety and protection.
- 7.2 Notices. Contractor shall provide notices as follows:
 - 7.2.1 Notify owners of adjacent property including those that own or operate utility services and/or underground facilities, and utility owners, when prosecution of the Work may affect them or their facilities, and cooperate with them in the protection, removal, relocation and replacement, and access to their facilities and/or utilities.
 - 7.2.2 Coordinate the exchange of material safety data sheets (MSDSs) or other hazard communication information required to be made available to or exchanged between or among employers at the site in connection with laws and regulations. Maintain a complete file of MSDSs for all materials in use on site throughout the construction phase and make such file available to Owner and its agents as requested.
- 7.3 Emergencies. In any emergency affecting the safety of persons or property, Contractor shall act to minimize, mitigate, and prevent threatened damage, injury or loss.
 - 7.3.1 Have authorized agents of Contractor respond immediately upon call at any time of day or night when circumstances warrant the presence of Contractor to protect the Work or adjacent

- property from damage or to take such action pertaining to the Work as may be necessary to provide for the safety of the public.
- 7.3.2 Give ODR and A/E prompt notice of all such events.
- 7.3.3 If Contractor believes that any changes in the Work or variations from Contract Documents have been caused by its emergency response, promptly notify Owner within seventy-two (72) hours of the emergency response event.
- 7.3.4 Should Contractor fail to respond, Owner is authorized to direct other forces to take action as necessary and Owner may deduct any cost of remedial action from funds otherwise due Contractor.
- 7.4 Injuries. In the event of an incident or accident involving outside medical care for an individual on or near the Work, Contractor shall notify ODR and other parties as may be directed promptly, but no later than twenty-four (24) hours after Contractor learns that an event required medical care.
- 7.4.1 Record the location of the event and the circumstances surrounding it, by using photography or other means, and gather witness statements and other documentation which describes the event.
- 7.4.2 Supply ODR and A/E with an incident report no later than thirty-six (36) hours after the occurrence of the event. In the event of a catastrophic incident (one (1) fatality or three (3) workers hospitalized), barricade and leave intact the scene of the incident until all investigations are complete. A full set of incident investigation documents, including facts, finding of cause, and remedial plans shall be provided within one (1) week after occurrence, unless otherwise directed by legal counsel. Contractor shall provide ODR with written notification within one week of such catastrophic event if legal counsel delays submission of full report.
- 7.5 Environmental Safety. Upon encountering any previously unknown potentially hazardous material, or other materials potentially contaminated by hazardous material, Contractor shall immediately stop work activities impacted by the discovery, secure the affected area, and notify ODR immediately.
- 7.5.1 Bind all Subcontractors to the same duty.
- 7.5.2 Upon receiving such notice, ODR will promptly engage qualified experts to make such investigations and conduct such tests as may be reasonably necessary to determine the existence or extent of any environmental hazard. Upon completion of this investigation, ODR will issue a written report to Contractor identifying the material(s) found and indicate any necessary steps to be taken to treat, handle, transport or dispose of the material.
- 7.5.3 Owner may hire third-party contractors to perform any or all such steps.
- 7.5.4 Should compliance with ODR's instructions result in an increase in Contractor's cost of performance, or delay the Work, Owner will make an equitable adjustment to the Contract Sum and/or the time of completion, and modify the Contract in writing accordingly.
- 7.6 Trenching Plan. When the project requires excavation which either exceeds a depth of four (4) feet, or results in any worker's upper body being positioned below grade level, Contractor is required to submit a trenching plan to ODR prior to commencing trenching operations unless an engineered plan is part of the Contract Documents. The plan is required to be prepared and sealed by a professional engineer registered in the State of Texas, and hired or employed by Contractor or Subcontractor to perform the work. Said engineer cannot be anyone who is otherwise either directly or indirectly engaged on this project.

Article 8. Quality Control

- 8.1 Materials & Workmanship. Contractor shall execute Work in a good and workmanlike matter in accordance with the Contract Documents. Contractor shall develop and provide a quality control plan specific to this Project and acceptable to Owner. Where Contract Documents do not specify quality standards, complete and construct all Work in compliance with generally accepted construction industry standards. Unless otherwise specified, incorporate all new materials and equipment into the Work under the Contract.
- 8.2 Testing.
- 8.2.1 Owner is responsible for coordinating and paying for routine and special tests required to confirm compliance with quality and performance requirements, except as stated below or otherwise required by the Contract Documents.
- 8.2.2 Contractor shall provide the following testing as well as any other testing required of Contractor by the Specifications:
- 8.2. 2.1 Any test of basic material or fabricated equipment included as part of a submittal for a required item in order to establish compliance with the Contract Documents.
- 8.2. 2.2 Any test of basic material or fabricated equipment offered as a substitute for a specified item on which a test may be required in order to establish compliance with the Contract Documents.
- 8.2. 2.3 Preliminary, start-up, pre-functional and operational testing of building equipment and systems as necessary to confirm operational compliance with requirements of the Contract Documents.
- 8.2. 2.4 All subsequent tests on original or replaced materials conducted as a result of prior testing failure.
- 8.2. 3 All testing shall be performed in accordance with standard test procedures by an accredited laboratory, or special consultant as appropriate, acceptable to Owner. Results of all tests shall be provided promptly to ODR, A/E, and Contractor.
- 8.2. 4 Non-Compliance (Test Results). Should any of the tests indicate that a material and/or system does not comply with the Contract requirements, the burden of proof remains with Contractor, subject to:
- 8.2. 4.1 Contractor selection and submission of the laboratory for Owner acceptance.
- 8.2. 4.2 Acceptance by Owner of the quality and nature of tests.
- 8.2. 4.3 All tests taken in the presence of A/E and/or ODR, or their representatives.
- 8.2. 4.4 If tests confirm that the material/systems comply with Contract Documents, Owner will pay the cost of the test.
- 8.2. 4.5 If tests reveal noncompliance, Contractor will pay those laboratory fees and costs of that particular test and all future tests, of that failing Work, necessary to eventually confirm compliance with Contract Documents.
- 8.2. 4.6 Proof of noncompliance with the Contract Documents will make Contractor liable for any corrective action which ODR determines appropriate, including complete

removal and replacement of non-compliant work or material.

- 8.2.5 Notice of Testing. Contractor shall give ODR and A/E timely notice of its readiness and the date arranged so ODR and A/E may observe such inspection, testing, or approval.
- 8.2.6 Test Samples. Contractor is responsible for providing Samples of sufficient size for test purposes and for coordinating such tests with their Work Progress Schedule to avoid delay.
- 8.2.7 Covering Up Work. If Contractor covers up any Work without providing Owner an opportunity to inspect, Contractor shall, if requested by ODR, uncover and recover the work at Contractor's expense.
- 8.3 Submittals.
- 8.3.1 Contractor's Submittals. Contractor shall submit with reasonable promptness consistent with the Project schedule and in orderly sequence all Shop Drawings, Samples, or other information required by the Contract Documents, or subsequently required by Change Order. Prior to submitting, Contractor shall review each submittal for general compliance with Contract Documents and approve submittals for review by A/E and Owner by an approval stamp affixed to each copy. Submittal data presented without Contractor's stamp of approval will be returned without review or comment. Any delay resulting from Contractor's failure to certify approval of the Submittal is Contractor's responsibility.
- 8.3.1.1 Contractor shall within twenty-one (21) days of the effective date of the Notice To Proceed with construction, submit to ODR and A/E, a submittal schedule/register, organized by specification section, listing all items to be furnished for review and approval by A/E and Owner. The list shall include Shop Drawings, manufacturer's literature, certificates of compliance, materials Samples, materials colors, guarantees, and all other items identified throughout the Specifications.
- 8.3.1.2 Contractor shall indicate the type of item, Contract requirements reference, and Contractor's scheduled dates for submitting the item along with the requested dates for approval answers from A/E and Owner. The submittal register shall indicate the projected dates for procurement of all included items and shall be updated at least monthly with actual approval and procurement dates. Contractor's Submittal Register must be reasonable in terms of the review time for complex submittals. Contractor's submittal schedule must be consistent with the Work Progress Schedule and identify critical submittals. Show and allow a minimum of fifteen (15) days duration after receipt by A/E and ODR for review and approval. If re-submittal required, allow a minimum of an additional fifteen (15) days for review. Submit the updated Submittal Register with each request for progress payment. Owner may establish routine review procedures and schedules for submittals at the preconstruction conference and/or elsewhere in the Contract Documents. If Contractor fails to update and provide the Submittal Register as required, Owner may, after seven (7) days notice to Contractor withhold a reasonable sum of money that would otherwise be due Contractor.
- 8.3.1.3 Contractor shall coordinate the Submittal Register with the Work Progress Schedule. Do not schedule Work requiring a submittal to begin prior to scheduling review and approval of the related submittal. Revise and/or update both schedules monthly to ensure consistency and current project data. Provide to ODR the updated Submittal Register and schedule with each application for progress payment. Refer to requirements for the Work Progress Schedule for inclusion of procurement activities therein. Regardless, the Submittal Register shall identify dates submitted and returned and shall be used to confirm status and disposition of particular items submitted, including approval or other action taken and other

information not conveniently tracked through the Work Progress Schedule.

- 8.3.1.4 By submitting Shop Drawings, Samples or other required information, Contractor represents that it has determined and verified all applicable field measurements, field construction criteria, materials, catalog numbers and similar data; and has checked and coordinated each Shop Drawing and Sample with the requirements of the Work and the Contract Documents.
- 8.3.2 Review of Submittals. A/E and ODR review is only for conformance with the design concept and the information provided in the Contract Documents. Responses to submittals will be in writing. The approval of a separate item does not indicate approval of an assembly in which the item functions. The approval of a submittal does not relieve Contractor of responsibility for any deviation from the requirements of the Contract unless Contractor informs A/E and ODR of such deviation in a clear, conspicuous, and written manner on the submittal transmittal and at the time of submission, and obtains Owner's written specific approval of the particular deviation.
- 8.3.3 Correction and Resubmission. Contractor shall make any corrections required to a submittal and resubmit the required number of corrected copies promptly so as to avoid delay, until submittal approval. Direct attention in writing to A/E and ODR, when applicable, to any new revisions other than the corrections requested on previous submissions.
- 8.3.4 Limits on Shop Drawing Review. Contractor shall not commence any Work requiring a submittal until review of the submittal under Subsection 8.3.2. Construct all such work in accordance with reviewed submittals. Comments incorporated as part of the review in Subsection 8.3.2 of Shop Drawings and Samples is not authorization to Contractor to perform extra work or changed work unless authorized through a Change Order. A/E's and ODR's review, if any, does not relieve Contractor from responsibility for defects in the Work resulting from errors or omissions of any kind on the submittal, regardless of any approval action.
- 8.3.5 No Substitutions Without Approval. ODR and A/E may receive and consider Contractor's request for substitution when Contractor agrees to reimburse Owner for review costs and satisfies the requirements of this section. If Contractor does not satisfy these conditions, ODR and A/E will return the request without action except to record noncompliance with these requirements. Owner will not consider the request if Contractor cannot provide the product or method because of failure to pursue the Work promptly or coordinate activities properly. Contractor's request for a substitution may be considered by ODR and A/E when:
 - 8.3.5.1 The Contract Documents do not require extensive revisions; and
 - 8.3.5.2 Proposed changes are in keeping with the general intent of the Contract Documents and the design intent of A/E and do not result in an increase in cost to Owner; and
 - 8.3.5.3 The request is timely, fully documented, properly submitted and one or more of the following apply:
 - 8.3.5.3.1 Contractor cannot provide the specified product, assembly or method of construction within the Contract Time;
 - 8.3.5.3.2 The request directly relates to an "or-equal" clause or similar language in the Contract Documents;
 - 8.3.5.3.3 The request directly relates to a "product design standard" or "performance standard" clause in the Contract Documents;

- 8.3.5.3.4 The requested substitution offers Owner a substantial advantage in cost, time, energy conservation or other considerations, after deducting additional responsibilities Owner must assume;
- 8.3.5.3.5 The specified product or method of construction cannot receive necessary approval by an authority having jurisdiction, and ODR can approve the requested substitution;
- 8.3.5.3.6 Contractor cannot provide the specified product, assembly or method of construction in a manner that is compatible with other materials and where Contractor certifies that the substitution will overcome the incompatibility;
- 8.3.5.3.7 Contractor cannot coordinate the specified product, assembly or method of construction with other materials and where Contractor certifies they can coordinate the proposed substitution; or
- 8.3.5.3.8 The specified product, assembly or method of construction cannot provide a warranty required by the Contract Documents and where Contractor certifies that the proposed substitution provides the required warranty.

8.3.6 Unauthorized Substitutions at Contractor's Risk. Contractor is financially responsible for any additional costs or delays resulting from unauthorized substitution of materials, equipment or fixtures other than those specified. Contractor shall reimburse Owner for any increased design or contract administration costs resulting from such unauthorized substitutions.

8.4 Field Mock-up.

- 8.4.1 Mock-ups shall be constructed prior to commencement of a specified scope of work to confirm acceptable workmanship.
 - 8.4.1.1 As a minimum, field mock-ups shall be constructed for roofing systems, exterior veneer / finish systems, glazing systems, and any other Work requiring a mock-up as identified throughout the Contract Documents. Mock-ups for systems not part of the Project scope shall not be required.
 - 8.4.1.2 Mock-ups may be incorporated into the Work if allowed by the Contract Documents and if acceptable to ODR. If mock-ups are freestanding, they shall remain in place until otherwise directed by Owner.
 - 8.4.1.3 Contractor shall include field mock-ups in their Work Progress Schedule and shall notify ODR and A/E of readiness for review sufficiently in advance to coordinate review without delay.

8.5 Inspection During Construction.

- 8.5.1 Contractor shall provide sufficient, safe, and proper facilities, including equipment as necessary for safe access, at all reasonable times for observation and/or inspection of the Work by Owner and its agents.
- 8.5.2 Contractor shall not cover up any Work with finishing materials or other building components prior to providing Owner and its agents an opportunity to perform an inspection of the Work.
 - 8.5.2.1 Should corrections of the Work be required for approval, Contractor shall not over

up corrected Work until Owner indicates approval.

- 8.5.2.2 Contractor shall provide notification of at least five (5) working days or otherwise as mutually agreed, to ODR of the anticipated need for a cover-up inspection. Should ODR fail to make the necessary inspection within the agreed period, Contractor may proceed with cover-up Work, but is not relieved of responsibility for Work to comply with requirements of the Contract Documents.

Article 9. Construction Schedules

- 9.1 Contract Time. **TIME IS AN ESSENTIAL ELEMENT OF THE CONTRACT.** The Contract Time is the time between the dates indicated in the Notice to Proceed for commencement of the Work and for achieving Substantial Completion. The Contract Time can be modified only by Change Order. Failure to achieve Substantial Completion within the Contract Time **or** as otherwise agreed to in writing will cause damage to Owner and may subject Contractor to liquidated damages as provided in the Contract Documents. If Contractor fails to achieve Final Completion in a reasonable time after Substantial Completion, Contractor shall be responsible for Owner's damages including, but not limited to, additional inspection, project management, and maintenance cost to the extent caused by Contractor's failure to achieve Final Completion.
- 9.2 Notice to Proceed. Owner will issue a Notice to Proceed which shall state the dates for beginning Work and for achieving Substantial Completion of the Work.
- 9.3 Work Progress Schedule. Refer to Owner's Special Conditions and Division 1 of the Specifications for additional schedule requirements. Unless indicated otherwise in those documents, Contractor shall submit their initial Work Progress Schedule for the Work in relation to the entire Project not later than twenty-one (21) calendar days after the effective date of the Notice to Proceed to ODR and A/E. Unless otherwise indicated in the Contract Documents, the Work Progress Schedule shall be computerized Critical Path Method (CPM) with fully editable logic. This initial schedule shall indicate the dates for starting and completing the various aspects required to complete the Work, including mobilization, procurement, installation, testing, inspection, delivery of Close-out Documents and acceptance of all the Work of the Contract. When acceptable to Owner, the initially accepted schedule shall be the Baseline Schedule for comparison to actual conditions throughout the Contract duration. Note: This article pertains to construction phase schedules. Additional requirements for design phase scheduling for Construction Manager-at-Risk and Design-Build contracts are outlined in Division 1 Project Planning and Scheduling Specifications.
- 9.3.1 Schedule Requirements. Contractor shall submit electronic and paper copy of the initial Work Progress Schedule reflecting accurate and reliable representations of the planned progress of the Work, the Work to date if any, and of Contractor's actual plans for its completion. Contractor shall organize and provide adequate detail so the schedule is capable of measuring and forecasting the effect of delaying events on completed and uncompleted activities.
- 9.3.1.1 Contractor shall re-submit initial schedule as required to address review comments from A/E and ODR until such schedule is accepted as the Baseline Schedule.
- 9.3.1.2 Submittal of a schedule, schedule revision or schedule update constitutes Contractor's representation to Owner of the accurate depiction of all progress to date and that Contractor will follow the schedule as submitted in performing the Work.
- 9.3.2 Schedule Updates. Contractor shall update the Work Progress Schedule and the Submittal Register monthly, as a minimum, to reflect progress to date and current plans for completing the Work, while maintaining original schedule as Baseline Schedule and submit paper and electronic copies of the update to A/E and ODR as directed, but as a minimum with each

request for payment. Owner has no duty to make progress payments unless accompanied by the updated Work Progress Schedule. Show the anticipated date of completion reflecting all extensions of time granted through Change Order as of the date of the update. Contractor may revise the Work Progress Schedule when in Contractor's judgment it becomes necessary for the management of the Work. Contractor shall identify all proposed changes to schedule logic to Owner and to A/E via an executive summary accompanying the updated schedule for review prior to final implementation of revisions into a revised Baseline Schedule. Schedule changes that materially impact Owner's operations shall be communicated promptly to ODR and shall not be incorporated into the revised Baseline Schedule without ODR's consent.

- 9.3.3 The Work Progress Schedule is for Contractor's use in managing the Work and submittal of the schedule, and successive updates or revisions, is for the information of Owner and to demonstrate that Contractor has complied with requirements for planning the Work. Owner's acceptance of a schedule, schedule update or revision constitutes Owner's agreement to coordinate its own activities with Contractor's activities as shown on the schedule.
 - 9.3.3.1 Acceptance of the Work Progress Schedule, or update and/or revision thereto does not indicate any approval of Contractor's proposed sequences and duration.
 - 9.3.3.2 Acceptance of a Work Progress Schedule update or revision indicating early or late completion does not constitute Owner's consent, alter the terms of the Contract, or waive either Contractor's responsibility for timely completion or Owner's right to damages for Contractor's failure to do so.
 - 9.3.3.3 Contractor's scheduled dates for completion of any activity or the entire Work do not constitute a change in terms of the Contract. Change Orders are the only method of modifying the Substantial Completion Date(s) and Contract Time.
- 9.4 Ownership of Float. Unless indicated otherwise in the Contract Documents, Contractor shall develop its schedule, pricing, and execution plan to provide a minimum of ten (10) percent total float at acceptance of the Baseline Schedule. Float time contained in the Work Progress Schedule is not for the exclusive benefit of Contractor or Owner, but belongs to the Project and may be consumed by either party. Before Contractor uses any portion of the float Contractor must submit a written request to do so to the Owner and receive Owner's written authorization to use the float. Owner's approval shall not be unreasonably withheld.
- 9.5 Completion of Work. Contractor is accountable for completing the Work within the Contract Time stated in the Contract, or as otherwise amended by Change Order.
 - 9.5.1 If, in the judgment of Owner, the work is behind schedule and the rate of placement of work is inadequate to regain scheduled progress to insure timely completion of the entire work or a separable portion thereof, Contractor, when so informed by Owner, shall immediately take action to increase the rate of work placement by:
 - 9.5.1.1 An increase in working forces.
 - 9.5.1.2 An increase in equipment or tools.
 - 9.5.1.3 An increase in hours of work or number of shifts.
 - 9.5.1.4 Expedite delivery of materials.
 - 9.5.1.5 Other action proposed if acceptable to Owner.
 - 9.5.2 Within ten (10) days after such notice from ODR, Contractor shall notify ODR in writing of the specific measures taken and/or planned to increase the rate of progress. Contractor shall

include an estimate as to the date of scheduled progress recovery and an updated Work Progress Schedule illustrating Contractor's plan for achieving timely completion of the Project. Should ODR deem the plan of action inadequate, Contractor shall take additional steps or make adjustments as necessary to its plan of action until it meets with ODR's approval.

9.6 Modification of the Contract Time.

9.6.1 Delays and extension of time as hereinafter described are valid only if executed in accordance with provisions set forth in Article 11.

9.6.2 When a delay defined herein as excusable prevents Contractor from completing the Work within the Contract Time, Contractor is entitled to an extension of time. Owner will make an equitable adjustment and extend the number of days lost because of excusable delay or Weather Days, as measured by Contractor's progress schedule. All extensions of time will be granted in calendar days. In no event, however, will an extension of time be granted for delays that merely extend the duration of non-critical activities, or which only consume float without delaying the project Substantial Completion date(s).

9.6.2.1 A "Weather Day" is a day on which Contractor's current schedule indicates Work is to be done, and on which inclement weather and related site conditions prevent Contractor from performing seven (7) hours of Work between the hours of 7:00 a.m. and 6:00 p.m. Weather days are excusable delays. When weather conditions at the site prevent work from proceeding, Contractor shall immediately notify ODR for confirmation of the conditions. At the end of each calendar month, Contractor shall submit to ODR and A/E a list of Weather Days occurring in that month along with documentation of the impact on critical activities. Based on confirmation by ODR, any time extension granted will be issued by Change Order. If Contractor and Owner cannot agree on the time extension, Owner may issue a ULCO for fair and reasonable time extension.

9.6.2.2 Excusable Delay. Contractor is entitled to an equitable adjustment of the Contract Time, issued via change order, for delays caused by the following:

9.6.2.2.1 Errors, omissions and imperfections in design, which A/E corrects by means of changes in the Drawings and Specifications.

9.6.2.2.2 Unanticipated physical conditions at the Site, which A/E corrects by means of changes to the Drawings and Specifications or for which ODR directs changes in the Work identified in the Contract Documents.

9.6.2.2.3 Changes in the Work that effect activities identified in Contractor's schedule as "critical" to completion of the entire Work, if such changes are ordered by ODR or recommended by A/E and ordered by ODR.

9.6.2.2.4 Suspension of Work for unexpected natural events (sometimes called "acts of God"), civil unrest, strikes or other events which are not within the reasonable control of Contractor.

9.6.2.2.5 Suspension of Work for convenience of ODR, which prevents Contractor from completing the Work within the Contract Time.

9.6.3 Contractor's relief in the event of such delays is the time impact to the critical path as determined by analysis of Contractor's schedule. In the event that Contractor incurs

additional direct costs because of the excusable delays other than described in Subparagraph 9.6.2.2.4 and within the reasonable control of Owner, the Contract price and Contract Time are to be equitably adjusted by Owner pursuant to the provisions of Article 11.

- 9.7 No Damages for Delay. An extension of the Contract Time shall be the sole remedy of Contractor for delays in performance of the Work, whether or not such delays are foreseeable, except for delays caused solely by acts of Owner that constitute intentional interference with Contractor's performance of the Work and then only to the extent such acts continue after Contractor notifies Owner in writing of such interference. For delays caused by any act(s) other than the sole intentional interference of Owner, Contractor shall not be entitled to any compensation or recovery of any damages including, without limitation, consequential damages, lost opportunity costs, impact damages, loss of productivity, or other similar damages. Owner's exercise of any of its rights or remedies under the Contract including, without limitation, ordering changes in the Work or directing suspension, rescheduling, or correction of the Work, shall not be construed as intentional interference with Contractor's performance of the Work regardless of the extent or frequency of Owner's exercise of such rights or remedies.
- 9.8 Concurrent Delay. When the completion of the Work is simultaneously delayed by an excusable delay and a delay arising from a cause not designated as excusable, Contractor may not be entitled to a time extension for the period of concurrent delay.
- 9.9 Other Time Extension Requests. Time extensions requested in association with changes to the Work directed or requested by Owner shall be included with Contractor's proposed costs for such change. Time extensions requested for inclement weather are covered by Paragraph 9.6.2.1 above. If Contractor believes that the completion of the Work is delayed by a circumstance other than for changes directed to the Work or weather, they shall give ODR written notice, stating the nature of the delay and the activities potentially affected, within five (5) days after the onset of the event or circumstance giving rise to the excusable delay. Contractor shall provide sufficient written evidence to document the delay. In the case of a continuing cause of delay, only one notice of claim is necessary. State claims for extensions of time in numbers of whole or half days.
- 9.9.1 Within ten (10) days after the cessation of the delay, Contractor shall formalize its request for extension of time in writing to include a full analysis of the schedule impact of the delay and substantiation of the excusable nature of the delay. All changes to the Contract Time or made as a result of such claims is by Change Order, as set forth in Article 11.
- 9.9.2 No extension of time releases Contractor or the Surety furnishing a performance or payment bond from any obligations under the Contract or such a bond. Those obligations remain in full force until the discharge of the Contract.
- 9.9.3 Contents of Time Extension Requests. Contractor shall provide with each Time Extension Request a quantitative demonstration of the impact of the delay on project completion time, based on the Work Progress Schedule. Contractor shall include with Time Extension Requests a reasonably detailed narrative setting forth:
- 9.9.3.1 The nature of the delay and its cause; the basis of Contractor's claim of entitlement to a time extension.
- 9.9.3.2 Documentation of the actual impacts of the claimed delay on the critical path indicated in Contractor's Work Progress Schedule, and any concurrent delays.
- 9.9.3.3 Description and documentation of steps taken by Contractor to mitigate the effect of the claimed delay, including, when appropriate, the modification of the Work Progress Schedule.
- 9.9.4 Owner's Response. Owner will respond to the Time Extension Request by providing to

Contractor written notice of the number of days granted, if any, and giving its reason if this number differs from the number of days requested by Contractor.

9.9.4.1 Owner will not grant time extensions for delays that do not affect the Contract Substantial Completion date.

9.9.4.2 Owner will respond to each properly submitted Time Extension Request within fifteen (15) days following receipt. If Owner cannot reasonably make a determination about Contractor's entitlement to a time extension within that time, Owner will notify Contractor in writing. Unless otherwise agreed by Contractor, Owner has no more than fifteen (15) additional days to prepare a final response. If Owner fails to respond within forty-five (45) days from the date the Time Extension Request is received, Contractor's request for a time extension shall be deemed rejected by Owner.

9.10 Failure to Complete Work Within the Contract Time. **TIME IS AN ESSENTIAL ELEMENT OF THE CONTRACT.** Contractor's failure to substantially complete the Work within the Contract Time or to achieve Substantial Completion as required will cause damage to Owner. These damages ~~shall~~ **may** be liquidated by agreement of Contractor and Owner, in the amount per day as set forth in the Contract Documents.

9.11 Liquidated Damages. Owner may collect liquidated damages due from Contractor directly or indirectly by reducing the Contract Sum in the amount of liquidated damages stated in the Agreement or the Owner's Special Conditions.

Article 10. Payments

10.1 Schedule of Values. Contractor shall submit to ODR and A/E for acceptance a Schedule of Values accurately itemizing material and labor for the various classifications of the Work based on the organization of the specification sections and of sufficient detail acceptable to ODR. The accepted Schedule of Values will be the basis for the progress payments under the Contract.

10.1.1 No progress payments will be made prior to receipt and acceptance of the Schedule of Values, provided in such detail as required by ODR, and submitted not less than twenty-one (21) days prior to the first request for payment. The Schedule of Values shall follow the order of trade divisions of the Specifications and include itemized costs for general conditions, costs for preparing ~~close-out~~ Close-Out documents, fees, contingencies, and Owner cash allowances, if applicable, so that the sum of the items will equal the Contract price. As appropriate, assign each item labor and/or material values, the subtotal thereof equaling the value of the work in place when complete.

10.1.1.1 Owner requires that the Work items be inclusive of the cost of the Work items only. Any contract markups for overhead and profit, general conditions, etc., shall be contained within separate line items for those specific purposes which shall be divided into at least two (2) lines, one (1) for labor and one (1) for materials.

10.1.2 Contractor shall retain a copy of all worksheets used in preparation of its bid or proposal, supported by a notarized statement that the worksheets are true and complete copies of the documents used to prepare the bid or proposal. Make the worksheets available to ODR at the time of Contract execution. Thereafter Contractor shall grant Owner during normal business hours access to said copy of worksheets at any time during the period commencing upon execution of the Contract and ending one year after final payment.

10.2. Progress Payments. Contractor will receive periodic progress payments for Work performed, materials in place, suitably stored on Site, or as otherwise agreed to by Owner and Contractor. Payment is not due until receipt by ODR or his designee of a correct and complete Pay Application in electronic

and/or hard copy format as set forth in the Agreement or the Owner's Special Conditions, and certified by A/E. Progress payments are made provisionally and do not constitute acceptance of work not in accordance with the Contract Documents. Owner will not process progress payment applications for Change Order Work until all parties execute the Change Order.

- 10.2.1 Preliminary Pay Worksheet. Once each month that a progress payment is to be requested, the Contractor shall submit to A/E and ODR a complete, clean copy of a preliminary pay worksheet or preliminary pay application, to include the following:
 - 10.2.1.1 Contractor's estimate of the amount of Work performed, labor furnished and materials incorporated into the Work, using the established Schedule of Values;
 - 10.2.1.2 An updated Work Progress Schedule including the executive summary and all required schedule reports;
 - 10.2.1.3 HUB subcontracting plan Progress Assessment Report as required in Paragraph 4.2.5.1;
 - 10.2.1.4 Such additional documentation as Owner may require as set forth in the elsewhere in the Contract Documents; and
 - 10.2.1.5 Construction payment affidavit.
- 10.2.2 Contractor's Application for Payment. As soon as practicable, but in no event later than seven (7) days after receipt of the preliminary pay worksheet, A/E and ODR will meet with Contractor to review the preliminary pay worksheet and to observe the condition of the Work. Based on this review, ODR and A/E may require modifications to the preliminary pay worksheet prior to the submittal of an Application for Payment, and will promptly notify Contractor of revisions necessary for approval. As soon as practicable, Contractor shall submit its Application for Payment on the appropriate and completed form, reflecting the required modifications to the Schedule of Values required by A/E and/or ODR. Attach all additional documentation required by ODR and/or A/E, as well as an affidavit affirming that all payrolls, bills for labor, materials, equipment, subcontracted work and other indebtedness connected with Contractor's Application for Payment are paid or will be paid within the time specified in Tex. Gov't Code, Chapter 2251. No Application for Payment is complete unless it fully reflects all required modifications, and attaches all required documentation including Contractor's affidavit.
- 10.2.3 Certification by Architect/Engineer. Within five (5) days or earlier following A/E's receipt of Contractor's formal Application for Payment, A/E will review the Application for Payment for completeness, and forward it to ODR. A/E will certify that the application is complete and payable, or that it is incomplete, stating in particular what is missing. If the Application for Payment is incomplete, Contractor shall make the required corrections and resubmit the Application for Payment for processing.
- 10.3 Owner's Duty to Pay. Owner has no duty to pay the Contractor except on receipt by ODR of: 1) a complete Application for Payment certified by A/E; 2) Contractor's updated Work Progress Schedule; and 3) confirmation that Contractor has maintained and updated the Record Documents kept at the Site.
 - 10.3.1 Payment for stored materials and/or equipment confirmed by Owner and A/E to be on-site or otherwise properly stored is limited to eighty-five (85) percent of the invoice price or eighty-five (85) percent of the scheduled value for the materials or equipment, whichever is less.
 - 10.3.2 Retainage. Owner will withhold from each progress payment, as retainage, five (5) percent of the total earned amount, the amount authorized by law, or as otherwise set forth in the Owner's Special Conditions. Retainage is managed in conformance with Tex. Gov't Code,

Chapter 2252, Subchapter B.

- 10.3.2.1 Contractor shall provide written consent of its surety for any request for reduction or release of retainage.
- 10.3.2.2 At least sixty-five (65) percent of the Contract, or such other discrete Work phase as set forth in Subsection 12.1.6 or Work package delineated in the Contract Documents, must be completed before Owner can consider a retainage reduction or release.
- 10.3.2.3 Contractor shall not withhold retainage from their Subcontractors and suppliers in amounts that are any percentage greater than that withheld in its Contract with Owner under this subsection, unless otherwise acceptable to Owner.
- 10.3.3 Price Reduction to Cover Loss. Owner may reduce any Application for Payment, prior to payment to the extent necessary to protect Owner from loss on account of actions of Contractor including, but not limited to, the following:
 - 10.3.3.1 Defective or incomplete Work not remedied;
 - 10.3.3.2 Damage to Work of a separate Contractor;
 - 10.3.3.3 Failure to maintain scheduled progress or reasonable evidence that the Work will not be completed within the Contract Time;
 - 10.3.3.4 Persistent failure to carry out the Work in accordance with the Contract Documents;
 - 10.3.3.5 Reasonable evidence that the Work cannot be completed for the unpaid portion of the Contract Sum;
 - 10.3.3.6 Assessment of fines for violations of prevailing wage rate law; or
 - 10.3.3.7 Failure to include the appropriate amount of retainage for that periodic progress payment.
- 10.3.4 Title to all material and Work covered by progress payments transfers to Owner upon payment.
 - 10.3.4.1 Transfer of title to Owner does not relieve Contractor and its Subcontractors of the sole responsibility for the care and protection of materials and Work upon which payments have been made until final acceptance, or the restoration of any damaged Work, or waive the right of Owner to require the fulfillment of all the terms of the Contract.
- 10.4 Progress Payments. Progress payments to Contractor do not release Contractor or its surety from any obligations under the Contract.
 - 10.4.1 Upon Owner's request, Contractor shall furnish manifest proof of the status of Subcontractor's accounts in a form acceptable to Owner.
 - 10.4.2 Pay estimate certificates must be signed by a corporate officer or a representative duly authorized by Contractor.
 - 10.4.3 Provide copies of bills of lading, invoices, delivery receipts or other evidence of the location and value of such materials in requesting payment for materials.

- 10.4.4 For purposes of Tex. Gov't Code § 2251.021(a)(2), the date the performance of service is complete is the date when ODR approves the Application for Payment.
- 10.5 Off-Site Storage. With prior approval by Owner and in the event Contractor elects to store materials at an off-site location, abide by the following conditions, unless otherwise agreed to in writing by Owner.
- 10.5.1 Store materials in a commercial warehouse meeting the criteria stated below.
- 10.5.2 Provide insurance coverage adequate not only to cover materials while in storage, but also in transit from the off-site storage areas to the Project Site. Copies of duly authenticated certificates of insurance, made out to insure the State agency which is signatory to the Contract, must be filed with Owner's representative.
- 10.5.3 Inspection by Owner's representative is allowed at any time. Owner's inspectors must be satisfied with the security, control, maintenance, and preservation measures.
- 10.5.4 Materials for this Project are physically separated and marked for the Project in a sectioned-off area. Only materials which have been approved through the submittal process are to be considered for payment.
- 10.5.5 Owner reserves the right to reject materials at any time prior to final acceptance of the complete Contract if they do not meet Contract requirements regardless of any previous progress payment made.
- 10.5.6 With each monthly payment estimate, submit a report to ODR and A/E listing the quantities of materials already paid for and still stored in the off-site location.
- 10.5.7 Make warehouse records, receipts and invoices available to Owner's representatives, upon request, to verify the quantities and their disposition.
- 10.5.8 In the event of Contract termination or default by Contractor, the items in storage off-site, upon which payment has been made, will be promptly turned over to Owner or Owner's agents at a location near the jobsite as directed by ODR. The full provisions of performance and payment bonds on this Project cover the materials off-site in every respect as though they were stored on the Project Site.
- 10.6 Time for Payment by Contractor Pursuant to Tex. Gov't Code § 2255.022.
- 10.6.1 Contractor who receives a payment from a governmental entity shall pay Subcontractor the appropriate share of the payment not later than the tenth (10th) day after the date Contractor receives the payment.
- 10.6.2 The appropriate share is overdue on the eleventh (11th) day after the date Contractor receives the payment.

Article 11. Changes

- 11.1 Change Orders. A Change Order issued after execution of the Contract is a written order to Contractor, signed by ODR, Contractor, and A/E, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time can only be changed by Change Order. A Change Order signed by Contractor indicates his agreement therewith, including the adjustment in the Contract Sum and/or the Contract Time. ODR may issue a written authorization for Contractor to proceed with Work of a Change Order in advance of final execution by all parties in accordance with Section 11.9.

- 11.1.1 Owner, without invalidating the Contract **and without approval of Contractor's Surety**, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, and the Contract Sum and the Contract Time will be adjusted accordingly. All such changes in the Work shall be authorized by Change Order or ULCO, and shall be performed under the applicable conditions of the Contract Documents. If such changes cause an increase or decrease in Contractor's cost of, or time required for, performance of the Contract, an equitable adjustment shall be made and confirmed in writing in a Change Order or a ULCO.
- 11.1.2 Owner and Contractor acknowledge and agree that the Specifications and Drawings may not be complete or free from errors, omissions and imperfections and that they may require changes or additions in order for the Work to be completed to the satisfaction of Owner. Therefore, any minor errors, omissions or imperfections in the Specifications or Drawings, or any changes in or additions to the Specifications or Drawings to correct minor errors or omissions or to the Work ordered by Owner shall not constitute or give rise to any claim, demand or cause of action of any nature whatsoever in favor of Contractor, whether for breach of Contract, or otherwise. However, should the nature of the errors or omissions necessitate substantial changes in the Work such that a Change Order is appropriate, Owner shall be liable to Contractor for the sum stated to be due Contractor in any Change Order approved and signed by both parties. The sum established in any Change Order, together with any extension of time contained in said Change Order, shall constitute full compensation to Contractor for all costs, expenses and damages to Contractor for the changes in the Work described in the Change Order, as permitted under Tex. Gov't Code, Chapter 2260.
- 11.1.3 Procedures for administration of Change Orders shall be established by Owner and stated in the Owner's Special Conditions, or elsewhere in the Contract Documents.
- 11.1.4 No verbal order, verbal statement, or verbal direction of Owner or his duly appointed representative shall be treated as a change under this article or entitle Contractor to an adjustment.
- 11.1.5 Contractor agrees that Owner or any of its duly authorized representatives shall have access and the right to examine any directly pertinent books, documents, papers, and records of Contractor. Further, Contractor agrees to include in all its subcontracts a provision to the effect that Subcontractor agrees that Owner or any of its duly authorized representatives shall have access to and the right to examine any directly pertinent books, documents, papers and records of such Subcontractor relating to any claim arising from the Contract, whether or not the Subcontractor is a party to the claim. The period of access and examination described herein which relates to appeals under the Disputes article of the Contract, litigation, or the settlement of claims arising out of the performance of the Contract shall continue until final disposition of such claims, appeals or litigation.
- 11.2 Unit Prices. If unit prices are stated in the Contract Documents or subsequently agreed upon and if the quantities originally contemplated in setting the unit prices are so changed in a Proposed Change Order that application of the agreed unit prices to the quantities of work proposed will cause substantial inequity to Owner or Contractor, the applicable unit prices shall be equitably adjusted as provided in the Owner's Special Conditions or as agreed to by the parties and incorporated into a Change Order.
- 11.3 Claims for Additional Costs.
 - 11.3.1 If Contractor wishes to make a claim for an increase in the Contract Sum not related to a requested change, it shall give Owner and A/E written notice thereof within twenty-one (21) days after the occurrence of the event or discovery of any conditions giving rise to such claim. Contractor must notify Owner and A/E before proceeding to execute any Work considered to add additional cost or time, except in an emergency endangering life or property in which case Contractor shall act in accordance with Subsection 7.2.1., and failure to provide the

required notice will invalidate any subsequent notice or claim for additional cost or time for the Work. If Owner and Contractor cannot agree on the amount of the adjustment in the Contract Sum, it shall be determined as set forth under Article 15. Any change in the Contract Sum resulting from such claim shall be authorized by a Change Order or a ULCO.

- 11.3.2 If Contractor claims that additional cost is involved because of, but not limited to, 1) any written interpretation of the Contract Documents, 2) any order by Owner to stop the Work pursuant to Article 14 where Contractor was not at fault, or 3) any written order for a minor change in the Work issued pursuant to Section 11.4, Contractor shall make such claim as provided in Subsection 11.3.1.
- 11.3.3 Should Contractor or his Subcontractors fail to call attention of A/E to discrepancies or omissions in the Contract Documents, but claim additional costs for corrective Work after Contract award, Owner may assume intent to circumvent competitive bidding for necessary corrective Work. In such case, Owner may choose to let a separate Contract for the corrective Work, or issue a ULCO to require performance by Contractor. Claims for time extensions or for extra cost resulting from delayed notice of patent Contract Document discrepancies or omissions will not be considered by Owner.
- 11.4 Minor Changes. A/E, with concurrence of ODR, will have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time. Such changes shall be effected by written order which Contractor shall carry out promptly and record on the Record Documents.
- 11.5 Concealed Site Conditions. Contractor is responsible for visiting the Site and being familiar with local conditions such as the location, accessibility, and general character of the Site and/or building. If, in the performance of the Contract, subsurface, latent, or concealed conditions at the Site are found to be materially different from the information included in the Contract Documents, or if unknown conditions of an unusual nature are disclosed differing materially from the conditions usually inherent in Work of the character shown and specified, ODR and A/E shall be notified in writing of such conditions before they are disturbed. Upon such notice, or upon its own observation of such conditions, A/E, with the approval of ODR, will promptly make such changes in the Drawings and Specifications as they deem necessary to conform to the different conditions, and any increase or decrease in the cost of the Work, or in the time within which the Work is to be completed, resulting from such changes will be adjusted by Change Order, subject to the prior approval of ODR.
- 11.6 Extension of Time. All changes to the Contract Time shall be made as a consequence of requests as required under Section 9.6, and as documented by Change Order as provided under Section 11.1.
- 11.7 Administration of Change Order Requests. All changes in the Contract shall be administered in accordance with procedures approved by Owner, and when required, make use of such electronic information management system(s) as Owner may employ.
 - 11.7.1 Routine changes in the construction Contract shall be formally initiated by A/E by means of a PCO form detailing requirements of the proposed change for pricing by Contractor. This action may be preceded by communications between Contractor, A/E and ODR concerning the need and nature of the change, but such communications shall not constitute a basis for beginning the proposed Work by Contractor. Except for emergency conditions described below, approval of Contractor's cost proposal by A/E and ODR will be required for authorization to proceed with the Work being changed. Owner will not be responsible for the cost of Work changed without prior approval and Contractor may be required to remove Work so installed.
 - 11.7.2 All proposed costs for change order Work must be supported by itemized accounting of material, equipment and associated itemized installation costs in sufficient detail, following the outline and organization of the established Schedule of Values, to permit analysis by A/E

and ODR using current estimating guides and/or practices. Photocopies of Subcontractor and vendor proposals shall be furnished unless specifically waived by ODR. Contractor shall provide written response to a change request within twenty-one (21) days of receipt.

- 11.7.3 Any unexpected circumstance which necessitates an immediate change in order to avoid a delay in progress of the Work may be expedited by verbal communication and authorization between Contractor and Owner, with written confirmation following within twenty-four (24) hours. A limited scope not-to-exceed estimate of cost and time will be requested prior to authorizing Work to proceed. Should the estimate be impractical for any reason, ODR may authorize the use of detailed cost records of such work to establish and confirm the actual costs and time for documentation in a formal Change Order.
- 11.7.4 Emergency changes to save life or property may be initiated by Contractor alone (see Section 7.3) with the claimed cost and/or time of such work to be fully documented as to necessity and detail of the reported costs and/or time.
- 11.7.5 The method of incorporating approved Change Orders into the parameters of the accepted Schedule of Values must be coordinated and administered in a manner acceptable to ODR.
- 11.8 Pricing Change Order Work. The amounts that Contractor and/or its Subcontractor adds to a Change Order for profit and overhead will also be considered by Owner before approval is given. The amounts established hereinafter are the maximums that are acceptable to Owner.
- 11.8.1 For Work performed by its forces, Contractor will be allowed its actual costs paid for materials, the total amount of its actual wages paid for labor, plus its actual cost paid for ~~of~~ State and Federal payroll taxes and for ~~of~~ worker's compensation and comprehensive general liability insurance, plus its actual additional bond and builders risk insurance cost if the change results in an increase in the premium paid by Contractor. To the total of the above costs, Contractor will be allowed to add a percentage as noted below to cover overhead and profit combined. Overhead shall be considered to include insurance other than mentioned above, field and office supervisors and assistants, including safety and scheduling personnel, use of small tools, incidental job burdens and general Home Office expenses, and no separate allowance will be made therefore.
- Allowable percentages for overhead and profit on changes will not exceed 15 percent if the total of self-performed work is less than or equal to \$10,000, 10 percent if the total of self-performed work is between \$10,000 and \$20,000 and 7.5 percent if the total of self-performed work is over \$20,000, for any specific change priced.
- 11.8.2 For subcontracted Work each affected Subcontractor shall figure its costs, overhead and profit as described above for Contractor's Work, all Subcontractor costs shall be combined, and to that total Subcontractor cost Contractor will be allowed to add a maximum mark-up of ten (10) percent if the total of all subcontracted work is less than or equal to \$10,000, seven and half (7.5) percent if the total of all subcontracted work is between \$10,000 and \$20,000 and five (5) percent if the total of all subcontractor work is over \$20,000.
- 11.8.3 On changes involving both additions and deletions, percentages for overhead and profit will be allowed only on the net addition. Owner does not accept and will not pay for additional Contract cost identified as indirect or consequential damages or as damages caused by delay.
- 11.8.4 For Contracts based on a Guaranteed Maximum Price (GMP), the Construction Manager-at-Risk or Design Builder shall NOT be entitled to a percentage mark-up on any Change Order Work unless the Change Order increases the Guaranteed Maximum Price.

- 11.9 Unilateral Change Order (ULCO). Owner may issue a written ULCO directing a change in the Work prior to reaching agreement with Contractor on the adjustment, if any, in the Contract price and/or the Contract Time.
- 11.9.1 Owner and Contractor shall negotiate for appropriate adjustments, as applicable, to the Contract Sum or the Contract Time arising out of a ULCO. As the changed Work is performed, Contractor shall submit its costs for such Work with its Application for Payment beginning with the next Application for Payment within thirty (30) days of the issuance of the ULCO. The Parties reserve their rights to dispute the ULCO amount, subject to Article 15.
- 11.10 Finality of Changes—Contractor. Upon execution of a Change Order and /or a ULCO by Owner, Contractor and A/E, all costs and time issues claimed by Contractor regarding that change are final and not subject to increase.
- 11.11 Audit of Changes—Owner. All Changes Orders are subject to audit by Owner or its representative at any time in accordance with Article 17.4 and Change Order amounts may be adjusted lower as a result of such audit.

Article 12. Project Completion and Acceptance

- 12.1 Closing Inspections.
- 12.1.1 Substantial Completion Inspection. When Contractor considers the entire Work or part thereof Substantially Complete, it shall notify ODR in writing that the Work will be ready for Substantial Completion inspection on a specific date. Contractor shall include with this notice Contractor's Punchlist to indicate that it has previously inspected all the Work associated with the request for inspection, noting items it has corrected and included all remaining work items with date scheduled for completion or correction prior to final inspection. The failure to include any items on this list does not alter the responsibility of Contractor to complete all Work in accordance with the Contract Documents. If any of the items on this list prevents the Project from being used as intended, Contractor shall not request a Substantial Completion Inspection. Owner and its representatives will review the list of items and schedule the requested inspection, or inform Contractor in writing that such an inspection is premature because the Work is not sufficiently advanced or conditions are not as represented on Contractor's list.
- 12.1.1.1 Prior to the Substantial Completion inspection, Contractor shall furnish a copy of its marked-up Record Documents and a preliminary copy of each instructional manual, maintenance and operating manual, parts catalog, wiring diagrams, spare parts, specified written warranties, and like publications or parts for all installed equipment, systems, and like items as described in the Contract Documents. Delivery of these items is a prerequisite for requesting the Substantial Completion inspection.
- 12.1.1.2 On the date requested by Contractor, or as mutually agreed upon pending the status of the Open Items List, A/E, ODR, Contractor, and other Owner representatives as determined by Owner will jointly attend the Substantial Completion inspection, which shall be conducted by ODR or their delegate. If ODR concurs with the determination of Contractor and A/E that the Work is Substantially Complete, ODR will issue a Certificate of Substantial Completion to be signed by A/E, Owner, and Contractor establishing the date of Substantial Completion and identifying responsibilities for security, insurance and maintenance. A/E will provide with this certificate a list of Punchlist items (the pre-final Punchlist) for completion prior to final inspection. This list may include items in addition to those on Contractor's Punchlist, which the inspection team deems necessary to correct or complete prior to final inspection. If Owner

occupies the Project upon determination of Substantial Completion, Contractor shall complete all corrective Work at the convenience of Owner, without disruption to Owner's use of the Project for its intended purposes.

- 12.1.2 Final Inspection. Contractor shall complete the list of items identified on the pre-final Punchlist prior to requesting a final inspection. Unless otherwise specified, or otherwise agreed in writing by the parties as documented on the Certificate of Substantial Completion, Contractor shall complete and/or correct all Work within thirty (30) days of the Substantial Completion date. Upon completion of the pre-final Punchlist work, Contractor shall give written notice to ODR and A/E that the Work will be ready for final inspection on a specific date. Contractor shall accompany this notice with a copy of the updated pre-final Punchlist indicating resolution of all items. On the date specified or as soon thereafter as is practicable, ODR, A/E and Contractor will inspect the Work. A/E will submit to Contractor a final Punchlist of open items that the inspection team requires corrected or completed before final acceptance of the Work.
 - 12.1.2.1 Correct or complete all items on the final Punchlist before requesting Final Payment. Unless otherwise agreed to in writing by the parties, complete this work within seven (7) days of receiving the final Punchlist. Upon completion of the final Punchlist, notify A/E and ODR in writing stating the disposition of each final Punchlist item. A/E, Owner, and Contractor shall promptly inspect the completed items. When the final Punchlist is complete, and the Contract is fully satisfied according to the Contract Documents ODR will issue a certificate establishing the date of Final Completion. Completion of all Work is a condition precedent to Contractor's right to receive Final Payment.
- 12.1.3 Annotation. Any Certificate issued under this Article may be annotated to indicate that it is not applicable to specified portions of the Work, or that it is subject to any limitation as determined by Owner.
- 12.1.4 Purpose of Inspection. Inspection is for determining the completion of the Work, and does not relieve Contractor of its overall responsibility for completing the Work in a good and competent fashion, in compliance with the Contract. Work accepted with incomplete Punchlist items or failure of Owner or other parties to identify Work that does not comply with the Contract Documents or is defective in operation or workmanship does not constitute a waiver of Owner's rights under the Contract or relieve Contractor of its responsibility for performance or warranties.
- 12.1.5 Additional Inspections.
 - 12.1.5.1 If Owner's inspection team determines that the Work is not substantially complete at the Substantial Completion inspection, ODR or A/E will give Contractor written notice listing cause(s) of the rejection. Contractor will set a time for completion of incomplete or defective work acceptable to ODR. Contractor shall complete or correct all work so designated prior to requesting a second Substantial Completion inspection.
 - 12.1.5.2 If Owner's inspection team determines that the Work is not complete at the final inspection, ODR or A/E will give Contractor written notice listing the cause(s) of the rejection. Contractor will set a time for completion of incomplete or defective work acceptable to ODR. Contractor shall complete or correct all Work so designated prior to again requesting a final inspection.
 - 12.1.5.3 The Contract contemplates three (3) comprehensive inspections: the Substantial Completion inspection, the Final Completion inspection, and the inspection of completed final Punchlist items. The cost to Owner of additional inspections

resulting from the Work not being ready for one or more of these inspections is the responsibility of Contractor. Owner may issue a ULCO deducting these costs from Final Payment. Upon Contractor's written request, Owner will furnish documentation of any costs so deducted. Work added to the Contract by Change Order after Substantial Completion inspection is not corrective Work for purposes of determining timely completion, or assessing the cost of additional inspections.

- 12.1.6 Phased Completion. The Contract may provide, or Project conditions may warrant, as determined by ODR, that designated elements or parts of the Work be completed in phases. Where phased completion is required or specifically agreed to by the parties, the provisions of the Contract related to closing inspections, occupancy, and acceptance apply independently to each designated element or part of the Work. For all other purposes, unless otherwise agreed by the parties in writing, Substantial Completion of the Work as a whole is the date on which the last element or part of the Work completed receives a Substantial Completion certificate. Final Completion of the Work as a whole is the date on which the last element or part of the Work completed receives a Final Completion certificate or notice.
- 12.2 Owner's Right of Occupancy. Owner may occupy or use all or any portion of the Work following Substantial Completion, or at any earlier stage of completion. Should Owner wish to use or occupy the Work, or part thereof, prior to Substantial Completion, ODR will notify Contractor in writing and identify responsibilities for security, insurance and maintenance Work performed on the premises by third parties on Owner's behalf does not constitute occupation or use of the Work by Owner for purposes of this Article. All Work performed by Contractor after occupancy, whether in part or in whole, shall be at the convenience of Owner so as to not disrupt Owner's use of, or access to occupied areas of the Project.
- 12.3 Acceptance and Payment
- 12.3.1 Request for Final Payment. Following the certified completion of all work, including all final Punchlist items, cleanup, and the delivery of record documents, Contractor shall submit a certified Application for Final Payment and include all sums held as retainage and forward to A/E and ODR for review and approval.
- 12.3.2 Final Payment Documentation. Contractor shall submit, prior to or with the Application for Final Payment, final copies of all Close-Out documents, maintenance and operating instructions, guarantees and warranties, certificates, Record Documents and all other items required by the Contract. Contractor shall submit evidence of return of access keys and cards, evidence of delivery to Owner of attic stock, spare parts, and other specified materials. Contractor shall submit consent of surety to Final Payment form and an affidavit that all payrolls, bills for materials and equipment, subcontracted work and other indebtedness connected with the Work, except as specifically noted, are paid, will be paid, after payment from Owner or otherwise satisfied within the period of time required by Tex. Gov't Code, Chapter 2251. Contractor shall furnish documentation establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of claims and liens arising out of the Contract. Contractor may not subsequently submit a claim on behalf of Subcontractor or vendor unless Contractor's affidavit notes that claim as an exception.
- 12.3.3 Architect/Engineer Approval. A/E will review a submitted Application for Final Payment promptly but in no event later than ten (10) days after its receipt. Prior to the expiration of this deadline, A/E will either: 1) return the Application for Final Payment to Contractor with corrections for action and resubmission; or 2) accept it, note their approval, and send to Owner.
- 12.3.4 Offsets and Deductions. Owner may deduct from the Final Payment all sums due from Contractor. If the Certificate of Final Completion notes any Work remaining, incomplete, or defects not remedied, Owner may deduct the cost of remedying such deficiencies from the

Final Payment. On such deductions, Owner will identify each deduction, the amount, and the explanation of the deduction on or by the twenty-first (21st) day after Owner's receipt of an approved Application for Final Payment. Such offsets and deductions shall be incorporated via a final Change Order, including a ULCO as may be applicable.

- 12.3.5 Final Payment Due. Final Payment is due and payable by Owner, subject to all allowable offsets and deductions, on the thirtieth (30th) day following Owner's approval of the Application for Payment. If Contractor disputes any amount deducted by Owner, Contractor shall give notice of the dispute on or before the thirtieth (30th) day following receipt of Final Payment. Failure to do so will bar any subsequent claim for payment of amounts deducted.
- 12.3.6 Effect of Final Payment. Final Payment constitutes a waiver of all claims by Owner, relating to the condition of the Work except those arising from:
- 12.3.6.1 Faulty or defective Work appearing after Substantial Completion (latent defects);
 - 12.3.6.2 Failure of the Work to comply with the requirements of the Contract Documents;
 - 12.3.6.3 Terms of any warranties required by the Contract, or implied by law; or
 - 12.3.6.4 Claims arising from personal injury or property damage to third parties.
- 12.3.7 Waiver of Claims. Final payment constitutes a waiver of all claims and liens by Contractor except those specifically identified in writing and submitted to ODR prior to the application for Final Payment.
- 12.3.8 Effect on Warranty. Regardless of approval and issuance of Final Payment, the Contract is not deemed fully performed by Contractor and closed until the expiration of all warranty periods.

Article 13. Warranty and Guarantee

- 13.1 Contractor's General Warranty and Guarantee. Contractor warrants to Owner that all Work is executed in accordance with the Contract, complete in all parts and in accordance with approved practices and customs, and of the required finish and workmanship. Contractor further warrants that unless otherwise specified, all materials and equipment incorporated in the Work under the Contract are new. Owner may, at its option, agree in writing to waive any failure of the Work to conform to the Contract, and to accept a reduction in the Contract price for the cost of repair or diminution in value of the Work by reason of such defect. Absent such a written agreement, Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute and is not waived by any inspection or observation by Owner, A/E or others, by making any progress payment or final payment, by the use or occupancy of the Work or any portion thereof by Owner, at any time, or by any repair or correction of such defect made by Owner.
- 13.2 Warranty Period. Except as may be otherwise specified or agreed, Contractor shall repair all defects in materials, equipment, or workmanship appearing within one year from the date of Substantial Completion of the Work. If Substantial Completion occurs by phase, then the warranty period for ~~that~~ the Work performed for each phase begins on the date of Substantial Completion of that phase, or as otherwise stipulated on the Certificate of Substantial Completion for the particular phase.
- 13.3 Limits on Warranty. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
- 13.3.1 Modification or improper maintenance or operation by persons other than Contractor, Subcontractors, or any other individual or entity for whom Contractor is not responsible, unless Owner is compelled to undertake maintenance or operation due to the neglect of

Contractor.

13.3.2 Normal wear and tear under normal usage after acceptance of the Work by Owner.

13.4 Events Not Affecting Warranty. Contractor's obligation to perform and complete the Work in a good and workmanlike manner in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or relieve the Contractor from its obligation to perform the Work in accordance with the Contract Documents:

13.4.1 Observations by Owner and/or A/E;

13.4.2 Recommendation to pay any progress or final payment by A/E;

13.4.3 The issuance of a certificate of Substantial Completion or any payment by Owner to Contractor under the Contract Documents;

13.4.4 Use or occupancy of the Work or any part thereof by Owner;

13.4.5 Any acceptance by Owner or any failure to do so;

13.4.6 Any review of a Shop Drawing or sample submittal; or

13.4.7 Any inspection, test or approval by others.

13.5 Separate Warranties. If a particular piece of equipment or component of the Work for which the Contract requires a separate warranty is placed in continuous service before Substantial Completion, the warranty period for that equipment or component will not begin until Substantial Completion, regardless of any warranty agreements in place between suppliers and/or Subcontractors and Contractor. ODR will certify the date of service commencement in the Substantial Completion certificate.

13.5.1 In addition to Contractor's warranty and duty to repair, Contractor expressly assumes all warranty obligations required under the Contract for specific building components, systems and equipment.

13.5.2 Contractor may satisfy any such obligation by obtaining and assigning to Owner a complying warranty from a manufacturer, supplier, or Subcontractor. Where an assigned warranty is tendered and accepted by Owner which does not fully comply with the requirements of the Contract, Contractor remains liable to Owner on all elements of the required warranty not provided by the assigned warranty.

13.6 Correction of Defects. Upon receipt of written notice from Owner, or any agent of Owner designated as responsible for management of the warranty period, of the discovery of a defect, Contractor shall promptly remedy the defect(s), and provide written notice to Owner and designated agent indicating action taken. In case of emergency where delay would cause serious risk of loss or damage to Owner, or if Contractor fails to remedy within thirty (30) days, or within another period agreed to in writing, Owner may correct the defect and be reimbursed the cost of remedying the defect from Contractor or its surety.

Article 14. Suspension and Termination

14.1 Suspension of Work for Cause. Owner may, at any time without prior notice, suspend all or any part of the Work if, after reasonable observation and/or investigation, Owner determines it is necessary to do so to prevent or correct any condition of the Work which constitutes an immediate safety hazard or which may reasonably be expected to impair the integrity, usefulness or longevity of the Work when

completed.

- 14.1.1 Owner will give Contractor a written notice of suspension for cause, setting forth the reason for the suspension and identifying the Work suspended. Upon receipt of such notice, Contractor shall immediately stop the Work so identified. As soon as practicable following the issuance of such a notice, Owner will initiate and complete a further investigation of the circumstances giving rise to the suspension, and issue a written determination of the findings.
 - 14.1.2 If it is confirmed that the cause was within the control of Contractor, Contractor will not be entitled to an extension of time for delay resulting from the suspension. If the cause is determined not to have been within the control of Contractor, and the suspension has prevented Contractor from completing the Work within the Contract Time, the suspension is an excusable delay and a time extension will be granted through a Change Order.
 - 14.1.3 Suspension of Work under this provision will be no longer than is reasonably necessary to remedy the conditions giving rise to the suspension.
- 14.2 Suspension of Work for Owner's Convenience. Upon seven (7) days written notice to Contractor, Owner may at any time without breach of the Contract suspend all or any portion of the Work for a period of up to sixty (60) days for its own convenience. Owner will give Contractor a written notice of suspension for convenience, which sets forth the number of suspension days for which the Work, or any portion of it, and the date on which the suspension of Work will cease. When such a suspension prevents Contractor from completing the Work within the Contract Time, it is an excusable delay. A notice of suspension for convenience may be modified by Owner at any time on seven (7) days written notice to Contractor. If Owner suspends the Work for its convenience for more than sixty (60) consecutive days, Contractor may elect to terminate the Contract pursuant to the provisions of the Contract.
- 14.3 Termination by Owner for Cause.
- 14.3.1 Upon thirty (30) days written notice to Contractor and its surety, Owner may, without prejudice to any right or remedy, terminate the Contract and take possession of the Site and of all materials, equipment, tools, construction equipment, and machinery thereon owned by Contractor under any of the following circumstances:
 - 14.3.1.1 Persistent or repeated failure or refusal, except during complete or partial suspensions of work authorized under the Contract, to supply enough properly skilled workmen or proper materials;
 - 14.3.1.2 Persistent disregard of laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, including ODR;
 - 14.3.1.3 Persistent failure to prosecute the Work in accordance with the Contract, and to ensure its completion within the time, or any approved extension thereof, specified in the Contract;
 - 14.3.1.4 Failure to remedy defective work condemned by ODR;
 - 14.3.1.5 Failure to pay Subcontractors, laborers, and material suppliers pursuant to Tex. Gov't Code, Chapter 2251;
 - 14.3.1.6 Persistent endangerment to the safety of labor or of the Work;
 - 14.3.1.7 Failure to supply or maintain statutory bonds or to maintain required insurance, pursuant to the Contract;

- 14.3.1.8 Any material breach of the Contract; or
- 14.3.1.9 Contractor's insolvency, bankruptcy, or demonstrated financial inability to perform the Work.
- 14.3.2 Failure by Owner to exercise the right to terminate in any instance is not a waiver of the right to do so in any other instance.
- 14.3.3 Upon receipt of a termination notice, the Contractor or its Surety has thirty (30) days to cure the reasons for the termination or demonstrate to the satisfaction of the Owner that it is prepared to remedy to the condition(s) upon which the notice of termination was based with diligence and promptness. If the Owner is satisfied that the Contractor or its Surety can remedy the reasons for the termination and complete the Work as required, the notice of termination shall be rescinded in writing by the Owner and the Work shall continue without an extension of time.
- 14.3.4 If at the conclusion of the thirty (30) day cure period the Contractor or its Surety is unable to demonstrate to the satisfaction of the Owner its ability to remedy the reasons for termination, the Owner may immediately terminate the employment of the Contractor, make alternative arrangements for completion of the Work and deduct the cost of completion from the unpaid Contract Sum.
 - 14.3.4.1 Owners cost to complete the Work includes, but is not limited to, fees for additional services by A/E and other consultants, and additional contract administration costs.
 - 14.3.4.2 Owner will make no further payment to Contractor or its surety unless the costs to complete the Work are less than the Contract balance, then the difference shall be paid to Contractor or its surety. If such costs exceed the unpaid balance, Contractor or its surety will pay the difference to Owner.
 - 14.3.4.3 This obligation for payment survives the termination of the Contract.
 - 14.3.4.4 Owner reserves the right in termination for cause to take assignment of all the Contracts between Contractor and its Subcontractors, vendors, and suppliers. ODR will promptly notify Contractor of the contracts Owner elects to assume. Upon receipt of such notice, Contractor shall promptly take all steps necessary to effect such assignment.
- 14.4 Conversion to Termination for Convenience. In the event that any termination of Contractor for cause under Section 14.3 is later determined to have been improper, the termination shall automatically convert to a termination for convenience under Section 14.5 and Contractor's recovery for termination shall be strictly limited to the payments allowable under Section 14.5.
- 14.5 Termination for Convenience of Owner. Owner reserves the right, without breach, to terminate the Contract prior to, or during the performance of the Work, for any reason. Upon such an occurrence, the following shall apply:
 - 14.5.1 Owner will notify Contractor and A/E in writing specifying the reason for and the effective date of the Contract termination. The notice may also contain instructions necessary for the protection, storage or decommissioning of incomplete work or systems, and for safety.
 - 14.5.2 Upon receipt of the notice of termination, Contractor shall immediately proceed with the following obligations, regardless of any dispute in determining or adjusting any amounts due at that point in the Contract:

- 14.5.2.1 Stop all work.
- 14.5.2.2 Place no further subcontracts or orders for materials or services.
- 14.5.2.3 Terminate all subcontracts for convenience.
- 14.5.2.4 Cancel all materials and equipment orders as applicable.
- 14.5.2.5 Take appropriate action that is necessary to protect and preserve all property related to the Contract which is in the possession of Contractor.
- 14.5.3 When the Contract is terminated for Owner's convenience, Contractor may recover from Owner payment for all Work executed. Contractor may not claim lost profits or lost business opportunities.
- 14.6 Termination By Contractor. If the Work is stopped for a period of ninety (90) days under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as a declaration of a national emergency making materials unavailable, through no act or fault of Contractor or Subcontractor or their agents or employees or any other persons performing any of the Work under a contract with Contractor, then Contractor may, upon thirty (30) additional days written notice to ODR, terminate the Contract and recover from Owner payment for all Work executed, but not lost profits or lost business opportunities. If the cause of the Work stoppage is removed prior to the end of the thirty (30) day notice period, Contractor may not terminate the Contract.
- 14.7 Settlement on Termination. When the Contract is terminated for any reason, at any time prior to one hundred eighty (180) days after the effective date of termination, Contractor shall submit a final termination settlement proposal to Owner based upon recoverable costs as provided under the Contract. If Contractor fails to submit the proposal within the time allowed, Owner may unilaterally determine the amount due to Contractor because of the termination and pay the determined amount to Contractor.

Article 15. Dispute Resolution

- 15.1 Unresolved Contractor Disputes. To the extent that it is applicable, the dispute resolution process provided for in Tex. Gov't Code, Chapter 2260, shall be used by Contractor to resolve any claim for breach of Contract made by Contractor that is not resolved under procedures described in these Uniform General Conditions or Owner's Special Conditions of the Contract.
- 15.2 Alternative Dispute Resolution Process. Owner may establish a dispute resolution process to be utilized in advance of that outlined in Tex. Gov't Code, Chapter 2260.
- 15.3 Nothing herein shall hinder, prevent, or be construed as a waiver of Owner's right to seek redress on any disputed matter in a court of competent jurisdiction.
- 15.4 In any litigation between the Owner and the Contractor arising from this Contract or this Project, neither party will be entitled to an award of legal fees or costs in any judgment regardless which one is deemed the prevailing party.
- 15.5 Nothing herein shall waive or be construed as a waiver of the State's sovereign immunity.

Article 16. Certification of No Asbestos Containing Material or Work

- 16.1 Contractor shall insure that Texas Department of State Health Services licensed individuals, consultants or companies are used for any required asbestos work including asbestos inspection, asbestos abatement plans/specifications, asbestos abatement, asbestos project management and third-party asbestos monitoring.

- 16.2 Contractor shall provide a notarized certification to Owner that all equipment and materials used in fulfillment of its Contract responsibilities are non-Asbestos Containing Building Materials (ACBM). This certification must be provided no later than Contractor's application for Final Payment.
- 16.3 The Contractor shall insure compliance with the following acts from all of his subcontractors and assigns:
- Asbestos Hazard Emergency Response Act (AHERA—40 CFR 763-99 (7));
 - National Emission Standards for Hazardous Air Pollutants (NESHAP—EPA 40 CFR 61, Subpart M—National Emission Standard for Asbestos;
 - Texas Asbestos Health Protection Rules (TAHPR—Tex. Admin. Code Title 25, Part 1, Ch. 295C, Asbestos Health Protection

Article 17 Miscellaneous

- 17.1 Owner's Special Conditions. When the Work contemplated by Owner is of such a character that the foregoing Uniform General Conditions of the Contract cannot adequately cover necessary and additional contractual relationships, the Contract may include Owner's Special Conditions that relate to the Project. In the event of a conflict between the UTUGCs and the Owner's Special Conditions, the Owner's Special Conditions will govern.
- 17.2 Federally Funded Projects. On Federally funded projects, Owner may waive, suspend or modify any Article in these Uniform General Conditions which conflicts with any Federal statute, rule, regulation or procedure, where such waiver, suspension or modification is essential to receipt by Owner of such Federal funds for the Project. In the case of any Project wholly financed by Federal funds, any standards required by the enabling Federal statute, or any Federal rules, regulations or procedures adopted pursuant thereto, shall be controlling.
- 17.3 Internet-based Project Management Systems. At its option, Owner may administer its design and construction management through an Internet-based management system. In such cases, Contractor shall conduct communication through this media and perform all Project related functions utilizing this database system. This includes correspondence, submittals, Requests for Information, vouchers or payment requests and processing, amendment, Change Orders and other administrative activities.
- 17.3.1 Accessibility and Administration.
- 17.3.1.1 When used, Owner will make the software accessible via the Internet to all Project team members.
- 17.3.1.2 Owner shall administer the software.
- 17.3.2 Training. When used, Owner shall provide training to the Project team members.
- 17.4 Right to Audit.
- 17.4.1 Contractor understands that acceptance of funds under this Contract acts as acceptance of the authority of the State Auditor's Office, Owner, any successor agency and their representatives, including independent auditors, to conduct an audit or investigation in connection with those funds. Contractor further agrees to cooperate fully with any party conducting the audit or investigation, including providing all records requested.
- 17.4.2 Contractor shall maintain and retain supporting fiscal and any other documents relevant to showing that any payments under this Contract funds were expended in accordance with the terms of this Contract, the requirements of Owner, and with the laws and regulations of the State of Texas including, but not limited to, requirements of the Comptroller of the State of

Texas and the State Auditor. Contractor shall maintain all such documents and other records relating to this Contract and Owner's property for a period of four (4) years after the date of submission of a request for Final Payment or until a resolution of all billing questions, whichever is later. Contractor shall make available at reasonable times and upon reasonable notice and for reasonable periods all documents and other information related to the Work of this Contract.

- 17.4.3 Contractor shall ensure that this clause concerning the authority to audit funds received indirectly by subcontractors through the Contractor and the requirement to cooperate is included in any subcontract it awards.

17.5 **179 D Benefit Allocation.** Owner may decide to seek the allocation of certain tax benefits pursuant to Section 179D of the Internal Revenue Code of 1986, as amended, (the "Code") through its Agreement with Contractor

If the Owner and the Internal Revenue Service (IRS) determine that the Contractor is eligible to receive the 179D deduction allocation as a "Designer" for the purposes of Section 179D of the Code or that Contractor could otherwise profit financially from the monetization of the benefit (separately and collectively, the "Rebate"), Contractor hereby agrees to allocate to the Owner a portion of the Rebate in an amount to be determined and contracted for on mutually agreeable terms when the value of the Rebate becomes ascertainable, net of associated costs realized by the Owner and Project Architect. At its sole discretion, the Owner shall determine whether to receive its portion of the Rebate in cash, discounted Contractor fees or both.

Owner reserves the right to retain a third party consultant (the "Consultant") to manage and administer the process of obtaining and monetizing the Rebate derived from the Project(s).

Contractor agrees to cooperate in all reasonable respects with the Consultant's efforts to obtain and monetize any such Rebates derived from the Project(s) on behalf of the Owner. Certification of eligibility and negotiation of the Rebates should be facilitated by the Owner's 179D Consultant.

End of Uniform General Conditions

REVISIONS

DATE	REVISED	INITIALS
9-1-2013	2010 Uniform General and Supplementary Conditions merged into and Reissued as new document: 2013 Uniform General Conditions for UT System Building Construction Projects (UTUGCs); <i>Special Conditions</i> and <i>Supplementary General Conditions</i> deleted from Definitions; <i>Owner's Special Conditions</i> added to Definitions; Para. 3.3.11, <i>Indemnification</i> , moved to new Para. 3.4; Para 5.2.2.1.4 added Asbestos Transportation Insurance Coverage; Para. 5.2.2.1.7 added Umbrella Insurance Coverage; Para. 13.7, <i>Certification of No Asbestos Containing Material</i> moved to renamed Article 16 and revised; Article 15, <i>Dispute Resolution</i> , revised; Existing Article 16, <i>Miscellaneous</i> , re-numbered as Article 17.	
10-29-15	Added Section 17.5 regarding D Benefit Allocation 179	mgm
11-12-15	Art. 11.11, changed reference from 16.4 to 17.4	mgm
4-21-16	Misc. minor revisions in Art. 5.2 and 6.1.4	mgm

OWNER'S SPECIAL CONDITIONS

PART 1 - GENERAL

1.1 PURPOSE

- 1.1.1 These Special Conditions are in addition to the requirements of the Uniform General Conditions for University of Texas System Building Construction Contracts (UGC), and are a part of the Contract Documents.
- 1.1.2 Terms and conditions set forth in this document are for the Contractor only, and are valid regardless of the project delivery method. For Construction Manager at Risk or Design-Build, the final version of the document shall be confirmed by the Owner, and included by the Construction Manager or Design-Build Contractor in the Guaranteed Maximum Price Proposal.

1.2 SEPARATE CONTRACT

- 1.2.1 As provided in the UGC, the Owner may award other contracts for other portions of the Project. Additional separate contracts may include, but are not limited to, commissioning, geotechnical, surveying services, furnishings procurement, furnishings installation, equipment installation, fire alarm certification, HVAC test and balance services, construction materials testing, subsurface utility engineering, security, and IT installation.

1.3 PREVAILING WAGE RATE DETERMINATION

- 1.3.1 In accordance with the UGC, the attached schedule identifies the Prevailing Minimum Wage Rate determination for **HIDALGO COUNTY**. Refer to "Attachment A."
- 1.3.2 The Owner may verify wage rate compliance in the field by interviewing workers. The Contractor shall assist the Construction Inspector (CI) with this task, including providing translation for non-English speaking workers.

1.4 RELATED DOCUMENTS

In addition to specific references indicated herein, the Contractor's attention is specifically directed, but not limited, to the following Sections and Documents, which include additional administrative requirements.

- 1.4.1 Provisions established within the Uniform General Conditions for University of Texas System Building Construction Contracts (UGC), all Sections of Division 1 - General Requirements, other applicable Sections of all Divisions of Specifications, and the Drawings are collectively applicable to this Section. In the event of conflict between specific requirements of the various documents, the more restrictive, the more extensive (i.e. more expensive) requirement shall govern.
 - 1.4.1.1 Effective February 1, 2008, all references within the UGC to the Texas Workers Compensation Commission shall be revised to the Texas Department of Insurance, including all subsequent acronyms.
- 1.4.2 "Attachment A" (To Special Conditions): Prevailing Wage Rate Determination.
- 1.4.3 "Attachment B" (To Special Conditions): Project Sign.
- 1.4.4 "Attachment C" (To Special Conditions): Weather Days.

PART 2 – PRODUCTS

2.1 OWNER'S SPECIAL CASH ALLOWANCES

2.1.1 A total Owner's Special Cash Allowance of \$0 shall be included in the Contractor's base proposal amount, to cover expenses identified below. The Contractor shall confirm the costs and inform the Owner at least 30 calendar days prior to purchase or payment. The Contractor shall be reimbursed through a reduction in the scheduled Owner's Special Cash Allowance amount below in accordance with the UGC.

2.1.1.1 The Owner is exempt from paying for permits and fees to local government entities related to work on the Owner's property. There shall be no building permit required, no platting fees, and no local government inspection fees for permanent work on the Owner's property. The Owner is not exempt from permits and fee requirements for work in public rights-of-way or outside the boundaries of the Owner's property.

2.1.1.1.1 For permanent improvements or utility service when permits, governmental or utility company inspections or related fees are required, it is anticipated that such a fee shall be necessary.

2.2 NOT USED

2.3 ANIMALS AND LIVESTOCK

- 2.3.1 Animals including, but not limited to, personal pets and livestock, are prohibited from the Project site, except assistance animals as defined by the Americans with Disabilities Act 28 CFR § 36.104 and Texas Human Resources Code, Title 8, Chapter 121.
- 2.3.2 Modifications and adjustments to the work environment will be considered by the Owner for contracted work force that require or utilize animal assistance to address limitations associated with a recognized disability. The Contractor shall submit the written request to the Owner's Designated Representative (ODR) and shall demonstrate appropriate monitoring measures for control in the Project Safety Plan.

2.4 TEMPORARY FIELD OFFICE STRUCTURES, FURNISHINGS, AND EQUIPMENT

- 2.4.1 Unless otherwise agreed to by the Owner, temporary field office(s) shall be provided and maintained for the duration of the construction phase (from Notice to Proceed until at least Substantial Completion) and removed only after concurrence from the Owner's Designated Representative.
- 2.4.2 Temporary field office(s) shall have adequate and safe entry, including steps with railings and landings or stoops as appropriate, and shall provide hard, non-slip surface walkways to connect the field office structures to one another and to site entry or exit.
- 2.4.3 The Contractor shall provide field office(s) and storage sheds/trailers/accommodations as necessary for the major subcontractors to adequately perform their respective work.
 - 2.4.3.1 All storage sheds/trailers shall be secure and weather tight for the storage of tools and all materials, which may be damaged by the weather. All storage sheds floors shall be raised at least 6 inches above grade.
- 2.4.4 Contractor's Temporary Field Office:
 - 2.4.4.1 The Contractor shall coordinate and direct the work of the Project from the Project site.
 - 2.4.4.2 The Contractor shall provide and maintain at least one temporary field office that is adequately staffed, furnished, and equipped.
 - 2.4.4.3 Conference areas shall include at least one primary area suitable for up to 15 persons to participate in Project progress and coordination meetings. The walls of this conference area are to serve as display surfaces for maintaining current project photos, color boards, prints of project schedules, work placement plans, etc.
- 2.4.5 Owner's Temporary Field Office(s)
 - 2.4.5.1 **The Contractor will not provide a temporary field office for Owner. The Owner has a permanent Edinburg Campus field office located at the corner of Elizabeth and Shunior Road.** The Contractor shall provide utility costs for heating, cooling, and janitorial service for the duration of the project from the Notice to Proceed for Construction to at least Substantial Completion.
 - 2.4.5.1.1 The permanent office shall include provisions for telephones, facsimile machines, Internet connection services, conference area(s), and maintenance of all Project files.
 - 2.4.5.2 The Contractor shall provide Internet connectivity at a minimum of 20 megabits per second

(Mbps) for offices of 1-9 OFPC employees (40 Mbps for offices of 10-19 OFPC employees, and so forth). The prescribed minimum connection speed applies to both upstream and downstream directions, and must not be shared with other entities (e.g., contractor computers) or devices such as telephones (excluding OFPC telephones). Where such sharing is necessary, additional bandwidth must be provided so that the prescribed minimums for OFPC employee computers are met. Connectivity must be provided in the form of a 10/100-base-T Ethernet handoff. For offices of at least 5 OFPC employees a single static IP from the ISP is required, which will be used with a UT System-provided router and switch to provide seamless connectivity to the UT System network via an IPSEC tunnel. For offices of 1-4 OFPC employees it is acceptable to have the ISP provide DHCP IP's directly to OFPC computers, in which case an Ethernet switch with at least 4 user ports shall be provided by the contractor, and OFPC employees will use UT System-provided tools (e.g. software VPN, terminal server, Outlook Web Access, etc.) to provide connectivity to the UT System network. In addition, the Contractor shall provide wireless connection services for the Owner anywhere within the project construction fence using wireless router(s) and other equipment conforming to the 802.11n standard as set by IEEE or the most currently available wireless standard.

2.4.5.3 The Contractor shall provide the following additional office and technology equipment as approved by the Owner:

2.4.5.3.1 The Contractor will provide one new digital copier/scanner/networked printer (115 volt / 15 amp) with a minimum copy speed of 30 pages per minute, automatic document feeder, auto duplex, collator, two standard paper trays (one of which supports 11 inches x 17 inches paper), scanner (including pdf, tiff, jpg file formats), and fax with monthly service agreement, including supplies, paid by the Contractor. Contractor will also provide a wireless (Wi-Fi enabled) color printer, scanner, and copier capable of printing up to legal size documents from mobile devices (IPad/iPhone). Cartridges for printer shall be separate black, and individual color cartridges (not combined) Printer shall be maintained for duration of work and through final completion (2 months after substantial completion). Maintenance to include paper, and print cartridges as needed.

2.4.5.3.1.1 Printer capability shall include black & white and color printing; minimum print speed of 26 ppm black & white; scan with a minimum of 1200 x 2400 dpi scan resolution; and 600 dpi black and white and 4800 x 1200 dpi color printing capability.

2.4.5.3.2 One new digital camera equipped with at least 12-megapixel resolution, 6x optical zoom (or greater), viewfinder (3") for daylight photos, flash, case, and min 32 gigabytes and 4 gigabytes of storage space.

2.4.5.3.3 Three office telephones, each equipped with voicemail

2.4.5.3.4 Contractor shall also provide 2 mobile wireless hot spots (min 4g or better) for internet connectivity in the field. Provider shall vary contingent on region and best available coverage. Resident Construction Manager to advise as to compatibility for region. Service shall be provided and maintained for the duration of the work and extend to Final completion of the work (approx. 2 months beyond substantial completion). Provide devices and all necessary accessories for charging and storage.

2.4.5.4 The Contractor shall provide (2) IPAD Pro, IOS 11, 10.5 inches, with pen accessory and life proof case.

2.4.5.5 The Contractor shall provide weekly janitorial services for Owner's temporary field office(s), including supplying and servicing of toilet facilities.

2.4.5.6 The Contractor shall provide and maintain a coffee station in the Owner's permanent field office, including supplying all consumables.

2.4.5.7 The Contractor shall supply all transitory supplies for the Owner's permanent field office, including all office supplies.

2.4.5.7.1 The Contractor shall provide an always-on broadband internet connection capable of at least 5 megabits per second simultaneously in both upstream and downstream directions, with a 10/100-base-T Ethernet handoff connection for UT System Administration networking equipment if applicable. Where applicable contractor will also provide internet service in the form of one routable statically-assigned IP address with no restrictions placed on types of traffic passed and a secure location for a network device with access to power and the network.

2.4.5.7.1.1 For Information Only: Once Internet connectivity is established, the UT System Administration – Office of Technology and Information Systems (OTIS) will provide a method for employees to connect to the UT System network. Software, router-to-router, or site-to-site VPN will be used depending on the needs of employees and any limitations imposed by the ISP (this may be a commercial Internet Service Provider or a UT System institution). OTIS will provide, install and support standard configuration desktop or laptop devices as required by the Owner's personnel officing on site. These machines will comply with UT System UTS165 Information Resources Use and Security Policy (<http://www.utsystem.edu/policy/ov/uts165.html>) and the Information Resources Security Operations Manual of UT System Administration (<http://www.utsystem.edu/systempolicies/infosecurityoperationsmanual.pdf>).

2.4.5.7.2 For a construction trailer with more than 10 people, provide at least 10.0 megabits per second simultaneously in both upstream and downstream directions.

2.5 PROJECT FENCING

2.5.1 The Contractor and Subcontractors shall confine their activities to the Project Site and in no way obstruct any other part of the campus or utilize any campus facilities for any purpose.

2.5.1.1 Upon mobilization, the Contractor shall build a substantial wire mesh fence at least 6 feet high with top rails as shown on the Site Plan, completely surrounding the site. Posts shall be placed not more than 8 feet apart and securely set in the ground. Wire mesh shall be tightly stretched over the supports and attached at the top rail.

2.5.1.2 The Project site fencing shall include Emergency Service and trucking gates in locations shown on the Site Plan. The gates shall be hung with heavy strap hinges and hasps for locking. Fences and gates shall be properly maintained until Substantial Completion, and only removed with concurrence from the Owner.

2.6 PROJECT SIGNAGE

2.6.1 The Contractor shall construct and erect one Project sign on the Project site in a location designated by the Owner. The sign shall be constructed as instructed by the Owner. Refer to Attachment "B."

2.6.2 The Contractor shall submit a ¼" = 1'-0" scale shop drawing of the sign, including all lettering, to the Owner for approval prior to installation. The sign shall remain the property of the Owner. Upon project completion, the Contractor shall remove the sign and deliver it to a location designated by the Owner.

2.6.3 Additional Contractor or Subcontractor signs or advertisements shall not be permitted without the Owner's written approval. Corporate logos and artwork are prohibited.

2.7 TEMPORARY PROJECT WATER

2.7.1 The Contractor shall provide temporary lines for all water required during the Project and shall make

arrangements with the Owner's Utility Department for water service. This shall include all means of conveying and the necessary metering devices. In lieu of temporary connections, the Contractor may make permanent connections and such may serve for the construction period.

2.7.2 In the event water is not available at the Project site from the Owner's existing distribution system, the Contractor shall negotiate with the local distributor for water and pay all fees and rates required by the local Water Department.

2.7.3 The Contractor shall pay all costs related to providing and installing temporary construction water, except water utility charges (if Owner-provided).

2.8 TEMPORARY PROJECT POWER AND LIGHTING

2.8.1 The Contractor shall make arrangements with the local Utility Company for temporary construction power. If power is available only through the Owner's system, the Contractor shall provide metering equipment and extend temporary power to the site, even if the monthly consumption is paid by the Owner. The Contractor may energize the permanent power system in the building only with prior written approval from the Owner. The Contractor shall provide adequate ground fault interruption (GFI) protection and a main disconnect panel at the point of connection to the Owner's system.

2.8.2 The Contractor shall provide adequate lighting about the site for security, inspections of excavations, and if night shift work occurs. The Contractor shall also provide adequate temporary interior lighting throughout the building enclosure to facilitate quality workmanship and appropriate inspection conditions.

2.8.3 The Contractor shall pay all costs related to providing and installing temporary construction power and lighting, except electric utility charges (if Owner-provided).

2.9 TEMPORARY PROJECT MECHANICAL SERVICES

2.9.1 If temporary heat is required for the installation or protection of the work, the Contractor shall provide heating and proper ventilation in such a manner that no work shall be damaged.

2.9.2 After the mechanical equipment has been connected to the local chilled water and steam distribution systems, the equipment may be operated by the Contractor to heat and cool the building if automatic controls have been activated to limit thermal usage as deemed acceptable to the Owner.

2.9.3 During operation of the mechanical equipment, prior to achieving Substantial Completion, the Contractor shall keep the mechanical equipment in good operating condition, properly maintained, including cleaning and changing of all filters. New, non-construction filters shall be installed prior to the Owner's acceptance of the mechanical equipment. The warranty period for the equipment shall start on the Substantial Completion date.

2.9.4 The Contractor shall pay for all costs related to temporary project mechanical services.

2.10 TEMPORARY PROJECT PARKING

2.10.1 If available, parking within the Project site shall be at the Contractor's discretion, however, at least two (4) marked dedicated parking spaces shall be provided for the Owner's Designated Representative and Construction Inspector at the Project site.

2.10.2 The Owner will not provide Project parking.

2.10.3 The Owner will provide/share approximately **150** parking spaces located at the North end of the campus at no cost to the Contractor.

2.10.4 Owner-provided parking is for the convenience of the Contractor with the understanding that the

Contractor is responsible for all workers and vehicles while they are on campus.

2.10.5 The Owner may remove or revoke such convenience at any time, for any reason.

PART 3 – EXECUTION

3.1 PROJECT PARTNERING

3.1.1 The Owner desires to create a cohesive team for this project, to include all primary parties. The Contractor and its primary Subcontractors shall join the Owner and the rest of the Project Team in project "Partnering" as a means of achieving success. The Partnering process is voluntary and the Owner and Contractor shall equally share all costs with no impact to the Construction Contract price. The results of the workshop are not legally binding, but do represent a commitment by the parties to work together cooperatively toward common goals.

3.2 CONTRACTOR SITE ACCESS AND LIMITS OF CONSTRUCTION

3.2.1 Prior to any site activity on CSP projects, during Design Development phase on CM/DB projects, and prior to execution of the first GMP, the Contractor shall submit a draft Site Utilization Plan (1" = 30'-0" scale, or larger) showing proposed location of temporary fencing, lay down area, temporary trailers, stabilized construction entrance(s), cranes, signage, parking, temporary utilities, field offices, size and arrangement of spaces, site control points, and utility tie-in locations, dumpster, sidewalk and/or parking space closures, and truck routes in/out of site for Owner review and approval. The Plan must clearly show location and dimension of gates indicating proposed entry circulation and egress sufficient for fire and other emergency vehicles. Give adequate consideration for safe and accessible pathway at perimeter of fencing, and provide signage indicating "Detour," "Dead End," or other messages as appropriate. On CMR/DB projects, the approved site utilization plan will be included in the documents that are the basis for the GMP.

3.2.2 All project personnel shall confine and limit their work and use of the Project site to those areas within the defined limits of construction. All public and university rules, laws, and requirements shall be obeyed and enforced by the Contractor. No tools, construction vehicles, or construction material shall be permitted beyond the Project site limits of construction.

3.2.3 All campus roads, drives, and fire lanes as well as all sidewalks and pedestrian routes, other than those specifically indicated to be in the Contractor's area of control, must be kept open at all times. The Contractor shall make advance preparations for, and obtain security clearance for, all significant material deliveries and truck traffic, cranes, concrete trucks, etc., through the campus to the project site.

3.3 ON-GOING CAMPUS OPERATIONS

3.3.1 The Project is surrounded by and/or adjacent to continuously functioning campus facilities, including academic and research efforts. The Contractor shall make every effort to avoid disruptions to ongoing campus activities and to maintain a safe environment for students, faculty, and staff in the areas adjacent to the project.

3.3.2 Campus utilities must not be interrupted except when scheduled and approved in advance by the Owner with appropriate campus technical staff.

3.3.3 Any necessary disruption of campus utilities must be scheduled at least five work days in advance through established procedures with campus technical staff. The Contractor shall not activate or de-activate any campus system, or component of any such system, without written direction from the Owner.

- 3.3.4 Equipment locations and timing or sequence of work operations shall be coordinated so as to not conflict with the Owner's continuing use of adjacent buildings and/or create any interference with scheduled meetings or events.
- 3.3.5 The use of the campus' sanitary facilities by the Contractor, or any of the construction workers, is prohibited.
- 3.3.6 Preventable False Fire Alarms that occur during the execution of the work may be subject at the discretion of the Owner to a service charge of \$1,500 per occurrence to be deducted from the CM/R's or D/B's construction phase fee. For CSP projects, this charge will be deducted from the Contractor's contract amount. A Root Cause Analysis (RCA) shall be prepared and used to determine the cause of the alarm and the service charge will be assessed when the findings indicate the alarm was preventable and directly attributable to actions or inaction of the CM/R/Contractor or the subcontract workforce under their direction.

3.4 CONTRACTOR'S RESPONSIBILITY OF THE PROJECT WORKFORCE

- 3.4.1 The Contractor is responsible for the actions of the entire Project workforce, including subcontractors' and suppliers' employees, whenever they are on the campus. Responsibilities may include identification badges for workers, busing of workers from remote parking lot(s), written and verbal reminders to workforce of appropriate behavior and avoidance of campus facilities. Established access and egress routes for vehicular and pedestrian traffic are required, as a minimum, in order to maintain control of the work force.
 - 3.4.1.1 Failure to obtain parking permits, or traffic violations while on campus may lead to cancellation of any Owner provided parking.
 - 3.4.1.2 The Contractor shall demonstrate the plan for controlling the workforce at all times, while on campus. Unacceptable behavior on the part of a worker anywhere on campus, including parking lots, the Project site, and the accessing route(s) through the site through the campus shall be the responsibility of the Contractor.
 - 3.4.1.2.1 Harassment of any person, whether student, faculty, staff, or visitor to the campus, is strictly forbidden. Harassment includes any action such as jeering, whistling, calling-out, staring, snickering, making rude or questionable comments, or similar behavior. Identifiable offending worker(s) shall be permanently removed from the Project.

3.5 PROJECT SECURITY

- 3.5.1 The Contractor is responsible for security of the Project, including site access and exiting. Campus police will not provide security for the Contractor's (or subcontractor's) areas or personnel.
 - 3.5.1.1 The Contractor may employ unarmed security personnel for the Project.
 - 3.5.1.2 The Contractor shall provide a full-time site access monitoring system for the duration of the project
 - 3.5.1.3 Canine and other forms of animal security and enforcement are prohibited on the Project site.
 - 3.5.1.4 The Owner may reduce or withhold payment to the Contractor, if deemed necessary, until adequate Project security is in place.

3.6 PROTECTION OF WORK

3.6.1 The Contractor and every Subcontractor shall properly and effectively protect all materials and equipment furnished during and after installation. Building materials, contractor's equipment, etc., may be stored on the premises, but the placing of it shall be within the construction fence. When any room in the building is used as a shop, storeroom, etc., the Contractor shall be held responsible for any repairs, patching, and cleaning arising from such use. The Contractor shall protect and be responsible for any damage to its work or material, from the date of the agreement until the final payment is made, and shall make good without cost to the Owner, any damage or loss that may occur during this period. All material affected by weather shall be covered and protected to keep free from damage while being transported to the site and while stored on the site.

3.6.1.1 During the execution of the Work, open ends of all piping, conduit, ductwork, and all openings in equipment shall be capped and sealed prior to completion of final connections, so as to prevent the entrance of foreign matter.

3.6.1.2 All heating, ventilating, plumbing, and electrical equipment shall be protected during the execution of the Work.

3.6.1.3 All plumbing fixtures shall be protected and covered so that no one can use them. All drains shall be covered until placed in service to prevent the entrance of foreign matter.

3.6.1.4 Trees and shrubs, within the Project site assigned to be saved and maintained, shall be protected by the Contractor with strong open slat fences at least six (6) feet high, completely surrounding the perimeter of the drip line, maintained in sound condition until permission is given for removal. The Contractor shall not remove, cut, or trim any trees or shrubs without the Owner's written approval, unless specifically identified to be removed on the Construction Documents.

3.7 PROJECT SURVEYING

3.7.1 The Contractor shall employ an experienced and competent licensed Professional Surveyor to establish at least three separate permanent benchmarks and shall maintain easy access during the progress of the Work, in order to determine and verify the lines and grades. As the Work progresses, the Contractor shall establish additional and easily accessible benchmarks at each level referenced to first floor finish floor line.

3.7.1.1 Level or Transit: The Contractor shall maintain an accurate level or transit at the site at all times. This instrument shall be used to verify lines, grades, etc., and shall be available at all times for use by the Architect/Engineer and the Owner. A level shall be used to layout all work and shall be used by operators skilled in its use.

3.7.1.2 The Contractor shall erect and maintain substantial and braced batter boards at all corners of structures, set their location to provide proper working clearance and verify that they are level and at the proper grade.

3.7.1.3 As the Work progresses, the Contractor shall lay out partitions on the floor in exact locations as a guide to all contractors and trades.

3.7.1.4 Before ordering any materials or doing any work, the Contractor shall verify and be responsible for the correctness of all measurements. No extra charge or compensation shall be allowed on account of difference between actual dimensions and the measurements indicated on the Drawings. Any differences, which may be found, shall be submitted to the Architect/Engineer for consideration before proceeding with the Work.

3.8 TEMPORARY SHORING

- 3.8.1 All temporary shoring required for the installation of work shall be included in this Contract and the Contractor shall assume all responsibility for this work and make good any damage caused by improper supports or failure of shoring in any respect. Any provisions that are installed to assure the stability of adjacent structures, trees, roadways, or infrastructure, shall be in accordance with engineered plans (provided by the Contractor).

3.9 CUTTING AND PATCHING OF SLEEVES

- 3.9.1 The Contractor shall consult with the Project Architect/Engineer prior to the commencement of any cutting and/or patching of sleeves, holes, or openings in the execution of the work.
 - 3.9.1.1 Excessive cutting of the structure that is not shown in the contract documents shall not be permitted, nor shall any piers or other structural members be cut without the written approval of the Project Architect/Engineer. After such work has been installed, the Contractor shall carefully fit around, close up, repair, patch, and point-up as directed by the Project Architect/Engineer.
 - 3.9.1.2 All cutting and patching of sleeves shall be done carefully, with proper tools by qualified workers, at no additional cost to the Owner. The Contractor or Subcontractor shall build into the work, as indicated on the plans and/or specifications, any and all items furnished by others. Cutting and repairing of work in place, as a result of negligence by the Contractor, shall be completed at no cost to the Owner.
 - 3.9.1.3 The work performed within each section of the Specifications, unless otherwise indicated in the plans and/or specifications, includes all cutting, patching, and digging for work in that trade section required for proper accommodations of work of other trades. Execute such work with competent workers skilled in trade required for restoration.
 - 3.9.1.4 The Contractor shall provide sleeves for all service lines, including piping, ductwork, and conduit covered in their scope of work, which may pass through walls, roof, or floors.

3.10 HAZARDOUS MATERIAL ABATEMENT

- 3.10.1 The Contractor shall abate hazardous materials located within the limits of construction as identified in the Drawings and Specifications.
- 3.10.2 Should the Contractor discover unforeseen hazardous materials (e.g., asbestos, lead, mold), the Contractor shall stop work, properly seal off the affected area, and immediately inform the ODR and the campus' Environmental Health & Safety office. The Contractor shall make provisions to abate the hazardous materials (i.e., the Owner will not abate the hazardous materials). The Contractor shall ensure that the mandatory Texas Department of State Health Services notification is promptly initiated or amended as appropriate. If lab tests confirm the presence of hazardous materials, the Contractor shall not resume the non-hazardous material-related work in the affected area until the hazardous material has been removed by a licensed abatement subcontractor, and the licensed hazardous materials consultant confirms that the abatement is complete.
- 3.10.3 The Contractor shall ensure that Texas Department of State Health Services licensed individuals, consultants, or companies are used for any required hazardous materials work including inspection, abatement plans/specifications, abatement, project management, and third-party monitoring.

3.11 CERTIFICATION OF NO ASBESTOS CONTAINING MATERIALS OR WORK

- 3.11.1 The Contractor shall provide a certification statement, included with each materials submittal, stating that no asbestos containing materials or work is included within the scope of the proposed submittal.

- 3.11.2 The Contractor shall provide at Substantial Completion, a notarized affidavit to the Owner and the Architect stating that no asbestos containing materials or work was provided, installed, furnished, or added to the Project.
- 3.11.3 The Contractor shall take whatever measures necessary to ensure that all employees, suppliers, fabricators, material handlers, subcontractors, or their assigns, comply with this requirement.
- 3.11.4 All materials used on this Project shall be certified as non-Asbestos Containing Building Materials (ACBM). The Contractor shall ensure compliance with the following acts from all Subcontractors:
 - 3.11.4.1 Asbestos Hazard Emergency Response Act (AHERA—40 CFR 763-99 (7))
 - 3.11.4.2 National Emission Standards for Hazardous Air Pollutants (NESHAP—EPA 40 CFR 61, National Emission Standard for Asbestos
 - 3.11.4.3 Texas Asbestos Health Protection Rules (TAHRP—Tex. Admin. Code Title 25, Part 1, Ch. 295C, Asbestos Health Protection)
- 3.11.5 The Contractor shall provide a notarized statement from all subcontractors that no ACBM has been used, provided, installed, furnished, added to, or left on the Project.
- 3.11.6 The Contractor shall provide, in hard copy and electronic form, all necessary material safety data sheets (MSDS) of all products used in the construction of the Project to the Texas Department of State Health Services licensed inspector. The contractor shall provide a person appropriately licensed in accordance with the provisions of the Texas Administration Code, Title 25, Part 1, Ch. 295C, and compile the information from the material safety data sheets of all products used in the construction or renovation, and finding no asbestos in any of those products, prepare a signed written certification that he has reviewed the MSDSs for all products used in the construction and that none of those products contain ACBM and; therefore, the building materials do not contain asbestos.
- 3.11.7 At Final Completion the Contractor shall provide a notarized certification statement per TAC Title 25 Part 1, Ch. 295.34, par. c.1 that no ACBM was used during construction of the Project.

PART 4 – SUBSTANTIAL COMPLETION

4.1 ELECTRONIC O&M MANUALS & RECORD DOCUMENTS

- 4.1.1 Prior to Requesting Substantial Completion, and as a prerequisite thereto, and prior to submitting Application for Payment including release of any sums held as retainage, and in lieu of the following requirement in UGC 6.2.5 to:
 - 4.1.1.1 *“...provide one (1) reproducible copy and one (1) electronic media copy in a format acceptable to the ODR of all Record Documents, unless otherwise required by the Owner’s Special Conditions”*
 - 4.1.1.2 Contractor shall provide instead, in electronic format as specified herein, all Operating and Maintenance manuals, approved submittals, shop drawings, warranties, certificates, test reports, record documents, commissioning documentation and other items as required by the contract. This requirement is in addition to hardcopies of these documents and all other submittals required elsewhere in the contract, except as specifically stipulated herein.
- 4.1.2 All small format (11" x 17") or smaller photographs, cut sheets, sketches, instructions, diagrams & graphical literature shall be scanned at a resolution of at least 300 DPI to produce sufficient

quality to allow zoom features and readable prints. Color charts or other documents where color is required to convey full information shall be scanned in color. Color line drawings shall be scanned at 200 DPI to avoid excessive file size.

- 4.1.3 All documents shall be scanned into a single file in current version of Adobe PDF format with expandable indexed file structure organized according to current CSI format and shall conform to AIA standards, bookmarked to at least Division and Section level and searchable by keyword. Verify that all pages on every document have been scanned. Review each page to ensure scan captures original detail. If images appear too dark or too light, or smudged, rescan to ensure proper image quality & legibility.
- 4.1.4 Proper labeling must appear on the disk and jewel case to include the Owner's Name (Institution), Project No & Title, Contents of CD / DVD (O&M Record Documents DIV 1- 33), the Sequence Number of the disk if part of a multi-disk set (i.e. DVD 1 of 3) and the Archive Date. CD/DVD must be inkjet printable not using adhesive labels which can delaminate and gum up reader mechanism.
- 4.1.5 Prior to final submission, (2) two preliminary sets shall be provided for review and approval: One set for Project Architect/Engineer (AE) to review for completeness and accuracy, and one for Facilities Management (FM) to review for conformance to format and file structure as stated herein. Upon acceptance by Project AE and FM, provide **(7) seven** sets of CD-ROM's or DVD's.
- 4.1.6 This requirement in no way modifies or alters other requirements of UGC 6.2.1 through 6.2.4 or in any way diminishes contractor's responsibility therein defined regarding the requirements prior to requesting Substantial Completion.

PART 5 – DELETED/NOT USED

Part 6 - Background Criminal Checks (BCC)

- 6.1 The Owner has elected to implement a mandatory requirement for Criminal Background Checks for all Construction Managers' personnel, subcontractors, and tiered subcontractors performing work associated with this contract. All background checks will be implemented and all personnel must be approved prior to enrolling in ROCIP. Background checks will be performed by:

FC Background, LLC

Melanie Laird, Executive Vice President (214) 306-8210 (Direct)

melanie.laird@fcbackground.com www.fcbackground.com

It shall be the Construction Managers responsibility to contact FC Background to determine the cost for the required criminal background check for all employees, pass or fail, used to provide manpower for this project. All associated costs are to be included in general conditions submitted. The minimum requirements shall be based on submission of the following records search:

- Search of the Texas DPS's Statewide Criminal Records Database
- SSN verification/ID trace
- Photo ID badge
- IF additional addresses outside TX are identified from the ID trace, FC Background will order the record from the national database called the MJS, additional costs per worker will be assessed beyond the original BCC fee. If either search results in records found, FC Background will order the record directly from the issuing agency for a supplemental cost per jurisdiction. Verifying these records identified on database searches is standard

p r o t o c o l in the industry.

- 6.2 Covered employees: All employees of a contractor who have or will have continuing duties related to the service to be performed at the UT System institution ("UT") and have or will have direct contact with UT employees, patients or students ("U.T. community"). UT will be the final arbiter of what constitutes direct contact.

6.3 Contractor Criminal Background Check Certification

- 6.3.1 Covered employees: All employees of a contractor who have or will have continuing duties related to the service to be performed at the UT System institution ("UT") and have or will have direct contact with UT employees, patients or students ("U.T.community"). UT will be the final arbiter of what constitutes direct contact.

6.3.2 Disqualifying Offense:

6.3.2.1 All Jobs

A felony conviction or pending felony case involving any of the following:

Offenses against the Person(Title V of the Texas Penal Code (includes murder, capital murder, manslaughter, unlawful restraint, kidnapping, aggravated kidnapping, smuggling of persons, trafficking of persons, sexual offenses, assaultive offenses); offenses involving violence; an offense for which a defendant is required to register as a sex offender under Chapter 62, Texas Code of Criminal Procedure; offenses involving the possession, transfer, sale, or distribution of or conspiracy to possess, transfer, sell, or distribute a controlled substance, as defined by Chapter 481, Texas Health and Safety Code, or by 21 U.S.C. Section 801 et seq.; offenses involving weapons; offenses against property such as Texas Penal Code, Chapters 28 (Arson, Criminal Mischief, and Other property Damage or Destruction), 29 (Robbery), 30 (Burglary and Criminal Trespass), and 31(Theft).

A misdemeanor conviction or pending case within the last 7 full calendar years of the date of assignment as a covered employee involving any of the following:

Assaultive offenses punishable as a class A misdemeanor; drug offenses punishable as a class A misdemeanor; weapons; theft;

Any conviction, deferred adjudication or pending case for an offense that would require the individual to register as a sex offender

An equivalent offense to any of those above under federal law or the laws of another state.

6.3.2.4 Jobs Involving Equipment Operation

A felony conviction or pending felony case involving operation of a motor vehicle and drugs or alcohol

A misdemeanor conviction or pending misdemeanor case within the last 7 full calendar years of the date of assignment as a covered employee involving operation of a motor vehicle and drugs or alcohol.

6.3.2.5 Jobs involving Chemicals –Offenses Involving Crimes against the U.S. Government or Damage to the Environment

6.3.2.5.1 Required Criminal Background Information: Contractor will at a minimum perform a criminal background search to obtain criminal background information within the last 7 full calendar years of the date of assignment as a covered employee. Contractor will at a minimum perform:

A social security number trace/ID trace; A Texas DPS Statewide Criminal Records Database search; For each individual who has resided outside Texas, a database search of the applicable jurisdiction.

SAMPLE SUBCONTRACTOR NOTIFICATION LETTER

RE: CRIMINAL HISTORY CLEARANCE PROCEDURES

Dear Subcontractor,

We are going to begin using a 3rd party company to conduct Background Checks and issue clearance badges for the UTRGV - Science Building, Edinburg. The company performing these reviews will be FC Background.

All employees on site or personnel who will be on site at any time need to be submitted using the new process as outlined below:

Attached are the Spanish and English versions of the Consent Document to be filled out by each employee. Once completed, please fax the form to 972-404-4415 or email to: customer.support@fcbackground.com. (This information is located in the upper section of the Consent Document).

As more are scheduled, they will also need to be forwarded before beginning work. A badge and badge number will be issued to each employee upon clearance. Please be sure to check the appropriate box regarding whether or not the person being submitted will be required to operate equipment.

Your company "Branch Code" for the new independent monitoring service with FC Background will be:__. Write this code in the space next to your company name at the top.

To assist with your selection of crew, I have also attached the criteria required of the owner by which your employees will be judged. The Criteria Certification form must be signed and returned to me.

If you have questions regarding this process, please call me at (XXX) 123-4567 or email me at XXXX@xxx.

Sincerely,

Name, Title

Company



Interdisciplinary Engineering and Academic Studies Building

Consent and Notification Document

Client Code:	Branch Code: See Below	Service Code:
Company Name: _____		Branch Code: _____
Equipment Operator (REQUIRED): <input type="checkbox"/> YES (SPAWA) <input type="checkbox"/> NO (SPAWB)		
Employer: Fax back to 972-404-4415 or email to customer.support@fcbackground.com		

contractor requires FC Background perform a background investigation and drug test on each subcontractor working on their University of Texas – Pan Am project(s). FC Background, LLC, is a Texas licensed, Private Investigations Agency, and may verify certain information provided by you on this document. The information requested below is necessary to complete this task. This information is NOT intended to be part of the application for employment and will be used for the sole purpose of verification of information, and/or statements made by you.

PLEASE PRINT LEGIBLY – ALL INFORMATION IS REQUIRED

LEGAL NAME:		
Last Name	First	M.I.
SOCIAL SECURITY NUMBER:		
CURRENT ADDRESS:		
Street	City/State	Zip
DATE OF BIRTH:		CELLPHONE # (if no cell, home):
Month/Day/Year		
DRIVER'S LICENSE #:		STATE OF ISSUANCE:
LIST ALL PRIOR ADDRESSES (CITY & STATE):		

CONSENT: I understand and agree that FC Background, LLC may verify information provided on this consent document if requested by contractor. I understand that this verification may include any inquiry into my social security number, motor vehicle driving record, criminal and civil records, as well as other public record information. I authorize the release of such information as may be necessary to verify the information I have provided. I release and hold harmless from all liability any individual or entity requesting or supplying information.

I further understand that FC Background has developed the WorkerCheck Program whereby subjects will be screened and the results measured in accordance with certain agreed upon minimum standards. Subjects meeting the minimum standards will be enrolled in the WorkerCheck Program. Participants will be issued an ID Badge bearing the person's digital photo, logos of contractor and WorkerCheck, the employer's name, and a Confirmation number. FC Background will maintain a web site where your employer and the district's authorized agents can enter the Confirmation number and view a digital photo of the subject and the dates and results of the drug test and/or background screen. I understand and agree to the following:

1. My picture may be used for identification purposes. My picture and name may appear on the WorkerCheck website.
2. Results may be shared with contractor upon request.
3. I may be re-screened periodically for purposes of continued participation in the WorkerCheck Program.
4. If at any time during participation, I fail to meet the established minimum standards, my participation in the WorkerCheck Program may be suspended or eliminated.
5. In the event my participation in the Worker Check Program is suspended or terminated I will immediately return the photo ID badge to my employer, FC Background or a district's authorized agent.

It is possible that your eligibility for worksite access may be determined in whole or in part by your employer using data from a report supplied by FC Background, LLC, Dallas, TX. Pursuant to Section 609 of the Fair Credit Reporting Act, you may be entitled to a copy of this report.

SIGNATURE: _____	DATE: _____
------------------	-------------

www.fcbackground.com | www.workercheck.com



Interdisciplinary Engineering and Academic Studies Building
Consent and Notification Document

Client Code: SPAWG	Branch Code: See Below	Service Code: SPAWG
Company Name: _____		Branch Code: _____
Equipment Operator (REQUIRED): <input type="checkbox"/> YES <input type="checkbox"/> NO		
Employer: Fax back to 972-404-4415 or email to customer.support@fcbackground.com		

Contractor FC Background realizar una prueba de investigacion de drogas y antecedentes de cada subcontratista y proveedor trabajando en sus proyectos **University of Texas – Pan Am**. FC Background, LLC es una licencia en Texas Agencia, Investigaciones Privadas, y puede verificar cierta informacion que usted proporcione en este documento. La informacion solicitada a continuacion es necesario para completar esta tarea. Esta informacion no tiene la intencion de ser parte de la solicitud de empleo y se utilizaran con el unico fin de verificar la informacion y/o declaraciones hechas por usted.

ESCRIBA EN MOLDE – SE REQUIERE TODA LA INFORMACION

EL NOMBRE LEGAL:			
Apellido	Nombre	Segundo Nombre	
NUMERO DE SEGURO SOCIAL:			
DIRECCION ACTUAL:			
Número	Calle	Ciudad/Estado	Código Postal
FECHA DE NACIMIENTO:		NUMERO DE CELULAR (si no de casa):	
Mes/Día/Año			
NUMERO DE LICENCIA:		ESTADO DE EMISIÓN:	

**LISTA DE TODAS LAS DIRECCIONES
ANTERIORES (CIUDAD Y ESTADO):**

CONSENTIMIENTO DEL SOLICITANTE: Entiendo y estoy de acuerdo que FC Background, LLC verificará todo o parte de la información que yo he dado a Contractor Entiendo que esta verificación puede incluir cualquier investigación de mi seguro social, mi registro de conducir un automóvil, mis registros criminales y civiles, así como otra información de registro pública. Yo autorizo la liberación de tal información que sea necesario para verificar la información que yo he proveído. Yo libero y eximo de toda responsabilidad cualquier individual o entidad que solicita o suministra información.

Entiendo, además, que mi empleador/empleador prospectivo y FC Background han desarrollado en el Programa de WorkerCheck según lo cual los solicitantes y empleados serán investigados y los resultados serán medidos en acuerdo con ciertos estándares mínimos convenidos. Empleados que satisfacen estándares mínimos se inscribirán en el Programa de WorkerCheck. Participantes recibirán una insignia de identificación con la foto digital de la persona, logotipos ambos de Contractor y WorkerCheck, el nombre del empleador y un número de Confirmación. FC Background mantendrá un sitio web donde el empleador de usted y agentes autorizados pueden entrar el número de Confirmación y ver una foto digital del empleado y las fechas y resultados de la comprobación de trasfondo. Yo entiendo y estoy de acuerdo con el siguiente:

1. Mi foto puede ser usada con el proposito de identificacion. Mi foto y nombre puede aparecer en el sito web de WorkerCheck.
2. Los resultados de la verificación pueden ser expedidos al Contractor
3. Puedo ser reinvestigado periódicamente para el propósito de mi participación continuada en el Programa de WorkerCheck.
4. Si en cualquier momento durante mi participacion, no cumplo con los requisitos establecidos, mi participacion puede ser suspendido o eliminado el en WorkerCheck Program.
5. Tal como resultó después mi participación en el Programa de WorkerCheck es suspendida o eliminada, devolveré inmediatamente la foto insignia de ID a mi patrón o su representante autorizado.

Es posible que su elegibilidad de acceso al sitio de trabajo puede ser determindao en total o en parte por su empleador usando los datos de un informe suministrado por FC Background, LLC.

FIRMA: _____	FECHA: _____
---------------------	---------------------

www.fcbackground.com | www.workercheck.com

CRITERIA CERTIFICATION FORM

On behalf of _____ ("Contractor"), I certify that [check one]

☐ None of the Contractor's employees are covered employees, as defined above.

Or

☐ Some or all of Contractor's employees are covered employees. If this box is selected, I further certify that:

(1.) Contractor has obtained all required criminal record information, through FC Background, regarding its covered employees. None of the covered employees has a disqualifying offense. Contractor has taken reasonable steps to ensure that its employees who are not covered employees do not have continuing duties related to the contract services or direct contract with UT community.

(2.) If Contractor receives information that a covered employee has a disqualifying offense, Contractor will immediately remove the covered employee from contract duties and notify UT in writing within three (3) business days.

(3.) Upon request, Contractor will make available for UT's inspection the criminal background information of any covered employee. If UT objects to the assignment of a covered employee for any reason, Contractor agrees to discontinue using that covered employee to provide services at UT.

(4.) Noncompliance by Contractor with this certification may be grounds for contract termination.

Company Name: _____/Submitter's Name/Title _____

Email Address: (PLEASE TYPE EMAIL ADDRESS) _____

Submitter's Signature: _____ Telephone No. _____

Fax No. _____ Date: _____

Address: _____ City, State, and Zip Code: _____

SAMPLE SUBCONTRACTOR NOTIFICATION LETTER

RE: CRIMINAL HISTORY CLEARANCE PROCEDURES

Dear Subcontractor,

We are going to begin using a 3rd party company to conduct Background Checks and issue clearance badges for the UTRGV - Science Building, Edinburg. The company performing these reviews will be FC Background.

All employees on site or personnel who will be on site at any time need to be submitted using the new process as outlined below:

Attached are the Spanish and English versions of the Consent Document to be filled out by each employee. Once completed, please fax the form to 972-404-4415 or email to: customer.support@fcbackground.com. (This information is located in the upper section of the Consent Document).

As more are scheduled, they will also need to be forwarded before beginning work. A badge and badge number will be issued to each employee upon clearance. Please be sure to check the appropriate box regarding whether or not the person being submitted will be required to operate equipment.

Your company "Branch Code" for the new independent monitoring service with FC Background will be: _____. Write this code in the space next to your company name at the top.

To assist with your selection of crew, I have also attached the criteria required of the owner by which your employees will be judged. The Criteria Certification form must be signed and returned to me.

If you have questions regarding this process, please call me at 956-535-2350 or email me at Christine.blouch@spawglass.com.

Sincerely,

Name, Title
Company

Criminal Background Check Fact Sheet

IMPORTANT Completing the Criminal Back Check (CBC) form- Any misstatement, falsification, or omission of information on the CBC form will void the process and the person will be deemed "notsuitable".

A criminal conviction means the outcome of a criminal prosecution which concludes in a judgment that the defendant is guilty of the crime charged. It is the juncture of a criminal proceeding during which the question of guilt is ascertained. In a case where the perpetrator has been adjudged guilty and sentenced, a record of the summary proceedings brought pursuant to any penal statute before one or more justices of the peace or other properly authorized persons. *NOTE: The terms conviction and convicted refer to the final judgment on a verdict of guilty, a plea of guilty, or a plea of nolo contendere.*

Deferred Adjudication is described as a postponement of entering a finding of guilt, where the offender undergoes a term of community supervision that if completed successfully, will prevent a final conviction from appearing on the offender's record; a type of community supervision where if the conditions are met for the time period set by the court, not to exceed two (2) years, no record of the crime will be made.

*****Misconception***** The criminal conviction was several years ago and will not appear on the records 'check- The form must list ANY/ALL criminal convictions and any deferred adjudications where the final disposition is still pending since the age of 17.

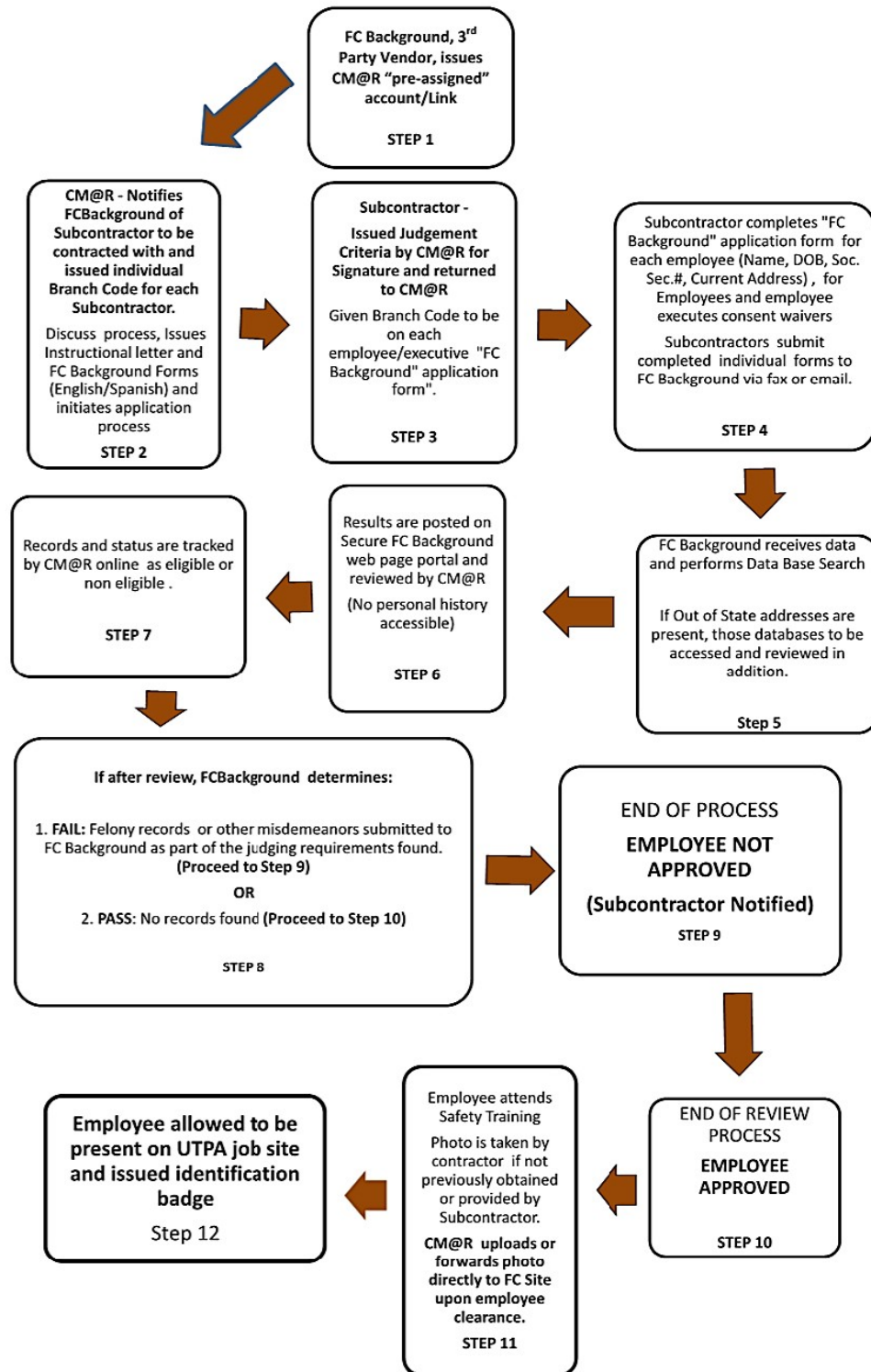
The University, in making decisions will not automatically disqualify individuals with criminal records. In the event the check reveals a criminal record or other relevant information, it will be determined on a case-by-case basis whether the individual will be deemed "suitable".

A conviction for a felony or misdemeanor does not necessarily mean that a person will be prohibited from working on the University campus; the University takes into consideration such things as the length of time that has passed since the last conviction and the severity of the crime convicted of when making a decision.

All employee information listed on the Criminal Background Check Form will remain private between the employee and the University, where it will be used for screening purposes only.

UTRGV BACKGROUND CHECK PROCESS

2014-October-5



END OF OWNER'S SPECIAL CONDITIONS

ATTACHMENT “A”
(to Owner’s Special Conditions)
PREVAILING WAGE RATE DETERMINATION

The University of Texas System is the contracting agency for this construction project. The following statute requires the contracting agency to specify the generally minimum rates of wages in contracts that are bid.

Government Code 2258
“Construction of Public Works in State and
Municipal or Political Subdivisions; Prevailing
Wage Rates to be maintained”
and
The Uniform General Conditions
for University of Texas System Building Construction Contracts

Pursuant to the requirements of this statute, we have determined that the following rates of wages are paid to various classifications of workers in the locality of this project.

Total hourly compensations to each worker must equal or exceed the minimum wage rates stated in the following attachment. Contributions by a worker toward health, pension, vacation, and the like are part of the worker’s pay; contributions by the employer are not. Any dollar amounts shown in columns for health, pension, and vacation may be paid either in cash or in kind. Workers in classifications where rates are not identified shall be paid not less than the general minimum rate of “laborer” for the various classifications of work therein listed.

All hours of work over 40 hours per week are overtime and will be compensated at the rate of 1 and ½ times the regular wage.

Trainees/helpers, where not otherwise specified above, may be compensated at a rate determined mutually by the worker and employer, commensurate with the experience and skill of the worker but a rate not less than 60% of the journeyman’s wage or less than the Laborers (General) rate. At no time shall a journeyman supervise more than two of apprentices, trainees or helpers. All apprentices/trainees/helpers shall be under the direct supervision of a journeyman working as a crew.

ATTACHMENT “A”

PREVAILING WAGE DETERMINATION

SB 311 COMPLIANT – CAMERON-HIDALGO-STARR COUNTIES

**The University of Texas System
Office of Facilities Planning and Construction**

Date: December 31, 2012

Construction Type: Building

Area: SB 311 Compliant – Cameron-Hidalgo-Starr Counties

Building Construction Trade Classification	Prevailing Wage Rate (1)
Carpenter	\$10.75
Concrete Finisher	\$11.50
Drywall/Ceiling Installer	\$11.25
Electrician	\$12.44
Elevator Mechanic	\$22.81
Fire Proofing Installer	\$12.75
Flooring Installer	\$11.50
Glazier	\$10.06
Heavy Equipment Operator	\$11.41
Ironworker	\$11.75
Laborer	\$ 8.50
Light Equip Operator/Driver	\$ 9.82
Mason/Bricklayer	\$10.13
Painter	\$10.50
Pipefitter	\$15.16
Piping/Ductwork Insulator	\$12.66
Plasterer	\$12.75
Plumber	\$14.04
Roofer	\$10.23
Sheetmetal Worker	\$11.44
Sprinkler Fitter	\$13.76
Tile Setter	\$10.64
Waterproofer	\$10.00

(1) Wages shown are for entry level, minimum wages for each classification and do not include fringe benefits.

Unlisted classifications needed for work not included within the scope of the classifications listed may not be added after award. The job classifications are not inclusive of all possible trades on the construction project.


It is the responsibility of the contractor to classify the worker in accordance with the published classifications, and demonstrate that workers are paid commensurate with determined rates.

ATTACHMENT "B"

(to Owner's Special Conditions)

PROJECT SIGN

SEAL (EITHER UT SYSTEM OR INSTITUTIONAL SEAL)

 THE UNIVERSITY OF TEXAS SYSTEM	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>NAME OF PROJECT</p> <p>NAME OF INSTITUTION</p> <p>ARCHITECT ENGINEER - (FIRM'S NAME)</p> <p>GENERAL CONTRACTOR - (FIRM'S NAME)</p> </div> <div style="width: 45%; border: 1px solid black; padding: 5px; text-align: center;"> PICTURE OF PROJECT </div> </div>
OFFICE OF FACILITIES PLANNING AND CONSTRUCTION	

*ADJUST LETTER SIZE AS REQUIRED FOR LENGTH OF NAME. STYLE OF LETTERING TO BE ARIAL BOLD.

SUBMIT A ONE-QUARTER SCALE SHOP DRAWING OF THE SIGN COMPLETE WITH ALL LETTERING TO THE OWNER FOR APPROVAL BEFORE CONSTRUCTION. THE SIGN SHALL BE CONSTRUCTED OF 3/4 INCH THICK A-C GRADE EXTERIOR PLYWOOD. THE SIGN SHALL RECEIVE TWO COATS OF AN APPROVED WHITE SEMIGLOSS EXTERIOR ENAMEL ON ALL SURFACES BEFORE LETTERING. THE OWNER WILL DESIGNATE THE COLORS FOR THE LETTERING ON THE SHOP DRAWING.

SCHEDULE

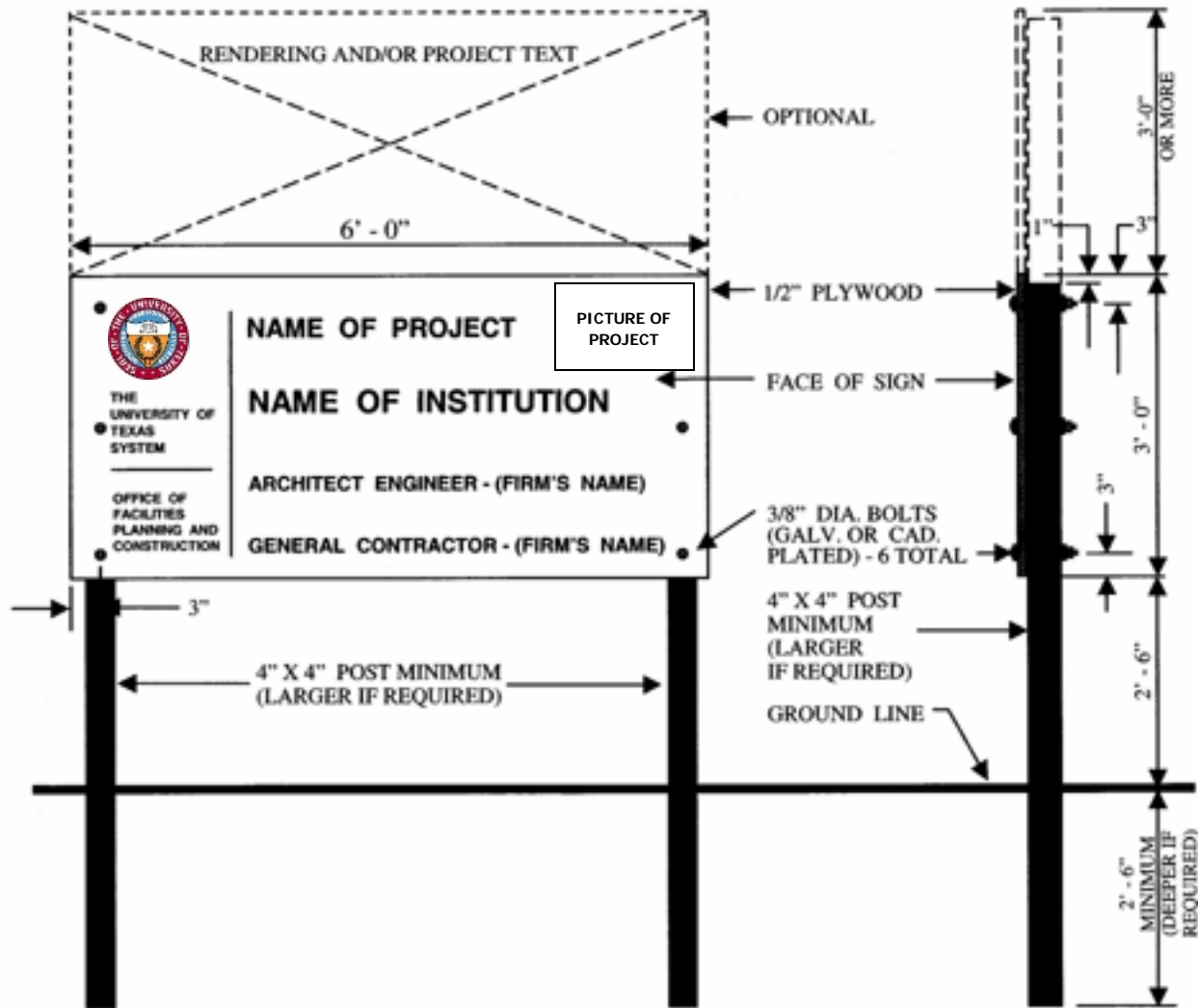
LINE	DESCRIPTION	LETTER HEIGHT *	STROKE *
1	NAME OF PROJECT	2-1/4"	1/2"
2	NAME OF INSTITUTION	2-3/4"	1/2"
3	THE UNIVERSITY OF TEXAS SYSTEM	1-1/4"	1/4"
4	OFFICE OF	2" & 1-1/2"	3/8" & 1/4"
5	FACILITIES	2" & 1-1/2"	3/8" & 1/4"
6	PLANNING AND	2" & 1-1/2"	3/8" & 1/4"
7	CONSTRUCTION	2" & 1-1/2"	3/8" & 1/4"
8	SEAL (APPROX. 8" DIAMETER)		
9	ARCHITECT ENGINEER - (FIRM'S NAME)	1-1/2"	1/4"
10	GENERAL CONTRACTOR - (FIRM'S NAME)	1-1/2"	1/4"

12-16-2002

FRONT ELEVATION

SIDE ELEVATION

PROJECT SIGN DETAILS - NOT TO SCALE



12-16-2002

FRONT ELEVATION SIDE ELEVATION

PROJECT SIGN DETAILS - NOT TO SCALE

ATTACHMENT "C"
(to Owner's Special Conditions)

WEATHER DAYS

- C1.1 In addition to the project scheduling requirements outlined in the Uniform General Conditions for UT System Construction Contract (UGC), the minimum Total Float required per specification section 01 32 00 - PROJECT PLANNING AND SCHEDULING, and those stipulated in the Owner-Contractor Agreement, the Contractor shall plan for at least the following number of Weather Days for the corresponding institution in the construction schedule.

Weather Days (Calendar Days)												
Institution	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
UT Arlington, UT Dallas, and UT Southwestern Medical Center Dallas	6	4	4	3	4	4	1	1	2	3	2	4
UT Austin	4	4	4	4	4	4	4	3	4	5	4	4
UT San Antonio and UT Health Science Center San Antonio	4	4	4	4	4	3	4	2	4	4	4	4
UT Tyler and UT Health Science Center Tyler	6	4	5	4	5	5	3	3	3	5	4	5
UT Rio Grande Valley	2	2	2	2	3	3	3	3	5	3	2	3
UT Medical Branch Galveston	4	4	4	3	3	4	6	5	5	4	4	5
UT Health Science Center Houston and UT M.D. Anderson Cancer Center	3	3	3	2	2	3	5	4	6	6	6	5
UT El Paso	1	1	1	1	1	2	4	5	3	1	1	3
UT Permian Basin	3	3	2	2	2	3	4	3	4	2	2	3

Note: see F:\users\OFPC\PMSS\Project Improvements\Improvement stuff\Owners Spec Conditions Updates\Weather Days\Climatological Data & Update Instructions.xlsx for methodology on derivation of anticipated weather days.

- C1.2 A Weather Day, as defined in UGC 9.6.2.1, is further defined as a day with 0.25 inches of rainfall or more, and/or has an average temperature at or below 32 degrees, and/or has a sustained wind speed (average of observed values over a two minute period) above 25 miles per hour (21.7 knots) as recorded at the project jobsite.

- C1.3 Weather Days shall be planned for by the Contractor in the preparation, development, and monitoring of the construction baseline schedule and status of subsequent updates.
- C1.3.1 Weather Days shall be recorded as full calendar days.
- C1.3.2 Weather Days shall not be included as a construction schedule activity nor as additional float (i.e., days are included as part of the activity's original duration).
- C1.4 The Contractor shall submit written notification to the Owner's Designated Representative (ODR) of an actual Weather Day within two (2) business days of the event. The written notification must contain the same amount of information as that shown on the attached Exhibit 1 to Attachment "C" - Monthly Documentation of Adverse Weather form. An editable version of this form is available (not mandatory) for use from the ODR.
- C1.5 The Contractor may be granted a contract time extension due to weather only when 1) actual weather days exceed the number of weather days for the month shown on the table above, 2) the available project Total Float is zero or less, and 3) the Weather Day causes an actual delay to the Substantial Completion date of the project by impacting one or more planned activities on the longest path of the approved updated Contractor's construction schedule.
- C1.5.1 Time extensions for Weather Days are non-compensatory per Articles 9 and 11 of the UGC for delay of, and extension of time requirements.

(to Owner's Special Conditions)

MONTHLY DOCUMENTATION OF ADVERSE WEATHER

CONTRACTOR: _____

ATTACH DOCUMENTATION FOR JUSTIFICATION OF TIME EXTENSION, OR USE OF SCHEDULE FLOAT, BY DEMONSTRATING THE DELAY OF CRITICAL PATH ACTIVITIES.

[illegible]

DAYS REQUESTED: _____

F:\users\OFFICE\PMSS\Project Improvements\Schedule Float\WEATHER DAY REQUEST FORM 140621

REVISION LOG

The following is provided for convenience to the Owner, Architect/Engineer and Contractor to track changes between annual document issuances and is not to be considered by any party to be contractual or 100% complete.

Date	Paragraph Revised	Initials
02/01/08	1.4.1.1 Added Section - Effective February 1, 2008, all references within the UGC to the Texas Workers Compensation Commission ...	
05/07/08	General edits incorporated addressing specific project requirements for capital projects at UT Austin.	
08/10/09	UT Austin specific version issued to OFPC Austin Team staff	
9/30/09	Updated section 2.2 and subsequent subsections - Builders Risk Endorsements. Deleted Article 2.4.5.5 in its entirety.	
10/05/09	UT Austin version – Wireless Computing, Contractor Parking Requirements	
3/1/10	Revisions to sections 2.4.5.4 and 2.4.5.10 and subsequent subsections.	
7/18/11	Articles 2.2.3 and 2.2.4 regarding insurance provisions have been added.	Mgm
2-8-12	Add Art. 3.3.6 regarding Preventable False Alarms	MGM
9-11-12	Added "Attachment D" builders risk additional coverage worksheet.	MGM
12-7-12	Revised Art. 2.2.3, umbrella limits, 2 nd sentence, demolition	MGM
2-11-13	Revised Art. 3.11.6 regarding contractor's requirements to certify MSDS product sheets and asbestos certification.	MGM
10-25-13	Revised Art.2.2 to add new provisions for the Owner Provided Builder's Risk Insurance coverage. Deleted all previous requirements for builders risk coverage provided by the contractor. Deleted 'Attachment D', Builders Risk Additional coverage worksheet.	MGM

5/23/14	<p>Modified Attachment C to add text referring to new document "Monthly Documentation of Adverse Weather", and inserted this new document as Exhibit 1 of Attachment C.</p> <p>Corrected numbering indentations in section 2.2.</p>	pac
5-18-15	Revised the 'Editor's Notes' for Attachment A regarding the Prevailing Wage Determination locations	mgm
10/01/15	<p>Added "Additional Discussion Items" at the beginning for consideration by PM.</p> <p>Revised the title of UGC to match the 2013 version in sections 1.1.1, 1.4.1, and 4.1.1.</p> <p>Inserted additional services in section 1.2.1 for reference.</p> <p>Corrected titles in 1.4.2 and 1.4.4 to match their respective Attachments ("A" and "C").</p> <p>Revised internet connectivity requirements (per OTIS) in sections 2.4.5.4 and 2.4.5.9 (and subsections).</p> <p>Added Part 4 - Substantial Completion - Electronic O&M Manuals & Record Documents, sections 4.1.1 through 4.1.6.</p> <p>Revised Attachment "B" to require the use of a new font type for the project sign - Helvetica Medium is no longer available.</p> <p>Attachment "C":</p> <p>Updated the anticipated weather days in Attachment C based on a current dataset and revised threshold for a rain event from 0.10" to 0.25" in C1.2.</p> <p>Removed C1.2.1 - repetitive with 2013 UGC definition.</p> <p>Removed C1.3 - "Calendar Day" is not defined in spec 01 32 00.</p> <p>Removed C1.5 re: accumulating unused anticipated weather days month-to-month.</p> <p>Revised C1.6 to call attention to the availability of Exhibit 1 to Attachment "C".</p> <p>Removed C1.7 - repetitive with 2013 UGC requirement; renumbered all remaining statements.</p>	pac
12/18/15	Relocated Section 2.2 Builders Risk Insurance into specification section 00 73 16 Project Insurance.	pac

SECTION 00 73 16 - PROJECT INSURANCE REQUIREMENTS

PART 1 - GENERAL

1.1. DEFINITIONS

- 1.1.1. The term "OCIP", as used throughout the Contract documents, shall refer to the Owner Controlled Insurance Program.
- 1.1.2. The term "OCIP Administrator", as used throughout the Contract documents, shall refer to those employees of the firm that acts as the Owner's Insurance broker whose duties include, but are not limited to, confirming Contractor and Subcontractor enrollments, tracking monthly payroll reports, ordering final payroll audits, and reporting program costs to the Owner.
- 1.1.3. The term "OCIP Loss Control Representative", as used throughout the Contract documents, shall refer to those employees and representatives of the firm that acts as the Owner's Insurance broker who conduct Project site safety services, track insurance claims, and issue reports concerning Contractor management of safety and insurance claims.
- 1.1.4. The term "MWrap", as used throughout the Contract documents, shall refer to the OCIP Administrator's online portal which shall be utilized by Contractor and all enrolled Subcontractors to submit documentation relative to the OCIP.

1.2. PURPOSE

- 1.2.1. The purpose is to have one (1) major insurance program in place to address those risks associated with Workers' Compensation and Employer's Liability, and General Liability which will exist on the Owner's property during construction. The Owner expects the majority of employers performing construction work under this Contract to enroll in the OCIP.
- 1.2.2. The Owner shall provide, at its own expense, specific insurance policies and coverage for the Contractor and for all enrolled Subcontractors on the Project, as described in Article 2.1 and 2.2 of this Section.
- 1.2.3. The Contractor and all enrolled Subcontractors shall provide all other insurance coverages, including those described in Articles 2.3 in this Section and as necessary or required to address all other risks for the Project.
- 1.2.4. **The Contractor and all enrolled Subcontractors shall disregard those Articles of the Uniform General Conditions for University of Texas Building Construction Contracts (UGC) which are in conflict with this Section and shall recognize and agree to the requirements described in this Section.**
- 1.2.5. **The Subcontractors and all other parties to the Contract that are not enrolled shall furnish proof of insurance in accord with the UGC.**

1.3. RELATED DOCUMENTS

1.3.1. In addition to specific references indicated herein, the Contractor's attention is directed, but not limited, to the following Sections and Documents, which include additional administrative requirements.

1.3.1.1. Current Edition of the Uniform General Conditions for University of Texas Building Construction Contracts (UGC).

1.3.1.2. Owner's Special Conditions and 01 35 23 Project Safety Requirements

PART 2 – PRODUCTS

2.1 INSURANCE COVERAGE FURNISHED BY OWNER (OCIP): The following insurance shall be furnished to the Contractor and all enrolled Subcontractors in separately issued coverage. A copy of the Project Insurance Manual is provided as Attachment A.

2.1.1 Workers' Compensation and Employer's Liability

2.1.1.1 Carrier and contact information as provided in the Project Insurance Manual.

2.1.1.2 Policies will be issued on an annual basis until project substantial completion.

2.1.1.3 Coverage A - Statutory Benefits: Liability imposed by the Workers' Compensation and/or Occupational Disease statute of the State of Texas and any other State or governmental authority having jurisdiction over or related to the work performed on the Project.

2.1.1.4 Coverage B - Employer's Liability Limits:

2.1.1.4.1 \$1,000,000.00 bodily injury per accident/employee;

2.1.1.4.2 \$1,000,000.00 bodily injury per disease/employee;

2.1.1.4.3 \$1,000,000.00 policy limit by disease.

2.1.1.5 Extensions of Coverage

2.1.1.5.1 Other States Endorsement(s)

2.1.1.5.2 Voluntary Compensation, if exposure exists may be added

2.1.1.5.3 United States Longshoreman's & Harborworker's Act, may be added if needed

2.1.1.5.4 Ninety (90) day Notice of Cancellation from the Insurance Provider, except 10 days for non-payment of premium

2.1.1.5.5 Amendment of Notice of Occurrence

2.1.2 Commercial General Liability (Primary and Excess)

2.1.2.1 Carrier and contact information as provided in the Project Insurance Manual.

2.1.2.2 Certificates of Insurance will be issued naming each Contractor as a named insured upon enrollment.

2.1.2.3 Limits:

2.1.2.3.1 \$2,000,000.00 Each Occurrence/all insured

2.1.2.3.2 \$2,000,000.00 Personal Injury and Advertising Injury limit

2.1.2.3.3 \$5,000,000.00 Completed Operations aggregate/all insured

2.1.2.3.4 \$5,000,000.00 General Aggregate/all insured (Annual Aggregate Per Project)

2.1.2.3.5 \$10,000.00 Medical Expense Limit

2.1.2.3.6 \$250,000.00 Fire Legal Liability

2.1.2.4 Policy Form:

2.1.2.4.1 Insurance Service Office "Occurrence" form – CG 00 01 (12/07)

2.1.2.5 Extensions of Coverage:

2.1.2.5.1 Incidental Medical Malpractice Liability

2.1.2.5.2 Completed Operations Liability coverage for a period of ten (10) years after substantial completion notification by the Owner.

2.1.2.5.3 Waiver of Subrogation Endorsement, if required by written contract

2.1.2.5.4 Ninety (90) day Notice of Cancellation from the Insurance Provider, except 10 days for non-payment of premium

2.1.2.5.5 Engineers, Architects or Surveyors Professional Liability Exclusions

2.1.2.5.6 Extended Ongoing Operations coverage for repair work for a period of two (2) years after Substantial Completion.

2.1.2.6 Excess Liability Coverage:

2.1.2.6.1 As following form over Employer's Liability and Commercial General Liability, \$100,000,000.00 of excess insurance has been obtained by the Owner for the benefit of the Owner, Contractor and all enrolled Subcontractors of every tier.

2.1.2.6.2 Carrier and contact information as provided in the Project Insurance Manual

2.1.3 Deductible:

2.1.3.1 Insurance policy deductibles under the OCIP program are paid by the Owner

2.1.3.2 Issue of Certificates:

2.1.3.2.1 The OCIP Administrator and/or Insurance Carriers will issue separate Certificates of Insurance for Workers' Compensation, Comprehensive General Liability and Excess Liability to the Contractor and each enrolled Subcontractor. Copies of holder policies will be issued following receipt of written request from the OCIP Certificate holders to the OCIP Administrator and copied to the ODR.

2.2 INSURANCE COVERAGE FURNISHED BY OWNER (BUILDER'S RISK) - COVERAGE AND DEDUCTIBLE DESCRIPTION:

2.2.1 The Owner intends to provide builder's risk insurance for this project. Refer to the Agreement for additional information (Art. 17 in the CM & DB Agreements and Art. 11 in the CSP Agreement).

2.2.2 The Contractor and all subcontractors shall disregard Article 5.2.2.1.5 through 5.2.2.1.5.10 and 10.5.2 of the Uniform General Conditions for UT System Construction Projects (UGC) and shall recognize and agree to the requirements described in this Section.

2.2.3 Owner will purchase and maintain in force builder's risk insurance on the Work. The insurance will apply on a replacement cost basis with no coinsurance provision.

2.2.4 This insurance will name as insureds the Owner, the Contractor, and all subcontractors and sub-subcontractors in the Work but only to the extent of their financial interest in the Work.

2.2.5 Builder's risk insurance will be on an "all risk" or equivalent policy form and will include insurance against fire and extended coverage perils, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, boiler and machinery/mechanical breakdown, testing and startup, and terrorism.

- 2.2.6 The builder's risk insurance will be specific as to coverage and will be primary to any permanent insurance or self-insurance that may be maintained on the property by Owner.
- 2.2.7 The builder's risk insurance will include a waiver of subrogation in favor of Owner, the Contractor, and all subcontractors and sub-subcontractors in the work.
- 2.2.8 Upon request, Owner will provide to Contractor a certificate of insurance that provides evidence of builder's risk insurance.
- 2.2.9 In the event of an insured loss caused by the action or inaction of Contractor, any subcontractor or sub-subcontractor, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, Contractor will be responsible for, and reimburse to Owner, any applicable deductible under the builder's risk insurance policy, which may be up to \$50,000. Any costs associated with Contractor's responsibility for the applicable deductible will not be considered cost of Work.
- 2.2.10 Any loss insured under Owner's builder's risk insurance will be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear. Contractor shall track and submit all claim expenses on a time and materials basis unless previously agreed to in writing by Owner. Any mark-up expenses included as part of the claim expenses will be subject to the percentage maximums specified in the initial agreement. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in a similar manner. Contractor will be required to provide a Release of Lien to Owner for any insurance proceeds received by the Contractor.
- 2.2.11 Owner's builder's risk insurance will not cover Contractor's, Subcontractors' and Subsubcontractors' construction machinery, equipment and tools used in the performance of the work. It will be the Contractor's, Subcontractors' and Sub-subcontractors' responsibility to insure their construction machinery, equipment and tools. Contractors, Subcontractors and Sub-subcontractors shall waive all rights of subrogation and recovery against and in favor of Owner for any loss, claim or expense, including, but not limited to, partial or total damage or theft.
- 2.2.12 Contractor shall assist Owner in obtaining and maintaining builder's risk insurance by providing, in a timely manner, project-related information required by an insurance carrier when requested by the Owner or the Owner's insurance broker.
- 2.3 **INSURANCE POLICIES AND AMOUNTS OF COVERAGE FURNISHED BY CONTRACTOR AND ENROLLED SUBCONTRACTORS:** All Project insurance not identified in Article 2.1 and 2.2 above shall be provided by the Contractor and all enrolled Subcontractors to meet or exceed terms and amounts of coverage as per requirements of the UGC. Liability coverages shall include the following (as applicable to the Work):

2.3.1 Business Automobile Liability Owned/Leased

2.3.2 Equipment (covering total value of owned/rented equipment)

2.3.3 Workers' Compensation/Employers' Liability (for work not covered by the OCIP program)

2.3.4 General Liability (**Off Site Only**)

2.3.5 Professional Liability Insurance (Errors and Omissions)

2.3.5.1 In the event any Contract specifications require a contractor to provide professional services, such as, but not limited to, architectural, engineering, construction management, surveying, design, etc., a Certificate of Insurance must be provided prior to commencing work evidencing such coverage with a limit of not less than \$1,000,000.00. Any material change in limits, coverage or loss of aggregate limit due to outstanding claims must be reported to the Owner within thirty (30) days of any such event.

2.3.6 Aviation Insurance - \$10,000,000.00 (as applicable)

2.3.6.1 In the event any fixed-wing or rotary aircraft are used in connection with this Agreement and/or in the execution of the work, a minimum of \$10,000,000 of Aviation Liability Insurance must be maintained with the following requirements: The Owner must be named as an "additional insured" and a waiver of hull damage must be provided in favor of the Owner.

2.3.6.2 If any aircraft is to be used to perform lifts at the Project site, a "slung cargo" endorsement must be included to cover the full replacement value of any equipment or material being lifted. All such lifts must be coordinated with the Owner for approval prior to lift execution.

2.3.7 Environmental and Asbestos Abatement Insurance - \$5,000,000.00 per claim (as applicable)

2.3.7.1 If this Agreement involves environmentally sensitive operations (such as the removal of asbestos, the removal/replacement of underground tanks or operations involving toxic chemicals, heavy metals and/or carcinogenic substances), the Contractor and/or involved Subcontractors shall submit proof of full coverage for such exposures subject requirements and obtain approval of the Owner prior to commencement of such operations. Subcontractors that are directly and actively involved in the performance of work associated with environmentally sensitive operations will be excluded from the OCIP. If Environmental Coverage is written on a Claims Made basis, five years Completed Operations shall be included.

2.3.8 Maritime Insurance - Hull, Protection and Indemnity (including crew) - \$10,000,000.00
(as applicable)

2.3.8.1 In the event any watercraft is used in connection with the Project, the Contractor and/or involved Subcontractor shall submit proof of a "Hull and Protection and Indemnity Policy". The amount of insurance on the Hull shall be sufficient to cover the watercraft, its equipment and all additional equipment aboard during the time it is in use on the Project. Protection and Indemnity shall have limits of liability of no less than \$10,000,000.00 including coverage of the construction activity for which the watercraft is used. Master and Crew coverage shall include General Maritime Liability, Jones Act and Wages, Transportation, Maintenance and Care.

2.3.9 Waiver of Subrogation

2.3.9.1 To meet the requirements of Article 2.3, all policies shall contain a Waiver of Subrogation in favor of the Board of Regents of The University of Texas System, their respective agents, consultants, servants and employees of each and all other indemnities.

2.3.10 Names of Additional Insured

2.3.10.1 To meet the requirements of Article 2.3, for each of the preceding coverages, excepting Workers Compensation, all policies shall endorse the Board of Regents of The University of Texas System, its respective agents, consultants, servants and employees of each and all other indemnities as "Additional Insured".

2.3.11 Waiver of Property Damage and Right of Recovery

2.3.11.1 To meet the requirements of the UGC, all policies shall contain written agreement to waive the Contractor's and each enrolled Subcontractor's right for recovery of physical damage or loss to their respective properties against each other for damages, losses or claims arising out of or in connection with this Project and this Contract. This written waiver shall also extend to the benefit of the Board of Regents of The University of Texas System, its respective agents, consultants, servants and employees. This waiver of the right of recovery for property damage shall be binding upon any property (real or personal), builders risk, automobile, aircraft, watercraft, tools or equipment insurer as respects any subrogation rights that such insurer may possess by virtue of any payments of damage or loss.

2.4 CONTRACTOR ASSURANCE OF SAVINGS

2.4.1 The Contractor and all enrolled Subcontractors shall agree, warrant, and represent that any proposal(s) for Construction services exclude all costs associated with Owner furnished insurance coverage as specified in Article 2.1 and 2.2 of this Section.

2.4.2 The Contractor and all enrolled Subcontractors shall agree to be subject to audits for payroll, work hours and insurance costs by the respective insurance companies providing coverage under the OCIP. The purpose of such audits is to validate insurance premiums and compare wages and other OCIP costs. The Contractor and all Subcontractors shall agree to furnish payroll and other information in the forms and formats as requested by the OCIP Administrator in the ROCIP Project Insurance Manual and as required via MWrap. Further, the Contractor and all Subcontractors agree to cooperate fully with any and all audits by supplying the required information in the manner required and as expeditiously as possible. . If proprietary information is involved, the Contractor and all enrolled Subcontractors will be allowed to guard the material while it is being reviewed by the Owner or any of its agents.

2.4.3 The Contractor and enrolled Subcontractors agree, warrant, and represent that all Changes to the Contract as described in the UGC, shall exclude any cost for the insurance provided by the OCIP.

2.5 EXCLUSION FROM OCIP ENROLLMENT: Prior to commencement of any work at the Project site and until completion and acceptance of Work, Subcontractors that are allowed by the Owner to be excluded from enrollment in the OCIP shall maintain, at their sole expense, insurance coverage as per the UGC and Article 2.3 of this Section.

2.5.1 Automatic Exclusion

2.5.1.1 Temporary workforce agencies (unless approved per Article 3.1.5), consultants, vendors, suppliers, material dealers, and delivery service companies shall not be considered as a Contractor or Subcontractor and therefore shall be automatically excluded from enrollment in the OCIP. The Contractor shall confirm that the companies in these categories produce copies of proof of proper insurance for the risk exposures that each one will create or experience while on the Project.

2.5.1.2 Subcontractors performing environmentally sensitive or highly hazardous work will be required to furnish proof of special coverage in adequate amounts for Aviation Insurance, Environmental and Asbestos Abatement Insurance, Maritime Insurance and any other policies of such nature.

2.5.1.2.1 Before performing any work, the Subcontractor shall provide to the Contractor and the OCIP Administrator, a Certificate of Insurance that matches the requirements described in the UGC and 2.3 above.

2.5.1.3 Excluded Subcontractor(s) shall adhere to all project safety requirements and take all necessary precautions to protect all other persons in the vicinity from the risk

exposures that the excluded Subcontractor may create while performing work on the Project.

2.5.2 Discretionary Exclusion

2.5.2.1 The Contractor may issue a written request on behalf of a Subcontractor of any tier for a discretionary exclusion from enrollment in the OCIP. To be considered, the Subcontractor must be bound to a scope of Work that anticipates a total labor value of less than \$5,000.00. A Certificate of Insurance with coverage amounts and language as required by the UGC and 2.3 above shall be furnished to the OCIP Administrator. The OCIP Administrator, in concurrence with the ODR, will review issues such as prior enrollment, scope of work and associated risk. Based on this evaluation, exclusion may or may not be granted.

2.5.3 Excluded Subcontractors

2.5.3.1 Excluded Subcontractors shall submit Certificates of Insurance for Owner acceptance for adequacy of protection and for the satisfactory character of the Insurer prior to performing any work on the Project. Each Certificate must have a thirty (30) day prior written notice of cancellation showing the Board of Regents of The University of Texas System as the Certificate Holder.

2.5.3.2 In the event of failure of the excluded Subcontractor to furnish and maintain said insurance and to furnish satisfactory evidence thereof, the Owner and/or Contractor shall have the right to take out and maintain coverage for all parties on behalf of the excluded Subcontractor who agrees to furnish all necessary information to bind such coverage and to allow deduction for the cost thereof immediately upon presentation of an invoice.

2.6 GOVERNING CONDITIONS

2.6.1 The Owner's payment of premiums for the insurance described in this section shall in no way be interpreted as relieving the Contractor and/or any enrolled Subcontractor of any responsibility of liability under this agreement.

2.6.2 The amount and types of insurance coverage required herein shall not be construed to be a limitation of liability on the part of the Contractor or any of its Subcontractors.

2.7 ELECTIVE INSURANCE FURNISHED BY A CONTRACTOR

2.7.1 The Contractor and any enrolled Subcontractor may elect to maintain a supplementary insurance policy(s) to extend the coverage terms and/ or conditions that are described in this Section. The cost of any policy(s) shall be at the sole expense of the contractor, and shall not be reimbursed by the Owner.

PART 3 – EXECUTION

3.1 OCIP ENROLLMENT PROCESS

- 3.1.1 The Contractor shall provide all subcontractors with the information in this Project Insurance Requirements, not later than the 10th day before the Contractor enters into a contract with the subcontractor. The Contractor shall provide written acknowledgement from each subcontractor to the OCIP Administrator of enrollment and issuance of OCIP “Certificate of Insurance”.
- 3.1.2 The Contractor and all enrolled Subcontractors shall submit all insurance, underwriting, payroll, rating or loss history information as required by the Owner to the OCIP Administrator for enrollment and issuance of OCIP “Certificates of Insurance” via MWrap. The OCIP Administrator shall provide MWrap Contractor Portal Instructions which shall guide Contractor and its Subcontractors in accessing and using MWrap. Online forms, and other requested documentation, shall be completed within ten (10) working days of contract award unless work under the contract is commencing within this ten day period which shall cause the Subcontractor to expedite his enrollment via MWrap. No contractor shall perform any work on the Project until it is recognized as having been enrolled in or excluded from the OCIP by the OCIP Administrator.
- 3.1.3 The Contractor and enrolling Subcontractors shall provide all information necessary to bind coverage under the OCIP. The OCIP Administrator will notify the Contractor and respective Subcontractor when an application has been approved and coverage afforded.
- 3.1.4 OCIP enrollment will not be complete and work shall not commence until the OCIP Administrator has issued the OCIP “Certificates of Insurance” to the applicant.
- 3.1.5 General Contractor(s) and Subcontractor(s) of any tier who perform operations on the Project site and such other persons or entities as Owner may designate as enrolled parties, who perform direct labor at the project site or sites incidental to the Work are considered enrolled parties. **Temporary labor services and leasing companies are to be included as Subcontractor(s) only at the approval of Owner.** Contractor(s) and Subcontractor(s) of any tier must have submitted all necessary enrollment forms and have been accepted into the OCIP as evidenced by a confirmation of enrollment letter and issuance of OCIP “Certificates of Insurance”.
- 3.1.6 Participation in the OCIP is mandatory for ALL Contractors and their Subcontractors of any tier unless excluded by Owner or as outlined in Article 2.5. **However, enrollment is not automatic.** Work will not be permitted at the project site until the Contractor and Subcontractor, regardless of tier, is properly enrolled in the OCIP.
- 3.1.7 **OCIP Coverage applies only to work performed at the project site by the enrolled parties.** Enrolled parties must provide their own insurance for off-site activities including, but not limited to, work at their permanent shops, fabrication or manufacturing of building products, materials or supplies.

3.2 PROJECT ADMINISTRATION AND FORMS

3.2.1 The Contractor shall be responsible to manage and ensure the transmission of all administrative and safety documentation, including subcontractor insurance and payroll information, as required and directed by the Owner.

3.2.2 The Contractor and all enrolled Subcontractors shall include those administrative costs in the Construction Contract Limit (CCL) or Guaranteed Maximum Price (GMP) proposal which are necessary to properly comply with the Contract.

3.3 OCIP DOCUMENTATION COMPLIANCE

3.3.1 Failure by the Contractor and/or any Subcontractor to submit documentation and forms as directed by the Owner, or the OCIP Administrator, as described in Article 3.1 and 3.2 and in the Project Insurance Manual may result in an Owner-issued deductive Change Order to the Contractor for each delinquent document. The Contractor will be held accountable for all costs and schedule impacts associated with this action.

3.3.2 Persistent failures by the Contractor and/or any enrolled Subcontractors may result in a "stop work" order by the Owner. The Contractor will be held accountable for all costs and schedule impacts associated with this action.

3.3.3 **Payroll Reporting**—for insurance and program purposes, each contractor agrees to keep and maintain an accurate record of payroll for operations at the Project site. Enrolled subcontractors agree to furnish full and accurate payroll information and data via MWrap and in accordance with the requirements of the OCIP program and as detailed in the Project Insurance Manual..

Payroll must be submitted by Contractor and all tiers of enrolled Subcontractors via MWrap at each of the following occurrences:

- Monthly on or by the 10th of each month, following the end of the previous month. • Final: Due upon completion of sublet work or at Project Substantial Completion, whichever occurs first.

The payroll will identify the Project site work-hours and payroll. Only the payroll of the Contractor and all enrolled Subcontractors' employees who perform duties at the Project site should be included on the payroll report.

Enrolled subcontractors who did not perform any work at the Project site in a given month must **still** submit a payroll form via MWrap showing zero (0) payroll and applicable completed contract value to date (if applicable) for the month.

Contractors and enrolled subcontractors with payroll reporting delinquent beyond 30 days will receive a Payroll Reminder Letter requesting response of activity in accordance with each contract under coverage.

The OCIP insurer is required to file experience data for each enrolled party with the appropriate rating authority. The loss experience of the Contractor and enrolled subcontractors for work performed on the Project site may affect the experience modification factor of that Contractor or enrolled subcontractor.

Contractor and enrolled subcontractors should exclude payrolls reported for work performed under the OCIP from payrolls submitted to their primary insurer to avoid duplicate premium charges. The insurance policies written by your primary insurance provider may need to be endorsed or modified to assist in this process.

3.3.4 Incident Notification and Claims Management:

3.3.4.1 Workers Compensation claims are to be initiated immediately by the employer, and shall always be within twenty-four (24) hours or one (1) work day of the occurrence, **or immediately upon acknowledgement of an injury from an employee**, whichever is later. The mechanism for initiating such a claim shall be the completion and transmittal of a “First Report of Injury” form (DWC Form 1) to the OCIP insurance carrier. Late reporting has been proven to substantially escalate the cost of claims and may therefore result in action on the part of the Owner to recover these avoidable costs from the Contractor by applying the following charges:

3.3.4.1.1 \$1,500.00 for reports that are 2 – 3 workdays beyond the date of occurrence

3.3.4.1.2 \$5,000.00 for reports that are 4 – 30 workdays beyond the date of occurrence

3.3.4.1.3 \$7,500.00 for reports that are 31 – 60 workdays beyond the date of occurrence

3.3.4.1.4 \$10,000.00 for reports that are more than 60 days beyond the date of occurrence

3.3.4.2 General Liability claims are to be initiated immediately and shall be within twenty-four (24) hours or one (1) workday of the occurrence, whichever is later. The mechanism for initiating such a claim shall be the completion and transmittal of a Notice of Occurrence / Claim form to the designated OCIP administrative representative or as directed by the Owner. Late reporting has been proven to substantially escalate the cost of claims and may therefore result in action on the part of the Owner to recover these avoidable costs from the Contractor by applying the following charges:

3.3.4.2.1 \$1,500.00 for reports that are 2 – 3 workdays beyond the date of occurrence

3.3.4.2.2 \$5,000.00 for reports that are more than 3 workdays beyond the date of occurrence

3.3.4.3 General Liability – Property Damage:

3.3.4.3.1 If the Owner determines that the Contractor failed to take proper precautions prior to an incident that results in a property damage claim against the General Liability coverage, the Owner may recover from the Contractor the first \$5,000.00 of incurred cost against the claim.

3.4 WORKERS COMPENSATION PROCEEDINGS

3.4.1 The ODR may require the Contractor and/or the enrolled employer of an injured worker to provide knowledgeable representation at legally binding proceedings scheduled by the Texas Department of Insurance. The proceedings that affect the amount of compensation are “Benefit Review Conferences” and “Contested Case Hearings”. Failure to provide such representation may result in Owner issuance of a recovery charge to the Contractor of \$5,000.00 per proceeding.

3.5 EMPLOYEE RETURN TO WORK PLAN

3.5.1 The Contractor and every Subcontractor shall develop an Employee Return to Work (“Light Duty”) Plan that allows and encourages medically restricted workers to resume employment as soon as a physician assigns limits. The Plan shall include the following elements:

3.5.1.1 A written policy with signed acknowledgement from a Company Executive that declares intent to provide proactive safety prevention measures, immediate and appropriate medical care, aggressive claims management, and rapid return to work as critical elements of a successful safety and loss control program.

3.5.1.2 Job descriptions that clearly identify and explain essential job functions and tasks required for each position. Minimum physical limits, motor skills, and endurance times shall be included.

3.5.1.3 Procedures and responsibilities shall help physicians understand the Plan, the employee’s typical work assignments and activities, and available alternate assignments.

3.5.1.4 A commitment to the continuous employee education about the Plan, shall include monitoring of assignments, record keeping, and communications with physician(s) and injured worker(s), and tracking of compensation reports.

3.5.1.5 Full compliance with the Americans with Disabilities Act, Family Medical Leave Act, the Texas Worker’s Compensation Act, and any other State or federal law.

3.5.2 Employment for Workers with Medical Restrictions (“Return to Work” or “Light Duty” policy):

3.5.2.1 Either the absence of a written policy or the presence of a written policy that lacks a responsible commitment to restoring medically restricted workers to gainful employment (considered to be at a similar work schedule and wage that was in effect at the time of the injury) may result in an assessment of a recovery charge by the Owner to the Contractor of \$5,000.00 per finding.

3.5.2.2 If the Owner determines that the Contractor or any enrolled Subcontractor deliberately obstructs a reasonable request that is intended to restore an injured worker to gainful employment, the Owner will assess a recovery charge against the Contractor of \$5,000.00 per claim per month until the worker is returned to employment. If the Contractor or enrolled Subcontractor believes that the medical restrictions prohibit gainful employment, the Contractor will be required to prove this to the Owner's satisfaction.

3.5.2.3 Failure to pass or refusal to take any substance impairment screening will result in Owner requirement that the involved worker be removed from the Project and not be allowed to work on any Owner Project.

3.5.2.4 The cost of all post-accident screening is the responsibility of the injured worker's employer.

3.6 EXPIRATION AND AVAILABILITY OF OCIP COVERAGE

3.6.1 Termination of OCIP Coverage

3.6.1.1 Except for Extended Completed Operations coverage or Extended Ongoing Operations coverage for Repair Work, the General Liability and Excess Liability insurance furnished by the Owner under this agreement will cease for the Contractor and each enrolled Subcontractor at the earlier of OCIP program expiration or when work called for in the Contract has been completed and accepted by the Owner. Workers Compensation coverage will continue until the earlier of OCIP program expiration or when work called for in the Contract has been accepted as identified in the Certificate of Substantial Completion issued by the Owner.

3.6.2 Availability and Cancellation

3.6.2.1 Subject to market availability, all insurance specified herein shall be maintained continuously until the scheduled completion/termination date. All insurance shall provide for Owner to take occupancy of the Work or any part thereof during the term of said insurance. If coverage is diminished or cannot be renewed due to market constraints and limitations, all insured Contractors will be notified within the ninety (90) day cancellation or non-renewal period as provided in the policies. Upon termination of the Owner-provided insurance, the Contractor and all enrolled Subcontractors shall be responsible for furnishing all insurance as described in the UGC and Article 2.3 above.

3.6.2.2 Owner-furnished insurance may also be discontinued in the event the Project is substantially delayed for an extended period of time, or the Project is permanently terminated for any cause.

END OF SECTION 00 73 16

SECTION 00 7400
SPECIAL PROJECT CONDITIONS FOR CIVIL-SITE WORK

In all cases where these Special Project Conditions conflict with the Technical Specifications Sections, Plans, General Conditions of the Agreement, Special Conditions of the Agreements, Contract Conditions, or any other document contained or attached or made a part herein, these Special Project Conditions shall govern. The Contractor shall refer to the other sections of the plans Specifications such as Architectural, Electrical, Mechanical, Plumbing, Telecommunications, and Landscaping for clarification and to aid in coordination of all components of the Project.

- 1.1. It is the intention that all Civil Engineering related work is done in strict accordance with the plans and specifications. Any deviations from these plans due to any reason shall be submitted in writing to the Civil Engineer and approved in writing by the Civil Engineer before such modification. The Contractor shall not make any modifications without written approval by the Civil Engineer.
- 1.2. All excavation is unclassified. The Contractor is encouraged to visit the site and become familiar with all the site conditions. Soil testing has been performed by the Owner; However the Contractor is responsible for verifying all site conditions prior to bidding the project. Any Testing that the contractor may want to do at his expense is encouraged and shall be done at his expense and must be coordinated with the Owner.
- 1.3. The information and data shown or indicated in the contract documents with respect to existing underground facilities at or contiguous to the site is based on information and data furnished to the engineer by the surveyor and owners record drawings and or as-built drawings. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data and the cost of all of the following will be included in the contract price, and contractor shall have full responsibility for:
 - A. Reviewing and checking all such information and data.
 - B. Locate all underground facilities show or indicated in the contract documents.
 - C. Coordinate work with the Owners such as underground facilities.
 - D. Safety and protection of all such underground facilities and repairing any damage thereto resulting from the work.
- 1.4. If an under underground facility is uncovered or revealed at or contiguous to the site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the contract documents, Contractor shall promptly, after becoming aware thereof and before further disturbing conditions affected thereby or performing any work in connection therewith, the Contractor shall notify the Owner of such underground facility and give written notice to that Owner and to Owner and Engineer. Engineer will promptly review the underground facility and determine the extent, if any, to which a change is required in the contract documents to reflect and document the consequences of the existence or location of the underground facility. During such time, the Contractor shall be responsible for the safety and protection of such underground facility.
- 1.5. The Contractor shall do all necessary excavation, filling, fine grading, trenching, demolition, grading, backfilling, dewatering, tree removal, etc., to complete the project. Such costs shall be subsidiary to the various items of the proposal and shall not be paid directly. All material removed and not deemed salvageable, shall become the property of the contractor and he shall be responsible for removing it from the site at no extra expense to the owner. It will be necessary to grade as shown within the "project limits" on the plans. Any material used for fill must be free of trash, large boulders, organic or other material or debris, and in accordance with specifications. All fill material shall be placed, spread shaped and compacted to 95% standard proctor density and

SPECIAL PROJECT CONDITIONS FOR CIVIL-SITE WORK 00 7400 - 2
UTRGV SOM TBL CENTER
100% CD SET

shall have a maximum P.I. (Plasticity Index) of 15. Any material unsuitable for fill shall be rejected and shall become the property of the Contractor and disposed of at the expense of the Contractor.

- 1.6 All Trees, Plants, Grass and Shrubs, outside limits of construction, shall be protected at all times. The areas in and adjacent to the construction site shall be restored to their original conditions after necessary fine grading is completed. The Contractor shall provide new grass of the same type removed to restore damaged areas. Only quality sandy loam topsoil shall be used for filling the top four inches of those areas damaged or filled. The cost for doing such work shall not be paid for directly, but shall be subsidiary to the various items of the proposal.
- 1.7 Quality Control testing shall be done by the Owner on random testing selected by the Engineer to determine if the specifications are being adhered to. Retesting of failed samples shall be charged to the Contractor and deducted from his final payment, and no additional compensation will be made or allowed for reworking the necessary defective work not meeting the specified work of the plans and specifications.
 - A. Testing for the Contractor's benefit and construction quality control shall be paid directly by the Contractor.
 - B. It will be the Contractor's responsibility to submit to the ENGINEER, test results for materials used for the project, such as base material, subgrade, concrete and asphalt.
 - C. The CONTRACTOR will at all times furnish the necessary materials, equipment and assistance to secure the necessary samples to be tested by others.
 - D. The strength, thickness, density and other requirements have been indicated on the plans and/or Specifications.
 - E. Re-tests due to failures shall be paid for by the CONTRACTOR and deducted from his final payment.
- 1.8 The Contractor shall furnish the Owner and Architect the names, address and telephone numbers of all personnel responsible for the work in case of emergencies.
- 1.9 Damages done to all existing utilities, power poles, fences, signs, driveways, culverts, pavement, drainage systems, chiller lines, sprinkler systems, hose bibs, irrigation lines, etc., shall be repaired by the contractor at no cost to the Owner, and such costs shall be subsidiary to the various unit items in the proposal.
- 1.10 Electrical conduits, telecommunication, plumbing and irrigation conduits are not shown in the civil plans. The Contractor shall refer to electrical, plumbing telecommunications, and landscaping plans for locations, size and inverts of such conduits.
- 1.11 Existing tree protection is not shown in the Civil plans for clarity. The Contractor shall refer to the Landscape Architect plans for the existing trees and vegetation to remain and protect.
- 1.12 The Contractor shall be limited only to existing project limits. Any damages done to property outside these designated work areas will be corrected to its original or better conditions by the contractor at no extra cost to the Owner. It is important that the Contractor be aware of the work limits so that no damage can result to those areas outside these limits..
- 1.13 The Contractor shall be responsible for construction staking by a Licensed Professional Land Surveyor in the State of Texas for the entire project. Horizontal and Vertical control will be provided by the owner before construction. Contractor is responsible for protecting survey control and benchmark provided by the Owner. Any additional survey control required from the owner will be paid for by the Contractor.

SPECIAL PROJECT CONDITIONS FOR CIVIL-SITE WORK 00 7400 - 3
UTRGV SOM TBL CENTER
100% CD SET

- 1.14 The plans do not show all locations of existing water, sanitary, telephone, fiber optic, sprinkler, irrigation, and gas lines. The Contractor is responsible to call appropriate public or private utility company to locate all lines before construction operations begin. The Contractor shall exercise extreme care in working in the vicinity of these lines.
- 1.15 The Contractor is expected to conduct his work in such a manner as to minimize any soil erosion or sediment runoff from the construction site. Earth cuts and fills shall have smooth, flat side slopes, as generally indicated on the plans, to preclude erosion of the soil. Such operations should be timed consistent with the actual need for doing the work and only leave the raw, unprotected surfaces for a minimum of time.
- 1.16 The Contractor shall attend a Pre-Construction meeting with the Engineer and the Owner at a date and time yet to be determined.
- 1.17 The Contractor shall implement the Storm Water Pollution Prevention Plan (SW3P) AS PER Texas Commission on Environmental Quality (TCEQ) rules and regulation for areas that disturb more than 1 acre. All application fees for the SW3P's shall be paid for by the Contractor. A copy of the SWPPP's including the TDPE's General Permit TXR150000 is included with the Specifications as well as Erosion Control Devices shown in the Construction Plans as a Guidelines. Contractor shall refer to and comply with all other applicable discharge permits as per TCEQ rules and regulations.
- 1.18 The Contractor shall coordinate his work with the City of Edinburg and UTRGV Traffic Department in order to minimize inconvenience to traffic during school hours if applicable and City of Edinburg Engineering and Public Utilities Departments when making utility connections and street tie-ins where applicable. Contractor is responsible for preparing and submitting a traffic control plan if required by the City of Edinburg to complete his work.
- 1.19 It is the intent of this project to comply with the latest TAS Texas Accessibility Standards. The Contractor is responsible to set all the site work, such as sidewalks, ramps and handicap parking areas according to the latest TAS standards. The Contractor shall notify the Engineer when forms for all flat work are set in order to determine if TAS standards have been complied with prior to pouring the walks or other TAS sensitive areas. Failure to do so shall be reason to reject the work and any reconstruction of affected areas shall be paid for by the Contractor.
- 1.20 All reinforced concrete pipe shall be C-76 of the class specified in the plans with rubber gasket joints.
- 1.21 The proposed permanent pavement markings shall be applied in all areas designated on the plans. Prior to placing pavement markings, prepare pavement surface of sufficient area for the pavement markings, shown on the plans. Remove all contamination and loose material. Avoid damaging the pavement surface. Approved pavement surface preparation methods are sweeping, air blasting, flar milling, and blast cleaning unless otherwise specified on the plans. Reflectorized pavement markings shall be installed in accordance to the 2004 Texas Department of Transportation (TxDOT) standard specifications item 666.
 - A. Permanent pavement markings shall be placed no later than two weeks after final surfacing.
- 1.22 The Contractor shall submit to the Engineer shop drawings of all products used in this project for review and approval.
- 1.23 The Contractor shall submit Request for Information (RFI) in writing of any question of possible conflict for consideration by the Engineer.

SPECIAL PROJECT CONDITIONS FOR CIVIL-SITE WORK 00 7400 - 4
UTRGV SOM TBL CENTER
100% CD SET

- 1.24 The Contractor will understand that the construction of this project and subsequent projects is being constructed over existing sites that contain utilities or other structures that may create conflicts with the new construction. It has been the intent by the Engineer to show possible areas of conflict and caution. The Contractor shall be responsible to locate all utilities (Public or Private) by notifying the proper utility or department.
- 1.25 It is the intent for all Water and Sanitary Sewer utilities to comply with City of Edinburg Public Utilities and all Storm Sewer Systems to comply with City of Edinburg Design Standards.

END OF SECTION

SECTION 01 31 00 - PROJECT ADMINISTRATION

PART 1 - GENERAL

1.1. DEFINITIONS

1.1.1. The term "Architect" or ARCHITECT as used throughout the contract documents, is defined in the UGC.

1.1.1.1. On Design/Build contracts, the construction management staff may provide general administration, including management of meeting records and preparation of change orders, only with prior written approval of the Owner.

1.2. RELATED DOCUMENTS

1.2.1. In addition to specific references indicated herein, the Contractor's attention is specifically directed, but not limited, to the following Sections and Documents, which include additional administrative requirements.

1.2.1.1. Exhibit H - Policy on Utilization Historically Underutilized Businesses

1.2.1.2. Owner's Special Conditions

1.2.1.3. Section 00 73 16 - Project Insurance Requirements – If applicable

1.2.1.4. Section 01 32 00 - Project Planning and Scheduling

1.2.1.5. Section 01 35 23 - Project Safety

1.2.1.6. Section 01 45 00 - Project Quality Control

1.2.1.7. Section 01 57 23 - Temporary Storm Water Pollution Control

1.2.1.8. Section 01 77 00 - Project Closeout Procedures

1.2.1.9. Section 01 91 00 - Project Commissioning

1.2.1.10. Section 23 00 00 - General Mechanical Requirements

1.2.1.11. Section 26 00 00 - General Electrical Requirements

1.3. CONTRACT SUBSTANTIAL COMPLETION

1.3.1. The terms "Substantial Completion" and "Pre-Final" shall be considered the same, and are used interchangeably throughout the Contract Documents.

1.3.2. In order to obtain a Substantial Completion inspection, the contractor shall fulfill all requirements as specified in the UGC and Specification Section 01 77 00 - Project Closeout.

1.4. PROCUREMENT OF SUBCONTRACTS (CONSTRUCTION MANAGER AT RISK AND DESIGN-BUILD AGREEMENTS ONLY)

1.4.1. The Construction Manager at Risk (CM) or Design/Build Contractor (DB) shall provide a written Bid/Proposal Package Strategy (B/PPS) for procuring subcontracts including self-performance work (other than General Conditions), prior to the approval of the Guaranteed Maximum Price, but no later than twenty (20) calendar days prior to the first advertisement for proposals. The B/PPS shall be a written plan submitted to, and reviewed by the ODR and the Architect.

1.4.1.1. The plan shall identify bid packages that are most advantageous to the project and align with the CM/DB's HUB Good Faith Effort (Exhibit H) by providing at least three (3) qualified respondents, including the CM/DB. Each bid package shall include the UGC, the Owner's Division 1 Specifications, Drawings and Specifications and any other OFPC requirements included in the CM/DB Agreement pertaining to the scope of work covered in the packages.

1.4.1.2. The B/PPS shall conspicuously identify any and all work that the CM/DB will submit a bid/proposal for, but will not perform with its own forces (i.e. subcontract to someone else if determined to be "best value").

1.4.1.3. The B/PPS shall include the following for each bid package contemplated:

1.4.1.3.1. Anticipated scope of work to be procured;

1.4.1.3.2. A current Work Progress Schedule;

1.4.1.3.3. Anticipated selection criteria and questions;

1.4.1.3.4. Self-perform work proposals to be submitted by the CM/DB;

1.4.1.3.5. Proposed advertising dates;

1.4.1.3.6. Proposed Pre-proposal meeting(s);

1.4.1.3.7. Exhibit H and Information on 00 73 16 Project Insurance Requirements (if applicable);

1.4.1.3.8. Proposed Receipt, review and award dates;

1.4.1.3.9. Anticipated notice to proceed dates.

1.4.1.3.10. To ensure compliance with SB 1081, all bid/proposals shall contain the following language on the signature page, "By signing this document, I acknowledge that this project will use an Owner Controlled Insurance Program (OCIP) and I will participate in the program".

- 1.4.1.4. The CM/DB shall update the B/PPS monthly as a minimum, as conditions change, or as proposed dates are revised.
- 1.4.2. Per Texas Higher Education Code 51.782: “A construction manager-at-risk shall publicly advertise, in the manner prescribed by the institution, and receive bids or proposals from trade contractors or subcontractors for the performance of all major elements of the work other than the minor work that may be included in the general conditions”. This requirement applies to DB as well.
- 1.4.3. The goal of the project team shall be to have all work procured through advertised competitive proposals, however, if a “minor procurement” condition arises during the process, the following procurement guidelines may be used by the CM/DB, with Owner approval, for procurement of work:
 - 1.4.3.1. Less than \$5,000.00: No requirements
 - 1.4.3.2. Between \$5,000.01 and \$25,000.00: Obtain three (3) solicitations
 - 1.4.3.3. Greater than \$25,000.00: Obtain three (3) advertised competitive proposals
 - 1.4.3.3.1. If the CM/DB does not receive at least three (3) competitive proposals, the CM/DB shall re-package the scope and re-issue without additional cost to the Owner or delay to the project “Substantial Completion” date (unless approved by the Owner).
 - 1.4.3.3.2. If the CM/DB receives less than three (3) competitive proposals and the ODR determines that specific factors related to the project’s schedule or quality do not require re-issuance, the CM/DB shall provide the ODR with a letter stating the CM/DB does not have any ownership interest in, or a controlling relationship with, the recommended “best value” vendor.
 - 1.4.3.3.2.1. If the CM/DB cannot provide a letter, the package shall be re-issued without additional cost to the Owner or delay to the project “Substantial Completion” date, unless otherwise approved by the Owner.
- 1.4.4. This specification does not pertain to Change Orders to existing subcontracts.
- 1.4.5. Work shall be divided into reasonable lots; however, material or labor acquired through purchase order/vendor type agreements are subject to the entire project (i.e. Concrete material shall be procured as a unit price times an estimated total project quantity provided by the CM/DB to equal a total construction cost). Work shall not be incrementally divided for the purpose of circumventing the procurement guidelines.

- 1.4.6. The CM/DB may establish selection criteria for each phase of work for review by the project team. Criteria shall be qualifications based and consistent with the information needed by the CM/DB to make a proper evaluation and selection. The CM/DB shall establish a selection matrix including cost, criteria, weighting and ranking procedures for evaluation. The CM/DB shall work with the project team to tailor the selection criteria to be project and scope specific, and ensure that the questions are proper and relevant to the goals of the project. The CM/DB shall follow the Good Faith Effort requirements identified in Exhibit H of the Agreement, including attachments to be completed by 1st tier subcontractors. However, HUB participation/status cannot be used as criteria for determining “best value”, only for determining if the respondent is responsive.
- 1.4.6.1. The CM/DB shall establish clear criteria and questions so that those reading the Request For Proposals will understand how they will be evaluated.
- 1.4.6.2. If criteria are not included in the advertisement for proposals, the proposal shall be considered a lump sum bid, and the CM/DB shall award the work to the lowest qualified, responsive bidder.
- 1.4.6.3. After selection criteria have been established, the CM/DB shall publicly advertise the work in general circulations and trade associations in accordance with TEC 51.782 for CM, Article 7 of the current Agreement for DB and Texas Administrative Code 111.14 – “HUB” for both CM and DB. This advertisement shall include, at a minimum, the following:
- 1.4.6.3.1. OFPC Project Number and Project Name;
- 1.4.6.3.2. Institution/Campus name;
- 1.4.6.3.3. CM/DB name and address;
- 1.4.6.3.4. CM/DB contact name and phone number;
- 1.4.6.3.5. Location for viewing plans and specifications;
- 1.4.6.3.6. Date, time and location of Pre-proposal meeting;
- 1.4.6.3.7. Date, time deadline(s), and location for receiving proposals;
- 1.4.6.3.8. Instructions to respondents for submitting proposals;
- 1.4.6.3.9. Selection criteria, questions and submittal requirements.
- 1.4.7. At the time and location identified in the advertisement, the CM/DB shall hold a Pre-proposal meeting for all potential subcontractors with the project team and Owner’s HUB Coordinator. The CM/DB shall review as a minimum:

- 1.4.7.1. The general scope of the project and the specific scope of work included in this package;
 - 1.4.7.2. Instructions to respondents for submitting proposals;
 - 1.4.7.3. Selection criteria and questions;
 - 1.4.7.4. HUB Good Faith Effort requirements (Exhibit H);
 - 1.4.7.5. Project Safety requirements;
 - 1.4.7.6. ROCIP requirements (if applicable);
 - 1.4.7.7. Project Schedule requirements;
 - 1.4.7.8. Payment procedures and requirements, including retainage;
 - 1.4.7.9. Commissioning and Close-out requirements.
- 1.4.8. If the CM/DB identifies any self-performance in the B/PPS (work to be performed by its own employees), the CM/DB shall submit a proposal to the Owner at the advertised time and location in a manner so as not to compromise the competitive process.
- 1.4.8.1. Regardless of the work or method of accepting proposals, all CM/DB self-performance proposals shall be:
 - 1.4.8.1.1. Estimated and submitted by a separate estimating team that is not associated with the CM/DB's pre-construction and/or construction team;
 - 1.4.8.1.2. Submitted in a sealed envelope;
 - 1.4.8.1.3. The final proposal price and not subject to change for any reason prior to recommendation of subcontract award.
- 1.4.9. The CM/DB shall accept all proposals at the advertised location until the advertised deadline. Upon receipt, the ODR shall be allowed to review the proposal and confirm the time and date received. Any proposals received after the deadline shall not be considered by the CM/DB, and shall be returned to the respondent unopened.
- 1.4.9.1. Fax proposals shall not be accepted unless the Owner, prior to the initial advertisement for proposals, approves a detailed plan by the CM/DB of care and custody.
- 1.4.10. After compiling, reviewing and verifying the costs and scope associated with all proposals, the CM/DB shall provide a "bid tabulation" matrix and a proposed

Schedule of Values (refer to Attachment C (CSP format) or D (CM and DB format)) for review by the project team.

- 1.4.10.1. The “bid tabulation” matrix shall compare all equivalent scope proposals to the CM/DB’s estimate.
- 1.4.10.2. Each matrix shall indicate the CM/DB estimate(s) for each scope of work and identify the respective cost savings/over-runs.
- 1.4.10.3. The CM/DB may use values/quantities from its own estimate to provide full scope comparisons between each respondent, however, these “plug” numbers shall be clearly identified in the matrix to the project team and be used only to compare the various proposals.
- 1.4.10.4. The proposed updated Schedule of Values shall summarize all executed and recommended “best value” subcontracts to provide a current status of the Guaranteed Maximum Price Proposal.
- 1.4.10.5. Once the proposals are compiled into a “bid tabulation” matrix and the proposed Schedule of Values has been updated, the CM/DB shall request a meeting with the project team to review the proposals.
- 1.4.11. The CM/DB shall lead the proposal review meeting by reviewing the scope of work, the proposals received, any exclusions or conditions, identify any non-qualified respondents and any other problems that may have occurred during the process.
 - 1.4.11.1. The CM/DB shall confirm that the respondents are qualified, meet the established selection criteria (if applicable), and identify the amount of the proposals.
 - 1.4.11.2. The CM/DB shall identify the “best value” and the current status of the buy-out savings to the project team. If the “best value” causes the CM/DB to exceed the Cost of Work line item, including contingencies in the GMP the CM/DB shall acknowledge that the overage will be deducted from the CM/DB’s Construction Phase Fee.
- 1.4.12. Once the “best value” respondent has been identified by the CM/DB, without exception (or as noted) by the Owner, the CM/DB shall finalize negotiations with the selected “best value” respondent.
 - 1.4.12.1. The CM/DB shall identify and confirm with the ODR which competitive proposal “plug” numbers it intends to use in its negotiations. “Plug” numbers may be established through the CM/DB’s own estimate (if turned into the ODR before the advertised deadline) or values included in other non-selected respondent competitive sealed proposals.

1.4.12.2. If the CM/DB cannot reach an agreement with the selected respondent, the CM/DB shall notify the ODR that it intends to begin negotiations with the second “best value” respondent.

1.4.12.3. The CM/DB shall issue a letter to the Owner indicating that it intends to write a subcontract to the selected “best value” respondent (including self-perform work), identifying the following:

1.4.12.3.1. The bid package number;

1.4.12.3.2. The base bid from the selected respondent and any alternates included in the proposal;

1.4.12.3.3. The total value of the proposed subcontract with a description of any changes from bid day values;

1.4.12.3.4. Drawings and/or specifications related to the subcontract;

1.4.12.3.5. Additional scope items added to the subcontract (as previously agreed to by the Owner), and their value;

1.4.12.3.6. Current status of the GMP identifying current savings/overages;

1.4.12.3.7. A copy of the bid tabulation matrix;

1.4.12.3.8. A copy of the executed subcontract or purchase order, etc. is required prior to any request for payment by the CM/DB for applicable work.

1.4.12.4. If the Owner objects to the “best value” identified by the CM/DB, the Owner may conduct an evaluation of the selection process and/or results.

1.4.12.4.1. If, after evaluation, the ODR disagrees with the CM/DB “best value” recommendation, the ODR may instruct the CM/DB to either re-bid the scope of work or use the Owners’ “best value” selection.

1.4.12.4.2. If the value of the Owners’ selection causes an increase in the Total Contract Price, the increase will be the responsibility of the Owner.

1.4.12.5. The CM/DB shall provide one (1) complete copy of all recommendation letters and proposals to the ODR for record, as they occur until final payment.

1.4.13. For additional bid packages, the CM/DB shall repeat the steps identified in this section as many times as identified in the current B/PPS for the entire project.

1.5. SUBCONTRACTS

- 1.5.1. **Contractor agrees to bind every subcontractor, and every subcontractor agrees to be bound by all the terms and conditions of the Owner's Contract.**
- 1.5.2. The Contractor is required to submit a list of all first tier subcontractors to the Owner as subcontracts are executed.
- 1.5.3. **All subcontractor procurement strategies, procedures and documents issued by the Contractor shall comply with, and enforce the Project Safety, 00 73 16 Project Insurance Requirements and UT System Historically Underutilized Business requirements referenced above.**

1.6. FLOW OF COMMUNICATIONS

- 1.6.1. The Architect is responsible for document control and general project administration. The Owner's written instructions to the Contractor will generally be issued through the Architect. The Architect is the key contact for written communications.
 - 1.6.1.1. On Design-Build projects, the construction management staff may provide this service if approved by the Owner prior to the Notice To Proceed for Construction Services.
- 1.6.2. All subcontractor correspondence shall be routed through the Contractor. All written Contractor correspondence is to be directed to the Architect, with simultaneous copies to the Owner's Designated Representative (ODR) and Construction Inspector(s) (CI). The actual parties for this project will be confirmed at the Pre-Construction Conference.
- 1.6.3. The ODR and the CI are the Owner's primary representatives for the Project. The CI is the key contact for verbal communications and site issue coordination.
- 1.6.4. The ODR and the CI are the only parties authorized to direct changes in the work, and issue written and/or oral instructions directly to the Contractor.
 - 1.6.4.1. All ORAL instructions must be issued by the ODR and/or the CI, or in their presence, and shall be promptly confirmed in writing by the Contractor. Any oral instructions or discussions with subcontractors in the absence of the Contractor are not contractual and are not binding on either party.
- 1.6.5. The Architect may issue clarification and other information not affecting the contract cost or time by means of an Architect's Supplemental Instruction form, (ASI), or similar clarification form and will be sequentially numbered. Both the Architect and the Contractor shall maintain a separate ASI register.
 - 1.6.5.1. If the Contractor considers such clarification to be a change in the contract scope, written notification of such must be provided before performing the work considered to be a change within thirty (30) calendar days of Contractor's receipt, or with the Change Order Proposal.

- 1.6.6. All subcontractor Requests for Information, (RFI), are to be submitted by and under cover of the Contractor, who is to carefully review and ensure the completeness and appropriateness of the question, sequentially number each, and submit to the Architect with copies to the ODR and CI. The Contractor and Architect shall maintain separate RFI logs.
- 1.6.7. All project correspondence shall include OFPC Project Number and Project Name in the title or reference.
- 1.6.8. Pay Estimates, Requests for Information, Changes, Submittals, etc... are to be processed as shown in the Pre-Construction Conference Brochure.

1.7. PROJECT CHANGES

- 1.7.1. All changes shall be administered per the UGC.
- 1.7.2. All changes to the contract affecting cost, scope and/or time will be issued as a formal Change Order to the Contract on the standard University of Texas System Change Order form. The Change Order may include separate change issues, identified as Change Order Proposals and Field Orders.
- 1.7.3. Upon authorization by the Owner, Change Order Proposals may be issued to the Architect for pricing by the Contractor. All contractor pricing shall be submitted on the standard OFPC "Change in Work Cost Analysis" ("Cost Analysis") form provided by the project manager. Prior to its inclusion in a Change Order, the Owner must accept a Change Order Proposal. When the Owner has approved a Change Order Proposal it will be included in a Change Order for execution.
 - 1.7.3.1. The Contractor shall summarize all costs for each change at each level of subcontractor and supplier by preparing the "Cost Analysis" form, and shall provide each subcontractor's cost summary on separate "Cost Analysis" forms as backup. Additional support documentation from both the Contractor and its subcontractors is encouraged, but such will not replace use of the standard U.T. System form.
 - 1.7.3.2. Where the Contractor believes it is entitled to a time extension, it shall so state as part of its response to the Change Proposal, including a justification for such request. Time extensions will be granted only if a Change Order Proposal affects the activities on the Critical Path of the Owner approved Project Schedule (i.e., when the work impacts the "Contract Substantial Completion Date").
 - 1.7.3.3. If the Owner and Contractor cannot mutually agreed upon a fair and reasonable cost and time settlement, the Owner may: 1) Reject the quotation and void the Change Order Proposal, 2) Issue instructions to the Contractor to proceed on a time and material basis for a price to be determined later not to

exceed a fixed maximum dollar and time, or 3) Issue a Unilateral Change Order.

- 1.7.3.4. The Owner may issue Field Orders directly to the Contractor for minor changes to the contract, which can be negotiated in the field. Pricing backup shall be the same as a Change Order Proposal and is to be outlined on the "Cost Analysis" form noted above. Once the Owner and the Contractor have signed the Field Order, the work is authorized and the Field Order will be included in the next Change Order.

1.8. LIQUIDATED DAMAGES

- 1.8.1. If assessed, liquidated damages will be withheld from progress payments beginning with the first payment after the adjusted Contract completion date and until all work of the contract is complete. The amount assessed shall be deducted from the contract price through a written Change Order.

1.9. SITE USE ISSUES

- 1.9.1. Harassment of any kind toward any person will not be tolerated; offending workers will be removed from the project immediately and permanently.
- 1.9.2. The Contractor shall provide and submit a program plan for worker orientation, identification and control of access to the site. All workers on the project shall participate in this program before beginning work on the project. This plan shall include, as a minimum:
 - 1.9.2.1. Employee identification badges with a photograph of the employee, the employer and employees' name. Badges shall be provided for all employees and produced by a system on site. This identification shall be worn at all times while on the project site. Lack of an id badge shall be grounds for removal from the project until badge is produced.

PART 2 - PRODUCTS

2.1 SHOP DRAWINGS AND SUBMITTALS

- 2.1.1 Refer to the UGC for requirements not identified in this section.
- 2.1.2 The Contractor shall assign an identifying number to each submittal following a format to be established at the Pre-Construction Conference. The same number with a numerical or alphabetical suffix will be used to identify re-submittals.
- 2.1.3 The burden of timeliness to complete the submittal process is on the Contractor. The Contractor shall allow sufficient time within the construction schedule to the

Architect and Owner to review and approve all submittals, including time for all re-submittals on any unaccepted/rejected submittal.

- 2.1.4 Any deviation from the Contract Documents shall be conspicuously noted on the submittal and the transmittal cover sheet. Failure to so note deviation will void any action taken on the submittal.
- 2.1.5 All manufacturer's data contained within the submittal shall have all inapplicable features crossed out or deleted in a manner that will clearly indicate exactly what is to be furnished.
- 2.1.6 Equipment of larger sizes than shown, even though of a specified manufacturer, will not be acceptable unless it can be demonstrated that ample space exists for proper installation, operation, and maintenance.
- 2.1.7 The Owner will not be responsible for payment of any item that has not been submitted and approved through the established submittal process.
- 2.1.8 The exact number of submittal copies required for distribution will be determined at the Pre-construction Conference. The Contractor shall anticipate providing a minimum of twelve (12) copies of each submittal in addition to those needed by the Contractor and its subcontractors. Two (2) of the approved copies returned to the Contractor shall be set aside for subsequent turn over to Owner at Project Closeout.

2.2 SUBSTITUTION OF MATERIALS, LABOR AND EQUIPMENT

- 2.2.1 Refer to the UGC for requirements not identified in this section.
- 2.2.2 The specified products referenced in the Contract Documents establish minimum qualities for which substitutions shall at least equal to be considered acceptable. The burden of proof of equality rests with the Contractor. The Owner retains sole authority for acceptance of substitutions.
- 2.2.3 All substitutions shall be submitted within ninety (90) days of the Notice to Proceed for Construction and clearly marked as such on the transmittal cover sheet for the submittal.
- 2.2.4 The Contractor shall allow a minimum of six (6) weeks for review of each substitution by the Architect and/or Owner in addition to the requirements identified in Section 2.2.3 above.
- 2.2.5 When requested by the Architect, the Contractor shall provide a sample of the proposed substitution item. In some cases, samples of both the specified item and the proposed item shall be required for comparison purposes.
- 2.2.6 Acceptance of materials and equipment will be based on the supplier / manufacturer's published data and will be tentative subject to the submission of complete shop drawings and/or specifications indicating compliance with the

Contract Documents. Acceptance of materials and/or equipment under this provision shall not be construed as authorizing any deviation from the Contract Documents, unless specifically directed in writing from the Architect.

2.2.6.1 Any and all additional costs or time resulting from the acceptance or rejection of any substitution shall be the sole responsibility of the Contractor. These include costs that are not presented at the time of the substitution request and those costs that become known after the approval of the substitution. This includes direct as well as indirect costs.

2.2.7 If a substitution is accepted, and the substitute proves defective, or otherwise unsatisfactory as determined by the Owner for the service intended within the guarantee period, the substitute shall be replaced with the material or equipment specified in the Contract Documents, or as approved by the Owner, at no additional cost to the Owner.

2.3 INITIAL APPLICATION FOR PROGRESS PAYMENT

2.3.1 The Contractor shall submit an initial request for a progress payment per the UGC.

2.3.2 Such requests shall be presented on the University of Texas System Application for Payment and Schedule of Values (refer to Attachment No. 1 and No. 2) forms supplemented by columnar continuation sheets, which represent updates to the original Contract Price or GMP Schedule of Values.

2.3.3 The Contractor's Project accounting records shall be kept on the basis of generally accepted accounting principles in accordance with cost accounting standards issued by the Federal Office of Management and Budget Cost Accounting Standards Board and organized by each Application for Payment period.

2.3.4 Prior to the submission of the initial Application for Payment the Contractor shall submit the following documents to the Architect, Owner for review:

2.3.4.1 Contract Price or GMP Schedule of Values: A single document itemizing the breakdown of the Contract Price/GMP, including general conditions, contingencies and allowances shall be submitted using the OFPC Standard Schedule of Values format. The Contractor shall submit a draft breakdown and such submittal shall be a condition precedent to the processing of the first payment application. The Contractor shall submit subsequent draft copies of the Schedule of Values no later than five (5) working days prior to formal submission of each monthly payment.

2.3.4.1.1 The breakdown shall follow the trade divisions of the specifications and shall be itemized by submittal, floor, area, elevation or other building systems, as a minimum. The breakdown shall include a labor and material breakdown for each activity and be of such detail as may be required by the Owner and/or Architect, but in general

shall limit each line item to less than \$100,000, or as approved by the Owner.

- 2.3.4.1.2 No adjustment to the original detailed breakdown of a contract line item shall be made once accepted by the Owner and Architect. Once accepted, the breakdown will form the basis for all periodic payments.

- 2.3.4.1.2.1 Contracts with Construction Manager at Risk or Design/Build Agreements may adjust the detailed breakdown of a General Conditions line item if the total invoices for a General Conditions line item exceeds one hundred percent (100%). A corresponding amount shall be deducted from another General Condition line item(s) or the Construction Phase Fee to pay for the overage.

- 2.3.4.1.3 The Contractor shall not use subcontractor invoices/pay applications in lieu of a single Schedule of Values from the Contractor.

- 2.3.4.1.4 The breakdown shall anticipate future Change Orders and make provisions for incorporating all changes into the breakdown listing. If issued, Change Orders shall be identified separately and shall itemize the GMP Change Orders, Change Proposals and/or Field Orders, which are incorporated into each Change Order for payment on a line-item basis as required by this section.

- 2.3.4.1.5 Contracts with Guaranteed Maximum Price proposals shall repeat the process outlined in this section every time a subcontract is added to the monthly Schedule of Values for payment.

- 2.3.4.2 Work Progress Schedule: Refer to specification section 01 32 00 for all project schedule requirements.

- 2.3.4.3 Shop Drawing/Submittal Schedule: The Contractor is to provide the Owner and Architect with a Submittal Schedule of all items requiring submittal review showing their anticipated submission date and late finish date for completion of the review process. This Schedule shall be incorporated with the Work Progress Schedule, and each will be updated monthly and submitted to the Architect and Owner with each draft payment request.

- 2.3.4.4 Equipment List/Matrix: Specification Sections 01 91 00 and 23 00 00 require a matrix of all operable devices, building system components and mechanical equipment be submitted at least one week prior to the first application for progress payment. These lists may be combined and, further, may be incorporated into equipment documentation required in Operating and Maintenance Manuals as indicated in Specification Section.

2.3.4.5 The Contractor is encouraged to integrate these documents to the extent practical to avoid duplication, both in initial setup and ongoing updates to each.

2.3.5 Once the line item amounts are agreed to by the Owner and the Contractor, the Contractor is to submit at least ten (10) copies of the formal application to the Architect, utilizing the University of Texas System form, with original signatures of an officer of the contracting firm and original notarization. The Contractor shall furnish a certificate designating a person(s) who has authority to sign pay applications on behalf of the firm if such is not an officer of the firm.

2.3.5.1 At a minimum, the Contractor shall provide attachments to each month's payment request as follows:

2.3.5.1.1 Ten (10) copies of the monthly HUB Progress Assessment reports (Attachment H to Exhibit H)

2.3.5.1.2 Four (4) copies of the updated Submittal Schedule

2.3.5.1.3 Four (4) copies of all invoices required by the contract.

2.3.5.1.4 Three (3) of the wage rate notification form for each member of the workforce not previously submitted.

2.3.5.1.5 Two (2) copies (paper and electronic) of the updated Work Progress Schedule as specified in Specification Section 01 32 00.

2.3.5.2 The formal payment requests with attachments shall be organized and distributed according to the flow chart included in the Pre-Construction Brochure.

2.4 MONTHLY APPLICATION FOR PROGRESS PAYMENTS

2.4.1 For regular monthly applications for payment, the Contractor shall submit for review and approval a draft payment request to the ODR, CI, and the Architect no less than five (5) working days prior to formal submission. The Contractor shall be prepared to review the draft copy at the project site with the Owner and the Architect. Failure to comply with the requirements outlined in Section 2.3 above shall relieve the Owner from its obligation to make payments on any/all line items until the Contractor meets all requirements.

2.4.1.1 Payments cannot exceed the contract, work in-place, or subcontract amounts as depicted on Schedule of Values line items.

2.4.1.2 All as-built drawings shall be reviewed to ensure updates are current.

2.4.1.3 Retainage shall not be used to cover "punch-list" work items.

- 2.4.1.4 All off-site stored materials shall be specifically identified, including the required documentation, photographs, insurance and arrangements for the Contractor to escort the CI to visit and personally verify the stored material is physically separated and secure from other material.
- 2.4.2 Requests for payments in association with release of, or reduction in retainage or completion of work have additional requirements as outlined in the UGC and Specification Section 01 77 00.
- 2.4.3 The Owner may withhold Progress Payments in accordance with the UGC.
- 2.4.4 The Owner's Designated Representative shall determine acceptance of either mailed or electronically submitted invoices. The payment due date is when the invoice can be viewed by an employee on the first business day following the submittal, if the agency receives the invoice after normal business hours.

2.5 CONTRACTOR'S DAILY REPORT

- 2.5.1 The Contractor shall provide the Architect, ODR and CI with a report detailing its daily activities on the Project in a format acceptable to the Owner. All tests performed by the Contractor are to be attached. All work reports required of subcontractors shall be attached to the Contractor's daily report.
 - 2.5.1.1 The report shall include, as a minimum, the following information as it relates to the day's activities on site: subcontractors on site (including number of employees for each sub), equipment, areas of work and type of work performed, material received, tests performed, any injuries and/or accidents, total number of employees on site (including Contractor) any oral instructions received, any material damage, any change in personnel and anything else that might impact quality or schedule.
- 2.5.2 These reports shall be submitted to the CI on a daily basis, and are ground for withholding payment.

2.6 AS-BUILT DRAWINGS AND RECORD DOCUMENTS

- 2.6.1 "As-Built" drawings, specifications, detail manuals, and submittals shall be continuously annotated by the Contractor to reflect actual record conditions, addenda, issuance of all Change Orders and clarifications, and actual dimensional records for underground and all other services.
- 2.6.2 Maintenance of current documentation by the Contractor is required in order to process pay applications. The CI and the Architect will review the status of such documentation monthly, at a minimum.
- 2.6.3 Refer to Specification Section 01 91 00 – Project Commissioning for requirements regarding the Commissioning and Closeout Manual tracking of these documents.

- 2.6.4 Refer to Specification Section 01 77 00 – Project Closeout Procedures for detailed instructions on As-Built Drawings, Specifications, O&M manuals and other records.

PART 3 – EXECUTION

3.1 PRE-CONSTRUCTION CONFERENCE (WITH OR WITHOUT A PARTNERING WORKSHOP)

- 3.1.1 A Pre-Construction Brochure will be prepared by the Architect using the standard OFPC Pre-Construction Brochure, as an overview of administrative procedures for the project. A review of the Brochure, including this Section, identification of key project personnel, diagrams illustrating documentation routing, Owner's sample administrative forms, and other information will be conducted at the conference.
- 3.1.2 Upon mutual agreement, a Partnering Workshop may be held with or near the time of the Pre-Construction Conference. The Preconstruction Conference and/or Partnering Workshop will be paid for in total by the Contractor, and reimbursed by the Owner for fifty percent (50%) of the mutually agreed upon costs (100% of the costs shall be reimbursed to the Contractor as part of the General Conditions in the GMP for CM and DB contracts).
- 3.1.2.1 The conference and/or workshop is intended to provide further understanding among the parties, to establish mutual goals for the project and to develop strategies for achieving those goals.
- 3.1.3 The Owner will schedule a Pre-Construction Conference to generally coincide with issuance of Notice to Proceed for Construction. The conference agenda will cover broad project issues followed by detail review of administrative procedures.
- 3.1.3.1 The UGC requires the Contractor to comply with the Owner's administrative requirements as outlined herein and as reviewed at the Pre-Construction Conference.
- 3.1.3.1.1 For projects with Guaranteed Maximum Price contracts the Owner may require a Pre-Construction meeting prior to Notice to Proceed Construction.
- 3.1.3.1.2 For projects with Guaranteed Maximum Price contracts and multiple bid packages, the Owner may schedule additional Pre-Construction Conferences to include any subcontractors added to the project after the initial Pre-Construction Conference.
- 3.1.4 Attendance may be required as determined by the Owner at the conference by all appropriate representatives of the Contractor, mechanical, electrical, plumbing subcontractors, and any additional subcontractors (proposed or engaged), whose scope of work represents five percent (5%) or more of the total construction cost. The Contractor shall request all HUB subcontractors also be represented. Each firm is to be represented by personnel directly involved in the Project, including Project

Managers and Project Superintendents or labor foremen, as a minimum.

3.1.4.1 Project representatives of the Contractor and all other parties directly involved with the processing or executing of project submittals, changes and/or payments should attend the conference.

3.1.5 Prior to the scheduled time of the Pre-Construction Conference, the Contractor is to provide the Architect a written outline of all involved firms, their key personnel, including mailing address and phone numbers to be incorporated into a Project Directory and included in the Pre-Construction Brochure.

3.1.6 The Architect will provide to the Contractor, a minimum of eight (8) copies of the Pre-Construction Conference Brochure prior to the scheduled date of the Conference. The Contractor shall review the contents of the manual with its key project personnel and those of its' subcontractors in preparation for the conference.

3.2 OWNER'S MONTHLY PROJECT PROGRESS MEETINGS

3.2.1 In addition to specific coordination meetings, pre-installation contractor meetings for each element of work, and other project meetings for other purposes; the Owner will schedule and conduct a Project Progress Meeting at least once each month.

3.2.2 The Contractor shall have all preparations of payment request, and submission of the updated Project Schedule submitted to the Owner at least (5) days prior to this meeting date.

3.2.3 Prior to the Owner Monthly Project Progress Meetings, the Contractor shall convene a similar progress meeting with their subcontractors to review each of their present and future needs including interface requirements, utility outages required, sequences, deliveries, access, site utilization, temporary facilities and services, hours of work, hazards and risks, housekeeping, change orders, and documentation of information for payment requests in order to be fully prepared to discuss all pertinent issues with the Owner. The Contractor is to notify the Owner and Architect in advance of such meetings with subcontractors.

3.2.4 Owner Monthly Project Progress Meetings are to include review of Contractor's updated project schedule and forecast of operations for coming period, as well as issues of coordination, anticipated utility outages, status of requested change proposals and other cost impact issues, status of the Commissioning process, status of the HUB Plan, and other project issues

3.2.5 The Contractor and Architect shall provide separate tracking logs for submittals, RFIs, ASIs, and changes in a package for each primary meeting participant. On Design/Build contracts, a single set of tracking logs may be utilized if accepted in advance by the Owner.

3.2.6 This meeting will be chaired by the ODR. The Contractor shall be specifically prepared to discuss the following at each Progress Meeting:

- 3.2.6.1 Status of all activities appearing on the current Longest Path Bar Chart and the Three Month Rolling Schedule as required in Specification Section 01 32 00 – Project Planning and Scheduling;
 - 3.2.6.2 Status of Project Safety;
 - 3.2.6.3 Status of "action" items from the previous meeting;
 - 3.2.6.4 Status of Buyout on Guaranteed Maximum Price projects;
 - 3.2.6.5 Current status of product submittals and shop drawings, requests for information (RFI), and Architect's clarifications (ASI);
 - 3.2.6.6 Status of project changes and other items of significance, which could affect progress;
 - 3.2.6.7 Status of the Commissioning process for the project;
 - 3.2.7 In addition to the monthly progress meeting, the Owner may also schedule bi-monthly, weekly, or other project meetings at various stages of the project as conditions may dictate. However, the complete report requirements noted above will apply only to the monthly project progress meetings.
- 3.3 UTILITY OUTAGES
- 3.3.1 The Contractor shall notify the CI and the ODR, in writing, of any planned utility outages ten (10) calendar days in advance for academic and office campuses and not less than three weeks for all medical or research campuses.
 - 3.3.2 A standard form for processing a request for utility shutdown or any other campus disruption is included in the Pre-Construction Conference Brochure. The Contractor shall utilize this form, with attachments as necessary, in requesting an outage.
- 3.4 The Contractor shall not turn service on or off, without prior written authorization. Unless directed otherwise, the campus Physical Plant will turn services on and off.
- 3.5 TESTING
- 3.5.1 Refer to the UGC and Specification Section 01 45 00 for additional requirements.
 - 3.5.2 The Contractor shall not employ the same testing entity engaged by the Owner.
- 3.6 INSPECTIONS
- 3.6.1 Refer to the UGC and Specification Section 01 45 00 for inspection requirements.
- 3.7 FINAL ACCEPTANCE AND PAYMENT
- 3.7.1 The Contractor must notify the Architect, Owner, in writing that the Work will be

ready for final acceptance verification on a definite date, a minimum of ten (10) calendar days prior to such proposed date.

3.7.2 In addition to requirements noted for Substantial Completion, final payment and/or release of remaining retainage requires submission of the following:

3.7.2.1 Consent of Surety;

3.7.2.2 Release of Liens and Claims;

3.7.2.3 Affidavit of payment of Debts and Claims;

3.7.2.4 Final Historically Underutilized Business Plan;

3.7.2.5 Completed and signed SWPPP Notice Of Termination;

3.7.2.6 Closeout of the Owner's Construction Contingency and/or Owner's Special Cash Allowance to a zero (\$0) balance.

3.7.3 Refer to UGC and Section 01 77 00.

3.8 ONE YEAR WARRANTY

3.8.1 If informed of a defect, the Contractor shall remedy the defect at its own cost and respond in writing to the ODR and the notifying party within ten (10) calendar days indicating the action taken to resolve the defect. Refer to the UGC.

3.8.2 The Contractor shall attend any and all meetings to resolve warranty issues. The Contractor will provide a tracking log of all warranty issues, and their resolution.

3.8.3 The Contractor shall participate in an end of warranty project review with the Owner, as scheduled by the ODR, at a time prior to termination of the warranty period.

3.8.4 Per the UGC and unless directed in writing by the Owner, all warranties shall use the date of Substantial Completion as the start date for that particular warranty.

3.8.4.1 If any equipment and/or system is completed prior to the date of Substantial Completion, the Contractor shall provide, at their own cost, for the necessary warranty extension as required to meet the requirements of the UGC.

3.8.4.2 All equipment shall be delivered to the Owner in an "as-new" condition. If equipment is put into service for the convenience of the contractor, the contractor shall, at their own expense, maintain, service and refurbish the equipment to "as-new" condition prior to delivery to the Owner.

END OF SECTION 01 31 00

ATTACHMENT A – OFPC APPLICATION FOR PAYMENT (CSP FORMAT)

THE UNIVERSITY OF TEXAS SYSTEM - OFFICE OF FACILITIES PLANNING & CONSTRUCTION APPLICATION FOR PAYMENT - GENERAL CONTRACTOR			
APPLICATION FOR PARTIAL PAYMENT No. <u>(ENTER No.)</u>		OFPC PROJECT No. <u>(ENTER No.)</u>	
FOR THE PERIOD: <u>(ENTER BEGINNING DATE)</u>	TO: <u>(ENTER ENDING DATE)</u>	INCLUSIVE.	
NAME OF PROJECT: <u>(ENTER PROJECT NAME)</u>			
CONTRACTOR NAME & ADDRESS: <u>(ENTER CONTRACTOR NAME & ADDRESS)</u>			
TO BE COMPLETED BY THE GENERAL CONTRACTOR			
1 Original Contract Amount:	\$	<u>0</u>	
2 Approved Change Order Extras:	\$	<u>0</u>	
3 Accepted Change Order Deductions:	\$	<u>0</u>	
4 Current Contract Amount:	\$	<u>0</u>	
5 Total Completed/Designed To Date:	\$	<u>0</u>	
6 Less Total Retainage (5%):	\$	<u>0</u>	
7 Total Net Earned Amount:	\$	<u>0</u>	
8 Less Previous Payments:	\$	<u>0</u>	
9 Current Payment Due:	\$	<u>0</u>	
10 Balance To Finish, Including Retainage: (line 4 less line 7)	\$	<u>0</u>	
AFFIDAVIT Insurance: I, agent for the General Contractor, do hereby certify that all insurances as required by law, and by the specifications, are in full force and effect as of this date. Claims & Liability: I, agent for the General Contractor, do furthermore certify that all current invoices and obligations have been paid in full, and there are no claims or liabilities against this contract. <div style="text-align: right; margin-top: 10px;"> <u>(CONTRACTOR SIGNATURE)</u> <i>Signature of CONTRACTOR</i> </div>			
<div style="display: flex; justify-content: space-between;"> <div> STATE OF TEXAS COUNTY OF <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px auto;"> <div style="text-align: center; font-size: 8px;">(STAMP SEAL BELOW)</div> </div> </div> <div> Personally before me, the undersigned authority, this day appeared <u>(PRINTED NAME OF CONTRACTOR AGENT)</u> who being by me duly sworn, on his oath says that the account hereto attached, in the amount of <u>(ENTER AMOUNT)</u> in favor of <u>(PRINTED NAME OF CONTRACTOR FIRM)</u> and against THE BOARD OF REGENTS OF THE UNIVERSITY OF TEXAS SYSTEM is, within the knowledge of affiant, just true, and correct; that it is due and that all just and lawful offsets, payments, and credits have been allowed. Sworn to and subscribed before me, <u>(CONTRACTOR SIGNATURE)</u> this _____ day of _____, 20____. <i>Signature of CONTRACTOR</i> Notary Public <u>(NOTARY SIGNATURE)</u> _____ County, Texas <i>Signature of Notary</i> </div> </div>			
CONSTRUCTION SERVICES: TO BE COMPLETED BY THE OFPC CONSTRUCTION INSPECTOR (OR RCM)			
CONTRACTOR has submitted an updated Project Schedule: <input type="checkbox"/> Yes <input type="checkbox"/> No		CONTRACTOR has updated the Record Drawings: <input type="checkbox"/> Yes <input type="checkbox"/> No	
This Pay Application includes a current Release of Retainage: <input type="checkbox"/> Yes <input type="checkbox"/> No		if "Yes", CONTRACTOR has included a "Consent of Surety": <input type="checkbox"/> Yes <input type="checkbox"/> No	
Current Payment For Construction Services		\$	<u>(ENTER CONSTRUCTION AMOUNT)</u>
Inspected and Approved on		<u>(DATE)</u> <i>Date</i>	By: <u>(OFPC RCM/CI SIGNATURE)</u> <i>Signature of OFPC CSM/CI</i>
CONSTRUCTION SERVICES CERTIFICATE: TO BE COMPLETED BY THE PROJECT ARCHITECT/ENGINEER TO THE BOARD OF REGENTS OF THE UNIVERSITY OF TEXAS SYSTEM, AUSTIN, TEXAS			
This is to certify that <u>(ENTER CONTRACTOR FIRM NAME)</u> , General Contractor for the Project <u>(ENTER PROJECT NAME)</u> is entitled to payment for Construction Services of this Certificate in the amount of \$ <u>(ENTER CONSTRUCTION SERVICES AMOUNT)</u>			
Architect/Engineer <u>(ENTER PROJECT A/E FIRM NAME)</u>			
Reviewed and Approved on		<u>(DATE)</u> <i>Date</i>	By: <u>(A/E SIGNATURE)</u> <i>Signature of A/E</i>
OFPC CONTRACTS MANAGER:		Reviewed and Approved on	<u>(DATE)</u> <i>Date</i>
			By: <u>(OFPC CONTRACT MANAGER INITIALS)</u> <i>Contracts Manager Initials</i>

ATTACHMENT B – OFPC APPLICATION FOR PAYMENT (CM/DB FORMAT)

THE UNIVERSITY OF TEXAS SYSTEM - OFFICE OF FACILITIES PLANNING & CONSTRUCTION APPLICATION FOR PAYMENT - CONSTRUCTION MANAGER AT RISK			
APPLICATION FOR PARTIAL PAYMENT No. <u>(ENTER No.)</u>		OFPC PROJECT No. <u>(ENTER No.)</u>	
FOR THE PERIOD: <u>(ENTER BEGINNING DATE)</u>	TO: <u>(ENTER ENDING DATE)</u>	INCLUSIVE.	
NAME OF PROJECT: <u>(ENTER PROJECT NAME)</u>			
CM-R NAME & ADDRESS: <u>(ENTER CM-R NAME & ADDRESS)</u>			
TO BE COMPLETED BY THE CONSTRUCTION MANAGER AT RISK			
	PRE-CONSTRUCTION SERVICES	CONSTRUCTION SERVICES (GMP)	TOTAL CONTRACT AMOUNT
1 Original Contract Amount:	\$ <u>0</u>	\$ <u>0</u>	\$ <u>0</u>
2 Approved Change Order Extras:	\$ <u>0</u>	\$ <u>0</u>	\$ <u>0</u>
3 Accepted Change Order Deductions:	\$ <u>0</u>	\$ <u>0</u>	\$ <u>0</u>
4 Current Contract Amount:	\$ <u>0</u>	\$ <u>0</u>	\$ <u>0</u>
5 Total Completed To Date:	\$ <u>0</u>	\$ <u>0</u>	\$ <u>0</u>
6 Less Total Retainage Held To Date:	<u>N/A</u>	\$ <u>0</u>	\$ <u>0</u>
7 Total Net Earned Amount:	\$ <u>0</u>	\$ <u>0</u>	\$ <u>0</u>
8 Less Previous Payments:	\$ <u>0</u>	\$ <u>0</u>	\$ <u>0</u>
9 Current Payment Due For Each Part:	\$ <u>0</u>	\$ <u>0</u>	\$ <u>0</u>
10 Balance To Finish, Including Retainage: (line 4 less line 7)	\$ <u>0</u>	\$ <u>0</u>	\$ <u>0</u>
AFFIDAVIT Insurance: I, agent for the Construction Manager-at-Risk, do hereby certify that all insurances as required by law, and by the specifications, are in full force and effect as of this date. Claims & Liability: I, agent for the Construction Manager-at-Risk, do further certify that all current invoices and obligations have been paid in full, and there are no claims or liabilities against this contract.			
<i>Signature of CM-R</i>			
STATE OF TEXAS COUNTY OF (STAMP SEAL BELOW)	Personally before me, the undersigned authority, this day appeared _____ who being by me duly sworn, on his oath says that the account hereto attached, in the amount of _____ in favor of _____ and against THE BOARD OF REGENTS OF THE UNIVERSITY OF TEXAS SYSTEM is, within the knowledge of affiant, just true, and correct; that it is due and that all just and lawful offsets, payments, and credits have been allowed. Sworn to and subscribed before me _____ this _____ day of _____, 20 _____. Notary Public _____ County, Texas <i>Signature of Notary</i>		
PRE-CONSTRUCTION SERVICES : TO BE COMPLETED BY THE OFPC PROJECT MANAGER			
Current Payment For Pre-Construction Services _____ \$ _____		Reviewed and Approved on _____ Date By: _____ Signature of OFPC PM	
CONSTRUCTION SERVICES : TO BE COMPLETED BY THE OFPC CONSTRUCTION INSPECTOR (OR RCM)			
CM-at-Risk has submitted an updated Project Schedule: <input type="checkbox"/> Yes <input type="checkbox"/> No		CM-at-Risk has updated the Record Drawings: <input type="checkbox"/> Yes <input type="checkbox"/> No	
This Pay Application includes a current Release of Retainage: <input type="checkbox"/> Yes <input type="checkbox"/> No		if "Yes", CM-at-Risk has included a "Consent of Surety": <input type="checkbox"/> Yes <input type="checkbox"/> No	
Current Payment For Construction Services _____ \$ _____		Inspected and Approved on _____ Date By: _____ Signature of OFPC CURCM	
CONSTRUCTION SERVICES CERTIFICATE: TO BE COMPLETED BY THE PROJECT ARCHITECT/ENGINEER			
TO THE BOARD OF REGENTS OF THE UNIVERSITY OF TEXAS SYSTEM, AUSTIN, TEXAS			
This is to certify that _____, Construction Manager-at-Risk for the Project _____ is entitled to payment for Construction Services of this Certificate in the amount of _____ \$ _____ Architect/Engineer _____ Reviewed and Approved on _____ Date By: _____ Signature of A/E			
OFPC CONTRACTS MANAGER:		Reviewed and Approved on _____ Date By: _____ Contracts Manager Initials	

ATTACHMENT C - OFPC STANDARD SCHEDULE OF VALUES (CSP FORMAT)

The U.T. System Schedule of Values - Contractor's Estimate Continuation Sheet (CSP)									
University of Texas System Project Number				OFPC Contract Number:					
University of Texas System Project Name				Project Address:					
General Contractor				Application For Payment Number:					
Date Prepared				Application Period: To					
A	B	C *	D	E	F	G	H	I	J
CSI Section	CSI Description of Work / Subcontractor Name / Specification Section	Detailed Breakdown of Contract Line Items	Total Amount Previously Requested & Percent	Current Application					Retainage (5%)
				This Period Amount & Percent	Total Amount Completed To Date & Percent				
Column Equations			H'	I'	F / C	D + F	H / C	H X 5%	
	Division 1 - General Conditions & Requirements	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Contractor Provided Owner Equipment / Furniture								
	Temporary Field Office(s)	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Weekly Janitorial Services	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Furnishings	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Digital Copier	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Multifunctional Printer/Scanner/Fax	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Telephone System & Monthly Service	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	DSL Internet Connection & Monthly Service	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Division 2 - Sitework	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Division 3 - Concrete	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Division 4 - Masonry	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Division 5 - Metals	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Division 6 - Woods & Plastics	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Division 7 - Thermal & Moisture Protection	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Division 8 - Doors & Windows	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Division 9 - Finishes	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Division 10 - Specialties	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Division 11 - Equipment	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Division 12 - Furnishings	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Division 13 - Special Construction	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Division 14 - Conveying Systems	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Division 15 - Mechanical	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Division 16 - Electrical	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
Cost of Work Subtotal		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
Owner Construction Contingency		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
Owner's Cash Allowance (If Applicable)		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
Contract Total		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -

ATTACHMENT D – OFPC STANDARD SCHEDULE OF VALUES (CM/DB FORMAT)

The U.T. System Schedule of Values - Contractor's Estimate Continuation Sheet (8 1/2" x 11" Sheet ONLY)														
OFPC Project No.:							Project Address:							
OFPC Project Name:							Application For Payment Number:							
Construction Manager Name:							Application Period: From To							
A	B	C	D	E	F	G	H	I	J	K	L	M	N	
Spec. Section / Bid Package	Description of Work / Subcontractor / Supplier / Vendor / Specification Section	Initial Proposed Line Item Values	Additional Services / GMP Change Order Values	Actual Subcontract Amount at Buyout	Delta (Proposed to Actual)	Subcontract, Purchase Order or Vendor No.	Detailed Breakdown of Contract Line Items	Total Amount Previously Requested & Percent	Current Application			Retainage (5%)		
Column Equations									Total Amount This Period & Percent	Total Amount Completed To Date & Percent				
									L - H	J / G	H + J	L / G	L x 5%	
Pre-Construction Services														
	Programming (20% If Applicable)	\$ -	\$ -	\$ -	\$ -	N/A	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	N/A
	Schematic Design (20%)	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	
	Design Development (20%)	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	
	GMP Development (10%)	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	
	Construction Documents (20%)	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	
	Bidding/Proposals (10%)	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	
	Additional Services	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	
Pre-Construction Services Subtotal		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	
Construction Services														
General Conditions														
	On-Site Project Management Staff	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Bonds and Insurance	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Temporary Project Utilities	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
	Field Offices & Office Supplies	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
General Conditions Subtotal		\$ -	\$ -	\$ -	\$ -	N/A	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
Cost of the Work														
02	Sitework	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
03	Concrete	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
04	Masonry	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
05	Metals	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
06	Woods & Plastics	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
07	Thermal & Moisture Protection	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
08	Doors & Windows	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
09	Finishes	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
10	Specialties	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
11	Equipment	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
12	Furnishings	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
13	Special Construction	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
14	Conveying Systems	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
15	Mechanical	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
16	Electrical	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
Cost of Work Subtotal		\$ -	\$ -	\$ -	\$ -	N/A	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
Construction Manager's Contingency														
	Construction Manager's Contingency	\$ -	\$ -	\$ -	\$ -	N/A	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
Construction Phase Fee														
	Construction Phase Fee	\$ -	\$ -	\$ -	\$ -	N/A	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
Owner's Special Cash Allowance														
	Owner's Special Cash Allowance	\$ -	\$ -	\$ -	\$ -	N/A	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
Owner's Construction Contingency														
	Owner's Construction Contingency	\$ -	\$ -	\$ -	\$ -	N/A	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
Construction Services (GMP) Subtotal		\$ -	\$ -	\$ -	\$ -	N/A	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -
Contract Total														
	Contract Total	\$ -	\$ -	\$ -	\$ -	N/A	\$ -	\$ -	0%	\$ -	0%	\$ -	0%	\$ -

REVISION LOG

The following is provided for convenience to the Owner, Architect/Engineer and Contractor to track changes between annual document issuances and is not to be considered by any party to be contractual or 100% complete.

Date	Paragraph Revised	
09/01/08	2.5.3.4 – Added... (unless approved by the Owner).	
09/01/08	Replaced RCM with Owner’s Designated Representative (ODR) throughout document to align with Uniform General Conditions	
09/01/08	2.5.8.1 - Added section... Regardless of the work or method of accepting proposals, all CM/DB self-performance proposals shall be:	
03/02/09	1.4.3. - Added sentence... All subcontractor procurement strategies, procedures and documents issued by the Contractor shall comply with, and enforce the Project Safety, Project Insurance and UT System Historically Underutilized Business requirements referenced above.	
3/1/11	Clarified competitive pricing requirements (section 1.4.3.3.2); relocated PROCUREMENT OF SUBCONTRACTS section; miscellaneous minor revisions.	
9-13-12	Added Art. 1.7.3.2 and Art. 1.4.12.3.9 regarding requirements for Subcontractor Change Order Pricing Proposal Summary Sheet.	MGM
9-13-12	Added “Attachment E” Subcontractor Change Order Pricing Proposal Form.	MGM
4/15/14	Removed the text previously added in Art. 1.7.3.2 and 1.4.12.3.9, and “Attachment E” Subcontractor Change Order Pricing Proposal Form (available in the eManual).	pac
12/18/15	Added language for compliance with SB 1081.	
12/12/16	Added the revision activity noted above (dates 9/13/12 and 4/15/14), which was previously omitted from this log.	pac
4/27/17	Inserted article 2.4.4 – electronic submittal of pay apps.	

SECTION 01 32 00 - PROJECT PLANNING AND SCHEDULING

PART 1 - GENERAL

1.1. DEFINITIONS

- 1.1.1 The term “Baseline Schedule,” as used throughout the contract documents, shall refer to a fixed projection of the project schedule. It is the standard by which project performance is measured.
- 1.1.2 The term “Calendar Day,” as used throughout the contract documents, is any day of the week, including weekends and holidays.
- 1.1.3 The term “Construction Schedule” (a.k.a. Work Progress Schedule as defined by the UGC), as used throughout the contract documents, shall refer to the schedule for the construction phase of the Project as developed, monitored and maintained, by the Contractor’s Scheduler, and as used by the Project Team during Pre-Construction and/or Construction Services.
- 1.1.4 The term “Critical Path,” as used throughout the contract documents, shall refer to the sequence of activities that determines the longest duration for the Project when the Longest Path has zero or less Total Float, the Longest Path becomes the Critical Path.
- 1.1.5 The term “Critical Path Method” (CPM), as used throughout the contract documents, is a technique used to predict project duration by analyzing which sequence of activities has the least amount of scheduling flexibility. Early dates are figured by a forward pass using a specific start date and late dates are figured by using a backward pass starting from a completion date. Most scheduling programs (e.g., Microsoft Project, Primavera) automatically calculate the Longest Path using the CPM to identify critical activities.
- 1.1.6 The term “Data Date,” as used throughout the contract documents, shall refer to the day after the date through which a schedule is current. Everything occurring earlier than the data date is "as-built" and everything on or after the data date is "planned."
- 1.1.7 The term “Detailed Schedule,” as used throughout the contract documents, shall refer to a schedule with small-scale, well-defined activities that are typically less than 30 calendar days in length.
- 1.1.8 The term “Fragnet,” as used throughout the contract documents, shall refer to a copy of the Construction Schedule (or portion thereof) used to conduct an analysis of proposed changes or revisions to the Construction Schedule.
- 1.1.9 The term “Free Float,” as used throughout the contract documents, is the time by which an activity may be delayed or extended without affecting the start of any succeeding activity. Note: Free float can never be negative.

- 1.1.10 The term “Longest Path,” as used throughout the contract documents, shall refer to the sequence of interdependent activities that aggregate to determine the minimum duration of a project.
- 1.1.11 The term “Milestone Schedule,” as used throughout the contract documents, shall refer to a schedule with specific non-duration related activities, work packages, stages, or phases, typically marked by a high level event such as an approval, execution of a contract, Notice to Proceed, issuance of a set of documents, completion of work, etc.
- 1.1.12 The term “Precedence Diagramming Method” (PDM), as used throughout the contract documents, shall refer to the relationship between activities by linking sequences with precedence relationships in the development of the Construction Schedule.
- 1.1.13 The Term “Project” means all activities necessary for the realization of the Work. This includes design, contract award(s), execution of the Work itself, and fulfillment of all contract and warranty obligations.
- 1.1.14 The term “Project Team,” as used throughout the contract documents, shall refer to the Owner, Architect, Design Consultants, User, Contractor and Subcontractors (as applicable) that are contracted and/or specifically assigned to the Project.
- 1.1.15 The term “Total Float,” as used throughout the contract documents, shall refer to the time by which an activity may be delayed or extended without affecting the total project duration or violating a target finish date (i.e. Substantial Completion Date).
- Negative Total Float indicates that the Project is late, while Positive Total Float is the property of the Project and does not belong to any one party (Refer to the UGC).
- 1.1.16 For the term “Weather Day” – refer to Attachment “C” to the Owner’s Special Conditions.
- 1.1.17 The term “Work Day,” as used throughout the contract documents, shall refer to a day in which a minimum of 8 hours of work is planned, excluding weekends and holidays.

1.2. PURPOSE

- 1.2.1 **Time is an essential part of this contract. Therefore, the timely and successful completion of the Work requires careful planning and scheduling of all activities inherent in the completion of the Project.**
- 1.2.2 **Acceptance of the Construction Schedule, or any subsequent update thereof by the Owner, is for format and extent of detail of the Construction Schedule only. Such “Acceptance” does not indicate approval of the Contractor’s means or methods, or of any change to the contract terms including without limitation any required contract Milestones.**

- 1.2.3 The Construction Schedule shall be developed to allow for a minimum amount of Total Float for the Project during Pre-Construction and/or Construction Services, and shall be formatted in a manner that facilitates reporting of progress and trends, identification of risks and opportunities, projecting upcoming activities, and forecasting of project milestones.
- 1.2.4 The Owner must be able to reasonably rely on the Contractor's Construction Schedule for projected activity dates in order to make accurate commitments to design professionals, contractors, vendors, user group(s), campus administration and other parties as necessary.
- 1.2.5 This specification applies to all project delivery methods regardless of contract type. For Projects with multi-phase delivery, the requirements within shall pertain to each.
- 1.2.6 All references to Pre-Construction Services in this specification shall apply to all contract types other than Competitive Sealed Proposals (CSP).

1.3. RELATED DOCUMENTS

- 1.3.1. In addition to specific references indicated herein, the Contractor's attention is specifically directed to, but not limited to, the following Sections and Documents, which include additional administrative requirements.
 - 1.3.1.1. Uniform General Conditions for University of Texas System Building Construction Contracts (UGC)
 - 1.3.1.2. Owner's Special Conditions
 - 1.3.1.3. Section 01 31 00 - Project Administration
 - 1.3.1.4. Section 01 35 23 - Project Safety Requirements
 - 1.3.1.5. Section 01 45 00 - Project Quality Control
 - 1.3.1.6. Section 01 77 00 - Project Closeout Procedures
 - 1.3.1.7. Section 01 91 00 – Project Commissioning

1.4. CONTRACTOR RESPONSIBILITY

- 1.4.1. The Contractor is responsible for planning, management, coordination, and scheduling of all activities from a Notice to Proceed for Construction to Final Completion of the Project within the time allotted by the Agreement.
- 1.4.2. The Contractor is responsible for keeping the Owner and the Project Team fully informed of schedule status and upcoming activities throughout the Project via the Construction Schedule.

- 1.4.3. The Contractor is solely responsible for scheduling and statusing of all activities related to Pre-Construction, procurement of materials and subcontractors, construction, testing, inspection, commissioning, and Project turn-over to the Owner.
- 1.4.4. The Contractor shall provide adequate, reasonable, and detailed project planning throughout all aspects of its work to ensure completion of all activities within the Contract Time.
- 1.4.5. The Contractor's Pre-Construction and Construction project management personnel shall actively participate in the planning and development of the Construction Schedule and shall be prepared to review such development and progress with the Owner, Architect, and any other members of the Project Team so that the planned sequences and procedures are clearly understood by all parties.
- 1.4.6. The Contractor shall plan for appropriate activity durations to allow for thorough review, procurement, submittal, installation, inspection, testing, and commissioning, of all work and/or systems in order to confirm contract compliance, including work relying on Owner participation or coordination.
- 1.4.7. The Contractor shall include in the schedule any activities required by local, municipal, county, state, or federal authorities having jurisdiction over the project including, but not limited to, durations for permits, easements, and utility connections.

PART 2 – PRODUCTS

2.1 QUALIFICATIONS OF THE CONTRACTOR'S SCHEDULER

- 2.1.1 The Contractor shall assign a Scheduler who shall be responsible for the Construction Schedule throughout Pre-Construction and Construction Services.
- 2.1.2 The Contractor's Scheduler shall have at least an undergraduate degree in a construction related field, and continuous experience on similar size and type of project(s) within the past five (5) years including at least two (2) years with the current specified scheduling software.
- 2.1.3 In lieu of a degree, the Contractor's Scheduler may have at least five (5) years continuous experience on similar size and type of project(s) with the current specified scheduling software.
- 2.1.4 The Contractor's Scheduler shall be an integral part of the Project Team during Pre-Construction Services and on-site full time for Construction Services until at least Substantial Completion of the work. The Contractor's Scheduler may have additional responsibilities such as Senior Project Manager, Project Manager, Superintendent, Assistant Project Manager, Assistant Superintendent, or Project Engineer.

2.1.5 If the Contractor's Scheduler is outsourced, the Contractor shall assign an on-site contact for all Construction Schedule related issues.

2.1.6 All Contractor personnel involved in the preparation, updating and reporting of the Construction Schedule shall possess adequate construction scheduling knowledge related to the Project, Critical Path Method (CPM) scheduling, as well as a general understanding of the specified software.

2.2 REQUIRED SCHEDULING SOFTWARE

2.2.1 The Construction Schedule shall be developed and maintained by the Contractor's Scheduler using Oracle Primavera P6 software.

Website: www.Oracle.com

2.3 NAMING THE CONSTRUCTION SCHEDULE

2.3.1 The Contractor's Scheduler shall title the Project Baseline Schedule "*Project No. BL yymmdd*" (i.e., 102-081 BL 181009) once accepted by the Owner's Designated Representative.

2.3.2 Subsequent updates to the Construction Schedule shall be titled "*Project No. UD yymmdd*" (i.e., 102-081 UD 190125) where "yymmdd" equals the schedule update's Data Date – January 25th, 2019.

2.3.3 If at any time the Baseline Schedule is "reset" (with approval by the Owner), the title shall be titled "*Project No. BLR# yymmdd*" (i.e., the first revised baseline would be 102-081 BLR1 190325) once accepted by the Owner's Designated Representative.

2.4 CONSTRUCTION SCHEDULE DEVELOPMENT REQUIREMENTS

2.4.1 The Construction Schedule calendar shall be based on a five (5) day work week.

2.4.1.1 The term "Holidays", as used throughout the contract documents, shall refer to New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving (including the Friday after), Christmas Eve, Christmas Day, and New Year's Eve.

2.4.1.2 The Contractor may plan to work weekends and holidays, but the Construction Schedule shall be based on completing all work during normal work days and hours.

2.4.1.3 The Contractor shall include in the Construction Schedule any other non-work periods such as campus special events, ceremonies, and final exams referenced in the Owner's Special Conditions or as directed by the ODR.

2.4.2 The Construction Schedule shall include a Work Breakdown Structure (WBS) organized by project phase, stage, location, building, floor, area, elevation, system, etc.

<u>Example WBS Organization</u>	
FP	Facilities Programming
SD	Schematic Design
DD	Design Development
CD	Construction Documents
TH	THECB Submittal
GM	Guaranteed Maximum Price

<u>Example WBS Organization</u>	
SP	Subcontractor Bidding / Procurement
SU	Submittals
FD	Fabricate and Delivery
C	Construction
PC	Project Close-Out
CX	Commissioning Activities

- 2.4.3 The Construction Schedule shall assign “Responsibility Codes” (i.e., create a responsibilities directory) for every Contractor, subcontractor, supplier, fabricator, installer, design consultant, Owner, and any other party responsible for the accomplishment of an activity using the following Responsibility Codes as applicable:

<u>Responsibility Code & Description</u>	
Arch	Architect / Engineer
AV	A/V Equipment
Blind	Blinds, Shades, Window Coverings
Carp	Carpet
Casf	Casework Fabricator
Casi	Casework Installer
Cocw	Concrete Formwork
Conf	Concrete Finishing
Ctil	Ceiling / Acoustical Tile
Door	Doors & Frames
Dryw	Drywall / Light Gauge Stud Installer
Elec	Electrical
Elev	Elevator
Falm	Fire Alarm Systems
Fire	Fire Protection Systems
Ftil	Floor Tile
Furn	Furnishings
Glas	Glass / Glazing
Hard	Hardware
Hvac	HVAC
Insu	Insulator
Irri	Irrigation
Labc	Laboratory Casework Fabricator
Labi	Laboratory Casework Installer
Land	Landscaping
Lbeq	Laboratory Equipment
Masn	Masonry
Offe	Owner’s Furnishings
Omat	Owner’s Material Testing Firm

<u>Responsibility Code & Description</u>	
OPCI	Owner Provided – Contractor Installed Equipment
OPOI	Owner Provided – Owner Installed Equipment
Otab	Owner’s Test & Balance Firm
Owne	Owner
Pntr	Paint & Wall Coverings
Pier	Piers / Piles / Caissons
Plas	Plaster / EIFS
Plum	Plumber
Rebf	Reinforcing Steel Fabricator
Rebi	Reinforcing Steel Installer
Roof	Roofing
Seal	Sealants
Sign	Signs
Site	Sitework
Stee	Steel Erector
Stef	Steel Fabricator
Mstf	Miscellaneous Steel Fabricator
Msti	Miscellaneous Steel Installer
Site	Site Utilities
Tele	Telephone / Communication Systems
Terz	Terrazzo
Toia	Toilet Accessories
Toip	Toilet Partitions
Watp	Waterproofing / Dampproofing
Wodf	Wood Flooring
Wods	Wood Framing & Supplier

- 2.4.3.1 The Contractor’s Scheduler shall use additional Responsibility Codes as applicable.
- 2.4.3.2 If a subcontractor(s) has been procured, the Contractor may substitute the associated Responsibility Code above with a different code identifying the name of the subcontractor.

2.4.3.3 The Contractor's Scheduler may use additional Secondary Activity and Responsibility Codes as necessary for monitoring, statusing, and reporting the Construction Schedule.

2.4.4 The Contractor's Scheduler shall assign a unique "Activity Identification" (Activity ID) and "Activity Description" to every activity, and they shall be meaningful, easily understood by the Project Team, similar to like activities at differing locations, and as shown on the Contractor's Schedule of Values.

2.4.4.1 Activity Descriptions shall start with a verb to indicate what is to be done and end with a location (Example: Install Metal Studs - 3rd floor Bldg B).

2.4.4.2 A "Milestone" Activity shall refer to any major event or phase, or any other important point in the Project, including the following Activities as applicable:

<u>Milestone Activity ID & Description</u>		<u>Milestone Activity ID & Description</u>	
PC1	NTP for Pre-Construction Services	C4	Start Demolition
SD1	Start Schematic Design	C5	Complete Primary Foundations
SD2	Submit for Owner Review	C6	Structural Top-Out
SD3	Joint Review for Owner Comments	C7	Start New Framing
SD4	Approve Schematic Design	C8	Start MEP Rough-In
BR1	FPCC & BOR Submission	C9	Building Dry-In
BR2	FPCC & BOR Approval	C10	Start Mockups
DD1	Start Design Development	C11	Start Finishes
DD2	Submit for Owner Review	C12	Permanent Power
DD3	Joint Review for Owner Comments	C13	Energize Equipment
DD4	Approve Design Development	C14	Conditioned Air
TH1	Construction Application Submittal	CX1	Commissioning Kickoff Meeting
TH2	Construction Application Approval	CX2	Building Automation System Submittal Approval
GM1	Submit GMP	CX3	Control Sequence of Operation Coordination Meeting
GM2	Approve GMP	CX4	Ethernet Connectivity
CD1	Start Construction Documents	CX5	Building Envelope Testing & Verification Documents
CD2	Submit for Owner Review	CX6	Major HVAC System Startup
CD3	Joint Review for Owner Comments	CX7	System Specific TAB Activities
CD4	Approve Construction Documents	CX8	Integrated System Tests
C1	NTP for Construction Services	CX9	Entire Facility Integration Tests
C2	Partnering/Pre-construction Conference	C15	Start Above Ceiling Inspections
C3	Establish Site Controls /Mobilize	C16	Start Pre-Final Inspections
		C17	Start Final Inspections
		C18	Substantial Completion

2.4.4.3 A “Detailed” Activity shall refer to a singular work event in the Project.

2.4.4.4 A “Summary” Activity shall refer to a grouping (or a summary) of Milestone and/or Detailed activities in the Construction Schedule.

2.4.5 The Construction Schedule shall include all construction procurement “Administration” activities associated with the submittal, fabrication and delivery of work as applicable. The schedule shall, at a minimum, include procurement activities for materials and equipment that may have significant fabrication and delivery lead times. This does not preclude the requirement for the Contractor to maintain a separate detailed submittal tracking log.

2.4.6 A minimum of 15 calendar days total shall be allotted to the A/E and ODR for each submittal review unless otherwise approved by the ODR.

2.4.7 The Construction Schedule shall include all detailed commissioning related activities as listed in Part 3 of Specification Section 01 91 00, General Commissioning Requirements, as applicable.

2.4.8 The Construction Schedule shall include activities for any anticipated local, municipal, county, state, or federal requirements for utilities connections, easements, vacations, upgrades, replacements, extensions, and/or permits.

2.5 PROJECT SCHEDULING REQUIREMENTS

2.5.1 The Contractor’s Scheduler shall use the Critical Path Method (CPM) as the scheduling technique in the development of the Construction Schedule.

2.5.1.1 “Retained Logic” is the required scheduling mode when scheduling progressed activities. The “Retained Logic” scheduling mode requires that the remaining duration of a progressed activity not be scheduled until all of its predecessors are completed. The Contractor’s Scheduler shall not use the “Progress Override” mode option in developing or updating the Construction Schedule.

2.5.1.2 Appropriate activity predecessor and successor logic relationships must be in place. With the exception of the first and last activity in the schedule, every activity shall have at least one predecessor and one successor activity.

2.5.1.3 Other than the first and last activity, the construction schedule shall be free of any mandatory date constraints unless approved by the ODR.

2.5.1.4 The use of a “Must Finish By” constraint on the overall Project is required. The “Must Finish By” constraint is placed at the project level and not at the activity level.

2.5.2 Estimated construction Activity Durations shall be stated in work days (i.e. Monday through Friday).

2.5.2.1 The maximum duration for any Detailed Activity shall be thirty (30) work days.

2.5.2.2 The minimum durations for any Owner Inspection activity (i.e. concealed space, above ceiling, substantial and final completion) shall be at least three (3) work days per inspection and re-inspection, per work area.

2.5.3 Estimated remaining Activity Durations shall be stated in work days, as of the Data Date of every Construction Schedule update.

2.5.4 Administrative activities, including material and equipment procurement lead times, may have durations longer than thirty (30) work days.

2.6 CONSTRUCTION SCHEDULE ANALYSIS REQUIREMENTS

2.6.1 The Contractor's Scheduler shall use the Critical Path Method (CPM) technique to determine the overall Project duration through the analysis of the durations of each of the activities, their schedule dependencies, and their resultant float.

2.6.2 In accordance with the UGC, the Project Schedule shall include at least **10%** Total Float from the effective date of Notice to Proceed for Construction Services to the Substantial Completion Date.

2.6.2.1 If the Project warrants the planning of work to occur on Saturday and/or Sunday, the respective days shall be used in the calculation of the Total Float requirements. (i.e., Normal 5 day work week x 10% = 0.5 days of Total Float required, while an Accelerated 6 day work week x 10% = 0.6 days of Total Float required.)

2.6.2.2 The 10% minimum Total Float requirement for construction services shall be in addition to the anticipated weather days specified in Attachment "C" in the Owner's Special Conditions.

2.6.2.3 The 10% minimum Total Float requirement for construction services shall not be represented as a single activity, but rather the resultant of the relationship between the early and late finish dates or early and late start dates of each Activity on the schedule's Longest Path.

2.6.2.4 Per the Uniform General Conditions (UGC), float time contained in the CPM schedule is not for the exclusive benefit of the Contractor or the Owner, but belongs to the Project and may be consumed by either party as needed on a first-used basis. The use of project Total Float shall be documented in the "Executive Summary Report" (see Attachment A) and agreed upon by the Project Team.

2.7 COORDINATION WITH OTHER DOCUMENTS AND WORK

2.7.1 The Construction Schedule shall be coordinated with the Contractor's Submittal Schedule and Schedule of Values, as required by the UGC and Specification Section

01 31 00. (i.e., the Work Breakdown Structure shall be arranged, numbered, and described consistently across the various documents.)

- 2.7.2 Cost and/or resource loading of the Construction Schedule is allowed. If the Contractor elects to cost-load the Construction Schedule, the Contractor shall provide a separate Schedule of Values in the format required by Specification Section 01 31 00 - Project Administration.

PART 3 – EXECUTION

3.1 PLANNING AND SCHEDULING WORKSHOP

- 3.1.1 Within fifteen (15) calendar days after a Notice to Proceed, the Contractor shall conduct a Planning and Scheduling Workshop with at least the Contractor's Scheduler, Project Manager, Superintendent, the Owner, the Architect, User representatives, and any available Subcontractors prior to submitting the Construction Schedule to the Owner.

3.1.1.1 The Contractor's Scheduler shall schedule and coordinate the workshop with the Owner's Designated Representative at least ten (10) calendar days prior to the Planning and Scheduling Workshop.

3.1.1.2 The Contractor's Scheduler shall submit a complete draft Construction Schedule to the Owner's Designated Representative at least five (5) calendar days prior to the Planning and Scheduling Workshop.

3.1.1.3 The Contractor's Scheduler shall review the draft Construction Schedule with the Project Team, including a verbal description of the logic and sequencing of activities, method for determining estimated activity durations and corresponding resources required, and any activities involving Owner participation and/or approval.

- 3.1.2 For CM and DB projects, at least two (2) Planning and Scheduling Workshops shall be scheduled; the first shall be within fifteen (15) calendar days after a Notice to Proceed Pre-Construction Services and the second at within fifteen (15) calendar days after a Notice to Proceed Construction Services for each "major" GMP executed.

The purpose of the pre-construction conference shall result in approval of the baseline for pre-construction.

- 3.1.3 Attendance at the Planning and Scheduling Workshop and acceptance of the Baseline Construction Schedule is a condition precedent to the Contractor submitting initial and any subsequent progress payments.

3.2 CONSTRUCTION PHASE BASELINE SCHEDULE SUBMITTAL

- 3.2.1 The Baseline Construction Schedule shall be submitted to the Owner with the required Total Float and a current Data Date (less than or equal to five (5) work days) as prescribed by the UGC (or as accepted by the Owner in the Project Planning and Scheduling Workshop).
- 3.2.1.1 The Contractor is responsible for submitting the Baseline Construction Schedule within the prescribed time regardless of when Subcontractors are procured and brought on to the project.
- 3.2.1.2 For contract types other than Competitively Sealed Proposals (CSP), the Construction Schedule may include Milestone and/or Summary Activities for the remaining work that has not been approved in an executed GMP Proposal for Construction Services.
- 3.2.1.3 Once the “full” scope of the Project has been approved (i.e., the last Stage GMP Change Order has been executed), the Contractor’s Scheduler shall coordinate with the Owner’s Designated Representative to “reset” the Baseline Construction Schedule.
- 3.2.1.4 The minimum 10% Total Float (or as amended by the Owner’s Special Conditions) shall remain in the Construction Schedule from the Notice to Proceed for Construction Services until the Baseline Schedule is accepted by the Owner, regardless of any delays incurred by the Project without affecting the Substantial Completion Date.
- 3.2.1.5 No activity shall have a Total Float amount greater than the minimum Total Float identified by the Longest Path plus forty-five (45) days.
- 3.2.1.6 The Owner reserves the right to withhold any and all payments related to the Construction Schedule and/or General Conditions if a Baseline Construction Schedule is not submitted, or is not acceptable to the Owner. If the parties cannot agree on a Baseline Schedule, the Owner may deduct any monies related to Project Scheduling, and/or costs associated with schedule recovery.
- 3.2.1.7 If the Baseline Construction Schedule has not been accepted by the Owner, each successive baseline submittal shall be updated to status the current progress of the work until it is accepted by the Owner.
- 3.2.1.8 A Baseline Construction Schedule that does not have at least the minimum amount of Total Float at submission shall result in the Contractor forfeiting all claims to Construction Schedule extensions and/or delays as a result of contract changes and/or excusable delays as described in the UGC.

3.2.2 The Contractor's Scheduler shall submit two (2) electronic Primavera P6 backup files (.xer), two (2) electronic Adobe PDF files, and two (2) paper copies of the following Baseline Construction Schedule reports to the Owner's Designated Representative:

3.2.2.1 Graphic Time-Scaled Report (Gantt Chart): A graphic time-scaled view including all activities, Percent Complete, Start and Finish dates, estimated durations, and Total Float. Organize activities by Work Breakdown Structure (WBS) and sort by activity Start Date.

3.2.2.2 Longest Path Time-Scaled Report (Gantt Chart): A graphic time-scaled view of Detailed Activities on the Longest Path from the Data Date to Contract Completion. Organize activities by Work Breakdown Structure (WBS) and sort by activity Start Date.

3.2.2.3 Owner Activity Time-Scaled Report (Gantt Chart): A graphic time-scaled view of Detailed Owner Activities from the Data Date to Contract Substantial Completion. Organize activities by Work Breakdown Structure (WBS) and sort by activity Start Date.

3.2.2.4 Milestone Activity Report: A listing of every Milestone Activity organized by Work Breakdown Structure (WBS) and sorted by Milestone Start Date.

3.2.2.5 Detailed Activity Report: A listing of every Detailed Activity sorted by activity Start Date.

3.2.2.6 CPM Logic Report: A listing of every detailed activity identifying every Predecessor and Successor activity sorted by Activity ID.

3.2.3 Once the initial Construction Schedule has been accepted, it shall be referred to as the Baseline Construction Schedule, and shall be used for all future Construction Schedule updates and reports as "Project Baseline."

3.2.3.1 For all project delivery methods other than Competitively Sealed Proposals (CSP), the Construction Schedule may include Milestone and Summary activities until thirty (30) days prior to the submittal of a Guaranteed Maximum Price (GMP) Proposal for Construction Services, but shall include Detailed Activities for at least the first ninety (90) days of Construction Services when submitted with the GMP Proposal.

3.3 UPDATING THE CONSTRUCTION SCHEDULE

3.3.1 Once the Baseline Construction Schedule has been accepted, the Contractor's Scheduler shall update the Construction Schedule for Pre-Construction and Construction Services at least once a month and submit reports at least five (5) work days prior to any application for payment.

- 3.3.1.1 Construction Schedule updates shall be based on actual work progress, current logic and remaining durations.
- 3.3.1.2 The Contractor shall maintain throughout the duration of construction a Total Float value on the Longest Path of not less than 10% of the remaining schedule duration unless approved by the ODR. Use of Total Float shall be documented in the end-of-month schedule update and associated “Executive Summary Report” (see Attachment A) and agreed upon by the Project Team.
- 3.3.1.3 The Contractor shall transmit to the Owner and ODR an electronic copy of the Final As-built schedule (PDF and Primavera XER Backup files) at Substantial Completion.

3.4 CONSTRUCTION SCHEDULE REPORTS

- 3.4.1 The Data Date for all Construction Schedule Update Reports shall be current within five (5) work days of submission to the Owner’s Designated Representative.
- 3.4.2 The Contractor’s Scheduler shall submit two (2) electronic Primavera P6 backup files (.xer), two (2) electronic Adobe PDF files, and two (2) paper copies of the following construction schedule reports to the Owner’s Designated Representative:
 - 3.4.2.1 Executive Summary Report: A narrative report developed, monitored and updated by the Contractor’s Scheduler for each schedule submission that includes:
 - 3.4.2.1.1 A Total Float Usage Log that identifies the number of days lost / gained each month, including an explanation of each event.
 - 3.4.2.1.2 An Adverse Weather Day Summary comparing the anticipated weather days to the actual weather days.
 - 3.4.2.1.3 A description of the progress of the Detailed Activities on the Longest Path Bar Chart
 - 3.4.2.1.4 A description of current and anticipated problems and/or delaying factors and their possible impact
 - 3.4.2.1.5 An explanation of any and all changes to the CPM logic, including constraints, durations, and relationships

Refer to Attachment A to this specification for an example Executive Summary Report.

- 3.4.2.2 Graphic Time-Scaled Report (Gantt Chart): A graphic time-scaled view including all activities, Percent Complete, Start and Finish dates, estimated durations, and Total Float. Organize activities by Work Breakdown Structure

(WBS) and sort by activity Start Date. Include a comparison to the accepted Baseline Construction Schedule.

- 3.4.2.3 Longest Path Bar Chart: A graphic time-scaled view of on-going and future Detailed Activities on the Longest Path from the Data Date to the contract Substantial Completion Date.

Level 1 Filter is “Longest Path = Yes”

Level 2 Filter is “% Complete < 100”

- 3.4.2.4 Owner Activity Bar Chart: A graphic time-scaled view of Detailed Owner Activities from the Data Date to the Owner’s established Substantial Completion Date.

- 3.4.2.5 Three-Month Rolling Bar Chart: A graphic time-scaled view of all Detailed Activities completed, on-going or starting one (1) month earlier and two (2) months after the Data Date.

Level 1 Filter is “Actual Finish WR DD – 20”

Level 1 Filter is “Actual Finish WR DD + 0”

Level 1 Filter is “Early Start WR DD + 0”

Level 1 Filter is “Early Start WR DD + 40”

Level 2 Filter is “Activity % Complete < 100”

- 3.4.2.6 The Owner at any time may request additional Construction Schedule reports.

3.5 FORMATTING CONSTRUCTION SCHEDULE REPORTS

- 3.5.1 Printed schedule reports shall be on standard 8 ½” x 11” paper unless otherwise directed by the Owner’s Designated Representative.

- 3.5.2 Electronic copies of the Construction Schedule and associated reports shall be submitted to the ODR via e-mail or other approved method with the subject/contents clearly titled (example: 102-081 10/25/18 Schedule Update).

All electronic Construction Schedule submittals shall include copies of the Primavera P6 backup file in XER format and associated reports in Adobe PDF format.

- 3.5.3 Each report shall include a footer with the following information:

- 3.5.3.1 A “Date Block” indicating the start date, finish date, Data Date, run date, and “Must Finish By” date

- 3.5.3.2 A “Title Block” indicating the Owner’s Project Number and Title, and the Name of the Report (i.e., Layout)

- 3.5.4 Refer to “Attachment B” to this specification for an example Gantt chart report layout.

3.6 CONSTRUCTION SCHEDULE SLIPPAGE

3.6.1 If the percent Total Float used by the project exceeds the percent of construction duration spent, or the Total Float is negative, the Contractor's schedule update shall include a Recovery Plan to make immediate revisions to the work force, work-hours, shifts, material deliveries or any other aspects of the work. The Recovery Plan shall be for review and acceptance by the Owner's Designated Representative (ODR) as part of the following schedule update (i.e., If the project has 50% of the original construction duration remaining, but has only 25% of the original Total Float remaining, the Contractor shall submit a Recovery Plan.)

3.6.2 The Contractor shall submit the Recovery Plan to the Owner's Designated Representative (ODR) as required in the UGC, clearly describing all the changes in schedule or work enacted and/or planned in order to ensure completion by the contract Substantial Completion date. The Recovery Plan shall reference the Work Progress Schedule Activity IDs included in the plan.

The Owner shall have the right to review and comment on any Recovery Plan activities that include Owner participation, or affect any Owner consultants or outside contractors.

3.6.3 Once the Owner's Designated Representative (ODR) accepts the Recovery Plan, the proposed revision shall be incorporated into the Work Progress Schedule. While the schedule is in recovery mode, the Work Progress Schedule shall be updated and submitted to the ODR on a weekly interval until the ODR determines that a full recovery of the schedule has been made.

3.7 CONSTRUCTION SCHEDULE CHANGES

3.7.1 If the Owner or Architect issues a Change Order Proposal, the Contractor shall submit a proposed fragnet revision for all proposed contract changes that affect the Substantial Completion Date or remaining Total Float with the Change Order Proposal pricing.

Proposed fragnet revisions shall be accompanied by a narrative listing of the affected activities including a statement of the expected overall impact of the change proposed.

3.8 EXCUSABLE DELAYS AND TIME EXTENSIONS

3.8.1 Excusable delays shall be administered per the UGC.

3.8.2 If an excusable delay extends the Contract Substantial Completion Date, the Owner's Designated Representative may extend the contract time by the number of excusable calendar days lost on the Construction Schedule, or take other actions as appropriate under terms of the Agreement.

Change Order Proposal pricing that does not impact the Substantial Completion Date or does not include a proposed fragnet revision prior to approval by the Owner's Designated Representative, shall not be due a time extension.

- 3.8.3 Once the Owner's Designated Representative accepts a time extension, and authorizes the Contractor to proceed with the contract change, the proposed revision shall be incorporated into the Construction Schedule.

END OF SECTION 01 32 00

ATTACHMENT A – EXAMPLE EXECUTIVE SUMMARY REPORT

The University of Texas at Austin Example Project OFPC Job No. XXX-XXX

Executive Summary Report for MAR 2006
Contractor Name
As of March 25, 2006

Schedule Overview

a.	Date of Notice to Proceed	5/10/2005	
b.	Current Contractual Substantial Completion Date *	11/15/2006	
c.	Duration in Calendar Days	554	(b-a)
d.	Duration in Work Days	396	(c*5/7)
e.	10% Minimum Total Float in Baseline *	40	(d*10%)
f.	CPM Update Date (Data Date)	3/25/2006	
g.	Calendar Days Consumed	319	(f-a)
h.	Work Days Consumed	228	(g*5/7)
i.	% Time Consumed (From NTP through CPM Data Date	58%	(h/d)
k.	% Time Remaining (From CPM Data Date to Current S/C Date)	42%	(1-i)
l.	10% Total Float Expected for Remaining Project Duration	17	(k*e)
m.	Actual days Total Float Remaining on CPM's Longest Path	21	
n.	Days Ahead (+)/Behind(-) based on CPM Total Float	+4	(m-l)

* Executed Change Orders involving time will need to be accounted for in rows (b) and (e).

Project Duration and Total Float

The project Total Float increased to 21 days for this update (3/25/06). The substantial completion date remains November 15, 2006. Following issues caused changes in project Total Float.

1. **OCT 2005 (Revised Baseline Schedule)**
 - a. Site Permit Delay to Start Work – Activity ID 1010 - 11 days
 - b. Biggs's Heavy Duty Plumbing – Activity ID 1544 - 6 days
 - c. Relocation for Overhead Utilities – Activity ID 1228 - 10 days
2. **NOV 2005 (Monthly Update)**
 - a. Relocation for Overhead Utilities – Activity ID 3334 - 8 days
3. **Recovery Schedule (12/25/2005)**
 - a. Recovery Plan – See Attached Plan + 24 days
4. **JAN 2006 (Monthly Update)**
 - a. Weather Impact (11 Jan 06) – See Weather Day Log Attached - 1 day
 - b. Approval for the Windows – Activity ID 4321 - 11 days
5. **FEB 2006 (Monthly Update)**
 - a. Windows Fab & Delivery Expedition – Activity ID 1774 + 4 days
6. **MAR 2006 (Monthly Update)**
 - a. No changes this month 0 days

ATTACHMENT A – EXAMPLE EXECUTIVE SUMMARY REPORT (CONTINUED)

Weather Day Summary (Owner's Special Conditions Attachment C)

	2005 MAY	2005 JUN	2005 JUL	2005 AUG	2005 SEP	2005 OCT	2005 NOV	2005 DEC	2006 JAN	2006 FEB	2006 MAR	2006 APR	2006 MAY	2006 JUN	2006 JUL	2006 AUG	2006 SEP	2006 OCT	2006 NOV
Anticipated	4	4	1	1	2	3	2	4	6	4	4	3	4	4	1	1	2	3	2
Actual	2	3	2	3	0	1	3	0	7	3	6								
Over			1	2			1		1		2								

Longest Path Activities Completed or In Progress This Period

1. Main Building (Phase 2)
 - ◆ Activity 4332 - M/S frame & exterior gypsum - Completed
 - ◆ Activity 4505 - Set FCU's and carriers – In Progress
2. Utility/Tunnel Work
 - ◆ Activity 5900 – Tunnel Overhead MEP - Completed.
 - ◆ Activity 5910 - SS Line MH #6 to ML #8 - In Progress.

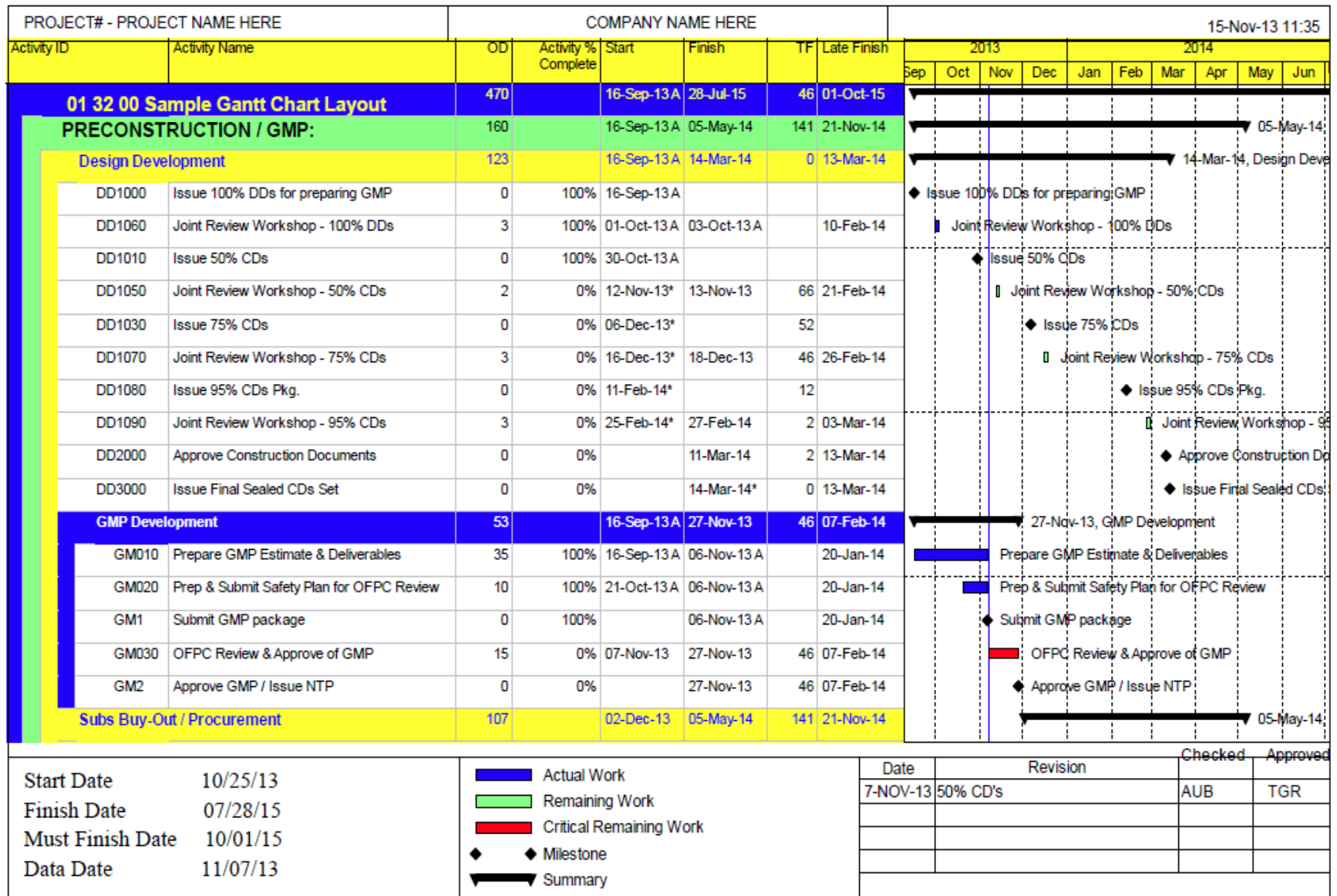
Current and Anticipated Problem, Delays and Impact

1. The slab deflections are greater than the engineer's model. If a load test is required, this could have an impact on our schedule. After the meeting on February 1, 2006, Contractor was unofficially informed that a load test was not going to be performed. However, Contractor has not received the official report indicating this issue is resolved.
2. The issuance of construction documents for interior finishes dated 2/22/06 were received on February 24, 2006. Contractor is currently reviewing these drawings and will forward on any schedule impacts created by these drawings.
3. The brick veneer was delivered and it did not match the mockup. Our subcontractor is currently working with their suppliers to have the brick remade. Contractor continues to track this issue and will forward any schedule impacts created by this issue.

Added, Deleted and Revised activities and Logic

- New activities named “1st, 2nd and 3rd Owner-EXT. Finish Inspection” were added on schedule instead of the Owner-EXT. Finish Inspections of each side to reflect actual construction sequence.
- Added new activity for “Insulate Duct Work” and tied to “Frame hard ceiling” as a predecessor with FS relationship.
- Revised the activity description “Install/Insulate process pipe” to “Install process pipe”.
- Set Plumbing Fixtures is tied to 2nd Side Drywall with FS relationship as a successor to reflect actual sequence.
- Deleted the FS relationship between Install Brick Veneer, Cast Stone (P1LE04001) and Install Deck & Felt @ Roof (P1LR05003) to reflect actual sequence.
- Deleted the FS relationship between Install Brick Veneer, Cast Stone (P1LE04002) and Install Wood Soffits, Gutter System (P1LE07008) to reflect actual sequence.
- Deleted the FS relationship between Owner-Roof Inspection (P1LR077500) and Install Wood Soffits, Gutter System (P1LE07009) to reflect actual sequence.
- Install Process Pipe @ Level 6 Wall is tied to Insulate Process Pipe @ Level 1 with FS as a predecessor to reflect actual construction sequence.

ATTACHMENT B – EXAMPLE GANTT CHART LAYOUT



REVISION LOG

The following is provided for convenience to the Owner, Architect/Engineer and Contractor to track changes between annual document issuances and is not to be considered by any party to be contractual or 100% complete.

Date	Paragraph Revised
09/01/08	Revised section 3.6.2.1 - All Electronic Construction Schedule submittals shall be in *.xer (P6) or concentric format (P3 to P5).
	Revised “Project Schedule” to “Construction Schedule” throughout the document in recognition that the specification only controls the contractor’s schedule, and not the entire Capital Improvement Program project schedule as previously implied.
	Updated entire section 2.5
03/02/09	Added scheduling terms to section 1.1
	Revised list of required milestones in section 2.4.4.2 – Due to the transition from P3 to P6 the requirement to include Final Completion and Operational Occupancy milestones was deleted.
	Revised section 2.5.1.3 to allow the final Substantial Completion Date Milestone to have an open end, in lieu of Final Completion.
03/01/11	Updated section 2.2.1 Oracle contact information; added Commissioning Activities to sections 2.4.2 and 2.4.4.2; revised “Owner Provided – Owner Installed Equipment” Responsibility Code & Description in section 2.4.3
10/01/16	<p>Overhauled spec section to align with P6. Removed references and vocabulary related to earlier versions of P6. Spec was originally written around a decade old version of P3. Also modified, added, deleted, and clarified other sections to align the specification with current policies and procedures.</p> <ul style="list-style-type: none"> • Replaced references of “Precedence Diagram Method PDM” with “Critical Path Method (CPM). • Added definition of “Calendar Day” in Definitions section 1.1 • Added definition of “Project” in Definitions section 1.1 • Added further definition to “Work Day” as a minimum 8-hour day in section 1.1.15 • Added reference to Attachment “C” to the Owner’s Special Conditions for definition of “Weather Day”. • Added Section 01 35 23 – Project Safety Requirements to 1.3 – Related Documents. • Added requirement for contractor to include any activities involving local municipal or county authorities (i.e.: permits, easements, connection, etc.) • Updated section 2.3 to reflect P6’s current file naming conventions. • Updated section 2.4.1 to require contractor to include activities for campus special events, ceremonies, and final exams referenced in the Owner’s Special Conditions. • Updated section 2.4.2 to replace the term “Activity Code” with “Work Breakdown Structure.”

SECTION 01 35 23 – PROJECT SAFETY REQUIREMENTS

PART 1 – GENERAL

1.1 OVERVIEW

The Owner's objective is an injury and incident-free Project, with a focus on project safety that shall not be compromised to achieve any other business objective. The Contractor shall structure an effective and systematic safety management approach that emphasizes continuous improvement.

1.2 GENERAL REQUIREMENTS

The Owner recognizes that the Contractor and Subcontractors may have existing safety management programs with established safety policies, processes, procedures, and work practices. The Owner will support these where they prove to be as effective and meet the intent and purpose of this Section. Upon request by the Owner, the Contractor and/or Subcontractors (of any tier) shall promptly produce and provide copies of any required documents related to Project safety. Where opportunities for improvement are identified, the Contractor and Subcontractors of any tier shall work collaboratively with OFPC in making appropriate revisions to progress toward an injury and incident-free workplace.

1.3 DEFINITIONS

- 1.3.1 The term "Owner's Safety Representative" (OSR) as used throughout the Contract documents shall refer to any construction safety professional who is acting on behalf of the Owner. This will include, but may not be limited to the OFPC Safety Analyst, and any Risk Control Consultants associated with the Owner.
- 1.3.2 The term "Project Safety Coordinator" (PSC) as used throughout the Contract documents shall refer to the Contractor's construction safety professional who is acting on behalf of the Contractor and who shall be responsible for safety training, inspections, incident investigations, record keeping, reporting, incident response, and claims management, and shall serve as the technical advisor to the Contractor's project staff for all safety issues.
- 1.3.3 The term "Project Safety Assistant(s)" (PSA) as used throughout the Contract documents shall refer to any Contractor's construction safety professional who is acting on behalf of the Contractor and who shall perform safety related tasks as delegated by the PSC.
- 1.3.4 The term "Subcontractor's Safety Representative" (SSR) as used throughout the Contract documents shall refer to a person employed by the Subcontractor of any tier who is identified as the designated safety representative and who possesses the proper credentials for the position. The SSR is understood to be the immediate supervisor unless identified and documented otherwise. All subcontractors of any tier shall provide at least one SSR per shift.

- 1.3.5 The term “qualified” as used throughout this Section shall match the definition within the OSHA construction safety standards (Title 29 CFR, Part 1926). *Qualified means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to resolve problems relating to the subject matter, the work, or the Project.*
- 1.3.6 The term “competent” as used throughout this Section shall match the definition within the OSHA construction safety standards (Title 29 CFR, Part 1926). *Competent person means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. In addition to the OSHA standard, this person must be trained and knowledgeable in the construction and/or operation of specific equipment or a specific work method and show proper documentation to support such training. Basic awareness training will not be acceptable for this position.*
- 1.3.7 The term “Construction Area” as used throughout this Section shall refer to the portion of the Owner’s property that is released to the Contractor’s care and control and is designated by the Contractor as the space where actual construction efforts will be undertaken to execute the Work.
- 1.3.8 The term “Administration Area” as used throughout this Section shall refer to the portion of the Owner’s property that is released to the Contractor’s care and control and is designated by the Contractor as the space where support efforts will be undertaken to provide administrative needs for the Work. If the Project has project office trailers within the confines of the Owner’s property, that space and the parking area around it may be designated as an Administration Area.
- 1.3.9 The term “worker” as used throughout this Section shall refer to any person who is assigned specifically to the Project and has successfully completed the Project safety orientation.
- 1.3.10 The term “visitor” as used throughout this Section shall refer to any person who is not assigned specifically to the Project. Visitors shall not be allowed access to the “construction areas” unless they are escorted by a member of the Contractor’s project management staff or an OFPC representative.
- 1.3.11 The term “Owner’s Designated Representative” (ODR) as used throughout the Contract documents shall refer to the individual(s) assigned by the Owner to act on its behalf, and to undertake certain activities as specifically outlined in the Contract. For the purposes of this specification section, the words “Owner” and “Owner’s Designated Representative” are interchangeable. The Owner’s Designated Representative is a representative of The University of Texas System Office of Facilities Planning and Construction. The ODR is the only party authorized to direct changes to the scope, cost, or time of the contract.

1.4 PURPOSE

1.4.1 The Contractor shall bear overall responsibility for all aspects of safety for the Project.

1.4.2 The Contractor shall, at all times, provide adequate resources, equipment, training, and documentation to:

1.4.2.1 Comply with the requirements of this Section and all applicable Federal, State, and local statutes, standards, and regulations.

1.4.2.2 Provide a safe work environment at the Project.

1.4.2.3 Instill a culture of safe behavior in all supervisors and workers.

1.4.2.4 Ensure a universal understanding that safety and health issues take precedence over all other considerations at the Project.

1.4.3 In any circumstance where this Section differs from, or conflicts with any statutory requirement, the more stringent shall apply.

1.4.4 The ODR reserves the right to have any person removed from the Project for disregarding Project safety requirements. Removal of the Project Superintendent, Project Manager, any Supervisor, PSC, PSA or SSR may result in work stoppage that will remain in effect pending approval of a suitable replacement. The Contractor shall not be allowed any consideration for time or monetary compensation for said stoppage.

1.4.5 The ODR reserves the right to deduct from the Contract any safety related expenses that the Owner incurs as a result of the Contractor's, or any Subcontractor's, failure to comply with the requirements of this Section.

1.4.6 The ODR will deny requests for time extensions and/or monetary considerations whenever the Owner intercedes on behalf of safety compliance as a result of Contractor failure to act as required by Contract.

1.5 RELATED DOCUMENTS

In addition to specific references indicated herein, the Contractor's attention is also directed, but not limited, to the following publications and documents:

1.5.1 Current edition of Uniform General Conditions for The University of Texas System Building Construction Contracts (UGC);

1.5.2 Owner's Special Conditions;

1.5.3 Current edition of OSHA Safety Standards for the Construction Industry, CFR Title 29, Part 1926.

PART 2 – PRODUCT

2.1 PROJECT SAFETY COORDINATOR (PSC)

- 2.1.1 Overall career experience must include at least seven (7) years that have been dedicated solely to building construction safety with at least five (5) years of construction safety management experience. Any candidate that has completed a four (4) year degree in a safety-related discipline must show at least two (2) years of actual field experience in safety to qualify for a PSC position. The PSC must have practical knowledge, working experience, and documented continuing education in fall protection, scaffolds, excavation, confined space, crane/equipment operations, electrical, incident investigation, and other such safety/health related training. Initial training of less than four (4) hours in duration per topic will not be considered acceptable for this requirement. Continuing education of noted training must be dated within five (5) years of the executed contract. OSHA 10/30 hour Construction Outreach or OSHA 510 certificates will not be acceptable for this training requirement. The PSC shall possess a certificate of completion for the OSHA 500 or 502 (Train the Trainer in Occupational Safety and Health for Construction Industry). The PSC must show evidence of specialized training for Emergency First Aid, Cardio Pulmonary Resuscitation (CPR), and Automatic External Defibrillator (AED) current to within two (2) years. Formal submittal of proof must be provided prior to acceptance and before any portion of the Work will be allowed to commence. The ODR reserves the right to determine acceptability of the submitted training. Any candidate proposed that does not meet these minimum qualifications will not be accepted.

2.2 PROJECT SAFETY ASSISTANT (PSA)

- 2.2.1 Primary experience of any proposed PSA, during the most recent six (6) years of work history must include at least five (5) years that have been dedicated solely to building construction safety. The PSA must have practical knowledge, working experience, and documented continuing education in fall protection, scaffolding, excavations, confined spaces, crane/equipment operations, electrical, incident investigation, and other such safety/health related training. Initial training of less than four (4) hours in duration per topic will not be considered acceptable for this requirement. Continuing education of noted training must be dated within five (5) years of the executed contract. An OSHA 10/30 Construction Outreach or OSHA 510 certification will not be acceptable for this training requirement. The PSA shall possess a certificate of completion for the OSHA 510 (Occupational Safety and Health Standards for the Construction Industry) in addition to the continuing education requirements previously noted. The certificate must be dated within four (4) years of the executed Contract. The PSA must show evidence of specialized training for Emergency First Aid, Cardio Pulmonary Resuscitation (CPR) and Automatic External Defibrillator (AED) current to within two (2) years. Formal submittal of proof must be provided prior to acceptance. The ODR reserves the right to determine acceptability of the submitted training. Any candidate proposed that does not meet these minimum qualifications will not be accepted.

2.2.1.1 On projects over \$180M, the option of a PSA-IT (In-Training) may be considered for the required third PSA after the initial qualified PSAs are already active on the project. At no time shall a PSA-IT be used as a permanent substitute in place of a fully qualified PSA when required. Qualifications for individuals seeking PSA-IT classification shall comply with one of the following options:

2.2.1.1.1 Option I (College Degree in Safety) - Individuals that have obtained a Bachelor's or Master's Degree in Safety

1. The safety degree will count for four (4) years of the five (5) years currently required for a PSA position.
2. Successful achievement of a nationally recognized safety certification (CSP, CHST). The Owner reserves the right to determine years of credit based on the recognition of the certification, requirements to achieve certification, and continuing education to maintain certification. This option can be used to add additional experience
3. Successful completion of one (1) year of dedicated safety work experience on the project.

Once this individual completes all the requirements indicated above for this option, the "In Training" will be dropped and the individual will be consistent with the current requirements of the UTS Safety Specification.

or

2.2.1.1.2 Option II (Field Experience Only) - Individuals that have a minimum of seven (7) years in the construction industry and two (2) years of safety responsibilities that are ancillary to their primary duties

1. The experience noted above will count for two (2) years of the four (4) years currently required for a PSA position.
2. Must have documented successful completion of initial training (minimum of eight (8) hours) each in cranes, electrical, fall protection, excavations and soil mechanics, scaffold, permit-required confined space, and incident investigation and
3. Documented successful completion of Supervisor Safety Training or equivalent from an OSHA Training Institute such as TEEX, UT Arlington, etc.

Once this individual completes all the requirements indicated above for this option, the experience level will be counted as four (4) years of dedicated safety experience. At successful completion of one (1) year of dedicated safety work, the "in Training" will be dropped and the individual will be consistent with the current requirements of the UTS Safety Specification.

2.3 PSC AND PSA - Verification of Qualifications

2.3.1 The qualifications and previous work experience of the proposed Project Safety Coordinator and Project Safety Assistant(s) shall be submitted with the RFP. Based on final Contractor selection for the project, additional information for the Project Safety Coordinator and Project Safety Assistant will be required prior to written acceptance for the position. Any PSC or PSA additions or changes after the original acceptance date(s) must be formally submitted for consideration to the ODR. In the case of the PSC, work shall not be allowed to commence prior to written acceptance by the ODR. In the case of the PSAs, each must be assigned to the project on or before the worker count reaches the numbers indicated in Sections 2.4 and 2.5. Any cost related to the Contractor's failure to meet this requirement will not be reimbursed by the Owner and additional time extension of the Project schedule will not be allowed.

2.3.2 For two (2) years of military service that cites construction safety experience or an Associate's Degree in the field of safety, two (2) years of required experience will be credited for the requirements listed above. For four (4) years of military service that cites construction safety experience or a Bachelor's (Undergraduate) Degree in a safety related field, four (4) years of required experience will be credited for the requirements listed above. Military experience and/or degree will only receive credit once. A professional certification in a safety related field (CSP, OHST, CHST, etc.) may receive credit for up to four (4) years of experience in addition to the years noted above. The ODR reserves the right to determine year(s) of credit based on recognition of certification, requirements to receive certification, and continuing education requirements to maintain certification.

2.4 PSC AND PSA – Determining the Number of Required PSCs and PSAs

2.4.1 The total number of PSCs and PSAs for a Project will be determined by the anticipated total cost for construction services for the completed project using the values below:

2.4.1.1 For projects up to and including Ten Million Dollars (\$10,000,000), only the PSC shall be required.

2.4.1.2 For projects over Ten Million Dollars (\$10,000,000) and up to and including Thirty Million Dollars (\$30,000,000), the PSC and the initial PSA will be required. For projects over Thirty Million Dollars (\$30,000,000) and up to and including One Hundred Eighty Million Dollars (\$180,000,000), the PSC, initial PSA and an additional PSA will be required. For projects over One Hundred Eighty Million Dollars (\$180,000,000), the PSC, initial PSA, and two (2) additional PSAs will be required. Based on scope of work and/or anticipated hazard(s), additional PSA(s) may be required. Any additional PSA(s) beyond those noted above shall be determined and negotiated by the ODR prior to GMP.

2.5 PSC AND PSA -- Placement on the Project and Removal from the Project

2.5.1 The placement and removal of the PSC and any PSA for a Project will be determined by the daily population of persons, using the following:

2.5.1.1 One (1) PSC shall be provided by the Contractor and shall be assigned full time, have no duties other than safety, and be dedicated daily to the Project from the commencement of construction activities until at least Substantial Completion. The ODR's written concurrence is required prior to release.

2.5.1.2 The initial one (1) PSA shall be provided by the Contractor and shall be assigned full time, have no duties other than safety, and be dedicated daily to the Project at the time that the daily population reaches twenty-five (25) persons, and shall remain on the Project until at least Substantial Completion and the population decreases to less than 25 persons. The ODR's written concurrence is required prior to release.

2.5.1.3 The second PSA shall be provided by the Contractor and shall be assigned full time, have no duties other than safety, and be dedicated daily to the Project when the daily population at the Project rises to one hundred and fifty (150) persons. Additional PSAs shall be provided by the Contractor and shall be assigned full time, have no duties other than safety, and be dedicated daily to the Project when the daily population increases by another increment of one hundred and fifty (150) persons. The additional PSAs shall remain on the Project until the daily population falls below the number that required them to be added. The ODR's written concurrence is required prior to release.

2.5.1.4 For Contracts that involve multiple Phases, Stages, and Change Orders, the value for construction services shall accumulate as additional packages of work are added to the overall contract. If there are significant gaps between the head count of the previous or current work and the additional work, the ODR will decide if the additional work shall impact only the demand for additional PSAs. The requirement for the PSC will remain as indicated in Section 2.5.1.1.

2.5.1.5 During scheduled daily work, a full complement of safety persons must be on site in the numbers as required in Sections 2.5.1.1, 2.5.1.2 and 2.5.1.3. If either the PSC or any of the assigned PSAs will not be on site during the project work scheduled, OFPC must be notified no less than one (1) week prior to the absence (for non-emergencies only) or as soon as the safety person's status is confirmed (for emergencies only). An acceptable replacement must be provided if the absence will be for more that twenty-four (24) continuous hours in any week or as directed by the ODR. If any other work (nights, weekends, or holidays) is planned, the crew size of that specific shift shall determine the number of safety personnel required, but at least the PSC or one (1) PSA must be on site during any work activities. The number of safety persons on site during nights, holidays, or weekends must be with written concurrence of the ODR.

2.6 SUBCONTRACTOR'S SAFETY REPRESENTATIVE (SSR)

- 2.6.1 Each tiered Subcontractor shall declare one (1) or more employees to be its designated SSR. The SSR shall be dedicated to the Project for on-site safety responsibilities. This position cannot be delegated to another tiered contractor.
- 2.6.2 The SSR may have collateral duties, but must be on the Project site when any part of the applicable Subcontractor's work is being performed. The PSC shall formally approve each SSR prior to the commencement of work for that subcontractor.
- 2.6.3 Each first-tier Subcontractor's SSR shall possess a certificate of completion for the OSHA 30 hour Outreach Training in the Construction Industry. Remaining tiered Subcontractor SSRs shall possess at least a certificate for the OSHA 10 hour Outreach Training in the Construction Industry. Certificates must be dated within four (4) years of the executed Subcontract. Only a sub-tiered contractor that will have no more than three (3) workers on the project during their scope of work may petition to be excluded from this requirement. Any exception shall be by written approval of the ODR.

2.7 CONTRACTOR PROJECT SAFETY MANAGEMENT PLAN (PSMP)

- 2.7.1 The Contractor shall develop, implement, and furnish adequate resources for their PSMP.
- 2.7.2 The objectives and intent of the PSMP shall include, but not be limited to:
 - 2.7.2.1 Anticipating, planning, controlling and coordinating work to eliminate hazards, minimize risks, and aggressively manage losses involving injuries or property damages;
 - 2.7.2.2 Ensuring education and training for best safety practices by all workers and holding supervisors accountable for safety performance;
 - 2.7.2.3 Documenting and recording preventative measures, establishing inspection, notification, and investigation requirements, and measuring results of performance;
 - 2.7.2.4 Providing protection for adjacent property and safety for the public.
- 2.7.3 The PSMP shall address the inclusion of the OFPC SafetyNet Program for electronic collection of safety observations. The terms of this OFPC directed Program shall not be replaced by any existing program including any existing version of the SafetyNet Program already used by the Contractor. Within fourteen (14) calendar days of the issue of the NTP, the Contractor shall have available a means to record field observations.
- 2.7.4 The Contractor shall submit a complete draft of the PSMP to the ODR for review and written acceptance prior to the issuance of NTP for construction services. The Contractor shall incorporate ODR comments into a final draft and shall resubmit the

amended version to the ODR within thirty (30) calendar days following the return date of ODR comments to the initial draft.

- 2.7.5 Beginning with the Notice to Proceed for Construction Services, the PSC shall formally evaluate and update the PSMP and its supporting documentation as construction activities dictate, but at least semi-annually to assure effectiveness and continuous improvement. The PSC must provide means to verify required evaluation and update.

2.8 PERSONAL PROTECTIVE EQUIPMENT (PPE)

- 2.8.1 PPE shall be required for all persons in construction areas. The following items shall be furnished, inspected, and maintained by the employer:
- 2.8.2 Hard Hats shall be ANSI stamped (Z89.1-1997, Type I, Class E, G and C). Hard Hats shall be worn 100% of the time in construction areas, with the brim forward (or as allowed by the manufacturer). “Cowboy” style hard hats shall not be allowed (even if ANSI stamped). Hard hats with noticeable wear or damage shall be replaced. Each hard hat shall be examined by the PSC or PSA during the Project Safety Orientation to confirm acceptable condition.
- 2.8.3 Eye Protection (Safety Glasses) shall be stamped ANSI Z87. If a worker wears prescription glasses (plastic lens only) that are not marked Z87, the employer shall furnish goggles or safety glasses that are designed to fit over another pair of glasses. Eye Protection (Safety Glasses) shall be worn 100% of the time in construction areas. Additional eye and face protection shall be provided by employers for any employee when work operations create an exposure to airborne particles, chips, sparks, radiation, etc. The additional eye protection must be designed to prevent any airborne material from penetrating the opening between the protection and the eyes.
- 2.8.4 High visibility vests or high visibility upper body clothing (equivalent to ANSI Class 2 or greater as applicable) shall be worn when the worker’s primary work activities are subject to vehicle traffic and/or heavy equipment movement in the construction area. Primary work activities such as traffic control, excavations, rigging from ground level, exterior work at ground level or sub-ground level, earth moving operations will adhere to this requirement. All other activities can be considered by the PSC with written concurrence by the ODR on a case by case basis.
- 2.8.5 The Contractor shall purchase and maintain an appropriate inventory of types and sizes to be able to furnish a hard hat, pair of safety glasses and vest for up to ten (10) Owner representatives who may visit the Project.
- 2.8.6 Hearing Conservation and Protection shall meet or exceed OSHA requirements. Except for suppression of sound energy level, no devices or equipment shall be placed in or over the ears. Portable radios, cell phones or any other electronic devices shall not be used by the general work force for any reason while in the construction areas. Use by supervision, project management, and safety persons is allowed for work related and emergency communications only. Any additional persons using these devices must be

by written concurrence of the ODR. Music devices with or without ear pieces are strictly prohibited by anyone while in the construction areas.

- 2.8.7 Hand Protection that is designed to counter the potential for injury exposure shall be furnished to all workers who must handle materials or equipment with sharp edges, slick surfaces, chemically reactive components or extreme temperatures.
- 2.8.8 Respiratory Protection shall meet or exceed OSHA requirements.
- 2.8.9 Foot Protection (work shoes) must have soles with a resistance to punctures, uppers that cover the entire foot and ankle and offer resistance to scrapes and cuts. Sandals, open-toed shoes, dress loafers, high-heels, and all athletic style shoes (including those with ANSI markings) are prohibited. Additional protection such as metatarsal guards over work shoes (including steel toe boots) shall be provided when work operations create impact exposures.
- 2.8.10 Other OSHA required PPE shall be furnished as appropriate for specific tasks.
- 2.8.11 Other clothing:
 - 2.8.11.1 Shirts shall not have noticeable holes and shall be free of profane, inflammatory, sexually explicit or discriminatory messages. Sleeve length shall cover the ball of the shoulder and shirt length shall reach waist of pants. Shirts shall not provide snag points.
 - 2.8.11.2 Pants shall be full length. Holes must not be large enough to provide snag points or offer measurable amounts of exposed skin.

2.9 MEDICAL EQUIPMENT

- 2.9.1 The Contractor shall purchase and maintain at least one (1) First Aid Kit on the Project site as per the current version of ANSI Z308.1. Depending on the size, configuration of the site, travel distance to retrieve, and time required to administer medical treatment, additional First Aid Kits may be required. The kit(s) should be readily available as needed.
- 2.9.2 The Contractor shall purchase and maintain at least one Automatic External Defibrillator (AED) unit on the Project site. The unit shall be located in the Contractor project site office with appropriate signage and must be accessible whenever work is ongoing. Depending on the size, configuration of the site, travel distance to retrieve, and time required to administer medical treatment, an additional AED unit may be required.
- 2.9.3 A minimum of two (2) Contractor employees, with current certifications for First Aid / CPR and for use of the AED, shall be at the Project whenever work is being performed.

2.10 WORKER TRAINING

2.10.1 All workers shall be trained to perform their specific task(s). Formal documentation to support claimed training must be provided. Acceptable documentation for all certifications and training claimed shall contain organization, name, and title of the trainer(s), date of training, material covered with time spent on each topic, and evaluation process used to determine worker understanding of training. The database of employers' workers must be kept up to date and accessible for review as requested. No work or operations may commence without the PSC having completed review and acceptance under this Section. The ODR reserves the right to determine acceptability of training being claimed.

2.10.2 For every brand and model of crane and motor driven equipment (earth moving, lift platforms, suspended stages, material handling, etc.) brought onto the Project, the using company shall transmit to the PSC a list of employees who are trained and authorized to operate that brand and model of equipment. Copies of training documentation in addition to any required certifications shall be provided. In addition, cranes shall be operated only by persons who possess certification from an organization that carries nationally recognized accreditation. Industrial Trucks (forklifts) shall only be operated by persons who have been certified by their employer. Individuals who possess required credentials shall demonstrate acceptable proficiency to the PSC or PSA.

2.10.3 For every position that is required to assist with crane and motor driven equipment operations (flaggers, signal persons, riggers, spotters, etc.), the using company shall transmit to the PSC a list of employees who are trained and authorized to perform these functions.

2.11 PROJECT SAFETY SIGNS AND POSTERS

2.11.1 The Contractor shall post a pair of safety regulation signs at every point of entry to the Project: one in English and one in Spanish. Font shall be black in color and sized in each language to completely fill the surface of a white-coated four foot (4') vertical by eight foot (8') horizontal sheet of 3/4 inch plywood and shall contain only the following text:

ALL VISITORS, DELIVERY PERSONS, AND NEW WORKERS MUST REPORT TO THE PROJECT OFFICE BEFORE ENTERING ANY CONSTRUCTION AREA.

**ALL PERSONS ENTERING ANY CONSTRUCTION AREA MUST WEAR STURDY WORK SHOES, PROPER CLOTHING, A HARD HAT AND SAFETY GLASSES AT ALL TIMES
– NO EXCEPTIONS ARE ALLOWED DURING WORK HOURS.**

POSSESSION OF WEAPONS, ALCOHOLIC BEVERAGES, CONTROLLED SUBSTANCES, OR DRUG PARAPHERNALIA WILL RESULT IN IMMEDIATE REMOVAL FROM THIS PROPERTY.

**EXCEPT WHERE DESIGNATED (BY POSTED SIGNS AND AVAILABLE RECEPTACLES),
USE OF ANY TOBACCO PRODUCT IS PROHIBITED ON THIS PROJECT**

**THE MAXIMUM SPEED LIMIT FOR ALL VEHICLES ON THE PROJECT SITE IS NINE (9) MPH
– LOWER SPEED MAY BE REQUIRED BY POSTED SIGNS IN SOME AREAS.**

ONLY AUTHORIZED VEHICLES ARE ALLOWED ENTRY INTO CONSTRUCTION AREAS.

- 2.11.2 The Contractor shall post a notice sign at the project office in English and Spanish. Font shall be black in color on a white coated board and size of letters shall be at least three inches (3") in height, and shall contain at least the following text:

VISITORS, DELIVERY PERSONS AND NEW WORKERS MUST CHECK-IN HERE FIRST.

COPIES OF MATERIAL SAFETY DATA SHEETS (MSDS) FOR MATERIALS THAT WILL BE USED OR STORED ON SITE MUST BE DELIVERED BY ALL SUBCONTRACTORS TO THIS LOCATION AND SHALL BE AVAILABLE TO ANY REQUESTOR.

- 2.11.3 The Contractor shall also post the following in locations that may easily be viewed by workers:

2.11.3.1 Color Codes for Quarterly Equipment Safety Inspections:

- 2.11.3.1.1 1st Quarter = White (January 01– March 31)
- 2.11.3.1.2 2nd Quarter = Green (April 01 – June 30)
- 2.11.3.1.3 3rd Quarter = Red (July 01– September 30)
- 2.11.3.1.4 4th Quarter = Orange (October 01 – December 31)

2.11.3.2 Emergency contacts list, including mobile phone numbers

2.11.3.3 Hazard Rating Guide (HMIS and/or NFPA)

2.11.3.4 Insurance Provider for Worker's Compensation Coverage for the Project

2.11.3.5 Others as required by Federal and/or State regulation

2.12 PROJECT SAFETY FILE DOCUMENTS

The Contractor shall create and maintain files for Owner review. The following files shall be established in one location on the Project and shall be made accessible to Owner agents during working hours. Additional files shall be created as directed by the ODR.

- 2.12.1 Project Safety Management Plan (PSMP)
- 2.12.2 Project Safety Management Plan Evaluations
- 2.12.3 Project Safety Orientation Checklists
- 2.12.4 Project Access Log
- 2.12.5 Project First Aid Log
- 2.12.6 Project Incident Notification, Investigation, and Evaluation Reports
- 2.12.7 All Qualified Person Certifications and Training Documentation
- 2.12.8 Project Competent Persons Lists
- 2.12.9 Project Equipment and Crane Operators Lists
- 2.12.10 Job Hazard/Safety Analysis (from each Subcontractor per operation)
- 2.12.11 Project Weekly Safety ("Tool Box") Meeting

- 2.12.12 Project Weekly Subcontractor Safety Representative Meeting Minutes
- 2.12.13 Contractor Monthly Safety Report
- 2.12.14 Project Quarterly (Portable) Equipment Inspection Reports
- 2.12.15 Project Annual (Large) Equipment Inspection Reports
- 2.12.16 Project Permits (Closed Out)
- 2.12.17 Project Safety Infraction Records

PART 3 – EXECUTION

3.1 POSITIONS, ROLES AND REQUIREMENTS FOR PROJECT SAFETY

3.1.1 Contractor's Project Superintendent

The Project Superintendent shall have overall responsibility for all aspects of project safety and shall support the PSC and PSA when actions are required to maintain a safe work environment at the Project.

3.1.2 Project Safety Coordinator (PSC)

3.1.2.1 The PSC shall report directly to a corporate safety officer of the Contractor and shall not report through the Contractor's Project Management team.

3.1.2.2 If removal of the PSC is initiated by the Contractor, the existing PSC shall remain in position until a replacement candidate has been proposed to and accepted by the ODR in writing and is specifically assigned to the Project. If the PSC leaves before the proposal and acceptance procedure is concluded, the Contractor shall temporarily install either a Safety Director (Regional or Corporate) or a professional construction safety consultant as the PSC until a suitable replacement is accepted in writing by the ODR. Any temporary replacement must meet the qualification levels, perform the duties, and be present full time on the Project as required of the PSC in order for work to proceed. A permanent replacement shall be accomplished within thirty (30) calendar days.

3.1.3 Project Safety Assistant (PSA)

3.1.3.1 The PSA shall report to and perform duties as directed by the PSC.

3.1.3.2 If removal of a PSA is initiated by the Contractor, the existing PSA shall remain in position until a replacement candidate has been proposed and accepted by the ODR in writing and is specifically assigned to the Project. If the PSA leaves before the proposal and acceptance procedure is concluded, the contractor shall temporarily install either a Safety Director (Regional or Corporate) or a professional construction safety consultant as the PSA until a suitable replacement is accepted in writing by the ODR. Any temporary replacement must meet the qualification levels, perform the duties, and be present full time on the Project as required of the

PSA position. A permanent replacement shall be provided within thirty (30) calendar days.

3.1.4 Both PSC and PSA

- 3.1.4.1 The PSC and PSA shall have the authority to direct Contractor and Subcontractor personnel to correct any safety violations.
- 3.1.4.2 The PSC and PSA shall have the authority to stop operations that involve any level of risk.
- 3.1.4.3 The PSC and PSA shall be fluent in English and shall have immediate access to the necessary resources to communicate verbally with all workers on the Project.

3.1.5 Subcontractor Safety Representative (SSR)

- 3.1.5.1 The SSR name, emergency contact information, and documentation of qualifications shall be submitted to and accepted by the PSC prior to the commencement of any work activities by the Subcontractor. Per this section, at least one SSR is required; however, the Subcontractor must plan for and make available as needed a qualified replacement should the primary SSR not be on site. The SSR shall have the authority to direct actions, stop work and enforce discipline for safety issues.
- 3.1.5.2 The SSR shall submit a written task specific Job Hazard/Safety Analysis (JH/SA) daily and as work conditions change for each of the risk exposures associated with the employer's portion of the work. Documentation of attendees and subject material covered must be provided by the SSR. Each submittal shall be reviewed and accepted by the PSC or PSA prior to commencement of the work operation that will create the exposure.
- 3.1.5.3 The SSR shall attend the Project Weekly Subcontractor Safety Representatives Meeting when their company is actively performing work at the Project.
- 3.1.5.4 The SSR shall accompany any injured worker that requires medical attention at a facility outside the Project. The SSR shall be responsible for notification to the PSC of any incident including near-misses, and shall complete all the documents required to manage any insurance claims. The SSR shall participate in incident investigations that involve their employer's portion of the work.
- 3.1.5.5 Each SSR may be required to accompany the PSC or PSA during portions of each safety inspection that involves the Subcontractor's part of the Work.
- 3.1.5.6 The SSR shall ensure that planning, training, equipment and materials are provided so that workers can perform their duties safely.

3.1.6 Work Crew Supervisor, Equipment Operator, Competent Person, Qualified Person Medical Responder

3.1.6.1 Supervisors, Operators, Competent Persons, and Medical Responders for each of the positions held, shall be recognized by the employer through formal submittal to the PSC. Documentation of training with applicable certification shall be maintained in the Project safety file.

3.1.6.2 Designations of certifications and qualifications for special roles shall be clearly displayed on the back of the worker's photo identification badge.

3.1.7 Tradesman, Worker, and Laborer

3.1.7.1 All persons assigned to perform any portion of the work at the Project shall attend a Project safety orientation to become acquainted with potential hazards, and the general safety rules that must be observed. No person shall be allowed to perform any work at the Project until the PSC or PSA declares a successful completion of the Project safety orientation and issues a photo identification badge.

3.1.7.2 At a minimum, all topics indicated in the Project Safety Orientation Checklist (Exhibit D) that apply to the attendee's scope of work shall be discussed. Additional topics may be added as the PSC determines to increase the effectiveness of the orientation. A signed copy of the Project Safety Orientation Checklist shall indicate attendance. The PSC must be able to demonstrate effectiveness of the orientation and worker understanding of the material presented.

3.2 PROJECT SAFETY MANAGEMENT PLAN (PSMP)

3.2.1 Safety Mission and Policy Statement. The Contractor's Safety Mission Statement shall include a commitment to create and maintain a work environment that will eliminate or minimize all risk exposures for all workers at the Project. The Safety Policy Statement shall include acknowledgement that the Contractor is accountable for providing and controlling a safe environment for all workers and members of the public. An original signature and date to endorse and assure commitment by a Corporate Executive or Business Owner shall be affixed to this element of the PSMP. The PLAN shall include the following as a minimum:

3.2.2 Safety Roles and Responsibilities. This element shall outline and describe roles, responsibilities, and authority of each member of the Project staff for involvement in site safety, security, incident command, and incident claims management. The Contractor's Project organization chart shall indicate the reporting line for the PSC and PSA(s) as applicable. The PSC and PSA(s) roles shall include authority to direct actions of Subcontractors and to stop work operation whenever any worker is exposed to a risk that cannot be reduced or eliminated.

- 3.2.3 Safety Enforcement. This element shall include the Contractor's disciplinary procedure for its own employees and for those of all Subcontractors. It shall include a description of the levels of severity and frequency (repetition) that will result in Contractor intervention and provide details of the retraining and/or disciplinary steps that will ensue from the possible combinations of unsafe behaviors. It shall also include discipline for supervisors who tolerate risk.
- 3.2.4 Safety Recognition and Incentive. This element shall include a description of how those workers who demonstrate exemplary safety behavior and those supervisors who manage, enforce, educate and promote safety will be recognized and commended. Any celebration that will occur as part of this element shall not be minimized with achievement of Project milestones that are associated with production, schedule, quality or budget.
- 3.2.5 Safety Hazards. This element shall include a narrative that recognizes existing site conditions, foreseeable changes to existing conditions, local climate, Owner and public interface, environmental impact and remediation issues, skill and experience levels of available work force, utility interruptions, water supply sources, power supply sources, Owner facility provisions, sanitation requirements, parking, material storage areas, and proximity to students and public walkways and roadways. It shall contain a completed copy of the Anticipated Project Hazards Checklist (EXHIBIT A). It shall also be expanded throughout the duration of Work to include Subcontractor plans for elimination or minimization of risk. All portions of this element shall be consistent with existing procedures for the campus Environmental Safety and Health department, the campus Security department, and local municipal Fire and Rescue.
- 3.2.5.1 Hazard Communication ("HazCom"). Insert the elements required by OSHA. The PSC shall maintain a Hazardous Materials Inventory List with individual SDS for each and every hazardous substance brought onto the Project site. In addition to the product label of contents, all containers with at least five (5) gallons of fluid capacity or twenty (20) pounds of chemical content shall include either HMIS or NFPA hazards warning labels (except drinking water and fire extinguishers). All products with HMIS/NFPA number ratings greater than zero, or one in any of the three categories (health, flammability, or reactivity), shall be considered as hazardous.
- 3.2.5.2 Environmental (Sensory) Hazards. Insert actions to measure worker exposures and to control hazards that exist beyond OSHA permissible exposure limits (i.e. dust, fumes, noise, chemicals, and extreme temperatures). Also, include control and remediation plans for incidents that result in a spill or discharge of a potentially hazardous or toxic substance (fluid or gas).
- 3.2.5.3 Roadway and Traffic Hazards. Insert actions to be taken at times when public roadways or sidewalks are affected by construction activities. Signs, devices, and procedures shall be identified where public passage is to be closed or altered.

Procedures and training for flaggers shall be required and shall be in compliance with all applicable Texas Department of Transportation (TxDOT) regulations for road safety; specifically the Texas Manual on Uniform Traffic Control Devices (TMUTCD) shall be referenced.

3.2.6 Fire Prevention and Control

3.2.6.1 Insert arrangements and equipment necessary to provide adequate protection during all phases of construction. All portions of this element shall be developed to be consistent with existing procedures of the campus Environmental Safety and Health department, the campus Security department, and local municipal Fire and Rescue.

3.2.6.2 Burning, Welding, Flame Operations. Insert the process for issuance of a “Hot-Work” permit (EXHIBIT B). Daily permit forms shall be issued by the PSC or PSA, even if the campus Environmental Health and Safety department desires to be involved and issues a campus permit. The permit form shall be completed by the SSR and returned to the PSC or PSA for field verification of noted conditions and written acceptance prior to start of operation. All permits shall expire at the end of the shift. Permits shall identify fire watcher(s) and require pre-operation and post-operation inspections.

3.2.7 Emergency Response. Describe each type and level of emergency that may reasonably be expected to occur on the Project. Insert response or rescue plan for each kind of potential emergency. This element shall address first aid, off-site medical care, property damage, rescue, project alarm signals, wind, flood, lightning strikes, and evacuation, threat of violence, protests or deliberately disruptive events. NOTE: A designated Campus Spokesperson shall be the only person authorized to communicate with the media. This element shall include a drawing or sketch of the site (maintained for “as built” conditions) to indicate gates, emergency vehicle roadways, lay down areas, crane set up positions, exterior hoists, etc. All portions of this element shall be developed to be in accord and cooperation with existing procedures for the campus Environmental Safety and Health department, the campus Security department, and local municipal Fire and Rescue.

3.2.7.1 Incident Notification. Insert the list of personnel with mobile phone, email, position and company information who may be contacted. The ODR and others as directed shall be included in the incident notification process. Depending on potential severity of the incident, notification may be in written and/or verbal form as directed. Incident notification flow shall be as indicated in EXHIBIT K. Indicate specific positions within the campus staff that may be contacted and/or involved in the notification and control process; i.e. site control and utility management. Campus Public Relations (PR) officer shall be the only person authorized to release live or pre-recorded video or written statements to the media. The Contractor shall cooperate with campus PR officer and coordinate media arrangements as directed.

- 3.2.7.2 Site Security. Insert actions and control measures to prevent intrusion during work and non-work hours. Describe intended controls for perimeter security, gate security, pedestrian crosswalks, protection at public paths through and alongside construction areas, warning signage, etc. Identify special work that may not be performed during regular hours, and will require special precautions. Include descriptive detail for some method of gathering names and probable locations of workers who have not been cleared for safe departure during any type of emergency. Identify the position(s) of all who will possess this information and be prepared to convey critical details quickly to any outside emergency response command that might arrive at the Project.
- 3.2.8 Project Trenching, Tunneling and Excavation. Insert soil boring reports, soil classification analysis, site sketch and any other information that may support, explain or clarify the intent of this element. In addition to requirements in the UGC, this element must be stamped and sealed by a Registered Professional Engineer recognized in the State of Texas in the field of Civil or Soils Engineering.
- 3.2.9 Drug and Alcohol Impairment. The Contractor, for itself and all Subcontractors, shall have a robust drug and alcohol screening and intervention plan. Insert details of the Contractor policy for screening both direct employees and Subcontractor employees for the presence of controlled substances, prescription pharmaceuticals, and alcohol. Describe all of the types of testing and confirmation that the Contractor requires and the tolerance thresholds for each substance. This element shall include, as a minimum, a detailed explanation of the following situations and mandatory testing events:
- 3.2.9.1 Pre-project entry – Test results conducted within two weeks preceding issuance of badge for Project access. Any worker that has been off the project for more than sixty (60) consecutive days must also be retested within the two weeks requirement prior to re-entry.
 - 3.2.9.2 Post-incident
 - 3.2.9.3 Random selection
 - 3.2.9.4 Suspicion
- 3.2.10 Concrete (for slip-form, crane bucket, pump truck, cast-in-place)
- 3.2.11 Confined Space Entry (Permit Required and Restricted Entry)
- 3.2.12 Crane Operations (for set-up/use requirements and limitations)
- 3.2.13 Demolition (Mechanical and/or Explosive Blasting)
- 3.2.14 Electrical Power Service (address power supply and use during construction)
- 3.2.15 Fall Prevention and Protection (from elevations and at same level)

3.2.16 Hand and Power Tools

3.2.17 High Voltage (“Proximity Work”)

3.2.18 Ladders and Stairs

3.2.19 Lock-out, Tag-out (Energy Isolation for sudden release of any kind of energy)

3.2.20 Respiratory Protection

3.2.21 Safety Inspection

3.3 PROJECT SAFETY MEETINGS AND TRAINING

3.3.1 Project Initial (Safety Kick-Off) Meeting

3.3.1.1 At any time within, but no later than fifteen (15) calendar days after the issuance of the Notice to Proceed with Construction Services, the Contractor shall arrange suitable accommodations and the OFPC PM or RCM will schedule and chair the meeting. Minimum attendance shall include the OFPC RCM and/or PM, Construction Inspector(s), OSR, Contractor’s PM, Superintendent, PSC and PSA. The Contractor’s safety director, additional representatives for the Owner, the Institution, the A/E, the Contractor and local regulatory entities may also attend.

3.3.1.2 The Contractor shall confirm the schedule availability for all non-OFPC attendees at least fourteen (14) calendar days prior to the meeting date.

3.3.2 Initial Meeting with Subcontractors for acknowledgment of Safety Requirements

3.3.2.1 At any time after the date of intent to award each first tier Subcontract, but prior to commencement of any work, the Contractor shall arrange and chair a documented meeting with Subcontractor to explain safety requirements. Minimum attendance shall include the OFPC Construction Inspector(s), Contractor’s PM, Superintendent, PSC, PSA, and SSR. Other interested parties for OFPC, campus and Contractor may also attend. Any lower-tier Subcontractors that have been awarded part of the work shall also attend.

3.3.2.2 In addition to all of the pertinent safety regulations that apply to the portion of the work that the Subcontractor will perform, the Contractor shall clearly state the expectation that safety management of its workers and Sub-tier workers shall be the Subcontractor’s responsibility and that failure to adequately manage safety could result in a demand for the removal and replacement of supervisors.

3.3.3 Project Safety Orientation Training

- 3.3.3.1 The PSC or PSA shall conduct formal training to every worker who is to be allowed into the construction area(s) without an escort. This duty shall not be delegated. Unless the PSC and/or PSA are bi-lingual, a translator shall be present when there are workers in attendance who do not speak English. Workers and their immediate supervisors shall be required to attend a repetition of the orientation whenever observed behavior indicates a lack of understanding or repeated non-compliance of project safety requirements.
- 3.3.3.2 The PSC shall review the Safety Orientation Checklist (EXHIBIT D) and incorporate each applicable topic within the presentation. The PSC shall develop and administer a process to ensure and demonstrate worker understanding.
- 3.3.3.3 The PSC shall furnish a photo-identification badge to each worker who satisfactorily completes the Project Safety Orientation. The badge will indicate the worker's name, company, job title, project name, and OFPC project number. The badge must be visible at all times that the worker is on the Project and be located above the waist using clip or arm band. Lanyards are prohibited. Failure to maintain the badge will be grounds for removal from the Project. Operator qualifications for the specific equipment that can be operated will be identified on the back of the worker's photo identification badge.
- 3.3.3.4 The PSC shall confirm employer insurance requirements have been met and that all required documentation is on site and has been reviewed and found acceptable prior to start of orientation. PSC shall confirm documented credentials for operators and SSR prior to start of orientation. The PSC shall maintain a site access log to document each successful orientation and any reorientations. The log shall include Project critical information (name, employer, badge number and position).

3.3.4 Daily Job Hazard / Safety Analysis (JH/SA) Training

- 3.3.4.1 Prior to start of the work for each shift, the SSR shall conduct a meeting with all members of the work crew to explain how the work steps for the shift are to be accomplished. Explanation shall include a discussion of all the work activities that will be performed in the vicinity as well as the work that the crew is expected to accomplish. Explanation shall address all of the recognized risks associated with the task and the hazard controls to be installed or actions to be taken to eliminate or minimize the exposures. Actions to be taken in the event of an emergency shall also be included and documented.
- 3.3.4.2 A daily JH/SA shall be produced to document this meeting. (Exhibit M – Non-Mandatory JHA is a sample form that outlines the key elements that should be addressed in any JHA.) It shall contain names and initials of all attendees, name of supervisor (SSR if same), a project specific daily statement of task(s), and any special safety measures or actions that are required to assure elimination or minimization of risk. A copy of the JH/SA shall be reviewed in the field comparing planned and actual work and endorsed by the PSC or PSA prior to work activities

and copies of any completed permits shall be clipped to the document. The supervisor's and workers' signatures on the JH/SA shall be understood to also mean a thorough communication of all anticipated hazards and controls has been provided to all workers. A copy of the JH/SA will be posted in the immediate work area until the daily activities are complete. The JH/SA shall be modified as work activities change, warranting additional review and communications to the affected workers throughout the shift. Modified JH/SA must be re-reviewed and endorsed by the PSC or PSA prior to work re-start.

- 3.3.4.3 Project Management team members (OFPC, Contractor and Subcontractor) are encouraged to attend these JH/SA meetings as frequently as possible to reinforce the Project safety culture.

3.3.5 Project Weekly Subcontractor Safety Representatives Meeting

- 3.3.5.1 The PSC shall chair a weekly meeting with all SSR(s) to ensure that all are aware of the existing hazards and exposures that should be addressed with each crew. A written agenda (EXHIBIT E), attendance roster, and meeting minutes shall be prepared and maintained at the Project site by the PSC.
- 3.3.5.2 This meeting shall be exclusively reserved for safety and hazard control issues. Attendance shall be required of all SSR(s) when their employer is actively conducting work operations on the Project. Project Management team members (OFPC, Contractor and Subcontractor) are encouraged to attend these weekly meetings as frequently as possible to reinforce the Project safety culture.

3.3.6 Project Weekly Site Safety ("Tool Box Talk") Meeting

- 3.3.6.1 All workers on the project site, including site Project Management team members, shall attend a weekly safety Tool Box Talk, which shall be presented in English and all other languages that are natively spoken at the Project. The PSC or PSA may deliver each talk to the entire Project population or each SSR may deliver individual meetings to their specific trade and/or group. The PSC or PSA shall periodically participate and review individual meetings to ensure effectiveness. The PSC or PSA shall collect and maintain copies of all sign-in sheets for every meeting.
- 3.3.6.2 Meetings shall address appropriate topics for the current and future work operations and current site conditions. In addition, the PSC or PSA shall communicate information regarding statewide safety results discussed during Monthly PSC Conference Calls, inspection results, and other project safety-related topics.

3.3.7 Safety Lessons Learned and Best Practices

The Contractor shall work with OFPC to use Lessons Learned to capture significant safety experiences and best practices over the course of the work. The Contractor will work with OFPC to facilitate Lessons Learned at Substantial Completion and will work

with Subcontractors to actively participate in Lessons Learned. The Contractor shall develop and distribute any reports that detail findings to OFPC as requested.

3.4 SAFETY INSPECTIONS

3.4.1 Daily SafetyNet Inspections

- 3.4.1.1 Project safety inspections shall be entered into SafetyNet. The OSR(s), OFPC RCM, CI, PSC and PSA, shall all be recognized users of the Owner's SafetyNet Program. Other persons such as the Contractor's project management team and the sub-contractor's SSRs are encouraged to participate in daily project inspections. Information entry into SafetyNet conducted by these individuals shall be through the PSC or PSA.
- 3.4.1.2 User participation shall include recording of all observations and conditions at the Project (via the Program's menu-driven checklist). Additionally, the PSC shall review on-line reports and respond appropriately, detailing sustainable action(s) taken to correct the identified safety process deficiencies.
- 3.4.1.3 Each deficient safety observation shall be corrected or controlled immediately. The PSC shall be responsible for reviewing and ensuring proper closure of all unresolved ("open issues") observations. ODR shall concur prior to closure.
- 3.4.1.4 An OSR will conduct initial training for Contractor understanding and use of the SafetyNet Program. All subsequent training for follow-on Subcontractors shall be accomplished by the PSC.
- 3.4.1.5 At a minimum, a daily SafetyNet inspection shall be conducted by each PSC and PSA on site during the shift. The daily inspection may only record a group of observations within a single work operation, but the accumulated inspections conducted by the PSA and PSC throughout each work week shall reflect a comprehensive report of all operations at the Project. Each inspection shall be entered into SafetyNet within twenty-four (24) hours of the inspection. All inspections for the current month must be entered into SafetyNet no later than the last day of that month.
- 3.4.1.6 When an OSR conducts an inspection, the PSC and/or PSA shall be available to join in during the walk around. Other OFPC users may also require the PSC and/or PSA to join in during inspections.
- 3.4.1.7 When the PSC or PSA conducts an inspection, at least one SSR shall join in for the portion of the inspection that addresses the Subcontractor's portion of the Work.

3.4.2 Quarterly (documented) Inspection of all tools, rigging, and portable equipment

- 3.4.2.1 In addition to the required daily equipment user prior to use inspection, the PSC shall facilitate a documented safety inspection each quarter. Each contractor shall produce and submit a document (EXHIBIT F) that addresses all tools, rigging, and

portable equipment within the company's inventory on the Project site. Documents shall be maintained by the PSC.

3.4.2.2 This inspection shall include, but not be limited to, the following: Fall Arrest Equipment, Rigging, Manufactured Ladders, Job Built Ladders, Power Tools, Electrical Cords, Welding Leads, Hoses, First Aid Kits, AEDs, Atmosphere Monitoring Meters, and Ground Fault Circuit Interrupter devices. Personally owned hand tools are exempt from this inspection procedure, but daily examinations of all portable items prior to start of work shift as prescribed by OSHA standards are not relaxed.

3.4.2.3 For every item that "passes" the quarterly inspection, the SSR must remove the previous quarter's color coding and affix the current quarter's color coding. The PSC shall establish a universal system for the placement of the color coding for each individual piece of equipment identified in Section 3.4.2.2 (i.e., male end of an extension cord, spreader bar on portable step ladder, etc.) Every item removed from service shall be repaired, replaced, destroyed or immediately removed from the Project. The inspection report shall reflect such actions. Inspection reports shall be completed by the SSR and submitted to the PSC prior to use of any new equipment on the Project site and re-inspections before the first calendar day of the beginning of each quarter of the year. Quarterly re-inspections may begin and color coding may be changed anytime during the final one-week period of the previous quarter.

3.4.3 Initial and Annual Inspection of all Cranes and Motor Driven Equipment

3.4.3.1 The PSC shall ensure manufacturer required safety inspections and written certifications for all hoists, cranes, mobile equipment, motorized scissors and aerial lift platforms, motorized stage platforms, generators, and compressors are maintained on the Project.

3.4.3.2 The PSC shall ensure that all equipment inspections are consistent with the manufacturer's requirements. An initial inspection and certification of proper condition shall be transmitted to PSC before a piece of equipment is allowed to commence operations on the Project.

3.4.3.3 The PSC shall ensure all equipment is inspected annually and certified as required prior to initial use. Any equipment that leaves the Project and returns will require re-certification before it shall be allowed to resume operation at the Project.

3.4.4 Inspections by Regulatory Agencies

The PSC or PSA shall notify the ODR immediately of the arrival at the Project site by a representative of a Regulatory Agency (OSHA Compliance Officer, TCEQ Representative, Law Enforcement Officer, etc.), and provide the ODR with a copy of any published findings or citations issued to any employer, and shall ensure that

statutory posting requirements are met. PSC shall provide the ODR with a copy of any employer's response to the same findings or citations.

3.5 CONTRACTOR RECORDS, INVESTIGATIONS AND REPORTS

3.5.1 Mobile Equipment and Crane Operator Records

Consistent with the requirements of Section 2.10.2, each employer shall submit to the PSC, for each operator, a record of training. The minimum amount of detail as applicable for the specific piece of equipment shall include the following:

- 3.5.1.1 Pre-start up inspection, travel path issues, and location/set up procedure;
- 3.5.1.2 Start up, operation, intended use, and shut down (normal and emergency);
- 3.5.1.3 Equipment Operations Manual, Limit Chart(s), Motor Plate information, equipment capacities and limitations, alarm features, safety stops, seat belts, roll over protection and preventive maintenance;
- 3.5.1.4 Any additional operational topics as indicated by the equipment manufacturer.

3.5.2 Contractor Monthly Safety Report

- 3.5.2.1 The PSC shall enter the following project information directly into SafetyNet; total man hours by month, all OSHA recordable and days away from work incidents including descriptions and relevant fields, near misses, first aid rendered, and property and equipment damage. Data shall be entered into SafetyNet by the 10th of the month following the reporting period.
- 3.5.2.2 This information is vital to the Owner's safety benchmarking efforts. Failure to submit the information in a timely manner may result in ODR withholding a portion of the Contractor application for payment, and shall disqualify the Contractor from consideration for safety recognition for the month of failure to submit.

3.5.3 Incident Notification, Investigation and Reporting Procedure

- 3.5.3.1 During the orientation, the PSC shall instruct all workers to immediately report every incident to their supervisor, even if there is no obvious injury or property damage. Supervisors shall immediately notify the PSC or PSA, who shall immediately notify the ODR of any incident. All Near Miss incidents, First Aid injuries, High Severity Safety Inspection Observations, and other such incidents as directed by the Owner shall be entered into SafetyNet by the PSC. All incidents shall be investigated. The PSC shall lead the efforts and follow a structured incident investigation program. The Contractor and involved subcontractors shall tailor the magnitude and depth of the investigation effort to correspond to the potential, rather than the actual outcome of the incident. Investigation team members shall include safety

personnel, project management, line management, affected workers, and safety consultants as the circumstances dictate. The ODR reserves the right to participate in any incident investigation. The PSC shall develop a Root Cause(s) Analysis report (Exhibit J) that summarizes the incident, identifies the underlying contributing factor(s), determines which process element(s) failed to control the incident, determines which process element(s) will be implemented or improved, and the time needed to take sustainable corrective action(s). PSC shall conduct and submit incident investigation report that supports the Root Cause(s) Analysis in the manner and time as directed by the ODR. The Owner reserves the right to determine the acceptability of the findings. The PSC shall prepare and submit reports that will allow OFPC and Subcontractors to understand findings and any planned changes to the PSMP based on those findings.

3.5.3.2 Incident Responsibilities for Workers and Supervisors

3.5.3.2.1 The PSC or PSA shall cover the information in the Worker Responsibilities (EXHIBIT G) document during the orientation and keep copies to hand out to any worker who appears to have sustained an occupational injury.

3.5.3.2.2 The PSC or PSA shall cover the information in the Supervisor Responsibilities (EXHIBIT H) document during the orientation and keep copies to hand out to any supervisor who informs PSC or PSA that a worker injury has occurred.

3.5.4 Contractor Final Safety Report

3.5.4.1 The PSC shall work with all contributing subcontractors to prepare a Final Safety Report and shall forward to the ODR no later than thirty (30) calendar days after Substantial Completion.

3.5.4.2 Report shall include at least the following items:

3.5.4.2.1 Summary of the PSMP with description of improvement initiatives undertaken during the course of the Project

3.5.4.2.2 Evaluation of the effectiveness of the PSMP, including summary results of assessments performed

3.5.4.2.3 Project safety performance results (leading and trailing indicator measures)

3.5.4.2.4 Project safety lessons learned and best practices

3.5.4.2.5 Summary of Project incidents

3.5.4.2.6 Evaluation of Contractor and all subcontractors overall safety performance

- 3.5.5 The Contractor shall provide additional reports as requested by the ODR. This may include work force histograms, training documents, safety trending reports, etc.

3.6 CONSTRUCTION OPERATIONS

The following requirements are either in addition to or in the absence of Federal and State regulations. Where conflicts exist, the most stringent directives shall apply.

3.6.1 CRANES

- 3.6.1.1 Tower cranes (including affiliated transformers and power supply equipment) shall be surrounded by at least a sixteen-foot (16') high, 5/8-inch plywood enclosure with a lock-controlled entrance.
- 3.6.1.2 Operators of cranes shall be trained in the specific make and model of crane and possess certification from a nationally accredited certifying organization.
- 3.6.1.3 Every crane and piece of hoisting equipment shall be equipped with an anti-two blocking sensor above each lifting block.
- 3.6.1.4 Unless the crane is equipped with sensors that inform the operator of the weight of the load on the hook and the current wind speed, these measurements shall be determined by other means before commencement of each lift.
- 3.6.1.5 When outriggers are used on cranes, they shall be fully extended. Float pads shall be landed onto leveled and properly designed and sized slabs or cribbing. Where steel plate is used for cribbing, welded or bolted cleats shall be attached to upper surface to prevent float pads from moving horizontally.

For cranes of up to and including 35-ton capacities, wooden cribbing shall be a minimum of four inches (4") in thickness. For cranes over 35-ton capacities and up to 150-ton capacities, cribbing shall be a minimum of eight inches (8") in thickness. For all cranes up to 150-ton capacity, the minimum size of the surface ("footprint") of the cribbing assembly shall be determined by the following formula: the capacity of the crane (in tons) divided by 5 equals the minimum square footage required. Properly sized circular crib pads are acceptable. Side dimensions for rectangular crib pads shall be equal to each other or differ by no more than one foot. For cranes larger than 150-ton capacities, a qualified person shall design the cribbing. "Sandwich" units of cribbing are allowed as long as the plywood on bottom and on top is at least one inch in thickness.

- 3.6.1.6 For "Pick and Move" operations, the pick shall be made directly in front of the crane with the boom as near vertical as possible. Move at walking speed with a "spotter" in front of the load and another behind the crane. Guy wire cables that secure the load to the body (to prevent lateral force loading of the boom) of the

crane shall be required if the grade slope is more than three (3) degrees or the terrain is uneven. Only rubber-tired cranes shall be allowed to perform this operation without a “critical lift” plan and the load must be under fifty percent (50%) of the “on rubber” chart limit.

- 3.6.1.7 Critical Lifts shall include, but not be limited to: (1) Tandem Lifts, (2) Lifts greater than seventy-five (75%) percent of Load Chart, (3) Crane Suspended Personnel Hoists, (4) Non-Conventional Outrigger placements and (5) “Blind” picks and/or placements. All of these events shall require submittal of custom designed plans by qualified persons. The PSC is responsible for review and acceptance prior to planned lifts.
- 3.6.1.8 Multiple lift operations (“Christmas Treeing”) shall not be permitted.
- 3.6.1.9 All crane operators on rigs rated for more than five (5) tons of capacity shall submit to a physical examination prior to conducting any work on the Project and, if still on the Project, at least every twelve (12) months thereafter. The physician’s written declaration of fitness shall be submitted to and maintained by the PSC in the Project files.
- 3.6.1.10 Only the designated rigger and/or signal persons shall issue lift instructions to the operator. The only exception shall be an emergency stop signal, which may be delivered by anyone on the Project who knows how to alert the operator.
- 3.6.1.11 All loads lifted more than six feet (6’) above ground elevation shall have a tag line attached that is long enough to allow control of load spin without placing any part of the body directly below the load. When “shake out” hooks are used, the load must never be elevated above five feet (5’) over the surrounding surface and workers must stay at least five feet (5’) horizontally away from the suspended load.
- 3.6.1.12 For any load that may be elevated and the travel path may impact any worker, a means for worker notification must be in place. The crane operator may perform this notification by horn if the load can be seen at all times. If the crane operator may lose sight of the load at any time, notification must be made by a designated individual who can maintain sight of the load. Notification must be accomplished by some means that attracts the attention of all workers.
- 3.6.1.13 Any assembly or disassembly of a tower crane will only be done while activities are monitored by a crane consultant provided by the Owner. Prior to any operation, the tower crane assembly/disassembly contractor shall provide a detailed plan for the work. Details of the plan must include at a minimum, all elements in Exhibit L, and the plan must be provided to the ODR as required. The ODR reserves the right to determine acceptability of the information provided. Submission of this plan in no way relieves the Contractor from ensuring all documentation is provided, reviewed for accuracy based on the planned task(s), ensuring that the work is pre-planned and communicated to all affected workers, all workers are properly trained to perform

their tasks, and that all work is done according to the agreed to plan. The PSC is responsible for the review and acceptance for the Contractor.

3.6.2 DEMOLITION

- 3.6.2.1 Maintain clearly marked and well-illuminated egress paths at all times.
- 3.6.2.2 Maintain barricades and signage that isolates impacted areas to prevent entry by other trades and members of the public.
- 3.6.2.3 Removal of materials and trash from elevated locations must be controlled. Materials, scraps or waste shall never be allowed to free-fall from a height greater than ten feet (10'). Items that may be caught by wind and carried horizontally shall never be allowed to drop freely from any distance. If items are allowed to be dropped freely (unless as indicated previously), a person shall be stationed at the landing elevation at a safe distance to warn others away from the operation, and the landing area shall be surrounded by fence type barricade placed at least six feet (6') outside of the expected landing area. Wall openings that may be located vertically between the material drop point and the expected landing area shall be securely covered and marked from inside. Anything that is to move downward at a distance greater than ten feet (10') or is capable of sailing horizontally shall be contained within a chute or controlled by hoist.
- 3.6.2.4 Unless the Contract documents clearly call for it, the use of explosives for demolition is prohibited.

3.6.3 ELECTRICAL POWER

- 3.6.3.1 Ground Fault Circuit Interruption (GFCI) shall be the primary protection from exposure to electrical current for all workers on the Project. Only exit lighting and medium-high (greater than 240) voltage service will not be GFCI protected.
- 3.6.3.2 All strings of temporary lights shall be fully lamped and guarded regardless of height, and shall be continuously maintained. PSC shall ensure that illumination levels are periodically monitored and adequate for the expected work activities in those areas.
- 3.6.3.3 All receptacles and switches shall have trim plates installed before they are energized.
- 3.6.3.4 All power distribution panels shall have full covers installed before primary power is brought into the panel. When energized panels are located in open areas, covers shall be locked except when an authorized electrician is working in the immediate area. When panels are located inside separate rooms or closets, automatic closers and automatically locking hardware shall be installed on doors as soon as equipment is energized, and only authorized persons shall be provided a key. Doors

shall not be wedged to stay open. Warning signs shall be placed in conspicuous locations. Locked electrical room or panel doors will not be considered to meet the requirements of a Lock Out / Tag Out program. The Lock Out / Tag Out program in use must ensure that any affected worker has the ability to confirm equipment being worked on has been de-energized, made safe, and has individual control of the locking device and tag used to control inadvertent startup of the equipment.

3.6.3.5 The employer shall implement and document an overall safety program that directs activities appropriate for the electrical hazards, voltage, energy level, and circuit conditions anticipated.

3.6.3.6 Extension cords used must be a minimum of 12 gauge.

3.6.4 EXCAVATIONS

3.6.4.1 Any and all trenching operations that are four (4) feet or more in depth or could result in any worker's upper body being positioned below grade level shall adhere to the requirements of the UGC. In addition to UGC requirements, every excavation shall require a preliminary meeting with the ODR to determine historical knowledge of existing utilities. Where applicable, a phone call for utility "locates" shall be completed seventy-two (72) hours in advance. "Potholing" and/or hand digging shall be required within three (3) horizontal feet of "located" centerlines, and in areas where knowledge is lacking.

3.6.4.2 The "toe" of spoil piles that are less than four feet (4') in height shall be at least two feet (2') from the edge of any excavation. Spoil piles greater than four feet (4') in height shall add one foot (1') of distance from the excavation for every additional foot in height. Spoils shall be managed to prevent airborne dust.

3.6.4.3 Trench and/or excavations should be backfilled at the end of each shift as applicable.

3.6.4.3.1 When a trench or excavation cannot be backfilled in the same day as it is created, a highly visible fence type barricade shall be erected at a minimum distance of six feet (6') from all approachable edges. All portable means of access shall be removed at the end of each workday.

3.6.4.3.2 Earth ramps that are to be used for walking access shall not exceed twenty percent (20%) in grade slope. Steeper slopes shall be gate controlled for equipment only, and alternate access shall be added for pedestrian traffic.

3.6.5 FALL PROTECTION AND PREVENTION

3.6.5.1 Any walking/working surface that is equal to or greater than six feet (6') above the surrounding area shall present an unacceptable fall exposure unless it has all edges (side and ends) protected by an attached guardrail system, fall arrest equipment, fall

restraint equipment, fall capture netting, or is blocked off by an adjacent wall. An adjacent wall shall be continuous, structurally sound, and at least thirty-nine (39) vertical inches above the walking/working surface, and within eight (8) horizontal inches from the open edge.

3.6.5.2 Any employer that will create a fall exposure equal to or greater than six feet (6') shall submit a detailed plan and set of drawings in advance of the operation to indicate how the exposure shall be addressed. The Contractor shall require the plan to contain either "engineered" or conventional fall protection measures for each and every exposure that involves vertical distances equal to or greater than six feet (6'). Any precautionary measure that would allow greater risk than that afforded by a guardrail system, fall restraint equipment, fall arrest equipment, or fall capture netting shall be prohibited. The use of a "Monitor" is expressly prohibited. The recognized exemptions/exceptions are as follows:

3.6.5.2.1 Allow work from portable step ladders as long as a "three point" contact is maintained, the ladder is properly positioned, secured from movement, the worker's center of gravity remains between the rails and in front of the feet, and the worker's waist does not extend above the top of the ladder. The height of the worker's feet is limited to twelve feet (12') above the supporting work surface for this exemption/exception.

3.6.5.2.2 Allow work from an extension or straight ladder if the ladder is properly positioned, secured from movement, "three point" contact is maintained, the worker's center of gravity remains between the rails and in front of the feet, and the worker's waist does not extend above the top of the ladder. The height of the worker's feet is limited to twelve feet (12') above the supporting work surface for this exemption/exception.

3.6.5.2.3 The use of a warning line system is prohibited unless all other means of fall protection have been demonstrated to be infeasible. If infeasibility is demonstrated to the satisfaction of the PSC and the ODR, work may be performed without fall arrest measures while standing on an elevated walking/working surface only if maintaining a distance of at least fifteen (15) horizontal feet from the edge. The unprotected edge shall be clearly identified by posted signage and a warning line erected continuously at a fifteen-foot (15') setback distance.

3.6.5.2.4 When work is to be performed from a ladder placed near a guardrail system and the ladder can fall toward the leading edge, the safe distance from an unprotected edge shall increase one foot (1') horizontally for each vertical foot that a worker climbs above the surrounding surface. This requirement shall also apply to a ladder that is being placed beside a protected edge. Any leading edge ("controlled access") zone work shall require fall protection arrangements prior to entry.

- 3.6.5.3 Covers placed over pier holes, and roof or floor openings shall be physically secured and clearly marked with warning message "HOLE COVER - DO NOT REMOVE." Any cover that is too small for legible wording shall be bright orange or red.
- 3.6.5.4 Job built ramps and bridges shall be surfaced with an abrasive (non-skid) material. Ramps shall comply with ADA slope requirements.
- 3.6.5.5 Equipment and work operations of any description shall not be permitted to be performed directly above a worker unless adequate overhead protection is provided prior to commencement of the operation.
- 3.6.5.6 Any tiered contractor that utilizes fall protection equipment in the course of their work shall provide for prompt rescue of a worker in the event of a fall or shall ensure that a worker is able to self – rescue. Specific plans for rescue of workers shall be developed prior to initiating work requiring the use of a personal fall arrest system. The fall protection plan along details for self - rescue as needed shall be submitted to the PSC for review prior to work start.

3.6.6 FIRE PROTECTION

- 3.6.6.1 All floors that have combustible materials present shall be accessible from ground level by a usable stair system (temporary or permanent). For structures greater than three (3) stories in height, fire sprinkler standpipes shall be completed and charged to within two (2) stories, or thirty (30) vertical feet of all floors containing combustible materials. Siamese connection shall be installed at every level to provide access for fire hoses. All fire extinguishers that are not task-specific shall be adequate in number and description to comply with OSHA declared limits for egress points, floor area and travel distances. In multistory buildings, at least one fire extinguisher rated no less than 2A shall be located adjacent to each stairway on each floor. They shall be situated in highly visible locations mounted at a height to facilitate ease of inspection and retrieval for use. All fire extinguishers shall be inspected monthly. Inspections tags shall be attached to each extinguisher and initialed by the inspector after each inspection.
- 3.6.6.2 All fire extinguishers that are task specific shall be inspected and furnished in advance by the employer that will be conducting the work requiring such firefighting provisions. The fire extinguisher shall be situated within sight of and less than twenty-five feet (25') from the perimeter of the task operation. All work that includes burning or welding of any type shall be defined as "hot work" and shall require the presence of a fire extinguisher, at least one fire watcher, and a Hot Work Permit. Refer to WELDING AND BURNING for additional details.
- 3.6.6.3 No more than twenty-five (25) gallons per floor, of flammable or combustible liquids shall be stored in a room outside of an approved storage cabinet.

3.6.7 HOUSEKEEPING

The PSC or PSA shall ensure that the Contractor and all Subcontractors “effectively” clean the Project site continuously throughout each workday. “Effective clean-up” shall adequately address all of the following housekeeping issues:

- 3.6.7.1 All construction waste, trash, and debris shall be placed in designated receptacles. Glass bottles shall not be permitted on the Project site.
- 3.6.7.2 Stack (or restack) all whole and scrap materials in locations that shall not obstruct a clear pathway nor create a risk for toppling onto a person passing through the area.
- 3.6.7.3 Place all hoses, cords, cables and wires in locations that prevent them from being damaged by equipment, sharp edges or pinch points and from creating tripping hazards.
- 3.6.7.4 Secure and effectively cover all materials on roofs or elevated levels that may be displaced by wind or damaged by driving rain or standing water.
- 3.6.7.5 Restore all signs, barricades, fire extinguishers, guardrails, gates, etc. to proper locations and sound condition.
- 3.6.7.6 Properly store and secure all flammable and combustible liquids and gases.
- 3.6.7.7 Collect and place all cut-off or waste pieces of rolling stock, as they are created, into waste or scrap containers.
- 3.6.7.8 Live rounds that have been ejected from powder-actuated tools shall be immediately placed in designated containers and properly disposed of as recommended by the manufacturer.
- 3.6.7.9 All puncture and impalement exposures shall be covered or eliminated as soon as they are created. As per ANSI specification, effective covers shall be designed to prevent impalement of a 250-pound body being dropped from a fall of four feet (4’).

3.6.8 LADDERS

- 3.6.8.1 Until such time that usable stairways are in place, every elevated platform (slab, deck or work surface) shall have at least two (2) remote means of access/egress when the platform is populated by more than three (3) persons. As the population rises above twenty-five (25), additional means of independent access/egress shall be required. A double-cleated ladder may only serve as one (1) independent means of access/egress.

- 3.6.8.2 At the end of each workday, ground access to elevated levels shall be eliminated. This shall be accomplished by removal and storage of all portable and job-built ladders, or installation of a lockable shield that prevents use of the lower rungs.
- 3.6.8.3 Portable aluminum ladders shall be prohibited.
- 3.6.8.4 Extension ladders, straight ladders and job-built ladders shall be secured from movement at the top and the bottom.
- 3.6.8.5 Physical barricade offsets that force at least one change in walking path direction shall be constructed within a six-foot (6') radius around the upper access points for any ladder's step off landing area.
- 3.6.8.6 All elevated landings shall include a rope hoist (manual or motorized) near the ladder's upper-most access point.
- 3.6.8.7 Minimum acceptable manufactured step or extension ladder that can be used is an ANSI heavy-duty rating Type IA. All ladders must be inspected daily for condition and set up. All manufacturer installed labels must be maintained in legible condition on all ladders. All ladders must be marked in such a way as to identify the owner.

3.6.9 MEDICAL ASSISTANCE AND SCREENING

- 3.6.9.1 The PSC shall maintain a First Aid Log for all treatment administered on the Project (including any that might later escalate). Each SSR shall report and record details daily.
- 3.6.9.2 The PSC or PSA and SSR shall transport or accompany any injured worker for initial off-site medical treatment.
- 3.6.9.3 Drug and Alcohol Screening shall be mandatory for every supervisor and/or worker who sustains or contributes to any incident that involves property damage or injury beyond first aid. If impairment or poor judgment appears to be involved in a first aid event, PSC shall direct injured employee to be screened for probable cause.
- 3.6.9.4 Minimum requirements for chemical screening shall at least match the threshold limits for a NIDA 5-panel protocol and for alcohol screening shall at least match the Texas DOT vehicle operator's limit for blood alcohol content. Only negative results are acceptable for employment on the Project.
- 3.6.9.5 Screening shall be initiated as soon as possible, but not later than two (2) hours after the incident occurrence. No matter where the worker receives medical treatment, a drug and alcohol test MUST occur at the Project assigned clinic. Any worker's refusal to submit to screening shall be treated in the same manner as a "positive" finding. Any worker who withholds notification of an incident for longer than one (1) hour after

the alleged event shall be evaluated by the PSC or PSA, and if declared to be negligent shall be permanently removed from the Project.

3.6.10 MOTORIZED OR SITE EQUIPMENT OPERATION

- 3.6.10.1 Where possible, equipment operator cabs shall be locked during non-working hours. Only equipment operators and direct supervisors shall have access to keys.
- 3.6.10.2 No combustion engine equipment shall be operated in enclosed spaces unless the exhaust is piped to outside air, and "fresh" air is brought into the space to replace the amount being consumed. The PSC shall be responsible for monitoring air quality on the Project when combustible engine equipment is used in enclosed spaces. This includes generators, welding machines, and compressors as well as mobile equipment.
- 3.6.10.3 For hose and termination fittings on air compressors, "whip checks" shall be used at all connection points. Emergency automatic shut off valves shall be installed on every discharge fitting of all air compressors that are capable of producing air pressure greater than thirty (30) pounds per square inch.
- 3.6.10.4 Any equipment that operates by rotating such that a worker can possibly be exposed to caught between hazards must have the swing radius barricaded to prevent worker entry.

3.6.11 PUBLIC PROTECTION

- 3.6.11.1 The project boundary perimeter shall be secured from public intrusion by fencing and locked gates.
- 3.6.11.2 "Attractive nuisance" items such as tower cranes, tall ladders, fire escapes, large excavations, etc. shall require additional and separate security measures.
- 3.6.11.3 No visitor or member of the public shall enter a construction area without an authorized escort.
- 3.6.11.4 All visitors to the project must abide by all applicable project safety requirements. Visitors must read and sign the Visitor's General Waiver and Release (Exhibit C) prior to entry to the construction area(s).
- 3.6.11.5 The Contractor shall be authorized to contact campus police to remove anyone who refuses to abide by Contractor directive to leave the construction area. The ODR shall be notified immediately should this occur.

3.6.12 SANITARY FACILITIES

- 3.6.12.1 The Contractor shall provide at least one (1) toilet facility per twelve (12) workers (separate count per gender) at the Project site; and shall pump, clean and re-supply at least once per week to maintain sanitary conditions. When average temperatures during daylight hours exceed 85 degrees, pump outs shall occur at least twice per week. When female workers are present at the site, toilets designed and designated for their exclusive use shall be clearly marked. Toilets located in project management office trailers and used by office support staff shall not be considered to meet this requirement unless by written consent of the ODR.
- 3.6.12.2 On all projects that are four (4) stories in height or greater, sanitary facilities shall be furnished on ground level and every third level (maximum 45 vertical feet).
- 3.6.12.3 The Contractor shall provide and maintain hand washing and sanitizing facilities sufficient in numbers and locations as to support the toilet facilities indicated in Section 3.6.12.1 and 3.6.12.2.
- 3.6.12.4 The use of any Owner toilet facility is strictly prohibited unless by written consent of the ODR.

3.6.13 SCAFFOLDING

- 3.6.13.1 Each ground-supported scaffold shall bear a shift inspection tag (initialed and dated by the competent person for each company that requires use of the scaffold) to indicate the status of the scaffold (green tag means completely safe and red tag means specific precautions required, or not safe/do not use). For suspended scaffold, inspection tags shall also be placed on the outrigger as well as the work platform. The PSC shall purchase and control a universal system to be used by all employers at the Project site. Training with supporting documentation shall be required for all workers on the Project who will climb onto any kind of scaffolding. The PSC shall furnish tags, and ensure that all applicable workers understand the procedure. This requirement shall apply to all scaffolds.
- 3.6.13.2 Mudsills and surrounding areas at the base of ground-supported scaffolds shall be maintained in a well-dressed and level condition. Scaffold foot plates (or casters) shall be installed on the legs of all ground level frame sections and shall be visible for inspection at all times. Diagonal braces shall be included in every scaffold section as is practically possible. Every walking/working level shall be fully planked and kick-off protection shall be included along open sides and ends. Overhead protection shall be constructed where walk-through passages are allowed. Mudsills shall be at least 2"x12" in one-foot lengths with foot plate centered and nailed in two corners.
- 3.6.13.3 Brakes on rolling scaffolds shall be secure at all times, except when the scaffold is being moved. Workers shall not be allowed on the platform when a scaffold is being moved. Rolling scaffolds should be used on solid, unobstructed, and flat floor surfaces only.

3.6.13.4 Workers in any type of aerial lift including man lift or scissor lift shall be provided with a means to be secured to the lift so that movement is limited to the floor of the lift. No worker shall be allowed to stand on the toe board or rail of the lift. No lift shall be modified to allow the operator to stand above the floor of the lift.

3.6.13.5 Stilts shall be inspected daily by the equipment user and maintained properly. Surfaces on which stilts will be used must be dry, flat, and free of pits, holes and obstructions such as debris, as well as other slip, trip and fall hazards. When a worker is using stilts in an area where a guardrail system is used for fall protection, the guardrail system must be increased in height by an amount equal to or greater than the height of the stilts being used. A rigid platform at a height equal to or greater than the height of the stilts shall be used for mounting/dismounting stilts. The platform must be wide and deep enough to sit comfortably, be stable, and be secured from movement while in use. The platform must be kept clear and accessible while stilts are in use. Stepladders or makeshift platforms can not be used for this requirement.

3.6.14 STAIRS

3.6.14.1 Properly designed and built stair and landing units shall be placed at access doors for every Project office and storage trailer prior to use. Per ANSI requirements, the landing outside each door of any office trailer shall be no greater than one quarter inch (1/4") below the threshold and the unobstructed (standing) area outside the swing radius shall be no less than twenty-two inches (22"). Fire & Life safety code (NFPA) and ADA requirements shall also be satisfied as they apply. Ramps or connecting decks may be installed to satisfy this requirement.

3.6.14.2 For incomplete permanent stair sections, at least the bottom four (4) risers and upper entry points for each floor shall be physically blocked with a hard barricade and marked "INCOMPLETE – DO NOT USE." Until a complete section is made acceptable for general use, the barricades and signs for that section shall be maintained. Once permanent stairs are put into service for general use, no less than two (2) stairs must be maintained as open and accessible from the uppermost floor to ground level at all times. To be considered usable, all treads and landings must be filled to the top of the pan and handrails must be in place.

3.6.15 PROJECT SERVICE WATER

3.6.15.1 Potable Water: Potable water shall comply with city and community health requirements.

3.6.15.2 Non-potable Water: Water storage containers, hose bibs and faucets shall be posted in English and Spanish "DANGER – DO NOT DRINK."

3.6.16 WELDING AND BURNING

- 3.6.16.1 Splices, taps, welds and/or burning operations that may produce sparks, slag or hot scraps shall require “Hot-Work” or “Burn” Permits (daily or per shift). “Burn Permit” forms shall be furnished by the Contractor and issued by the PSC. The SSR shall submit completed permit form in advance of the Work to the PSC for acceptance. One copy of the accepted permit form shall be posted by the SSR in the vicinity of the operation. At the conclusion of the work and successful completion of the smolder/re-kindle watch, a copy of the expended permit shall be signed off and returned to and filed by the PSC. If the campus Environmental Health and Safety group wishes to be involved in the process (provision of permit and/or pre-inspection of the permit space), the Contractor shall accommodate these wishes. The PSC will also issue work specific permit daily or per shift. The PSC shall ensure that all Hot Work will be provided with at least a fire watcher(s), fire extinguisher(s), and smolder watch. If the work produces intense light, permit shall also contain requirement for screens to protect others from flash burns.
- 3.6.16.2 Oxygen and fuel gas cylinders shall not be stored together, including on bottle carts, but shall be separated by at least twenty (20) feet and properly secured from movement. At the end of any cutting operation and/or any shift, bottles must be removed from carts. Hoses and gauges shall be removed and caps restored onto cylinders.
- 3.6.16.3 Anti-flashback arrestors shall be installed at the pressure regulator gauges of all Oxy-Acetylene cutting rigs, even if the torch is equipped with a built-in arrestor.
- 3.6.16.4 Fire watchers shall be posted at every operation that produces sparks, flames or sufficient heat to create an ignition or to fall onto another person. If multiple activities are no more than twenty (20) feet apart and all activities can be seen at all times, a single fire watch can be utilized. This allowance must be noted on the Hot Work permit. Watchers shall be trained in the use of extinguishers, shall keep other people from entering exposure areas, and shall not be assigned other duties until the rekindling possibility ("smolder watch") is over. When sparks, slag, or fire cannot be controlled at the source and may fall to a different level, a separate watcher shall monitor each level directly below the work (including exterior locations).
- 3.6.16.5 Heater boxes for welding electrodes shall have a manufacturer's label that certifies the purpose of the unit. Job-built heaters shall be prohibited.
- 3.6.16.6 The unused stubs of welding electrodes (“rod butts”) shall be collected and placed in proper disposal containers (i.e. metal bucket with sand or water) as soon as each one is expended. Whenever operation is idle, electrode shall be removed from stinger.
- 3.6.16.7 Welding operations shall not be allowed to present an opportunity for flash burn exposures to the eyes of any workers in the vicinity. All welding operations shall

provide appropriate screening measures, erected in advance to contain the high energy light.

3.7 REQUEST FOR SAFETY VARIANCE

If the Project conditions present a situation that will not allow compliance with any portion of this Section, the Contractor shall submit a Request for Safety Variance (EXHIBIT I) to the ODR. The Request for Safety Variance must provide sufficient detail(s) regarding the action(s) to be taken that will provide a measure of safety that is equal to or exceeds the stated requirement. Until the variance is approved and signed by the ODR, compliance with this Section is required.

EXHIBIT Attachments:

- EXHIBIT A Anticipated Construction Project Hazards – Checklist submittal
- EXHIBIT B Hot Work Burning/Welding Permit – Project file document
- EXHIBIT C Visitor’s General Waiver and Release – Contractor submittal
- EXHIBIT D Project Safety Orientation Checklist – Project file document
- EXHIBIT E Subcontractor Safety Representatives Weekly Meeting Agenda - Template
- EXHIBIT F Quarterly Equipment Inspection Report – Project file document
- EXHIBIT G Worker Guide for Reporting Injury - Handout
- EXHIBIT H Supervisor Guide for Management of Worker Injury - Handout
- EXHIBIT I Request for Safety Variance – Contractor submittal
- EXHIBIT J Root Cause Analysis
- EXHIBIT K Incident Notification Flow Chart
- EXHIBIT L Tower Crane Assembly/Disassembly Documentation
- EXHIBIT M Job Hazard Analysis Form (Non-Mandatory)

END OF SECTION 01 35 23

EXHIBIT A**CONTRACTOR SUBMITTAL TO OWNER – CHECKLIST****The University of Texas System – Construction Project Safety****ANTICIPATED CONSTRUCTION PROJECT HAZARDS**

CIP (Owner's Project) #		Project Name		Date
No	Yes	Issue	Timing for appearances & ID for Subcontractor JH/SA's	
General Health Exposures				
		Noise, Illumination, Lasers and X-ray		
		Dusts, Mists, Vapors, Gases		
		Chemical exposures		
		Proximity to public and/or traffic		
		Existing geography/ extreme weather		
Electrical Exposures				
		Overhead power lines in area		
		High Voltage (≥ 600 volts)		
		Hot taps and/or Double fed circuits		
Excavations				
		Tunnels and/or Jack and Bore		
		Maximum estimated trench depth		
		Maximum estimated pier sizes		
		Existing underground services		
		Proximity to streets or buildings		
Elevated Fall Exposures				
		Excavations and piers		
		Structural erection (steel/precast)		
		Building exterior		
		Stairwell/ Chase/Elevator Shaft		
		Roof (note steep or low slope)		

Cranes/ Hoists/ Derricks			
		Pier Drilling/ Pile Driving	
		Exterior Hoists (Elevators)	
		Mobile Cranes (track and rubber tire)	
		Tower Cranes	
		Critical lifts	
Tools and Equipment			
		Powder Actuated	
		Pneumatics or High Torque power tools	
		Generators and Compressors	
Motor-Driven Equipment			
		Earth moving equipment	
		Lift Platforms (articulating and/or scissor)	
		Industrial trucks (fork lifts)	
		Bulk fuel storage area	
Demolition			
		Structural, Explosive or Mechanical	
		Jackhammers and power cutting	
Scaffolding			
		Ground supported (static and/or motorized)	
		Suspended	
Welding and Burning			
		Types and Locations	
Confined Space			
		Permit required and/or not required	

EXHIBIT B**CONTRACTOR DECISION MATRIX – GUIDELINE****The University of Texas System – Construction Project Safety****HOT WORK (BURNING/WELDING) PERMIT**
(ONE COPY MUST BE POSTED IN THE VICINITY OF THE WORK)

CIP Number		Request Date:
UT Campus / Institution		
Project Name		
Requesting Company		
Responsible Supervisor		
Work Location		
General Description of Work Tasks		

ISSUES AND/OR PREVENTION MEASURES	DESCRIPTION
Dedicated Fire Extinguisher(s)	
Special Suppression Equipment	
Fire Blankets/Equipment Shielding	
Flash Burn (Eye Safety) Screening	
Fire Watch Position(s)	
Existing Sprinklers Disabled	
OTHER CONSIDERATIONS:	

NOTES:

1. All permits are good for one (1) shift only.
2. Unless a specific task requires a **LONGER** time period, fire watch positions must also conduct a smolder-rekindle watch for at least THIRTY (30) MINUTES after the burning/welding operation is completed.
3. If the work moves from one area to another during a single shift, the permit must accompany the move and all task areas must be identified on the permit.
4. After the work is completed, the permit must be initialed by the RESPONSIBLE SUPERVISOR (below) and a copy must then be forwarded to the Prime (Controlling) Contractor within one (1) work day.

If unexpected events during the work led to modified plan, place initials in appropriate box: ☐ NO ☐ YES
If **YES**, describe the unexpected events and the subsequent actions.



**Visitor's General Waiver and Release
The University of Texas System (Owner)**

Project Name: _____

Project Number: _____ Location: _____

General Contractor: _____

OFPC Resident Construction Manager: _____

Project Safety Coordinator: _____

On behalf of The University of Texas (Owner) and the General Contractor, we welcome you to the project. Construction projects can be dangerous and hazardous to employees and visitors alike. Upon entering the site, you must exercise extra care to adhere to safety protocols and instructions from knowledgeable construction professionals.

Initials _____ I acknowledge that I will observe and follow all safety procedures, including any warning signs or safety instructions posted on or about the premises. In addition, I acknowledge that proper safety vests, hard hats and safety glasses have been provided to me for my visit. I am wearing closed toed shoes that the Project Safety Coordinator has acknowledged will be appropriate for my visitation.

Initials _____ I hereby waive, release and hold harmless, as well as forever discharge, The University of Texas System, the General Contractor and all subcontractors, their agents and employees from all claims which I, or my heirs, executors or administrators shall or may have, because of bodily injury or death to me or damage to my property resulting from any act or omission of the Released Parties. I AM NOT AGREEING, HOWEVER, TO RELEASE THE RELEASED PARTIES FROM GROSS NEGLIGENCE.

Initials: _____ I hereby agree to indemnify, defend and hold harmless the Released Parties for any bodily injury, death or damage to other persons or property caused by my acts or omissions while visiting the project.

Initials: _____ I, the undersigned, acknowledge that I (1) have requested permission from the Owner and General Contractor to visit the Project Site; 2) have executed this Waiver and Release as a condition of and in consideration for being permitted by Owner and General Contractor to visit the project Site; and 3) agree to exercise extreme care while on the Project Site and to comply with all safety rules and requirements of the Owner and General Contractor.


Date: _____ Visitor Signature: _____

Number in Visiting Party: _____ Group Affiliation: _____

Project Safety Coordinator Signature: _____

EXHIBIT D**CONTRACTOR CHECKLIST – TRAINING DOCUMENT****The University of Texas System – Construction Project Safety****PROJECT SAFETY ORIENTATION**

OFPC Project #:	Date of Safety Orientation Training:
OFPC Project Name:	
Trainer's Name:	
Contractor/Employer's Company Name:	

INSTRUCTIONS: Place a  mark in the box to the right of each topic as it is discussed.

1-	Review General Purpose of Rules	7-	Daily Issues
a.	Do NOT work alone – stay in contact	a	Housekeeping
2-	Personal Protective Equipment (PPE)	ITEM	Slippery surfaces and Trip hazards
	Purpose, use, storage and care of:	ITEM	Visual obstructions to emergency equipment
a	Safety Helmets (Hard Hats)	ITEM	Blocked Exit paths
b	Basic Eye Protection	ITEM	Emergency Roadways
c	Additional Eye/Face Protection	ITEM	Trash = Vermin/Fire hazards
d	Feet/Hands/Clothing Protection	ITEM	Puncture/Impalement hazards
e	Respiratory Protection	ITEM	Unstable Stacks of materials
f	Hearing Protection	b	Manual Lifting
g	Fall Protection	c	Ladders and Stairs
h	Special Protection issues	d	Scaffolding (frame and suspended)
3-	Hazard Communication (aka Right to Know)	e	Tools and Portable equipment
a	General Plan	f	GFCI/Electrical power
b	Major Chemical hazards on-site:	g	Surface and ground conditions
NAME		h	Overhead exposures
NAME		8-	Motorized Equipment Operations
NAME		a	Mobile equipment (uses and alarms)
NAME		b	Crane and Rigging Operations
c	Hazard Labels	c	Lift platform equipment
d	Material Safety Data Sheet (MSDS)	d	Hoists/ Exterior Elevators
e	Location of MSDS	e	Company/ Personal Vehicles
f	Safe Task Training requirements	9-	Special Operations (with and w/out permit)
4-	Emergency Equipment (location and use)	a	Excavations
a	First Aid Station and AED	b	Concrete pour and place
b	Fire Extinguisher	c	Steel and Precast erection
c	Eye Wash/Shower Stations	d	Decking and roofing
5-	Emergency Procedures	e	Lock/Tag out of Energized Systems
a	Medical/ Injury incident	f	Hot work and Burn Permits
b	Fire incident	g	Scaffold erection/dismantle and use
c	Weather/ Evacuate	h	Critical shutdown
d	Violence, Protest, Spill, Explosion	10-	Miscellaneous Issues
6-	Incident Notification/Reporting	a	Parking, Smoking, Harassment
a	Tell Supervisor Immediately	b	Signs, Barricades, Handrails
b	Help –OR- stay out of the way	c	Traffic, Pedestrians, Neighbors
c	Give a statement of facts	d	Drugs and Alcohol
d	Assist investigation	e	Meetings, Badges, Incentives
e	Report Unsafe acts and conditions	f	Enforcement

I understand that this training is designed to help me make safe decisions and act to reduce risks.

Employee Name (print)

Employee Signature

The University of Texas System – Construction Project Safety**SAFETY REPRESENTATIVES WEEKLY MEETING AGENDA**

- Sign in and introduction of any new Subcontractor Safety Representatives
- Read minutes from last meeting and vote final adjustments before filing into record

Past (Old Business):

1. Discuss investigations (findings and conclusions) from recent past incidents.
 2. If the Project has a safety committee, have someone from the committee report the safety conditions and behaviors noted in the past week.
 3. Review safety issues/conditions identified during Project Safety Coordinator's weekly safety inspection or third party inspection.
 4. Discuss any pending claims (worker injury or general liability). Review claims handling procedures.
 5. Discuss trends identified regarding claims or safety performance.
-

Present (Current and New Business):

6. Review the activities for the week ahead. Identify particular safety concerns and issues. Develop actions to control identified hazards.
7. Review any MSDS for potential exposure warnings that pertain to upcoming operations.
8. Review specific PSMP elements and/or requirements.
9. Safety suggestions.
10. Open forum for general Q and A.
11. Announcements
 - Subcontracts that are concluding – need final look at their areas
 - Upcoming safety recognition events
 - Upcoming training opportunities
 - Upcoming professional safety seminars or workshops
 - Names of workers who are not permitted to return to Project
 - Time and date of next meeting
 - Next week's mandatory topic for the Weekly Tool Box talk

The University of Texas System – Construction Project Safety**WORKER GUIDE FOR REPORTING INJURY**

- ❖ **WORKERS MUST IMMEDIATELY REPORT** all injuries (no matter how minor) to a supervisor.
- ❖ The supervisor will report the incident to the Contractor and take care of all paperwork.
- ❖ The worker's SSR will drive the injured employee to the clinic to guarantee safe transport and to secure swift and complete medical attention.
- ❖ The doctor may prescribe written "orders" for medical restrictions. The supervisor must then assign temporary duties that fit the restrictions ("Light Duty"). This guarantees the worker a full paycheck while the injury heals.
- ❖ The worker's SSR will drive the injured worker back to the Project and make arrangements with the employer to get the worker and personal vehicle home by a safe method.
- ❖ Injured employees must follow the doctor's "orders" and comply with work restrictions – **at home and at work**. Employers must allow reasonable times for visits to the doctor and to therapy sessions. Normally, sessions can be scheduled during non-work hours.
- ❖ The insurance company may contact the injured employee to discover how the doctor and the employer are planning to treat the injury and the recovery. Injured workers should share any personal details that might help the agent understand the situation. If anything needs to be changed in order to help the recovery process, the agent will contact the proper people to make it happen.
- ❖ The insurance company will pay the medical bills for injuries on this Project. Workers should never pay any medical bills for an injury that is related to work. If there are any questions, talk to a supervisor and/or the Project Safety Coordinator for the Contractor.

SPECIAL WARNING TO USERS AND ABUSERS (of alcohol and other controlled substances):

No matter where a worker receives medical care, the treatment will include a drug and alcohol test. Workers who are injured as a result of impairment from alcohol or non-prescribed drugs will lose the guarantee that all medical treatment will be covered by insurance. Also, they will not be allowed to return to work on any UT System Project.

EXHIBIT H**CONTRACTOR INFORMATION – SUPERVISOR HANDOUT****The University of Texas System – Construction Project Safety****SUPERVISOR GUIDE FOR MANAGEMENT OF WORKER INJURY**

1. Workers must **IMMEDIATELY REPORT** all injuries (no matter how minor they appear at the time of the incident) to a supervisor (foreman, general foreman, superintendent, etc.).
2. The supervisor must **IMMEDIATELY REPORT** any injury to the Contractor's Project Superintendent or Safety Coordinator. Improper and/or late reporting of injuries will result in Owner directed recovery charges as described in the Contract.
3. The supervisor must then escort the injured employee to the Contractor's Project office (**except when the injury requires an ambulance or emergency response**).
4. The Contractor's Project Safety Coordinator (PSC) shall retrieve 5 documents from the Project Safety Files as follows:
 - a. The form (Authorization for Medical Treatment) that guarantees quickest medical response at the clinic
 - b. A map that shows the best route to the clinic
 - c. A copy of the Return to Work Policy from the employer of the injured worker
 - d. A "First Report of Injury" form to furnish the insurance company with the necessary information to start a claim and pay medical bills
 - e. A "Bona Fide Offer of Employment" form to guarantee suitable employment for medically restricted workers
5. The worker's SSR will drive the injured employee to the clinic to guarantee safe transport and present the "Authorization to Treat" form to obtain swift response. This form will also notify the clinic that a test for drugs and alcohol is required. If the injured worker is transported elsewhere, the Contractor shall also notify the insurer. The supervisor shall also be at the clinic to respond to questions from the physician.
6. After the doctor has completed the examination and all required medical care, the worker's SSR and the worker shall meet with the doctor to accomplish three objectives:
 - a. Review the injury and discover the need for any additional medical assistance.
 - b. Discuss suitable Return to Work positions to accommodate any medical restrictions.
 - c. Present the worker with a "Bona Fide Offer of Employment" form to guarantee continuing employment and to guarantee work tasks that will not exceed prescribed medical restrictions.
7. The worker's SSR shall then drive the worker back to the Project and shall make suitable arrangements to get the worker and personal vehicle home at the end of the day. If the doctor has written a prescription that contains orders for medical restrictions, the worker must be assigned to ("Light Duty") tasks that meet the restrictions. This presents a "win-win" for all involved as follows:
 - a. The injured worker will continue to draw his/her full paycheck.
 - b. The employer will be able to keep its insurance rating as competitive as possible.
 - c. The insurance provider will be able to keep the costs of medical claims as low as possible.
8. The SSR must promote three issues to quickly and completely restore health:
 - a. Maintain awareness of medical restrictions, and assign work tasks that do not violate the restrictions.
 - b. When contacted by the insurance agent, be candid and share any information that may expedite the physical recovery of the injured worker.
 - c. Allow reasonable times for physical therapy (or other medical treatment) and maintain contact with worker.
9. **Zurich** is the insurance company that will pay the medical bills. The Contractor's Project Safety Coordinator will have the contact information to file the required insurance claim.

SPECIAL NOTE: No matter where the worker receives medical treatment, a drug and alcohol test **MUST** occur at the Project assigned clinic. Employers must not allow workers with confirmed drug or alcohol impairment to return to employment on any UT System Project unless the drug is prescribed by a physician and the work assignment can be safely performed.

EXHIBIT I**CONTRACTOR SUBMITTAL TO OWNER - TEMPLATE****The University of Texas System – Construction Project Safety****REQUEST FOR VARIANCE**

Date of Request:

From: *(insert name of Contractor and name of person signing on behalf of company)*

To: Office of Facilities Planning and Construction – *(insert name of OFPC RCM)*

Project Name: _____

Project Number: _____

We respectfully request a variance from the Contract, Section # 01 35 23 (Project Safety Requirements). We understand that no alteration of safety procedures is to be allowed until formal acceptance is executed by OFPC.

We believe that the following regulation(s) is/are either not practicable or not the best practice for the Project at this time.

(Insert verbiage that describes the specified regulation.)

(Insert description of how and why the existing conditions make the existing regulation less than the safest method for accomplishing the work – convenience is not an acceptable reason.)

(Insert the proposed method in sufficient detail to allow a reader to visualize the better plan.)

Very truly yours,

Signature

Position

On behalf of the Board of Regents of The University of Texas System, Contractor's request is:

ACCEPTED



DENIED



Printed name

Request reviewed by OFPC Regional Program Manager

Signature

Printed Name

Request reviewed by OFPC Resident Construction Manager

Signature

*Note: This variance as reviewed is understood to be for this scope of work and this project only. It is further understood that this variance is not portable as it relates to any other OFPC Project.

Cc: OFPC Safety Analyst - Austin

Root Cause Analysis

OFPC Project Name _____

Name of Incident _____

OFPC Project Number _____

Date of Incident _____

Employee Injury? ☐ No ☐ Yes

If yes, list employee name _____

Date of RCA _____

If revising, date of revision _____ Revision No. _____

Contractor _____

Subcontractor (if applicable) _____

This RCA is due to:
☐ Injury, ☐ Level "A" Safety Deficiency, ☐ Property Damage, ☐ Other Incidents as directed by the Owner
Identify all underlying contributing factors to reduce potential for recurrence of same type incident. Remember:

- ✓ Worker's actions made sense to that person at the time (circumstances & perceptions)
- ✓ Understand the thought process behind the decisions that were made at the time
- ✓ Look beyond the individuals involved to uncover systemic contributing risk factors
- ✓ Break the blame cycle (culture must value honest reporting - learning organization)
- ✓ Find error precursors & flawed or missing defenses or processes that led to incident

The Root Cause Analysis investigation should thoroughly address these questions:

1. Was the incident controlled and limited so that all workers and the project were made safe post - incident?

What was done?

2. Explain what happened (facts and circumstances) that resulted in the incident.

3. Are there other work areas or tasks where this type of incident could occur again?

4. If worker's actions contributed to the incident, why did the worker feel this was the best course of action at the time?

5. What processes were in place to prevent the incident? Identify processes that failed.

6. Is there any other information that should be known that is relevant to this incident?

7. What processes could have been implemented or improved that might have prevented this incident?

8. What processes will be improved or implemented to reduce risk of recurrence?

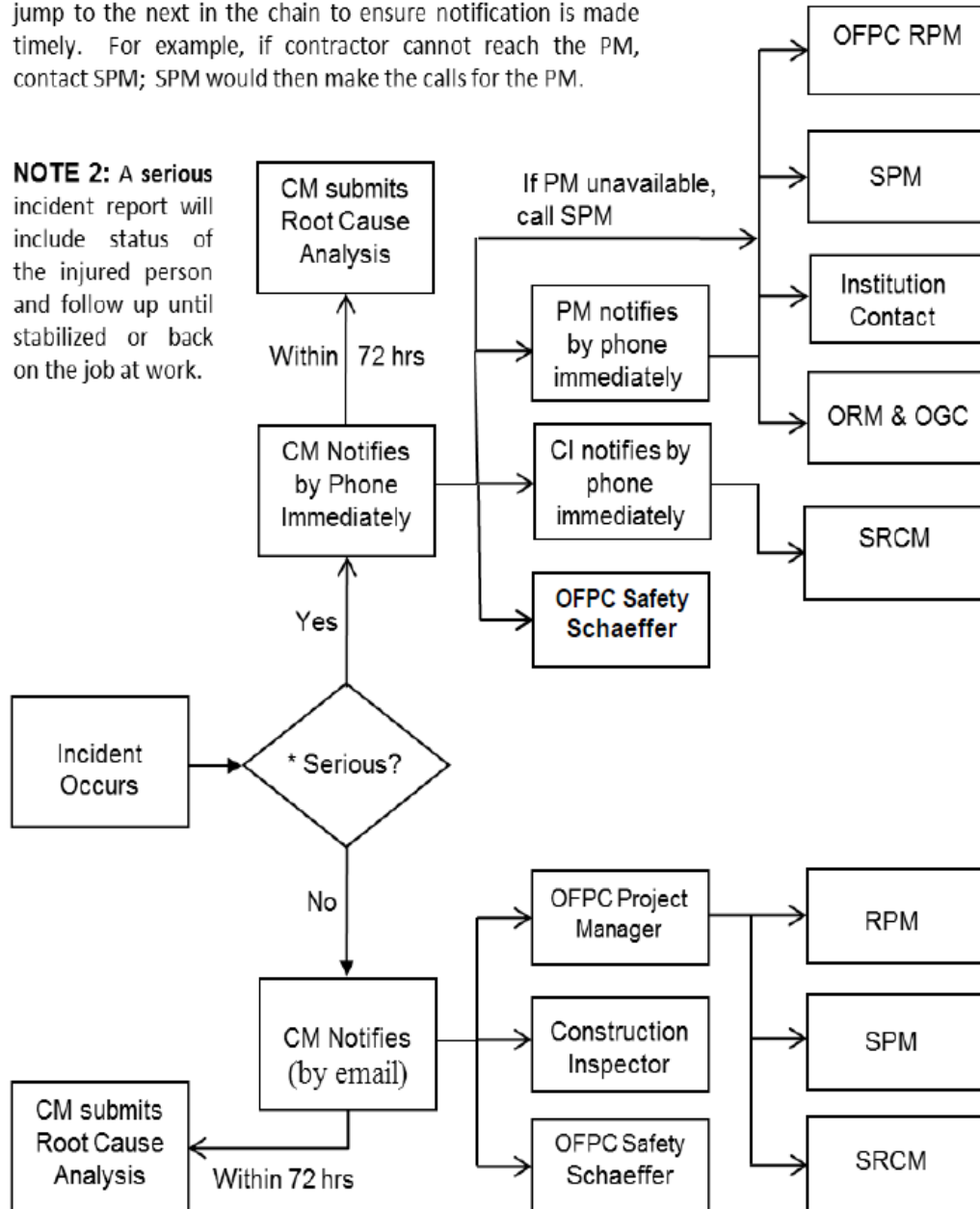
When will these new processes be in place?

FOR OFPC USE ONLY

Level	<input type="checkbox"/> Fire Alarm	<input type="checkbox"/> First Aid	<input type="checkbox"/> Level A	<input type="checkbox"/> Near miss	<input type="checkbox"/> Property Damage	<input type="checkbox"/> Recordable	<input type="checkbox"/> SWPP	<input type="checkbox"/> Other
Incident	<input type="checkbox"/> Caught between	<input type="checkbox"/> Electrical	<input type="checkbox"/> Equipment handling	<input type="checkbox"/> Fall	<input type="checkbox"/> Fall protection	<input type="checkbox"/> Foreign body		
Type:	<input type="checkbox"/> Haz mat	<input type="checkbox"/> Heat exhaustion	<input type="checkbox"/> Ladder	<input type="checkbox"/> Material Handling	<input type="checkbox"/> Puncture	<input type="checkbox"/> Security	<input type="checkbox"/> Slip/trip	<input type="checkbox"/> SWPP
	<input type="checkbox"/> Tool handling	<input type="checkbox"/> Worn Equipment	<input type="checkbox"/> Other					
Injury	<input type="checkbox"/> N/A	<input type="checkbox"/> Blunt trauma	<input type="checkbox"/> Chemical burn	<input type="checkbox"/> Contusion	<input type="checkbox"/> Cramps	<input type="checkbox"/> Crushing	<input type="checkbox"/> Dust in eye	
Type:	<input type="checkbox"/> Fall	<input type="checkbox"/> Flash burn	<input type="checkbox"/> Heat exhaustion	<input type="checkbox"/> Insulation in eye	<input type="checkbox"/> Knee blood blister	<input type="checkbox"/> Laceration	<input type="checkbox"/> Laceration & shock	
	<input type="checkbox"/> Other	<input type="checkbox"/> Puncture	<input type="checkbox"/> Shock	<input type="checkbox"/> Sprain	<input type="checkbox"/> Strain			

NOTE: if calling to report a **serious** incident and someone in the calling chain is unavailable, leave a message, but then jump to the next in the chain to ensure notification is made timely. For example, if contractor cannot reach the PM, contact SPM; SPM would then make the calls for the PM.

NOTE 2: A **serious** incident report will include status of the injured person and follow up until stabilized or back on the job at work.



* An incident is considered serious if any of the following occur:

- EMS/Ambulance responds
- hospitalization is involved
- Life threatening or potentially life threatening
- Involves more than one employee injured

The University of Texas System – Construction Project Safety**REQUIRED INFORMATION TO BE SUBMITTED AND REVIEWED PRIOR TO ANY TOWER CRANE ASSEMBLY OR DISASSEMBLY OPERATION**

The plan will need to be submitted for review by the Owner at least two weeks prior to the date of the planned assembly or disassembly. OFPC will be providing a third party consultant during the assembly or disassembly process. No work will begin until all plan elements noted below have been submitted and reviewed for acceptance. The plan must include at a minimum:

1. Annual inspection of all assist cranes that will be utilized to assemble or disassemble the tower crane.
2. Operator's nationally recognized certification(s) and supporting training documentation for all make and model of cranes that will be used. Operator's annual physical.
3. Qualifications (with supporting training documentation) for the Assembly/Disassembly Director and all crew members, riggers and signal persons. Training documentation must include organization and person(s) that conducted the training, material covered in the training, time spent on each training element, and details to the evaluation process used to verify worker understanding of training. This may be through testing and/or demonstration of skills. Rigging can only be performed by persons who possess documentation of completion from a training program that carries recognized accreditation.
4. Verification of soil conditions for all anticipated mobile crane positions. Detailed plan with map for the location(s) of the assist crane(s) and associated hazards in close proximity to those locations. Plan to control identified hazards.
5. Training documents for all crew members for their assigned task(s). A letter indicating positions with no supporting documentation is not acceptable. Fall protection training must be included. See # 3 for the required training documentation.
6. Details for work stoppage due to high wind speed or other inclement weather conditions. The actual shutdown procedure, including who is responsible for shutdown determination and how it will be communicated to all affected workers.
7. Copy of the manufacturer's equipment manual for review for the make and model of tower crane that will be erected or dismantled.
8. Structural information regarding the tower crane base pad (prior to assembly).
9. Details on sequencing for sectional assembly and bolting (including torque) (prior to assembly), details on sequencing for sectional disassembly with bolt removal procedure (prior to

disassembly) and rigging procedure with verifications. Cannot indicate that plan will follow manufacturer's equipment manual.

10. Documentation showing that each worker has been drug tested within two (2) weeks prior to work start on the project. Negative result per worker is needed for entry.

11. Prior to the assembly of a tower crane, the General Contractor will need to develop a High Angle Rescue Plan. The intent of this plan is to be able to effectively remove an individual from the horizontal portion of the crane in the event of an emergency prior to assembly and during use of tower crane.

REMINDER - this information submission in no way removes **the General Contractor's safety professionals and project management team** from the obligation of ensuring all documentation is provided, reviewed for adequacy based on the planned task(s), ensuring that the work is pre-planned and communicated to all affected workers, all workers are properly trained to perform their individual tasks, and that all work is done according to the agreed upon plan and the manufacturer's requirements.

Daily Job Hazard Analysis

This JHA is valid only for the work and date specified. This JHA shall be posted at the immediate work area while the work is ongoing. If the noted conditions change, the JHA shall be re-evaluated to incorporate changes and reissued immediately. Any emergency or incident automatically invalidates this JHA. When this JHA expires, it must be returned to the PSC/PSA for record purposes.

Project Name and Number		Date and Time	
Company Name		Supervisor	

Description of work to be performed:

A. Are Permits Required? Are they displayed and properly signed by the PSC/PSA?

Hot Work	Y		N		Confined Space	Y		N	
Lockout/Tag-out	Y		N		Roadway Traffic	Y		N	
Excavation	Y		N		Other (specify)				

B. Atmospheric Monitoring

Oxygen Concentration	Y		N		Reading	
Combustible Gas/Flammable Vapors	Y		N		Reading	
Hazardous/Toxic Gas	Y		N		Reading	
Are concentration levels safe?	Y		N			

C. THINK about the work you and your crews will be doing today. Place a Y for Yes or N for No next to each element. All elements identified with a Y or Yes must be addressed in Section D.

C.1 Specialized Operations

Confined Space		A-Frame Ladders		Other (provide details below)
Aerial Man-lifts		Extension Ladders		
Lockout/Tagout		Scissor Lifts		
Excavations		Opening/Isolation of equipment		
Trenches		Loading/Un-loading >50lbs		
Motorized Equipment		Work on live equipment		
Ground Supported Scaffold		Welding		
Suspended Scaffold		Burning/Cutting operations		
Mobile/Rubber Tire Crane		Work at Heights >6'		
Tower Crane				

C.2 Hazards

Airborne Particulates	Falls	Public Traffic (vehicle/Foot)
Body Stress (hot/cold)	Slip/Trip Hazards	Repetitive Motion
Lighting	Pinch Points	Lifting
Noise	Electric Shock	Material Handling
Radiation	Sharp Objects	Work of Others (specify)
Chemical Exposure (skin/eyes/inhalation)	Thermal Burns	
Flammable Materials	Housekeeping	
Overhead Work	Obstructed View	Other Hazards (specify)
Motorized Equipment	Awkward Positioning	
Access/Egress Paths	Insects/Animals	
Floor Cut-outs	Walking Surfaces	

C.3 Hazard Controls

C.4 Proper PPE

Hazard Assessment	Walking/working surfaces clear and unobstructed	Protective Suits
Pre-task Planning	Proper storage of material and equipment	Hard Hats
Worker Training	Equipment warning/safety devices operational	Safety Glasses
Equipment Selection	Proper lifting./placement/securing of material	Face Shield/Goggles
Equipment Inspection	Fall protection in place/inspected/maintained	Traffic Safety Clothing
Permits developed and reviewed	Housekeeping maintained daily and verified	Fall Protection
Work area verification of conditions	Fire protection measures in place	Hearing Protection
Review of As-builts	Equipment grounded/bonded	Gloves
Utility owners contacted	Flash burns shielded	Respirator
Utilities located and confirmed	Spark containment	Foot Protection
Equipment operators qualified	Flow able material contained	Other (specify)
Equipment training documented and on-hand	Emergency response in place and communicated	
Atmospheric Testing	Barricades/covers/signs in place and secure	
Live equipment isolated? (list equipment below)	Stand-by persons (specify name and task below)	
Competent Person (print name)	Spotter/Flagger/Traffic Control (print name and task)	

D. This portion of this JHA is to be completed by the supervisor with input from crew members. Once complete this JHA must be reviewed with all affected crew members or when conditions change.

Work Activities based on C.1

Possible Hazards base on C.2

Controls to Address Hazards based on C.3

C.5 Emergency Response							
Fire Extinguishers located at?				Report Emergencies to? (name & number)			
SDS located at?				(name & number)			
Eye Wash Station located at				Emergency alarm sounds like?			
First-aid/AED located at?				Muster Point is located at?			

E.	Crew Printed Name	Signature	Badge #		Crew Printed Name	Signature	Badge #
1.				11.			
2.				12.			
3.				13.			
4.				14.			
5.				15.			
6.				16.			
7.				17.			
8.				18.			
9.				19.			
10.				20.			

F. JHA developed and communicated by;		Daily JHA reviewed by (PSC/PSA):	
Printed Name	Signature	Printed Name	Signature
Date	Time	Date	Time

REVISION LOG

The following is provided for convenience to the Owner, Architect/Engineer and Contractor to track changes between annual document issuances and is not to be considered by any party to be contractual or 100% complete.

Date	Paragraph Revised
02/01/08	Correct numbering in Section 3.8
06/01/08	Include SafetyNet Program in Section 2.4
04/01/09	Reissue date of substantially revised document. (not posted to eManual)
04/26/10	Reissue date of substantially revised document. Notable changes include: <ul style="list-style-type: none"> • increased experience level and qualifications of the Project Safety Coordinator (PSC) and Project Safety Assistant(s) (PSA) • modified the number of PSAs required on a Project and their start and conclusion of service days • increased credit for formal education, continuing education, and certification for PSCs and PSAs • modified OSHA 10/30 hour training requirements • modified hard hat sticker process for equipment operators • modified safety vest requirement • modified height requirement for ladder use without fall protection • removed other exemptions for fall protection • added visitor waiver and release requirement and document • other cosmetic changes with no impact to content or intent of specifications.
3/24/11	Inclusion of criminal background check requirement and associated forms
5/17/11	Removal of criminal background check requirement and associated forms
9/1/12	Clarifications to align with SafetyNet data gathering and Exhibit title revisions
12/18/15	Inclusion of PSC in training and other minor clarifications

REVISION LOG

SECTION 01 45 00 - PROJECT QUALITY CONTROL

PART 1 - GENERAL

1.1. RELATED DOCUMENTS

- 1.1.1. Drawings and general provisions of the Contract, including Uniform General and Supplementary General Conditions for University of Texas System Building Construction Contracts (UGC) and other Division 1 – Division 33 Specification Sections, apply to this Section. In the event of conflict between specific requirements of the various documents, the more restrictive, more extensive (i.e., more expensive) requirement shall govern.

1.2. DEFINITIONS

1.2.1. QUALITY CONTROL

- 1.2.1.1. Quality Control shall be the sole responsibility of the Contractor, unless specifically noted otherwise. The Contractor shall be responsible for all testing, coordination, start-up, operational checkout and commissioning of all items of work included in the project, unless specifically noted otherwise. All costs for these services shall be included in the Contractor's cost of work and general conditions.
- 1.2.1.2. The Contractor shall assign one employee, not the project superintendent, to be responsible for Quality Control. This individual can have other responsibilities, but shall not be the project superintendent or the project manager.

1.2.2. QUALITY ASSURANCE

- 1.2.2.1. Quality Assurance is performed by the Owner or their delegated representatives. These procedures may include observations, inspections, testing, verification, monitoring and any other procedures deemed necessary to ensure compliance with the contract documents.
- 1.2.2.2. The Contractor shall cooperate with and provide assistance to the Owner for all aspects of this endeavor. This shall include providing ladders, lifts, scaffolds, lighting, protection, safety equipment and any other devices and/or equipment (including operators if required) deemed necessary by the Owner to access the work for observation/inspection.

1.3. SUMMARY

- 1.3.1. This section provides administrative and procedural requirements for Contractor quality control on the project.
- 1.3.2. Specific quality-control requirements for individual construction activities are specified in the Sections that govern those activities. Requirements in those Sections may also cover production of manufactured products.

- 1.3.3. Specified tests, inspections, and related actions do not limit Contractor's quality control obligations to comply fully with the Contract Document requirements in all regards.
- 1.3.4. Provisions of this Section do not limit the requirements for the Contractor to provide quality control services required by the contract documents or the Authority Having Jurisdiction.
- 1.3.5. The following quality issues are addressed in detail in this Section:
 - 1.3.5.1. Quality Control
 - 1.3.5.2. Quality Assurance
 - 1.3.5.3. Testing Agency
 - 1.3.5.4. Testing
 - 1.3.5.5. Inspections
 - 1.3.5.6. Pre-installation Meetings
 - 1.3.5.7. Mock-ups

1.4. TESTING AGENCY

- 1.4.1. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.
- 1.4.2. Owner will employ services of independent testing agencies to perform certain specified testing, as it deems necessary.
- 1.4.3. The Contractor shall employ and pay for services of an independent testing agency to perform all specified testing requiring an independent agency, unless noted otherwise.
- 1.4.4. Employment of agency in no way relieves the Contractor of the obligation to perform Work in accordance with requirements of Contract Documents.
- 1.4.5. The Contractor Employed Agency:
 - 1.4.5.1. Testing agency shall comply with requirements of ASTM E 329, ASTM E 548, ASTM E 543, ASTM C 1021, ASTM C 1077, and ASTM C 1093.
 - 1.4.5.2. Laboratory shall maintain a full time Engineer on staff to review services. Engineer shall be licensed in the state of Texas.
 - 1.4.5.3. Testing Equipment: Calibrate devices at reasonable intervals (minimum yearly) with accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

- 1.4.6. The Contractor shall not employ the same testing entity engaged by the Owner for the project, unless agreed to in writing by the Owner.

1.5. TESTING

- 1.5.1. Where specific testing is specified in a technical section of the Specifications or indicated in the Contract Documents, the Contractor shall bear all costs of such tests unless they are specifically stated to be paid by the Owner.
- 1.5.2. Testing specifically identified to be conducted by Owner will be performed by an independent entity and will be arranged and paid for by the Owner unless otherwise indicated in the Contract Documents. Should the test return unacceptable results, the Contractor shall bear all costs of retesting and reinspection as well as the cost of all material consumed by testing, and replacement of unsatisfactory material and/or workmanship.
- 1.5.3. The Owner's Construction Inspector (CI) will schedule the Owner's testing services unless otherwise directed in writing by the Owner. The Contractor is required to coordinate with the CI to facilitate timeliness of such testing services.
- 1.5.4. The Owner may engage additional consultants for testing, air balancing, or other special services. The activities of any such Owner consultants are in addition to Contractor testing of materials or systems necessary to prove that performance is in compliance with requirements. The Contractor must cooperate with persons and firms engaged in these activities in accordance with the Contract.
 - 1.5.4.1. The Contractor is required to self-perform various tests to verify performance and/or operation of various systems. These test reports shall be consecutively numbered and defined by scope and extent of test. Copies of the test report forms can be obtained from the RCM. The following OFPC test report forms shall be used for this purpose and shall not be altered in any manner:
 - 1.5.4.1.1. Pipe Test Report
 - 1.5.4.1.2. Duct Test Report
 - 1.5.4.1.3. Equipment Start-up Request Form
 - 1.5.4.1.4. Contractor's Request for Utility Shutdown
 - 1.5.4.1.5. Domestic Water Sterilization and Flushing Report

1.6. INSPECTIONS

- 1.6.1. It is the intent of the Contract Documents that all work be subjected to inspection and verification of correct operation prior to 100% payment of the line item(s) pertaining to that aspect of the Work.
- 1.6.2. The Contractor shall incorporate adequate time for performance of all inspections and correction of noted deficiencies into the Work Progress Schedule for the project.

1.6.3. During the course of construction, the Owner, Architect and/or other Owner representatives may visit the site for observation of the work in place. The Contractor shall provide all necessary equipment for safe access to the work to be inspected or observed. This requirement shall extend to all Owner personnel and their representatives. Some of these inspections will be informal and some will require formal notification by the Contractor. The following are typical project inspections:

1.6.3.1. Informal Daily Reviews of project conditions by the Construction Inspector and/or members of the Owner's and/or Design Consultant's team(s). When considered appropriate, results of these reviews will be documented via Observation Report or Memorandum. In addition to cooperating with, and providing safe access for the Owner's agents, the Contractor shall provide a system of tracking all field reports, describing items noted and resolution of each item. This printed report shall be reviewed as necessary, at least on a monthly basis.

1.6.3.2. Concealed Space Inspections are to be formally scheduled in advance through the Construction Inspector by submitting written notification at least five (5) workdays in advance. Subject areas include partitions, structural walls, chases, crawl spaces, ceiling spaces, and any other work which will be difficult or impossible to examine once concealed in the final construction.

1.6.3.3. Progress Inspections for piping, ductwork, and other systems are to be scheduled with the Construction Inspector as appropriate portions, or sections, of the work are completed. This is in addition to "system-wide" performance verification and tests. These tests are to be scheduled and documented using the standard OFPC Pipe Test and Duct Test report forms. The forms shall be filled out and signed as meeting contract requirements prior to submission for verification by the OFPC CI. The Contractor shall conduct the tests and the OFPC CI will witness and approve the results.

1.6.3.3.1. The Contractor shall coordinate their intended "apportioning" of systems tests with the Construction Inspector immediately following formal submission of their Work Project Schedule so that all parties are aware of the intended work and inspection sequence.

1.6.3.4. Overhead and Above Ceiling Inspections are similar in nature and requirements to the Concealed Space Inspections. Where ceilings are to be fixed in place, such as gypsum board or plaster, it would constitute a Concealed Space. Where ceilings are of "lay-in" type, or where no finish ceiling is scheduled, it would be considered an "overhead" inspection. Such inspections are to be included in the Contractor's Detailed Construction Schedule. Contractor shall provide written inspection request notice to the CI and Architect at least five (5) workdays in advance.

1.6.3.4.1. No finish ceiling material shall be installed until all overhead punchlist items have been resolved to the satisfaction of the Owner.

1.6.3.4.2. Work in place necessary for an overhead inspection shall include:

- 1.6.3.4.2.1. Ceiling grid or framework installed
- 1.6.3.4.2.2. All above ceiling electrical work, including light fixtures, installed and operational
- 1.6.3.4.2.3. All HVAC and plumbing work above ceiling complete with diffusers installed and connected
- 1.6.3.4.2.4. Fire sprinkler heads installed
- 1.6.3.4.2.5. All required tests for above ceiling work completed and approved
- 1.6.3.4.2.6. Contractor generated punchlist of all areas being requested for inspection
- 1.6.3.5. Inspections of Building Systems and Equipment are required to confirm acceptable operation and are to be formally scheduled through the Construction Inspector with the Architect. Refer to Section 01 91 00 for additional requirements pertaining to system start-up, operation, demonstration and acceptance.
- 1.6.4. On systems/equipment requiring a manufacturers representative to verify installation/operation, the Contractor is required to perform a thorough check-out of operations with the manufacturer's representatives prior to requesting formal inspection by the Owner be scheduled. Notify the CI, in advance, as to when the manufacturer's representative is scheduled to arrive.
- 1.6.5. Inspection of individual equipment and/or system(s) must be accomplished prior to requesting Substantial Completion Inspection for any area affected by that equipment and/or system.
- 1.6.6. For "building-wide" and/or life safety systems, such as fire alarm, fire sprinkler systems, smoke evacuation systems, toxic gas monitoring, captured exhaust systems, etc., completion and acceptance of Functional Testing is required prior to requesting Substantial Completion Inspection for any area of the Project.
 - 1.6.6.1. The manufacturer's representatives and the installing contractor will be expected to demonstrate both operation and compliance to the Owner's agents and consultants. If coordinated and scheduled appropriately by the Contractor, these equipment and/or systems inspections may also serve to provide the required Owner Training, if approved in advance by the Owner.
 - 1.6.6.2. The Contractor is responsible for requesting that the Construction Inspector and Architect arrange for the inspection of materials, equipment and work prior to assembly or enclosure that would make the materials, equipment or work inaccessible for inspection, and at such other times as may be required.
- 1.6.7. For any requested inspection, the Contractor shall make prior inspection to ensure that items are ready for inspection and acceptance by the Owner and/or Architect.

The Contractor will be responsible for any and all costs incurred by Owner and/or Owner representatives, including consultants, resulting from a review or inspection that was scheduled prematurely.

- 1.6.8. The Contractor shall coordinate the work and schedule the inspections in advance so as not to delay the work. All major inspections should be indicated on the Work Progress Schedule for advance planning and the Contractor should allow a minimum of five (5) working days to confirm schedule of requested inspections with Owner and its consultants.
- 1.6.9. The contractor shall list and track all punchlist items on the OFPC Project Inspection Matrix (refer to Attachment A). The matrix shall be kept up-to-date reflecting status of work in place and inspections on the project. Copies of this populated and updated matrix shall be supplied to the A/E and the OFPC CI for use during the course of the project.

1.7. PRE-INSTALLATION MEETINGS

- 1.7.1. The Contractor shall coordinate and conduct meetings to review the installation of major systems/equipment on the project.
- 1.7.2. The Contractor shall ensure attendance of the installing subcontractor, manufacturer and/or supplier (if appropriate), supporting subcontractors involved in the installation and any other parties involved in the phase of work to be reviewed. The Owner and Architect shall be notified in writing at least five (5) days in advance of the meeting.
- 1.7.3. Each party shall be prepared to discuss in detail the staging, installation procedure, quality control, testing/inspection, safety and any other pertinent items relating to the work being reviewed. Submittal approval shall be a prerequisite of the meeting.
- 1.7.4. The Contractor shall chair and take minutes of this meeting and distribute to all attending parties.
- 1.7.5. Whether required in the technical section or not, a pre-installation meeting shall be conducted for the following work, if included in the project:
 - 1.7.5.1. Concrete
 - 1.7.5.2. Masonry
 - 1.7.5.3. Large Steel Fabrications/Erection
 - 1.7.5.4. Waterproofing
 - 1.7.5.5. Roofing
 - 1.7.5.6. Exterior Glazing (including storefront and curtain wall)
 - 1.7.5.7. Door Hardware

- 1.7.5.8. Security
- 1.7.5.9. Audio/Visual Equipment
- 1.7.5.10. Air Handling Units
- 1.7.5.11. Medical Gas Systems

1.8. MOCK-UPS

- 1.8.1. Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required, using materials indicated for the completed Work.
- 1.8.2. Build mockups in location and of size indicated or, if not indicated, as directed by Architect. The mock-up may be work in place that is intended to remain, unless otherwise directed by the Owner.
- 1.8.3. Notify Architect and Owner five (5) working days in advance of dates and times when mockups will be constructed.
- 1.8.4. Demonstrate the proposed range of aesthetic effects and workmanship. Include anticipated repairs in mockup, such as stone veneer.
- 1.8.5. Obtain Architect's and Owner's approval of mockups before starting work, fabrication, or construction.
- 1.8.6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
- 1.8.7. Demolish and remove mockups when directed, unless otherwise indicated.
- 1.8.8. For any of the following work items included in the project, a mockup shall be prepared whether required by the technical section or not:
 - 1.8.8.1. Exterior wall system to include: substructure, masonry/stone veneer, plaster, architectural concrete and windows.
 - 1.8.8.2. Roof system
 - 1.8.8.3. Interior lab room
 - 1.8.8.4. Interior patient care room
 - 1.8.8.5. Interior wall finishes
 - 1.8.8.6. Ceramic tile
 - 1.8.8.7. Finished flooring

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 45 00

ATTACHMENT A – OFPC PROJECT INSPECTION MATRIX



OFPC PROJECT INSPECTION MATRIX

Office of Facilities Planning & Construction

Project Number:

Project Name:

OFPC Construction Inspector:

Contractor Inspector:

PROJECT AREA & SYSTEM INSPECTION LIST									
Item #	Inspection Type	Location	Date Initiated	Date of Follow Up Inspection	Date of Final Sign-Off	OFPC Final Sign-Off			Comments
1	Above Ceiling	Corridors East of Interaction 6/3005	06/28/05	07/13/05	07/28/05	Jane Smith			
2	Hydronic Hot Water	Mech. Space	06/28/05	07/13/05	07/28/05	Jane Smith			
3	Pre-Final all AHU	Mech. Space	06/29/05	07/14/05	07/29/05	Jane Smith			
4	Chilled water	Mech. Space	06/30/05	07/15/05	07/30/05	Jane Smith			
5	Exhaust Fans	Mech. Roof	07/07/05	07/22/05	08/06/05	Jane Smith			
6	Pre-Final Electric System	Various	07/09/05	07/24/05	08/08/05	Jane Smith			
7	R.O. Water System	Mech. Room	07/12/05	07/27/05	08/11/05	Jane Smith			
8	Roof	Roof system	07/21/05	08/05/05	08/20/05	Jane Smith			
9	Exterior Bldg	All	07/25/05	08/09/05	08/24/05	Jane Smith			
10	Hardscape	All	07/29/05	08/13/05	08/28/05	Jane Smith			
11	Substantial Completion	All	08/04/05	08/19/05	09/03/05	Jane Smith			
12	Point to Point	All	08/16/05	08/31/05	09/15/05	Jane Smith			
INDIVIDUAL INSPECTION ITEM LIST									
Item #	Level	Room	Item Description	Date Inspected	Responsible Sub	Contractor Sign-Off	OFPC Final Sign-Off		Comments
1	1	1.304B.5	Cut drops on fire sprinkler.	05/11/05	Simplex	John Doe	Jane Smith		
2	1	1.304B.5	Adjust hangers on fire sprinkler pipe to meet spec.	05/11/05	Simplex	John Doe	Jane Smith		
3	1	1.304B.4	Support wires for ceiling need to be moved where touching other work.	05/11/05	MBS	John Doe	Jane Smith		
5	1	1.304B.4	Complete installation of conduit and boxes for electrical.	05/11/05	Design	John Doe	Jane Smith		
6	1	1.304B.4	Complete installation of conduit and boxes for controls.	05/11/05	Siemens	John Doe	Jane Smith		
7	1	1.304B.4	Cut drops on fire sprinkler.	05/11/05	Simplex	John Doe	Jane Smith		
8	1	1.304B.4	Adjust hangers on fire sprinkler pipe to meet spec.	05/11/05	Simplex	John Doe	Jane Smith		
9	1	1.304B.4	Support cables for remote damper adjustment.	05/11/05	Todd-Ford	John Doe	Jane Smith		
10	1	1.304B.5	Plug ball valve above ceiling.	05/11/05	Simplex	John Doe	Jane Smith		
11	1	1.304B	Support wires for ceiling need to be moved where touching other work.	05/11/05	MBS	John Doe	Jane Smith		
12	1	1.304B	Seal all holes in masonry floor.	05/11/05	Todd-Ford	John Doe	Jane Smith		
13	1	1.304B	Complete installation of conduit and boxes for electrical.	05/11/05	Design	John Doe	Jane Smith		
14	1	1.304B	Complete installation of conduit and boxes for controls.	05/11/05	Siemens	John Doe	Jane Smith		
15	1	1.304B	Cut off all-thread on hangers to one inch.	05/11/05	Various	John Doe	Jane Smith		
16	1	1.304B	Cut drops on fire sprinkler.	05/11/05	Simplex	John Doe	Jane Smith		
17	1	1.304B	Adjust all-thread on hangers to prevent touching other work or isolate	05/11/05	Various	John Doe	Jane Smith		
18	1	1.304B.2	Remove unused all-thread above East wall	05/11/05	Todd-Ford	John Doe	Jane Smith		
19	1	1.304B.2	Remove or re-attach metal stud corner brace	05/11/05	MBS	John Doe	Jane Smith		
20	1	1.304B.2	Cut drops on fire sprinkler.	05/11/05	Simplex	John Doe	Jane Smith		
21	1	1.304B.1	Cut drops on fire sprinkler.	05/11/05	Simplex	John Doe	Jane Smith		
22	1	1.304B.1	Adjust all-thread on hangers to prevent touching other work or isolate	05/11/05	Todd-Ford	John Doe	Jane Smith		
23	1	1.304A	Complete shower chase and ceiling framing	05/11/05	MBS	John Doe	Jane Smith		
24	1	1.304A	Complete installation of conduit and boxes for electrical.	05/11/05	Design	John Doe	Jane Smith		
25	1	1.304A	Complete installation of conduit and boxes for controls.	05/11/05	Siemens	John Doe	Jane Smith		
26	1	1.304A	Cut drops on fire sprinkler.	05/11/05	Simplex	John Doe	Jane Smith		
27	1	1.304A	Cut off all-thread on hangers to one inch	05/11/05	Various	John Doe	Jane Smith		
28	1	1.304A	Remove or re-connect loose all thread	05/11/05	Simplex	John Doe	Jane Smith		
29	1	1.304A	Label copper lines	05/11/05	Todd-Ford	John Doe	Jane Smith		
30	1	1.304A	Cut off all-thread on hangers to one inch	05/11/05	Various	John Doe	Jane Smith		

REVISION LOG

The following is provided for convenience to the Owner, Architect/Engineer and Contractor to track changes between annual document issuances and is not to be considered by any party to be contractual or 100% complete.

Date	Paragraph Revised
02/01/08	Added section 1.6.9 - The contractor shall list and track all punchlist items on the OFPC Project Inspection Matrix...
02/01/08	Added Attachment A

SECTION 01 57 23 - TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 - GENERAL

1.1 DEFINITIONS

- 1.1.1 BMP – Best Management Practices
- 1.1.2 CSN –Construction Site Notice- (Large CSN for large sites; Small CSN for small sites)
- 1.1.3 NOI and NOT – Notice of Intent and Notice of Termination for TPDES permits
- 1.1.4 SWPPP – Storm Water Pollution Prevention Plan
- 1.1.5 TCEQ – Texas Commission on Environmental Quality
- 1.1.6 TPDES – Texas Pollutant Discharge Elimination System
- 1.1.7 Large Construction Activities – Construction activities including clearing, grading and excavating that result in land disturbance equal to or greater than 5 acres of land
- 1.1.8 Small Construction Activities - Construction activities including clearing, grading and excavating that result in land disturbance equal to or greater than 1 acre and less than 5 acres of land

1.2 RELATED DOCUMENTS AND APPLICABLE WORK

- 1.2.1 The TCEQ TPDES General Permit No. TXR150000 effective March 5, 2013 and the project SWPPP. This specification requires compliance with all provisions of the TCEQ TPDES permit. The TCEQ requirements currently pertain to large construction activities of 5 acres or more and small construction activities that disturb 1 to less than 5 acres.
- 1.2.2 Information to Respondents, Agreement, Uniform General and Supplementary General Conditions for The University of Texas System Building Construction Contracts (UGC) and Special Conditions shall be read carefully for provisions pertaining to this work. In the event of conflict, the better quality or greater quantity shall prevail.
- 1.2.3 The work described in this section is applicable to any and all sections of the contract documents. Any and all work that would disturb the existing site conditions or present the potential for site runoff shall adhere fully to this specification section.
- 1.2.4 Unless specifically notified to the contrary in writing by the Owner, all aspects of this specification shall apply to this project.

1.3 CONTRACTOR RESPONSIBILITIES

- 1.3.1 This project requires implementation of storm water Best Management Practices for control devices and monitoring by the Contractor to comply with all provisions of the SWPPP developed for the project by the licensed civil engineer. The Contractor must fulfill all TPDES regulatory requirements, including the filing of the NOI and NOT or signing and posting of the CSN.
- 1.3.2 The Contractor shall provide signatures of a Corporate Officer for the NOI, Large CSN, Small CSN, NOT and any other forms or applications as required by the TPDES General Permit TXR150000. The Contractor shall also provide delegated authorization to sign reports per 30 TAC 305.128. Individuals conducting site inspections shall be qualified to the satisfaction of the Owner.
- 1.3.3 When the Contractor receives the approved SWPPP from the Owner, the Contractor signs the NOI or Small CSN (see Sample form in Part 4 of this section) and forwards it to the Owner. Two separate \$325 application fees (one for the Owner and one for the Contractor) must accompany the NOI. The Owner signs his NOI and sends both NOIs and application fees to TCEQ. The Contractor shall insert a copy of the signed NOI or Small CSN into the SWPPP book to be kept at the jobsite. The \$325 application fees are not required for small construction sites.
- 1.3.4 The SWPPP book kept at the jobsite shall also contain the following:
 - 1.3.4.1 A letter delegating signature authority to the field personnel for both the Contractor and the Owner
 - 1.3.4.2 A copy of the TPDES permit when received
 - 1.3.4.3 A copy of the Large or Small CSN
 - 1.3.4.4 A copy of the Shared SWPPP Acceptance Certification form
- 1.3.5 The Contractor shall review the SWPPP and verify existing conditions at the site before determining scope of implementation of site controls. Site survey and site plan drawings shall be used for additional reference. The Contractor shall notify the Owner, in advance, of this site review to allow for Owner participation.
- 1.3.6 The Contractor shall construct a Project SWPPP sign and place it at the main entrance to the project site. This sign shall include the NOI and TPDES permit along with the TCEQ TPDES Large or Small CSN, depending on the size of the construction project. The sign shall be constructed as detailed in the sample SWPPP sign drawing included in Part 4 of this Section.
- 1.3.7 The Contractor shall contact the OFPC Construction Inspector (CI) for review of initial site controls in place prior to commencing site-disturbing activities, to ensure that any unusual circumstances or unforeseen site conditions with regard to erosion

and sedimentation have been addressed. The Contractor shall complete the SWPPP Project Start-up form (see Sample in Part 4 of this Section)) and review it with the Owner before commencing soil disturbing activities. Both parties shall sign this form when the requirements listed in the SWPPP Project Start-up form have been met.

- 1.3.8 The Contractor shall provide all material, labor, equipment and services required to implement, maintain and monitor all erosion and sedimentation controls in compliance with the SWPPP. All controls implemented by the Contractor shall comply with the TPDES regulations as issued by the TCEQ on March 5, 2013. These controls shall remain in operation until project completion and re-establishment of the site or longer as directed by the OFPC Resident Construction Manager (RCM). The work shall include, but not be limited to, the following:
 - 1.3.8.1 All earthwork as required to implement swales, dikes, basins and other excavations for temporary routing of utilities, to protect against erosion or sediment-laden (polluted) storm water runoff.
 - 1.3.8.2 All structural controls as shown or specified, including silt fences, sediment traps, stabilized construction entrance, subsurface drains, pipe slope drains, inlet/outlet protection, reinforced soil retention, gabions, rock berms, etc.
 - 1.3.8.3 All non-structural controls as shown or specified, including temporary or permanent vegetation, mulching, geotextiles, sod stabilization, preservation of vegetative buffer strips, preservation/protection of existing trees and other mature vegetation.
 - 1.3.8.4 All modifications and revisions to SWPPP necessary to meet changing site conditions and to address new sources of storm water discharges, as the work progresses.
 - 1.3.8.5 All maintenance and repair of structural and non-structural controls in place shall continue until final stabilization is achieved or as directed by the RCM.
 - 1.3.8.6 Weekly site inspections, as required by the SWPPP, of pollutant sources, including hazardous sources, structural and non-structural controls, and all monitoring of SWPPP revisions and maintenance of inspection records.
 - 1.3.8.7 Removal of all structural and non-structural controls as necessary upon completion, and only after final stabilization is achieved.
 - 1.3.8.8 Filing of NOT with the RCM within 30 days of final stabilization being achieved and being approved by the Owner, or of another Operator assuming control of the unstabilized portions of the site.
 - 1.3.8.9 Refer to the SWPPP for additional requirements to ensure compliance with TPDES regulations.

1.4 QUALITY ASSURANCE

- 1.4.1 In order to minimize the discharge of pollutants to storm water, the Contractor shall implement all permanent and temporary site controls according to TPDES Guidelines, as set forth by the TCEQ.
- 1.4.2 Implementation of site controls shall be performed by a qualified contractor experienced in the proper installation of such devices in accordance with manufacturers' specifications, and in keeping with recognized Best Management Practices (BMPs), and in keeping with TPDES regulations. Qualification of installing Contractor shall be reviewed with the Owner prior to entering into a contract with them for services.
- 1.4.3 The Contractor shall inspect all BMPs at regular intervals as specified in the Storm Water Pollution Prevention Plan for this project. Use standard Owner Inspection forms (see form at the end of this Section) for each inspection. Record all deficiencies of site controls, and take immediate action to correct any deficiencies recorded. Keep records of inspections current and on file, available for review by EPA, TCEQ, MS4 Operator and Owner.

1.5 SUBMITTALS

- 1.5.1 Submittals of products used in structural and non-structural controls shall be made through established procedures for review and approved by the Owner prior to installation on the site. The Contractor shall make available physical samples and product literature on any material used in structural or non-structural controls during the course of the project prior to its implementation in the field.

PART 2 - PRODUCTS

2.1 MATERIALS

Specific site control devices are identified in the SWPPP. Where such devices are indicated, their material composition shall comply with this section.

- 2.1.1 Materials to be used in structural and non-structural site controls shall include, but not be limited to the following:

- 2.1.1.1 **Area Inlets, Curb Inlets and Silt Fences:** implemented to filter and remove sediment from storm water; they shall be composed of the following materials:

- a. Geotextile fabric – a non-woven, polypropylene, polyethylene, or polyamide fabric with non-raveling edges. It shall be non-biodegradable, inert to most soil chemicals, ultraviolet resistant, unaffected by moisture and other weather conditions, and permeable to water while retaining sediment. Fabric shall be 36 inches wide, with a minimum weight of 4.5 oz./yd.

- b. Wire Backing – a galvanized, 2"x4" welded wire fencing, 12-gauge minimum. Width shall be sufficient to support geotextile fabric 24 inches above adjacent grades. Chain link fences located along the same lines as silt fences may be used to support geotextile fabric. In this circumstance, the geotextile fabric shall be firmly attached to the fence.
 - c. Posts for area inlets and silt fences – steel fence posts shall be made of hot rolled steel, galvanized or painted, a minimum of 4 feet long, with a Y-bar or TEE cross-section of sufficient strength to withstand forces implied.
- 2.1.1.2 **Rock Berms:** shall be composed of the following materials:
- a. Rock – clean open graded rock, with a maximum diameter of 3 inches
 - b. Wire Mesh Support – a galvanized, woven wire sheathing having a maximum opening size of 1 inch, and a minimum wire diameter of 20 gauge
 - c. Ties – metal hog rings or standard wire/cable ties
- 2.1.1.3 **Triangular filter dikes:** for use on surfaces or in locations where standard silt fence cannot be implemented, shall be composed of the following:
- a. Geotextile fabric – a non-woven, polypropylene, polyethylene, or polyamide fabric with non-raveling edges, with a minimum width of 60 inches
 - b. Dike Structure – 6-gauge, 6" x 6" welded wire mesh, 60 inches wide, folded into a triangular form. Each side shall be 18 inches with an overlap of 6 inches
 - c. Ties – metal hog rings or standard wire/cable ties for attachment of wire mesh to itself, and for attachment of geotextile fabric to wire mesh
- 2.1.1.4 **Stabilized construction exit:** a steel grid that allows the safe passage of vehicles while agitating the tires to loosen and remove the soil buildup. The grid or structures shall conform to the following:
- a. It shall consist of pipes or tubes spaced such that there is a minimum clear distance between the pipes or tubes of 4½ inches. It shall be elevated above the ground surface a minimum of 8 inches to allow water, debris and soil to drain.
 - b. Minimum diameter of pipe or tube shall be 3 inches.
 - c. It shall be designed to support any and all vehicles entering and leaving the construction site.
 - d. It shall be firmly placed in the ground at the exit.
 - e. It shall be of sufficient length so that the agitation will remove the soil from the tires, or a minimum of 12 feet.
 - f. At the street side approach of the grid there shall be an impervious surface or it shall consist of 3" to 5" diameter angular crushed stone/rock approximately 5 feet in length, minimum, and 8 inches deep, minimum. On the job site side of the grid, there shall be 3" to 5" diameter angular crushed stone/rock 15 feet in length, a minimum of 8

inches deep. The steel grid will be between the street side approach and the job site crushed stone/rock. All crushed stone/rock shall have filter fabric beneath the stone/rock. See diagram on Exhibit F.

- g. Steel grid area shall be used as the tire wash area. When tire wash is in use (rainy or muddy days), the area shall be manned and the tires shall be washed using a high pressure hose/nozzle.
- h. The area beneath the grid shall be sloped such that debris, soil and water shall be diverted back onto the construction site or to a sediment basin. No water, soil or debris shall leave the construction site. The resulting discharge shall be disposed of properly.

2.1.1.5 **Concrete Truck Washout:** shall be used for containment of fluids from concrete truck washout wastes.

- a. Gravel bags, concrete blocks or open graded rock
- b. 10 mil plastic sheeting

2.1.1.6 **Temporary Storage Tanks:** shall be used for temporary storage of fuels on the construction project site

- a. 2 inches of sand on the bottom of the containment area
- b. 6 mil plastic sheeting
- c. 2 inches of sand on top of the plastic sheeting

2.1.1.7 **Erosion Control Matting:** shall be used on steep slopes, in drainage swales, and in high traffic pedestrian areas of barren soil. It shall include one or more of the following:

- a. Jute Mat – a plain fabric made of jute yarn, woven in a loose and simple manner, with a minimum unit weight of 2.7 pounds per square yard. Width shall be as required for the dimensions of the area to be covered.
- b. Wood Fiber Mat – a mat composed of wood fibers, which are encased in nylon, cotton or other type of netting
- c. Synthetic Webbing Mat – a mat manufactured from polyvinyl chloride or polypropylene monofilaments, which are bonded together into a three-dimensional web to facilitate erosion control and/or re-vegetation.

2.1.1.8 **Organic mulches:** shall be used for covering bare soil, retaining moisture under existing vegetation being preserved, and for absorbing the energy of compaction caused by foot or vehicular traffic. Mulch shall be one or more of the following:

- a. Straw – from broken straw bales that are free of weed and grass seed where the grass from the seed is not desired vegetation for the area to be protected.
- b. Wood Chips – from chipped limbs of cleared trees on site, or delivered in chipped form, in bulk quantities of pine, cedar or cypress. Wood chips of all species shall be partially decomposed to alleviate nitrogen

depletion of the soil in areas where existing vegetation is to be preserved and protected.

- c. Shredded Mulches – from pine, cypress or cedar, mechanically shredded, and capable of forming an interlocking mat following placement, and after sufficient wetting and drying has taken place naturally.

2.1.1.9 Any other materials indicated in the SWPPP.

PART 3 - EXECUTION

3.1 GENERAL

- 3.1.1 The Contractor shall provide a complete installation of all site control devices and measures (BMPs) indicated in the SWPPP book, including the Site Erosion and Sedimentation Control Drawing and as specified herein. These BMPs must be confirmed as fully operational with the Owner before any work that disturbs the site can begin.

As an alternative to the BMPs indicated in the SWPPP book, the Site Erosion and Sediment Control Drawing and as specified herein, the Contractor may propose alternate BMPs that perform the same function as the indicated BMP but may be of a different configuration, material or type for review and approval by OFPC. Installation of alternate BMPs shall not proceed until approved by OFPC.

- 3.1.2 The Contractor shall provide inspection and monitoring of controls in place and shall perform all revisions and updating of SWPPP book. An accurate, chronological record of all Contractor inspections, revisions and additional controls shall be kept on file at the project site, for review, with a copy of the SWPPP book.
- 3.1.3 The Contractor shall submit their NOT to the Owner after all disturbed areas are re-established (stabilized) with vegetative cover following completion of construction. Following acceptance of stabilized areas, all site controls that are no longer necessary shall be removed.

3.2 CONTROL DEVICES

Execution of specific site control devices is described in the following paragraphs. Refer to the SWPPP for applicable devices, extent and location.

3.2.1 AREA INLET DETAIL

- 3.2.1.1 Area inlet fences shall consist of non-woven geotextile fabric attached to wire fabric backing to support the geotextile. The wire fabric should be galvanized 2" x 4" welded wire, 12-gauge minimum. Attach non-woven geotextile fabric to the fence with hog rings or standard cable/wire ties, leaving a toe of fabric at the bottom of the fence of not less than 6 inches. Steel posts as specified shall be driven to a depth of 1 foot minimum and spaced not more than 6 feet

on center. Attach fencing to posts with standard cable/wire ties. Abutting ends of geotextile fabric shall be overlapped a minimum of 12 inches. Wrap grates with non-woven geotextile fabric. See Exhibit A at end of section.

3.2.1.2 Maintain silt fence daily as necessary to repair breaches in geotextile fabric. Maintain steel posts as specified in tilted condition. When siltation has occurred, it shall be removed when it has reached a depth of 6 inches. Silt that has been removed shall be disposed of offsite.

3.2.1.2 Remove area inlet when the disturbed areas have been completely stabilized as specified. Minimize site disturbance while removing area inlet protection and posts.

3.2.2 CURB INLET PROTECTION

3.2.2.1 Cover curb storm inlet with non-woven geotextile fabric covered wire fabric. Wire fabric to be 2"x4" – W1.4 x W1.4. Extend fabric 2 feet beyond inlet opening at each end and 12 inches in front of opening in the gutter. Remove a strip of filter fabric approximately 12 inches high for the length of the protection to act as overflow. Extend fabric over the top of opening to allow placement of gravel bags. Anchor fabric with 20 lb. gravel bags placed 3 feet on center. See Exhibit B at end of section.

3.2.2.2 Maintain inlet protection daily as necessary to repair breaches in geotextile fabric. When siltation has occurred, it shall be removed when it has reached a depth of 2 inches. Silt that has been removed shall be disposed of offsite.

3.2.3 ROCK BERM

3.2.3.1 Rock berm shall consist of rip-rap type rock, secured within a wire sheathing as specified, and installed at the toe of slopes, or at the perimeter of developing or disturbed areas. Height of berm shall be a minimum of 18 inches from top of berm to uphill toe of berm. Top width shall be a minimum of 24 inches, with side slopes of 2:1 or flatter. Uphill toe of berm shall be buried a minimum of 4 inches into existing grade. Rock berm shall have a minimum flow-through rate of 60 gallons per minute per square foot of berm face. See Exhibit C at end of section.

3.2.3.2 Maintain rock berm in a condition that allows the sediment to be removed, when the depth of sediment has reached 1/3 the height of the berm. Berm shall be reshaped as needed, and silt buildup removed, to maintain specified flow through berm.

3.2.3.3 Rock berm shall be removed when the disturbed areas served have been stabilized as specified.

3.2.4 SILT FENCE

- 3.2.4.1 Silt fences shall consist of non-woven geotextile fabric, attached to wire fabric backing to support the geotextile. The wire fabric should be galvanized 2" x 4" welded wire, 12-gauge minimum. Attach non-woven geotextile fabric to fence with hog rings or standard cable/wire ties, leaving a toe of fabric at the bottom of the fence of not less than 6 inches. Steel posts as specified shall be driven to a depth of 1 foot minimum and spaced not more than 6 feet on center. Tilt posts slightly, in an uphill direction for additional strength. Attach fencing to posts with standard cable/wire ties. Dig a 6 inch deep by 6 inch wide trench on the disturbed side of the fence, bury geotextile fabric in trench, backfill and tamp. Abutting ends of geotextile fabric shall be overlapped a minimum of 12 inches. See Exhibit D at end of section.
- 3.2.4.2 Maintain silt fence daily as necessary to repair breaches in geotextile fabric. Maintain steel posts as specified in tilted condition. When siltation has occurred, it shall be removed when it has reached a depth of 6 inches. Silt that has been removed shall be disposed of offsite.
- 3.2.4.3 Remove silt fence when the disturbed areas protected by silt fence have been completely stabilized as specified. Minimize site disturbance while removing silt fence and posts.

3.2.5 TRIANGULAR DIKE

- 3.2.5.1 See Exhibit E for information regarding installation of Triangular Dike

3.2.6 STABILIZED CONSTRUCTION EXIT

- 3.2.6.1 A steel grid that allows the safe passage of vehicles while agitating the tires to loosen and remove the soil buildup. The grid or structures shall conform to the following:
- It shall consist of pipes or tubes spaced such that there is a minimum clear distance between the pipes or tubes of 4½ inches. It shall be elevated above the ground surface a minimum of 8 inches to allow water, debris and soil to drain.
 - Minimum diameter of pipe or tube shall be 3 inches.
 - It shall be designed to support any and all vehicles entering and leaving the construction site.
 - It shall be firmly placed in the ground at the exit.
 - It shall be of sufficient length so that the agitation will remove the soil from the tires or a minimum of 12 feet.
 - At the street side approach of the grid, there shall be an impervious surface or it shall consist of 3" to 5" diameter angular crushed stone/rock approximately 5 feet in length, minimum, and 8 inches deep, minimum. On the job site side of the grid, there shall be 3" to 5" diameter angular crushed stone/rock 15 feet in length, minimum, and 8 inches deep, minimum. The steel grid will be between the street side

approach and the job site crushed stone/rock. All crushed stone/rock shall have filter fabric beneath the stone/rock. See diagram on Exhibit F at end of section.

- g. Steel grid area shall be used as the tire wash area. When tire wash is in use (rainy or muddy days) the area shall be manned and the tires shall be washed using a high pressure hose/nozzle.
- h. The area beneath the grid shall be sloped such that debris, soil and water shall be diverted back on to the construction site or to a sediment basin. No water, soil or debris shall leave the construction site. The resulting discharge shall be disposed of properly.
- i. The stabilized construction exit shall be properly maintained throughout the entire construction process until removal is approved by OFPC.

3.2.7 CONCRETE/PAINT/STUCCO/EQUIPMENT WASHOUT (SELF INSTALLED)

3.2.7.1 Concrete Truck Washout (self installed) shall be constructed so that it will be able to accommodate the maximum number of anticipated concrete trucks that will be cleaned on any given day at any given time using 7 gallons of water for washout per truck or 50 gallons of water to wash out pump trucks. The area utilized to contain the wash water and concrete solids cleaned from the trucks will be a minimum of 10 feet in width. The containment area will be covered with 10 mil plastic sheeting without any holes or tears and the seams shall be sealed according to manufacturer's recommendations. The gravel bags, concrete blocks or open graded rocks shall line the outside perimeter and shall be double wrapped with the 10 mil plastic sheeting to prevent any potential for runoff from the containment area. See Exhibit G at end of section.

3.2.7.2 The concrete truck washout containment area shall be maintained in a condition that will not allow concrete buildup within the containment area to exceed 50% of the storage capacity.

3.2.7.3 The concrete truck washout area will be removed when it is no longer necessary to wash out concrete trucks on the site.

3.2.7.4 Equipment Cleaning: Clean equipment in a manner that does not create any discharge of cleaning agents, paints, oil or solvents to a storm sewer, waterway or onto the ground. Soaps and detergents must never be discharged to the ground. Cement handling equipment must be rinsed in a contained area and there must be no drainage off-site or onto to ground.

3.2.7.5 When rinsing painting equipment/tools outside, rinse water must be contained in a bucket or other container for appropriate disposal. Water based or latex paint rinse water may be discharged to the sanitary sewer only with permission/approval from UT EH&S.

3.2.7.6 Oil based paint wastes, including solvents and thinners, must not be disposed

of in the sanitary sewer; they must be collected and disposed of through the contractor's disposal company in accordance with applicable laws and regulations.

- 3.2.7.7 Discharges from pressure washing using soaps or chemicals must not be allowed to enter a storm sewer. The wastewater will need to be collected with a berm and vacuumed (transported to appropriate disposal site). If the rinse only contains water and dirt (sediment) it may be spread on a grass area or contained/filtered with clean water allowed to enter storm sewer. In some cases it may also be possible to discharge to a sanitary sewer with permission from UT EH&S.

3.2.8 TEMPORARY STORAGE TANKS

- 3.2.8.1 Must be located in a bermed containment area. The berm must be a minimum 3 feet in all directions, and the height of the berm must contain the maximum contents of the largest tank plus 8 inches (approximately 110% of the tank capacity). The containment area is constructed by beginning with a 2-inch sand pad, and then covered with 6-mil plastic or rubber sheeting. The sheeting is then covered with another 2-inch layer of sand. The plastic sheeting is secured to the outer berm.
- 3.2.8.2 Storage tanks are to be placed no closer than 50 feet from a building or property line.
- 3.2.8.3 If using tanks with a gravity feed setup, the containment must be of sufficient size to be able to contain the tank if it should fall over.
- 3.2.8.4 There must be a fusible link at the valve that will shut off the flow to the hose in the event of a fire.
- 3.2.8.5 There must be sufficient cover for the tank and the containment area to prevent potential storm water runoff.
- 3.2.8.6 The area within the containment area is to be kept free and clear of spills; if a spill occurs, the sand is to be removed and replace with a fresh layer of sand.
- 3.2.8.7 The storage tank containment area is to be removed from the site once it has been determined that it will no longer be used on the construction site.

3.2.9 DIVERSION DIKE

- 3.2.9.1 Diversion dikes shall be formed and shaped using compacted fill, and shall not intercept runoff from more than 10 acres. The dike shall have a minimum top width of 24 inches, and a minimum height of 18 inches. Soil shall have side slopes of 3:1 or flatter, and shall be placed in 8-inch lifts. Compact soil to 95% standard proctor density. Where protected slopes exceed 2 percent, the uphill side of diversion dike shall be stabilized with

crushed stone or erosion control matting to a distance of not less than 7 feet from toe of dike. The channel that is formed by the diversion dike must have positive drainage for its entire length to a stabilized outlet, such as a rock berm, sandbag berm, or stone outlet structure. Storm water shall not be allowed to overflow the top of diversion dike at any point other than the stabilized outlet.

3.2.9.2 Maintain the diversion dike in a condition that allows the storm water runoff to be diverted away from exposed slopes. Repair any failures at top of dike and remove sediment as necessary behind the dike to allow positive drainage to a stabilized outlet.

3.2.9.3 Remove diversion dike when the exposed slopes being protected are stabilized with vegetation or other permanent cover.

3.2.10 INTERCEPTOR SWALE

3.2.10.1 An interceptor swale shall be implemented to prevent on or off-site storm water from entering a disturbed area, or prevent sediment-laden runoff from leaving the site or disturbed area. The interceptor swale shall be excavated as required by the SWPPP drawings, with side slopes of 3:1 or flatter. This shall include all labor and equipment associated with the installation and maintenance of the swale as shown on the construction documents. Constructed swale may be v-shaped or trapezoidal with a flat bottom, depending on the volume of water being channeled. Sediment laden runoff from swale shall be directed to a stabilized outlet or sediment-trapping device. Flow line of swale shall have a continuous fall for its entire length and shall not be allowed to overflow at any other points along its length.

3.2.10.2 Maintain interceptor swale in a condition that allows the storm water runoff to be channeled away from disturbed areas. Remove sediment in swale as necessary to maintain positive drainage to a stabilized outlet.

3.2.10.3 Fill in or remove swale after the disturbed area/s being protected is completely stabilized as specified.

3.2.11 EROSION CONTROL MATTING

3.2.11.1 Remove all rocks, debris, dirt clods, roots, and any other obstructions which would prevent the matting from lying in direct contact with the soil. 6 inch by 6 inch anchor trenches shall be dug along the entire perimeter of the installation. Bury matting in trenches, backfill and compact. Fasten matting to the soil using 10-gauge wire staples, 6 inches in length and 1 inch wide. Use a minimum of 1 staple per 4 square feet of matting, and at 12 inches on center along all edges. Install parallel to flow of water and overlap joining strips a minimum of 12 inches.

- 3.2.11.2 Maintain erosion control matting by repairing any bare spots. Missing or loosened matting shall be promptly replaced or re-anchored.
- 3.2.11.3 Remove matting where protection is no longer required. In areas where permanent vegetation is established along with matting, matting can be left in place permanently.

3.2.12 MULCHES

- 3.2.12.1 Apply specified mulches in areas identified on the SWPPP, to a depth of 3 inches or as otherwise specified on the SWPPP drawings.

3.2.13 BPM Details

- 3.2.13.1 Refer to Exhibits for the following BMP details:
 - Exhibit A -- Area Inlet Detail
 - Exhibit B -- Curb Inlet Detail
 - Exhibit C -- Rock Berm Detail
 - Exhibit D -- Silt Fence Detail
 - Exhibit E -- Triangular Dike Detail
 - Exhibit F -- Stabilized Construction Exit
 - Exhibit G -- Concrete Truck Washout

3.3 INSPECTIONS AND RECORD KEEPING

- 3.3.1 Contractor shall inspect all BMPs on 7-day intervals. Coordinate inspections with OFPC CI, who is also required by TPDES to regularly inspect the site. Use standard Owner Inspection forms (see form in Part 4 of this Section) for each inspection. Record all deficiencies of site controls, and take appropriate action to correct any deficiencies recorded. Exception is rock berms located in a streambed. Any rock berm located in a streambed shall be inspected on a daily basis. Keep records of inspections current and on file, available for review by EPA, TCEQ, MS4 Operator Representative and/or Owner's Representative.
- 3.3.2 Contractor shall keep records of all Contractor inspections on file with SWPPP book at project site, and make available for review by Owner's Representative or EPA, TCEQ or MS4 Operator officials requesting review of SWPPP inspection records. One copy of each inspection report shall be delivered to the CI and the RCM office.
- 3.3.3 Contractor shall keep records of all major grading and stabilization activities on file with the SWPPP book at the project site and make available for review by Owner's representative, EPA, TCEQ, or MS4 Operator officials requesting review of the SWPPP.
- 3.3.4 Contractor shall retain copies of all inspection records and the Major Grading and

Stabilization Log along with SWPPP book for 3 years from NOT date per TCEQ regulations.

3.4 MAINTENANCE

- 3.4.1 All erosion and sediment control measures and other protective measures identified in the SWPPP must be maintained in effective operating condition. If through inspections the permittee determines that BMPs are not operating effectively, maintenance must be performed before the next anticipated storm event or as necessary to maintain the continued effectiveness of storm water controls. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable. Erosion and sediment controls that have been intentionally disabled, run over, removed or otherwise rendered ineffective must be replaced or corrected immediately upon discovery.

3.5 Waste Disposal

- 3.5.1 Contractor is responsible for proper disposal of hazardous materials. Hazardous wastes (such as flammable petroleum products and solvents, thinners) and materials contaminated with hazardous wastes are considered regulated wastes, and should be containerized for transport and disposal by a permitted company in accordance with applicable laws and regulations.
- 3.5.2 Any trash or debris must be contained on site and disposed of in a recycling bin or waste receptacle in accordance with applicable laws and regulations to prevent wind or rain from carrying it off-site into a storm drain. Non-hazardous solid wastes such as general construction debris may be recycled or disposed of in the trash container. Never dispose of liquid wastes of any kind in University dumpsters.

PART 4 - SAMPLE FORMS

The following forms or sketches are to be used by the Contractor in the execution of the work in this Section, in compliance with TPDES requirements and the SWPPP.

- UT System OFPC SWPPP Project Start-up
- Major Grading and Stabilization Log
- SWPPP Posting Sign for Main Construction Entrance for large construction site 5 acres or greater
- SWPPP Posting Sign for Main Construction Entrance for small construction site 1 to less than 5 acres

Contact the Owner's representative for electronic copies of these forms to be used in the execution of work in this section:

- TCEQ TPDES Notice of Intent (NOI)

- TCEQ TPDES CSN (Large CSN or Small CSN)
- TCEQ TPDES Notice of Termination (NOT)
- UT System OFPC Notice of Termination (OFPC NOT)
- Shared SWPPP Acceptance Certification form
- UT System OFPC SWPPP Inspection form

END OF SECTION 01 57 23

The University of Texas System

*Office of Facilities Planning and Construction
702 Colorado Street, Suite 4.100 Austin, Texas 78701
(512) 499-4600 FAX (512) 499-4604*

SWPPP Project Start-up

Contractors must meet 4 TPDES requirements before soil-disturbing activities can commence on OFPC construction projects. This form provides the Contractor and Owner an acceptance of compliance with initial BMPs and required paperwork for commencement of work on the project site.

The Contractor is to initial items that are certified as complete and then review for concurrence with the Owner's Designated Representative.

1 BMPs applicable to this project have been inspected to ensure correct placement in accordance with the SWPPP and for proper installation according to specifications.

Initial by Contractor

Initial by OFPC CI

2 The SWPPP is approved and on site.

Initial by Contractor

Initial by OFPC CI

3 The TCEQ NOI and OFPC Posting Notice forms (and permits if received) or the TCEQ CSNs are complete and posted for all permittees at the main entrance to the project site.

Initial by Contractor

Initial by OFPC CI

4 Inspector qualifications and letter of delegation of authority are inserted in the SWPPP.

Initial by Contractor

Initial by OFPC CI

Having met the above requirements and in recognition of prior receipt of Notice to Proceed, the Contractor is authorized to commence work on site.

Contractor

OFPC Project #_

OFPC Resident Construction Manager

Date: _

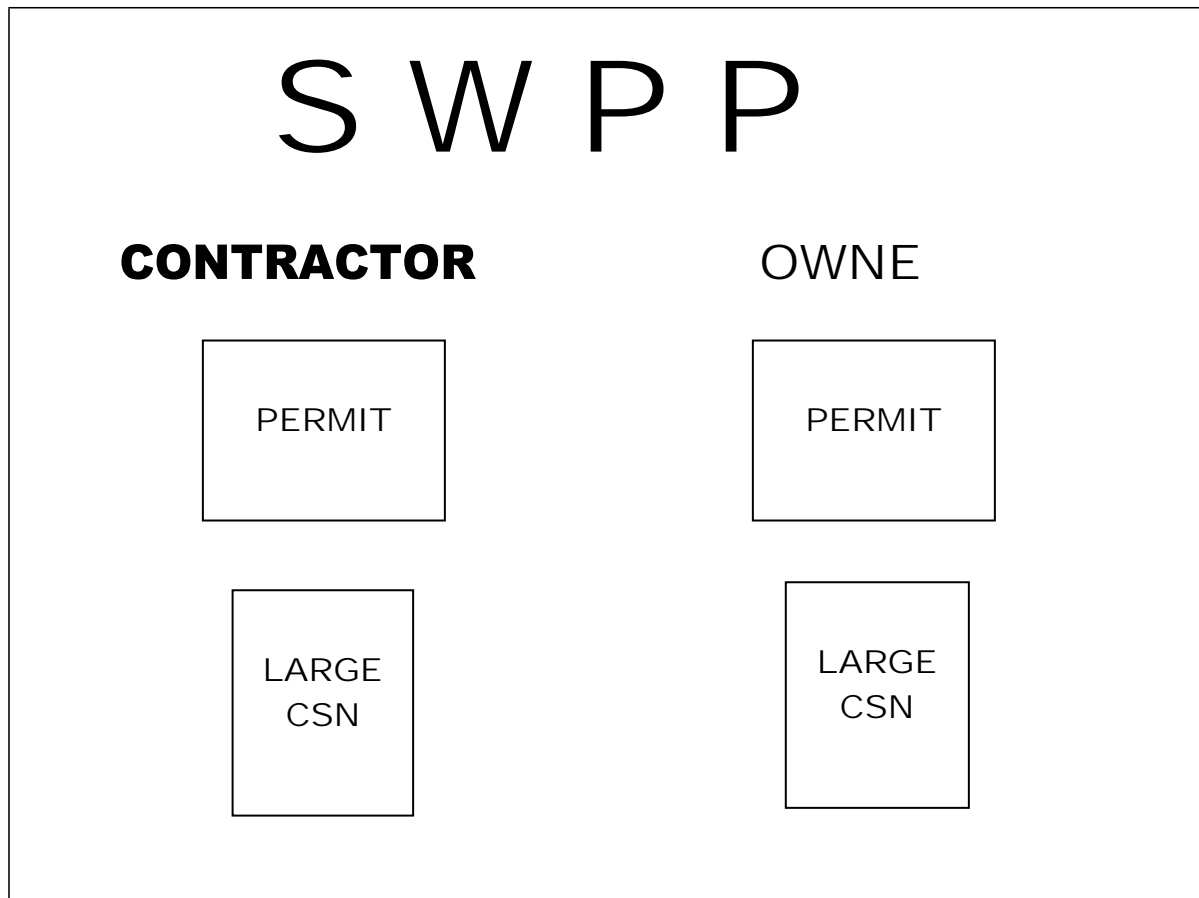
The University of Texas System
Office of Facilities Planning and Construction
702 Colorado Street, Suite 4.100 Austin, TX 78701
(512) 499-4600 FAX (512) 499-4604

Storm Water Pollution Prevention Plan
Major Grading and Stabilization Activities Log

Start Date	End Date*	Type and Location of Activity

***End Date does not pertain to stabilization activities**

Sign for Large Construction Site



MINIMUM SIGN SPECIFICATIONS: 5 Acre or Greater Sites

SIGN - Exterior grade $\frac{3}{4}$ " plywood, cut 4' x 4', with red painted letters, background painted white - **DISPLAY ON CONSTRUCTION FENCE AT MAIN ENTRANCE TO PROJECT SITE.**

S W P P P - 10-inch painted letters, 3 inches from top of sign, centered

CONTRACTOR OWNER - 3 inch painted letters, 4 inches below SWPPP letters, centered on each half of sign

PERMIT, CSN - 8-1/2 X 11 TCEQ forms, laminated beyond edges of documents, stapled to plywood.

Sign for Small Construction Site

S W P P	
CONTRACTOR	OWNE
<div>CSN</div>	<div>CSN</div>

MINIMUM SIGN SPECIFICATIONS: 1 to Less than 5 Acre Sites

SIGN - Exterior grade $\frac{3}{4}$ " plywood, cut 4' x 4', with red painted letters, background painted white - **DISPLAY ON CONSTRUCTION FENCE AT MAIN ENTRANCE TO PROJECT SITE.**

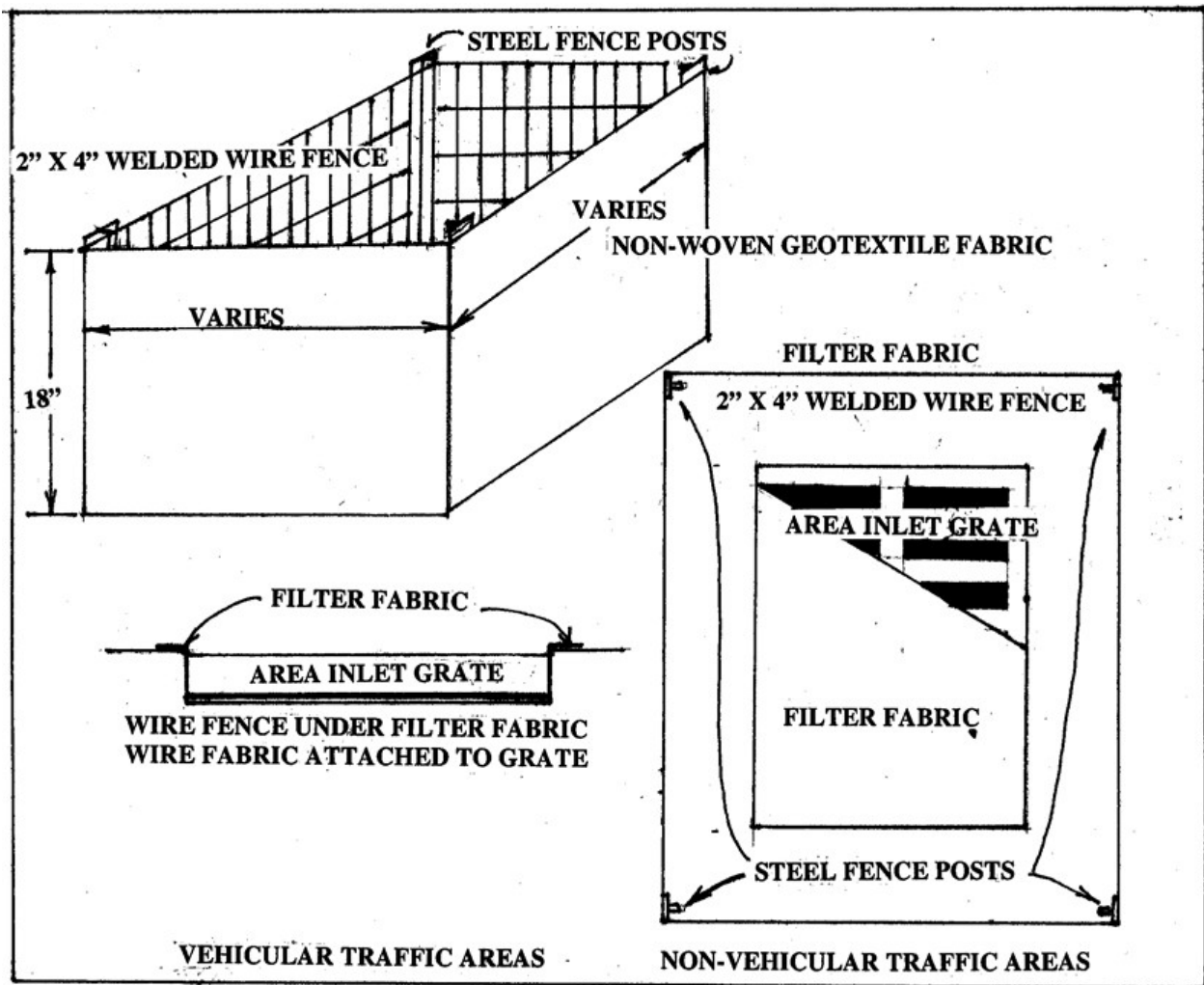
S W P P P - 10-inch painted letters, 3 inches from top of sign, centered

CONTRACTOR OWNER - 3-inch painted letters, 4 inches below SWPPP letters, centered on each half of sign

CONSTRUCTION SITE NOTICE - 8-1/2 X 11 TCEQ forms, laminated beyond edges of documents, stapled to plywood.

EXHIBIT A

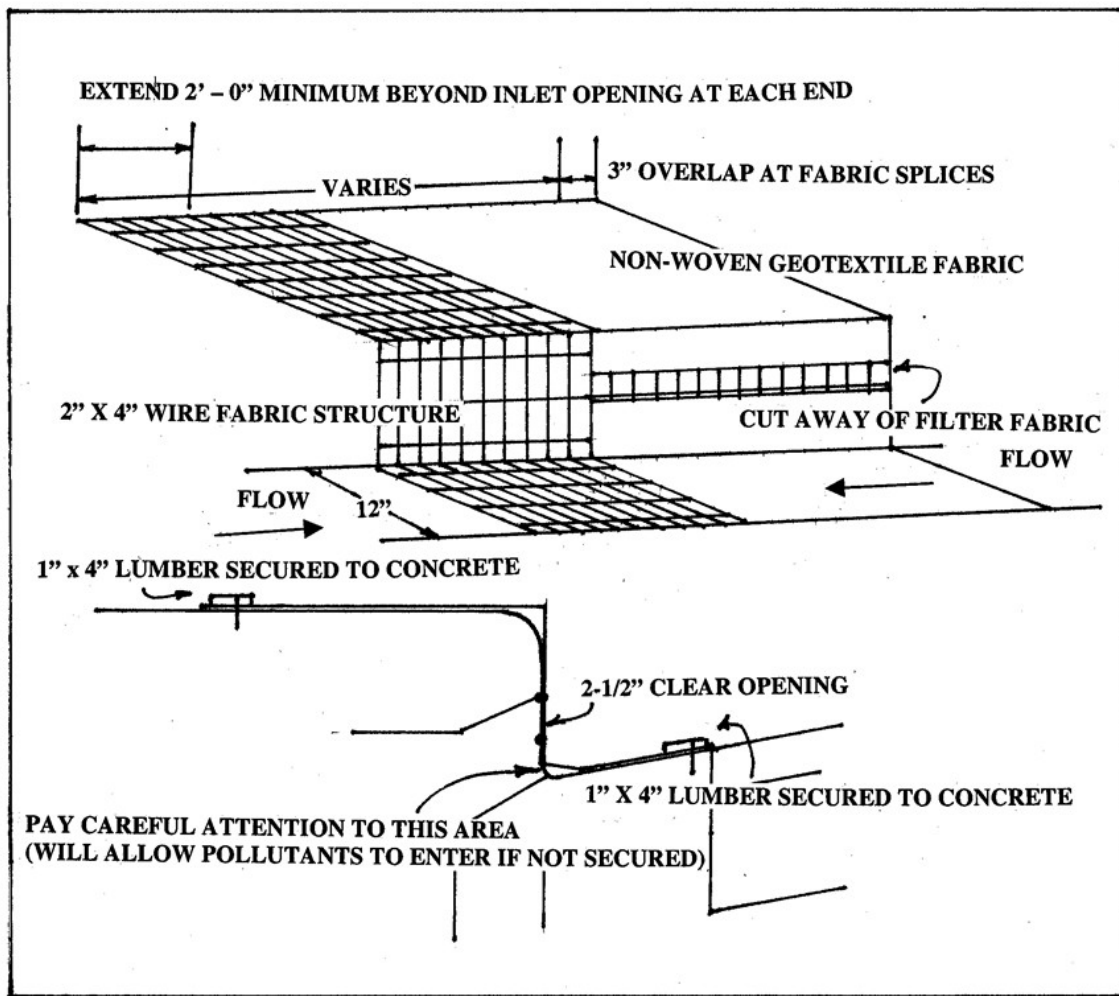
Area Inlet Detail



1. INSTALL STEEL POSTS THAT SUPPORT THE SILT FENCE AT EACH CORNER, AND ALSO BETWEEN CORNERS IF THE DISTANCE IS GREATER THAN 6 FEET BETWEEN CORNER POSTS.
2. USE SILT FENCE DETAIL FOR INSTALLATION OF THE SILT FENCE AROUND THE AREA INLET.
3. LIFT THE METAL AREA INLET GRATE, WRAP THE FILTER FABRIC AROUND IT, AND THEN REPLACE THE GRATE.
4. IN VEHICULAR TRAFFIC AREAS, LIFT THE METAL GRATE OUT AND PLACE WIRE FENCE MATERIAL UNDER IT WITH FILTER FABRIC PLACED BETWEEN THE GRATE AND THE WIRE FENCE. THEN ATTACH THE WIRE FENCE TO THE GRATE.
5. REMOVE ACCUMULATED SILT WHEN THE FILTER FABRIC OVE THE GRATE COMPLETELY COVERS THE GRATE AREA AND THE SILT AROUND THE SILT FENCE REACHES A HEIGHT OF 6 INCHES.
6. REMOVE AREA INLET PROTECTION WHEN THE SITE IS COMPLETELY STABILIZED.

EXHIBIT B

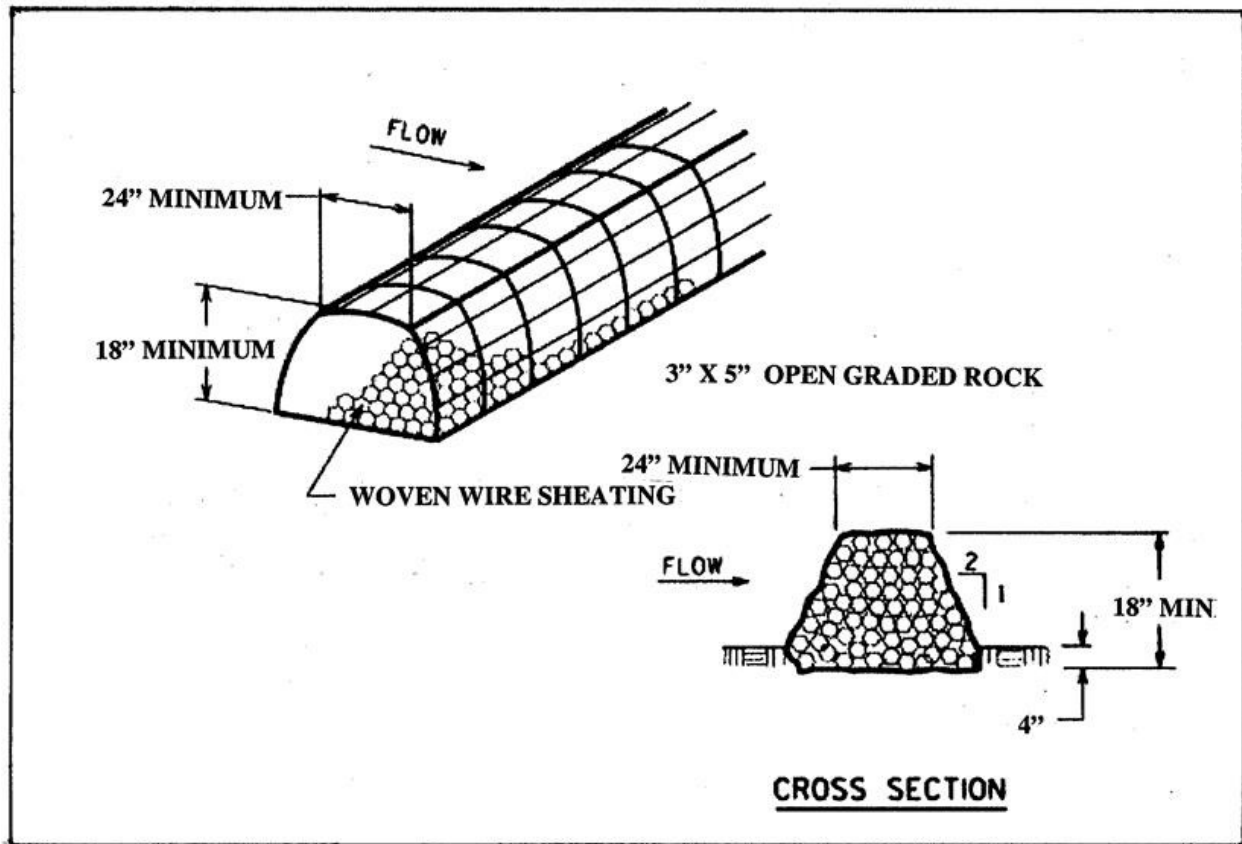
Curb Inlet Detail



1. WHERE MINIMUM CLEARANCES CAUSE TRAFFIC TO DRIVE IN THE GUTTER, USE 1" BY 4" LUMBER SECURED WITH CONCRETE NAILS 3 FEET ON CENTER NAILED INTO THE CONCRETE. IF THERE IS PEDESTRIAN TRAFFIC ONLY, THE USE OF 20# GRAVEL BAGS TO SECURE MATERIAL IS PERMITTED.
2. REMOVE SECTION OF FILTER FABRIC AS SHOWN IN THIS DETAIL. SECURE FABRIC TO WIRE BACKING WITH CLIPS OR HOG RINGS AT THIS LOCATION.
3. INSPECT DAILY AND REMOVE SILT ACCUMULATION WHEN THE DEPTH REACHES 2 INCHES.
4. MONITOR THE PERFORMANCE OF THE INLET PROTECTION DURING EACH RAINFALL EVENT AND REMOVE PROTECTION IMMEDIATELY IF THE STORM WATER BEGINS TO OVERTOP THE CURB.
5. REMOVE ACCUMULATED SILT WHEN THE FILTER FABRIC OVER THE GRATE COMPLETELY COVERS THE GRATE AREA AND THE SILT AROUND THE SILT FENCE REACHES A HEIGHT OF 6 INCHES.
6. REMOVE INLET PROTECTION AS SOON AS THE SOURCE OF SEDIMENT IS STABILIZED.

EXHIBIT C

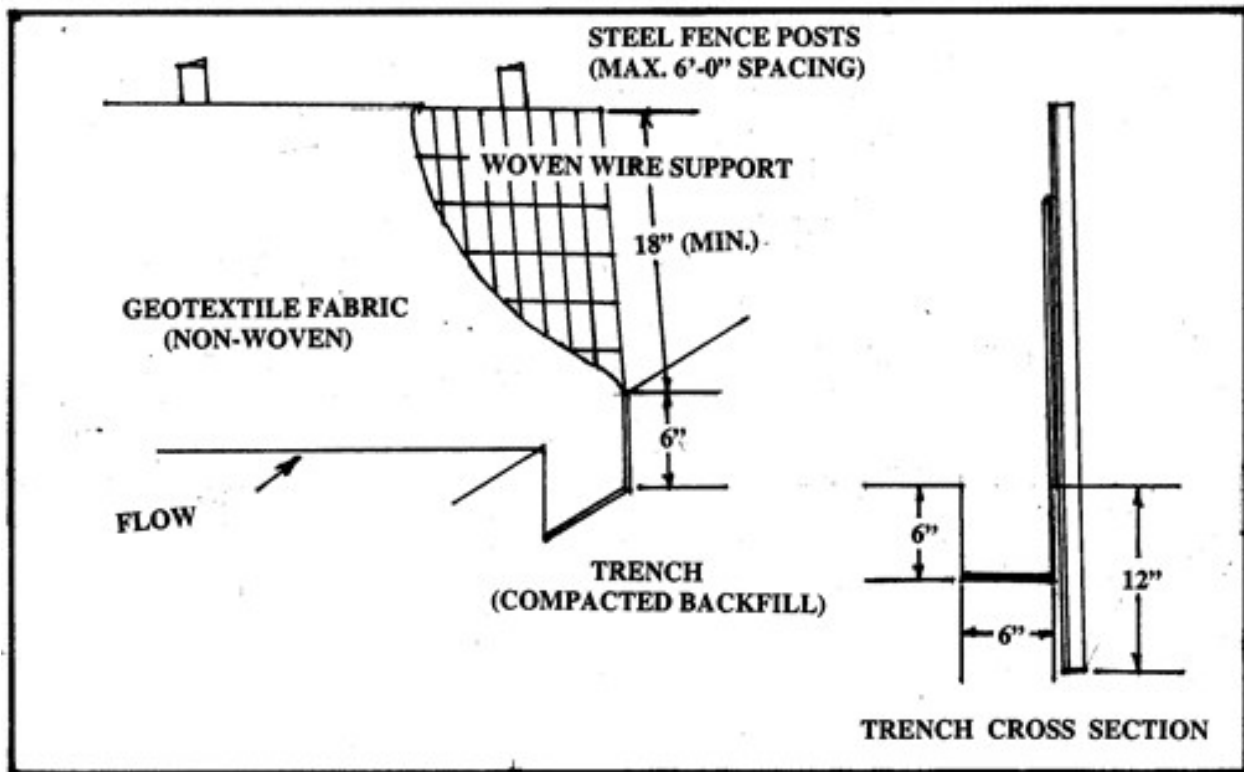
Rock Berm Detail



1. USE ONLY OPEN GRADED 4" X 8" ROCK FOR STREAM FLOW CONDITIONS. USE 3" X 5" OPEN GRADED ROCK FOR OTHER CONDITIONS.
2. SECURE THE ROCK BERM WITH A WOVEN WIRE SHEATHING HAVING A MAXIMUM 1 INCH OPENING AND A MINIMUM 20-GAUGE WIRE DIAMETER. ANCHOR ROCK BERMS IN CHANNEL APPLICATIONS FIRMLY INTO THE SUBSTRATE A MINIMUM OF 6 INCHES WITH TEE POSTS OR WITH #5 OR #6 REBAR WITH A MAXIMUM SPACING OF 48 INCHES ON CENTER.
3. INSPECT THE ROCK BERM WEEKLY. REPLACE THE STONE AND/OR FABRIC CORE-WOVEN SHEATHING WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC, ETC.
4. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD THE HEIGHT OF THE BERM OR 6 INCHES, WHICHEVER IS LESS, REMOVE THE SILT AND DISPOSE OF ON AN APPROVED SITE AND IN A MANNER THAT WILL NOT CREATE A SILTRATION PROBLEM.
5. INSPECT SEVERE SERVICE ROCK BERMS DAILY, AND REMOVE SILT WHEN ACCUMULATION REACHES 6 INCHES.
6. WHEN THE SITE IS COMPLETELY STABILIZED, REMOVE THE ROCK BERM AND ACCUMULATED SILT AND DISPOSE OF IN AN APPROVED MANNER.

EXHIBIT D

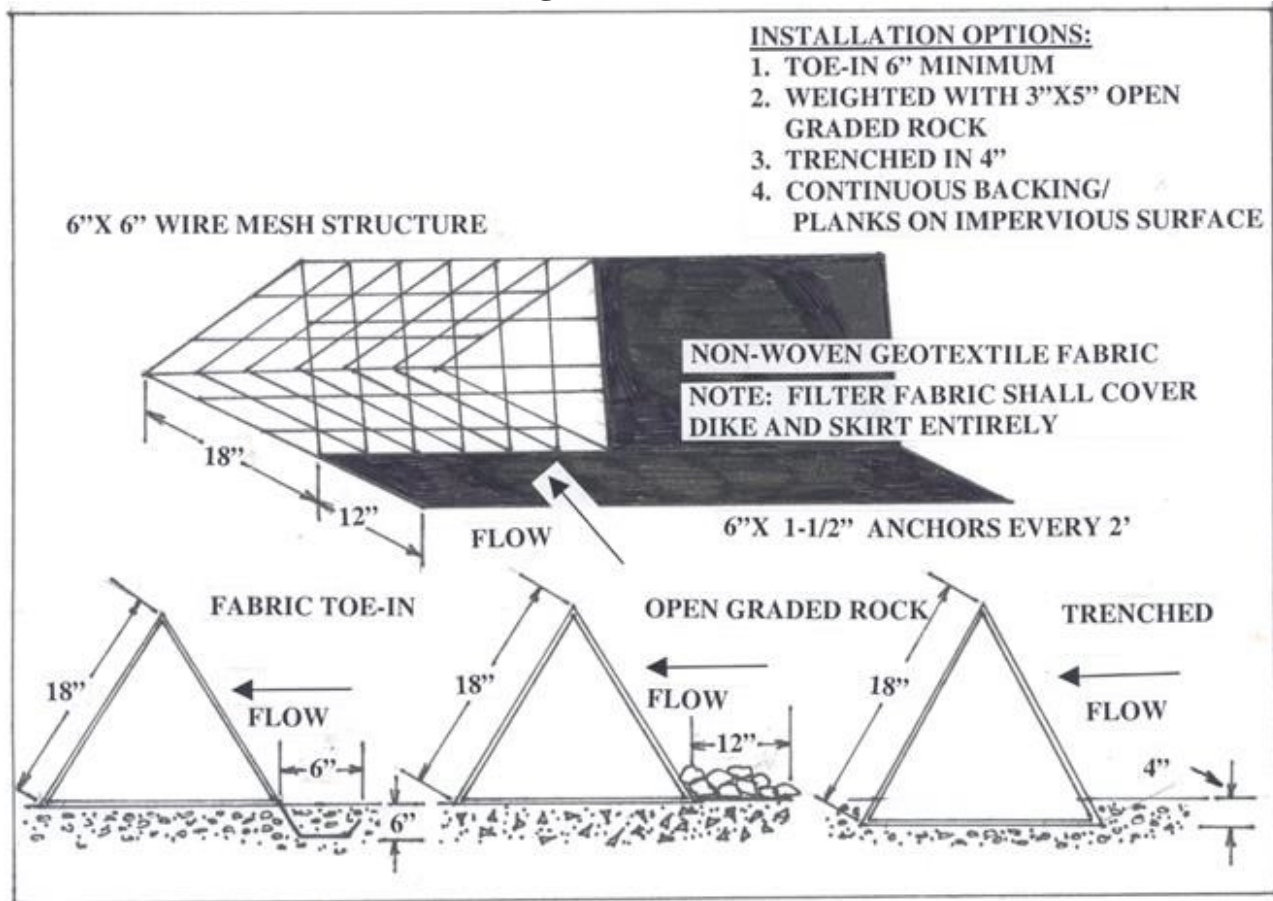
Silt Fence Detail



1. INSTALL STEEL POSTS THAT SUPPORT THE SILT FENCE ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POSTS MUST BE EMBEDDED A MINIMUM OF 12 INCHES.
2. TRENCH IN THE TOE OF THE SILT FENCE WITH A SPADE OR MECHANICAL TRENCHER SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF THE FLOW. WHERE FENCE CAN NOT BE TRENCHED INTO THE SURFACE, (E.G., PAVEMENT), WEIGHT THE FABRIC DOWN WITH ROCK OR 1" X 4" LUMBER SECURELY FASTENED TO THE SURFACE. PLACE ON THE UPSTREAM SIDE TO PREVENT FLOW UNDER THE FENCE.
3. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE FILTER FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. FASTEN THE FILTER FABRIC SECURELY TO THE WOVEN WIRE BACKING, AND IN TURN FASTEN IT SECURELY TO THE STEEL FENCE POST.
5. REMOVE ACCUMULATED SILT WHEN IT REACHES A DEPTH OF 6 INCHES, DISPOSE OF THE SILT ON AN APPROVED SITE AND IN SUCH A MANNER THAT IT WILL NOT CONTRIBUTE TO ADDITIONAL SILTRATION.
6. INSPECT THE SILT FENCE WEEKLY AND REPAIR OR REPLACE PROMPTLY IF NEEDED.
7. WHEN THE SITE IS COMPLETELY STABILIZED, REMOVE THE SILT FENCE.

EXHIBIT E

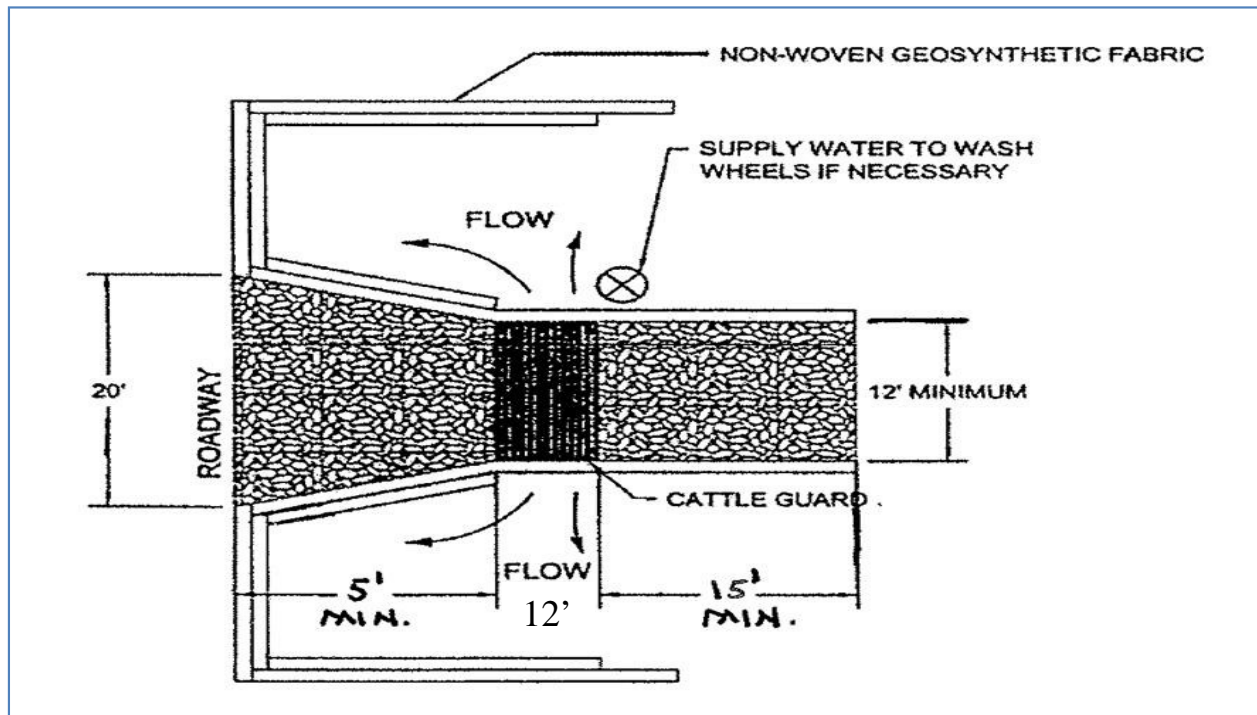
Triangular Dike Detail



1. PLACE DIKES IN A ROW WITH EACH END TIGHTLY ABUTTING THE ADJACENT DIKE.
2. THE FABRIC COVER AND SKIRT SHALL BE A CONTINUOUS WRAPPING OF NON-WOVEN GEOTEXTILE. THE SKIRT SHALL BE A CONTINUOUS EXTENSION OF THE FABRIC ON THE UPSTREAMFACE.
3. WEIGHT THE SKIRT WITH A CONTINUOUS LAYER OF 3" x 5" OPEN GRADED ROCK, 1" x 4" SECURELY FASTENED LUMBER, OR TOED-IN 6 INCHES WITH MECHANICALLY COMPACTED MATERIAL. OTHERWISE, TRENCH IT IN 4 INCHES IN DEPTH.
4. ANCHOR DIKES AND SKIRT SECURELY IN PLACE USING 6 INCH WIRE STAPLES ON 2 FOOT CENTERS ON BOTH EDGES OF SKIRT, OR STAKE USING 3/8 INCH REBAR WITH TEE ENDS.
5. LAP FILTER MATERIAL OVER ENDS 6 INCHES TO COVER DIKE TO DIKE JOINTS. FASTEN JOINTS WITH GALVANIZED HOG RINGS.
6. THE DIKE STRUCTURE SHALL BE 6-GAUGE 6" x 6" WIRE MESH, 18 INCHES ON A SIDE.
7. REMOVE ACCUMULATED SILT WHEN IT REACHES A DEPTH OF 6 INCHES, AND DISPOSE OF IT IN A MANNER THAT WILL NOT CAUSE ADDITIONAL SILTRATION.
8. INSPECT TRIDIKES WEEKLY AND REPAIR OR REPLACE PROMPTLY AS NEEDED.
9. AFTER THE SITE IS COMPLETELY STABILIZED, REMOVE THE DIKES AND ANY REMAINING SILT.

EXHIBIT F

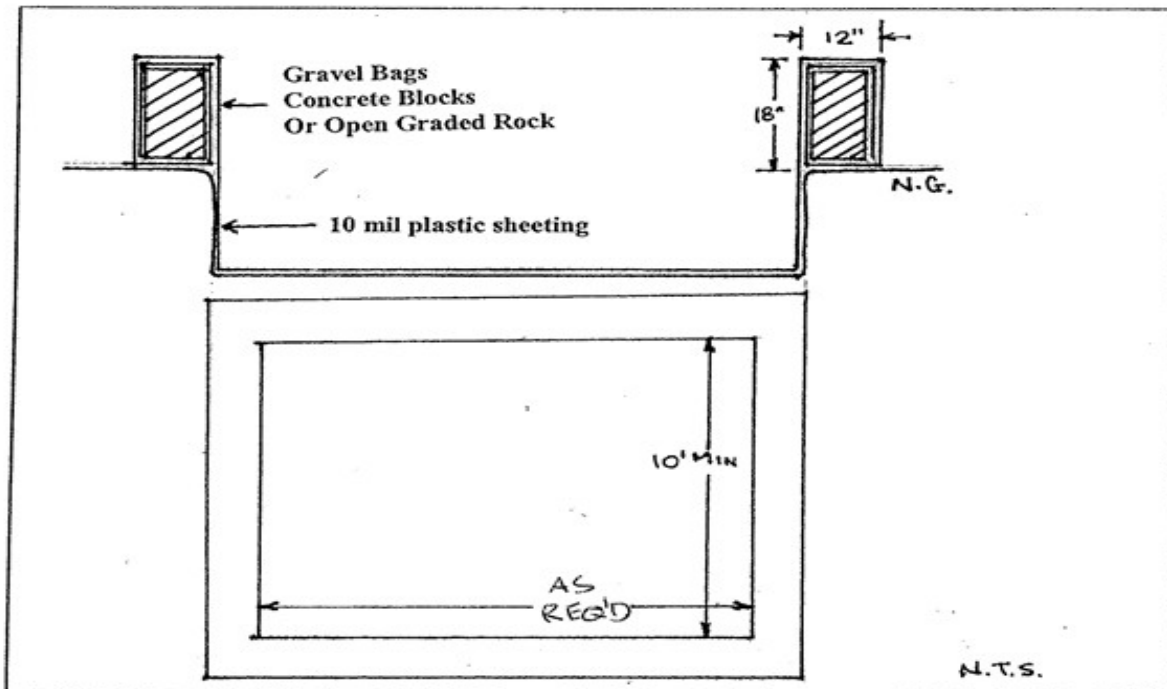
Stabilized Construction Exit



1. THE GRID CONSISTS OF PIPES OR TUBES WITH A MINIMUM DIAMETER OF 3 INCHES, AND SPACED SUCH THAT THERE IS A MINIMUM CLEAR DISTANCE OF 4 1/2 INCHES BETWEEN THEM. ELEVATE THE GRID ABOVE THE GROUND SURFACE A MINIMUM OF 8 INCHES TO ALLOW WATER, DEBRIS AND SOIL TO DRAIN.
2. THE GRID SHALL BE DESIGNED TO SUPPORT THE WEIGHT OF ANY AND ALL VEHICLES ENTERING AND LEAVING THE CONSTRUCTION SITE.
3. THE GRID SHALL BE FIRMLY PLACED IN THE GROUND AT THE EXIT, AND SHALL BE OF SUFFICIENT LENGTH THAT THE AGITATION WILL REMOVE THE SOIL FROM THE TIRES, OR A MINIMUM OF 12 FEET.
4. AT THE STREET SIDE APPROACH OF THE GRID, THERE SHALL BE AN IMPERVIOUS SURFACE OR IT SHALL CONSIST OF 3" x 5" ANGULAR CRUSHED STONE/ROCK 5 FEET IN LENGTH MINIMUM, AND 8 INCHES DEEP, MINIMUM. ON THE JOB SITE SIDE OF THE GRID, THERE SHALL BE 3" x 5" ANGULAR CRUSHED STONE/ROCK 15 FEET IN LENGTH, MINIMUM, 8 INCHES DEEP, MINIMUM. THE STEEL GRID WILL BE BETWEEN THE STREET SIDE APPROACH AND THE JOB SITE CRUSHED STONE/ROCK. ALL CRUSHED STONE/ROCK SHALL HAVE FILTER FABRIC PLACED BENEATH IT.
5. THE STEEL GRID AREA SHALL BE USED AS THE TIRE WASH AREA. WHEN TIRE WASH IS IN USE (RAINY OR MUDDY DAYS), THE AREA SHALL BE MANNED AND THE TIRES SHALL BE WASHED USING A HIGH PRESSURE HOSE/NOZZLE.
6. THE AREA BENEATH THE GRID SHALL BE SLOPED SUCH THAT DEBRIS, SOIL AND WATER SHALL BE DIVERTED BACK ON TO THE CONSTRUCTION SITE OR TO A SEDIMENT BASIN. NO WATER, SOIL OR DEBRIS SHALL LEAVE THE CONSTRUCTION SITE, AND THE RESULTING DISCHARGE SHALL BE DISPOSED OF PROPERLY.

EXHIBIT G

Concrete Truck Washout



1. THE EXCAVATION FOR THE CONCRETE TRUCK WASHOUT SHALL BE A MINIMUM OF 10 FEET WIDE AND OF SUFFICIENT LENGTH AND DEPTH TO ACCOMMODATE 7 GALLONS OF WASHOUT WATER AND CONCRETE PER TRUCK PER DAY AND/OR 50 GALLONS OF WASHOUT WATER AND CONCRETE PER PUMP TRUCK PER DAY.
2. IN THE EVENT THAT THE CONCRETE TRUCK WASHOUT IS CONSTRUCTED ABOVE GROUND, IT SHALL BE 10 FEET WIDE AND 10 FEET LONG, WITH THE SAME REQUIREMENTS FOR CONTAINMENT AS DESCRIBED IN ITEM 1.
3. THE CONTAINMENT AREA SHALL BE LINED WITH 10 MIL PLASTIC SHEETING WITHOUT HOLES OR TEARS. WHERE THERE ARE SEAMS, THESE SHALL BE SECURED ACCORDING TO MANUFACTURERS' DIRECTIONS.
4. THE BERM CONSISTING OF GRAVEL BAGS, CONCRETE BLOCKS OR OPEN GRADED ROCK SHALL BE NO LESS THAN 18 INCHES HIGH AND NO LESS THAN 12 INCHES WIDE.
5. THE PLASTIC SHEETING SHALL BE OF SUFFICIENT SIZE SO THAT IT WILL OVERLAP THE TOP OF THE CONTAINMENT AREA AND BE WRAPPED AROUND THE GRAVEL BAGS, CONCRETE BLOCKS OR OPEN GRADED ROCK AT LEAST 2 TIMES.
6. THE GRAVEL BAGS OR CONCRETE BLOCKS SHALL BE PLACED ABUTTING EACH OTHER TO FORM A CONTINUOUS BERM AROUND THE OUTER PERIMETER OF THE CONTAINMENT AREA.
7. THE WASHOUT MATERIAL IN THE CONTAINMENT AREA SHALL NOT EXCEED 50% OF CAPACITY AT ANY ONE TIME.
8. SOLIDS SHALL BE REMOVED FROM CONTAINMENT AREA AND DISPOSED OF PROPERLY. ANY DAMAGE TO THE PLASTIC SHEETING SHALL BE REPAIRED OR SHEETING REPLACED BEFORE THE NEXT USE.

REVISION LOG

The following is provided for convenience to the Owner, Architect/Engineer and Contractor, and is not to be considered by any party to be contractual or 100% complete.

The Architect/Engineer shall remove this revision log before publication of the project manual for construction.

Date	Paragraph Revised
02/01/08	Updated the SWPPP Inspection Form
05/27/08	Revisions to formatting/New 2008 Permit info/ Certification form
11/08	Revisions to formatting and sequence/ added language for alternative BMPs
7/13	Revisions to formatting/New 2013 Permit Info
10/2014	Added Sections 3.2.7.4, .5, .6, .7 and 3.5.2

SECTION 01 77 00 - PROJECT CLOSE-OUT PROCEDURES

PART 1 - GENERAL

1.1. RELATED DOCUMENTS

- 1.1.1. Provisions established within the Uniform General and Supplementary General Conditions for University of Texas System Building Construction Contracts (UGC), all Sections of Division 1 - General Requirements, other applicable Sections of all Divisions of Specifications, and the Drawings are collectively applicable to this Section. In the event of conflict between specific requirements of the various documents, the more restrictive, the more extensive (i.e.. more expensive) requirement shall govern.

1.2. SECTION OVERVIEW

- 1.2.1. General Description of Closeout Requirements
- 1.2.2. Requirements for Substantial Completion
- 1.2.3. Provisions for Release of Retainage
- 1.2.4. Requirements for Final Acceptance
- 1.2.5. Required Project Record Documents
- 1.2.6. Project Cleaning

1.3. GENERAL DESCRIPTION OF CLOSEOUT REQUIREMENTS

- 1.3.1. DEFINITION: Project Closeout is hereby defined to include requirements near the end of the Contract Time, in preparation for substantial completion acceptance, occupancy by Owner, release of retainage, final acceptance, final payment, and similar actions evidencing completion of the work. Specific additional requirements for individual units of work are specified in Sections of Divisions 2 - 33.
- 1.3.2. TIME of closeout is directly related to completion and acceptance, and therefore may be either a single time period for the entire project, or a series of time periods for individual portions or phases of the project that have been certified as substantially complete at different dates.
- 1.3.3. This Section is based on completion and acceptance of the entire project during a single time period.
 - 1.3.3.1. If the project is to be accepted in phases, whether by originally specified project scope or by subsequent agreement between the parties, then Project Closeout requirements shall pertain to each separately accepted portion or phase of the project; unless by written notice the Owner allows for these requirements to be done singularly upon anticipated acceptance of the final phase.

1.3.4. RECORD DOCUMENTS for Project Closeout include, but are not necessarily limited to the following drafts, which are required at substantial completion:

- 1.3.4.1. As-Built Record Drawings
- 1.3.4.2. As-Built Record Specifications
- 1.3.4.3. Operating & Maintenance Manuals
- 1.3.4.4. Record Approved Submittals and Samples
- 1.3.4.5. Certification of No Asbestos Products Incorporated in Project
- 1.3.4.6. Completed Punch Lists

1.3.5. REQUIRED DOCUMENTS for final payment to be released include final versions of all of the above and the following:

- 1.3.5.1. Final Release of Claims & Liens
- 1.3.5.2. Affidavit of payment of Debt and Claims
- 1.3.5.3. Consent(s) of Surety
- 1.3.5.4. Completed SWPPP documents and Notice Of Termination
- 1.3.5.5. Final Historically Underutilized Business Plan
- 1.3.5.6. Completed Commissioning and Closeout Manual

1.4. REQUIREMENTS FOR SUBSTANTIAL COMPLETION

1.4.1. Prior to requesting Architect and Owner to schedule a Substantial Completion, or Pre-Final, inspection (for either the entire work or portions thereof as agreed to by the parties to the contract); complete the following and list known exceptions in request.

- 1.4.1.1. In progress payment request coincident with period of time anticipated for substantial completion, Contractor's payment request should reflect a minimum of 95% completion for all applicable work.
- 1.4.1.2. Submit to Architect and Owner a complete copy of the Contractor's most current punch list covering the portion(s) of the Project claimed as substantially complete.
 - 1.4.1.2.1. Such punch list shall indicate dates of Contractor re-checks and schedule for completion of work items remaining.
 - 1.4.1.2.2. All items remaining outstanding on the Contractor's punch list shall include a projected date of completion and/or correction with an explanation of why such is not presently completed.

- 1.4.1.3. Submit to Architect for review the full set of as-built marked-up record drawings and marked-up record specifications as described later in this Section.
- 1.4.1.4. Submit to Architect for review the preliminary copies of Owner's Operating and Maintenance (O&M) Manuals as described later in this Section.
- 1.4.1.5. Provide access to Contractor's copy of the Commissioning and Closeout Manual for review by Owner and Architect. The Manual shall be up to date before the Substantial Completion inspection can be requested.
- 1.4.1.6. Submit certification statement that no asbestos containing materials have been used or incorporated into the project.
- 1.4.1.7. Obtain and submit releases enabling Owner's full and unrestricted use of the work and access to services and utilities, including (where applicable) operating certificates, and similar releases.
- 1.4.1.8. Deliver tools, spare parts, extra stocks of materials, and similar physical items to Owner.
- 1.4.2. If Owner intends to occupy Project upon Substantial Completion Acceptance, Contractor shall make provisions for final changeover of locks with the Owner's personnel. Upon written directive from Owner, this task may be waived until final acceptance for the convenience of the Contractor in completing punch list activity.
- 1.4.3. Complete instructions of Owner's personnel for all systems and equipment serving the areas claimed as substantially complete, for which Owner Training was not completed in association with system demonstrations and inspections. Refer also to Section 01 91 00 - Project Commissioning.
- 1.4.4. Complete initial clean up requirements as described later in this Section for the entire portion of the Project claimed as substantially complete. Touch up and otherwise repair and restore marred exposed finishes.
- 1.4.5. SUBSTANTIAL COMPLETION INSPECTION PROCEDURE
 - 1.4.5.1. Refer to UGC and Section 01 45 00 - Project Quality Control
 - 1.4.5.1.1. The Contractor shall ensure the work is ready for inspection and/or reinspection. If the work is found not to be as stated in the Contractor's punchlist or the items have not been substantially corrected/completed; the inspection will be terminated all costs for the Owner and A/E team for scheduling and attendance at the terminated inspection(s) shall be the responsibility of the Contractor.

1.5. PROVISIONS FOR RELEASE OF RETAINAGE

- 1.5.1. Refer to UGC

1.5.2. Release of any retainage, or reduction in amount of retainage withheld, is strictly at the discretion of the Owner, regardless of Contractor compliance with requirements. All of the requirements noted for Substantial Completion Acceptance must be completed prior to application for final release of contract retainage. In addition, meet the following requirements:

1.5.2.1. Submit affidavits of final release of claim and lien from each subcontractor and supplier who provided materials and/or labor to the Project.

1.5.2.2. Submit affidavit that all bills for the Project have been paid, or will be paid within thirty (30) days of Contractor receipt of payment.

1.5.2.3. Submit Consent of Surety to Release of Retainage.

1.6. REQUIREMENTS FOR FINAL ACCEPTANCE

1.6.1. Prior to requesting Architect and Owner to schedule Final Inspection for the Project, complete the following:

1.6.1.1. Prepare draft payment request showing 100% completion for each line item on the Schedule of Values. Submit with this draft all final releases and supporting documentation not previously submitted and accepted. Include Certificates of Insurance where applicable. Note that Final Payment, including final release of retainage, will not be issued until all work (including punch list items) has been completed, all requirements met, a project closeout audit performed (if deemed necessary) and a Final Change Order has been processed if required to resolve final cost or closeout audit issues, including deletion of any remaining contract allowances.

1.6.1.2. Submit copy of Architect/Engineer's pre-final, or substantial completion, punch list, which includes evidence that each item has been completed or otherwise resolved.

1.6.1.3. Submit final meter readings for utilities, and similar data as of time of substantial completion or when Owner took possession of and responsibility for corresponding elements of the work.

1.6.1.4. Submit final record as-built drawings and specifications, copies of all approved submittals, and operating & maintenance manuals as described later in this Section. This includes specific warranties, maintenance agreements, product certifications and similar documents. Record closeout documentation must be acceptable to Architect and Owner prior to issuance of final payment.

1.6.1.5. Transmit completed Commissioning and Closeout Manual to the Owner. This manual shall be complete, acknowledging receipt of all attic stock, spare parts, training/demonstration, test reports and any other requirements of the contract documents.

1.6.1.6. Complete final cleaning requirements, including touch-up of marred surfaces.

1.6.1.7. Submit final payment request, including the following documentation:

1.6.1.7.1. Consent of Surety

1.6.1.7.2. Release of Liens and Claims

1.6.1.7.3. Affidavit of payment of Debts and Claims

1.6.1.7.4. Final Historically Underutilized Business Plan

1.6.1.7.5. Completed and signed Notice Of Termination

1.6.1.8. Revise and submit evidence of final and continuing insurance coverage complying with applicable insurance requirements.

1.6.2. FINAL ACCEPTANCE INSPECTION PROCEDURE

1.6.2.1. Upon compliance with all above noted requirements, and following completion of the work required in the substantial completion punch list, provide written notice to the Architect and Owner that the project is ready for Final Inspection. Refer to UGC for additional requirements.

1.6.2.2. All Owner and Architect costs for travel and man-hours for additional inspections at either Substantial Completion or Final Acceptance which are required either by failure of the Contractor to complete the noted punch list items, or by erroneous notices that the work is ready for such inspections, will be the responsibility of the Contractor. Such costs will be deleted from the contract amount in Change Order.

1.7. REQUIRED PROJECT RECORD DOCUMENTS

[U. T. Austin projects require three (3) copies of project record documents where two (2) are indicated under this section.]

1.7.1. AS-BUILT RECORD DRAWINGS

1.7.1.1. Do not use record documents for construction purposes; protect from deterioration and loss in a secure location; provide access to record documents for Owner and/or Architect's reference or review during normal working hours.

1.7.1.2. In general terms; the Contractor is to furnish one set of 4 mil Mylar prints made from the Architect's contract drawings, or subsequent updates thereof, annotated as noted below with actual as-built conditions, two sets of prints made from the mylars, and the original marked-up prints.

1.7.1.2.1. As-built information is to be professionally drafted on first-generation contract prints from which the mylars are to be made.

1.7.1.2.2. As-builts are required to show all changes in the work relative to the original contract documents; and show additional information of

value to Owner's records, but not indicated in original contract documents.

- 1.7.1.3. Record as-builts are to include marked-up copies of contract drawings and specifications, including newly-prepared drawings if any such are applicable or necessary to achieve the intended result, and shop drawings to include all changed conditions issued through addenda and/or change orders.
 - 1.7.1.3.1. Include marked up product data submittals, field records for variable and concealed conditions such as excavations and foundations, and further; miscellaneous record information on work, which is otherwise recorded only schematically or not at all.
- 1.7.1.4. Certain individual sections of Divisions 2 through 33 indicate specific requirements, which may clarify requirements of this section. Where a conflict may be perceived to exist, the more restrictive (i.e., more expensive) requirement will prevail. There is no intent, however, to require more sets of as-builts than is indicated herein.
- 1.7.1.5. The Contractor shall bear all costs associated with obtaining the Architect's original contract documents, or subsequent updated plots thereof, drafting of as-built information, reproduction, including mylar drawings, or other related work.
 - 1.7.1.5.1. All "as built" changes shall be of good drafting quality, performed by a person skilled in drafting and knowledgeable of the conventions of the trades involved.
 - 1.7.1.5.2. The Contractor may utilize his staff or seek outside assistance, including the Project Architect, for this drafting work so long as the requirements pertaining to quality, format, and content are met.
- 1.7.1.6. MAINTENANCE OF AS-BUILT DRAWINGS DURING CONSTRUCTION
 - 1.7.1.6.1. During progress of the work, maintain a printed set of contract drawings along with specifications and shop drawings in the construction office. Update these drawings weekly, at a minimum, with markup of actual installations, which vary from the work as originally shown.
 - 1.7.1.6.1.1. Mark whatever drawing is most capable of showing actual physical condition, fully and accurately, and reference all other appearances of this work to the sheet, which was updated. Include cross-reference to the official change number on the updated sheet and all additional sheets where the work is shown.

- 1.7.1.6.1.2. Mark with erasable colored pencil, using separate colors where feasible to distinguish between changes for different categories of work at same general location.
- 1.7.1.6.1.3. Mark up important additional information, which was either shown schematically or omitted from original drawings. Give particular attention to information on work concealed, which would be difficult to identify or measure and record at a later date.
- 1.7.1.6.1.4. Note alternative numbers, change order numbers and similar identification for any change.
- 1.7.1.6.1.5. Require each person preparing markup to initial and date markup and indicate name of firm.
- 1.7.1.6.2. The Contractor shall maintain and have available for review in conjunction with the regular project meetings, a current set of the as-built drawings and specifications marked with "as constructed" information. Availability for review, and acceptability, of both the format and the content is a prerequisite condition for certification of monthly pay requests by the Owner and Architect.

1.7.2. SUPPLEMENTAL DRAWINGS

- 1.7.2.1. Where marked-up shop drawings are intended for inclusion in the record set, mark cross-reference on contract drawings at corresponding location. Use of shop drawings as supplements to the record as-builts is encouraged for all items which require the larger scale employed on the shop drawings in order to show the work in sufficient detail to be of future use to the Owner.
 - 1.7.2.1.1. Use of such shop drawings is particularly applicable to ductwork and electrical shop drawing layouts. Use of shop drawing supplements is acceptable so long as the following conditions are met:
 - 1.7.2.1.1.1. Regardless of overall size of the original shop drawings, such will be reproduced photographically onto mylar sheets of the same size with equivalent borders and titles as the contract drawings and other record as-built drawings. Include project name and number as well as the applicable submittal number.
 - 1.7.2.1.1.2. The applicable supplemental sheet shall be placed in the set directly behind the contract drawing, which it supplements, with appropriate reference notes on both the applicable contract drawing and all other affected drawings.

- 1.7.2.1.1.3. The supplemental document shall be identified as a "Supplementary Record As-Built Drawing" and shall be numbered with an extension to the contract drawing it supplements in a manner acceptable to the Owner.

1.7.3. PREPARATION OF FINAL AS BUILT DRAWINGS

- 1.7.3.1. This Section requires that a copy of the marked-up as-builts be submitted to the Architect for review prior to requesting substantial completion inspections.

- 1.7.3.1.1. Following the Architect's review of the marked-up prints, and upon authorization by the Architect based on their belief that the marked-up information is accurate and complete, the Contractor shall proceed with preparation of a full set of professionally drafted record drawings.

- 1.7.3.2. All record as-built drawings and supplemental shop drawing sheets must be reproduced on 4-mil thick mylar film. This includes the entire set of contract drawings, whether or not individual sheets are affected by as-built data. Mylars shall be made from the first-generation prints of the contract drawings; mylars or sepias made from marked up prints will not be accepted under any circumstances.

- 1.7.3.3. All drawings shall bear the official project name and number. Further, each drawing, including supplemental drawings, shall also bear a stamp to the effect of "Record As-Built" along with the Contractor's certification that such is an accurate reflection of actual as-built conditions. Each certification shall be signed and dated and shall be acceptable to the Owner.

- 1.7.3.3.1. All drawings shall be the same size as original contract documents.

- 1.7.3.3.2. All "as built" notes and drafting on mylars should be made with ink for use on mylars (no pencil lead or colored pencil).

- 1.7.3.3.3. The marked-up prints shall be turned over to the Architect along with the final mylar documents for review and acceptance. Once such final mylar documents are acceptable to the Architect as complying with this section and other contract requirements. They will transmit final mylars to the Owner along with the marked-up prints and all other close-out documentation

- 1.7.3.3.4. All drawings issued as addenda, clarifications and/or change orders shall be incorporated into the record as-built drawing set. Such shall be fully shown on the applicable contract drawing. If supplemental sheets are used, follow the requirements outlined above for supplemental shop drawing sheets.

1.7.4. AS-BUILT RECORD SPECIFICATIONS

- 1.7.4.1. During progress of the work, maintain and update one record copy of specifications at the jobsite, including addenda, change orders and similar modifications issued in printed form during construction, to indicate all significant variations in actual work in comparison with text of specifications as originally issued.
 - 1.7.4.1.1. Give particular attention to substitutions, selection of options, and similar information on work where the exact products used are not clearly identified or readily discernable in the original specifications. Note related record drawing information and product data, where applicable.
 - 1.7.4.1.2. It is not necessary to re-type an entire section if modified, but it is mandatory that all changes to specified materials, installation, warranty, etc. be clearly and fully marked within the applicable specifications section in a manner acceptable to the Architect and the Owner. Such should be reviewed and a documentation procedure established early in the construction period.
- 1.7.4.2. In association with request for substantial completion inspection, submit the marked-up copy of the Project Specifications to the Architect for review.
- 1.7.4.3. Once the marked-up Project Specifications are found acceptable by the Architect, and upon his authorization, based on his belief that the marked-up information is accurate and complete; proceed with preparation of a Record Set Project Specifications.
 - 1.7.4.3.1. Neatly transcribe and post all as-built mark-up information to a "clean" copy of the Project Specifications, insuring that similar types of information is annotated in like fashion throughout the Specifications.
- 1.7.4.4. Once completed, submit both the mark-up site copy of the Project Specifications and the newly prepared Record Project Specifications to the Architect for review and, if acceptable, for subsequent transmittal to the Owner.

1.7.5. OPERATING AND MAINTENANCE MANUALS

- 1.7.5.1. In general terms, the Contractor is to organize maintenance-and-operating manual information into suitable sets of manageable size, and bind into individual binders properly tabbed and indexed.
 - 1.7.5.1.1. Such shall include emergency instructions, spare parts listings, warranties, wiring diagrams, inspection procedures, shop drawings, product data, and similar applicable information.

- 1.7.5.1.2. Such shall be bound in heavy-duty, 3-ring vinyl-covered binders including pocket folders for folded sheet information. Mark binder identification on both front and spine of each binder.
- 1.7.5.1.3. Two complete copies of each bound O&M Manual are required.
- 1.7.5.2. The requirements of this Section are separate, distinct and in addition to product submittal requirements that may be established by other Sections of the Specifications. Owner's manuals, manufacturer's printed instructions, parts lists, and other submittals required by other Sections of the Specifications may be included in the O&M Manuals provided that they are approved and are formatted in a manner consistent with the requirements of this Section.
- 1.7.5.2.1. Test data and Commissioning data included in the O&M Manuals need not be duplicated in the Commissioning and Closeout Manual. Test data not pertaining to a particular device or piece of equipment (such as domestic water pipe pressure test reports) shall be inserted in the C&C Manual.
- 1.7.5.3. Equipment is defined as any mechanism, mechanical, electrical or electronic device, or any combination thereof, which is made up of two or more working parts to perform a particular function.
- 1.7.5.4. When an item of equipment is a packaged unit furnished by one manufacturer and the package as furnished contains proprietary items of equipment obtained from other sources; copies of equipment data as required herein shall be furnished for each item of such equipment as if it had been separately furnished.
- 1.7.5.5. For general guidance only, the following are examples of equipment, material, and systems for which operating and maintenance data is required:

Pipe & Fittings	Air Handling Units
Gate Valve	Temperature Controls
Elevators	Pumps and Controllers
Electrical Switchgear	Irrigation System
Light Fixtures	Fire Sprinkler
Transformers	Security Systems
Electric Panel	Wall Light Switches
Circuit Breakers	Motors & Devices
Metal Fabrications	Telephone Systems
Pressure Gauges	Fume Hoods
A/C Diffusers	Fire Alarm System
Sterilizers	Compressors
Laboratory Casework	Overhead Coiling Doors
Finish Hardware	Access Flooring
Automatic Door Operators	Finish Materials

- 1.7.5.6. All the applicable data for any one item of equipment or material or system shall be bound together as a package, within a Manual containing like equipment, materials, or systems, as indicated by the appropriate specification division. Each package of data shall be numbered according to the Specification Section governing the particular system.
- 1.7.5.7. All data furnished in accordance with this Section shall be submitted on bindable 8-1/2" x 11" sheets or on sheets that are bindable and foldable multiples of 8-1/2" x 11". The bindable edge shall be the left 11" edge.
- 1.7.5.8. Waivers to the size requirement may be requested in specific instances upon application in writing to the Architect and Owner with justification for substitution in size.
- 1.7.5.9. Material and equipment data required by this Section is intended to include all data necessary for the proper installation, removal, normal operation, emergency operation, startup, shutdown, maintenance, cleaning, adjustment, calibration, lubrication, assembly, disassembly, repair, inspection, trouble shooting and service of the equipment or materials.
- 1.7.5.10. The UGC requires that a preliminary copy of all operating and maintenance manuals, in addition to as-built documents, be furnished prior to the Substantial Completion inspection. The Contractor is to accumulate and package the documentation, and submit it to the Architect for review.
- 1.7.5.11. The Contractor's submission of a preliminary copy of all O&M Manuals to the Architect for review is a precondition for scheduling of a Substantial Completion Inspection. The Contractor's final submission of these Manuals in an acceptable format (based on review of preliminary copies by the Architect) is a precondition for scheduling of a Final Acceptance Inspection, release of remaining contract retainage, or application for Final Payment.
- 1.7.5.12. Equipment Data to be Included in O&M Manuals
 - 1.7.5.12.1. Description of Equipment shall be prepared upon 8-1/2" x 11" forms. Include one such form for each item of equipment. Refer also to the equipment list requirements of Sections 01 91 00 - Project Commissioning, 23 00 00 - General Mechanical and 26 00 00 - General Electrical. The equipment information to be included in the O&M Manuals is as follows:
 - 1.7.5.12.1.1. Complete description of item: Such should list basic descriptive terminology first, followed by modifying words to include model, size and weight, flow rate, amperage, voltage, material, etc., as applicable, plan designation, if any, and package serial number
 - 1.7.5.12.1.2. Part Number: Manufacturer's and supplier's part number.

- 1.7.5.12.1.3. Quantity: Total quantity of this equipment item installed under this Contract.
- 1.7.5.12.1.4. Specification Paragraph Reference: State the specification section and paragraph under which the item of equipment was procured, and page number.
- 1.7.5.12.1.5. Source: Manufacturer's name and address and supplier's name and address.
- 1.7.5.12.1.6. Serial Number: Complete manufacturer's serial number(s) or other identity symbol(s) as applicable.
- 1.7.5.12.1.7. Location: State the name of the system and/or sub-system in which each like item of equipment is installed and state the physical location of each like item of equipment by identifying the columnar grid intersections, as shown on the plans, near which the item is located and also state the room or space title as applicable.
- 1.7.5.12.2. Parts Lists which clearly identifies every part in the item of equipment with the proper manufacturer's name, part nomenclature and number, local source, and list price.
- 1.7.5.12.3. Recommended Spare Parts. Furnish a list of recommended spare parts for each equipment item that will be needed to support that item of equipment for a 12-month period. The quantities of spare parts recommended shall be based upon the quantity of like equipment items installed under the Contract. The recommended spare parts list for each equipment item shall be prepared upon 8-1/2" x 11" forms which contain the following information for each part in columns:
 - 1.7.5.12.3.1. Part Description: Complete descriptive nomenclature plus manufacturer's complete model and part number, and list price cost for each part.
 - 1.7.5.12.3.2. Quantity Per Assembly: Quantity of listed part that occurs in the item of equipment.
 - 1.7.5.12.3.3. Quantity of Equipment Items: Quantity of like equipment items installed under this Contract.
 - 1.7.5.12.3.4. Shelf Life: Storage life of part, in months, if the part has limited life.
 - 1.7.5.12.3.5. Recommended Quantity: Quantity of part recommended to support the installed quantity of equipment in which the part appears for a period of 12 months.

- 1.7.5.12.3.6. Source for part: Name, address, and phone number of the nearest supplier for the part.
- 1.7.5.12.4. Contractor's Purchase Order: Copy of Contractor's purchase order for equipment. The copy furnished need only show quantity ordered, part number, equipment description and name and address of vendor who supplied the item
- 1.7.5.12.5. Normal Operating Instructions: Normal operating instructions shall provide sufficient detailed information to permit a journeyman mechanic to adjust, startup, operate and shut down the equipment. Special startup precautions must be noted as well as other action items required before the equipment is put into service.
- 1.7.5.12.6. Emergency Operating Procedures: A detailed description of the sequence of action to be taken in the event of a malfunction of the unit, either to permit a short period of continued operation or emergency shutdown to prevent further damage to the unit and to the system in which it is installed.
- 1.7.5.12.7. Preventive Maintenance: Detailed information to cover routine and special inspection requirements, including field adjustments, inspections for wear, adjustment changes, packing wear, lubrication points, frequency and specific lubrication type required, cleaning of the unit and type solvent to use, and such other measures as are applicable to preventive maintenance program.
- 1.7.5.12.8. Calibration: Detailed data on what to calibrate, how to calibrate, when to calibrate and procedures to enable checking the equipment for reliability or indications as well as data for test equipment, special tools and the location of test points.
- 1.7.5.12.9. Scale and Corrosion Control: Detailed information covering the prevention of and removal of scale and corrosion.
- 1.7.5.12.10. Troubleshooting Procedures: Detailed information and procedures for detecting and isolating malfunctions and detailed information concerning probable causes and applicable remedies.
- 1.7.5.12.11. Removal and Installation Instructions: Detailed information concerning the logical sequence of steps required to remove and install the item including instructions for the use of special tools and equipment.
- 1.7.5.12.12. Disassembly and Assembly Instructions: Detailed illustrations and text to show the logical procedure and provide the

instructions necessary to disassemble and assemble the unit properly. The text shall include all checks and special precautions as well as the use of special tools and equipment required to perform the assembly or disassembly.

- 1.7.5.12.13. Repair Instructions: Detailed repair procedures to bring the equipment up to the required operating standard including instruction for examining equipment and parts for needed repairs and adjustments, and tests or inspections required to determine whether old parts may be reused or must be replaced.
- 1.7.5.12.14. System Drawings: Detailed drawings, where applicable, that clearly show wiring diagrams, control diagrams, system schematics, pneumatic and fluid flow diagrams, etc., which pertain to the unit function. Drawings are required to show modifications to another manufacturer's standard unit which is incorporated into the assembly or package unit
 - 1.7.5.12.14.1. System diagrams shall be provided on multiples of 8-1/2" x 11" format, folded to fit within the Manual. The outer (exposed) face of the folded drawing shall include identification of the system and the specification section that governs its installation and operation.
 - 1.7.5.12.14.2. The requirements of this paragraph are separate, distinct, and in addition to similar requirements that may be established by other Sections. Where such system diagrams are required for submittal by other specification sections, the same diagrams will be acceptable for inclusion herein, so long as the diagrams used were approved during the submittal phase and they are reproduced for clarity and to fit the size format of the O&M Manual.
 - 1.7.5.12.14.3. The Contractor shall provide diagrammatic drawings for each installed system, which shall show the placement of the system in relation to the building, and the physical location of each item or equipment installed within the system. Each installed item of equipment shown on the drawing will be identified by the equipment item model and/or serial/part number.
 - 1.7.5.12.14.4. System drawings may, for purpose of clarity, be prepared upon a major subsystem basis.
 - 1.7.5.12.14.5. The drawings may be prepared upon several drawings having referenced match lines.

- 1.7.5.12.15. Special Tools and Test Equipment: Furnish a detailed list of the special tools and test equipment needed to perform repair and maintenance for each equipment item. The list shall contain the special tool and test equipment part number, size, quantity, price, manufacturer's name and address, and local supplier's name and address.
- 1.7.5.12.16. Warranties & Guarantees: Bind within the tabbed section for each system, equipment item, or material, an executed copy of the specified warranty/guarantee covering that particular system, equipment item, or material.
- 1.7.5.12.16.1. This is to include both the manufacturer's warranty as specified and the installing contractor's guarantee for workmanship and system operation.
- 1.7.5.12.16.2. This copy of the particular warranty/guarantee is in addition to original signature copies of all project warranties/guarantees bound together separately. This binder shall be transmitted to the Owner when complete.
- 1.7.5.12.16.3. Provide in a separate tabbed section of the O&M Manual a grouping of all project warranties and guarantees as required by various specification sections and other conditions of the Contract. This is to include all specific warranties on manufactured items and installed systems as noted above, in addition to General Contractor's project warranty and applicable guarantees from all subcontractors and suppliers covering defects in workmanship or manufacture.
- 1.7.5.12.16.4. As clarification, it is intended that the Owner be provided with a separate binder containing all original project warranties and guarantees. Also provide a copy of the appropriate warranty in the same section as the equipment (or system) data furnished in individual tabbed sections of the O&M Manuals for convenient reference.
- 1.7.5.12.17. Training of Owner Personnel: Documentation of training of Owner's Personnel regarding operation of particular systems shall be included within the tabbed section for that particular system. Such documentation shall include identification of parties receiving training and date(s) of such training.

1.7.6. MISCELLANEOUS RECORD INFORMATION

- 1.7.6.1. The following shall be bound in like manner to above noted equipment data and system drawings. It is suggested that a separate tabbed section be included in the Commissioning and Closeout Manual for these

Miscellaneous Items. Categories of requirements resulting in miscellaneous work records are recognized to include, but not limited, the following:

- 1.7.6.1.1. Required field records on excavations, foundations, underground construction, wells and similar work.
- 1.7.6.1.2. Accurate survey showing locations and elevations of underground lines, including invert elevations of drainage piping.
- 1.7.6.1.3. Surveys establishing lines and levels of building.
- 1.7.6.1.4. Plant treatment records (wood, soil, etc)
- 1.7.6.1.5. Certifications received in lieu of labels on products and similar record documentation.
- 1.7.6.1.6. Batch mixing and bulk delivery records.
- 1.7.6.1.7. Testing and qualification of tradesmen.
- 1.7.6.1.8. Documented qualification of installation firms.
- 1.7.6.1.9. Load/performance testing.
- 1.7.6.1.10. Final inspection and deficiency corrections.

1.7.7. RECORD PRODUCT SUBMITTALS

- 1.7.7.1. During progress of the work, maintain approved copies of each product data submittal and shop drawing, and mark up significant variations in the actual work in comparison with submitted information. Include both variations in product as delivered to site, and variations from manufacturer's instructions and recommendations for installation.
 - 1.7.7.1.1. A separate binder with one copy off all MSDS sheets for any and all products incorporated into the project shall be maintained during the course of the project. This binder shall be included in the record submittal documents.
- 1.7.7.2. Give particular attention to concealed products and portions of the work that are not clearly identified in the original submittal or cannot otherwise be readily discerned at a later date by direct observation. Cross reference to change orders and markup of record drawings and specifications.
- 1.7.7.3. Upon completion of as-built revisions, submit two complete sets of all approved submittals to Architect for review and subsequent transmittal to Owner. Organize and group files in sturdy file boxes with tabbed dividers for each separate specification division. Include a complete table of contents.

- 1.7.7.4. These record submittal requirements are in addition to inclusion of similar material as supplementary as-built drawings or technical data for the O&M Manuals.

1.7.8. RECORD SAMPLE SUBMITTAL

- 1.7.8.1. Immediately prior to date(s) of substantial completion, arrange for Architect and Owner's representative to meet with Contractor at site to determine which (if any) of the submitted samples or mock-ups maintained by Contractor during progress of the work are to be transmitted to Owner for record purposes.
- 1.7.8.2. Comply with Architect's instructions for packaging, identification marking, and delivery to Owner's designated location at the Project Site or the Physical Plant.
- 1.7.8.3. Dispose of other samples in manner specified for disposal of surplus and waste materials, unless otherwise indicated or directed by Architect.

1.7.9. COMMISSIONING AND CLOSEOUT MANUAL (C&C Manual)

- 1.7.9.1. The Contractor shall incorporate all commissioning and closeout documentation and/or verification not included in the O&M manuals, into a Manual for transmittal to the Owner at the conclusion of the project. This Manual is intended to be a consolidation of documentation/verification for the project Commissioning and Closeout process.

- 1.7.10. Requirements for production of this manual are found in Section 01 91 00 Project Commissioning.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1. PROJECT CLEANING AT SUBSTANTIAL COMPLETION

- 3.1.1. The Contractor is required to maintain the project and site in a clean and orderly condition throughout the course of construction. In addition to continuous project cleaning, the following requirements are related to project closeout.
- 3.1.2. Special cleaning for specific units of work may also be specified in other sections of Project Specifications.
- 3.1.3. Provide an initial cleaning of the work consisting of cleaning each surface or unit of work to normal "clean" condition expected for a first-class building cleaning and maintenance program.
- 3.1.4. Comply with manufacturer's instructions for cleaning of all system components, equipment, and materials incorporated into the Project.

3.1.5. The following "initial" final cleaning is to be accomplished immediately prior to the time the Contractor requests Substantial Completion Inspection:

- 3.1.5.1. Remove labels that are not required as permanent labels.
- 3.1.5.2. Clean exposed hard-surfaced finishes, including glass, metals, stone, concrete, painted surfaces, plastics, tile, wood, special coatings, and similar surfaces, to a dirt-free condition, free of dust, stains, films and similar noticeable distracting substances. Restore reflective surfaces to original condition.
- 3.1.5.3. Remove debris and surface dust from limited-access spaces including plenums, shafts, and similar spaces.
- 3.1.5.4. Clean concrete floors in non-occupied spaces, wet-mop and broom clean.
- 3.1.5.5. Clean fixtures and lamps of all dust and debris.
- 3.1.5.6. Remove crates, cartons and other flammable waste materials or trash from work areas. Building(s) shall be turned over to the Owner free of concealed garbage, trash and rodent infestation. If any of the preceding are revealed, or odors from them occur, they shall be removed by the Contractor at his expense. Restore property to its original condition where no improvements are shown.
- 3.1.5.7. Elevator shafts, electrical closets, pipe and duct shafts, chases, furred spaces, and similar spaces which are generally unfurnished, shall be cleaned and left free from rubbish, loose plaster, mortar drippings, extraneous construction materials, dirt and dust.
- 3.1.5.8. Rubbish shall be lowered by way of chutes, taken down on hoists, or lowered in receptacles. Under no circumstances shall any rubbish or waste be dropped or thrown from one level to another within or outside the building(s).
- 3.1.5.9. Care shall be taken by workmen not to mark, soil or otherwise deface finished surfaces. In the event that finished surfaces become defaced, all costs for cleaning and restoring such surfaces to their originally intended condition shall be the responsibility of the Contractor.

3.2. PROJECT CLEANING AT FINAL ACCEPTANCE

3.2.1. The following "final" cleaning is to be accomplished immediately prior to the time the Contractor requests Final Acceptance Inspection:

- 3.2.1.1. Clean transparent materials, including mirrors and window/door glass, to a polished condition, removing substances that are noticeable as vision-obscuring materials.
- 3.2.1.2. Turn the work over in immaculate condition inside and outside including the premises.

- 3.2.1.3. Clean all work on the premises including walks, drives, curbs, paving, fences, grounds and walls. Slick surfaces shall be left with a clear shine. Cleanup shall include removal of smudges, marks, stains, fingerprints, soil, dirt, paint, dust, lint, labels, discolorations and other foreign materials.
- 3.2.1.4. Clean all finished surfaces on interior and exterior of project (again) including floors, walls, ceilings, windows, glass, doors, fixtures, hardware and equipment. Final wax and polish all natural finish metal on interior or exterior surfaces. Clean and apply finish (including wax) to all floors as recommended by the manufacturer.
- 3.2.1.5. In addition to the cleaning specified above and the more specific cleaning required in various Sections of the Specifications, the building(s) shall be prepared for occupancy by a thorough cleaning throughout, including washing (or cleaning by approved methods) surfaces on which dirt or dust has collected, and by washing glass on both sides. Wash exterior glass using a window-cleaning contractor specializing in such work.
- 3.2.1.6. Remove temporary buildings and structures, fences, scaffolding, surplus materials and rubbish of every kind from the site of the work. Repair these areas to be compatible with the surrounding construction finished condition.

END OF SECTION 01 77 00

REVISION LOG

The following is provided for convenience to the Owner, Architect/Engineer and Contractor to track changes between annual document issuances and is not to be considered by any party to be contractual or 100% complete.

Date	Paragraph Revised
3/1/11	General revisions

SECTION 01 91 00 – GENERAL COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- 1.1.1 Commissioning (Cx) is a quality-oriented process of assuring that a facility is constructed and performs as intended in accordance with the contract documents. The process confirms that all building systems (including building envelope) have been installed and exercised throughout their full range of intended operation, and that anticipated failures have been initiated or simulated to verify response and recovery.
- 1.1.2 Commissioning requires cooperation and direct involvement by all parties throughout the construction process. Successful Cx requires not only that all building systems and assemblies comply with contract requirements, but also that installation is achieved early enough in the construction phase to allow full operational check-out, testing, and adjusting of equipment and systems prior to Substantial Completion. Planning adequate time for all Cx activities will require the development and maintenance of a detailed Cx schedule with input from, and the active participation of, all members of the Cx team.
- 1.1.3 In addition to fulfilling scheduling and planning requirements, the Contractor is responsible for verifying and documenting equipment and system installation as well as demonstrating and documenting operational performance of all systems and assemblies. This includes successful demonstration of full systems integration in the facility to the Owner's Designated Representative (ODR). The cost of Cx administration as outlined in this specification shall be shown as a separate line item on the Contractor's schedule of values.
- 1.1.4 The Contractor is solely responsible for all Cx responsibilities contained in the project plans and specifications. The Contractor shall submit to the Owner within 30 days after Notice to Proceed the resume of a qualified individual to act as the Contractor's Commissioning Coordinator (CxC). The CxC shall be a full-time project resource and will be the primary point of contact for all Cx related activities. The proposed individual shall have formal Cx credentials from UW, BCA, AEE, ACG, or ASHRAE, or other Cx credentials can be submitted for evaluation and potential acceptability. The individual proposed to fill the Contractor's CxC role must be approved by the Owner. Fulfilling the Contractor's responsibilities for the CxC, as outlined herein, shall be the individual's primary role for the project. The CxC cannot be the project manager or a project superintendent. The Contractor may elect to outsource the CxC position to a third party firm with the approval of the Owner, and the outsourced individual filling the role of the CxC must be a full-time project resource. Outsourcing the CxC role will be contingent upon Owner review and approval of the proposed individual's qualifications to fill the position.

1.2 DEFINITIONS

- 1.2.1 Commissioning Coordinator (CxC) -- the individual appointed by the Contractor (and approved by the Owner) to act as the Contractor's single point-of-contact for all Cx related activities.
- 1.2.2 Cx Authority (CxA) -- the party having a contract Agreement with the Owner to provide third party Cx services as a consultant to the Owner. In some cases, the CxA will be contracted by the A/E firm.
- 1.2.3 Cx Team Members -- all parties who represent the Owner, A/E, Contractor, Subcontractors, Manufacturers, Vendors, and Suppliers and Consultants associated with the project.
- 1.2.4 Contractor's Cx Record (CCR) -- the compilation of Cx related documentation including but not limited to the Commissioning Plan, the Equipment Matrix, Close-out Documentation Matrix, Cx Schedule, observation reports, inspections, meeting minutes, Cx checklists/testing scripts/procedures, etc.
- 1.2.5 Building Automation System (BAS) – A control system designed to automatically control and monitor building systems.
- 1.2.6 Owner's Project Requirements (OPR) – A formal document developed early in the design process that communicates what the Owner wants accomplished in the project.
- 1.2.7 Basis of Design (BOD – A formal document developed by the design team early in the design process that communicates how the systems designed will meet the project objectives.
- 1.2.8 UW – University of Wisconsin
- 1.2.9 AEE – The Association of Energy Engineers
- 1.2.10 ACG – AABC Commissioning Group
- 1.2.11 BCA – The Building Commissioning Association
- 1.2.12 ASHRAE – The American Society of Heating, Refrigerating, and Air-conditioning Engineers

1.3 RELATED DOCUMENTS

- 1.3.1 The Uniform General Conditions, applicable requirements of all Divisions of the Contract specifications and all Contract Drawings apply to work of this section. In the event of conflict between specific requirements of the various documents, the more restrictive, the more extensive (i.e., more expensive) requirement shall apply.

1.3.2 Technical specifications throughout all Divisions of the Project Manual, which pertain to operable and non-operable equipment and/or building systems, are directly applicable to this section, and this section is directly applicable to them. Particular attention is directed to:

- 1.3.2.1 Division 1 General Requirements, specifically
 - Section 01 32 16 – Project Planning and Scheduling
 - Section 01 45 00 – Project Quality Control
 - Section 01 77 00 – Project Closeout Procedures
- 1.3.2.2 Divisions 7-14
- 1.3.2.3 Divisions 21-33 sections as appropriate, and Cx-specific sections:
 - Section 21 08 00 – Commissioning of Fire Protection Systems
 - Section 22 08 00 – Commissioning of Plumbing Systems
 - Section 23 08 00 – Commissioning of Mechanical Systems
 - Section 26 08 00 – Commissioning of Electrical Systems

1.4 WORK INCLUDED

1.4.1 SCOPE OF THIS SECTION

- 1.4.1.1 It is of primary concern that all systems installed in the project perform in accordance with the design intent and the OPR. This is particularly critical for systems affecting life safety, building controls, plumbing, HVAC, building envelope, lighting, power delivery systems, security system, article protection system, and access control system.
- 1.4.1.2 This section establishes minimum general and administrative requirements pertaining to Cx progress-tracking tools, documentation of installation, startup and performance testing of equipment, devices, assemblies and building systems. Additional technical and operational requirements for particular systems and components are established in the various technical sections of the specifications. The Contractor is solely responsible for the Cx process. This responsibility shall not be delegated to subcontractors, but by necessity will require the participation of subcontractors.
- 1.4.2 OFPC will provide the Contractor with an electronic copy of standard Cx coordination and tracking tools, and document templates for various inspections, outage requests, reports, etc. Cx-related documents, including tracking tools will be delivered to the Owner at Substantial Completion as part of the CCR. The Contractor shall customize the provided tools and templates to meet the specific details of the project. It is the responsibility of the Contractor to develop project-specific documentation forms and tracking tools where they are not provided by OFPC.

- 1.4.3 The Owner's Quality Assurance (QA) testing and inspection program is independent of the Cx program. The Contractor is required to perform all testing (or provide or make available portions of the building for consultant and/or third party testing) as specified in the contract documents in addition to the Cx requirements outlined herein. Coordination of these processes by the Contractor will help minimize any duplication of effort. Unless stipulated elsewhere in the contract documents, QA testing and inspection documentation shall be included in the CCR.

1.5 COMMISSIONING PLAN

- 1.5.1 The Cx Plan is a detailed description of the entire Cx process. The Cx Plan identifies processes, procedures, roles and responsibilities, and protocols to be administered and managed by the Contractor to satisfy the Cx responsibilities included in the contract documents. The Cx Plan provides a step-by-step outline to assure the Owner's project requirements are met during the construction process. The Contractor is responsible for development, implementation and maintenance of the Cx plan, and associated tools for scheduling and tracking Cx activities. The Owner may choose to engage a CxA to develop a draft construction phase Cx plan. When a draft Cx plan is provided by the Owner's CxA, the Contractor is required to review, submit recommended changes, and update the draft (template) Cx plan with approved changes. The Contractor shall adopt the final approved draft Cx plan as the project's Cx plan. The Cx plan will include, as a minimum, the following Project Cx Team Members:

- 1.5.1.1 Contractor's Cx Coordinator (CxC)
- 1.5.1.2 UT System Office of Facilities Planning and Construction (OFPC)
- 1.5.1.3 A/E and relevant consultants
- 1.5.1.4 Institution departments, groups, and representatives
- 1.5.1.5 Subcontractors
- 1.5.1.6 Manufacturers, vendors and suppliers as appropriate
- 1.5.1.7 Owner's TAB contractor
- 1.5.1.8 Independent testing labs
- 1.5.1.9 Campus Liaison(s)
- 1.5.1.10 Cx Authority (if appropriate)

- 1.5.2 Commissioning activities shall be identified, scheduled, executed, documented, and tracked by the Contractor and coordinated with the Owner and Owner-designated consultants, and shall include, but not be limited to:

- 1.5.2.1 Inspections/Tests as required by plans and specifications
- 1.5.2.2 Equipment Startup
- 1.5.2.3 Functional Tests
- 1.5.2.4 Integrated System Testing
- 1.5.2.5 Entire Facility Integration Testing
- 1.5.2.6 Training

1.5.3 Equipment List

- 1.5.3.1 The Contractor shall prepare an equipment list using the approved Commercial Software Solution or the Owner-furnished template form. This list shall contain a complete record of operable equipment, devices, and systems, organized by function and logically grouped with supported/related systems.
- 1.5.3.2 The list shall be populated with all available information for the Cx kickoff meeting. The list shall, as a minimum, include the following data for each item:
 - 1.5.3.2.1 Brief equipment identification text
 - 1.5.3.2.2 Equipment or device ID number (device tag)
 - 1.5.3.2.3 Startup inspection required? (Yes/No)
 - 1.5.3.2.4 Associated building system, (Lighting, Access Control, Life Safety, Building Envelope, Domestic Hot Water, Chilled Water Distribution, etc.)
 - 1.5.3.2.5 Governing specification section
 - 1.5.3.2.6 Installation location
 - 1.5.3.2.7 Area(s) served
 - 1.5.3.2.8 Manufacturer and model number
 - 1.5.3.2.9 Serial number
 - 1.5.3.2.10 Date of the Equipment Startup by the Contractor
 - 1.5.3.2.11 Completion date of Functional Test demonstration by the Contractor
 - 1.5.3.2.12 Completion date of Integrated System Test demonstration by the Contractor (multiple equipment items may be included in a single IST)
 - 1.5.3.2.13 Trending Data required? (Yes/No) Trending data includes loop tuning documentation (log values and graphed) of stable control through a setpoint change.
 - 1.5.3.2.14 Date of Verification of Trended Data (graphical data and tabular logs to be included in the CCR)
 - 1.5.3.2.15 Date of completion of Training
 - 1.5.3.2.16 Systems shall be included at the end of the list for systems that require an IST (not all columns, such as specific equipment-related data will be applicable).
- 1.5.3.3 During construction, the equipment list data shall be continuously updated at regular intervals and provided at each Cx Meeting. The equipment list will be a part of the CCR. Updates should occur at least weekly, and more often as deemed necessary by the Owner.
- 1.5.3.4 The requirement to provide continuous updates to the equipment list for distribution at Cx meetings may be waived with the employment of a commercial Cx software solution that is capable of generating equipment reports that satisfy the intent of the equipment list used as a progress-tracking tool. The aforementioned report shall be provided at each Cx meeting. The

Owner must approve any waiver of the use and maintenance of the equipment list, and reserves the right to reinstate the equipment list requirement.

1.6 COMMISSIONING ACTIVITY DOCUMENTATION REQUIREMENTS

1.6.1 To verify the Cx work, a logical sequence of Cx activity documentation shall be completed by the Contractor and witnessed and reviewed by The Owner (or an Owner-designated consultant). All Contractor installed systems (static and dynamic), subsystems, assemblies, equipment, components and devices shall be tested, operationally verified and documented. The Contractor is responsible to provide Cx forms and testing procedures with appropriate rigor to meet the specific needs of the project. Sequence of operation testing procedures (in an itemized action-response format) shall be contained in applicable FPTs and/or ISTs and the EFIT. The sequence of operation testing procedures shall include testing and demonstration of failure conditions. At a minimum, Cx documentation shall include:

- 1.6.1.1 Pipe/Duct Pressure Test - Contractor shall provide map (plan view) detailing each tested section.
- 1.6.1.2 Construction Checklist (CC) - CCs shall be used to document the condition of equipment upon delivery to the site and appropriate installation for submitted and approved components of a system, i.e., motor installation, waterproofing membrane application, roof application, etc. The manufacturer installation checklist should be completed and attached to the completed CC. (Contractor may implement with Owner approval either their own construction checklists or manufacturer checklists.
- 1.6.1.3 Equipment Startup Checklist (ESC) - Checklist shall be used to document the startup (energizing the equipment) of operable equipment. The purpose of the ESC is to verify and document that equipment is energized and started in accordance with manufacturer recommended procedures, and to coordinate witnessing of the event with the Owner and interested campus entities.
- 1.6.1.4 Functional Performance Test (FPT) - Document containing verification and operational procedures for demonstrating the full functionality and performance of an installed component, equipment or system. FPT procedures shall employ an itemized action-response format.
- 1.6.1.5 Integrated System Test (IST) - The IST documentation shall be used to document demonstration of operational performance of multi-component sequences of operation to include integration with other components, interlocks and alarm conditions for homogeneous systems. Testing procedures are to include all modes of operation and shall employ an itemized action-response format.

- 1.6.1.6 Entire Facility Integration Test (EFIT) - The EFIT shall document demonstration of operational performance and integrated operation of the entire facility as a multi-functioning operational system.
- 1.6.1.7 All FPT, IST, and EFIT documents shall be submitted to the Owner for approval for use no less than 60 calendar days before applicable scheduled activity.
- 1.6.1.8 Other specialized test reports (identified in technical specifications) - Contractor shall submit industry standard or custom forms and report formats as appropriate for approval by the Owner.
- 1.6.1.9 Closeout Documentation Matrix shall include all project deliverables to be transmitted to the Owner prior to substantial completion. Deliverables listed shall include:
 - 1.6.1.9.1 The prescribing specification section
 - 1.6.1.9.2 Description of item(s)
 - 1.6.1.9.3 Type of item to be transmitted (spare parts, attic stock, training, warranties beyond one year, O&M manuals, as-builts, keys checklist, and service contracts)
 - 1.6.1.9.4 Quantities transmitted
 - 1.6.1.9.5 Transmittal date
 - 1.6.1.9.6 Recipient of transmitted deliverable
 - 1.6.1.9.7 Initials of the recipient of transmitted deliverable

1.7 CONTRACTOR'S COMMISSIONING RECORD

- 1.7.1 The CCR is a consolidation of all Cx and testing documentation for the project. The Contractor shall transmit the CCR to the Owner at the conclusion of the project construction phase (Substantial Completion), as agreed upon in writing by the Owner.
- 1.7.2 The Contractor shall employ a commercial software solution to generate and maintain the CCR. A proposed commercial software solution shall be submitted to the Owner for approval.
- 1.7.3 The Contractor is responsible to provide the necessary input/access devices (iOS or Android device) for the Owner to utilize the software solution for the duration of the project. Each assigned construction inspector and the ODR shall receive an input/access device.
- 1.7.4 The Contractor may request that the Owner waive the requirement for the use of a commercial software solution. The requested waiver must include a detailed, project-specific plan for documenting and providing a comprehensive CCR.

1.7.5 The CCR shall include, but not be limited to, the following:

- 1.7.5.1 The Contractor's Cx Plan
- 1.7.5.2 Equipment List Cx Schedule (Duration to include every Cx activity through Substantial Completion)
- 1.7.5.3 Closeout Documentation Matrix
- 1.7.5.4 Commissioning Schedule (final with updates)
- 1.7.5.5 Paint/Finish Schedule

- 1.7.5.5.1 Schedule shall include all paints, wall coverings, flooring, finishes, etc. used on the project.

- 1.7.5.5.2 Provide manufacturer, model #, color formula, location on project, purchase source and any other information helpful to the institution's maintenance personnel.

- 1.7.5.6 Field Observation Reports
- 1.7.5.7 Cx Meeting Minutes
- 1.7.5.8 Building Envelope Inspections and Tests
- 1.7.5.9 Pipe Pressure Tests
- 1.7.5.10 Duct Pressure Tests
- 1.7.5.11 Fire Alarm and Suppression System Tests and Reports
- 1.7.5.12 Completed NFPA Forms
- 1.7.5.13 Commissioned Component/Equipment/System Documentation
- 1.7.5.14 Construction Checklists (w/attachments)
- 1.7.5.15 Equipment Startup Checklists (ESC)
- 1.7.5.16 Functional Performance Tests (w/attachments)
- 1.7.5.17 Integrated System Tests (w/attachments)
- 1.7.5.18 Entire Facility Integration Test
- 1.7.5.19 Owner Training Plans (with sign-in sheets)

1.7.6 Equipment and system submittals, shop drawings, and as-built documentation shall be submitted separately as required elsewhere in the contract documents.

1.7.7 Operating and Maintenance (O&M) Manuals for each system, equipment, and device shall be submitted separately as required elsewhere in the contract documents. An exception to the CCR including the O&M Manuals is made when a commercial software solution incorporates the O&M Manuals as attachments to the Equipment Record and the CCR is being delivered electronically as a packaged output (or export) from the commercial software solution.

1.7.8 Prior to delivering the CCR, Contractor shall schedule and facilitate a meeting to align BAS/HVAC Controls as-built documentation with TAB documentation and (as applicable) 3rd party Cx provider documentation. This meeting should focus on the sequences of operation for all operable equipment and associated control parameters, variables, algorithms and setpoints.

PART 2 PRODUCTS

2.1 TEST EQUIPMENT

- 2.1.1 Subcontractors shall provide all specialized tools, test equipment and instrumentation required to execute startup, checkout, functional performance, integrated systems and entire facility testing that includes equipment under their contract.
- 2.1.2 Test equipment shall be of sufficient quality and degree of accuracy to test and/or measure system performance within tolerances specified. Subcontractors and vendors shall provide calibration certificates for all test equipment and instrumentation. A testing laboratory shall use test equipment that has been calibrated within the previous 12 months. Calibration shall be NIST traceable. Test equipment shall be calibrated according to manufacturer's recommended intervals and recalibrated when dropped, damaged, or when Owner deems necessary. Calibration tags shall be affixed or certificates readily available.

PART 3 EXECUTION

3.1 COMMERCIAL COMMISSIONING SOFTWARE SOLUTION

- 3.1.1 The Contractor shall submit for approval by the Owner, a commercial Cx software solution used to generate and collect the CCR and associated Cx activity checklists and procedures, equipment information, associated manuals, photos, etc. in a database format that is COBie compliant, and that employs an issue/deficiency tracking system. The commercial Cx software solution shall provide for customizable systems and equipment types and designations such as, but not limited to, access control systems, security systems, building envelope systems and healthcare systems (nurse call, medical gas, pneumatic tube conveyance, etc.). The Cx Software shall:
 - 3.1.1.1 Provide for online storage of "library" files that can be organized in a customizable folder structure.
 - 3.1.1.2 Include sufficient licensing to accommodate the maximum users necessary to meet the needs of the project, including licenses necessary for Owner's project team. Coordinate with the Owner to determine license quantity requirements. Licenses and access to the Cx software will be required to be maintained for 12 months after Final Completion.
 - 3.1.1.3 Employ security capabilities using industry standard encryption (128-bit minimum) for web-based access and offline device synchronization. The software solution shall employ the use of a unique user ID and password for each individual user. Access and permissions shall be assignable to each unique user ID, or to categories or groupings of users engaged in similar roles. The Cx software shall allow for simultaneous multiple user access to database records

for checklist updates, entry of issues, attachment of photos, access to library files, etc.

- 3.1.1.4 Allow for custom data elements (attributes) associated with each type of equipment (VAV Box, Air Handling Units, Electrical Panels, etc.) that can be configured by the user. Each project must be able to support a unique (user defined) set of data elements specific to the requirements of the project. The system shall provide support for industry standard barcode or QR code for each equipment/system item.
- 3.1.1.5 Provide for checklist generation (creation) with customizable checklist responses. Software shall employ the use of checklist templates to create individual equipment-specific checklists. Software shall provide for auto “Issue Generation” based on user-selected trigger responses. Responses shall include a default “Pass/Fail”, numeric (only) response and user-defined “single item select list” as a minimum.
- 3.1.1.6 Provide for tracking of systems/equipment status as each item progresses through the Cx process. The process (progressive list of statuses) shall be user defined and selectable from a drop-down or “single item select list.”
- 3.1.1.7 Provide for interactive field data entry in either an online or offline environment. The data entry or Cx software remote (field) access device shall be Android and/or iOS compatible. Contractor shall provide (and maintain) Owner with Android or iOS compatible remote access devices for the duration of the project. (Examples are an iPad or tablet PC.) Offline access capability shall support storage of all database items enabling full software functionality. The remote access device shall be capable of storing for offline access contract documents (drawings, specifications, etc.) and software library documents.
- 3.1.1.8 Provide browser-based access to the online database via the internet using current industry standard browsers (e.g., Chrome, Fire Fox, Internet Explorer, Edge or Safari). Browser-based access must be fully compatible with a minimum of two of the listed industry standard browsers.
- 3.1.1.9 The use of any software that does not comply with each of the requirements listed above or use of an alternative methodology of generating/collecting/documenting the CCR shall require a written substitution proposal that includes samples of each tracking tool and document type (checklist, report, equipment tracking, etc.) that will be included in the CCR. Substitution proposals must list each criterion in Section 3.1 and designate compliance or detail specific non-compliance. Substitution proposal shall be submitted prior to Contractor’s Notice to Proceed (NTP) for project construction phase.

3.2 COMMISSIONING SCHEDULE

- 3.2.1 The objective of scheduling Cx process activities is to integrate and coordinate Cx activities with other construction phase activities. Detailed scheduling will allow Cx Team members to coordinate work with other team members in order to complete all Cx activities prior to Substantial Completion. The Cx Schedule shall include major Cx activities, essential prerequisites for major equipment and system activities and operable equipment/system/assembly functional and integrated systems performance demonstrations. The Cx Schedule shall account for Test and Balance (TAB) consultant activities properly scheduled and coordinated into the project work flow to allow for the completion of all TAB work prior to Substantial Completion. The Cx Schedule shall account for building envelope consultant inspections, tests and other activities properly scheduled and coordinated into the project work flow to allow for inspections and testing prior to covering or concealment. As applicable, the following milestones and activities shall be incorporated into the project master construction schedule:

- 3.2.1.1 Cx Kickoff Meeting
- 3.2.1.2 Building Automation System Submittal Approval
- 3.2.1.3 Control Sequence of Operation Coordination Meeting (reference Specification Section 23 05 93A)
- 3.2.1.4 Ethernet Connectivity
- 3.2.1.5 Building Envelope Testing and Verification Activities
- 3.2.1.6 Major HVAC Equipment/Systems Startup
- 3.2.1.7 System Specific Test and Balance Activities
- 3.2.1.8 Major HVAC Equipment Functional Performance Tests
- 3.2.1.9 Integrated System Tests
- 3.2.1.10 Entire Facility Integration Test
- 3.2.1.11 Training

- 3.2.2 The Contractor shall provide a minimum of 72 hours' notice prior to each Cx activity to the Owner and the CxA and Testing Consultants when applicable, unless stipulated otherwise in this specification or other technical specifications.

3.3 COMMISSIONING KICKOFF MEETING

- 3.3.1 Within 120 days after the effective date of the NTP for the construction scope or package that includes building operational systems, the CxC will schedule a date to conduct a Cx kickoff meeting with all parties involved in the Cx process. As a minimum the meeting should include the major subcontractors, specialty manufacturers/suppliers, the A/E, mechanical and electrical consultants, the Owner's testing, adjusting and balancing (TAB) firm, the CxA, the Owner and representatives from the UT institution.

3.3.1.1 The Contractor shall prepare for the meeting by creating drafts of the following documents for review at the meeting:

- 3.3.1.1.1 The Cx Plan
- 3.3.1.1.2 Equipment List
- 3.3.1.1.3 Closeout Documentation Matrix
- 3.3.1.1.4 The Cx Record - Table of Contents
- 3.3.1.1.5 An overview or demonstration of the approved Cx software
- 3.3.1.1.6 Sample ESCs and FPTs
- 3.3.1.1.7 Preliminary Cx Schedule incorporating Cx activities to coincide with the work flow contained in the master construction schedule

3.3.1.2 The Contractor shall conduct the meeting and review the Cx process and specifications, including discussion of documentation requirements, available test procedures and Cx forms.

3.3.1.3 The Cx Plan review shall outline roles and responsibilities of each Cx team entity and the potential schedule impact as related to Cx requirements.

3.3.1.4 The CCR Table of Contents review shall include discussion of the scope of work. The Contractor shall be prepared to distribute copies of the pertinent document samples to the subcontractors involved in the Cx process.

3.3.1.5 The Cx Schedule review shall include the dates and durations for major systems startup, and shall identify functional performance testing that is included in the master construction schedule. Team members should identify potential schedule impact pertaining to their scope of work and test sequencing.

3.3.1.6 Commissioning shall be an agenda item for project progress meetings until separate Cx meetings are deemed necessary.

3.4 PRE-INSTALLATION MEETINGS

3.4.1 At a minimum, the Contractor shall schedule a separate meeting for the work involving each major building system or systems and assemblies. The pre-installation meeting shall be scheduled, in writing, a minimum of five (5) days in advance, and shall be scheduled so that the Owner, Owner-designated consultants and Architect/Engineer can attend. The meeting shall be convened following approval of system submittals and prior to commencement of system installation work.

3.4.1.1 The Contractor shall arrange for all subcontractors, suppliers and manufacturers involved in the system to be present or adequately represented.

3.4.1.2 The Contractor shall bring the following to this conference, at a minimum, for review and discussion:

3.4.1.2.1 The portion of the equipment list applicable to the system/trade under discussion

3.4.1.2.2 Current work schedule data pertaining to the equipment delivery, installation, required testing, construction checklists, equipment startup and functional performance testing anticipated

3.4.1.2.3 Copy of all approved submittals for the system

3.4.1.2.4 Draft of documentation/checklists to be used for inspection, startup and functional performance testing of the system(s)/assembly under review.

3.4.1.3 The purpose of this meeting is for the Contractor and all applicable subcontractors and/or suppliers and/or factory representatives to discuss all aspects of the installation of the particular system, testing and documentation required and procedures to be followed. Special attention is to be directed to the scheduled order of work and any impact on or by any other building systems.

3.4.1.4 The Contractor shall demonstrate the commercial Cx software and use of remote access device. An explanation of the use and protocols that will be employed should accompany the demonstration. This is not intended to be a training session; it is a demonstration for familiarization purposes.

3.5 CONTRACTOR'S VERIFICATION OF INSTALLATION – CONSTRUCTION CHECKLIST

3.5.1 The Contractor shall document using a construction checklist a review of testing/inspection forms to ensure each is accurate and complete. This documentation shall include, but not be limited to, first-hand knowledge of the following items:

3.5.1.1 Equipment/system is delivered in new condition and in accordance with approved submittals. Delivered equipment and materials are protected, staged and stored in accordance with the specifications and the manufacturer recommendations.

3.5.1.2 Each component device has been installed and terminated in accordance with the project specifications and governing codes as well as the manufacturer's written recommendations.

3.5.1.3 All shop drawings and product data submittals have been approved for each component device.

- 3.5.1.4 All valve schedules, wiring diagrams, control schematics, electrical panel directories, etc. have been submitted, approved, and equipment/systems installed in accordance with specifications.
- 3.5.1.5 All test reports and/or certifications required have been submitted and accepted. If required, certificate of acceptance from manufacturer representative and/or engineering technician have been received. Provide copies of all checklist/inspection documentation completed by the manufacturer or certified technician.
- 3.5.2 The Contractor shall be responsible for correction of all noted deficiencies. Any request for inspection/re-inspection or test/retest of a device or system shall first be confirmed as being compliant by the Contractor before submitting a request to the Owner for inspection/re-inspection and testing/retesting.
- 3.6 EQUIPMENT STARTUP
 - 3.6.1 Startup of Independent Systems, Assemblies, Components and Devices
 - 3.6.1.1 Equipment startup is a documented formal Cx activity for the Owner (and others) to verify and witness proper startup in accordance manufacturer recommendations and contract documents. The Contractor shall utilize the Equipment Startup Checklist (ESC) to document the activity, participants, and witnesses.
 - 3.6.1.2 The Contractor shall not energize or activate, or allow activation of any operable device prior to equipment startup by a manufacturer representative. It is NOT permissible to “bump” motors prior to equipment startup. Contractor shall verify proper electrical service wiring (phasing) with the use of a phase rotation meter.
 - 3.6.1.3 The Contractor and manufacturer’s representative shall inspect and accept the installation and preparedness for startup. The Contractor shall execute startup under supervision of a responsible manufacturer's representative in accordance with manufacturer's instructions and as specified in the contract documents. The installation shall not vary from provisions of the applicable specifications and the manufacturer's written recommendations for startup. The Contractor shall develop and use the ESC to document (for the CCR) preparedness for startup, startup procedures and record operational measurements and data appropriate for the equipment and in accordance with the technical specifications. The Contractor is encouraged to incorporate any manufacturer provided installation and startup checklists as part of the ESC.
 - 3.6.1.4 The Contractor shall provide five (5) business days’ notification of scheduled equipment startup to the Owner, the Owner’s designated consultants and the A/E team.

3.7 FUNCTIONAL PERFORMANCE TESTING

- 3.7.1 After all relevant Construction Checklists are completed and startup has been accomplished, the Contractor shall coordinate pre-functional testing by the subcontractors and applicable Owner consultants in preparation for the Functional Performance Test (FPT). Contractor shall provide five (5) business days' notice of the scheduled FPT (demonstration) to the Owner, Owner designated consultants and A/E team.
- 3.7.2 The Demonstration of an FPT is a documented formal Cx activity for the Owner (and others) to verify the operation of equipment/assembly/system in accordance with contract documents to include all modes of operation, sequences of operation and anticipated failure conditions. The Contractor shall operate, or cause to be operated, each system, device, assembly or equipment item, both intermittently and continuously, for the duration indicated in the specification section(s) for such item and/or in accordance with the manufacturer's written recommendations, and in accordance with the approved FPT procedures. The details of these activities shall be documented for the CCR. The Owner and/or an Owner-designated consultant shall witness and verify the results of the functional performance test demonstration.
- 3.7.3 For operable equipment/systems, each component device and each building system shall be exercised to the full extent of its capability, from minimum to maximum, under automatic and manual control, and in bypass when applicable. The equipment/assembly/system shall be exercised using the Campus BAS graphics on a campus operator's workstation. All inputs, outputs and calculated values, as displayed on the operator's workstation graphics, shall be verified and documented.
- 3.7.4 The Contractor and, when applicable, manufacturer's representative, shall supervise and coordinate adjustments, alignments, calibrations and balancing of all devices, equipment and systems for proper operation as part of the pre-functional testing activities.
- 3.7.5 The Contractor shall coordinate with the Owner's consultants to support the progression and completion of their scope of work. The Contractor shall provide the TAB firm and envelope consultant with installation and performance data as requested by the consultant (and approved by the Owner).
- 3.7.6 For Static systems, periodic observations shall be documented in accordance with manufacturer installation guidelines and recommendations. Performance testing as recommended by the manufacturer and in accordance with applicable technical specifications requirements shall be documented.
- 3.7.7 Where final TAB of a system or particular components thereof are not specifically indicated to be performed by Owner or Owner's consultants, the Contractor is to

provide final balancing and adjustments for operation within specified tolerances and provide documentation of it prior to scheduled FPT of each system.

3.8 INTEGRATED SYSTEM TESTING

- 3.8.1 After successful completion and documentation of all system/assembly/equipment FPTs, the Contractor shall schedule a meeting with the Project Cx Team to review the approved Integrated System Tests (ISTs) and demonstration procedures for each designated system. An integrated system contains two or more system components that have been functionally tested and have physical, hardwired or software interfaces that require one component to respond as the result of the operation of one or more other components. Examples of a few systems that would require an IST are: chilled water distribution, domestic hot water system, primary electrical distribution, fire alarm, access control and security systems.
- 3.8.2 Development of IST and demonstration procedures may vary with each project. The Contractor is responsible for providing ISTs that include all modes of operation for the system that could act upon or react to operation of separate system components. An IST shall be submitted to the Owner for review and comment and final approval by the A/E team. Collaboration with the A/E design team during IST development will ensure that a thorough performance demonstration is achieved. ISTs shall include a comprehensive, action-response checklist for all modes of operation and failure conditions included in the sequence of operation and shall itemize for each action, the anticipated response from each integrated system and/or associated component.
- 3.8.3 Following compliance with the provisions noted above and following submission of Operating & Maintenance (O&M) Manuals for the all systems to be demonstrated, the Contractor shall provide the Owner a five (5) business day notice of their intent to perform an IST demonstration. The Contractor is responsible for documenting the results of the ISTs.

3.9 ENTIRE FACILITY INTEGRATION TESTING

- 3.9.1 After successful completion and documentation of all ISTs, the Contractor shall schedule a meeting with the Project Cx Team to review the Entire Facility Integration Test (EFIT). The EFIT is a facility-wide test to verify that all building systems interact and predictably perform in accordance with the design documents.
- 3.9.2 Development of the EFIT and demonstration procedures shall be a collaborative effort of the Cx Team facilitated by the Contractor. The Contractor is responsible for ensuring that all building systems are included in the EFIT, that each system responds to designed modes of operation, and that anticipated failure conditions are itemized for monitoring and verification. The format of the EFIT testing procedures shall be an action-response matrix that identifies for each action (mode of operation), the itemized list of responses that are to be verified and documented. The Contractor shall submit the EFIT to the Owner and A/E team for review and comment.

- 3.9.3 Following compliance with the provisions noted above, the Contractor shall provide the Owner a five (5) business day notice of their intent to perform an EFIT. The Contractor is responsible for documenting the results of the EFIT.

3.10 OWNER TRAINING

- 3.10.1 Training shall consist of classroom type sessions and on-site demonstrations of system operation. See specification technical sections for specific system/equipment requirements. If a system/equipment requires both field demonstration and training, they may be combined if the Owner approves.
- 3.10.2 The Contractor shall provide a professional-grade video recording of training, with audio, in accordance with the technical specifications. The Owner will select those portions of the training to be recorded.
- 3.10.3 The Contractor shall be responsible for submitting individual training plans and for coordination, scheduling and completion of the training for all equipment as specified in the contract documents. The training will be conducted by the installing subcontractor and/or manufacturer's representative for each specific piece of equipment in accordance with the applicable technical specification sections. Each training plan shall be submitted to the Owner no later than 14 calendar days in advance of proposed training. Training plans shall include the specifications section reference, proposed trainer and relevant qualifications (resume), training agenda with learning objectives, copies of training materials/handouts/visual aids, training date, time, location and duration.
- 3.10.4 Training shall use the O&M Manuals as a basis for instructing the Owner's personnel regarding system operation. Training shall include a review of the contents of O&M Manuals and a review of equipment data and performance verification from the FPT checklists.
- 3.10.5 Demonstrate in the field: startup, operation, control, adjustment, trouble-shooting, servicing, maintenance, each component device and shutdown of the system(s).
- 3.10.6 Demonstrate both in the field and with the use of operator (workstation) graphics a detailed check-out at each stage of the sequences of operation. All equipment graphics, alarms and sequences of operation are to be reviewed, and demonstrated to the extent the Owner agrees is feasible.
- 3.10.7 The Contractor shall participate in demonstration of Owner Furnished/Contractor Installed equipment in accordance with applicable technical specifications.

3.10.8 As a minimum, the Contractor shall perform training on all Life Safety systems including, but not limited to, the following (if system is part of the project):

- 3.10.8.1 HVAC and Controls
- 3.10.8.2 Fire Alarm
- 3.10.8.3 Fire Sprinkler Systems (including pumps)
- 3.10.8.4 Elevator/Escalator
- 3.10.8.5 Smoke Purge
- 3.10.8.6 Stairwell Pressurization
- 3.10.8.7 Communications Systems
- 3.10.8.8 Emergency Power/Generator/UPS
- 3.10.8.9 Alternative Energy/Energy Recovery Systems
- 3.10.8.10 Facility Security System
- 3.10.8.11 Medical Gas Systems
- 3.10.8.12 Security/CCTV/Access Control/Article Protection Systems

End of Section 01 91 00

REVISION LOG

The following is provided for convenience to the Owner, Architect/Engineer and Contractor to track changes between annual document issuances and is not to be considered by any party to be contractual or 100% complete.

Date	Items Revised
9/1/2007	Original Document
3/11/11	Provided additional language for CxC qualification and duties. Provided Owner approval for proposed candidate for this position
	Further defined role of 3 rd party Cx authority (CxA)
	Further defined Cx activities within project schedule and increase notice for testing/demonstration
	Renamed Pre-functional Test – Pre-functional Test <i>Checklist</i> and revised C&C documents accordingly
	Further defined Functional Testing and Integrated Testing
	Added Entire Facility Integration Test (EFIT) form to clarify test procedure to demonstrate operational performance of entire facility
12/12/16	Updated Contractor's Cx Coordinator (CxC) required qualifications
	Construction Checklist now replaced Pre-Functional Checklist
	Added requirement for Contractor to employ a Commercial Cx Software solution for managing the Cx Process
	General formatting update

SECTION 10 14 16.11 - CAST BRONZE DEDICATORY BUILDING PLAQUE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- 1.01.1 Bidding and Contract Requirements, and Division 1, General Requirements, are hereby made a part of this section.

1.02 DESCRIPTION

- 1.02.1 Work Included: Furnish and install one (1) cast bronze (or cast aluminum if preferred by Owner) plaque complete.

1.03 SUBMITTALS

- 1.03.1 OFPC will provide a detailed layout of the plaque.
- 1.03.2 Submit four copies of a full size shop drawing directly to OFPC for approval prior to casting.
- 1.03.3 OFPC will return two copies of the approved shop drawing to the contractor.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- 1.04.1 Deliver plaque crated to provide protection during transit and job storage.
- 1.04.2 Inspect plaque upon delivery for damage and correctness.
- 1.04.3 Store plaque inside building.

1.05 JOB CONDITIONS

- 1.05.1 Building shall be enclosed and in the dry. Coordinate installation with work of other trades.

PART 2 - PRODUCTS

2.01 CAST BRONZE PLAQUES (Alt. CAST ALUMINUM)

- 2.01.1 Plaques shall be as manufactured by The Southwell Company, P.O. Box 299, San Antonio, Texas 78291, or approved equal. Tablet shall be cast of virgin ingots (85-5-5 Standard U. S. bronze alloy, or, aluminum alloy 356.1). Casting shall be free of pits and gas holes and all letters shall be sharp and hand tooled. Border and faces of raised letters shall be satin/brushed finish and background shall be leatherette finish. Plaque shall be chemically cleaned and etched and treated with Alodine and sprayed with two coats of Clear Acrylic Lacquer.

- 2.01.2 Size: 36" W x 24" H.
- 2.01.3 Border Design: Raised, satin/brushed finish.
- 2.01.4 Letter style: "Seneca," satin/brushed finish.
- 2.01.5 Background: Leatherette finish, Oxidized-Dark Bronze or Black (if aluminum).
- 2.01.6 Text: Include Building Name, Year of Notice to Proceed, Names of Board of Regents at issuance of Notice to Proceed, and Names of Architect and Prime Contractor, etc. For Bidding Purposes, assume 60 large characters and 375 small characters. Owner shall provide exact wording at a later date.
- 2.01.7 Refer to the attached drawing.

PART 3 - EXECUTION

3.01 INSPECTION

- 3.01.1 Installer must examine the area and conditions under which plaque is to be installed and notify A/E in writing of conditions detrimental to proper and timely completion of work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

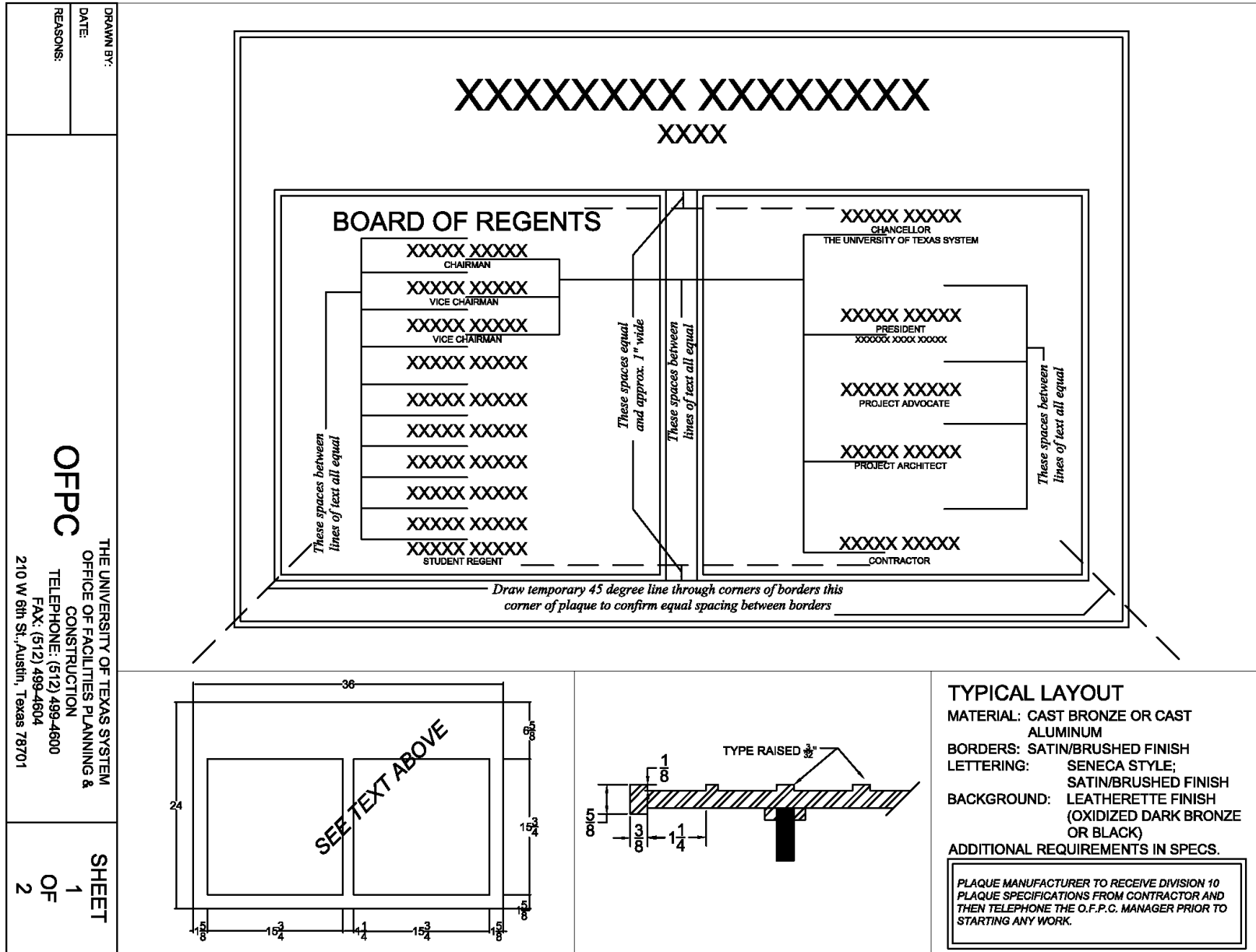
3.02 INSTALLATION

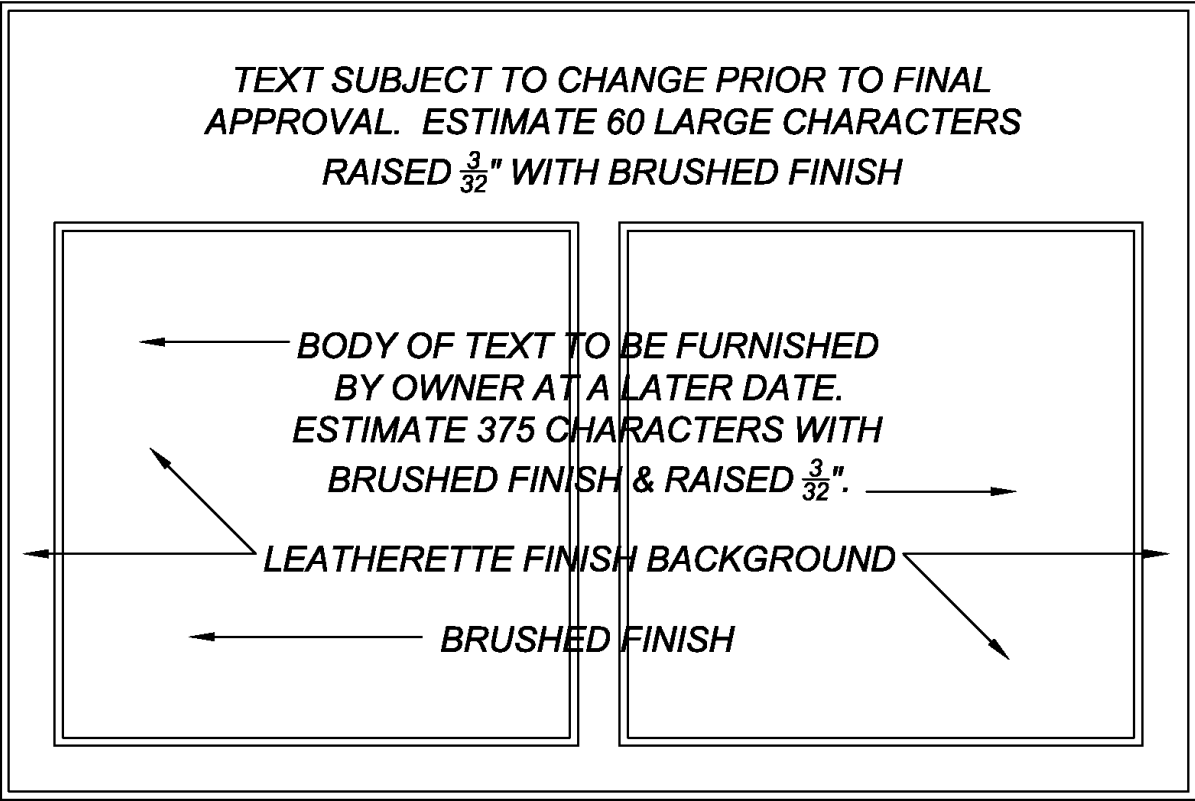
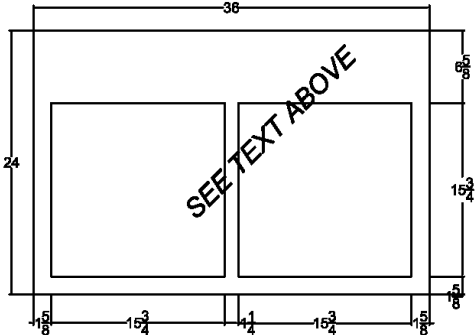
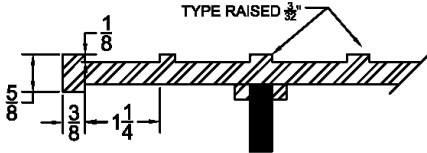
- 3.02.1 Install plaque plumb level and square, in proper planes with related surfaces, with concealed type fastening devices.

3.03 CLEAN UP

- 3.03.1 Clean up all debris caused by the work of this Section, keeping the premises clean and neat at all times.

END OF SECTION 10 14 16.11



DRAWN BY: DATE: REASONS:	<div style="text-align: center;"> <p>TEXT SUBJECT TO CHANGE PRIOR TO FINAL APPROVAL. ESTIMATE 60 LARGE CHARACTERS RAISED $\frac{3}{32}$" WITH BRUSHED FINISH</p>  </div>		
OFFPC THE UNIVERSITY OF TEXAS SYSTEM OFFICE OF FACILITIES PLANNING & CONSTRUCTION TELEPHONE: (512) 499-4600 FAX: (512) 499-4604 210 W 6th St., Austin, Texas 78701			<p>TYPICAL LAYOUT</p> <p>MATERIAL: CAST BRONZE OR CAST ALUMINUM</p> <p>BORDERS: SATIN/BRUSHED FINISH</p> <p>LETTERING: SENECA STYLE; SATIN/BRUSHED FINISH</p> <p>BACKGROUND: LEATHERETTE FINISH (OXIDIZED DARK BRONZE OR BLACK)</p> <p>ADDITIONAL REQUIREMENTS IN SPECS.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>PLAQUE MANUFACTURER TO RECEIVE DIVISION 10 PLAQUE SPECIFICATIONS FROM CONTRACTOR AND THEN TELEPHONE THE O.F.P.C. MANAGER PRIOR TO STARTING ANY WORK.</p> </div>

REVISION LOG

The following is provided for convenience to the Owner, Architect/Engineer and Contractor to track changes between annual document issuances and is not to be considered by any party to be contractual or 100% complete.

Date	Paragraph Revised
10/06/16	Revised text under 2.01.6; “Project Name” now reads “Building Name” “Year Contract Awarded” now reads “Year of Notice to Proceed” “Names of ... General Contractor” now reads “Names of ... Prime Contractor” “350 small characters” now reads “375 small characters” Revised layout plan to add names for Student Regent and Project Advocate, and Added a second layout drawing showing the spacing requirements for names Revised specification to include cast aluminum as an alternate plaque material

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL (PART 2 AND PART 3 NOT APPLICABLE)

1.1 RELATED DOCUMENTS

Requirements of Drawings, General and Supplementary Conditions and DIVISION 1 apply to this Section.

1.2 SCOPE

- A. Include Cash Allowances for work as herein after described. Types of Allowances include the following:
 - 1. Type A lump sum allowances

1.3 DESCRIPTION OF TYPES OF ALLOWANCES

- A. Type A - A lump sum construction contingency allowance to be used only as directed for Owner's purposes, and only by change orders which designate amounts to be charged to contingency allowance. Contractor's related costs are not included in the Contract Sum (other than allowance itself) for work so ordered to be charged to contingency allowance. The change orders will include direct costs and overhead/profit margins as provided for in the Agreement with the Owner.

1.4 GENERAL REQUIREMENTS

- A. Explanations: certain requirements of the work related to lump sum allowances are shown and specified in Contract Documents. The Allowance has been established in lieu of additional requirements for that work, and further requirements thereof (if any) will be issued by change order.
- B. Selection and Purchase: at earliest feasible date after award of Contract, advise Architect of scheduled date when final selection and purchase of each product or system described by each allowance must be accompanied in order to avoid delays in performance of the work.
 - 1. As requested by the Architect, obtain and submit proposals for the work of each allowance for use in making final selection.
 - 2. Purchase products and systems as specifically selected (in writing) by the Architect.
- C. Where economically feasible, and when so requested by the Architect, return unused materials to the manufacturer/supplier for credit to the Owner, after the installation has been completed and accepted.
- D. Final Settlement: Unexpended sums of Cash Allowance will revert to the Owner at the final settlement of the Contract.

1.5 SCHEDULE OF ALLOWANCES

Allowance:

A-1: Include enhancements to interior finish-out at Coffee Bar: Allowance of \$70,000.00.

END OF SECTION

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for procedures for using unit prices to adjust quantity allowances.

1.3 DEFINITIONS

- A. Unit price is a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

- A. Unit Price No. 1: General Excavation.
 - 1. Description: Soil excavation and disposal off-site as required, according to Section 312000 "Earth Moving."
 - 2. Unit of Measurement: Cubic yard of soil excavated, based on in-place surveys of volume before and after removal.

UNIT PRICES 01 2200 - 2
UTRGV SOM TBL CENTER
100% CD

B. Unit Price No. 2: Trench Excavation.

1. Description: Soil excavation and disposal off-site as required, according to Section 312000 "Earth Moving."
2. Unit of Measurement: Cubic yard of soil excavated, based on in-place surveys of volume before and after removal.

C. Unit Price No. 3: Footing Excavation.

1. Description: Soil excavation and disposal off-site as required, according to Section 312000 "Earth Moving."
2. Unit of Measurement: Cubic yard of soil excavated, based on in-place surveys of volume before and after removal.

D. Unit Price No. 4: Select Fill, compacted, in place.

1. Description: Satisfactory fill material or engineered fill from off-site, as required, according to Section 312000 "Earth Moving."
2. Unit of Measurement: Cubic yard of soil excavated, based on in-place surveys of volume before and after removal.

E. Unit Price No. 5: 4,500 PSI Concrete, in place.

1. Description: Concrete required for drilled pier length.
2. Unit of Measurement: Cubic yard of placed concrete, based on in-place surveys of volume before and after removal.

F. Unit Price No. 6: Reinforcing steel, in place.

1. Description: Reinforcing steel required for drilled pier length.
2. Unit of Measurement: Weight of steel in tons, based on assembly required for drilled piers.

G. Unit Price No. 7: Drilled Piers – 24" Diameter.

1. Description: Depth of piers required to reach subsurface soil conditions in accordance with bearing pressures indicated.
2. Unit of Measurement: Depth in linear feet of drilling required.

H. Unit Price No. 8: Drilled Piers – 30" Diameter.

1. Description: Depth of piers required to reach subsurface soil conditions in accordance with bearing pressures indicated.
2. Unit of Measurement: Depth in feet of drilling required.

I. Unit Price No. 9: Drilled Piers – 12" Diameter.

1. Description: Depth of piers required to reach subsurface soil conditions in accordance with bearing pressures indicated.
2. Unit of Measurement: Depth in feet of drilling required.

J. Unit Price No. 10: Drilled Pier Casing – 24" Diameter.

1. Description: Depth of casing required for unstable ground conditions and to retain groundwater encountered in drilling procedures.
2. Unit of Measurement: Depth in feet of casing required.

- K. Unit Price No. 11: Drilled Pier Casing – 30" Diameter.
1. Description: Depth of casing required for unstable ground conditions and to retain groundwater encountered in drilling procedures.
 2. Unit of Measurement: Depth in feet of casing required.
- L. Unit Price No. 12: Drilled Pier Casing – 12" Diameter.
1. Description: Depth of casing required for unstable ground conditions and to retain groundwater encountered in drilling procedures.
 2. Unit of Measurement: Depth in feet of casing required.
- M. Unit Price No. 13: Drilling Slurry.
1. Description: Placement of drilling slurry, removal of soil cuttings (including removal from site), testing of slurry in place, and removal of displaced slurry from site.
 2. Unit of Measurement: Cubic yard of drilling slurry placed.

END OF SECTION 012200

SECTION 012300 – ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. ALTERNATE NO. 1: Provide a SBS Modified Bituminous Membrane Roof System per Specification Section 075216, in lieu of "torch Applied" specification section 075500.
- B. ALTERNATE NO. 2: Provide CAT 6A in lieu of CAT 6 cable. Refer to Technology Drawings and Specifications.
- C. ALTERNATE NO. 3: Provide air flow measuring using thermal dispersion on the VAV boxes.
- D. ALTERNATE NO. 4: Provide and install a 100-gallon capacity grease interceptor and associated piping for a fully operational unit as indicated on the drawings.
- E. ALTERNATE NO. 5: Provide 10' x 35' grass paver area at NW corner, as indicated on the drawings. Provide electrical connection for temporary chiller as indicated on drawings.
- F. ALTERNATE NO. 6: Provide wheelchair accessible ramp at south side of building as indicated on the drawings.
- G. ALTERNATE NO. 7: Provide landscape materials as per plan L2.02 in lieu of landscape materials for base bid Sheet L2.01.
- H. ALTERNATE NO. 8: Provide card readers as indicated at security plan TS-201, TS-202 and security schedule TS-401.
- I. ALTERNATE NO. 9: Provide epoxy coated condenser coil as per 23 64 26 rotary screw water chillers.
- J. ALTERNATE NO. 10: Provide two pole lights at north side of building per Sheet E-101, C-102 and A-102.
- K. ALTERNATE NO. 11: Provide custom pattern vinyl window film as indicated on Sheet A-801.

END OF SECTION 012300

SECTION 01 5639- VEGETATION PROTECTION & RELOCATION

PART 1 GENERAL

1.1 SCOPE

General: Section Includes: Labor, materials, necessary equipment and services to complete the tree protection and relocation work.

A. Related Section:

1. 32 9000 – Planting
2. 32 8000 – Irrigation
3. 32 9200 – Lawns

B. Before tree excavation, pruning, removal, or relocation of existing trees, contractor shall engage a certified arborist (ISA Certified) and notify and meet with:

1. GC / SSP / Landscape Architect
2. Appropriate utility companies for spotting and coordination of service disconnection as necessary to complete work.
3. All other trades associated or affected by this work.

1.2 REFERENCES

- A. General: "Hortus Third," 1976.
- B. Texas Association of Nurserymen, Grades and Standards for Nursery Stock.
- C. Plant Material: "American Standard for Nursery Stock," ANSI Z60.1-1990.
- D. NAA: National Arborist Association Standards
- E. ISA: International Society of Arboriculture

1.3 DEFINITION

A. Toxic Substances:

1. Do not deliver any toxic substance or item to the site without furnishing to the owner a Texas Material Safety Data Sheet (MSDS).
2. Provide current MSDS information with each initial shipment.
3. The MSDS shall contain the following information:
 - a. The chemical name and the common name of the toxic substance.
 - b. The hazards or other risks in the use of the toxic substance, including:
 - 1) The potential for fire, explosion, corrosivity and reactivity.
 - 2) The known acute and chronic health effects of risks from exposure, including the medical conditions which are generally recognized as being aggravated by exposure to the toxic substance.
 - 3) The primary routes of entry and symptoms of overexposure.
 - c. The proper precautions, handling practices, necessary personal protective equipment, any other safety precautions in the use of or exposure to the toxic substance including appropriate emergency treatment in case of overexposure.
 - d. The emergency procedure for spills, fire disposal, and first aid.
 - e. A description in lay terms of the known specific potential health risks posed by the toxic substance intended to alert any person reading this information.
 - f. The year and month, if available, that the information was compiled and the name, address, and emergency telephone number of the manufacturer responsible for preparing the information.

1.04 DESCRIPTION

- A. Protect existing trees to remain during construction phases. Provide tree protection fencing around all trees to remain and barriers for existing trees adjacent to tree transplantation operations. Any trees designated to remain that are scarred, damaged or destroyed shall be replaced at the Contractor's expense, with similar species, size, and quality. Provide temporary watering methods for trees and vegetation to remain on site – hand water if required. Watering schedule shall be coordinated by contractors' certified arborist in conjunction with Owner.
- B. Relocate trees/palms as noted on plans. All relocations are within the campus as shown on plans and/or as directed by Owner / GC / SSP.
- C. Resulting tree pits of relocated material on site shall be backfilled with clean top soil fill and brought back flush with surrounding grade, unless the pits are to be immediately replanted. Stabilize/compact grade if required. Correct problems caused by erosion, wind, etc., in the reclaimed area. Pits to be quickly replanted shall be surrounded by safety barricades to prevent accidental falls into pits.
 - 1. In areas where new plant material will replace relocated plant material, appropriate planting soil mix shall be used as backfill.
- B. Remove other vegetation per plans or as directed by GC / SSP to accommodate new plantings. Prepare areas to be planted according to Section 32 9000.

1.05 SUBMITTALS

- A. Submit certified arborist information, protection measures & materials, pruning/trimming/watering schedule, for use in tree protection for approval by GC / SSP.
- B. Submit a list of equipment, procedures, and labor force anticipated for use in tree relocation for approval by GC / SSP.
- C. Submit a daily/weekly schedule indicating trees/palms to be dug and relocated. Note materials requiring root pruning, and that the relocation schedule is to begin at the end of the specified root pruning period.
- D. Obtain permits required by the local tree or landscape ordinances which may include meeting with the local City or Urban Forester.
- E. Submit written certification that trees indicated to remain have been protected during the course of construction according to industry standards. Certify that where damage did occur:
 - 1. Trees were promptly and properly treated.
 - 2. Indicate which damaged trees (if any) are incapable of retaining full growth potential and are recommended to be replaced.

1.06 QUALITY ASSURANCE

- A. The Contractor's crew used for the relocation of existing trees shall have minimum 10 years' experience in relocation of existing plant materials and shall include an ISA Certified Arborist.
- B. Unless otherwise specified, tree transplanting shall comply with NAA Ref.1.
- C. Comply with NAA standards for pruning and remove branches from trees to remain to clear new construction.
- D. Recommend procedures to compensate for loss of roots (if any) and perform initial pruning of branches and stimulation of root growth where removed to accommodate new construction.
- E. Perform tree repair work for damage incurred by new construction.
- F. Provide routine progress evaluation reports on relocated trees until the end of the maintenance period.

- G. Evaluate existing trees and verify trees are free of disease and ready to survive relocation from the site to their new location on-site or off-site.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Properly handle trees and palms during moving so trunks will not be scarred or damaged and to avoid broken limbs. Broken limbs not causing the tree to be rejected shall be repaired as follows:
 - 1. Properly prune dead, dying, or damaged branches with clean, sharp equipment.
 - 2. Remove injured bark and wood of a tree would with a clean, sharp knife to a point where healthy bark and wood make contact at their margins.
 - 3. Inspect and treat wound for insect and disease.
 - 4. Seal wounds with bituminous base wound paint for all limbs greater than 3 inch diameter.
- B. Transport trees on vehicles of adequate size to prevent overcrowding, broken limbs, foliage damage, or root ball damage.
- C. Keep root balls moist during relocation.
- D. Protect tree crowns with shade cloth to prevent desiccation and wind burn. Crowns shall be periodically sprayed with water to help ensure against desiccation.
- E. Handle plant material only in ways and means accepted by industry standards and accepted by Owner.
- F. Plant material shall be planted the same day it is dug. Coordinate preparation of planting pits or temporary nursery accommodations to ensure this schedule.

1.08 WARRANTY

- A. For protected/preserved trees or palms that die due to contractor negligence during construction, replace their canopy area with new trees as specified:
 - 1. Canopy spread for trees shall be a minimum of six feet and a caliper of at least 3 inches. Height for replacement palms shall be a minimum of six clear trunk feet.
 - 2. Replacements (mitigation plantings) shall be provided at no additional cost to the Owner.
 - 3. Proposed replacement canopy tree species shall be approved by Owner.
 - 4. The specification requirements for trees and palms are according to Section 32 9000.
- B. For relocated trees or palms that die, replace their canopy area with new trees as specified:
 - 1. Canopy spread for trees shall be a minimum of six feet and a caliper of at least 3 inches. Height for replacement palms shall be a minimum of six clear trunk feet.
 - 2. Replacements (mitigation plantings) shall be provided at no additional cost to the Owner.
 - 3. Proposed replacement canopy tree species shall be approved by Owner.
 - 4. The specification requirements for trees and palms are according to Section 32 9000.
- C. Repair damage to other plants and lawn or construction work within the relocation area during tree transplantation at no cost to the Owner. This includes, but is not limited to, damage to curbs, walks, roads, fences, site furnishings, etc. Replacing and replanting of damaged trees, shrubs or turf shall be according to Section 32 9000.

1.09 MAINTENANCE

- A. Maintain protected/preserved and relocated plant materials throughout construction period and continue until the 90 day maintenance period is complete, upon which time the Owner will take over maintenance of materials following procedures and recommendations of contractor and specifications.
- B. During the maintenance period, maintain protected and relocated plant materials according to procedures described in Section 32 9000.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Tree Protection Fence: Tree protection fence shall be a minimum of four feet high. Chain Link Fencing (No 9. GA. 2" Mesh with 2" Posts, driven at least 2' into ground @ 6 foot intervals or approved equal).
- B. Tree Protection Signage: Vegetation Protection Areas shall be labeled "Vegetation Protection Area". Signs shall be laminated or otherwise weatherproof and printed in bold text so as to be easily read from a distance of 20 feet. Wording on signage shall be provided in both English and Spanish.
- C. Compost, topsoil, planting soil, mulch, staking, and guying, shall be as specified in section 32 9000.
- D. Fill materials shall be as specified in Section 32 9000.

PART 3 EXECUTION

3.01 VEGETATION PROTECTION

- A. Initial Work: No other construction activity may occur on site until Tree Protection Fencing has been installed and approved by GC / SSP.
- B. Construction Activity: All construction activity within the areas fenced off around the trees shall be prohibited. This shall include the following activities:
 - 1. Parking or driving of equipment, machinery or vehicles of any type.
 - 2. Storage of any construction materials, equipment, stockpiling, excavation or fill, soil, gravel, etc.
 - 3. Dumping of any chemicals, (i.e. paint thinner from cleaning brushes), wash-out materials from cleaning equipment, concrete or mortar remainder, trash, garbage, or debris of any kind.
 - 4. Burning within or in proximity to protected areas.
 - 5. Felling trees into protected areas.
 - 6. Trenching or grading within the Critical Root Zones of protected trees for any purpose without notifying Owner 10 days in advance of operation in writing. This includes utilities, lighting, irrigation, drainage etc.
- C. Tree Protection Areas: Any work required by plans which is in a Tree Protection Area shall be performed by hand. All work shall be performed in a manner to prevent compaction, siltation and disturbance of the root systems of all associated trees and understory trees. At no time shall tree protection fencing be removed or relocated without permission of Owner.
- D. Subcontractor: The general contractor shall be responsible for insuring that all subcontractors are aware of all Vegetation Protection Specifications.
- E. Critical Root Zone: Contractor may operate equipment within the root zone of trees to be preserved only if buffered with 1/2" plywood with a 6" layer of wood chips underneath; or 12 inches of wood chips. Approval from Owner is required prior to operation of any equipment in tree protection areas. Root protection measures shall be inspected and maintained throughout construction.
- F. Location: Contractor will be responsible for installation, repairs and upkeep of tree protection fencing around trees and groups of trees to be preserved. See plan for locations.
- G. Flagging: Prior to installation, Contractor shall flag or paint location of fencing in field for verification by Owner.
- H. Contractor shall include supply, installation, maintenance, and removal of fencing in bid.

- I. Tree Protection Fence: Fencing shall remain in place and be continuously maintained for duration of construction.
- J. Watering: Contractor shall engage ISA Certified Arborist to coordinate and submit watering schedule for approval by Owner. Watering shall be scheduled as required specific species, soil conditions, and time or year.
- K. Damage: Contractor will provide services as necessary to respond to damage by construction activities within 48 hours of notification by the Owner.
- L. Penalties: Failure to comply with specifications will result in penalties as prescribed herein and by local codes and ordinances.

3.02 TRANSPLANTATION

- A. Transplanting shall consist of on-site or off-site transplanting of existing trees or palms from proposed construction areas to storage areas to permanent locations as noted on the drawings.
- B. Digging, Wrapping, and Handling: Plants shall be dug and prepared for moving in a manner that will not cause damage to branches, shape, root system, and development.
- C. Balled and Burlapped Plants:
 - 1. Balls shall be firmly wrapped with wire mesh, burlap or accepted cloth substitute.
 - 2. No balled plant will be acceptable if the ball is cracked and broken or if the stem or trunk is loose in the ball, either before or during transplanting.
 - 3. Balled plants shall be lifted and handled from the bottom of the ball.
 - 4. Protect ball and deliver to the site, plant immediately, and water thoroughly.
 - 5. Ball sizes shall be as recommended in ANSI Z60.1

3.02 PLANTING

- A. Relocated Material:
 - 1. Relocated trees/palms shall be planted according to procedures described for new material, Section 32 9000. Verify final grades have been established before planting operations. Ensure proposed planting pits drain freely by test-filling with water before transplantation.
 - 2. Continue watering and caring for relocated material as specified.
 - 3. Mulch tree pit areas to reduce weeds, discourage foot traffic, conserve moisture, and minimize temperature fluctuations.
 - 4. Brace trunk and leave in place for approximately one year until trees are wind firm.
 - 5. Wrap trunks and structural branches of thin-barked trees to protect against sun scald and dehydration. Retain through at least one growing season, and through hurricane season.
 - 6. Feed with a diluted solution of N-P-K in solution form with a soil needle, providing water, air, and nutrients.
 - 7. Where foliage is retarded, spray with soluble type foliage feeder.
 - 8. At time of planting, fill air pockets and keep roots, especially feeder roots, moist, live, and healthy. Use soil needles for watering new transplants. Direct fine spray at foliage to help harden-off new leaves.

3.03 STAKING AND GUYING

- A. Stake and guy designated material according to procedures described for new plant materials, Section 32 9000.

3.04 WATERING

- A. Following transplantation, water trees daily for the first two weeks, every other day for the next three weeks, and every third day for the balance of the three month watering/maintenance period. Such watering shall thoroughly saturate the root ball to its full depth.
- B. Following relocation, trees designated for transplanting shall be watered as specified in this section. Such watering shall thoroughly saturate the root ball to its full depth.
- C. Provide temporary automatic or manual watering of protected/preserved trees and relocated plant materials during construction and for 90 days after substantial completion. If used, after 90 day maintenance period, Contractor shall be responsible for the complete removal of all temporary watering systems.

3.05 TAGGING

- A. Trees within the designated areas for relocation shall be clearly marked by means of yellow plastic surveyor's ribbons and coordinated with, inspected, and accepted by Owner before root pruning and digging.

3.06 ROOT PREPARATION

- A. Trees to be relocated shall be root pruned at least 45 days before digging with clean, sharp equipment.
 - 1. Maintain root pruned materials by watering, weeding, mowing, spraying, fertilizing, and other horticulture practices.
 - 2. After root pruning, backfill with good rooting medium, fertilize with organic fertilizer to promote root growth.
 - 3. Mulch to reduce weeds, discourage foot traffic, conserve moisture, and minimize temperature fluctuation.
- B. Root Ball Size Chart: Root ball sizes shall be according to minimum standards set forth in Texas Association of Nurserymen, Grades and Standards for Nursery Stock.
 - 1. Trees-Minimum Ball Sizes:

Caliper Minimum Ball Diameter		(Larger sizes increase proportionally)
3-1/2" to 4"	28"	
4" to 4-1/2"	30"	
4-1/2" to 5"	32"	
5" to 5-1/2"	34"	
2. Minimum Ball Depth:		
Ball Diameter Depth		
Less than 20" Not less than 75 percent of diameter.		
20" to 30" Not less than 65 percent of diameter.		
30" to 48" Not less than 60 percent of diameter.		

3.07 CROWN PREPARATION

A. Shade and Flowering Trees:

1. Shade Trees: ISA Certified Arborist to selectively prune and thin crown to remove approximately one third of the branches. Preserve the basic shape and form of the tree, eliminate cross-branching and dead or diseased branches.
2. ISA Certified Arborist to hand strip selected species of all leaves following pruning and before moving.

B. Palms: Follow standard procedure for transplantation of palms as specified in Section 32 9000.

3.08 HAND DIGGING

- #### A. Burlapping is required. Trees that are burlapped for relocation shall comply and be handled in same manner as new plant material specified in Section 32 9000.

3.09 SPECIAL CONDITIONS

A. Multi-Trunk Trees: Relocate multi-trunk tree as one unit. Measure trees by taking the aggregate total of all DBH measurements.

B. Multi-Trunk Palms: Relocate multi-trunk palms as one. Palms shall be measured as follows:

1. 50 percent of the value in dollars of the largest trunk in the grouping times the number of trunks in the clump.

C. On/Off-site relocation:

1. Relocation shall include root pruning, canopy pruning, on/off-site transportation, off-site storage, watering and maintenance, hauling and dumping of debris, and 90-day maintenance after final planting.
2. If the tree or palm should die within the 90 day maintenance period, remove the tree, replace the material, and restore the site at no additional cost to the Owner.

3.10 CLEANING

A. Site Clean-up:

1. Upon completion of each day's work, thoroughly clean up the project site.
2. Remove equipment, unused materials, deleterious material, and surplus excavated material.
3. Fine grade all disturbed areas and the areas adjacent to the transplanted material to provide a neat and uniform site.
4. All damaged or altered existing structures, as a result of the landscape work, shall be corrected.

END OF SECTION 01 5639

SECTION 01 7419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

- A. Owner requires that this project generate the least amount of trash and waste possible.
- B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- D. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- I. Return: To give back reusable items or unused products to vendors for credit.
- J. Reuse: To reuse a construction waste material in some manner on the project site.
- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.01 PRODUCT SUBSTITUTIONS

- A. See Section 01 6000 - Product Requirements for substitution submission procedures.

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

- A. See Section 01 3000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. See Section 01 5000 for additional requirements related to trash/waste collection and removal facilities and services.
- C. See Section 01 6000 for waste prevention requirements related to delivery, storage, and handling.
- D. See Section 01 7000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
- B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Engineer.
- C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
- D. Meetings: Discuss trash/waste management goals and issues at project meetings.
 - 1. Pre-bid meeting.
 - 2. Pre-construction meeting.
 - 3. Regular job-site meetings.
- E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
 - 1. Provide containers as required.
 - 2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
 - 3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
- F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
- G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.
- H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
- I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 01 90 00 – INTERIOR FINISH LEGEND

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

SUMMARY

This Section includes color selections for materials and products referenced on the Drawings and in other Specification sections. Refer to the following Interior Color Schedule attached at the end of this Section. For all other requirements refer to the Drawings and the various applicable Specification sections.

PART 2 - PRODUCTS

GENERAL

Refer to the Drawings and the various applicable Specification sections for requirements for the indicated materials and products.

Products listed in the following schedule are the basis for design. Other manufacturers may have similar products that may be considered acceptable substitutions.

PART 3 - EXECUTION

GENERAL

Refer to the Drawings and the various applicable Specification sections for requirements for execution and installation of the indicated materials.

SCHEDULE OF INTERIOR FINISH MATERIALS

INTEGRAL COLOR CONCRETE- SECTION 03 54 00

Drawing Designation (abbreviation): **ICC (Stair Treads and landings)**

Manufacturer: Butterfield
Color: U18 Gull Gray

ARCHITECTURAL WOODWORK-SECTION 06 41 16

Plastic Laminates:

Drawing Designation (abbreviation): **PLAM-1 (Copier Alcove)**

Manufacturer: Abet Laminati
Color: White Dry Erase Magnetic Marker board

Drawing Designation (abbreviation): **PLAM-2 (Mill work cabinets)**

Manufacturer: Arborite
Color: W-464 EV Blonde Modern Cherry

FINISH LEGEND 01 90 00 - 2
UTRGV SOM TBL CENTER
100% CD

FLUSH DOORS– SECTION 08 14 16

Manufacturer: VT Industries; Graham or Equal
Door Face: White oak, Rift cut
Color: Custom to match architects sample
Finish: Matte

TILE-SECTION 09 30 00

Drawing Designation (abbreviation): **CT-1**

Manufacturer: Florida Tile
Product: Time 2.0
Finish: Natural
Size: 6 x 24
Colors:
CT-1.A T27B1 Grey Natural
CT-1.B T26B1 Silver Natural

Contact: Anne.Galmor@floridatile.com
Phone 210.981.2569

NOTE: Install with 1/8" grout joint. Provide Schluter SS trim at corners and exposed edges.
Provide cove base to match wall tile.

Drawing Designation (abbreviation): **CT-2**

Manufacturer: Florida Tile
Product: Time 2.0
Finish: Unpolished
Size: 12" x 24"
Color:
CT-2A Gray Natural
CT-2B Silver Natural

Drawing Designation (abbreviation): **CT-3 (Base)**

Manufacturer: Florida Tile
Product: Time 2.0 Bullnose
Color: T27B1 Grey Natural
Size: 12" x 3" high

Drawing Designation (abbreviation): **CT-4 (Coffee Bar Wall)**

Manufacturer: Daltile
Product: Modern Dimensions
Size: 4" x 12"
Colors: to be selected

TILE GROUT – SECTION 09 30 00

Tile Grout:

Drawing Designation (abbreviation): **TG-1**
Manufacturer: Mapei
Type: Flexcolor CQ
Color: To be Selected

Tile Grout:

Drawing Designation (abbreviation): **TG-2**
Manufacturer: Mapei
Type: Flexcolor CQ
Color: To be selected

ACOUSTICAL CEILINGS-SECTION 09 51 13

Mineral Fiber Ceiling Panel:

Drawing Designation (abbreviation): **ACP-1**

Manufacturer: Armstrong
Style: Ultima, tegular edge
Size: 24" x 24"
Suspension: 15/16" grid, White

Fiberglass Ceiling Panel:

Drawing Designation (abbreviation): **ACP-2 (Lobby)**

Manufacturer: Armstrong
Style: Lyra Vector, downward access
Size: 24" x 96"
Suspension: Prelude 15/16" grid, White

Washable Face Ceiling Panel:

Drawing Designation (abbreviation): **ACP-3 (food prep at Coffee Bar)**

Manufacturer: USG
Style: Clean Room ClimaPlus Size: 24" x 24"
Suspension: 15/16" grid; White

WOOD PANEL CEILINGS-SECTION 09 54 33

Wood Veneer Ceiling Panel

Drawing Designation (abbreviation): **Wood Panel (Lobby low ceiling)**

Manufacturer: Armstrong
Style: Woodworks Concealed Grid Panel
Finish: Unperforated Natural White Oak, rift sawn
Size: As shown on Drawings
Suspension: Prelude XL 15/16" grid, Silver

NOTE: Wood Panel to also be used on vertical wall surface as shown on drawings. Provide Ceiling manufacturer's integral mitered upturn trim piece to match panels.

RESILIENT FLOORING - SECTION 09 65 00

Drawing Designation (abbreviation): **LVT**

Manufacturer: Mohawk Group
Product: Matuto Plus
Size: 12" x 24"
Colors: 927 Sonic Silver; 915 Frostbite

Resilient Base

FINISH LEGEND 01 90 00 - 4
UTRGV SOM TBL CENTER
100% CD

Drawing Designation (abbreviation): **VB**

Manufacturer: Johnsonite
Type: Vinyl 4"H, straight at carpet, coved at resilient
Color: Pewter

MODULAR CARPET - SECTION 09 68 13

Modular Carpet:

Drawing Designation (abbreviation): **CPT-1**

Manufacturer: Mohawk Group
Style: Art Exposure Collection/Adaptable
Size: 24" x 24"
Color:
CPT 1A 959 Slate (Medium Gray)
CPT 1B 989 Charcoal (Dark Gray)

Modular Carpet:

Drawing Designation (abbreviation): **CPT-2**

Manufacturer: Mohawk Group
Style: Color Balance Tile
Size: 12" x 36"
Color: 575 Nightshade (Blue)

FIBERGLASS REINFORCED PLASTIC PANELS - SECTION 09 77 00

Drawing Designation (abbreviation): **FRP** (Janitor)

Manufacturer: Sequentia Structo Décor FRP
Finish: Class C Sandstone
Color: Cotton White

PAINT - SECTION 09 91 00

Drawing Designation (abbreviation): **PT-1** (General Wall Color)

Manufacturer: Sherwin Williams
Color: SW 7649 Silver Plate

Drawing Designation (abbreviation): **PT-2** (Large Classroom accent)

Manufacturer: Sherwin Williams
Color: To be Selected

Drawing Designation (abbreviation): **PT-3** (Collaboration Room accent)

Manufacturer: Sherwin Williams
Color: To be Selected

Drawing Designation (abbreviation): **PT-4** (Lobby Accent)

Manufacturer: Sherwin Williams
Color: TBS

Drawing Designation (abbreviation): **PT-5** (Drywall ceilings)

Manufacturer: Sherwin Williams
Color: SW 7008 Alabaster

Drawing Designation (abbreviation): **PT-6** (Coffee Bar)

Manufacturer: Benjamin Moore
Color: To be Selected

Drawing Designation (abbreviation): **PT-7** (Stair Walls)
Manufacturer: Sherwin Williams
Color: SW 6884 Obstinate Orange

Drawing Designation (abbreviation): **PT-8** (Steel Handrails and Stair structure)
Manufacturer: Sherwin Williams
Color: SW 7019 Gauntlet Gray

Drawing Designation (abbreviation): **PT-9** (Accent wall at Nursing Suite)
Manufacturer: Sherwin Williams
Color: SW 6550 Mythical

TOILET PARTITIONS – SECTION 10 01 00

Toilet Partitions

Manufacturer: Scranton
Material: Solid Plastic
Color: Stainless EX

WINDOW COVERINGS – SECTION 12 21 13

Roller Shades

Manufacturer: MechoShade or approved Equal
Shade Cloth: Thermoveil; 3% openness factor
Color: To be selected

Note- Refer Finish Schedule for location of dual roller shades and motorized shades.

QUARTZ & SOLID SURFACING COUNTERTOPS- SECTION 12 36 61

Engineered Stone

Drawing Designation (abbreviation): **QS-1 (Restroom Lavatory Counters)**

Manufacturer: Wilsonart
Product: Quartz Select, 2 cm
Color: Q6002 White Blossom

Solid Surface

Drawing Designation (abbreviation): **SS (Workroom, Lactation Counters)**
Manufacturer: LG
Product: Hi Macs
Color: T17 Andromeda

END OF SECTION-

SECTION 02 4100
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Selective demolition of built site elements.
- B. Removal of existing utilities and utility structures.

1.02 RELATED REQUIREMENTS

- A. Section 01 1000 - Summary: Limitations on Contractor's use of site and premises.
- B. Section 01 5713 - Temporary Erosion and Sediment Control.
- C. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.
- D. Section 01 7419 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.
- E. Section 31 1000 - Site Clearing: Vegetation and existing debris removal.
- F. Section 31 2200 - Grading: Topsoil removal.
- G. Section 31 2200 - Grading: Fill material for filling holes, pits, and excavations generated as a result of removal operations.
- H. Section 31 2323 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.
- I. Section 31 2323 - Fill: Filling holes, pits, and excavations generated as a result of removal operations.

1.03 REFERENCE STANDARDS

- A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.04 SUBMITTALS

- A. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
 - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
 - 2. Include a summary of safety procedures.
- B. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.05 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
 - 1. Minimum of 5 years of documented experience.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Fill Material: As specified in Section 31 2323 - Fill.

PART 3 EXECUTION

3.01 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.

2. Comply with applicable requirements of NFPA 241.
 3. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 4. Provide, erect, and maintain temporary barriers and security devices.
 5. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
 6. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 7. Do not close or obstruct roadways or sidewalks without permit.
 8. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
 9. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- B. Do not begin removal until receipt of notification to proceed from Owner.
- C. Do not begin removal until built elements to be salvaged or relocated have been removed.
- D. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.
- E. Protect existing structures and other elements that are not to be removed.
1. Provide bracing and shoring.
 2. Prevent movement or settlement of adjacent structures.
 3. Stop work immediately if adjacent structures appear to be in danger.
- F. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- G. If hazardous materials are discovered during removal operations, stop work and notify Engineer Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
- H. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.
- I. Perform demolition in a manner that maximizes salvage and recycling of materials.
1. Comply with requirements of Section 01 7419 - Waste Management.
 2. Dismantle existing construction and separate materials.
 3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

3.02 EXISTING UTILITIES

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

- H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.03 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 7419 - Waste Management.
- C. Leave site in clean condition, ready for subsequent work.
- D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01SECTION INCLUDES

- A. Miscellaneous concrete elements, including equipment pads, light pole bases, flagpole bases, thrust blocks, and manholes.

1.04REFERENCE STANDARDS

- A.ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).
- B.ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2015.
- C.ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2014.

PART 2 PRODUCTS

2.01CONCRETE MATERIALS

- A. Fly Ash: ASTM C618, Class C or F.
- B. Calcined Pozzolan: ASTM C618, Class N.
- C. Silica Fume: ASTM C1240, proportioned in accordance with ACI 211.1.

END OF SECTION

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
 - 1. Piers.
 - 2. Slabs-on-grade and beams.
 - 3. Slabs on metal deck
 - 4. Concrete toppings.
- B. WORK INCLUDED
 - 1. Design, fabrication, erection, and stripping of formwork for cast-in-place concrete including falsework, bracing, proprietary forming systems, prefabricated forms, permanent metal forms, bulkheads, keys, blockouts, sleeves, pockets, and accessories. Erection shall include installation in formwork of items furnished by other trades.
 - 2. Furnish all labor and materials required to fabricate, deliver and install reinforcement and embedded metal assemblies for cast-in-place concrete, including steel bars, welded steel wire fabric, ties and supports.
 - 3. Furnish all labor and materials required to perform the following:
 - a. Cast-in-place concrete
 - b. Concrete mix designs
 - c. Grouting structural steel baseplates
 - d. Concrete for drilled piers
- C. Related Sections include the following:
 - 1. Division 31 Section "Drilled Piers" for drilled concrete piers.
 - 2. Division 32 Section "Concrete Paving" for concrete pavement and walks.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: fly ash and other pozzolans; subject to compliance with requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture submit proposed mix designs in accordance with ACI 318 Chapter 26. Each proposed mix design shall be accompanied by a record of past performance.
 - 1. Submit mix designs on forms supplied at the end of this Section.
 - 2. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 3. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
 - 1. Do not reproduce the structural drawings for use as shop drawings.
 - 2. Embedded metal assemblies: Submit shop drawings for fabrication and placement. Use standard AWS welding symbols.
- D. Construction Joint Layout: Submit a diagram of proposed construction joint locations for horizontal framing that exceed the limits of a single placement as stated in the structural notes, other than those indicated on the Drawings.
- E. Floor surface flatness and levelness measurements to determine compliance with specified tolerances.
- F. Submit manufacturer's certification of maximum chloride ion content in admixtures.

1.5 INFORMATION SUBMITTALS

- A. Steel Reinforcement Submittals for Information: Mill test certificates of supplied concrete reinforcing, indicating physical and chemical analysis.
- B. Welding certificates.
- C. Qualification Data: For manufacturer.
- D. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
 - 1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
- E. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials
 - 2. Admixtures
 - 3. Steel reinforcement and accessories

4. Waterstops
 5. Curing compounds
 6. Bonding agents
 7. Adhesives
 8. Vapor retarders
 9. Semirigid joint filler
 10. Joint-filler strips
 11. Repair materials
- F. Fly ash: Submit certification attesting to carbon content and compliance with ASTM C618.
- G. Field quality-control test and inspection reports.
- H. Floor surface flatness and levelness measurements to determine compliance with specified tolerances.
- I. Minutes of preinstallation conference.

1.6 QUALITY ASSURANCE

- A. Domestic Iron and Steel Certification. Pursuant to sections 2252.201-2252.205 of the Government Code, the Contractor certifies that it is in compliance with the requirement that any iron or steel product produced through a manufacturing process and used in the Project is produced in the United States.
- B. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- C. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- E. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."
- F. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5.
 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

CAST IN PLACE CONCRETE - 4
UTRGV SOM TBL CENTER
100% CD

- G. Concrete Testing Service: Owner may engage a qualified independent testing agency to perform material evaluation tests.
- H. Mockups: Cast concrete slab-on-grade panels to demonstrate typical joints, surface finish, texture, tolerances, and standard of workmanship.
 - 1. Build panel approximately 200 sq. ft. for slab-on-grade in the location indicated or, if not indicated, as directed by Architect.
 - 2. Approved panels may become part of the completed Work if undisturbed at time of Substantial Completion.
- I. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
 - 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete subcontractor.
 - e. Specialty concrete finish subcontractor.
 - 2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
- B. Steel reinforcement: to be stored on pallets or dunnage and kept off the ground for protection from corrosion and inspection.
- C. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.
- D. Store all proprietary materials in accordance with manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Plywood, metal, or other approved panel materials.
 - 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
 - b. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.
- D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
 - 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.
- G. Expanded Polystyrene (EPS) Geofoam:
 - 1. Lightweight expanded polystyrene with a minimum compressive strength of 2.2 pounds per square inch (psi) at a 1% deformation.
 - 2. Geofoam shall be in compliance with ASTM D 6817.
 - 3. Geofoam shall be shaped to provide continuous support for raised slabs or to act as a lightweight fill material at locations indicated on the drawings.
 - 4. All Geofoam blocks shall be treated by the manufacturer with a tested and proven termite treatment for below grade applications, 3 year minimum field exposure. The treatment shall be EPA registered, meet the requirements of ICC ES AC 239, and be recognized in an ICC ES report.
 - 5. Available Products:
 - a. Foam-Control EPS Geofoam, AFM Corporation.

- b. InsulFoam GF, Insulfoam, LLC.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
- C. Plain-Steel Wire: ASTM A 1064, as drawn.
- D. Plain-Steel Welded Wire Reinforcement: ASTM A 1064, plain, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut bars true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
 - 2. For slabs on grade and slabs on void forms, provide sand plates, horizontal runners, or precast concrete blocks on bottom where base material will not support chair legs or where vapor barrier has been specified.

2.4 MECHANICAL SPLICES

- A. Provide mechanical splices designed to develop, in tension and compression, 125 percent of the minimum ASTM specified yield strength of the smaller bar being spliced. The following splicing systems are acceptable:
 - 1. Erico "Cadweld T-Series"
 - 2. Erico "Lenton"
 - 3. Dayton Barsplice "Bar-Grip"
 - 4. Dayton Barsplice "Grip-Twist"

2.5 DOWEL BAR ANCHORS

- A. Provide dowel bar anchors and threaded dowels designed to develop, in tension and compression, 125 percent of the minimum ASTM specified yield strength of the dowel bars. Unless otherwise indicated, anchors shall be furnished with ACI standard 90 degree hooks. Dowels shall be furnished by the anchor supplier. The following dowel splicing systems are acceptable:
 - 1. Richmond Screw Anchor "Dowel Bar Splicer"

2. Erico "Lenton Form Saver"
3. Dayton Barsplice "Grip-Twist"

2.6 EMBEDDED METAL ASSEMBLIES

- A. Steel Shapes and Plates: ASTM A36
- B. Headed Studs: Heads welded by full-fusion process, as furnished by TRW Nelson Stud Welding Division.
- C. Welded Deformed Bar Anchors: Welded by full fusion process, as furnished by TRW Nelson Stud Welding Division.
- D. Reinforcing Bars to be Welded: ASTM A706.
- E. Coatings
 1. Hot dip galvanizing shall conform to ASTM A123, "Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products."
 2. Cold Galvanizing Compound for field repair of galvanizing: "ZRC Cold Galvanizing Compound" by ZRC Chemical Products Company, Quincy, Massachusetts.

2.7 INSERTS

- A. Provide metal inserts required for anchorage of materials or equipment to concrete construction where not supplied by other trades:
 1. In vertical concrete surfaces for transfer of direct shear loads only, provide adjustable inserts, complete with bolts, nuts, and washers. Provide 3/4" bolt size unless otherwise indicated. Adjustable inserts shall be one of the following:
 - a. Malleable iron wedge inserts:
 - 1) Hohmann & Barnard, Inc.: #HW-340 and LW-340
 - 2) Heckmann Building Products, Inc: #425-6 and 425-6L
 - 3) Peerless Hardware, Inc.: #250-3/4 and 250-3/4L
 - b. Hohmann & Barnard, Inc. Sharktooth inserts ST-3 or ST-4 (hot-dip galvanized finish).
 - c. Provide the long versions of the inserts at beam and slab soffit conditions, unless noted otherwise.
 2. In horizontal concrete surfaces and whenever inserts are subject to tension forces, provide threaded inserts of malleable cast iron, furnished with full depth bolts, 3/4" bolt size unless otherwise indicated.

2.8 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type V, gray or an equivalent to C150, Type V per ACI 201.2R-08 section 6.2.5, 6.2.7, and 6.29 unless note otherwise. ASTM C 150, Type I/II at slab on composite metal deck. May supplement with the following as required:
 - a. Fly Ash: ASTM C 618, Class F or C.
 - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120
- B. Silica Fume: ASTM C 1240, amorphous silica.
- C. Normal-Weight Aggregates: ASTM C 33, Class 1N coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
 1. Maximum Coarse-Aggregate Size: As indicated on drawings.
 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Water: ASTM C94/94M and potable.

2.9 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- C. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable,[free of carbon black,] nonfading, and resistant to lime and other alkalis.
 1. Manufacturers:
 - a. ChemMasters.
 - b. Davis Colors.
 - c. Dayton Superior Corporation.
 - d. Hoover Color Corporation.

- e. Lambert Corporation.
 - f. QC Construction Products.
 - g. Rockwood Pigments NA, Inc.
 - h. Scofield, L. M. Company.
 - i. Solomon Colors, Inc.
 - j. Approved equal.
2. Color: As selected by Architect from manufacturer's full range.

2.10 WATERSTOPS

- A. Waterstops: At all construction joints below grade. "Synko-Flex" Preformed Plastic Waterstop by the Henry Company, Inc., meeting the requirements of Federal Specification SSS-210.

2.11 VAPOR RETARDERS

- A. Plastic Vapor Retarder: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape. Installation shall be in accordance with ASTM E 1643 and manufacturer's instructions.
- 1. Membrane shall have the thickness as indicated on the Structural Drawings.
 - 2. Products:
 - a. Carlisle Coatings & Waterproofing, Inc. Blackline 400.
 - b. Epro; Ecoshield-E 15 mil.
 - c. Reef Industries. Vaporguard.
 - d. Stego Wrap 15 mil, by Stego.
 - e. SureWrap 15 mil, by VoidForm Products, Inc.

2.12 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- 1. Products:
 - a. Axim Concrete Technologies; CATEXOL Cimfilm.
 - b. BASF Construction Chemicals – Building Systems; Confilm.
 - c. ChemMasters; Spray-Film.
 - d. Conspec by Dayton Superior; Aquafilm.

CAST IN PLACE CONCRETE - 10
UTRGV SOM TBL CENTER
100% CD

- e. Dayton Superior Corporation; Sure Film (J-74).
 - f. Edoco by Dayton Superior; BurkeFilm.
 - g. Euclid Chemical Company (The), an RPM company; Eucobar.
 - h. Kaufman Products, Inc.; Vapor Aid.
 - i. Lambert Corporation; LAMBCO Skin.
 - j. L&M Construction Chemicals, Inc.; E-Con.
 - k. Meadows, W. R., Inc.; EVAPRE.
 - l. Metalcrete Industries; Waterhold.
 - m. Nox-Crete Products Group; Monofilm.
 - n. Sika Corporation, Inc.; SikaFilm.
 - o. SpecChem, LLC; Spec Film.
 - p. Symons by Dayton Superior; Finishing Aid.
 - q. TK Products, Division of Sierra Corporation; TK-2120 TRI-FILM.
 - r. Unitex; Pro-Film.
 - s. Vexcon Chemicals, Inc.; Certi-Vex Envio Set.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: ASTM C1602.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
1. Products:
- a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
 - b. BASF Construction Chemicals – Building Systems; Kure 200.
 - c. ChemMasters; Safe-Cure Clear.
 - d. Conspec by Dayton Superior; W.B. Resin Cure.
 - e. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).
 - f. Edoco by Dayton Superior; Res X Cure WB.
 - g. Euclid Chemical Company (The), an RPM company; Kurez W VOX; TAMMSCURE WB 30C.
 - h. Kaufman Products, Inc.; Thinfilm 420.

- i. Lambert Corporation; Aqua Kure-Clear.
 - j. L&M Construction Chemicals, Inc.; L&M Cure R.
 - k. Meadows, W. R., Inc.; 1100 Clear.
 - l. Nox-Crete Products Group; Resin Cure E.
 - m. Right Pointe; Clear Water Resin.
 - n. SpecChem, LLC; Spec Rez Clear.
 - o. Symons by Dayton Superior; Resi-Chem Clear.
 - p. TK Products, Division of Sierra Corporation; TK-2519 DC WB.
 - q. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.
- F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.
- 1. Products:
 - a. Anti-Hydro International, Inc.; AH Clear Cure WB.
 - b. BASF Construction Chemicals – Building Systems; Kure-N-Seal WB.
 - c. ChemMasters; Safe-Cure & Seal 20.
 - d. Conspec by Dayton Superior; Cure and Seal WB.
 - e. Cresset Chemical Company; Crete-Trete 309-VOC Cure & Seal.
 - f. Dayton Superior Corporation; Safe Cure and Seal (J-18).
 - g. Edoco by Dayton Superior; Spartan Cote WB II.
 - h. Euclid Chemical Company (The), an RPM company; Aqua Cure VOX; Clearseal WB 150.
 - i. Kaufman Products, Inc.; Cure & Seal 309 Emulsion.
 - j. Lambert Corporation; Glazecote Sealer-20.
 - k. L&M Construction Chemicals, Inc.; Dress & Seal WB.
 - l. Meadows, W. R., Inc.; Vocomp-20.
 - m. Metalcrete Industries; Metcure.
 - n. Nox-Crete Products Group; Cure & Seal 150E.
 - o. Symons by Dayton Superior; Cure & Seal 18 Percent E.
 - p. TK Products, Division of Sierra Corporation; TK-2519 WB.
 - q. Vexcon Chemicals, Inc.; Starseal 309.

CAST IN PLACE CONCRETE - 12
UTRGV SOM TBL CENTER
100% CD

- G. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18 to 25 percent solids, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.

1. Products:

- a. BASF Construction Chemicals – Building Systems; Kure-N-Seal W.
- b. ChemMasters; Safe-Cure Clear.
- c. Conspec by Dayton Superior; High Seal.
- d. Dayton Superior Corporation; Safe Cure and Seal (J-19).
- e. Edoco by Dayton Superior; Spartan Cote WB II 20 Percent.
- f. Euclid Chemical Company (The), an RPM Company; Diamond Clear VOX; Clearseal WB STD.
- g. Kaufman Products, Inc.; SureCure Emulsion.
- h. Lambert Corporation; Glazecote Sealer-20.
- i. L&M Construction Chemicals, Inc.; Dress & Seal WB.
- j. Meadows, W. R., Inc.; Vocomp-20.
- k. Metalcrete Industries; Metcure 0800.
- l. Nox-Crete Products Group; Cure & Seal 200E.
- m. Symons by Dayton Superior; Cure & Seal 18 Percent E.
- n. Vexcon Chemicals, Inc.; Starseal 0800.

- H. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

1. Products:

- a. BASF Construction Chemicals – Building Systems; Kure 1315.
- b. ChemMasters; Polyseal WB.
- c. Conspec by Dayton Superior; Sealcure 1315 WB.
- d. Edoco by Dayton Superior; Cureseal 1315 WB.
- e. Euclid Chemical Company (The), an RPM company; Super Diamond Clear VOX; LusterSeal WB 300.
- f. Kaufman Products, Inc.; Sure Cure 25 Emulsion.
- g. Lambert Corporation; UV Safe Seal.
- h. L&M Construction Chemicals, Inc.; Lumiseal WB Plus.
- i. Meadows, W. R., Inc.; Vocomp-30.
- j. Metalcrete Industries; Metcure 30.

- k. Right Pointe; Right Sheen WB30.
 - l. Symons by Dayton Superior; Cure & Seal 31 Percent E.
 - m. Vexcon Chemicals, Inc.; Vexcon Starseal 1315.
2. VOC Content: Curing and sealing compounds shall have a VOC content of 200 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24)

2.13 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber .
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 per ASTM D 2240.
- C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- E. Reglets: Fabricate reglets of not less than 0.0217-inch- thick, galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- F. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.0336 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.
- G. Dovetail anchor slots: For receiving inserts for anchoring masonry veneer, cast stone, and natural stone to concrete structure. Slots shall be 22 gauge, galvanized sheet steel and dovetail slotted, with foam filler equal to No. 305 made by Hohmann and Barnard, Inc., or approved equal. Slots shall be 1" wide and 1" deep unless noted otherwise.
- H. Sleeves and Blockouts: Formed with galvanized metal, galvanized pipe, polyvinyl chloride pipe, fiber tubes, or wood.
- I. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required; of strength and character to maintain formwork in place while placing concrete.

2.14 REPAIR MATERIALS

- A. Repair Underlayment: Pre-packaged, cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

CAST IN PLACE CONCRETE - 14
UTRGV SOM TBL CENTER
100% CD

2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
 4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlayment: Pre-packaged, cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
 4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.
- C. Repair Mortar – Hand-Applied: Pre-packaged, cement-based, two-component, polymer-modified, trowel-grade mortar, enhanced with penetrating corrosion inhibitor.
1. Compressive Strength: 1200 psi minimum at 1 day; 6000 psi minimum at 28 days when tested according to ASTM C 109.
 2. Bond Strength: 1800 psi minimum at 28 days when tested according to ASTM C 882 (Modified).
 3. Product / Manufacturer: SikaTop 122 Plus or SikaTop 123 Plus, Sika Corporation, or approved equal.
- D. Repair Mortar – Form and Pour or Pump: Pre-packaged, cement-based, single-component, polymer-modified, silica-fume-enhanced, cementitious mortar.
1. Compressive Strength: 3000 psi minimum at 1 day; 6500 psi at 28 days when tested according to ASTM C 109.
 2. Bond Strength: 2200 psi at 28 days when tested according to ASTM C 882 (modified).
 3. Product / Manufacturer: Sika MonoTop 611, Sika Corporation, or approved equal.

2.15 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

2. The required average strength above specified strength shall be based on the procedure given in the "MIX DESIGN SUBMITTAL FORM" appended to the end of this Specification.
3. Required average strength above specified strength:
 - a. Based on a record of past performance: Determination of required average strength above specified strength shall be based on the standard deviation record of the results of at least 30 consecutive strength tests in accordance with ACI 301 section 4.23.
 - b. Based on laboratory trial mixtures: Proportions shall be selected on the basis of laboratory trial batches prepared in accordance with ACI 301, section 4.2.3. to produce an average strength greater than the specified strength f'_c by the amount defined in ACI 301 section 4.2.3.
 - 1) Proportions of ingredients for concrete mixes shall be determined by an independent testing laboratory or qualified concrete supplier.
 - 2) For each proposed mixture, at least three compressive test cylinders shall be made and tested for strength at the specified age. Additional cylinders may be made for testing for information at earlier ages.
- B. Cementitious Materials: Limit maximum percentage, by weight, of total cementitious materials in concrete as defined by ACI 301 as follows:
 1. Fly Ash: 20 percent.
 2. Combined Fly Ash and Pozzolan: 20 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
 1. Do not use admixtures which have not been incorporated and tested in accepted mixes.
 2. Use water-reducing, high-range water-reducing admixture in concrete, as required, for placement and workability.
 3. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 4. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
- E. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

2.16 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Proportion normal-weight concrete mixture as indicated on drawings.

2.17 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.18 FABRICATION OF EMBEDDED METAL ASSEMBLIES

- A. Fabricate metal assemblies in the shop. Holes shall be made by drilling or punching. Holes shall not be made by or enlarged by burning. Welding shall be in accordance with AWS D1.1.
- B. Welding of deformed bar anchors and headed stud anchors shall be done by full fusion process equal to that of TRW Nelson Stud Welding Division. A minimum of two headed studs shall be tested at the start of each production period for proper quality control. The studs shall be capable of being bent 45 degrees without failure.
- C. Welding of reinforcement shall be done in accordance with AWS D1.4, using the recommended preheat temperature and electrode for the type of reinforcement being welded. Bars larger than no. 9 shall not be welded. Welding shall be subject to the observance and testing of the Testing Laboratory.
- D. Metal assemblies exposed to earth, weather or moisture shall be hot dip galvanized. All other metal assemblies shall be either hot dip galvanized or painted with an epoxy paint. Repair galvanizing after welding with a Cold Galvanizing compound installed in accordance with the manufacturer's instructions. Repair painted assemblies after welding with same type of paint.

2.19 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
 - 1. When air temperature is between 85 and 95 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 95 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
 - 1. Vertical alignment:
 - a. Lines, surfaces and arises less than 100 feet in height - 1 inch.
 - b. Outside corner of exposed corner columns and control joints in concrete exposed to view less than 100 feet in height - 1/2 inch.

- c. Lines, surfaces and arises greater than 100 feet in height - $1/1000$ times the height but not more than 6 inches.
 - d. Outside corner of exposed corner columns and control joints in concrete exposed to view greater than 100 feet in height - $1/2000$ times the height but not more than 3 inches.
2. Lateral alignment:
- a. Members - 1 inch.
 - b. Centerline of openings 12 inches or smaller and edge location of larger openings in slabs - $1/2$ inch.
 - c. Sawcuts, joints, and weakened plane embedments in slabs - $3/4$ inch.
3. Level alignment:
- a. Elevation of slabs-on-grade - $3/4$ inch.
 - b. Elevation of top surfaces of formed slabs before removal of shores - $3/4$ inch.
 - c. Elevation of formed surfaces before removal of shores - $3/4$ inch.
 - d. Lintels, sills, parapets, horizontal grooves, and other lines exposed to view - $1/2$ inch.
4. Cross-sectional dimensions: Overall dimensions of beams, joists, and columns and thickness of walls and slabs.
- a. 12 inch dimension or less - plus $3/8$ inch to minus $1/4$ inch.
 - b. Greater than 12 inch to 3 foot dimension - plus $1/2$ inch to minus $3/8$ inch.
 - c. Greater than 3 foot dimension - plus 1 inch to minus $3/4$ inch.
5. Relative alignment:
- a. Stairs:
 - 1) Difference in height between adjacent risers - $1/8$ inch.
 - 2) Difference in width between adjacent treads - $1/4$ inch.
 - 3) Maximum difference in height between risers in a flight of stairs - $3/8$ inch.
 - 4) Maximum difference in width between treads in a flight of stairs - $3/8$ inch.
 - b. Grooves:
 - 1) Specified width 2 inches or less - $1/8$ inch.
 - 2) Specified width between 2 inches and 12 inches - $1/4$ inch.
 - c. Vertical alignment of outside corner of exposed corner columns and control joint grooves in concrete exposed to view - $1/4$ inch in 10 feet.
 - d. All other conditions - $3/8$ inch in 10 feet.

CAST IN PLACE CONCRETE - 18
UTRGV SOM TBL CENTER
100% CD

- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
 - 1. Class A, 1/8 inch for smooth-formed finished surfaces.
 - 2. Class B, 1/4 inch for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Construct formwork to cambers shown or specified on the Drawings to allow for structural deflection of the hardened concrete. Provide additional elevation or camber in formwork as required for anticipated formwork deflections due to weight and pressures of concrete and construction loads.
- H. Forms for Exposed Concrete:
 - 1. Drill forms from the contact face to the outside to suit form ties used. Do not splinter forms by driving ties through improperly prepared holes.
 - 2. Provide sharp, clean corners at intersecting planes without visible edges or offsets. Back joints with extra studs or girts if required to maintain corners.
 - 3. Provide extra studs, girts, walers, and bracing to prevent bowing of forms.
 - 4. Form shapes, recesses and projections with smooth finish materials, and install in forms with sealed joints.
 - 5. Locate form ties in level horizontal rows, plumbed vertically, and in symmetrical arrangements, unless noted otherwise.
- I. Foundation Elements: The sides of all below grade portions of pier caps, shall be formed straight and to the lines and grades specified. Foundation elements shall not be earth formed unless specifically indicated on the Drawings.
- J. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- K. Chamfer exterior corners and edges of permanently exposed concrete.
- L. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- M. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

- N. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- O. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement, anchoring devices, and embedded items.
 - 1. Do not apply form release agent where concrete surfaces are scheduled to receive subsequent finishes which may be affected by agent. Soak contact surfaces of untreated forms with clean water. Keep surfaces wet prior to placing concrete.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
 - a. Spacing within a bolt group: 1/8"
 - b. Location of bolt group (center): 1/2"
 - c. Rotation of bolt group: 5 degrees
 - d. Angle off vertical: 5 degrees
 - e. Bolt projection: $\pm 3/8$ "
 - 2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 - 3. Install dovetail anchor slots in concrete structures as indicated.

3.3 VAPOR RETARDERS

- A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Lap joints 6 inches and seal with manufacturer's recommended tape.

3.4 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

CAST IN PLACE CONCRETE - 20
UTRGV SOM TBL CENTER
100% CD

- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - 1. Weld reinforcing bars according to AWS D1.4, where indicated. Only steel conforming to ASTM A706 may be welded.
- D. Installation tolerances:
 - 1. Top and bottom bars in slabs, girders, beams and joists:
 - a. Members 8" deep or less: $\pm 3/8$ "
 - b. Members more than 8" deep: $\pm 1/2$ "
 - 2. Concrete Cover to Formed or Finished Surfaces: $\pm 3/8$ " for members 8" deep or less; $\pm 1/2$ " for members over 8" deep, except that tolerance for cover shall not exceed 1/3 of the specified cover.
- E. Concrete Cover
 - 1. Reinforcing in structural elements deposited against the ground: 3"
 - 2. Reinforcing in formed beams, columns and girders: 1 1/2"
 - 3. Grade beams and exterior face of formed walls and columns exposed to weather or in contact with the ground: 2"
 - 4. Interior faces of walls: 1"
 - 5. Slabs: 3/4"
 - 6. Top steel in open parking structure floors: 1 1/2" in post-tensioned concrete, 2" or 2 1/2" bar diameters in non post-tensioned concrete.
- F. Splices: Provide standard reinforcement splices by lapping and tying ends. Comply with ACI 318 for minimum lap of spliced bars where not specified on the documents. No. 14 and 18 bars shall not be lap spliced.
- G. Mechanical Splices: Use for splicing of bars larger than no. 11 or where no. 11 bars are spliced to larger size bars and where indicated on the drawings. Comply with manufacturer's instructions for preparation of bars and installation procedures.
- H. Field Welding of Embedded Metal Assemblies: All paint and galvanizing shall be removed in areas to receive field welds. All areas where paint or galvanizing has been removed shall be field repaired with the specified paint or cold galvanizing compound, respectively.
- I. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- J. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 - 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 - 5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 - 6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 - 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
 - 2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch below finished concrete surface where joint sealants, specified in Division 7 Section "Joint Sealants," are indicated.
 - 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.6 WATERSTOPS

- A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.

3.7 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
 - 1. Water may be added to the concrete at the project site only if specifically withheld at the time of batching and specifically noted on the batch ticket.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, and only if specifically noted as withheld on the batch ticket.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
 - 2. Water content shall not exceed the maximum specified water/cement ratio for the mix.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
 - 4. Do not permit concrete to drop freely any distance greater than 20'-0" for concrete containing a high range water reducing admixture (superplasticizer) or 5'-0" for other concrete. Provide chute or tremie to place concrete where longer drops are necessary. Do not place concrete into excavations with standing water. If place of deposit cannot be pumped dry, pour concrete through a tremie with its outlet near the bottom of the place of deposit.

5. Pump priming grout shall be discarded and not used in the structure.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Maintain reinforcement in position on chairs during concrete placement.
 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 4. Slope surfaces uniformly to drains where required.
 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- G. Hot-Weather Placement: Comply with ACI 305.1 and as follows:
1. Maintain concrete temperature below 95 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.8 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces exposed to public view or to receive a rubbed finish.

- C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:
1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
 2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
 3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.9 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in one direction.
1. Apply scratch finish to surfaces to receive concrete floor toppings.
- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.
1. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.
- D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:

- a. Specified overall values of flatness, F(F) 25; minimum local values of flatness, F(F) 20; for elevated slabs. For shored construction before the shoring is removed.
 - b. Specified overall values of flatness, F(F) 38; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.
- E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.
- 1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
- 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
- G. Water shall not be added to finished concrete surface during finishing operations.

3.10 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.
- 1. Mix one part Portland Cement and two parts crushed stone or gravel passing 3/8" sieve and retained on a 1/8" sieve, measured by volume with only sufficient water to produce a dry consistency for proper placing and finishing.
 - 2. Placing: Place fill and reinforcement in all steel pan treads and landings. Reinforcement shall be 2"x2" by 14 gauge welded wire fabric extending over the area of each tread and landings. Support reinforcement 3/4" above bottom of steel pans. After sufficient hardening of the concrete fill, steel trowel the exposed surface to a smooth finish.

3.11 INSTALLATION OF NON-SHRINK GROUT UNDER BASEPLATES

- A. Grout under all bearing and baseplates. Comply with manufacturer's instructions. Do not dry pack.
- B. Mixing: Use a mechanical mixer. Add only enough water to make grout placeable. Do not mix more grout than can be used in 20 minutes. Under no circumstances shall grout be retempered.

3.12 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 305.1 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

- a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.
4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.13 CONCRETE SURFACE REPAIRS

- A. Surface Defects in Concrete: Repair and patch defective areas when approved by Engineer. Remove and replace concrete that cannot be repaired and patched to Owner's approval.
- B. Contractor shall submit a detailed, descriptive procedure listing proposed pre-packaged repair materials and methods for the repair of surface defects prior to the start of repair work.
- C. Patching Mortar: Mix, place and finish pre-packaged repair mortar in accordance with manufacturer's instructions.
- D. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, minor honeycombs and rock pockets with no exposed reinforcement, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 1. Immediately after form removal, cut out minor honeycombs, rock pockets, and voids more than 1/2 inch in any dimension in solid concrete, but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface, 1/4 inch deep minimum. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 2. Repair defects on surfaces exposed to view using pre-packaged repair mortar so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
- E. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 1. Repair finished surfaces containing defects. Surface defects include minor spalls, pop outs, honeycombs and rock pockets with no exposed reinforcement, crazing and cracks in excess of 0.01 inch wide that do not penetrate to reinforcement, and other objectionable conditions.
 2. After concrete has cured at least 14 days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with patching mortar. Remove defective areas with clean, square cuts, 1/4" deep minimum. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Place, compact, and finish patching mortar to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
8. Unapproved and defective repairs shall be removed and replaced in accordance with requirements provided by the Engineer at no additional cost to the Owner.

3.14 STRUCTURAL REPAIRS

- A. Structurally Defective Concrete: Structural defects include spalls, honeycombs or rock pockets with exposed reinforcement, hollow-sounding concrete, cracks that penetrate to the reinforcement or completely through concrete elements, inadequate cover over reinforcement, and other conditions that affect the structural performance or durability of the concrete as determined by the Engineer.
- B. Repair structural defects in concrete in accordance with plans, specifications, details, etc. provided by the Engineer. Repairs shall be in accordance with ACI 562.
 1. The cost of the additional services provided by the Engineer to prepare the repair documents, and to oversee the repair work shall be borne by the Contractor.
- C. Unapproved and defective repairs shall be removed and replaced in accordance with requirements provided by the Engineer at no additional cost to the Owner.

3.15 CLEANUP

- A. Imperfect or damaged work or any material damaged or determined to be defective before final completion and acceptance of the entire job shall be satisfactorily replaced at the Contractor's expense, and in conformity with all of the requirements of the Drawings and Specifications. Removal and replacement of concrete work shall be done in such manner as not to impair the appearance or strength of the structure in any way.

- B. Cleaning: Upon completion of the work all forms, equipment, protective coverings and any rubbish resulting therefrom shall be removed from the site. After sweeping floors, wash floors with clean water. Finished concrete surfaces shall be left in a clean condition, satisfactory to the Owner.

3.16 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner may engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Inspections may include:
 - 1. Steel reinforcement placement.
 - 2. Steel reinforcement welding.
 - 3. Headed bolts and studs.
 - 4. Verification of use of required design mixture.
 - 5. Concrete placement, including conveying and depositing.
 - 6. Curing procedures and maintenance of curing temperature.
 - 7. Verification of concrete strength before removal of shores and forms from beams and slabs.
- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
 - 2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 - 3. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 - 4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture. Air content shall be tested at point of concrete placement and not at discharge from truck.
 - 5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.

CAST IN PLACE CONCRETE - 30
UTRGV SOM TBL CENTER
100% CD

6. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
7. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and laboratory cure four standard 6 x 12 cylinders for each composite sample.
 - 1) Do not transport field-cast cylinders until they have cured for a minimum of 24 hours.
 - 2) For High Volume Fly Ash Concrete do not transport field-cast cylinders until they have cured for a minimum of 48 hours.
 - b. Cast and field cure four standard 6 x 12 cylinders for each composite sample.
8. Compressive-Strength Tests: ASTM C 39;
 - a. Test one cylinder at 7 days
 - b. Test two cylinders at 28 days
 - c. Test one cylinder at 56 days
 - d. If 4" by 8" cylinders are used, provide 1 additional cylinder at each stage
9. Compressive-Strength Tests for High Volume Fly Ash: ASTM C 39/C 39M;
 - a. Test one cylinder at 7 days
 - b. Test one cylinder at 28 days
 - c. Test two cylinders at 56 days
 - d. If 4" by 8" cylinders are used, provide 1 additional cylinder at each stage
10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
11. Test results shall be reported in writing to Architect, structural engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cyl-

inders complying with ASTM C 42/C 42M or by other methods as directed by Architect.

- a. When the strength level of the concrete for any portion of the structure, as indicated by cylinder tests, falls below the specified requirements, the Contractor shall provide improved curing conditions and/or adjustments to the mix design as required to obtain the required strength. If the average strength of the laboratory control cylinders falls so low as to be deemed unacceptable, the Contractor shall follow the core test procedure set forth in ACI 318 Chapter 26. Locations of core tests shall be approved by the Architect. Core sampling and testing shall be at Contractors expense.
 - b. If the results of the core tests indicate that the strength of the structure is inadequate, any replacement, load testing, or strengthening as may be ordered by the Architect shall be provided by the Contractor without cost to the Owner.
14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 15. Correct deficiencies in the Work that test reports and inspections indicate does not comply with the Contract Documents.
 16. Air content shall be tested during concrete placement as opposed from truck discharge in order to avoid effects of air content due to pumping.
- D. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 24 hours of finishing.

MIX DESIGN SUBMITTAL FORM

Project: _____
Method used to select proportions (ACI 301 section 4.2.3.):
____ field experience or ____ trial mixture
Person that prepared the submittal: _____
Signed: _____ Date: _____
Person selecting the mixture proportions: _____
Ready-Mix Supplier Company: _____
Contact Person: _____ Phone Number: _____ Date: _____
Main Plant Location: _____ Miles from Project: _____
Secondary Plant Location: _____ Miles from Project: _____

SELECTION OF CONCRETE MIX PROPORTIONS

1. CEMENTITIOUS MATERIALS

Cement: ____ (lbs) ____ (cu.ft.) Type: ____ Source: ____ Manufacturer ____
Fly Ash: ____ (lbs) ____ (cu.ft.) Type: ____ Source: ____ Manufacturer ____
Other: ____ (lbs) ____ (cu.ft.) Type: ____ Source: ____ Manufacturer ____
Fly ash replacement: ____ %

2. AGGREGATES

Fine: ____ (lbs) ____ (cu.ft.) Size: ____ Type: ____ Source: ____
Coarse: ____ (lbs) ____ (cu.ft.) Size: ____ Type: ____ Source: ____
Total: ____ (lbs) ____ (cu.ft.) Size: ____ Type: ____ Source: ____

3. WATER

Water: ____ (lbs) ____ (cu.ft.) Source: ____

4. ADMIXTURES

HRWR _____ oz. per 100# cement dosage range
Non-Corrosive Accelerator _____ oz. per 100# Cement
W.R. _____ oz. per 100# Cement
A.E.A. _____ oz. per 100# Cement
Fibers or color pigments or other additions _____ oz. per 100# Cement

FRESHLY MIXED CONCRETE PROPERTIES

Slump before additive = _____ in. Air Content = _____ %
Final Slump after additive = _____ in. Unit Dry Wt. = _____ pcf
Unit Wet Wt. = _____ pcf
Placement Method = _____

DOCUMENTATION OF COMPRESSIVE STRENGTH AND REQUIRED STRENGTH ON THE BASIS OF FIELD EXPERIENCE

Check one, complete blanks and attach historical data used for these calculations (Reference ACI 301 section 4.2.3):

Ss= _____, f'_c = _____, f'_{cr} = _____, $f'_c(\text{avg})$ = _____

- 15 consecutive tests ($k = 1.16$)
- 20 consecutive tests ($k=1.08$)
- 25 consecutive tests ($k=1.03$)
- 30 or more consecutive tests ($k=1.00$)

DOCUMENTATION OF COMPRESSIVE STRENGTH AND REQUIRED STRENGTH ON THE BASIS OF TRIAL MIXTURES

Age (days)	Mix #1 (f'_c - W/C ratio)	Mix #2 (f'_c - W/C ratio)	Mix #3 (f'_c - W/C ratio)
28	_____	_____	_____
28	_____	_____	_____
28	_____	_____	_____

Attach a water cement ratio vs. f'_c graph.

Reference ACI 301 section 4.2.3. Show W/C ratio selected based on f'_c & f'_{cr} . Show mix design proportioned to achieve f'_{cr} .

ATTACHMENTS

Manufacturer's certification of cement materials
Grading chart of Aggregate
Admixture certification
Water cement ratio vs. f'_c graph
Past performance record submittal

SECTION 035400 - INTEGRAL COLORED CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to Work of this Section.
- B. Section Includes:
 - 1. Integrally colored concrete at interior stairs indicated on the drawings.
 - 2. Integrally colored concrete at exterior entry areas as indicated on the drawings.
- C. Related Sections:
 - 1. Division 03 Section "Cast-In-Place Concrete" for general applications of concrete and coordination of sample submittal and color selection.

1.2 REFERENCES

- A. American Concrete Institute (ACI):
 - 1. ACI 301 "Specification for Structural Concrete for Buildings."
 - 2. ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing of Concrete."
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM C979 "Standard Specification for Pigments for Integrally Colored Concrete."

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's complete technical data sheets for the following:
 - 1. Colored admixture.
- B. Samples for Initial Selection: Manufacturer's color charts showing full range of colors available.
- C. Qualification Data: For firms indicated in "Quality Assurance" Article, including list of completed projects.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer with 10-years of experience in the production of specified products.
- B. Installer Qualifications: An installer with 5-years of experience with work of similar scope and quality.
- C. Comply with the requirements of ACI 301.
- D. Obtain each specified material from same source and maintain high degree of consistency in workmanship throughout Project.

- E. Notification of manufacturer's authorized representative shall be given at least 1-week before start of Work.
- F. Integrally Colored Concrete Mockups:
 - 1. At location on Project selected by Architect, place and finish 4 feet by 2 feet area.
 - 2. For accurate color, the quantity of concrete mixed to produce the sample should not be less than 3 cubic yards (or not less than 1/3 the capacity of the mixing drum on the ready-mix truck) and should always be in full cubic yard increments. Excess material shall be discarded according to local regulations.
 - 3. Construct mockup using processes and techniques intended for use on permanent work, including curing procedures. Include samples of control, construction in sample panels. Mockup shall be produced by the individual workers who will perform the work for the Project.
 - 4. Retain samples of cements, sands, aggregates and color additives used in mockup for comparison with materials used in remaining work.
 - 5. Accepted mockup provides visual standard for work of Section.
 - 6. Mockup shall remain through completion of work for use as a quality standard for finished work.
 - 7. Remove mockup when directed.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Colored Admixture: Comply with manufacturer's instructions. Deliver colored admixtures in original, unopened packaging. Store in dry conditions.

1.6 PROJECT CONDITIONS

- A. Integrally Colored Concrete Environmental Requirements:
 - 1. Comply with professional practices described in ACI 305R and ACI 306R.
- B. Schedule delivery of concrete to provide consistent mix times from batching until discharge. Mix times shall meet manufacturer's written recommendations.

1.7 PRE-JOB CONFERENCE

- A. One week prior to placement of integrally colored concrete a meeting will be held to discuss the Project and application materials.
- B. It is suggested that the Architect, Subcontractor, Ready-Mix Concrete Representative, and a Manufacturer's Representative be present.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Basis for Design: Colored Admixture for Integrally Colored Concrete: Refer to Section 019000 – Finish Legend.
 - 1. Admixture shall be a colored, water-reducing, admixture containing no calcium chloride with coloring agents that are lime proof and ultra-violet resistant.

2. Colored admixture shall conform to the requirements of ACI 301, ASTM C979, ASTM C494 and ASSHTO M194.
- B. Acceptable Manufacturers:
 1. Butterfield
 2. Davis Colors
 3. L.M. Scofield Co.
- C. SUBSTITUTIONS: The use of products other than those specified will be considered. This request shall be accompanied by the following:
 1. A certificate of compliance from material manufacturer stating that proposed products meet or exceed requirements of this Section, including standards ACI 303.1, ASTM C979, ASTM C494 and AASHTO M194.
 2. Documented proof that proposed materials have a 10-year proven record of performance, confirmed by at least 5 local projects that Architect can examine.

2.2 COLORS

- A. Concrete Color:
 1. Cement: Natural Gray
 2. Sand: As required to produce the color selected.
 3. Aggregate: Concrete producer's standard aggregate complying with specifications.
 4. Colored Admixture: Refer to Section 019000 – Finish Schedule.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install concrete according to requirements of Division 3 Section "Cast-In-Place Concrete."
- B. Do not add water to concrete mix in the field.
- C. Surfaces shall be finished uniformly with the following finish:
 1. Trowel: Precautions should be taken to ensure that the surface is uniformly troweled so that it will not be slippery. Do not over-trowel or burnish the surface.

3.2 TOLERANCES

- A. Minor variations in appearance of integrally colored concrete, which are similar to natural variations in color and appearance of uncolored concrete, are acceptable.

3.3 APPLICATORS

- A. For a list of qualified contractors, contact your local Scofield representative or the appropriate Division Office: Eastern Division – 201-672-9050; Western Division – 323-720-3055; Central Division Office – 630-377-5959.

END OF SECTION 035400

SECTION 040523 - CONCEALED LINTEL SYSTEM FOR MASONRY

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Adjustable concealed lintel (channel and bracket) system and accessories.

1.2 RELATED REQUIREMENTS

- A. Section 042000 – Unit Masonry
- B. Section 054000 – Cold-Formed Metal Framing

1.3 PREINSTALLATION MEETINGS

- A. Convene pre-installation meeting at Project Site in conjunction with requirements for Section 042000 Unit Masonry.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, including installation instructions.
- B. Shop Drawings:
 - 1. Submit manufacturer's shop drawings, indicating component profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
 - 2. Indicate welded connections using standard welding symbols.
 - 3. Indicate net weld lengths.
- C. Delegated-Design Submittal: For cold-formed steel framing.
- D. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- E. Design Data: Submit manufacturer's design data, including structural calculations, signed and sealed by qualified professional engineer registered in state of the installation.
- F. Warranty Documentation: Submit manufacturer's standard warranty.

1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
 - 1. Capable of providing field service representation during installation.
 - 2. Minimum of 5 years of experience in manufacture of adjustable concealed lintel system for masonry.
 - 3. Experience in projects of similar scope.
 - 4. Manufacture in accordance with established quality assurance program.
 - 5. Build mockup for each type of concealed lintel system used, as required in section 04 2000 UNIT MASONRY.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

- B. Storage and Handling Requirements:
 - 1. Store and handle materials in accordance with manufacturer's instructions.
 - 2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
 - 3. Store materials in clean, dry area indoors.
 - 4. Protect materials and finish during storage, handling, and installation to prevent damage.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Halfen USA Inc., P.O. Box 18687, San Antonio, TX 78218. Toll Free 800-423-9140. Fax 888-277-1695. www.halfenusa.com. info @halfenusa.com.

2.2 DESIGN CRITERIA

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design cold-formed steel framing.
- C. Structural Performance: Provide concealed lintel system capable of withstanding design loads within limits and under conditions indicated.
 - 1. Brick Veneer Height: As indicated on Drawings.
 - 2. Design Loads: As indicated on Drawings.
 - 3. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
 - a. Exterior Load-Bearing Wall Framing: Horizontal deflection of 1/720 of the wall height.
 - 4. Design concealed lintel system to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
 - 5. Design concealed lintel system to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows: upward and downward movement of 1/2 inch.

2.3 MATERIALS

- A. Adjustable Concealed Lintel System for Masonry:
 - 1. Channel / Support Brackets / Stitching Rods: Structural carbon steel, ASTM A36, then hot-dip galvanized, ASTM A123 or A153 as applicable.
 - a. Bolts and Nuts:
 - 1) Bolt-Type Fasteners: T-head, in contact with channel slot faces, carbon steel, ASTM F568M.
 - 2) Bolt Diameter: As required for imposed loads.
 - 3) Bolt Length: As required for imposed loads.
 - 4) Finish for Carbon Steel T-Bolts: Hot-dip galvanized, ASTM A123.
 - 5) Nuts: Carbon steel.

2.4 FABRICATION

- A. Fabricate components to design required and provide for site-required adjustments.
- B. Weld and grind components flush and smooth with adjacent finish surface.
 - 1. Make exposed joints butt tight, flush, and hairline.
 - 2. Ease exposed edges to small uniform radius.
- C. Weld components indicated on shop drawings.

2.5 FINISHES

- A. Structural Carbon Steel Components and Anchors: Hot-dip galvanized after fabrication, ASTM A123.
- B. Stainless Steel: Mill-produced finish.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas and supports to receive adjustable concealed lintel system.
- B. Verify dimensions, tolerances, and method of attachment with other work.
- C. Notify Architect of conditions that would adversely affect installation.
- D. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

- A. Supply items required to be placed in masonry with setting templates to appropriate sections.

3.3 INSTALLATION

- A. Install adjustable concealed lintel system in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Install items plumb and level, accurately fitted, free from distortion or defects.
- C. Adjust components to suit site conditions.
- D. Provide formwork for placement in masonry to maintain true alignment until completion of permanent attachment.
- E. Obtain approval from Architect and manufacturer before site cutting or making adjustments not scheduled.
- F. Perform field welding in accordance with AWS D1.1/D1.1M where necessary using certified welders.

3.4 TOLERANCES

- A. Maximum Variation from Plumb and Level: 1/8 inch.

3.5 PROTECTION

- A. Protect installed adjustable concealed lintel system from damage during construction.
- B. Touch-up damage to factory-applied finishes using appropriate materials and techniques.

END OF SECTION 040523

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Concrete masonry units.
 - 2. Clay face brick.
- B. Products Installed but not Furnished under This Section:
 - 1. Steel lintels in unit masonry.
 - 2. Steel shelf angles for supporting unit masonry.
- C. Related Requirements specified elsewhere:
 - 1. Section 051200 "Structural Steel Framing" for installing anchor sections of adjustable masonry anchors for connecting to structural steel frame.
 - 2. Section 076200 "Sheet Metal Flashing and Trim" for exposed sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.
 - 3. Section 321400 "Unit Paving" for exterior unit masonry paving.

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site .

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For the following:
 - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
 - 2. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.
 - 3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
- C. Samples for Initial Selection:
 - 1. Colored mortar.
 - 2. Weep holes.
- D. Samples for Verification: For each type and color of the following:
 - 1. Clay face brick, in the form of straps of five or more bricks.
 - 2. Special brick shapes.

3. colored-aggregate mortar. Make Samples using same sand and mortar ingredients to be used on Project.
4. Weep holes.
5. Accessories embedded in masonry.

1.6 INFORMATIONAL SUBMITTALS

- A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.
 1. Submittal is for information only. Receipt of list does not constitute approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.
- B. Material Certificates: For each type and size of the following:
 1. Masonry units.
 - a. Include data on material properties.
 - b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
 - c. For exposed brick, include test report for efflorescence according to ASTM C 67.
 2. Cementitious materials. Include name of manufacturer, brand name, and type.
 3. Mortar admixtures.
 4. Grout mixes. Include description of type and proportions of ingredients.
 5. Reinforcing bars.
 6. Joint reinforcement.
 7. Anchors, ties, and metal accessories.
- C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
- D. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.
- E. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.7 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 1. Build mockup of typical wall area as shown on Drawings.
 2. Build mockups for each type of exposed unit masonry construction typical exterior and interior walls in sizes approximately 72 inches long by 48 inches high by full thickness, including face and backup wythes and accessories.
 - a. Include a sealant-filled joint at least 16 inches long in exterior wall mockup.
 - b. Include lower corner of window opening at upper corner of exterior wall mockup. Make opening approximately 12 inches wide by 16 inches high.
 - c. Include through-wall flashing installed for a 24-inch length in corner of exterior wall mockup approximately 16 inches down from top of mockup, with a 12-inch length of flashing left exposed to view (omit masonry above half of flashing).

- d. Include metal studs, sheathing, water-resistive barrier sheathing joint-and-penetration treatment, veneer anchors, flashing, cavity drainage material, and weep holes in exterior masonry-veneer wall mockup.
3. Where masonry is to match existing, erect mockups adjacent and parallel to existing surface.
4. Clean one-half of exposed faces of mockups with masonry cleaner as indicated.
5. Protect accepted mockups from the elements with weather-resistant membrane.
6. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
 - a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
 - b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
7. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.9 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.
 2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe, and hold cover in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 2. Protect sills, ledges, and projections from mortar droppings.
 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work and will be within 20 feet vertically and horizontally of a walking surface.

2.3 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
- B. CMUs: ASTM C 90.
 - 1. Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.
 - 2. Density Classification: Lightweight unless otherwise indicated.
 - 3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
 - 4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.

2.4 MASONRY LINTELS

- A. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.5 BRICK

- A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
 - 1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
 - 2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
 - 3. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
- B. Clay Face Brick: Match brick on adjacent existing buildings as directed by the Architect.
 - 1. Where shown to "match existing," provide face brick matching color range, texture, and size of existing adjacent brickwork.
 - 2. Color and Texture: Match existing.
 - 3. Provide scratch Face Brick where indicated.

2.6 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
 - 1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Mortar Cement: ASTM C 1329/C 1329M.
- D. Colored Cement Products: Packaged blend made from Portland cement and hydrated lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.
 - 1. Colored Masonry Cement:
 - a. Match mortar and adjacent building as directed by Architect.
 - 2. Formulate blend as required to produce color indicated .
- E. Aggregate for Mortar: ASTM C 144.
 - 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 - 2. For joints less than 1/4-inch-thick, use aggregate graded with 100 percent passing the No. 16 sieve.
- F. Aggregate for Grout: ASTM C 404.
- G. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
- H. Water: Potable.

2.7 REINFORCEMENT

- A. Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.
- B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
- C. Masonry-Joint Reinforcement, General: ASTM A 951/A 951M.

1. Exterior Walls: Hot-dip galvanized carbon steel.
- D. Masonry-Joint Reinforcement for Single-Wythe Masonry: truss] type with single pair of side rods.

2.8 TIES AND ANCHORS

- A. General: Ties and anchors shall extend at least 1-1/2 inches into veneer but with at least a 5/8-inch cover on outside face.
- B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M, with ASTM A 153/A 153M, Class B-2 coating.
 2. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Corrugated-Metal Ties: Not acceptable.
- D. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches wide.
1. Use adjustable ties with pintle-and-eye connections having a maximum adjustment of 1-1/4 inches.
 2. Wire: Fabricate from 1/4-inch- diameter, hot-dip galvanized steel wire.
- E. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
1. Tie Section: Triangular-shaped wire tie made from 0.25-inch- diameter, hot-dip galvanized steel wire (at parapet wall steel framing).
- F. Adjustable Masonry-Veneer Anchors:
1. General: Provide anchors that allow vertical adjustment but resist a 100-lbf load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch.
 2. Fabricate wire ties from 0.25-inch-diameter, hot-dip galvanized-steel wire unless otherwise indicated.
 3. Contractor's Option: Unless otherwise indicated, provide any of the adjustable masonry-veneer anchors specified.
 4. Screw-Attached, Masonry-Veneer Anchors: Wire tie and a corrosion-resistant, self-drilling, eye-screw designed to receive wire tie. Eye-screw has spacer that seats directly against framing and is same thickness as sheathing and has gasketed washer head that covers hole in sheathing.
 5. Polymer-Coated, Steel Drill Screws for Steel Studs: ASTM C 954 except manufactured with hex washer head and neoprene or EPDM washer, No. 10 diameter by length required to penetrate steel stud flange with not less than three exposed threads, and with organic polymer coating with salt-spray resistance to red rust of more than 800 hours according to ASTM B 117.

2.9 EMBEDDED FLASHING MATERIALS

- A. Metal Flashing: Provide metal flashing complying with Section 076200 "Sheet Metal Flashing and Trim" and as follows:
1. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet. Provide splice plates at joints of formed, smooth metal flashing.
 2. Fabricate metal sealant stops from stainless steel. Extend at least 3 inches into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch and down into joint 1/4 inch to form a stop for retaining sealant backer rod.
 3. Fabricate metal expansion-joint strips from stainless steel to shapes indicated.
 4. Solder metal items at corners.

- B. Flexible Flashing: Use the following unless otherwise indicated:
 - 1. Butyl Rubber Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.040 inch.
 - a. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.
- C. Application: Unless otherwise indicated, use the following:
 - 1. Where flashing is indicated to receive counterflashing, use metal flashing.
 - 2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
 - 3. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a drip edge.
 - 4. Where flashing is fully concealed, use metal flashing.
- D. Sealants for Sheet Metal Flashings: As specified in Section 076200 "Sheet Metal Flashing and Trim."
 - 1. Elastomeric Sealant: ASTM C 920, chemically curing sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and remain watertight.
- E. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.
- F. Termination Bars for Flexible Flashing: Aluminum bars 0.075 inch by 1 inch.

2.10 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from urethane.
- B. Preformed Control-Joint Gaskets: Made from PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226/D 226M, Type I (No. 15 asphalt felt).
- D. Weep/Cavity Vent Products: Use one of the following unless otherwise indicated:
 - 1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.
- E. Cavity Drainage Material Manufacturer: Mortar Net with Insect Barrier.

2.11 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned. Masonry cleaner must be biodegradable.

2.12 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. Use Portland cement-lime mortar unless otherwise indicated.
 - 3. For exterior masonry, use Portland cement-lime mortar.
 - 4. For reinforced masonry, use Portland cement-lime mortar.
 - 5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
 - 1. For masonry below grade or in contact with earth, use Type M.
 - 2. For reinforced masonry, use Type S.
 - 3. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; and for other applications where another type is not indicated, use Type N.
 - 4. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Pigments shall not exceed 10 percent of Portland cement by weight.
 - 5. Mix to match mortar in adjacent buildings.
 - 6. Application: Use pigmented mortar for exposed mortar joints with the following units:
 - a. CMUs.
 - b. Clay face brick.
- C. Grout for Unit Masonry: Comply with ASTM C 476.
 - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
 - 2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
 - 3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
 - 2. Verify that foundations are within tolerances specified.
 - 3. Verify that reinforcing dowels are properly placed.
 - 4. Verify that substrates are free of substances that impair mortar bond.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Build chases and recesses to accommodate items specified in this and other Sections.

- B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.
- C. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- D. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- E. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry in adjacent building as directed.
- F. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested according to ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

- A. Dimensions and Locations of Elements:
 - 1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
 - 2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
 - 3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2-inch total.
- B. Lines and Levels:
 - 1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
 - 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
 - 3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
 - 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
 - 5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
 - 6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet or 1/2-inch maximum.
 - 7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.
- C. Joints:
 - 1. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
 - 2. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets.

Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated match bond to adjacent building as directed by architect; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay CMUs as follows:
- B. Lay solid masonry units with filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

3.6 ANCHORED MASONRY VENEERS

- A. Anchor masonry veneers to wall framing with masonry-veneer anchors to comply with the following requirements:
 - 1. Fasten screw-attached anchors through sheathing to wall framing with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
 - 2. Embed tie sections in masonry joints.
 - 3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
 - 4. Space anchors as indicated, but not more than 16 inches o.c. vertically and 25 inches o.c. horizontally, with not less than one anchor for each 2.67 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 36 inches, around perimeter.
 - 5. Space anchors as indicated, but not more than 18 inches o.c. vertically and horizontally. Install additional anchors within 12 inches of openings and at intervals, not exceeding 24 inches, around perimeter.
- B. Provide not less than 2 inches of airspace between back of masonry veneer and face of insulation.
 - 1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.

3.7 MASONRY-JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
 - 1. reinforcement not more than 16 inches o.c.
 - 2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
 - 3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.

3.8 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:
 - 1. Provide an open space not less than 1 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
 - 2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
 - 3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

3.9 CONTROL AND EXPANSION JOINTS

- A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form expansion joints in brick as follows:
 - 1. Build flanges of factory-fabricated, expansion-joint units into masonry.

3.10 LINTELS

- A. Install steel lintels where indicated.
- B. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.11 FLASHING, WEEP HOLES, AND CAVITY VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install cavity vents at shelf angles, and other obstructions to upward flow of air in cavities, and where indicated.
- B. Install flashing as follows unless otherwise indicated:
 - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
 - 2. At masonry-veneer walls, extend flashing through veneer, across airspace behind veneer, and up face of sheathing at least 8 inches; with upper edge tucked under water-resistive

- barrier, lapping at least 4 inches. Fasten upper edge of flexible flashing to sheathing through termination bar.
3. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
 4. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal drip edge.
 5. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.
- C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.
- D. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.
1. Use specified weep/cavity vent products to form weep holes.
 2. Space weep holes 24 inches o.c. unless otherwise indicated.
- E. Place cavity drainage material in airspace behind veneers to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.
- F. Install cavity vents in head joints in exterior wythes at spacing indicated. Use specified weep/cavity vent products to form cavity vents.

3.12 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner may engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Inspections: Special inspections according to Level C in TMS 402/ACI 530/ASCE 5.
1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
 3. Place grout only after inspectors have verified proportions of site-prepared grout.
- C. Testing Frequency: One set of tests for each 5000-sq. ft. of wall area or portion thereof.
- D. Clay Masonry Unit Test: For each type of unit provided, according to ASTM C 67 for compressive strength.
- E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
- F. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.
- G. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar compressive strength.
- H. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.
- I. Prism Test: For each type of construction provided, according to ASTM C 1314 at 7 days and at 28 days.

3.13 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
 - 5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
 - 6. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

3.14 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Excess Masonry Waste: Remove excess clean masonry waste and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000

SECTION 048500 - STONework

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Requirements of Drawings, General and Supplementary Conditions and DIVISION 1 apply to this Section.

1.2 SCOPE

- A. Provide all stonework including but not necessarily limited to:
 - 1. Stonework for sand stone quarry block seats
- B. Related work specified elsewhere:
 - 1. Unit masonry SECTION 042000
 - 2. Joint sealants SECTION 079200

1.3 SYSTEM DESCRIPTION

- A. Provide stonework which is designed, fabricated and installed based on the following safety factors applied to minimum physical properties of stone indicated.
 - 1. Safety Factor for Limestone: 8

1.4 SUBMITTALS

- A. Submit manufacturer's technical data for each type of stone, and other manufactured products required.
- B. Submit cutting and setting drawings indicating sizes, dimensions, sections and profiles of stones; arrangement and provisions for jointing, anchoring, and bonding stonework; and details showing relationship with, attachment to, and reception of, related work.
- C. Submit the following samples:
 - 1. Stone samples in form of sets for each color, grade, finish, type and variety of stone required and consisting of stones not less than 12" square. Include 2 or more stones in each set of samples showing the full range of variations in appearance characteristics to be expected in completed work.

1.5 QUALITY ASSURANCE

- A. Obtain each finish, variety of stone from a single quarry with resources to provide materials of consistent quality in appearance and physical properties, including the capacity to cut and finish material without delaying the progress of the work.
- B. Engage an Installer who has successfully completed stonework similar in material, design and extent to that indicated for this project. Submit list of three completed projects; include project names, addresses, and names of Architects and Owners.
- C. Prepare mock-ups for the following types of stonework. Purpose of mock-ups is further verification of selections made for color and finish under sample submittals and establishing standard of quality for aesthetic effects expected in completed work. Build mock-ups to comply with following requirements:
 - 1. Locate mock-ups on site where indicated or, if not indicated, as directed by Architect.
 - 2. Retain mock-ups during construction as standard for judging completed stonework. When directed, demolish mock-ups and remove from site.
 - 3. Mock-up, if approved by Architect, could become part of the finished product.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle stone materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breakage, chipping, or other causes.
 - 1. Do not use pinch or wrecking bars.
 - 2. Lift with wide-belt type slings where possible; do not use wire rope or ropes containing tar or other substances which might cause staining. If required to move stone, use wood rollers with cushions at end of wood slides.
 - 3. Store stone on wood skids or pallets, covered with non-staining, waterproof membrane. Place and stack skids and stones to distribute weight evenly and to prevent breakage or cracking of stones.
 - 4. Protect stored stone from weather with waterproof, non-staining covers or enclosures, but allow air to circulate around stones.

1.7 PROJECT CONDITIONS

- A. Protect stonework during erection as follows:
 - 1. Cover top of walls with non-staining waterproof sheeting at end of each day's work.
 - 2. Prevent staining of stone from other sources. Immediately remove such materials from stone without damage to latter.
 - 3. Protect walls from rain-splashed mud splatter by means of coverings spread on ground and over wall surface.
 - 4. Install stonework only when the air temperatures existing at time of installation are at least 40 deg. F and rising.

PART 2 - PRODUCTS

2.1 MATERIALS - GENERAL

- A. Comply with referenced standards and other requirements indicated applicable to each type of material required.
- B. Match Architect's samples for variety, color, finish and other stone characteristics relating to aesthetic effects.
- C. Provide matched blocks from a single quarry for each type, variety, color and quality of stone required. Extract blocks from a single bed of quarry stratum, especially reserved for Project, unless stones from randomly selected blocks are acceptable to Architect for aesthetic effect.
- D. Require Fabricator to supervise quarrying of stone to ensure that as-quarried block orientations yield finished stone with required characteristics.
- E. Make quarried blocks available for inspection by Architect, if latter so requests.

2.2 LIMESTONE

- A. Limestone Building Stone Standard: ASTM C 568.
 - 1. Classification: Category II (Medium Density).
- B. Finish of Exterior Limestone Quarry Blocks:
 - 1. Finish limestone veneer to match standard Architect sample.

2.3 STONE

- A. Provide Rough Back Leuders Limestone Quarry Blocks for exterior seat wall as shown on the drawings.

2.4 STONE ANCHORS AND ATTACHMENTS

- A. Provide anchors and attachments of type and size required to support stonework and fabricated from the following metals for conditions and anchors indicated below:
 - 1. Stainless Steel, AISI Type 304, for anchors in direct contact with stone.

2.5 STONE ACCESSORIES

- A. Setting Buttons: Lead or resilient plastic buttons, non-staining to stone, sized to suit joint thicknesses of stonework involved.

2.6 STONE FABRICATION

- A. Fabricate stonework in sizes and shapes required to comply with requirements indicated, including details on Drawings and final shop drawings.
- B. Cut and drill sinkages and holes in stones for anchors, fasteners, supports and lifting devices as indicated or needed to set stonework securely in place; shape beds to fit supports.
- C. Cut stones to produce pieces of thickness, size and shape indicated
- D. Cut stones to produce joints of uniform width and in locations indicated.
 - 1. Joint Width: As indicated on drawings.
- E. Carefully inspect finished stones at fabrication plant for compliance with requirements relative to qualities of appearance, material and fabrication; replace defective stones with ones that do comply.
 - 1. Grade and mark stones for overall uniform appearance when assembled in place. Natural variations in appearance are acceptable if installed stones match range of colors and other appearance characteristics represented in approved samples and field-constructed mock-ups.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to receive stonework and conditions under which stonework will be installed. Do not proceed with installation until surfaces and conditions comply with requirements indicated in specifications or elsewhere for execution of other work which affects stonework.

3.2 PREPARATION

- A. Clean stone surfaces which have become dirty or stained prior to setting to remove soil, stains and foreign materials. Clean stones by thoroughly scrubbing stones with fiber brushes followed by a thorough drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh filler or abrasives.

3.3 SETTING STONE, GENERAL

- A. Execute stonework by skilled mechanics and employ skilled stone fitters at the site to do necessary field cutting as stones are set.
 - 1. Use power saws to cut stones; for edges, produce edges which are cut straight and true.

- B. Set stones to comply with requirements indicated on drawings and final shop drawings.
- C. Set stones to comply with the following tolerances:
 - 1. Variation from Plumb: For lines and surfaces of walls and arrises, do not exceed 1/4" in 10', maximum, nor 1/2" in 40' or more. For external corners, expansion joints and other conspicuous lines do not exceed 1/4".

3.4 ADJUSTING AND CLEANING

- A. Remove and replace stonework of the following description:
 - 1. Broken, chipped, stained or otherwise damaged stones.
 - 2. Stones and joints not matching approved samples and field-constructed mock-ups.
- B. Replace in manner which results in stonework matching approved samples and field-constructed mock-ups, complying with other requirements and showing no evidence of replacement.
- C. Clean stonework not less than 6 days after completion of work, using clean water and stiff bristle fiber brushes. Do not use wire brushes, acid type cleaning agents, cleaning compounds with caustic or harsh fillers, or other materials or methods which could damage stone.

3.5 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to Fabricator and Installer, which ensures stonework being without damage or deterioration at time of substantial completion.

SECTION 051200 - STRUCTURAL STEEL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Structural steel framing members and connections.
 - 2. Deck support angles.
 - 3. Shop welded shear studs.
 - 4. Shop prime painting and touch up painting in the field.
 - 5. Temporary construction bracing.
 - 6. Fabrication and erection inspection and testing.
 - 7. Grouting under base plates and bearing plates.
- B. Related Sections include the following:
 - 1. Division 1 Section "Quality Requirements" for independent testing agency procedures and administrative requirements.
 - 2. Division 1 Section "Submittals" for administrative requirements for the submission of shop drawings and other submittals.
 - 3. Division 5 Section "Steel Deck" for field installation of shear connectors.
 - 4. Division 5 Section "Metal Fabrications" for miscellaneous steel fabrications and other metal items not defined as structural steel.
 - 5. Division 5 Section "Metal Stairs".
 - 6. Division 9 painting Sections for surface preparation and priming requirements.

1.3 DEFINITIONS

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC's "Code of Standard Practice for Steel Buildings and Bridges," that support design loads.

1.4 PERFORMANCE REQUIREMENTS

- A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand LRFD loads indicated and comply with other information and restrictions indicated.
 - 1. Select and complete connections using schematic details indicated and AISC's "Steel Construction Manual, edition as referenced in the Building Code.
 - 2. Engineering Responsibility: Fabricator's responsibilities include using a qualified professional engineer to prepare structural analysis data for structural-steel connections.

1.5 SUBMITTALS

- A. Submit in accordance with Division 1 Section "Submittals".
 - B. Submittals for Review
 - 1. Provide complete details and schedules for fabrication and shop assembly of members, erection plans, details, procedures, and diagrams showing sequence of erection of structural steel components.
 - a. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 - b. Include embedment drawings.
 - C.
 - a. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.
 - b. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
 - 2. Shop drawings and erection drawings shall not be made by using reproductions of Contract Drawings.
 - 3. Structural steel members for which shop drawings have not been reviewed shall not be fabricated. Engineer's review shall cover general locations, spacings, and details of design. Omission from shop drawings of any materials required by the Contract Documents shall not relieve the Contractor of the responsibility of furnishing and installing such materials, even though such shop drawings may have been reviewed and returned.
- D. Submittals for Information:
 - 1. Product Data: For each type of product indicated.
 - 2. For structural-steel connections indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 3. Connection Calculations: Contractor shall design all connections not specifically detailed on the Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Texas. Submit design calculations for the connections designed by the contractor, prior to or with the steel shop drawings. Shop drawings containing connections for which calculations have not been received shall be returned unchecked as an incomplete submittal. Calculations shall be retained for the Engineer's file and will not be approved or returned.

- a. Connections shall be designed in accordance with the requirements specified in the Structural Drawings and Specifications.
 - b. Beam connections: Submit a complete calculation for each different beam connection used and detailed on the shop drawings. Conditions which are similar may be grouped together so as to utilize a single connection design.
 - c. Submit complete connection calculations for wind brace connections, truss connections, moment connections and other connections where specified on the Contract Drawings. Each calculation shall identify the location or locations for which the connection applies, the member mark(s) from the Contract Documents, the piece mark(s) from the shop drawings, the member size, the design loading(s), member size, and the end of the member to which the connection applies.
4. Welding certificates.
 5. Qualification Data: For Installer and fabricator.
 6. Mill Test Reports: Signed by manufacturers certifying that the following products comply with requirements:
 - a. Structural steel including chemical and physical properties.
 - b. Bolts, nuts, and washers including mechanical properties and chemical analysis.
 - c. Direct-tension indicators.
 - d. Tension-control, high-strength bolt-nut-washer assemblies.
 - e. Shear stud connectors.
 - f. Shop primers.
 - g. Nonshrink grout.
 7. Source quality-control test reports.

1.6 QUALITY ASSURANCE

- A. Domestic Iron and Steel Certification. Pursuant to sections 2252.201-2252.205 of the Government Code, the Contractor certifies that it is in compliance with the requirement that any iron or steel product produced through a manufacturing process and used in the Project is produced in the United States.
- B. Erector Qualifications: A qualified installer who participates in the AISC Certification Program and is designated an AISC-Certified Erector, Category CSE.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience.
- D. Fabricator Qualifications: The special inspector shall verify that the fabricator maintains detailed fabrication and quality control of the workmanship and the fabricator's ability to conform to approved construction documents and referenced standards. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricators scope of work.

1. Exception: Special inspections shall not be required where the work is done on the premises of a fabricator that is enrolled in a nationally accepted inspections program acceptable to the registered design professional in responsible charge. At completion of fabrication, the approved fabricator shall submit a certificate of compliance to building official upon request and to the registered design professional in responsible charge stating that the work was performed in accordance with the approved construction documents.
- E. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel."
- F. The latest adopted edition of all standards referenced in this Section shall apply unless noted otherwise. In case of conflict between these Contract Documents and the referenced standard, the Contract Documents shall govern. In case of conflict between these Contract Documents and the Building Code, the more stringent shall govern.
- G. The Contractor shall furnish fabrication and erection inspection and testing of all welds in accordance with AWS D1.1, Chapter 6. Submit records of inspections and tests to the Owner's testing laboratory for their review. The fabrication and erection inspectors shall be AWS certified welding inspectors.
- H. All materials, fabrication procedures and field erection are subject to verification inspection and testing by the Owner's testing laboratory in both the shop and field. Such inspections and tests will not relieve the Contractor of the responsibility for providing materials and fabrication procedures in compliance with specified requirements.
- I. Qualifications for Welding Work: Contractor shall be responsible for qualifying welding operators in accordance with the AWS "Standard Qualification Procedure." Provide certification to Owner's testing laboratory that welders to be employed in the work have satisfactorily passed AWS qualification tests. Recertification of welders shall be Contractor's responsibility.
- J. Qualification of Welding Procedures: Contractor shall provide the testing laboratory with welding procedures which are to be used. Welding procedures shall be qualified prior to use in accordance with AWS D1.1, Part B.
- K. Comply with applicable provisions of the following specifications and documents:
1. AISC's "Code of Standard Practice for Steel Buildings and Bridges" except that the following sentence in paragraph 4.2.1 shall not apply: "This approval constitutes the Owner's acceptance of all responsibility for the design adequacy of any detail configuration of connections developed by the fabricator as part of his preparation of these shop drawings.
 2. AISC's "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design or Load and Resistance Factor Design Specification for Structural Steel Buildings."
 3. ASTM A6 "Specifications for General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use."
 4. AISC's "Specification for the Design of Steel Hollow Structural Sections."
 5. RCSC's "Specification for Structural Joints Using High-Strength Bolts"
 6. AWS D1.1 "Structural Welding Code"

- L. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from erosion and deterioration.
1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.
 2. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.8 COORDINATION

- A. Furnish anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes, Channels, Angles, M-Shapes, S-Shapes, Plate and Bar Cold-Formed Hollow Structural Sections: Steel Pipe : As indicated in the Structural Notes.
- B. Welding Electrodes: Comply with AWS requirements.
- C. Welding electrodes: AWS D1.1, E70. Welding electrodes used in full penetration welds shall have a minimum Charpy V-Notch toughness of 20 ft.-lbs at -20 degrees Fahrenheit when tested in accordance with ASTM A6.

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM F3125 Grade 325, Type 1, heavy hex steel structural bolts; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.
1. Finish: Plain.
 2. Direct-Tension Indicators: ASTM F 959, Type 325 compressible-washer type. Direct -Tension indicators shall be "Load Indicator Washers" as manufactured by the Bethlehem Steel Corporation.
 - a. Finish: Plain.
- B. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy hex head steel structural bolts with splined ends; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers. Tension control bolts shall be as manufactured by the LeJeune Bolt Company, Lakeville, Minnesota or Lohr

Structural Fasteners, Inc., Humble, Texas. Tension control bolts may be used at the contractor's option in lieu of conventional high-strength bolts.

1. Finish: Plain.
- C. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1, Type B.
- D. Unheaded Anchor Rods: ASTM F 1554, Grade 55, weldable.
1. Configuration: Straight.
 2. Nuts: ASTM A 563 heavy hex carbon steel.
 3. Plate Washers: ASTM A 36/A 36M carbon steel.
 4. Washers: ASTM F 436 hardened carbon steel.
 5. Finish: Plain.
- E. Headed Anchor Rods: ASTM F 1554, Grade 36, straight.
1. Nuts: ASTM A 563 heavy hex carbon steel.
 2. Plate Washers: ASTM A 36/A 36M carbon steel.
 3. Washers: ASTM F 436 hardened carbon steel.
 4. Finish: Plain.
- F. Threaded Rods: ASTM A 36/A 36M.
1. Nuts: ASTM A 563 hex carbon steel.
 2. Washers: ASTM A 36/A 36M carbon steel.
 3. Finish: Plain.
- G. Clevises and Turnbuckles: ASTM A 108, Grade 1035, cold-finished carbon steel.
- H. Eye Bolts and Nuts: ASTM A 108, Grade 1030, cold-finished carbon steel.
- I. Sleeve Nuts: ASTM A 108, Grade 1018, cold-finished carbon steel.

2.3 PRIMER

- A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer.
- B. Galvanizing Repair Paint: ASTM A 780.
- C. Cold Galvanizing Compound shall be "ZRC" cold galvanizing compound as manufactured by ZRC Worldwide, Marshfield, Massachusetts.

2.4 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, Grade B, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time, capable of developing a minimum compressive strength of 5,000 psi at 28 days.

2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Comply with fabrication requirements, including tolerance limits, of AISC's "Code of Standard Practice for Steel Buildings and Bridges", AISC's "Specification for Structural Steel Buildings", and as indicated on accepted shop drawings.
1. Camber structural-steel members where indicated.
 2. Camber: Provide camber in members where indicated. Specified camber applies at the jobsite, just prior to erection, lying flat so that the member weight has no effect. Take necessary precautions to prevent or compensate for camber loss during shipment. Measured camber in members up to 50'-0" long shall be within a tolerance of minus 1/2" to plus zero from the amount specified. For members greater than 50'-0" long, both the positive and negative tolerance may increase 1/8" for every 10'-0" of length in excess of 50'-0". Members with field measured camber outside of the specified tolerance shall be returned to the shop.
 3. Mill tolerances shall conform to ASTM A6. Identify high-strength structural steel according to ASTM A 6/ A 6M and maintain markings until structural steel has been erected.
 4. Mark and match-mark materials for field assembly.
 5. Plates shall be free of gross discontinuities such as ruptures and delaminations. Plates shall comply with ASTM A578, Level 1.
 6. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads. Members in compression joints which depend on contact bearing shall have the bearing surfaces milled to a common plane. Members to be milled shall be completely assembled before milling.
- E. Base Plates: Oversize anchor bolt holes in base plates to facilitate erection as specified in the latest AISC Steel Construction Manual.
- F. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 3, "Power Tool Cleaning."
- G. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's written instructions.

- H. Holes: Provide holes required for securing other work to structural steel and for passage of other work through steel framing members.
 - 1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
 - 2. Base-Plate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.6 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using High-Strength Bolts " for type of bolt and type of joint specified.
 - 1. Joint Type: As indicated on the Drawings
 - 2. Provide washers over all slotted holes in an outer ply.
- B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work. Welds not specified shall be continuous fillet welds designed to develop the full strength of the member. A combination of welds and bolts shall not be used to transmit stress at the same face of any connections. Clean completed welds prior to inspection. Slag shall be removed from all completed welds.
 - 1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

2.7 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
 - 2. Surfaces to be field welded.
 - 3. Galvanized surfaces.
 - 4. Top surfaces of beams which support composite metal floor deck.
 - 5. Headed shear studs, although overspray is acceptable.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
 - 1. SSPC-SP 2, "Hand Tool Cleaning."
 - 2. SSPC-SP 3, "Power Tool Cleaning."

- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a dry film thickness of not less than 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
 - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
 - 2. Apply two coats of shop paint to inaccessible surfaces after assembly or erection. Change color of second coat to distinguish it from first.

2.8 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/ A 123M.
 - 1. Fill vent holes and grind smooth after galvanizing.
- B. Galvanizing: The following steel shall be hot-dip galvanized (including any associated fasteners):
 - 1. Lintels and shelf angles attached to structural-steel frame and located in exterior walls.
 - 2. Railing exposed to weather.

2.9 SOURCE QUALITY CONTROL

- A. Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.
 - 1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- C. Bolted Connections: Shop-bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using High-Strength Bolts."
- D. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1 and the following inspection procedures, at testing agency's option:
 - 1. Liquid Penetrant Inspection: ASTM E 165.
 - 2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - 3. Ultrasonic Inspection: ASTM E 164.
 - 4. Radiographic Inspection: ASTM E 94.
- E. In addition to visual inspection, shop-welded shear connectors will be tested and inspected according to requirements in AWS D1.1 for stud welding and as follows:

1. Bend tests will be performed if visual inspections reveal either a less-than- continuous 360-degree flash or welding repairs to any shear connector.
2. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments, with steel erector present, for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Design of temporary bracing and supports shall be the responsibility of the Contractor. Remove temporary supports when permanent structural steel, connections, and bracing are in place, unless otherwise indicated.
1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Load and Resistance Factor Design Specification for Structural Steel Buildings," unless closer tolerances are required for proper fitting of adjoining or enclosing materials, in which case the more stringent shall apply.
- B. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.
 1. Set base and bearing plates for structural members on wedges, shims, or setting nuts as required.
 2. Weld plate washers to top of base plate.
 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base or bearing plate before packing with grout.
 4. Promptly pack grout solidly between bearing surfaces and base or bearing plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
 5. Grout under baseplates in accordance with Section 03300.

- C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges," Unless adjoining materials dictate a tighter tolerance.
- D. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure.
 - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated. Any member having a splice not shown and detailed on the accepted shop drawings shall be rejected.
- F. Do not field cut or alter structural members without approval of Architect/Engineer. Do not use thermal cutting during erection.
- G. Gas Cutting: Do not use gas cutting torches in the field to correct fabrication errors in structural framing.
- H. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- I. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using High-Strength Bolts " for type of bolt and type of joint specified.
 - 1. Joint Type: As indicated on the Drawings.
 - 2. A307 bolts and high-strength (F3125 Grade A325 and A490) bolts noted to be "snug-tight" shall be tightened using a few impacts of an impact wrench or the full effort of a man using an ordinary spud wrench, bringing the plies into contact.
 - 3. High-strength bolts which are not specifically designated to be "snug-tight" shall be tightened to provide at least the minimum tension shown in Table 4 of the "Specification for Structural Joints using ASTM F3125 Grade 325 and A490 Bolts." Tightening shall be done by the turn-of-the-nut method, with direct tension indicators, or by properly calibrated wrenches.
 - 4. Bolts tightened with a calibrated wrench or by torque control shall have a hardened washer under the element (nut or bolt head) turned in tightening.
 - 5. Hardened washers shall be placed over slotted holes in an outer ply. Hardened beveled washers shall be used where the outer face of the bolted parts has a slope greater than 1:20 with respect to the bolt axis.
- B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work. Welds not specified shall be continuous fillet welds designed to develop the full strength of the member. A combination of welds and bolts shall not be used to transmit

stress at the same face of any connections. Clean completed welds prior to inspection. Slag shall be removed from all completed welds.

1. Comply with AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Load and Resistance Factor Design Specification for Structural Steel Buildings" for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.
- B. Bolted Connections: Shop-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using High-Strength Bolts"
- C. Welded Connections: Field welds will be visually inspected according to AWS D1.1.
 1. In addition to visual inspection, field welds will be tested according to AWS D1.1 and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.
- D. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1 for stud welding and as follows:
 1. Perform bend tests if visual inspections reveal either a less-than- continuous 360-degree flash or welding repairs to any shear connector.
 2. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1.
- E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.6 REPAIRS AND PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Touch-up Cold Galvanizing: Touch up areas of hot dip galvanized members where galvanizing has been abraded during shipping and erection and areas where galvanizing has been removed or damaged due to welding. Apply cold galvanizing compound in accordance with the manufacturer's instructions to a minimum dry film thickness of 2.0 mils.

- C. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories, bearing plates, and abutting structural steel.
1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

SECTION 052100 - STEEL JOISTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Furnish all labor and materials required to fabricate, deliver, and erect steel joists and joist girders, including all bridging, ceiling extensions, bearing plates, side wall anchors, and extended ends.
- B. This Section includes the following:
 - 1. K-series steel joists.
 - 2. KCS-type K-series steel joists.
 - 3. K-series steel joist substitutes.
- C. Related Sections include the following:
 - 1. Division 5 Section "Structural Steel" for structural framing support steel joists.

1.3 DEFINITIONS

- A. SJI "Specifications": Steel Joist Institute's "Standard Specification."
- B. SJI "Load Tables": Steel Joist Institute's "SJI Load Tables and Weight Tables for Steel Joists and Joist Girders."
- C. Special Joists: Steel joists or joist girders requiring modification by manufacturer to support nonuniform, unequal, or special loading conditions that invalidate load tables in SJI's "Load Tables."

1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide special joists and connections capable of withstanding design loads indicated.
- B. Design special joists to withstand design loads with live load deflections no greater than the following:
 - 1. Roof Joists: Vertical deflection of 1/240 of the span.

1.5 SUBMITTALS

- A. Submit in accordance with Division 1 Section "Submittals."

B. Submittals for Review:

1. Shop Drawings: Show layout, designation, number, type, location, and spacings of joists. Include joining and anchorage details, bracing, bridging, camber, coatings, material properties, configuration, joist accessories; splice and connection locations and details; and attachments to other construction.

C. Submittals for Information:

1. Design calculations for all joist girders, and for all joists for which the standard load tables are not applicable. Calculations shall bear the seal of a licensed Professional Engineer, licensed in the State of Texas. Calculations will be retained for the Architect's file.
2. Welders Certificates: Submit certificates to Owner's Testing Laboratory, certifying that welders to be employed on the project have passed AWS qualification tests within the previous 12 months. If recertification of welders is required, recertification shall be contractor's responsibility.
3. Product Data: For each type of joist, accessory, and product indicated.
 - a. Indicate locations and details of bearing plates to be embedded in other construction.
4. Manufacturer Certificates: Signed by manufacturers certifying that joists comply with requirements.

1.6 QUALITY ASSURANCE

- A. Domestic Iron and Steel Certification. Pursuant to sections 2252.201-2252.205 of the Government Code, the Contractor certifies that it is in compliance with the requirement that any iron or steel product produced through a manufacturing process and used in the Project is produced in the United States.
- B. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists, including headers and other supplemental framing, complying with applicable standard specifications and load tables of SJI "Specifications." Manufacturer shall have a minimum of five years documented experience in the design and fabrication of open-web joists and joist girders
 1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.
- C. SJI Specifications: Comply with standard specifications in SJI's "Specifications" that are applicable to types of joists indicated.
- D. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle joists as recommended in SJI's "Specifications."
- B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel: Comply with SJI's "Specifications" for web and steel-angle chord members.
- B. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A36, minimum
- C. Carbon-Steel Bolts and Threaded Fasteners: As indicated in the Structural Notes.
- D. High-Strength Bolts, Nuts, and Washers: As indicated in the Structural Notes.
- E. Welding Electrodes: Comply with AWS standards.

2.2 PRIMERS

- A. Primer: SSPC-Paint 15, Type 1 red oxide , or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

2.3 K-SERIES STEEL JOISTS

- A. Manufacture steel joists of type indicated according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.
 - 1. Joist Type: K-series steel joists and KCS-type K-series steel joists.
- B. Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.
- C. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work. Refer to Section 2.5 C. for additional welding requirements.
- D. Provide holes in chord members for connecting and securing other construction to joists. Do not make or enlarge holes by burning.
- E. Top-Chord Extensions: Extend top chords of joists with SJI's Type S top-chord extensions where indicated, complying with SJI's "Specifications."
- F. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications."
- G. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).
- H. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work. Refer to Section 2.7 C. for additional welding requirements.

2.4 JOIST ACCESSORIES

- A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.
- B. Steel bearing plates with integral anchorages are specified in Division 5 Section "Metal Fabrications."
- C. Supply ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch (13 mm) of finished wall surface, unless otherwise indicated.
- D. Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.

2.5 FABRICATION

- A. Splices: Shop splices may occur in chord or web members. Shop splices shall be designed in accordance with the latest applicable SJI specification.
- B. Holes shall not be made or enlarged by burning with a torch.
- C. Welds shall meet the following criteria for acceptance:
 - 1. Remove slag from welds prior to inspection.
 - 2. Cracked welds are not acceptable and must be repaired.
 - 3. Thorough fusion shall exist between the weld and base metal, as determined by visual inspection.
 - 4. Unfilled weld craters shall not be included in the design length of the weld.
 - 5. Undercut shall not exceed 1/16" provided that it is oriented parallel to the principal stress.
 - 6. The sum of surface (piping) porosity diameters shall not exceed 1/16" in any 1" of design weld length.
 - 7. Weld spatter that does not interfere with paint coverage is acceptable.

2.6 CLEANING AND SHOP PAINTING

- A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.
- B. Do not prime paint joists and accessories to receive sprayed fire-resistive materials.
- C. Apply 1 coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil (0.025 mm) thick.
- D. Shop priming of joists and joist accessories is specified in Division 9 painting Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Do not install joists until supporting construction is in place and secured.
- B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.
 - 1. Before installation, splice joists delivered to Project site in more than one piece.
 - 2. Space, adjust, and align joists accurately in location before permanently fastening.
 - 3. Minimum bearings and anchorage shall conform to referenced SJI standards and the Drawings.
 - 4. Allow for erection loads. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction. Construction loads shall not be applied until joists are permanently fastened to supports and all bridging has been installed.
- C. Field weld joists to supporting steel [bearing plates] [and] [framework]. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
- D. Bolt joists to supporting steel framework using ASTM A 307 carbon-steel bolts.
- E. Bridging shall conform to SJI standards and the shop drawings. Provide and install extra bridging, where indicated or where required due to loading, in addition to the minimum SJI requirements. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and bolted connections and to perform field tests and inspections and prepare test and inspection reports.
- B. Field welds will be visually inspected according to AWS D1.1/D1.1M.

- C. In addition to visual inspection, field welds may be tested according to AWS D1.1/D1.1M and the following procedures, as applicable:
 - 1. Radiographic Testing: ASTM E 94.
 - 2. Magnetic Particle Inspection: ASTM E 709.
 - 3. Ultrasonic Testing: ASTM E 164.
 - 4. Liquid Penetrant Inspection: ASTM E 165.
- D. Bolted connections will be visually inspected.
- E. High-strength, field-bolted connections will be tested and verified according to procedures in RCSC's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts."
- F. Correct deficiencies in Work that test and inspection reports have indicated are not in compliance with specified requirements.
- G. Additional testing will be performed to determine compliance of corrected Work with specified requirements.

3.4 REPAIRS AND PROTECTION

- A. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists, bearing plates, abutting structural steel, and accessories.
 - 1. Clean and prepare surfaces by hand-tool cleaning, SSPC-SP 2, or power-tool cleaning, SSPC-SP 3.
 - 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that joists and accessories are without damage or deterioration at time of Substantial Completion.

SECTION 053100 - STEEL DECK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Roof deck.
 - 2. Composite floor deck.
 - 3. Noncomposite form deck.
- B. Work Included
 - 1. Furnish all labor and materials required to fabricate, deliver and install steel roof deck and accessories including formed steel cant strips, eave strips, valley strips, sump pans, edge closures, pour stops, reinforcing plates and related accessories.
 - 2. Furnish all labor and materials required to fabricate, deliver and install steel floor deck and accessories including formed steel end closures, edge forms, flashings, and reinforcing plates, headed shear studs, and related accessories.
- C. Related Sections include the following:
 - 1. Division 3 Section "Cast-in-Place Concrete" for concrete fill.
 - 2. Division 5 Section "Structural Steel" for shop- and field-welded shear connectors.
 - 3. Division 5 Section "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Show layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.
 - 2. Product Data: For each type of deck, accessory, and product indicated. Provide deck dimensions, sectional properties, uplift resistance and diaphragm capacity for specified fastener layout and support spacing, and finishes.
- B. Submittals for Information:
 - 1. Product Certificates: For each type of steel deck, signed by product manufacturer. Certify that products comply with SDI, UL and ICC standards as specified.

2. Manufacturer's installation instructions.
3. Welding certificates: For each welder employed on the Work.
4. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
 - a. Power-actuated mechanical fasteners.
5. ICC-ES Reports: Deck units shall be approved by the International Code Council and shall have an ICC-ES report.
6. Deck units shall be classified by Underwriter's Laboratory, Inc. and shall be labeled and marked as required by UL, indicating manufacturer testing and inspection.

1.4 QUALITY ASSURANCE

- A. Domestic Iron and Steel Certification. Pursuant to sections 2252.201-2252.205 of the Government Code, the Contractor certifies that it is in compliance with the requirement that any iron or steel product produced through a manufacturing process and used in the Project is produced in the United States.
- B. Installer: Company specializing in performing the work of this Section with minimum 5 years documented experience.
- C. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated.
- D. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."
- E. Comply with applicable provisions of the following specifications and documents.
 1. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."
 2. SDI (Steel Deck Institute) - Design Manual for Composite Decks, Form Decks, Roof Decks, Cellular Metal Floor Deck with Electrical Distribution.
 3. SSPC (Steel Structures Painting Council) - Painting Manual.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
 1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Steel Deck:
 - a. ASC Profiles, Inc.
 - b. Canam Steel Corp.;The Canam Manac Group.
 - c. Consolidated Systems, Inc.
 - d. DACS, Inc.
 - e. D-Mac Industries Inc.
 - f. Epic Metals Corporation.
 - g. Marlyn Steel Decks, Inc.
 - h. New Millennium Building Systems, LLC.
 - i. Nucor Corp.; Vulcraft Division.
 - j. Roof Deck, Inc.
 - k. United Steel Deck, Inc.
 - l. Valley Joist; Division of EBSCO Industries, Inc.
 - m. Verco Manufacturing Co.
 - n. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.

2.2 ROOF DECK

- A. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Roof Deck Design Manual and as indicated in the Structural Notes.

2.3 COMPOSITE FLOOR DECK

- A. Composite Steel Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with "SDI Specifications and Commentary for Composite Steel Floor Deck," in SDI's "Floor Deck Design Manual", with the minimum section properties indicated, and as indicated in the structural notes.

2.4 NONCOMPOSITE FORM DECK

- A. Noncomposite Steel Form Deck: Fabricate ribbed-steel sheet noncomposite form-deck panels to comply with "SDI Specifications and Commentary for Noncomposite Steel Form Deck," SDI's "Floor Deck Design Manual", with the minimum section properties indicated, and as indicated in the Structural Notes.

2.5 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
 - 1. Mechanical Fasteners: Galvanized hardened ((Stainless)) steel, self tapping "Teks" screws, manufactured by Illinois Tool Works, Inc., Buildex Division, or equal. Size shall be #10 minimum, unless noted otherwise.
 - 2. Powder Actuated Fasteners: Zinc coated fastener with .145 inch shank diameter and 1 1/4 inch shank length. X-DNI pin as manufacturer by Hilti, or equal.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 (4.8-mm) minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), of same material and finish as deck, and of thickness and profile recommended by SDI Publication No. 30 for overhang and slab depth.
- G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck, unless otherwise indicated.
- H. Piercing Hanger Tabs: Piercing steel sheet hanger attachment devices for use with floor deck.
- I. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0598 inch (1.52 mm) thick, with factory-punched hole of 3/8-inch (9.5-mm) minimum diameter.
- J. Recessed Sump Pans: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck, with 3-inch- (76-mm-) wide flanges and sloped recessed pans of 1-1/2-inch (38-mm) minimum depth, sealed watertight. For drains, cut holes in the field.
- K. Flat Sump Plate: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck, sealed watertight. For drains, cut holes in the field.
- L. Galvanizing Repair Paint: ASTM A 780 SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94 percent zinc dust by weight.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI's Design manuals, manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels, if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

3.3 ROOF-DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches (38 mm) long, and as indicated in the Structural Notes
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals as indicated in the structural notes.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing as indicated in the structural notes.
- D. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld] or mechanically fasten to substrate to provide a complete deck installation.
 - 1. Weld cover plates at changes in direction of roof-deck panels, unless otherwise indicated.

- E. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.
- F. Architectural finishes and mechanical, electrical, and plumbing equipment shall not be hung directly from the metal deck.

3.4 FLOOR-DECK INSTALLATION

- A. Fasten floor-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as indicated in the structural notes.
- B. Fasten deck to concrete support members at ends and intermediate supports with powder actuated fasteners at 12 inches maximum spacing if deck spans parallel to the supporting member and at every other flute if the deck spans perpendicular to the supporting member.
- C. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of half of the span or 36 inches (910 mm), and as indicated in the structural notes.
- D. End Bearing: Install deck ends over supporting steel frame with a minimum end bearing as indicated in the structural notes. Provide end joints as indicated in the structural notes.
- E. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations, unless otherwise indicated.
 - 1. Install wet concrete stops at floor edges and around openings and penetrations up-turned to top surface of slab, to contain wet concrete. If size of stop is not shown on the Drawings, provide stops of sufficient strength to deflect no more than 1/8 inch vertically or horizontally.
- F. Install 6 inch minimum wide sheet steel cover plates, of same thickness as deck, where deck changes direction. Fusion weld or mechanically fasten plate to deck at 12 inches maximum spacing.
- G. Floor-Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.
- H. Install piercing hanger tabs at 14 inches (355 mm) apart in both directions, within 9 inches (228 mm) of walls at ends, and not more than 12 inches (305 mm) from walls at sides, unless otherwise indicated.
- I. Position floor drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field welds will be subject to inspection.

- C. Testing agency will report inspection results promptly and in writing to Contractor and Architect.
- D. Remove and replace work that does not comply with specified requirements.
- E. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.6 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Exterior Load Bearing wall framing.
- B. Related Requirements Specified Elsewhere:
 - 1. Section 055000 "Metal Fabrications" for masonry shelf angles and connections.
 - 2. Section 092116.23 "Gypsum Board Shaft Wall Assemblies" for interior non-load-bearing, metal-stud-framed, shaft-wall assemblies.
 - 3. Section 092900 "Gypsum Drywall Assemblies" for interior non-load-bearing, metal-stud framing and ceiling-suspension assemblies.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of cold-formed steel framing product and accessory.
- B. Shop Drawings: Provide shop drawings prepared by cold-formed metal framing manufacturer.
 - 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
 - 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
 - 3. For cold-formed metal framing indicated to comply with design loads, include structural analysis and detailed shop drawings signed and sealed by a qualified professional engineer, who shall be licensed in the State in which the Project is located and responsible for their preparation.
- C. Delegated-Design Submittal: For cold-formed steel framing.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.
- C. Product Test Reports: For each listed product, for tests performed by manufacturer and witnessed by a qualified testing agency.
 - 1. Steel sheet.
 - 2. Expansion anchors.
 - 3. Power-actuated anchors.

4. Mechanical fasteners.
 5. Vertical deflection clips.
 6. Horizontal drift deflection clips
 7. Miscellaneous structural clips and accessories.
- D. Research/Evaluation Reports: For cold-formed steel framing.
1. Metal stud manufacturer to have a third-party evaluation report for its products that are reviewed to the local building code (IBC 2015 and AISI S100).

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Member in good standing of the Steel Framing Industry Association (SFIA).
1. Products to be certified under an independent third-party inspection program administered by an agency accredited by IAS to ICC-ES AC98 IAS Accreditation Criteria for Inspection Agencies.
- B. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- C. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in Texas and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this project in material, design, and extent.
- D. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- E. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-steel thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- F. Welding Qualifications: Qualify procedures and personnel according to the following:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."
- G. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by, and displaying a classification label from, a testing and inspecting agency acceptable to authorities having jurisdiction.
- H. Comply with AISI Specifications and Standards.
1. AISI S100 "North American Specification for the Design of Cold-Formed Steel Structural Members".
 2. AISI S200 "North American Standard for Cold-Formed Steel Framing – General Provisions".
 3. AISI S201 "North American Standard for Cold-Formed Steel Framing – Product Standard".
 4. AISI S211 "North American Standard for Cold-Formed Steel Framing – Wall Stud Design".
 5. AISI S212 "North American Standard for Cold-Formed Steel Framing – Header Design".
 6. AISI S213 "North American Standard for Cold-Formed Steel Framing – Lateral Design".
 7. AISI "Code of Standard Practice for Cold-Formed Steel Structural Framing".

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect and store cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling as required in AISI's "Code of Standard Practice".

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide cold-formed metal framing products manufactured by Clark Dietrich Building Systems; as specified in other Part 2 articles or comparable products from members of the SFIA:
 - 1. Marino Industries, Inc.
 - 2. Alabama Metal Industries, Inc.
 - 3. United States Steel.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, registered in Texas, to design cold-formed steel framing.
- B. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads: As indicated on drawings.
 - 2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
 - a. Exterior Load-Bearing Wall Framing: Horizontal deflection of 1/720 of the wall height.
 - 3. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
 - 4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
 - a. Upward and downward movement of 1/2 inch .
 - 5. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
- C. Cold-Formed Steel Framing Design Standards:
 - 1. Wall Studs: AISI S211.
 - 2. Headers: AISI S212.
 - 3. Lateral Design: AISI S213.
- D. AISI Specifications and Standards: Unless more stringent requirements are indicated, comply with AISI S100 and AISI S200.
- E. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.3 COLD-FORMED STEEL FRAMING, GENERAL

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
 - 1. Grade: As required by structural performance.
 - 2. Coating: G90].

- C. Steel Sheet for Vertical Deflection and Drift Clips: ASTM A 1003/A 1003M, ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
 - 1. Grade: As required by structural performance.
 - 2. Coating: G90.

2.4 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
 - 1. Basis-of-Design Product: Clark Dietrich Building Systems.
 - 2. Minimum Base-Steel Thickness: 0.0677 inch.
 - 3. Flange Width: 1-5/8 inches.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
 - 1. Minimum Base-Steel Thickness: Matching steel studs.
 - 2. Flange Width: 1-1/4 inches .
- C. Headers and Jambs - Heavy-Duty Stud: Manufacturer's proprietary shape used to form header beams and jambs, columns or posts, of web depths indicated, unpunched, with stiffened flanges and as follows:
 - 1. Basis-of-Design Product: ClarkDietrich Building Systems; HDS Heavy Duty Stud.
 - 2. Minimum Base-Steel Thickness: Matching steel studs.
- D. Vertical Deflection Clips: Manufacturer's standard head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web and capable of resisting forces imposed by the wall system.
 - 1. Basis-of-Design Product: ClarkDietrich Building Systems; or a comparable product by one of the members of the SFIA:
- E. Deflection Track and Firestop Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thicknesses not less than indicated for studs and in width to accommodate depth of studs.
 - 1. Basis-of-Design Product: ClarkDietrich Building Systems; Blaze Frame Deflection Track.
- F. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads and transfer them to the primary structure. Install a continuous row of bridging, composed of 1-1/2 inch cold-formed channel secured to each stud with clip angle or Spazzer 5400, at upper-most knockout, not more than 12 inches from top of wall.
 - 1. Basis-of-Design Product: ClarkDietrich Building Systems; BlazeFrame DL Deflection Track, or a comparable product by one of the members of the SFIA
 - 2. Basis-of-Design Product: ClarkDietrich Building Systems; TradeReady Spazzer 5400 (SPZS).
 - 3. Minimum Base-Steel Thickness: 0.0538 inch
 - 4. Size: 1-1/4 by 1-1/4 by 50 inches long, pre-notched at 12, 16 and 24 inches centers.
- G. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
 - 1. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal and lateral loads and transfer them to the primary structure, and as follows:
 - a. Minimum Base-Steel Thickness: 0.0428 inch.
 - b. Flange Width: 1 inch plus the design gap for one-story structures and 1 inch plus twice the design gap for other applications.
 - 2. Inner Track: Of web depth indicated, and as follows:
 - a. Minimum Base-Steel Thickness: 0.0428 inch.

- b. Flange Width: Dimension equal to sum of outer deflection track flange width plus 1 inch.
- H. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

2.5 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated.

2.6 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.
- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488 conducted by a qualified testing agency.
- D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.
- E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
 - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

2.7 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint ASTM A 780.
- B. Shims: Load bearing, high-density multimonomer plastic, and nonleaching; or of cold-formed steel of same grade and coating as framing members supported by shims.
- C. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.8 FABRICATION

- A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.

1. Fabricate framing assemblies using jigs or templates.
 2. Cut framing members by sawing or shearing; do not torch cut.
 3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by no fewer than three exposed screw threads.
 4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
 2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

- A. Install cold-formed framing in accordance with ASTM C1007 and AISI S200 "North American Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.
- B. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.
- D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
 1. Cut framing members by sawing or shearing; do not torch cut.

2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- H. Install insulation, specified in Section 072100 "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.
- J. Erection Tolerances: Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
 1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Fasten both flanges of studs to bottom track unless otherwise indicated. Space studs as follows:
 1. Stud Spacing: 16 inches, unless indicated otherwise.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.
 1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
 - a. Install solid blocking at 96-inch centers.
 2. Bridging: Steel channel, welded or mechanically fastened to webs of punched studs.
- E. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.5 FIELD QUALITY CONTROL

- A. Testing: Owner may engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Remove and replace work where test results indicate that it does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.6 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, to ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Steel framing and supports for overhead doors and grilles.
 - 2. Steel framing and supports for countertops.
 - 3. Steel framing and supports for mechanical and electrical equipment.
 - 4. Steel framing and supports for applications where framing and supports are not specified in other Sections.
 - 5. Elevator machine beams, hoist beams.
 - 6. Steel shapes for supporting elevator door sills.
 - 7. Interior steel railings.
 - 8. Elevator pit sump covers.
 - 9. Miscellaneous steel trim including steel edgings.
 - 10. Loose bearing and leveling plates for applications where they are not specified in other Sections.
- B. Products furnished, but not installed, under this Section include the following:
 - 1. Loose steel lintels.
 - 2. Anchor bolts, steel pipe sleeves indicated to be cast into concrete or built into unit masonry.
 - 3. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.
- C. Related Requirements:
 - 1. Section 033000 "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, and other items cast into concrete.
 - 2. Section 042000 "Unit Masonry" for installing loose lintels, anchor bolts, and other items built into unit masonry.
 - 3. Section 051200 "Structural Steel Framing."
 - 4. Section 052100 "Steel Joists and Girders"
 - 5. Section 100100 "Miscellaneous Specialties"

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Paint products.
 - 2. Grout.
- B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:
 - 1. Steel framing and supports for countertops.
 - 2. Steel framing and supports for mechanical and electrical equipment.
 - 3. Steel framing and supports for applications where framing and supports are not specified in other Sections.
 - 4. Elevator machine beams, hoist beams.
 - 5. Steel shapes for supporting elevator door sills.
 - 6. Shelf angles.
 - 7. Elevator pit sump covers.
 - 8. Loose steel lintels.
- C. Samples for Verification: For each type and finish of extruded nosing.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer.
- B. Mill Certificates: Signed by stainless-steel manufacturers, certifying that products furnished comply with requirements.
- C. Domestic Iron and Steel Certification: In accordance with Sections 2252.201-2252.205 of the Government Code, certify compliance with the requirement that iron or steel products are produced in the United States.
- D. Welding certificates.
- E. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- F. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing metal fabrications similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 - 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.7 FIELD CONDITIONS

- A. Field Measurements: Where metal fabrications are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Allow for trimming and fitting.

1.8 COORDINATION

- A. Coordinate installation of anchorages for metal fabrications with all other trades affected by the Work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Stainless-Steel Sheet, Strip, and Plate: ASTM A 240/A 240M or ASTM A 666, Type 304.
- D. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.
- E. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.
- F. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.

2.2 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
 1. Provide stainless-steel fasteners for fastening aluminum.
 2. Provide stainless-steel fasteners for fastening stainless steel.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.
- C. High-Strength Bolts, Nuts, and Washers: ASTM F 3125, Grade A325, Type 3, heavy-hex steel structural bolts; ASTM A 563, Grade DH3, heavy-hex carbon-steel nuts; and where indicated, flat washers.
- D. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593; with hex nuts, ASTM F 594; and, where indicated, flat washers; Alloy Group 1.
- E. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
- F. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or

ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

- G. Post-Installed Anchors: Torque-controlled expansion anchors.
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
 - 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

2.3 MISCELLANEOUS MATERIALS

- A. Shop Primers: Provide primers that comply with Section 099010 "Painting."
- B. Water-Based Primer: Emulsion type, anticorrosive primer for mildly corrosive environments that is resistant to flash rusting when applied to cleaned steel, complying with MPI#107 and compatible with topcoat.
- C. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- D. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- E. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
- G. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- H. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi.

2.4 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.5 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
 - 1. Furnish inserts for units installed after concrete is placed.
- C. Drill or punch bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.
- D. Galvanize miscellaneous framing and supports where indicated.
- E. Prime miscellaneous framing and supports with zinc-rich primer where indicated.

2.6 SHELF ANGLES

- A. Fabricate shelf angles from steel angles of sizes indicated. Provide horizontally slotted holes to receive 3/4-inch bolts, spaced not more than 6 inches from ends and 24 inches o.c., unless otherwise indicated.
 - 1. Provide mitered and welded units at corners.
 - 2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 inches larger than expansion or control joint.
- B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.
- C. Galvanize and prime shelf angles located in exterior walls.
- D. Prime shelf angles located in exterior walls with zinc-rich primer.

2.7 ELEVATOR PIT SUMP COVERS

- A. Fabricate from 3/16-inch rolled-steel floor plate with four 1-inch-diameter holes for water drainage and for lifting.

- B. Provide steel angle supports as indicated.

2.8 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
 - 1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.
- C. Galvanize and prime exterior miscellaneous steel trim.
- D. Prime exterior miscellaneous steel trim with zinc-rich primer.

2.9 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.
- B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span, but not less than 8 inches unless otherwise indicated.
- C. Galvanize and prime loose steel lintels located in exterior walls.
- D. Prime loose steel lintels located in exterior walls with zinc-rich primer.

2.10 FINISHES, GENERAL

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.11 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
 - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.
- C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
 - 1. Shop prime with primers specified in Section 099010 "Painting" unless zinc-rich primer is indicated.
- D. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
 - 1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 3. Other Items: SSPC-SP 3, "Power Tool Cleaning."
- E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.12 ALUMINUM FINISHES

- A. Clear Anodic Finish: AA-M10C22A41 Mechanical finish as fabricated. Architectural Class I, clear coating 0.018 mm or thicker.
- a. Color: As indicated, scheduled, or specified in Division 9 Section.

2.13 STAINLESS STEEL FINISHES

- A. Remove tool and die marks and stretch lines or blend into finish.
- B. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
- C. Bright, Directional Polish: No. 4 finish.
- D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

- F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
 - 1. Cast Aluminum: Heavy coat of bituminous paint.
 - 2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 055000

SECTION 055113 - METAL PAN STAIRS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Preassembled steel stairs with integral color concrete-filled treads.
 - 2. railings attached to metal stairs.
 - 3. handrails attached to walls adjacent to metal stairs.
 - 4. Handrail and railing.
- B. Related Requirements specified elsewhere:
 - 1. Section 035400 "Integral Colored Concrete" for concrete fill for stair treads and platforms.
 - 2. Section 055000 "Metal Fabrications" for steel railings.

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for metal stairs. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- C. Coordinate locations of hanger rods and struts with other work so that they do not encroach on required stair width and are within the fire-resistance-rated stair enclosure.

1.4 ACTION SUBMITTALS

- A. Product Data: For metal pan stairs and the following:
 - 1. Prefilled metal-pan-stair treads.
 - 2. Paint products.
 - 3. Grout.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Samples for Verification: For each type and finish of tread.
- D. Delegated-Design Submittal: For stairs and railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

- B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.3/D1. 3M, "Structural Welding Code - Sheet Steel."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Preassembled Stairs:
 - a. Alfab, Inc.
 - b. American Metal Works, Inc.
 - c. American Stair Corp., Inc.
 - d. Florida Stairs & Rails, Inc.
 - e. National Stair & Rail, Inc.
 - f. Sharon Companies, Ltd. (The).
 - g. Architect approved equal.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer legally qualified to practice in the state of Texas to design stairs and railings.
- B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Uniform Load: 100 lbf/sq. ft..
 - 2. Concentrated Load: 300 lbf applied on an area of 4 sq. in..
 - 3. Uniform and concentrated loads need not be assumed to act concurrently.
 - 4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
 - 5. Limit deflection of treads, platforms, and framing members to L/360 or 1/4 inch, whichever is less.
- C. Structural Performance of Railings: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Handrails and Top Rails of Guards:
 - a. Uniform load of 50 lbf/ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.

2.3 ABRASIVE NOSINGS

- A. Cast Metal Units: Cast aluminum, with an integral abrasive as-cast finish consisting of aluminum oxide, silicon carbide, or a combination of both. Fabricate units in lengths necessary to accurately fit openings or conditions.
 - 1. Wooster Products, Inc.

2. Architect's approved equal.
- B. Extruded Units: Aluminum units with abrasive filler consisting of aluminum oxide, silicon carbide, or a combination of both, in an epoxy-resin binder. Fabricate units in lengths indicated.
 1. Provide solid-abrasive units without ribs.
 2. Nosings: Square back units, 3 inches wide, without lip.
- C. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with manufacturer.
- D. Apply clear lacquer to concealed surfaces of extruded units set into concrete.

2.4 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Galvanized-Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating, structural steel, Grade 33 (Grade 230), unless another grade is required by design loads.

2.5 FASTENERS

- A. General: Provide zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.
- B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.
- C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.

2.6 MISCELLANEOUS MATERIALS

- A. Shop Primers: Provide primers that comply with Section 099010 "Painting".
- B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- C. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
- F. Concrete Materials and Properties: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.

2.7 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, struts, railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
 - 1. Join components by welding unless otherwise indicated.
 - 2. Use connections that maintain structural value of joined pieces.
- B. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Form exposed work with accurate angles and surfaces and straight edges.
- F. Weld connections to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Weld exposed corners and seams continuously unless otherwise indicated.
 - 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 3 welds: partially dressed weld with spatter removed.
- G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated. Locate joints where least conspicuous.

2.8 STEEL-FRAMED STAIRS

- A. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," Commercial Class, unless more stringent requirements are indicated.
- B. Stair Framing:
 - 1. Fabricate stringers of steel tubes, unless indicated otherwise.
 - a. Provide closures for exposed ends of channel stringers.
 - 2. Construct platforms of steel plate headers and miscellaneous framing members as needed to comply with performance requirements.
 - 3. Weld stringers to headers; weld framing members to stringers and headers.
 - 4. Where stairs are enclosed by gypsum board shaft-wall assemblies, provide hanger rods or struts to support landings from floor construction above or below. Locate hanger rods and struts where they do not encroach on required stair width and are within the fire-resistance-rated stair enclosure.
 - 5. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.
- C. Metal Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements, but not less than 0.067 inch.
 - 1. Steel Sheet: Uncoated cold-rolled steel sheet unless otherwise indicated.
 - 2. Directly weld metal pans to stringers; locate welds on top of subtreads where they are concealed by concrete fill. Do not weld risers to stringers.

3. Attach risers and subtreads to stringers with brackets made of steel angles or bars. Weld brackets to stringers and attach metal pans to brackets by welding, riveting, or bolting.
 4. Shape metal pans to include nosing integral with riser.
 5. Attach abrasive nosings to risers.
 6. At Contractor's option, provide stair assemblies with metal pan subtreads filled with reinforced concrete during fabrication.
 7. Provide epoxy-resin-filled treads, reinforced with glass fibers, with slip-resistant, abrasive surface.
 8. Provide subplatforms of configuration indicated or, if not indicated, the same as subtreads. Weld subplatforms to platform framing.
 - a. Smooth Soffit Construction: Construct subplatforms with flat metal under surfaces to produce smooth soffits.
- D. Available Products:
1. MEBAC; IKO Borden
 2. Slip-Not; W.S. Molnar Co.

2.9 STAIR RAILINGS

- A. Steel Railings: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.
1. Rails and Posts: Refer to drawings.
 2. Picket Infill: Square pickets.
- B. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
- C. Form changes in direction of railings as follows:
1. As detailed.
 2. By bending.
 3. By radius bends of radius indicated.
- D. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- E. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- F. Connect posts to stair framing by direct welding unless otherwise indicated.

2.10 FINISHES

- A. Finish metal stairs after assembly.
- B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning" (Interior). SSPC SP6/NACE No. 3 "Commercial Blast" for exterior.
- C. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLING METAL PAN STAIRS

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.
- D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- E. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- F. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.
- G. Place and finish concrete fill for treads and platforms to comply with Section 033000 "Cast-in-Place Concrete."
 - 1. Install abrasive nosings with anchors fully embedded in concrete. Center nosings on tread width.
- H. Install precast concrete treads with adhesive supplied by manufacturer.

3.2 INSTALLING RAILINGS

- A. Adjust railing systems before anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as required by design loads. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:
 - 1. Anchor posts to steel by welding to steel supporting members.
 - 2. Anchor handrail ends to concrete and masonry with steel round flanges welded to rail ends and anchored with postinstalled anchors and bolts.
- B. Attach handrails to wall with wall brackets. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads. Secure wall brackets to building construction as follows:
 - 1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
 - 2. For hollow masonry anchorage, use toggle bolts.
 - 3. For steel-framed partitions, use self-tapping screws fastened to steel framing or to concealed steel reinforcements.

3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099010 "Painting".
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 055113

SECTION 055150 - LADDERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Aluminum ship's ladders.

1.2 RELATED SECTIONS

- A. Section 055000 – Metal Fabrications: Fasteners and installation requirements used to attach ladders to structure.
- B. Section 142400 – Elevators: For pit ladders.

1.3 REFERENCES

- A. AA – Aluminum Association.
- B. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- C. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

1.4 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product.
- B. Shop Drawings:
 - 1. Detail fabrication and erection of each ladder indicated. Include plans, elevations, sections, and details of metal fabrications and their connections.
 - 2. Provide templates for anchors and bolts specified for installation under other Sections.
 - 3. Provide reaction loads for each hanger and bracket.
- C. Qualification Data:
 - 1. Refer to Quality Assurance provisions for submittal requirements evidencing experience, certifications and resources.
- D. Verification Samples: For each finish specified, two samples, minimum size 6 inches (150 mm) square, represent actual product color.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in producing aluminum metal ladders similar to those indicated for this Project.
 - 1. Professional engineering competent in design and structural analysis to fabricate ladders in compliance with industry standards and local codes.
- B. Installer Qualifications: Competent and experienced firm capable of selecting fasteners and installing ladders to attain designed operational and structural performance.
- C. Product Qualification: Product design shall comply with OSHA 1910.27 minimum standards for ladders.
- D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Install ladder in area designated by Architect.
 - 2. Do not proceed with remaining work until workmanship and installation are approved by Architect.

3. Rework mock-up as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions by field measurement before fabrication.
 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, indicate established dimensions on shop drawing submittal and proceed with fabrication.

1.8 WARRANTY

- A. A. Manufacturer has responsibility for an extended Corrective Period for work of this Section for a period of 5 years commencing on the date of Substantial Completion against all the conditions indicated below, and when notified in writing from Owner, manufacturer shall promptly and without inconvenience and cost to Owner correct said deficiencies.
 1. Defects in materials and workmanship.
 2. Deterioration of material and surface performance below minimum OSHA standards as certified by independent third-party testing laboratory. Ordinary wear and tear, unusual abuse or neglect excepted.
 3. Within the warranty period, the manufacturer shall, at its option, repair, replace, or refund the purchase price of defective ladder.
- B. Manufacturer shall be notified immediately of defective products, and be given a reasonable opportunity to inspect the goods prior to return. Manufacturer will not assume responsibility, or compensation, for unauthorized repairs or labor.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
 1. O'Keeffe's, Inc
 2. Precision Ladders

2.2 APPLICATIONS/SCOPE

- A. Ship Ladder:
 1. Ship Ladder with Access to Roof Hatch.
 2. Incline:
 - a. 75-degree incline.

2.3 FINISHES

- A. Mill finish. As extruded.
- B. Clear Anodic Finish: AA-M10C22A41 Mechanical finish as fabricated. Architectural Class I, clear coating 0.018 mm or thicker.

2.4 MATERIALS

- A. Aluminum Sheet: Alloy 5005-H34 to comply with ASTM B209.
- B. Aluminum Extrusions: Alloy 6063-T6 to comply with ASTM B221.

2.5 FABRICATION

- A. Rungs: Not less than 1-1/4 inches in section and 18-3/8 inches long, formed from tubular aluminum extrusions. Squared and deeply serrated on all sides.
 - 1. Rungs shall withstand a 1,500-pound load without deformation or failure.
- B. Heavy Duty Tubular Side Rails: Assembled from two interlocking aluminum extrusions no less than 1/8-inch (3 mm) wall thickness by 3 inches wide. Construction shall be self-locking stainless-steel fasteners, full penetration TIG welds and clean, smooth and burr-free surfaces.
- C. Ship Ladders: Not less than 1-1/4 inches high, 4-1/8 inches deep and 2 feet wide; tread spacing shall be 1 foot on center. Handrails shall be aluminum pipe, not less than 1-1/2 inches in diameter with hemispheric end caps.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Coordinate anchorages. Furnish setting drawings, templates, and anchorage structural loads for fastener resistance.
- B. Do not begin installation until supporting structure is complete and ladder installation will not interfere with supporting structure work.
- C. If supporting structure is the responsibility of another installer, notify Architect of unsatisfactory supporting work before proceeding.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction.

3.3 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 055213 – EXTERIOR STEEL BAR RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Steel bar railings as indicated.
- B. Related Requirements:
 - 1. Section 055113 "Metal Pan Stairs" for steel railings associated with metal pan stairs.

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages that are to be embedded in concrete or masonry. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Railing brackets.
 - 2. Grout, anchoring cement, and paint products.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each type of exposed finish required.
 - 1. Sections of each railing member, including handrails, top rails, posts.
- D. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer licensed to practice in Texas responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

- D. Evaluation Reports: For post-installed anchors, from ICC-ES.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Railings, , shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Handrails and Top Rails:
 - a. Uniform load of 50 lbf/ ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.

2.2 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without stains, discolorations, or blemishes.

2.3 STEEL AND IRON

- A. Shapes, and Bars: ASTM A 36/A 36M.

2.4 FASTENERS

- A. General: Provide the following:
- B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- D. Intermediate Coats and Topcoats: Provide products that comply with Section 09 90 10 "Painting."

- E. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.
 - 1. Water-Resistant Product: At exterior locations provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.5 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form Changes in Direction as Follows:
 - 1. As detailed.
- E. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

2.6 STEEL AND IRON FINISHES

- A. Galvanized Railings:
 - 1. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
 - 2. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
 - 3. Galvanize railings after fabrication to the greatest extent possible.
- B. Shop-Painted Finish: Comply with Section 099010 "Exterior Painting."
 - 1. Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Perform cutting, required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 - 1. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 - 2. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
- C. Adjust railings before anchoring to ensure matching alignment at abutting joints.

EXTERIOR STEEL BAR RAILINGS 05 5213 - 1
UTRGV SOM TBL CENTER
100% CD

3.2 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.
 - 1. Apply by spray to provide a minimum 2.0-mil dry film thickness.
- B. Galvanized Surfaces: Clean field welds, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.

3.3 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION 055213

SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Rooftop equipment bases and support curbs.
 - 2. Wood blocking, cants, and nailers.
 - 3. Wood furring and grounds.
 - 4. Utility shelving.
 - 5. Plywood backing panels.
- B. Related Requirements:
 - 1. Section 061600 "Sheathing" for sheathing.

1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal or greater size but less than 5 inches nominal size in least dimension.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
 - 3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
 - 4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.5 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:
 - 1. Preservative-treated wood.
 - 2. Fire-retardant-treated wood.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
- B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

2.2 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1. Treatment shall not promote corrosion of metal fasteners.
 - 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 - 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 - 4. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664, and design value adjustment factors shall be calculated according to ASTM D 6841.]
- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
 - 1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.
- E. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not bleed through, contain colorants, or otherwise adversely affect finishes.
- F. Application: Treat all miscellaneous carpentry unless otherwise indicated.
 - 1. Concealed blocking.
 - 2. Roof framing and blocking.

3. Wood cants, nailers, curbs, equipment support bases, blocking, and similar members in connection with roofing.
4. Plywood backing panels.

2.3 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 1. Blocking.
 2. Nailers.
 3. Rooftop equipment bases and support curbs.
 4. Furring.
 5. Grounds.
 6. Utility shelving.
- B. Dimension Lumber Items: Construction or No. 2 grade lumber of any of the following species:
 1. Mixed southern pine or southern pine; SPIB.
 2. Hem-fir; WWPA.
 3. Spruce-pine-fir (south); WWPA.
- C. Utility Shelving: Lumber with 15 percent maximum moisture content of the following species and grades:
 1. Southern pine No. 1 grade; SPIB.

2.4 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, A-C, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

2.5 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153 or Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Screws for Fastening to Metal Framing: ASTM C 1002, length as recommended by screw manufacturer for material being fastened.
- D. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- E. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC308 as appropriate for the substrate.
 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
- C. Provide blocking as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- D. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- E. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- F. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 - 2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
 - 3. ICC-ES evaluation report for fastener.
- G. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood (pre-drill as required). Drive nails snug but do not countersink nail heads unless otherwise indicated. Countersink heads on exposed carpentry work and fill holes.

3.2 WOOD BLOCKING AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

3.3 PROTECTION

- A. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061053

SECTION 061600 – SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Wall sheathing.
 - 2. Parapet sheathing.
 - 3. Sheathing joint and penetration treatment.
- B. Related Requirements:
 - 1. Section 072500 "Weather Barriers" for water-resistive barrier applied over wall sheathing.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: As tested according to ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 WALL SHEATHING

- A. Paperless Glass Mat Gypsum Sheathing: ASTM C 1177, gypsum sheathing; with water-resistant-treated core and with water-repellent bonded to core's face, back, and long edges.
 - 1. Manufacturer: Dens-Glass Gold by Georgia Pacific Co.
 - 2. Type and Thickness: Regular, 12/ inch 8 inch thick.
 - 3. Size: 48 by 96 inches for vertical installation.

2.3 PARAPET SHEATHING

- A. Glass-Mat Gypsum Sheathing: ASTM C 1177/1177M.
 - 1. Manufacturer: Dens Deck Prime by Georgia Pacific Co.
 - 2. Type and Thickness: Regular ½ inch thick.
 - 3. Size: as indicated

2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. For parapet and wall sheathing, provide fasteners, 11 gauge, with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Screws for Fastening Sheathing to Cold-Formed Metal Framing: Type S Bugle Head Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached.
 - 1. For steel framing less than 0.0329 inch thick, use screws that comply with ASTM C 1002.

2.5 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

- A. Sealant for Glass-Mat Gypsum Sheathing: Provide sealant compatible with sheathing tape and sheathing and recommended by Fluid-Applied Membrane Air Barriers manufacturer for use with glass-fiber sheathing tape and for covering exposed fasteners.
 - 1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches wide, 10 by 10 or 10 by 20 threads/inch, of type recommended by sheathing and tape manufacturers for use in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

B. EXECUTION

2.6 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
 - 2. Table R602.3 (1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in the ICC's International Residential Code for One- and Two-Family Dwellings.
 - 3. ICC-ES evaluation report for fastener.
- D. Coordinate wall and parapet sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

- F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

2.7 SHEATHING INSTALLATION

- A. Comply with GA-253 and with manufacturer's written instructions.
 - 1. Fasten gypsum sheathing to cold-formed metal framing with screws.
 - 2. Install panels with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
 - 3. Install panels with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
- B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.
- C. Horizontal Installation: Install sheathing with gold side out. Abut ends over centers of studs, and stagger end joints of adjacent panels not less than one stud spacing. Attach at perimeter and within field of panel to each stud.
 - 1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.
- D. Vertical Installation: Install vertical edges centered over studs. Abut ends and edges with those of adjacent panels. Attach at perimeter and within field of panel to each stud.
 - 1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.
- E. Seal sheathing joints with WRB according to WRB manufacturer's recommendations.

END OF SECTION 061600

SECTION 064023 - INTERIOR ARCHITECTURAL WOODWORK

PART I - GENERAL

1.1 RELATED DOCUMENTS

Requirements of Drawings, General and Supplementary Conditions and DIVISION 1 apply to this Section.

1.2 SCOPE

- A. Provide all interior architectural woodwork including but not necessarily limited to:
 - 1. Closet and storage shelving
- B. Related work specified elsewhere:
 - 1. Rough Carpentry SECTION 061000
 - 2. Flush Wood Doors SECTION 081416
 - 3. Painting SECTION 099100

1.3 SUBMITTALS

- A. Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
 - 1. Product data for each type of product and process specified in this section and incorporated into items of architectural woodwork during fabrication, finishing, and installation.
 - 2. Shop drawings showing location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 - 3. Product certificates signed by woodwork manufacturer certifying that products comply with specified requirements.
 - 4. Qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of Architects and Owners, and other information specified.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Firm experienced in successfully producing architectural woodwork similar to that indicated for this Project, with sufficient production capacity to produce required units without causing delay in the Work.
- B. Single-Source Responsibility: Arrange for production by a single firm of architectural woodwork with sequence matched wood veneers.
- C. AWI Quality Standard: Comply with applicable requirements of "Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI) except as otherwise indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.

- B. Do not deliver woodwork until painting, wet work, grinding, and similar operations that could damage, soil, or deteriorate woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in "Project Conditions".

1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Obtain and comply with Woodwork Manufacturer's and Installer's coordinated advice for optimum temperature and humidity conditions for woodwork during its storage and installation. Do not install woodwork until these conditions have been attained and stabilized so that woodwork is within plus or minus 1.0 percent of optimum moisture content from date of installation through remainder of construction period.

PART 2 - PRODUCTS

2.1 FABRICATION, GENERAL

- A. Wood Moisture Content: Comply with requirements of referenced quality standard for moisture content of paneling in relation to relative humidity conditions existing during time of fabrication and in installation areas.

2.2 WOOD CLOSET AND STORAGE SHELVING

- A. Quality Standard: Comply with AWI Section 600.
 - 1. Wood Species For Opaque Finish: Any close grain hardwood.
 - 2. Fabrication: Provide ledgers, struts, standards and other members as indicated and required to match shelving requirements.

2.3 FASTENERS

- A. Nails: Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.

2.4 FACTORY FINISHING OF INTERIOR ARCHITECTURAL WOODWORK

- A. Quality Standard: Comply with AWI Section 1500 unless otherwise indicated.
- B. General: The entire finish of interior architectural woodwork is specified in this section, regardless of whether factory applied or applied after installation.
- C. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces and similar preparations for finishing of architectural woodwork, as applicable to each unit of work.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installing.

3.2 INSTALLATION

- A. Quality Standard: Install woodwork to comply with AWI Section 1700 for same grade specified in Part 2 of this section for type of woodwork involved.
- B. Install woodwork plumb, level, true, and straight with no distortions. Install to a tolerance of 1/8-inch in 8'0" for plumb and level and with no variations in flushness of adjoining surfaces.

3.3 ADJUSTMENT AND CLEANING

- A. Repair damaged and defective woodwork where possible to eliminate defects functionally and visually; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean woodwork on exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.4 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensures that woodwork is being without damage or deterioration at time of Substantial Completion.

- Σ -

SECTION 064116 - PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Plastic-laminate-faced architectural cabinets.
 - 2. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-faced architectural cabinets unless concealed within other construction before cabinet installation.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product, including panel products, high-pressure decorative laminate, adhesive for bonding plastic laminate, and cabinet hardware and accessories.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 - 1. Show details full size.
 - 2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
 - 3. Show locations and sizes of cutouts and holes for electrical switches and outlets and other items installed in architectural plastic-laminate cabinets.
 - 4. Apply AWI Quality Certification Program label to Shop Drawings.
- C. Samples for Verification:
 - 1. Plastic laminates, 12 by 12 inches, for each type, color, pattern, and surface finish, with one sample applied to core material and specified edge material applied to one edge.
 - 2. Corner pieces as follows:
 - a. Cabinet-front frame joints between stiles and rails, as well as exposed end pieces, 18 inches high by 18 inches wide by 6 inches deep.
 - b. Miter joints for standing trim.
 - 3. Exposed cabinet hardware and accessories, one unit for each type and finish.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and fabricator.
- B. Product Certificates: For each type of product.
 - 1. Composite wood and agrifiber products.
 - 2. Thermoset decorative panels.

3. High-pressure decorative laminate.
4. Glass.
5. Adhesives.

- C. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Fabricator of products.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 1. Build mockups of typical plastic-laminate cabinets as shown on Drawings.
 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver cabinets until painting and similar operations that could damage woodwork have been completed in installation areas. If cabinets must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed, and indicate measurements on Shop Drawings.
- C. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.9 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that cabinets can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL CABINET FABRICATORS

- A. Fabricators: Subject to compliance with requirements, provide products by one of the following:
1. Koehler Company, Seguin, Texas
 2. Terrill Manufacturing Co., San Angelo, Texas.

2.2 PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural plastic-laminate cabinets indicated for construction, finishes, installation, and other requirements.
1. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.
- B. Grade: Custom.
- C. Type of Construction: Face frame.
- D. Cabinet, Door, and Drawer Front Interface Style: Flush overlay.
- E. High-Pressure Decorative Laminate: NEMA LD 3, grades as.
- F. Laminate Cladding for Exposed Surfaces:
1. Horizontal Surfaces: Other than Top GP-50 (0.050 inches nominal thickness).
 2. Post formed Surfaces: PF-42 (0.042 inches nominal thickness).
 3. Vertical Surfaces: GP-50 (0.050 inches nominal thickness); GP-28 (0.028 inches nominal thickness).
 4. Edges: PVC tape, 0.018-inch minimum thickness, matching laminate in color, pattern, and finish.
 5. Pattern Direction: Vertically for drawer fronts, doors, and fixed panels.
- G. Materials for Semi Exposed Surfaces:
1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade VGS.
 - a. Edges of Plastic-Laminate Shelves: PVC tape, 0.018-inch minimum thickness, matching laminate in color, pattern, and finish.
 - b. For semi exposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, NEMA LD 3,.
 2. Drawer Sides and Backs: Solid-hardwood lumber.
 3. Drawer Bottoms: Hardwood plywood.
- H. Dust Panels: 1/4-inch plywood or tempered hardboard above compartments and drawers unless located directly under tops.
- I. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.
- J. Drawer Construction: Fabricate with exposed fronts fastened to sub front with mounting screws from interior of body.
1. Join sub fronts, backs, and sides with glued dovetail joints.
- K. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
1. Refer to Section 01 9000 "Finish Legend".

2.3 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
 - 1. Wood Moisture Content: 8 to 13 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

2.4 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 087111 "Door Hardware (Descriptive Specification)."
- B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 135 degrees of opening, self-closing.
- C. Back-Mounted Pulls: BHMA A156.9, B02011.
- D. Wire Pulls: Back mounted, solid metal, 4 inches long, 5/16 inch in diameter.
- E. Catches: Magnetic catches, BHMA A156.9, B03141 Push-in magnetic catches, BHMA A156.9, B03131.
- F. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.
- G. Drawer Slides: BHMA A156.9.
 - 1. Grade 1HD-100 and Grade 1HD-200: Side mounted; full-extension type; zinc-plated-steel ball-bearing slides.
 - 2. For drawers not more than 3 inches high and not more than 24 inches wide, provide Grade 1.
 - 3. For drawers more than 3 inches high but not more than 6 inches high and not more than 24 inches wide, provide Grade 1HD-100.
 - 4. For drawers more than 6 inches high or more than 24 inches wide, provide Grade 1HD-200.
 - 5. For computer keyboard shelves, provide Grade 1HD-100.
 - 6. For trash bins not more than 20 inches high and 16 inches wide, provide Grade 1HD-100.
- H. Door Locks: BHMA A156.11, E07121.
- I. Drawer Locks: BHMA A156.11, E07041.
- J. Door and Drawer Silencers: BHMA A156.16, L03011.
- K. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 - 1. Bright Chromium Plated: BHMA 625 for brass or bronze base; BHMA 651 for steel base.
- L. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.5 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.
- C. Adhesive for Bonding Plastic Laminate: Contact cement.
 - 1. Adhesive for Bonding Edges: Hot-melt adhesive.

2.6 FABRICATION

- A. Fabricate cabinets to dimensions, profiles, and details indicated.
- B. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
 - 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.
- C. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.
- B. Before installing cabinets, examine shop-fabricated work for completion and complete work as required.

3.2 INSTALLATION

- A. Grade: Install cabinets to comply with same grade as item to be installed.
- B. Assemble cabinets and complete fabrication at Project site to the extent that it was not completed in the shop.
- C. Install cabinets level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
- D. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

- E. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails for exposed fastening, countersunk and filled flush with woodwork.
 - 1. Use filler matching finish of items being installed.
- F. Cabinets: Install without distortion so doors and drawer's fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 - 2. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch penetration into wood framing, blocking, or hanging strips.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean cabinets on exposed and semi-exposed surfaces.

END OF SECTION 064116

SECTION 071326 - SELF-ADHERING SHEET WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Self-Adhering sheet waterproofing: WP-5. (at Elevator Pit)
- B. Related Sections:
 - 1. Section 072726 and other "Air Barrier" Sections for connections of waterproofing to air barrier at interface of the walls and the foundations.
 - 2. Section 076200 "Flashing and Sheet Metal" for connections of waterproofing at the interface of wall and roof membranes.
 - 3. Section 079200 "Joint Sealants".

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
 - 2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.
- B. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, sheet flashings, outside corners, tie-ins with adjoining waterproofing, and other termination conditions.
- C. Samples: For each exposed product and for each color and texture specified, including the following products:
 - 1. 8-by-8-inch square of waterproofing and flashing sheet.
- D. Qualification Data: For Installer.
- E. Sample Warranties: For special warranties.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.
- B. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for installation.
 - 1. Build for each typical waterproofing installation including accessories to demonstrate surface preparation, crack and joint treatment, corner treatment, and protection.
 - a. Size: 100 sq. ft. in area.
 - b. Description: Each type of wall installation.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.
 - 1. Do not apply waterproofing in snow, rain, fog, or mist.
- B. Maintain adequate ventilation during preparation and application of waterproofing materials.
- C. Observe safety and environmental measures indicated in manufacturer's MSDS, and mandated by federal, state and local regulations
- D. The Architect shall be given minimum 72 hours written notice to review work representative of all the Contractor's work on the site, before any such work shall be concealed by other work.

1.7 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's standard materials-only warranty in which manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.
 - 1. Warranty Period: Three years from date of Substantial Completion.
- B. Installer's Special Warranty: Specified form, signed by Installer, covering Work of this Section, for warranty period of two years.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Source Limitations for Waterproofing System: Obtain waterproofing materials from single source from single manufacturer for the entire scope of self-adhering waterproofing on the Project.

2.2 MODIFIED BITUMINOUS SHEET WATERPROOFING: WP-5

- A. Modified Bituminous Sheet: Minimum 60-mil nominal thickness, self-adhering sheet consisting of 56 mils of rubberized asphalt laminated on one side to a 4-mil-thick, polyethylene-film

reinforcement, and with release liner on adhesive side; formulated for application with primer or surface conditioner that complies with VOC limits of authorities having jurisdiction.

1. Subject to compliance with the requirements, acceptable products include, but are not necessarily limited to the following:
 - b. Carlisle Coatings & Waterproofing Inc; CCW MiraDRI 860.
 - c. GCP Applied Technologies Inc. (formerly Grace Construction Products); Bituthene 3000.
 - d. Henry Company; Blueskin WP 100.
 - e. Polyguard Products, Inc.; Polyguard 650 Membrane.
 - f. W.R. Meadows, Inc; Mel-Rol.
2. Physical Properties:
 - a. Tensile Strength, Membrane: 250 psi minimum; ASTM D 412, Die C, modified.
 - b. Ultimate Elongation: 300 percent minimum; ASTM D 412, Die C, modified.
 - c. Low-Temperature Flexibility: Pass at minus 20 deg F; ASTM D 1970.
 - d. Crack Cycling: Unaffected after 100 cycles of 1/8-inch movement; ASTM C 836.
 - e. Puncture Resistance: 40 lbf minimum; ASTM E 154.
 - f. Water Absorption: 0.2 percent weight-gain maximum after 48-hour immersion at 70 deg F; ASTM D 570.
 - g. Water Vapor Permeance: 0.05 perms maximum; ASTM E 96/E 96M, Water Method.
 - h. Hydrostatic-Head Resistance: 200 feet minimum; ASTM D 5385.

2.3 BLINDSIDE SHEET WATERPROOFING: WP-5A

- A. Bonded HDPE or Polyethylene Sheet for Blindside Horizontal Applications: Uniform, flexible, multilayered-composite sheet membrane consisting of either an HDPE film coated with pressure-sensitive adhesive and protective release liner, total 46-mil thickness, or a cross-laminated film of low- and medium-density polyethylene, coated with a modified asphalt layer and a nonwoven geotextile-fabric final layer, total 95-mil thickness; with the following physical properties:
 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
 - a. GCP Applied Technologies Inc. (formerly Grace Construction Products); Preprufe 300R.
 - b. Polyguard Products, Inc.; Underseal Underslab Membrane.
 2. Physical Properties:
 - a. Tensile Strength, Film: 2000 psi minimum; ASTM D 412.
 - b. Low-Temperature Flexibility: Pass at minus 10 deg F; ASTM D 1970.
 - c. Peel Adhesion to Concrete: 5 lbf/in. minimum; ASTM D 903, modified.
 - d. Lap Adhesion: 2.5 lbf/in. minimum; ASTM D 1876, modified.
 - e. Hydrostatic-Head Resistance: 231 feet; ASTM D 5385, modified.
 - f. Puncture Resistance: 200 lbf minimum; ASTM E 154.
 - g. Water Vapor Permeance: 0.01 perms maximum; ASTM E 96/E 96M, Water Method.
 - h. Water Absorption: 0.5 percent maximum; ASTM D 570.

2.4 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
- B. Primer: Liquid waterborne or solvent-borne primer recommended for substrate by sheet-waterproofing material manufacturer.
- C. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.
- D. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8-inch-thick, predrilled at 9-inch centers.

- E. Protection Course: ASTM D 6506, semirigid sheets of mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:
 - 1. Thickness: 1/8-inch, nominal, for vertical applications; 1/4-inch, nominal, elsewhere.
 - 2. Adhesive: Rubber-based solvent type recommended by waterproofing manufacturer for protection course type.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the waterproofing.
 - 1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
 - 2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
 - 3. Verify that compacted subgrade is dry, smooth, sound, and ready to receive waterproofing sheet.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- C. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.
- D. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.
 - 1. Install sheet strips of width according to manufacturer's written instructions and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch or 1/8 inch for modified bituminous deck-paving waterproofing.
- E. Corners: Prepare, prime, and treat outside corners according to ASTM D 6135.
- F. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions according to ASTM D 6135.

3.3 MODIFIED BITUMINOUS SHEET-WATERPROOFING APPLICATION

- A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions and recommendations in ASTM D 6135.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.
- C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch-minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.

1. When ambient and substrate temperatures range between 25 and 40 deg F, install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F.
- D. Horizontal Application: Apply sheets from low to high points of decks to ensure that laps shed water.
- E. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.
- F. Seal edges of sheet-waterproofing terminations with mastic.
- G. Install sheet-waterproofing and auxiliary materials to tie into adjacent waterproofing.
- H. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches beyond repaired areas in all directions.
- I. Immediately install protection course with butted joints over waterproofing membrane.

3.4 BLINDSIDE SHEET-WATERPROOFING APPLICATION

- A. Install bonded blindside sheet waterproofing according to manufacturer's written instructions.
- B. Horizontal Applications: Install sheet with face against substrate. Accurately align sheets and maintain uniform side and end laps of minimum dimensions required by membrane manufacturer. Overlap and seal seams, and stagger and tape end laps to ensure watertight installation.
- C. Corners: Seal lapped terminations and cut edges of sheet waterproofing at inside and outside corners with detail tape.
- D. Seal penetrations through sheet waterproofing to provide watertight seal with detail tape patches or wraps and a liquid-membrane troweling.
- E. Install sheet-waterproofing and auxiliary materials to produce a continuous watertight tie into adjacent waterproofing.
- F. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Tape perimeter of damaged or nonconforming area extending 6 inches beyond repaired areas in all directions. Apply a patch of sheet waterproofing and firmly secure with detail tape.

3.5 PROTECTION, REPAIR, AND CLEANING

- A. Do not permit foot traffic on unprotected membrane.
- B. Protect waterproofing from damage and wear during remainder of construction period.
- C. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- D. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 071326

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Polyisocyanurate foam-plastic board.
 - 2. Glass-fiber blanket.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each product, for tests performed by a qualified testing agency.

1.5 QUALITY ASSURANCE

- A. Where thermal resistivity properties of insulation materials are designated by R-values they represent the rate of heat flow through a homogenous material exactly 1" thick, and are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.
- B. Unless otherwise indicated, provide insulation thickness required to achieve R-19 at vertical installations and R-30 at horizontal installations. Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Surface Burning Characteristics: ASTM E 84.
 - 2. Fire Resistance Ratings: ASTM E 119.
 - 3. Combustion Characteristics: ASTM E 136.
- C. At installations where insulation is exposed or otherwise open to air spaces in plenums or similar voids, provide only insulation that is classified as noncombustible (flame spread 25 maximum - smoke developed 50 maximum).

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

- B. Protect foam-plastic board insulation as follows:
 - 1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
 - 3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 POLYISOCYANURATE FOAM – PLASTIC BOARD

- A. Polyisocyanurate Board, Glass-Fiber-Mat Faced: ASTM C 1289, glass-fiber-mat faced, Type II, Class 2.
 - 1. Manufacturers:
 - a. Firestone Building Products
 - b. Carlisle Coating and W/P, Inc.
 - 2. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.2 GLASS-FIBER BLANKET

- A. Glass-Fiber Blanket, Unfaced: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
- B. Glass-Fiber Blanket, Kraft Faced: ASTM C 665, Type II (nonreflective faced), Class C (faced surface not rated for flame propagation); Category 1 (membrane is a vapor barrier).
- C. Mineral Wool by Roxul Co., (for exterior cavity wall insulation).

2.3 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
 - 1. Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

- C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.
- E. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with Work.

3.3 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
 - 4. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 - 1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.

3.4 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

SECTION 072726 - FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Vapor-permeable, fluid-applied air barriers.
- B. Related Requirements:
 - 1. Section 042000 "Unit Masonry" for concrete masonry units used as a substrate for fluid applied air barriers.
 - 2. Section 061600 "Sheathing" for wall sheathings and wall sheathing joint-and-penetration treatments used as a substrate for fluid applied air barriers.

1.3 DEFINITIONS

- A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.
- B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.
- C. Air-Barrier Assembly: The collection of air-barrier materials and accessories applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review air-barrier requirements and installation, special details, mockups, air-leakage and bond testing, air-barrier protection, and work scheduling that covers air barriers.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's written instructions for evaluating, preparing, and treating each substrate; technical data; dry film thickness; and tested physical and performance properties of products.
- B. Sustainable Design Submittals:
 - 1. Product Data: For coatings, indicating VOC content.
 - 2. Laboratory Test Reports: For coatings, indicating compliance with requirements for low-emitting materials.
- C. Shop Drawings: For air-barrier assemblies.
 - 1. Show locations and extent of air-barrier materials, accessories, and assemblies specific to Project conditions.

2. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
3. Include details of interfaces with other materials that form part of air barrier.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer. Include list of ABAA-certified installers and supervisors employed by Installer, who work on Project.
- B. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with the barrier.
- C. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.
- D. Field quality-control reports.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
 1. Installer shall be licensed by ABAA according to ABAA's Quality Assurance Program and shall employ ABAA-certified installers and supervisors on Project.
- B. Mockups: Build mockups to set quality standards for materials and execution and for preconstruction testing.
 1. Build integrated mockups of exterior wall assembly, 150 sq. ft., incorporating backup wall construction, external cladding, window, storefront, door frame and sill, insulation, ties and other penetrations, and flashing to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, and penetrations of air-barrier assembly.
 - a. Coordinate construction of mockups to permit inspection and testing of air barrier before external insulation and cladding are installed.
 - b. Include junction with roofing membrane, building corner condition, and foundation wall intersection.
 - c. If Architect determines mockups do not comply with requirements, reconstruct mockups and apply air barrier until mockups are approved.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on field mockups.
- B. Mockup Testing: Air-barrier assemblies shall comply with performance requirements indicated, as evidenced by reports based on mockup testing by a qualified testing agency.
 1. Air-Leakage-Location Testing: Mockups will be tested for evidence of air leakage according to ASTM E 1186, chamber pressurization or depressurization with smoke tracers.
 2. Air-Leakage-Volume Testing: Mockups will be tested for air-leakage rate according to ASTM E 783 or ASTM E 2357.
 3. Adhesion Testing: Mockups will be tested for required air-barrier adhesion to substrate according to ASTM D 4541.
 4. Notify Architect seven days in advance of the dates and times when mockups will be tested.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- B. Protect stored materials from direct sunlight.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended in writing by air-barrier manufacturer.
 - 1. Protect substrates from environmental conditions that affect air-barrier performance.
 - 2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.
- B. VOC Content: 100 g/L or less.
- C. Low-Emitting Materials: VOC emissions of products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Formaldehyde emissions shall not exceed 9 mcg/cu. m or 7 ppb, whichever is less.

2.2 PERFORMANCE REQUIREMENTS

- A. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction shall be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E 2357.

2.3 AIR BARRIERS, VAPOR PERMEABLE

- A. Vapor-Permeable Air Barrier: Synthetic polymer material with an installed dry film thickness, according to manufacturer's written instructions, of 30 mils over smooth, void-free substrates.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Grace; Permabarrier VP
 - b. Henry; Air Bloc 31
 - c. Tremco; ExoAir 230
 - 2. Physical and Performance Properties:
 - a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.

- 100% CD
- b. Vapor Permeance: Minimum 11 perms; ASTM E 96/E 96M, Wet Cup Method, Procedure B.
 - c. Ultimate Elongation: Minimum 250 percent; ASTM D 412, Die C.
 - d. Adhesion to Substrate: Minimum 30 lbf/sq. in. when tested according to ASTM D 4541.
 - e. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
 - f. UV Resistance: Can be exposed to sunlight for 180 days according to manufacturer's written instructions.

2.4 ACCESSORY MATERIALS

- A. Requirement: Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by air-barrier manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.
- B. Primer: Liquid primer recommended for substrate by air-barrier material manufacturer.
- C. Transition Membrane: Manufacturer's recommended materials for transitioning between wall and roof air barrier systems, transitioning between flashing membrane and air barrier systems, and flashing around door and window rough openings.
 - 1. Liquid-applied or self-adhering as indicated for the application intended.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
 - 2. Verify that substrates have cured and aged for minimum time recommended in writing by air-barrier manufacturer.
 - 3. Verify that substrates are visibly dry and free of moisture.
 - 4. Verify that masonry joints are flush and completely filled with mortar.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate according to manufacturer's written instructions and details. Provide clean, dust-free, and dry substrate for air-barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching material.

- E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- G. Bridge expansion joints and discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with air-barrier transition membrane that accommodates joint movement according to manufacturer's written instructions and details.

3.3 ACCESSORIES INSTALLATION

- A. Install accessory materials according to air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.
 - 1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
 - 2. Install transition strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
 - 3. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
 - 4. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
- B. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- C. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.
- D. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- E. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames, with not less than 1 inch of full contact.
 - 1. Transition Strip: Roll firmly to enhance adhesion.
- F. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.
- G. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
- H. Seal top of through-wall flashings to air barrier with an additional 6-inch-wide, transition strip.
- I. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- J. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches beyond repaired areas in strip direction.

3.4 PRIMARY AIR-BARRIER MATERIAL INSTALLATION

- A. Apply air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions and details. Apply air-barrier material within manufacturer's recommended application temperature ranges.
 - 1. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
 - 2. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
 - 3. Where multiple prime coats are needed to achieve required bond, allow adequate drying time between coats.
- B. Air Barriers: Apply continuous unbroken air-barrier material to substrates according to the following thickness. Apply an increased thickness of air-barrier material in full contact around protrusions such as masonry ties.
 - 1. Vapor-Permeable Air Barrier: Total dry film thickness as recommended in writing by manufacturer to comply with performance requirements, applied in one or more equal coats. Apply additional material as needed to achieve void- and pinhole-free surface, but do not exceed thickness on which required vapor permeability is based.
- C. Do not cover air barrier until it has been tested and inspected by testing agency.
- D. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.5 FIELD QUALITY CONTROL

- A. ABAA Quality Assurance Program: Perform examinations, preparation, installation, testing, and inspections under ABAA's Quality Assurance Program.
- B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- C. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:
 - 1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
 - 2. Air-barrier dry film thickness.
 - 3. Continuous structural support of air-barrier system has been provided.
 - 4. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
 - 5. Site conditions for application temperature and dryness of substrates have been maintained.
 - 6. Maximum exposure time of materials to UV deterioration has not been exceeded.
 - 7. Surfaces have been primed, if applicable.
 - 8. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
 - 9. Termination mastic has been applied on cut edges.
 - 10. Strips and transition strips have been firmly adhered to substrate.
 - 11. Compatible materials have been used.
 - 12. Transitions at changes in direction and structural support at gaps have been provided.
 - 13. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
 - 14. All penetrations have been sealed.
- D. Tests: As determined by testing agency from among the following tests:

1. Air-Leakage-Location Testing: Air-barrier assemblies will be tested for evidence of air leakage according to ASTM E 1186, chamber pressurization or depressurization with smoke tracers.
 2. Adhesion Testing: Air-barrier assemblies will be tested for required adhesion to substrate according to ASTM D 4541 for each 600 sq. ft. of installed air barrier or part thereof.
- E. Air barriers will be considered defective if they do not pass tests and inspections.
1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
 2. Remove and replace deficient air-barrier components for retesting as specified above.
- F. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.
- G. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

- A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
1. Protect air barrier from exposure to UV light and harmful weather exposure as recommended in writing by manufacturer. If exposed to these conditions for longer than recommended, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed materials according to air-barrier manufacturer's written instructions.
 2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended in writing by manufacturer of affected construction.
- C. Remove masking materials after installation.

END OF SECTION 072726

SECTION 074293 - SOFFIT PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes metal soffit panels.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
- B. Shop Drawings:
 - 1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 - 2. Accessories: Include details of flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.
- C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.
 - 1. Include similar Samples of trim and accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
 - 1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each product, tests performed by a qualified testing agency.
- C. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockup of soffit as shown on Drawings; approximately four panels wide by full width, including attachments and accessories.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal panels during installation.

1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

- A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of walls, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, or puncturing.
 - b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
1. Wind Loads: As indicated on Drawings.
 2. Deflection Limits: For wind loads, no greater than 1/240 of the span.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METAL SOFFIT PANELS

- A. General: Provide metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.
- B. Flush-Profile Metal Soffit Panels: Solid and Perforated panels formed with vertical panel edges and intermediate stiffening ribs symmetrically spaced between panel edges; with flush joint between panels.
1. Basis of Design: Subject to compliance with requirements, provide aluminum soffit panels, model number FW-1025 as manufactured by Berridge Manufacturing Company or equivalent.
 2. Manufacturers: Subject to compliance with requirements, additional available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. AEP Span; A BlueScope Steel Company.
 - b. CENTRIA Architectural Systems.
 - c. MBCI.
 - d. PAC-CLAD; Petersen Aluminum Corporation.
 3. Aluminum Sheet: Coil-coated sheet, ASTM B 209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.
 - a. Thickness: 0.032 inch.
 - b. Surface: Smooth, flat finish.
 - c. Exterior Finish: Two-coat fluoropolymer.
 - d. Color: As selected by Architect from manufacturer's full range.
 4. Panel Coverage: 10 1/2 inches.
 5. Panel Height: 1.5 inches.
 6. Perforated panels: Provide net free area of 7.79 square inches per linear foot.

2.3 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 coating designation or ASTM A 792/A 792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Finish flashing and trim with same finish system as adjacent metal panels.
- C. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

2.4 FABRICATION

- A. General: Fabricate and finish metal panels and accessories at the factory. Comply with indicated profiles and with dimensional and structural requirements.
- B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- C. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that prevent metal-to-metal contact, and that minimize noise from movements.

2.5 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Aluminum Panels and Accessories:
 - 1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 - 1. Examine framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal panel manufacturer.

- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.
 - 1. Soffit Framing: Wire tie or clip furring channels to supports, as required to comply with requirements for assemblies indicated.

3.3 METAL PANEL INSTALLATION

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 1. Shim or otherwise plumb substrates receiving metal panels.
 - 2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Install screw fasteners in predrilled holes.
 - 3. Locate and space fastenings in uniform vertical and horizontal alignment.
 - 4. Install flashing and trim as metal panel work proceeds.
 - 5. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 - 6. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
 - 1. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.
- E. Accessory Installation: Install accessories with positive anchorage to building and provide for thermal expansion. Coordinate installation with flashings and other components.
 - 1. Install components required for a complete metal panel system including trim, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

3.4 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
- B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

SECTION 07 52 16 MODIFIED BITUMINOUS MEMBRANE ROOFING – ALTERNATE 1

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Base Sheet and/or Rigid Insulation Application
- B. Roof Membrane Application
- C. Roof Flashing Application

1.2 RELATED SECTIONS

- A. Section 06 1053 - Miscellaneous Rough Carpentry
- B. Section 05 3100 - Roof Decks
- C. Section 076200 - Sheet Metal Flashing and Trim
- D. Section 077233 - Sheet Metal Roofing Specialties

1.3 REFERENCE STANDARDS

- A. ASTM American Society for Testing and Materials - Philadelphia, PA
- B. NRCA National Roofing Contractors Association - Rosemont, IL
- C. CERTA Certified Roofing Torch Applicator - Rosemont, IL
- D. OSHA Occupational Safety and Health Administration - Washington, DC
- E. SMACNA Sheet Metal and Air Conditioning Contractors National Association, Chantilly, VA
- F. UL Underwriters Laboratories - Northbrook, IL

1.4 SUBMITTALS

- A. Submittals Prior to Contract Award:
 - 1. Letter from the proposed primary roofing manufacturer confirming that the bidder is an acceptable Contractor authorized to install the proposed system.
 - 2. Letter from the primary roofing manufacturer stating that the proposed application will comply with the Manufacturer's requirements in order to qualify the project for the specified guarantee.

1.5 QUALITY ASSURANCE

- A. Acceptable Products: Provide primary roofing products, including each type of sheet, all manufactured in the United States, supplied by a single manufacturer which has been successfully producing the specified types of primary products for not less than 10 years. Provide secondary or accessory products which are acceptable to the manufacturer of the primary roofing products.
- B. Product Quality Assurance Program: Primary roofing materials shall be manufactured under a quality management system that is monitored regularly by a third-party auditor under the ISO 9001 audit process. A certificate of analysis for reporting/confirming the tested values of the actual material being supplied for the project will be required prior to project close-out.
- C. Agency Approvals: The proposed roof system shall conform to the following requirements. No other testing agency approvals will be accepted.
 - 1. Underwriters Laboratories acceptance of the proposed roofing system.

- D. Scope of Work: The work to be performed under this specification shall include but is not limited to the following: Attend necessary job meetings and furnish competent and full-time supervision, experienced roof mechanics, all materials, tools, and equipment necessary to complete, in an acceptable manner, the roof installation in accordance with this specification. Comply with the latest written application instructions of the manufacturer of the primary roofing products. In addition, application practice shall comply with requirements and recommendations contained in the latest edition of the Handbook of Accepted Roofing Knowledge (HARK) as published by the National Roofing Contractors Association, amended to include the acceptance of a phased roof system installation.
- E. Local Regulations: Conform to regulations of public agencies, including any specific requirements of the city and/or state of jurisdiction.
- F. Manufacturer Requirements: The primary roofing materials manufacturer shall provide direct trained company personnel to attend necessary job meetings, perform periodic inspections as necessary, and conduct a final inspection upon successful completion of the project.

1.6 PRODUCT DELIVERY STORAGE AND HANDLING

- A. Delivery: Deliver materials in the manufacturer's original sealed and labeled containers and in quantities required to allow continuity of application.
- B. Storage: Store materials out of direct exposure to the elements. Store rolled goods on a clean, flat and dry surface. All material stored on the roof overnight shall be stored on pallets. Rolls of roofing must be stored on ends. Store materials on the roof in a manner so as to preclude overloading of deck and building structure. Store materials such as solvents, adhesives and asphalt cutback products away from open flames, sparks or excessive heat. Cover all material using a breathable cover such as a canvas. Polyethylene or other non-breathable plastic coverings are not acceptable.
- C. Handling: Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Handle rolled goods to prevent damage to edges or ends.
- D. Damaged Material: Any materials that are found to be damaged or stored in any manner other than stated above will be automatically rejected and will require removal and replacement at the Contractor's expense.

1.7 PROJECT/SITE CONDITIONS

- A. Requirements Prior to Job Start
 - 1. Notification: Give a minimum of 5 days' notice to the Owner and manufacturer prior to commencing any work and notify both parties on a daily basis of any change in work schedule.
 - 2. Safety: Familiarize every member of the application crew with all fire and safety regulations recommended by OSHA, NRCA and other industry or local governmental groups.
- B. Environmental Requirements:
 - 1. Precipitation: Do not apply roofing materials during precipitation or in the event there is a probability of precipitation during application. Take adequate precautions to ensure that materials, applied roofing, and building interiors are protected from possible moisture damage or contamination.
 - 2. Temperature Restrictions - asphalt: At ambient temperatures of 40°F (4°C) and below, special precautions must be taken to ensure that the specified Type IV asphalt maintains a minimum acceptable 400°F (204°C) at the point of sheet application. Do not overheat asphalt to compensate for cold conditions. The use of insulated handling equipment is

strongly recommended. Use insulated hot luggers, mop carts, and kettle-to-roof supply lines. Use hand mops constructed with a smaller yarn head to facilitate short moppings. Do not fill luggers and mop carts to more than half their capacity at all times.

C. Protection Requirements:

1. Membrane Protection: Provide protection against staining and mechanical damage for newly applied roofing and adjacent surfaces throughout this project.
2. Debris Removal: Remove all debris daily from the project site and take to a legal dumping area authorized to receive such materials.
3. Site Condition: Complete, to the owner's satisfaction, all job site clean-up including building interior, exterior and landscaping where affected by the construction.

1.8 WARRANTY

- A. General Warranty: The warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. 20-Year Non-Prorated No Dollar Limit Roofing Manufacturer's Warranty: Submit a written warranty, without monetary limitation, signed by roofing system manufacturer agreeing to promptly repair leaks in the roof membrane and base flashings resulting from defects in materials or workmanship, and repair of any substantial blistering, for the following warranty period to start with the date of the General Contractor's Substantial Completion of the Work as established by the Architect's Certificate of Substantial Completion:
1. Warranty Period: 20 years.
- C. Defects include, but are not limited to, the following:
1. Deterioration of the roofing membrane or flashing system resulting for ordinary wear and tear by the elements.
 2. Workmanship on the part of the approved roofing contractor in the application of the roofing system.
 3. Splits or breaks in the membrane not caused by structural movement or failure or any movement of material underlying the roofing membrane or base flashing.
 4. Blisters, wrinkles, ridges, fishmouths, or open laps in the roofing membrane.
 5. Slippage of the roofing membrane or base flashing.
- D. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including membrane roofing, base flashing, roofing insulation, fasteners, and vapor retarders, if any, for the following warranty period:
1. Warranty Period: 2 years from date of Substantial Completion.
 2. Warranty Inclusion: Warranty shall also include sheet metal work under Section 076000.

PART 2 - PRODUCTS

2.1 ROOFING SYSTEM ASSEMBLY/PRODUCTS

- A. Modified Base Sheet: A fiberglass reinforced, Styrene-Butadiene-Styrene (SBS) modified asphalt coated sheet having a minimum weight of 30 lb/sq.
- > Parabase Plus by Siplast; Irving, TX
- B. Rigid Roof Insulation: Roof insulation shall be UL and FM approved. Insulation shall be approved in writing by the insulation manufacturer for intended use and for use with the specified roof assembly. Maintain a maximum panel size of 4 feet by 4 feet where polyisocyanurate / fiberboard insulation is specified to be installed in hot asphalt or insulation adhesive.

1. Polyisocyanurate: A closed cell, rigid polyisocyanurate foam core material, integrally laminated between glass fiber reinforced organic facers, in full compliance with ASTM C 1289, Type II, Class 1, Grade 2 (20 psi). Panels shall have a nominal thickness as indicated. Acceptable types are as follows:
 - a. Paratherm by Siplast; Irving, TX
2. Polyisocyanurate Tapered Roof Insulation: Tapered panels and standard fill panels composed of a closed cell, rigid polyisocyanurate foam core material, integrally laminated between glass fiber reinforced organic facers, in full compliance with ASTM C 1289, Type II, Class 1, Grade 2 (20 psi). The tapered system shall provide for a roof slope of as indicated. Acceptable types are as follows:
 - a. Tapered Paratherm by Siplast; Irving, TX
3. Gypsum Sheathing Panel: A panel composed of a gypsum based, non-structural water-resistant core material integrally bonded with fiberglass mats on both sides having a nominal thickness of 1/2 inch. The panel surface shall be factory primed with a non-asphaltic primer. Acceptable types are as follows:
 - a. DensDeck Prime Gypsum Roof Board, by Georgia Pacific Corporation; Atlanta, GA

2.2 DESCRIPTION OF SYSTEMS

- A. Roofing Membrane Assembly: A roof membrane assembly consisting of two plies of a prefabricated, reinforced, homogeneous Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane, applied over a prepared substrate. Reinforcement mats shall be impregnated/saturated and coated each side with SBS modified bitumen blend. The cross-sectional area of the sheet material shall contain no oxidized or non-SBS modified bitumen. The roof system shall pass 500 cycles of ASTM D 5849 Resistance to Cyclic Joint Displacement (fatigue) at 14°F. Passing results shall show no signs of membrane cracking or interply delamination after 500 cycles. The roof system shall pass 200 cycles of ASTM D 5849 after heat conditioning performed in accordance with ASTM D 5147. The assembly shall possess waterproofing capability, such that a phased roof application, with only the modified bitumen base ply in place, can be achieved for prolonged periods of time without detriment to the watertight integrity of the entire roof system.
- A. Basis for Design: Subject to compliance with requirements, provide products manufactured by Siplast Roofing Co. or comparable products by the following manufacturers:
 1. GAF
 2. Johns Manville
 3. Soprema Roofing Co., Inc.
 - > Siplast Paradiene 20/30 FR roof system
1. Modified Bitumen Base and Stripping Ply
 - a) Thickness (avg): 91 mils (ASTM D 5147)
 - b) Thickness (min): 87 mils (ASTM D 5147)
 - c) Weight (min per 100 ft² of coverage): 62 lb
 - d) Peak filler content in elastomeric blend - 35% by weight
 - e) Low temperature flexibility @ -15°F: PASS (ASTM D 5147)
 - f) Peak Load (avg) @ 73°F: 30 lbf/inch (ASTM D 5147)
 - g) Peak Load (avg) @ 0°F: 70 lbf/inch (ASTM D 5147)
 - h) Ultimate Elongation (avg.) @ 73°F: 50% (ASTM D 5147)
 - i) Compound Stability (max): 0.1% (ASTM D 5147)
 - j) High Temperature Stability (min): 250°F (ASTM D 5147)
 - k) Approvals: UL Class listed, FM Approved (products shall bear seals of approval)
 - l) Reinforcement: fiberglass mat or other meeting the performance and Compound stability criteria.
 - > Paradiene 20 by Siplast; Irving, TX

2. Modified Bitumen Finish Ply

- a) Thickness (avg): 130 mils (ASTM D 5147)
- b) Thickness at selvage (coating thickness) (avg): 98 mils (ASTM D 5147)
- c) Thickness at selvage (coating thickness) (min): 94 mils (ASTM D 5147)
- d) Weight (min per 100 ft² of coverage): 90 lb
- e) Peak filler content in elastomeric blend: 35% by weight
- f) Low temperature flexibility @ -15°F: PASS (ASTM D 5147)
- g) Peak Load (avg) @ 73°F: 30 lbf/inch (ASTM D 5147)
- h) Peak Load (avg) @ 0°F: 75 lbf/inch (ASTM D 5147)
- i) Ultimate Elongation (avg.) @ 73°F: 55% (ASTM D 5147)
- j) Compound Stability (max): 0.1% (ASTM D 5147)
- k) High Temperature Stability (min): 250°F (121° C) (ASTM D 5147)
- l) Granule Embedment (max loss): 2.0 grams per sample (ASTM D 5147)
- m) Approvals: UL Class listed, FM Approved (products shall bear seals of approval)
- n) Reinforcement: fiberglass mat or other meeting the performance and Compound stability criteria
- o) Surfacing: ceramic granules
 - > Paradiene 30 FR by Siplast; Irving, TX

3. Modified Bitumen Finish Ply

- a) Thickness (avg): 138 mils (ASTM D 5147)
- b) Thickness at selvage (coating thickness) (avg): 118 mils (ASTM D 5147)
- c) Thickness at selvage (coating thickness) (min): 114 mils (ASTM D 5147)
- d) Weight (min per 100 ft² of coverage): 112 lb
- e) Maximum filler content in elastomeric blend: 35% by weight
- f) Low temperature flexibility @ -15°F: PASS (ASTM D 5147)
- g) Peak Load (avg) @ 73°F: 30 lbf/inch (ASTM D 5147)
- h) Peak Load (avg) @ 0°F: 75 lbf/inch (ASTM D 5147)
- i) Ultimate Elongation (avg.) @ 73°F: 55% (ASTM D 5147)
- j) Dimensional Stability (max): 0.1% (ASTM D 5147)
- k) Compound Stability (min): 250°F (ASTM D 5147)
- l) Granule Embedment (max individual loss): 2.0 grams per sample (ASTM D 5147)
- m) Approvals: UL Class listed, FM Approved (products shall bear seals of approval)
- n) Reinforcement: fiberglass mat or other meeting the performance and dimensional stability criteria
- o) Surfacing: ceramic granules
 - > Paradiene 30 FR TG by Siplast; Irving, TX

- B. Flashing Membrane Assembly: A flashing membrane assembly consisting of a prefabricated, reinforced, Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane with a continuous, channel-embossed metal-foil surfacing. The finish ply shall conform to ASTM D 6298 and the following physical and mechanical property requirements.

> Siplast Veral flashing system, aluminum finish

1. Cant Backing Sheet and Flashing Reinforcing Ply

- a) Thickness (avg): 102 mils (ASTM D 5147)
- b) Thickness (min): 98 mils (ASTM D 5147)
- c) Weight (min per 100 ft² of coverage): 72 lb

2. Metal-Clad Modified Bitumen Flashing Sheet

- a) Thickness (avg): 150 mils (ASTM D 5147)
- b) Thickness (min): 146 mils (ASTM D 5147)
- c) Weight (min per 100 ft² of coverage): 96 lb
- d) Coating Thickness – back surface (min): 40 mils (ASTM D 5147)
- e) Low temperature flexibility @ 0° F: PASS (ASTM D 5147)
- f) Peak Load (avg) @ 73°F: 85 lbf/inch (ASTM D 5147)
- g) Peak Load (avg) @ 0°F: 180 lbf/inch (ASTM D 5147)
- h) Ultimate Elongation (avg) @ 73°F: 45% (ASTM D 5147)
- i) Tear-Strength (avg): 120 lbf (0.54 kN) (ASTM D 5147)

- j) Dimensional Stability (max): 0.2% (ASTM D 5147)
- k) Compound Stability (min): 225°F (ASTM D 5147)
- l) Cyclic Thermal Shock Stability (maximum): 0.2% (ASTM D 7051)
- m) Approvals: UL Approved, FM Approved (products shall bear seals of approval)
- n) Reinforcement: fiberglass scrim mat or other meeting the performance and dimensional stability criteria
- o) Surfacing: aluminum metal foil

> Veral Aluminum by Siplast; Irving, TX

- C. Catalyzed Acrylic Resin Flashing System: A specialty flashing system consisting of a liquid-applied, fully reinforced, multi-component acrylic membrane installed over a prepared or primed substrate. The flashing system consists of a catalyzed acrylic resin primer, basecoat and topcoat, combined with a non-woven polyester fleece. The resin and catalyst are pre-mixed immediately prior to installation. The use of the specialty flashing system shall be specifically approved in advance by the membrane manufacturer for each application.

> Paraproy 123 Flashing System by Siplast; Irving, TX

2.3 ROOFING ACCESSORIES

A. Roofing Adhesives

1. Mopping Asphalt: Type IV asphalt certified for full compliance with the requirements listed in Table I, ASTM D 312. Each container or bulk shipping ticket shall indicate the equiviscous temperature, EVT, the finished blowing temperature, FBT, and the flash point, FP. Mopping asphalt shall be approved in writing by the roof membrane manufacturer.

- B. Sealant: A moisture-curing, elastomeric sealant designed for roofing applications. The sealant shall be approved by the roof membrane manufacturer for use in conjunction with the roof membrane materials. Acceptable types are as follows:

- > PS-209 Elastomeric Sealant by Siplast; Irving, TX
- > PS-715 NS Elastomeric Sealant by Siplast; Irving, TX

- C. Ceramic Granules: No. 11 grade specification ceramic granules of color scheme matching the granule surfacing of the finish ply.

- D. Perlite Cant Strips: A cant strip composed of expanded volcanic minerals combined with waterproofing binders. The top surface shall be pre-treated with an asphalt-based coating. The face of the cant shall have a nominal 4-inch dimension.

E. Fasteners

1. Base Sheet Fasteners: Base sheet fasteners shall be approved by the manufacturer of the primary roofing products. Acceptable base sheet fasteners for specific substrate types are listed below.
2. Insulation Fasteners: Insulation fasteners and plates shall be FM Approved, and/or approved by the manufacturer of the primary roofing products. The insulation fasteners shall provide attachment required to meet the specified uplift performance and to restrain the insulation panels against the potential for ridging. The fastening pattern for each insulation panel to be used shall be as recommended by the insulation manufacturer and approved by the manufacturer of the primary roofing products. Acceptable insulation fastener manufacturers for specific deck types are listed below.
 - a) Metal Decks: Insulation mechanical fasteners for metal decks shall be factory coated for corrosion resistance. Acceptable insulation fastener types for metal decks are listed below.

MODIFIED BITUMINOUS MEMBRANE ROOFING (ALTERNATE 1) 075216 - 7
UTRGV SOM TBL CENTER
100% CD

- A fluorocarbon coated screw type roofing fastener having a minimum 0.220-inch thread diameter. Plates used in conjunction with the fastener shall be a metal type having a minimum 3-inch diameter, as supplied by the fastener manufacturer.

> Parafast Fastener by Siplast; Irving, TX

- F. Walktread: A prefabricated, puncture resistant polyester core reinforced, polymer modified bitumen sheet material topped with a ceramic-coated granule wearing surface.
 - 1. Thickness: 0.217 in
 - 2. Weight: 1.8 lb/ft²
 - 3. Width: 30 in

> Paratread by Siplast; Irving, TX
- G. Provide pull test to determine the uplift resistance performance meets the design pressure requirements of ASCE 7-98 and ASTM Standards.

PART 3 - EXECUTION

3.1 PREPARATION

- A. General: Sweep or vacuum all surfaces, removing all loose aggregate and foreign substances prior to commencement of roofing.
- B. Asphaltic Primer: Prime metal and concrete and masonry surfaces with a uniform coating of the specified asphalt primer.

3.2 SUBSTRATE PREPARATION

- A. Insulation: Install insulation panels with end joints offset; edges of the panels shall be in moderate contact without forcing applied in strict accordance with the insulation manufacturer's requirements and the following instructions. Where insulation is installed in two or more layers, stagger joints between layers. Maintain a maximum panel size of 4 feet by 4 feet for polyisocyanurate insulation. Install only as much insulation as can be made watertight within the same work day.
 - 1. Insulation - single layer: Mechanically attach the insulation panels, using the specified fasteners, at a rate recommended by manufacturer. Increase the fastening frequency by 50% at the perimeter of the roof and 100% in the corners.
 - 2. Insulation - double layer: Mechanically attach both layers simultaneously to the substrate, using the specified fasteners, at a rate recommended by manufacturer. Increase the fastening frequency by 50% at the perimeter of the roof and 100% in the corners. Stagger the panel joints between insulation layers.
 - 3. Crickets: Construct crickets of tapered insulation panels in a layout as indicated on the roof plan.
 - 4. Tapered Edge at Transitions: Field-cut, shape and install tapered edge strip at transitions of 1/4 inch or greater between substrate components to provide a smooth transition and proper support for the subsequent insulation layer or membrane/flashing system components.

3.3 ROOF MEMBRANE INSTALLATION

- A. Membrane Application: Apply roofing in accordance with roofing system manufacturer's instructions and the following requirements. Application of roofing membrane components shall immediately follow application of base sheet and/or insulation as a continuous operation.
- B. Aesthetic Considerations: Construction of an aesthetically pleasing overall appearance of the finished roof application is a standard requirement for this project. Make necessary

preparations, utilize recommended application techniques, apply the specified materials including granules, and exercise care in ensuring that the finished application is acceptable to the Owner.

- C. Kettles: Kettles shall be equipped with accurate, fully readable thermometers. Do not heat asphalt to or above its flash point. Avoid heating at or above the FBT, should conditions make this impractical, heating must be no more than 25°F below the EVT and no more than 25°F above EVT.
- D. Asphalt Temperatures: If the EVT information is not provided, the following asphalt temperature shall be observed. Maximum heating temperature shall be 525°F. Minimum application temperature shall be 400°F.
- E. Asphalt Moppings: Ensure that all moppings do not exceed a maximum of 25 lb/sq. Mopping shall be total in coverage, leaving no breaks or voids.
- F. Bitumen Consistency: Cutting or alterations of bitumen, primer, and sealants will not be permitted.
- G. Roofing Application: Apply all layers of roofing free of wrinkles, creases or fishmouths. Exert sufficient pressure on the roll during application to ensure prevention of air pockets.
 - 1. Apply all layers of roofing perpendicular to the slope of the deck.
 - 2. Fully bond the base ply to the prepared substrate, utilizing minimum 3-inch side and end laps. Apply each sheet directly behind the asphalt applicator. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger end laps a minimum of 3 feet.
 - 3. Fully bond the finish ply to the base ply, utilizing minimum 3-inch side and end laps. Apply each sheet directly behind the asphalt applicator. Stagger end laps of the finish ply a minimum 3 feet. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger side laps of the finish ply a minimum 12 inches from side laps in the underlying base ply. Stagger end laps of the finish ply a minimum 3 feet from end laps in the underlying base ply.
- H. Granule Embedment: Broadcast mineral granules over all bitumen overruns on the finish ply surface, while the bitumen is still hot to ensure a monolithic surface color.
- I. Water Cut-Off: At end of day's work, or when precipitation is imminent, construct a water cut-off at all open edges. Cut-offs can be built using asphalt or plastic cement and roofing felts, constructed to withstand protracted periods of service. Cut-offs must be completely removed prior to the resumption of roofing.
- J. Sealant: Apply a smooth continuous bead of the specified sealant at the exposed finish ply edge transition to metal flashings incorporated into the roof system.

3.4 FIELD QUALITY CONTROL AND INSPECTIONS

- A. Site Condition: Leave all areas around job site free of debris, roofing materials, equipment and related items after completion of job.
- B. Notification of Completion: Notify the manufacturer by means of manufacturer's printed Notification of Completion form of job completion in order to schedule a final inspection date.
- C. Final Inspection/Post-Installation Meeting: Hold a meeting at the completion of the project, attended by all parties that were present at the pre-job conference. A punch list of items required for completion shall be compiled by the Contractor and the manufacturer's representative. Complete, sign, and mail the punch list form to the manufacturer's headquarters.

- D. Issuance of the Guarantee: Complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.

3.1 UPLIFT TESTING

- A. After completion of the roofing system (and prior to substantial completion) the Owner will perform uplift testing on the roof in accordance with ASTM E907. Uplift testing is a project requirement and will not give cause for adjustment of warranties at test areas. Any concerns related to testing should be communicated prior to submission of bid.
- B. Contractor shall be responsible for replacing or repairing the roof in locations of failed tests and mitigating any issues with the roofing system that allowed failure to meet prescribed uplift pressures.

End of Section

ROOFING INSTALLER'S WARRANTY

WHEREAS <NAME> of <ADDRESS>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

Owner:
Address:
Building Name/Type:
Address:
Area of Work:
Acceptance Date:
Warranty Period:
Expiration Date:

AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

The Roofing Installer is responsible for damage to work covered by this Warranty and is liable for consequential damages to building or building contents, resulting from leaks or faults or defects of work.

The Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.

This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this <DAY> day of <MONTH>, 20<YEAR>.

Authorized Signature:
Name:
Title:

--*

End of Section

SECTION 075500 -SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING (TORCH APPLIED)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Requirements of Drawings, General and Supplementary Conditions and DIVISION 1 apply to this Section.

1.2 SCOPE

- A. Provide all SBS-modified bituminous membrane roofing work including but not necessarily limited to:
 - 1. Two-ply modified bituminous membrane roofing.
 - 2. Metallic clad modified bituminous base flashing.
 - 3. Cover board.
 - 4. Roofing insulation.
 - 5. Base sheet.
 - 6. Walk treads.
 - 7. Roof penetration flashing system.
- B. Related Sections include the following:
 - 1. Rough carpentry SECTION 061000
 - 2. Flashing and sheet metal SECTION 076200
 - 3. Roof accessories SECTION 077200
 - 4. Joint sealants SECTION 079200
 - 5. Roof drains & flashing receiving members for Mechanical/Electrical penetrations & roof mounted equipment DIVISIONS 23 & 26

1.3 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 for definitions of terms related to roofing work not otherwise defined in this Section.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Install a watertight, modified bituminous membrane roofing and base flashing system with compatible components that will not permit the passage of liquid water and will withstand wind loads, thermally induced movement, and exposure to weather without failure. System shall include all associated flashing, coping and sheet metal work specified in Section 076200.

1.5 SUBMITTALS

- A. Product Data: For each type of roofing product specified. Include data substantiating that materials comply with requirements.
- B. Shop Drawings: Include plans, sections, details, and attachments to other work, for the following:
 - 1. Base flashings, cants, and membrane terminations.
 - 2. Tapered insulation, including slopes.
 - 3. Crickets, saddles, and tapered edge strips, including slopes.
- C. Samples for Verification: Provide 3 (each) of the following products:

1. 12-by-12-inch square of modified bituminous, granule-surfaced cap sheets, of colors selected.
 2. 12-by-12-inch square of metal-foil-surfaced, modified bituminous base flashing sheets.
 3. 12-by-12-inch square of roofing insulation.
 4. 12-by-12-inch sample of cover board.
- D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install specified roofing system and is eligible to receive the standard roofing manufacturer's warranty.
- E. Manufacturer Certificates: Signed by roofing system manufacturer certifying that the roofing system complies with requirements specified in the "Performance Requirements" Article.
- F. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified. Submit qualification data within thirty (30) days of Contractor's notice to proceed.
- G. Product Test Reports: Based on evaluation of tests performed by manufacturer and witnessed by a qualified independent testing agency, indicate compliance of components of roofing system with requirements based on comprehensive testing of current product compositions.
- H. Research/Evaluation Reports: Evidence of roofing system's compliance with building code in effect for Project from a model code organization acceptable to authorities having jurisdiction.
- I. Maintenance Data: For roofing system to include in the maintenance manuals specified in Division 1.
- J. Warranty: Sample copy of standard roofing manufacturer's non-prorated 20-year No Dollar Limit warranty stating obligations, remedies, limitations, and exclusions of warranty.
- K. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roof installation.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer to perform Work of this Section who has specialized in installing roofing similar to that required for this Project for a minimum of five (5) years in the state of Texas; who is approved, authorized, or licensed by the roofing system manufacturer to install manufacturer's product; and who is eligible to receive the standard roofing manufacturer's warranty.
- B. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method indicated below by UL, , or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
1. Exterior Fire-Test Exposure: Class A; complying with ASTM E 108, for application and slopes indicated.
 2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing materials are a part.
- C. Pre-installation Conference: Before installing roofing system, conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings." Notify participants at least 5 working days before conference.

1. Meet with Owner; Architect; Owner's insurer, if applicable; testing and inspecting agency representative; roofing Installer; roofing system manufacturer's representative; deck Installer; and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review status of all submittals.
3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and attachment to structural members.
5. Review loading limitations of deck during and after roofing.
6. Review flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
7. Review governing regulations and requirements for insurance, certifications, and inspection and testing, if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.
10. Document proceedings, including corrective measures or actions required, and furnish copy of record to each participant.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store roofing materials in a dry, well-ventilated, weathertight location to ensure no significant moisture pickup and maintain at a temperature exceeding roofing system manufacturer's written instructions. Store rolls of felt and other sheet materials on end on pallets or other raised surfaces. Do not double-stack rolls.
 1. Handle and store roofing materials and place equipment in a manner to avoid significant or permanent damage to deck or structural supporting members.
- B. Do not leave unused felts and other sheet materials on the roof overnight or when roofing work is not in progress unless protected from weather and moisture and unless maintained at a temperature exceeding 50 deg F (10 deg C).
- C. Deliver and store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
- D. Protect roofing insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

1.8 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with roofing work only when existing and forecasted weather conditions permit roofing to be installed according to manufacturers' written instructions and warranty requirements.
 1. Do not apply roofing membrane or insulation to damp deck surface.
- B. Do not apply roofing membrane during inclement weather or when a 40% chance of precipitation is forecast by the National Weather Service.

1.9 SEQUENCING AND INSTALLATION

- A. Sequence installation of modified bituminous sheet roofing with related units of Work specified in other Sections to ensure that roof assemblies, including roof accessories, flashing, trim, and joint sealers, are protected against damage from effects of weather, corrosion, and adjacent construction activity.

1.10 WARRANTY

- A. General Warranty: The warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. 20-Year Non-Prorated No Dollar Limit Roofing Manufacturer's Warranty: Submit a written warranty, without monetary limitation, signed by roofing system manufacturer agreeing to promptly repair leaks in the roof membrane and base flashings resulting from defects in materials or workmanship, and repair of any substantial blistering, for the following warranty period to start with the date of the General Contractor's Substantial Completion of the Work as established by the Architect's Certificate of Substantial Completion:
 - 1. Warranty Period: 20 years.
- C. Defects include, but are not limited to, the following:
 - 1. Deterioration of the roofing membrane or flashing system resulting for ordinary wear and tear by the elements.
 - 2. Workmanship on the part of the approved roofing contractor in the application of the roofing system.
 - 3. Splits or breaks in the membrane not caused by structural movement or failure or any movement of material underlying the roofing membrane or base flashing.
 - 4. Blisters, wrinkles, ridges, fishmouths, or open laps in the roofing membrane.
 - 5. Slippage of the roofing membrane or base flashing.
- D. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including membrane roofing, base flashing, roofing insulation, fasteners, and vapor retarders, if any, for the following warranty period:
 - 1. Warranty Period: 2 years from date of Substantial Completion.
 - 2. Warranty Inclusion: Warranty shall also include sheet metal work under Section 076000.

PART 2 – PRODUCTS

2.1 ROOFING SYSTEM ASSEMBLY/PRODUCTS

- A. Rigid Roof Insulation: Roof insulation, flat and tapered, shall be UL approved. Insulation shall be approved in writing by the insulation manufacturer for intended use and for use with the specified roof assembly. Tapered insulation complying with slopes required for positive drainage, minimum 2" thickness at roof drains and eaves
 - 1. Polyisocyanurate: A closed cell, rigid polyisocyanurate foam core material, integrally laminated between glass fiber facers, in full compliance with ASTM C 1289, Type II, Class 1, Grade 2. Panels shall have a nominal thickness to provide an average R-value of R-30. Board size shall be 48" X 96". Acceptable types are as follows:
 - 2. Gypsum Sheathing Panel: A panel composed of gypsum based, non-structural water-resistant core material integrally bonded with fiberglass mats on both sides having a nominal thickness of 1/2 inch. The panel surface shall be factory primed with a non-asphaltic primer. Acceptable types are as follows:

- > DensDeck Prime Gypsum Roof Board, by Georgia Pacific Corporation;
Atlanta, GA

2.2 DESCRIPTION OF SYSTEMS

- A. Roofing Membrane Assembly: A roof membrane assembly consisting of two plies of a prefabricated, reinforced, homogeneous Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane, applied over a prepared substrate. Both reinforcement mats shall be impregnated/saturated and coated each side with an SBS modified bitumen blend and coated one side with a torch grade SBS bitumen blend adhesive layer. The adhesive layer shall be manufactured using a process that embosses the surface with a grooved pattern to provide optimum burn-off of the plastic film and to maximize application rates. The roof system shall pass 500 cycles of ASTM D 5849 Resistance to Cyclic Joint Displacement (fatigue) at 14°F (-10°C). Passing results shall show no signs of membrane cracking or interply delamination after 500 cycles. The roof system shall pass 200 cycles of ASTM D 5849 after heat conditioning performed in accordance with ASTM D 5147. The assembly shall possess waterproofing capability, such that a phased roof application, with only the modified bitumen base ply in place, can be achieved for prolonged periods of time without detriment to the watertight integrity of the entire roof system.
- B. Basis For Design: Subject to compliance with requirements, provide products manufactured by Siplast Roofing Co. or comparable products by the following manufacturers:
1. GAF
 2. Johns Manville
 3. Soprema Roofing Co., Inc.
 - > Siplast Paradiene 20 TG/30 FR TG torchable roof system
- C. Modified Bitumen Base and Stripping Ply:
1. Thickness (avg): 114 mils (ASTM D 5147)
 2. Thickness (min): 110 mils (ASTM D 5147)
 3. Weight (min per 100 ft² of coverage): 76 lb
 4. Maximum filler content in elastomeric blend: 35% by weight
 5. Low temperature flexibility @ -13° F - PASS (ASTM D 5147)
 6. Maximum Load (avg) @ 73°F: 30 lbf/inch (ASTM D 5147)
 7. Maximum Load (avg) @ 0°F: 75 lbf/inch (ASTM D 5147)
 8. Elongation @ 5% Maximum Load (avg.) @ 73°F: 50% (ASTM D 5147)
 9. Dimensional Stability (max): 0.1% (ASTM D 5147)
 10. High Temperature Stability (min): 250°F (ASTM D 5147)
 11. Approvals: UL Class listed, d (products shall bear seals of approval)
 12. Reinforcement: fiberglass mat or other meeting the performance and dimensional stability criteria.
 - a) GAF – SBS Heat-weld Smooth
 - b) U.S.Ply – DuraFlex 90 TG SBS Base
 - c) Soprema – Elastophene Flam (30)
- D. Modified Bitumen Finish Ply:
1. Thickness (avg): 150 mils (ASTM D 5147)
 2. Thickness at selvage (coating thickness) (avg): 118 mils (ASTM D 5147)
 3. Thickness at selvage (coating thickness) (min): 114 mils (ASTM D 5147)
 4. Weight (min per 100 ft² of coverage): 112 lb
 5. Maximum filler content in elastomeric blend: 35% by weight
 6. Low temperature flexibility @ -13°F: PASS (ASTM D 5147)
 7. Maximum Load (avg) @ 73°F: 30 lbf/inch (ASTM D 5147)
 8. Maximum Load (avg) @ 0°F: 75 lbf/inch (ASTM D 5147)
 9. Elongation @ 5% Maximum Load (avg.) @ 73°F: 55% (ASTM D 5147)
 10. Dimensional Stability (max): 0.1% (ASTM D 5147)
 11. High Temperature Stability (min): 250°F (ASTM D 5147)
 12. Granule Embedment (max loss): 2.0 grams per sample (ASTM D 5147)

13. Approvals: UL Class listed, (products shall bear seals of approval)
 14. Reinforcement: fiberglass mat or other meeting the performance and dimensional stability criteria
 15. Surfacing: ceramic granules
 - > Siplast Paradiene 30 FR - torchable grade
- E. Flashing Membrane Assembly: A flashing membrane assembly consisting of a prefabricated, reinforced, Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane with a continuous, channel-embossed metal-foil surfacing. The finish ply shall conform to ASTM D 6298 and the following physical and mechanical property requirements:
- > Siplast Veral flashing system, aluminum finish
 1. Metal-Clad Modified Bitumen Flashing Sheet
 2. Thickness (avg): 150 mils (ASTM D 5147)
 3. Thickness (min): 146 mils (ASTM D 5147)
 4. Weight (min per 100 ft² of coverage): 96 lb
 5. Coating Thickness – back surface (min): 40 mils (ASTM D 5147)
 6. Maximum filler content in elastomeric blend: 35% by weight
 7. Low temperature flexibility @ 0° F: PASS (ASTM D 5147)
 8. Maximum Load (avg) @ 73°F: 85 lbf/inch (ASTM D 5147)
 9. Maximum Load (avg) @ 0°F: 180 lbf/inch (ASTM D 5147)
 10. Elongation @ 5% Maximum Load (avg) @ 73°F: 45% (ASTM D 5147)
 11. Tear-Strength (avg): 120 lbf (ASTM D 5147)
 12. Dimensional Stability (max): 0.2% (ASTM D 5147)
 13. High Temperature Stability (min): 225°F (ASTM D 5147)
 14. Cyclic Thermal Shock Stability (maximum): 0.2% (ASTM D 6298)
 15. Approvals: UL Approved, (products shall bear seals of approval)
 16. Reinforcement: fiberglass scrim mat or other meeting the performance and dimensional stability criteria
 17. Surfacing: aluminum metal foil
Soprema – Sopralast 50 TV Alum (57)
- F. Catalyzed Acrylic Resin Flashing System: A specialty flashing system consisting of a liquid-applied, fully reinforced, multi-component acrylic membrane installed over a prepared or primed substrate. The flashing system consists of a catalyzed acrylic resin primer, basecoat and topcoat, combined with a non-woven polyester fleece. The resin and catalyst are pre-mixed immediately prior to installation. The use of the specialty flashing system shall be specifically approved in advance by the membrane manufacturer for each application.
- > Parapro 123 Flashing System by Siplast; Irving, TX

2.3 ROOFING ACCESSORIES

- A. Fire Resistant Board Basic Design: Securock. Panel composed of gypsum based, non-structural water resistant core material integrally bonded with fiberglass mats on both sides having a nominal thickness of 1/2 inch. Acceptable types are as follows:
- > DensDeck Prime Gypsum Roof Board, by Georgia Pacific Corporation; Atlanta, GA
 1. Bituminous Cutback Materials
 2. Primer: An asphalt, solvent blend conforming to ASTM D 41 requirements.
 3. Mastics: An asphalt cutback mastic, reinforced with non-asbestos fibers, used as a base for setting metal flanges conforming to ASTM D 4586 Type II requirements.
- B. Sealant: A moisture-curing, non-slump elastomeric sealant designed for roofing applications. The sealant shall be approved by the roof membrane manufacturer for use in conjunction with the roof membrane materials.
- C. Ceramic Granules: No. 11 grade specification ceramic granules of color scheme matching the granule surfacing of the finish ply.

- D. Metallic Powder: A finely graded metal dust as supplied or approved by the membrane manufacturer, used for covering of bitumen overruns over the foil surfaced membrane.
- E. Parapro 123 Roof Penetration System (PMMA).
- F. Walk treads: A prefabricated, puncture resistant polyester core reinforced, polymer modified bitument sheet material topped with a ceramic-coated granule wearing surface.
 - 1. Thickness: 0.217 inch.
 - 2. Weight: 1.8 lb./ft².
 - 3. Width: 30 inches.
 - Paratread Roof Protection Material by Siplast; Irving, TX.

2.4 FASTENERS

- A. General: Furnish roofing insulation accessories recommended by insulation manufacturer for intended use and compatible with sheet roofing material.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions, designed for fastening roofing insulation to substrate, of sufficient length to penetrate roof deck at all locations, not exceeding one inch additional length, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

2.5 MANUFACTURERS

- A. Manufacturers: Subject to providing a system in compliance with requirements, products may be provided by one of the following:
 - 1. SBS-Modified Bituminous Sheet:
Siplast, Inc.
The Garland Co.
Soprema Roofing and Waterproofing, Inc.
Tremco Roofing Inc.
 - 2. Cover Board:
Georgia-Pacific
 - 3. Polyisocyanurate Board Insulation (R-26):
Siplast, Inc.
Apache Products Co.
Atlas Roofing Corporation.
Celotex Corp. (The).

PART 3 - EXECUTION

3.1 PREPARATION

- A. General: Sweep and vacuum all surfaces, removing all loose aggregate and foreign substances prior to commencement of roofing.

3.2 SUBSTRATE PREPARATION

- A. Insulation: Install insulation panels with end joints offset; edges of the panels shall be in moderate contact without forcing applied in strict accordance with the insulation manufacturer's requirements and the following instructions. Where insulation is installed in two or more layers, stagger joints between layers.
 - 1. Insulation - double layer: Mechanically attach first layer to the substrate, using the specified fasteners, at a rate of 1 fastener per 2.7 square feet of panel area (12 per 4'

x 8' panel). Stagger the panel joints between insulation layers. Subsequent layers to be fully adhered.

3.3 ROOF MEMBRANE INSTALLATION

- A. Membrane Application: Apply roofing in accordance with roofing system manufacturer's instructions and the following requirements. Application of roofing membrane components shall immediately follow application of base sheet and/or insulation as a continuous operation.
- B. Aesthetic Considerations: An aesthetically pleasing overall appearance of the finished roof application is a standard requirement for this project. Make necessary preparations, utilize recommended application techniques, apply the specified materials including granules and metallic powder, and exercise care in ensuring that the finished application is acceptable to the Owner.
- C. Priming: Prime metal and concrete and masonry surfaces with a uniform coating of the specified asphalt primer.
- D. Bitumen Consistency: Cutting or alterations of bitumen, primer, and sealants will not be permitted.
- E. Roofing Application: Apply all layers of roofing free of wrinkles, creases or fishmouths. Exert sufficient pressure on the roll during application to ensure prevention of air pockets.
 - 1. Apply all layers of roofing perpendicular to the slope of the deck.
 - 2. Fully bond the base ply to the prepared substrate, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the torch applicator. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger end laps a minimum of 3 feet.
 - 3. Fully bond the finish ply to the base ply, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the torch applicator. Stagger end laps of the finish ply a minimum 3 feet. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger side laps of the finish ply a minimum 12 inches from side laps in the underlying base ply. Stagger end laps of the finish ply a minimum 3 feet from end laps in the underlying base ply.
 - 4. Maximum sheet lengths and special fastening of the specified roof membrane system may be required at various slope increments where the roof deck slope exceeds 1/2 inch per foot. The manufacturer shall provide acceptable sheet lengths and the required fastening schedule for all roofing sheet applications to applicable roof slopes.
- F. Granule Embedment: Broadcast mineral granules over all bitumen overruns on the finish ply surface, while the bitumen is still hot or the adhesive is soft, to ensure a monolithic surface color.
- G. Flashing Application – surfaces sheathed with gypsum sheathing panels: Flash parapet walls and curbs sheathed with the specified gypsum sheathing panel using the reinforcing sheet and the metal foil flashing membrane. After the base ply has been applied to the top of the cant, fully adhere the reinforcing sheet, utilizing minimum 3 inch side laps and extend a minimum of 3 inches onto the base ply surface and up the gypsum sheathing panel surface above the cant. After the final roofing ply has been applied to the top of the cant, prepare the surface area that is to receive flashing coverage by torch heating granular surfaces or by application of asphalt primer; allowing primer to dry thoroughly. Torch apply the metal foil-faced flashing into place using three-foot widths (cut off the end of roll) always lapping the factory selvage edge. Stagger the laps of the metal foil flashing layer from lap seams in the reinforcing layer. Extend the flashing sheet a minimum of 4 inches beyond the toe of the cant onto the prepared surface of the finished roof and up the wall to the desired flashing height. Exert pressure on the flashing sheet during application to ensure complete contact with the wall/roof surfaces, preventing air pockets; this can be accomplished by using a damp sponge or shop rag. Check and seal all loose laps and edges. Nail the top edge of the flashing on 9-inch centers. (See manufacturer's schematic for visual interpretation).

- H. Use of Metallic Powder: Broadcast metallic powder over all bitumen overruns on the metal foil membrane surface while the bitumen is still hot to ensure a monolithic surface color.
- I. Water Cut-Off: At end of day's work or when precipitation is imminent, construct a water cut-off at all open edges. Cut-offs can be built using asphalt or plastic cement and roofing felts, constructed to withstand protracted periods of service. Cut-offs must be completely removed prior to the resumption of roofing.

3.4 FIELD QUALITY CONTROL AND INSPECTIONS

- A. Site Condition: Leave all areas around job site free of debris, roofing materials, equipment and related items after completion of job.
- B. Notification of Completion: Notify the manufacturer by means of manufacturer's printed Notification of Completion form of job completion in order to schedule a final inspection date.
- C. Final Inspection:
 - 1. Post-Installation Meeting: Hold a meeting at the completion of the project, attended by all parties that were present at the pre-job conference. A punch list of items required for completion shall be compiled by the Contractor and the manufacturer's representative. Complete, sign, and mail the punch list form to the manufacturer's headquarters.
- D. Issuance of The Guarantee: Complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.

3.5 UPLIFT TESTING

- A. After completion of the roofing system (and prior to substantial completion) the Owner will perform uplift testing on the roof in accordance with ASTM E907. Uplift testing is a project requirement and will not give cause for adjustment of warranties at test areas. Any concerns related to testing should be communicated prior to submission of bid.
- B. Contractor shall be responsible for replacing or repairing the roof in locations of failed tests and mitigating any issues with the roofing system that allowed failure to meet prescribed uplift pressures.

(SEE INSTALLER'S WARRANTY ON FOLLOWING PAGES).

ROOFING INSTALLER'S WARRANTY

WHEREAS <NAME> of <ADDRESS>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

Owner:
Address:
Building Name/Type:
Address:
Area of Work:
Acceptance Date:
Warranty Period:
Expiration Date:

AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

The Roofing Installer is responsible for damage to work covered by this Warranty and is liable for consequential damages to building or building contents, resulting from leaks or faults or defects of work.

The Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.

This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this <DAY> day of <MONTH>, 20<YEAR>.

Authorized Signature:
Name:
Title:

SECTION 076200 - FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Provide all flashing and sheet metal work including, but not necessarily limited to:
 - 1. Sheet metal fabrications for low slope roofs:
 - a. Metal copings
 - 2. Self-adhesive waterproofing underlayments (WP-11).
- B. Related Requirements:
 - 1. Section 072726 "Fluid-Applied Membrane Air Barriers" for flashings associated with air barrier assemblies.
 - 2. Section 077200 "Roof Accessories" for roof hatches and other manufactured roof accessory units.
 - 3. Section 079200 "Joint Sealants" for elastomeric sealants for sheet metal expansion joints.

1.3 COORDINATION

- A. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Require attendance by installers of primary roofing, waterproofing, and air barrier assemblies.
 - 2. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. For each type of flashing and sheet metal work, schedule a minimum of 72 hours with advance notice for Architect to review samples representative of the Contractor's work on the site before such work shall be concealed by other work.
 - 4. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
 - 5. Review requirements for insurance and certificates if applicable.
 - 6. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
 - 2. Sample Warranty: For special warranty, including metal finishes.

- B. Shop Drawings: For sheet metal flashing and trim.
 - 1. Submit shop drawings showing layout, joining, profiles and anchorages of fabricated work, layouts at 1/4" scale, details at 3" scale.
 - 2. Include plans, elevations, sections, and attachment details.
 - 3. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish manufactured or pre-fabricated, and field-assembled work.
 - 4. Include identification of material, thickness, weight, and finish for each item and location in Project.
 - 5. Include details for forming, including profiles, shapes, seams, and dimensions.
 - 6. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 - 7. Include details of termination points and assemblies.
 - 8. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
 - 9. Include details of special conditions.
 - 10. Include details of connections to adjoining work.
 - 11. Provide these details matching a submitted ANSI/SPRI ES-1 testing assembly.
- C. Samples for Initial Review: For each type of sheet metal and accessory indicated with factory-applied finishes.
 - 1. Submit two, 8" square samples of specified sheet materials.
 - 2. Submit two, 12" long, completely finished units of specified factory-fabricated products.
- D. Samples for Verification: For each type of exposed fabrication.
 - 1. Exposed to View Sheet Metal Flashings, Copings: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
 - 2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.
 - 3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Product Certificates: For each type of coping that is SPRI ES-1 tested and FM Approvals approved.
- C. Product Test Reports: For each product, for tests performed by a qualified testing agency.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and its accessories, to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing similar to that required for this Project and whose products have a record of successful in-service performance.
 - 1. For copings that are SPRI ES-1 tested and FM Approvals approved, shop shall be listed as able to fabricate required details as tested and approved.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.10 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. FM Approvals Listing: Manufacture and install copings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-105. Identify materials with name of fabricator and design approved by FM Approvals.
- D. SPRI Wind Design Standard: Manufacture and install copings tested according to SPRI ES-1 and capable of resisting the following design pressure:
 1. Design Pressure: As indicated on Drawings.
- E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Coil-Coated Steel Sheet: Provide aluminum-zinc alloy-coated steel sheet according to ASTM A 792/A 792M, Class AZ50 coating designation, Grade 40; pre-painted by coil-coating process to comply with ASTM A 755/A 755M; 24 gauge thick except as otherwise indicated.
 - 1. Surface: Smooth, flat.
 - 2. Exposed Coil-Coated Finish:
 - a. Gloss: 30% reflective gloss per ASTM D523 unless otherwise indicated.
 - b. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish (Kynar 500).
 - 1. Color: Kynar premium metallic color – metallic silver SRI-58.
 - a. Three-year aged solar reflectance: Not less than 0.55.
 - b. Three-year aged thermal emittance: Not less than 0.75.
 - c. Three-year aged solar reflectance index: Not less than 0.64.
 - 2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

2.3 UNDERLAYMENT AND ELASTIC FLASHING MATERIALS (WP-4C; WP-11)

- A. Self-Adhering, High-Temperature Sheet: Specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. GCP Applied Technologies Inc. (formerly Grace Construction Products); Grace Ice and Water Shield HT.
 - b. Carlisle Coatings & Waterproofing Inc; CCW WIP 300HT.
 - c. Henry Company; Blueskin PE200 HT.
 - d. Polyguard Products, Inc.; Deck Guard HT.
 - 2. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F or higher.
 - 3. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F or lower.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
 - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - c. Rivets: Stainless steel pop rivets.
 - 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
 - 3. Fasteners for Zinc-Coated (Galvanized) or Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

- C. Solder:
 - 1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2-inch-wide and 1/8 inch thick.
- E. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 - 2. Obtain field measurements for accurate fit before shop fabrication.
 - 3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 - 4. Conceal fasteners and expansion provisions. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
 - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep
- D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- E. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard, but not less than one gauge heavier of metal being secured.
- F. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- G. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer.
- H. Do not use graphite pencils to mark metal surfaces.

2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Copings: Fabricate in minimum 96-inch-long, but not exceeding 12-foot-long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, solder or weld watertight. Shop fabricate interior and exterior corners.

1. Coping Profile: Refer to Drawings.
 2. Joint Style: Butted with expansion space and 6-inch-wide, concealed backup plate.
 - a. Aluminum-Zinc Alloy-Coated Steel: 0.040 inch thick. (Kynar 500)
- B. Roof-Penetration Flashing: Fabricate from the following materials:
1. Zinc-Tin Alloy-Coated Stainless Steel: 0.018 inch thick. (Raw stainless steel if not exposed to view).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
1. Verify compliance with requirements for installation tolerances of substrates.
 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT(WP-11) AND SELF-ADHERING FLASHING (WP-4C) INSTALLATION

- A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate as recommended by underlayment manufacturer. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller. Cover underlayment within 14 days.

3.3 INSTALLATION, GENERAL

- A. Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA "ARCHITECTURAL SHEET METAL MANUAL". Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.
- B. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 3. Provide continuous cleats. Attach cleat fasteners at 12" o.c. minimum. Bend tabs over fasteners.
 4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 5. Torch cutting of sheet metal flashing and trim is not permitted.
 6. Do not use graphite pencils to mark metal surfaces.

- C. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
 - 1. Coat concealed side of uncoated-aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing sheet metal flashing and trim directly on wood substrates, install underlayment and cover with slip sheet.
- D. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim in accordance with approved samples and mockups.
 - 1. Use lapped expansion joints only where indicated on Drawings.
- E. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
- F. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- G. Seal joints as required for watertight construction.
 - 1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
 - 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
- H. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work.
 - 1. Do not solder aluminum alloy coated steel.
 - 2. Do not use torches for soldering.
 - 3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
- I. Rivets: Rivet joints where necessary for strength.

3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Copings: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for specified FM Approvals' listing for required windstorm classification.
- C. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric butyl or silicone sealant and clamp flashing to pipes that penetrate roof.

3.5 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.6 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.7 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- E. Advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction, to ensure that work will be without damage or deterioration, other than natural weathering, at time of substantial completion.
- F. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Requirements of Drawings, General and Supplementary Conditions and DIVISION 1 apply to this Section.

1.2 SCOPE

- A. Provide all roof accessories work including but not necessarily limited to:
 - 1. Fall protection equipment system.
 - 2. Prefabricated pipe and duct housing penetrations.
- B. Related work specified elsewhere:
 - 1. Metal fabrications SECTION 055000
 - 2. Flashing and sheet metal SECTION 076200
 - 3. Painting SECTION 099100

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, materials, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Show fabrication and installation details. Indicate dimensions, weights, loadings, required clearances, method of field assembly, and components. Include plans, elevations, sections, details, and attachments to other Work.
- C. Coordination Drawings: Roof plans drawn to scale and coordinating penetrations and roof-mounted items. Show the following:
 - 1. Size and location of roof accessories specified in this Section.
 - 2. Method of attaching roof accessories to roof or building structure.

1.4 QUALITY ASSURANCE

- A. Standards: Comply with the following:
 - 1. SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.
 - 2. NRCA's "Roofing and Waterproofing Manual" details for installing units.
 - 3. ANSI ES-1.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Fall Protection Equipment System:
 - a. Rooftop Anchors Inc., 844 South 430 West, Suite 200, Heber City, UT 84032: tel: 800-411-3914; fax: 800-839-2929; www.rooftopanchor.com Email: sales@RoofTopAnchor.com
 - b. Substitutions not permitted.
2. Pipe and Duct Penetration Housing: a. Provide products by the following manufacturers or submit products comparable in characteristics and described components for approval.
 - a. Roof Penetrations Housings, San Antonio, Texas; 1-800-994-0945; www.Roofpenetratinhousings.com.
 - b. Model: AWI-201412 "Medium Vault".

2.2 MATERIALS, GENERAL

- A. Insulation: Manufacturer's standard rigid or semi rigid glass-fiber board of thickness indicated.
- B. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, complying with AWPA C2; not less than 1-1/2 inches thick.
- C. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.
- D. Bituminous Coating: SSPC-Paint 12, solvent-type bituminous mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coating.
- E. Mastic Sealant: Polyisobutylene; non-hardening, non-skinning, nondrying, non-migrating sealant.
- F. Elastomeric Sealant: Generic type recommended by unit manufacturer that is compatible with joint surfaces; ASTM C 920, Type S, Grade NS, Class 25, and Uses NT, G, A, and, as applicable to joint substrates indicated, O.
- G. Roofing Cement: ASTM D 4586, non-asbestos, fibrated asphalt cement designed for trowel application or other adhesive compatible with roofing system.

2.4 FALL PROTECTION EQUIPMENT SYSTEM

- A. Design/Performance Requirements:
 1. Provide Fall Protection System in compliance with OSHA, ANSI, and all applicable state and federal regulatory requirements.
 2. Fall Protection System shall provide independent fall arrest in addition to suspension line anchorages for descent location.
 3. Design of fall arrest safety systems, and equipment shall meet or exceed the following:
 - a. Fall Arrest Safety Rooftop Anchors: designed to a maximum fall arresting force of typically 1800 lbs when wearing a body harness with a safety factor of 2 without any permanent deformation; and to 5000 lbs against fracture or detachment.
 - b. Ensure design of primary support equipment is capable of sustaining without failure at least four times the maximum static working load applied or transmitted to the components.
 - c. Design system fall arrest safety anchors and equipment supports to comply with the following structural requirements:

- 1) Supports for Suspended Platforms: Rooftop Davits, Rooftop Rigging Sleeves and Rooftop Monorails are used for suspending a powered Platform from storage and rigging/working locations on the building. These supports and the structures to which they are attached are typically designed to 1000 lbs (4.5 kN) vertical service load plus impact with a factor of safety as per AISC requirements and/or ACI or other applicable construction codes, and to 4 times the rated load against fracture or detachment (i.e. 4 to 1 stability factor).
- B. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- C. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for annual inspection, re-certifications, periodic checking and adjustment of cable tension and periodic cleaning and maintenance of all railing and infill components.
- D. Quality Assurance:
1. Manufacturer Qualifications: Work of this Section to be executed by manufacturer specializing in the design, fabrication and installation. Must carry specific liability insurance in the amount of \$10,000,000.00 to protect against product/system failure. Companies, such as miscellaneous metal fabricators, who do not typically engage in the design and manufacturing of suspended maintenance equipment, are not permitted to bid.
 2. Professional Engineer: A professional engineer who is legally qualified to practice in the jurisdiction where the project is located and who is experienced in providing engineering services of the kind required.
 3. Welding to be executed by certified welders in accordance with AWS requirements.
 4. Installer Qualifications: Specializing in the Work of this section and trained and certified by the fall protection system manufacturer.
- E. Delivery, Storage and Handling: Store products in manufacturer's unopened packaging until ready for installation.
- F. Sequencing:
1. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
 2. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.
- G. Project Conditions: Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- H. Maintenance Service: Furnish service and maintenance for fall protection system and components for a period of one year from Date of Substantial Completion with an option for extending maintenance service on an annual basis thereafter.
- I. Warranty: Rooftop RoofSafe Anchor (Aluminum): Provide with manufacturer's 25 year limited warranty.
- J. Materials:
1. Exposed Structural Components Finish: Stainless Steel: 304 ASTM A 182.
 2. Non-Structural Components:

- a. Sheet and Plate: ASTM A 36
 - b. Extruded Bars, Rods, Shapes, and Tubes
3. Nuts, Bolts, Davit Pins, and Washers:
 - a. Stainless Steel: 304 ASTM A 193 Grade B8 or ASTM F 593C
4. Anchor Bolts for securing base plates:
 - a. Metal: Stainless Steel, 304 Stainless Steel; ASTM A 193 Grade 8, B8
 - b. Size: 5/8 inch (16 mm) diameter minimum.
 - c. Galvanized Steel: SAE J429 Grade 2 or SAE J429 Grade 5
 - d. Galvanize Steel: ASTM A 36.
5. Hilti 150 Max-SD Adhesive Anchoring System:
 - a. Anchor size and embedment depth: As needed to suit loads imposed by Rooftop Anchor equipment.
 - b. Final determination of proper anchoring system shall be based on concrete condition, psi, and thickness.

2.5 ROOFTOP RAIL SYSTEMS

A. Horizontal Rigid Rail System

1. UniRail System is an extruded aluminum rail system that provides a simple continuous anchor for a free flowing carriage device to travel past joints, intermediate support brackets and around corners.
2. Multi-span horizontal rail system that provides uninterrupted pass through capabilities at any mid span points and continuous hands free operation.
3. Designed for at least 2 simultaneous users.
4. Provide plunger type end stops to facilitate the removal and replacement of carriages.
5. All attachment brackets, anchors and joint splices are 316 stainless steel.
6. 6082 T6 aluminum rail.
7. Rail sections must "float" in the attachment brackets so as to mitigate the effects of thermal expansion and contraction.
8. User(s) can bypass the intermediate bracket and rail joints.
9. Loads imposed on the system joints and intermediate supports are calculated for each installation assuming the worst case scenario to insure the anchorage strength meets the calculated loads as required by OSHA.
10. Manufacturer and or certified installer to submit loading calculations and performance data for UniRail fall protection system as well as fall clearance calculations reviewed and stamped by a professional engineer licensed in the state where the system will be located.
11. Quantity of free flowing carriages- 2

B. Rooftop RoofSafe Rail System: An extruded aluminum rail based fall arrest/restraint system used to provide continuous horizontal movement. It will not flex when a worker applies their body weight to it. The Rooftop RoofSafe Rail System consists of the following aluminum products:

1. Sliding Carriage for Attaching Fall-Arrest Equipment
2. Rivets & S-5! Clamps
3. Rail
4. Stainless Steel Connecting Spigot

C. Rooftop Monorail:

1. Furnish and install monorail track and related work necessary to provide a complete installation. Indicate compatibility of the total system with the building structure and notify the Architect if incompatibility exists. Give special attention to assure that the attachment to the building imparted to load carrying members is within allowable limits and that no

member is overstressed. The loads imposed on the structure shall be submitted to the EOR for review.

2. The monorail track used shall be fabricated from structural extruded aluminum channel capable of being color matched to the ceiling paint color.
3. Stops shall be provided to prevent the trolleys from leaving the end of the tracks. There shall be provisions for removal and inspection of trolleys during routine maintenance. Trolleys shall be designed for easy removal. (access panels to the top of the monorail to be coordinated with architect)
4. Trolley quantity-custom.
5. The track shall be sized to permit support spans of up to 10'-0".
6. The monorail system shall be designed to support a vertical service load of 1000 lbs. per support trolley.
7. The trolleys shall be designed to permit smooth, quiet running while supporting the working load. Load bearing wheels and guiding wheels shall be machined to suit the track profile. Trolleys shall be capable of being cleaned and maintained on a regular schedule.
8. Monorail channel must be installed in a plumb and level fashion to facilitate ease of trolley travel while supporting the working load.

2.6 PREFABRICATED PIPE AND DUCT HOUSING PENETRATIONS

A. General: Insulated roof-curb units with welded or mechanically fastened and sealed corner joints, straight sides, and integrally formed deck-mounting flange at perimeter bottom; with weathertight curb cover. Provide housing with single or multiple collared openings and pressure-sealed rubber or silicone gaskets sized for piping indicated.

1. Minimum 0.080-inch-thick aluminum housing and curb.
2. Finish: Powder coat
3. Color: As selected by Architect from manufacturer's standard offerings.

PART 3 - EXECUTION

3.1 INSTALLATION OF ROOF PROTECTION EQUIPMENT SYSTEM.

A. Examination

1. Do not begin installation until substrates have been properly prepared.
2. Examine project prior to installation and report in writing any defects or other site conditions that would cause problematic installation of Rooftop Anchor products or possible deficiency.
3. Confirm site dimensions.
4. If substrate preparation is the responsibility of another installer, notify client of unsatisfactory preparation before proceeding.

B. Preparation

1. Clean surfaces thoroughly prior to installation.
2. Prepare surfaces using the methods recommended by the manufacturer achieving the best result for the substrate under the project conditions.

C. Installation

1. Install in accordance with Roof Fall Protection manufacturer's instructions and approved shop drawings.
2. Roof Fall Protection manufacturer shall supervise, inspect, and test installation of fall protection system.
3. Non-swaged cable terminations are not acceptable.
4. All swaged cable terminations are to be statically load tested to 50% of the maximum design load prior to being placed in service.
5. Assure that all anchors are level, tightly fitted and flush with adjoining surfaces as required.
6. To prevent accidental removal, deform minimum of two threads of tail end of anchor studs after nuts have been tightened.
7. Isolate dissimilar materials as required to prevent electrolytic corrosion.
8. Coordinate with roofing specified in Section 07500 for the installation of flashings to assure a watertight C.
9. Adjust and leave properly functioning equipment.

D. Manufacturer's Field Services

1. Testing and certification shall be provided under supervision of the fall protection manufacturer or original installer.
2. Annual inspection plus 5 and 10 year recertification provided by the manufacturer or their authorized rep representatives.
3. Repair or replace parts whenever required. Use parts produced by manufacturer of original equipment.
4. Provide emergency call back service at all hours for this maintenance period.
5. Perform maintenance work using competent and qualified personnel under supervision of the fall protection manufacturer or original installer.
6. Annual inspection of horizontal lifeline shall include documented static load testing of every swaged termination.

E. Protection

1. Protect installed products until completion of project.
2. Touch-up, repair or replace damaged products before Substantial Completion.

3.2 CLEANING AND PROTECTION

- A. Clean exposed surfaces according to manufacturer's written instructions. Touch up damaged metal coatings.

END OF SECTION

SECTION 077233 - ROOF HATCHES

PART 1 - GENERAL

1.1 SUMMARY

- A. Work Included:
 - 1. Provide factory-fabricated roof hatches for ladder access.
 - 2. Safety Rail attachment to Roof Hatch.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data.
- B. Shop Drawings: Submit shop drawings including profiles, accessories, location, adjacent construction interface, and dimensions.
- C. Warranty: Submit executed copy of manufacturer's standard warranty.

1.3 QUALITY ASSURANCE

- A. Manufacturer: A minimum of 5 years experience manufacturing similar products.
- B. Installer: A minimum of 2 years experience installing similar products.
- C. Manufacturer's Quality System: Registered to ISO 9001:2008 Quality Standards including in-house engineering for product design activities.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original packaging. Store materials in a dry, protected, well-vented area. Inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.

1.5 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard warranty. Materials shall be free of defects in material and workmanship for a period of five years from the date of Substantial Completion. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis-of-Design Manufacturer for hatch and safety rail: Type NB Roof Hatch by The BILCO Company, P.O. Box 1203, New Haven, CT 06505, 1-800-366-6530, Fax: 1-203-535-1582, Web: www.bilco.com.

2.2 ROOF HATCH

- A. Furnish and install where indicated on plans metal roof hatch Type NB, size width: 30" x length: 54". The roof hatch shall be single leaf. The roof hatch shall be pre-assembled from the manufacturer.
- B. Performance characteristics:
 - 1. Cover shall be reinforced to support a minimum live load of 40 psf with a maximum deflection of 1/150th of the span or 20 psf wind uplift.
 - 2. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
 - 3. Operation of the cover shall not be affected by temperature.
 - 4. Entire hatch shall be weathertight with fully welded corner joints on cover and curb.
- C. Cover: Shall be 11-gauge aluminum with a 3" beaded flange with formed reinforcing members. Cover shall have a heavy extruded EPDM rubber gasket that is bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.
- D. Cover insulation: Shall be fiberglass of 1" (25mm) thickness, fully covered and protected by an 18-gauge (1mm) aluminum liner.
- E. Curb: Shall be 12" in height and of 14-gauge, G-90 galvanized steel or 11-gauge aluminum. The curb shall be formed with a 3-1/2" (89mm) flange with 7/16" holes provided for securing to the roof deck. The curb shall be equipped with an integral metal capflashing of the same gauge and material as the curb, fully welded at the corners, that features the Bil-Clip® flashing system, including stamped tabs, 6" (153mm) on center, to be bent inward to hold single ply roofing membrane securely in place.
- F. Curb insulation: Shall be rigid, high-density fiberboard of 1" thickness on outside of curb.
- G. Lifting mechanisms: Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe.
- H. Hardware
 - 1. Heavy pintle hinges shall be provided
 - 2. Cover shall be equipped with a spring latch with interior and exterior turn handles
 - 3. Roof hatch shall be equipped with interior and exterior padlock hasps.
 - 4. The latch strike shall be a stamped component bolted to the curb assembly.
 - 5. Cover shall automatically lock in the open position with a rigid hold open arm equipped with a 1" (25mm) diameter red vinyl grip handle to permit easy release for closing.
 - 6. Compression spring tubes shall be an anti-corrosive composite material and all other hardware shall be zinc plated and chromate sealed. For installation in highly corrosive environments or when prolonged exposure to hot water or steam is anticipated, specify Type 316 stainless steel hardware.
 - 7. Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.
 - 8. Refer to Security and Technology Sections for monitoring.
- I. Finishes: Factory finish shall be mill finish aluminum.

2.3 SAFETY RAIL

- A. General: Furnish and install where indicated on plans, hatch rail system sized to fit roof hatch. The hatch rail system shall be field assembled and installed per the manufacturer's instructions.
- B. Performance characteristics:
 - 1. High visibility safety yellow powder coat paint finish.
 - 2. Hatch rail system shall attach to the capflashing of the roof hatch and shall not penetrate any roofing material.
 - 3. Hatch rail system shall satisfy the requirements of OSHA 29 CFR 1910.29 and shall meet OSHA strength requirements with a factor of safety of two.
 - 4. Corrosion resistant construction with a five-year warranty.
 - 5. Hinged gate shall ensure continuous barrier around the roof hatch.
 - 6. Self-closing gate hinge and positive latching system provided with hatch rail system.
- C. Posts and Rails: 1-1/4" (32mm) 6061 T6 schedule 40 aluminum pipe
- D. Hardware: Mounting brackets shall be 3/8" (9mm) thick extruded aluminum. Pivoting post guides with compression fittings and latching mechanism shall be cast aluminum. Self-closing hinges and all fasteners shall be type 316 stainless steel.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and openings for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install products in strict accordance with manufacturer's instructions and approved submittals. Locate units level, plumb, and in proper alignment with adjacent work.
 - 1. Test units for proper function and adjust until proper operation is achieved.
 - 2. Repair finishes damaged during installation.
 - 3. Restore finishes so no evidence remains of corrective work.

3.3 ADJUSTING AND CLEANING

- A. Clean exposed surfaces using methods acceptable to the manufacturer which will not damage finish.

END OF SECTION

SECTION 079100 - PREFORMED JOINT SEALS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes preformed, foam joint seals.

1.2 ACTION SUBMITTALS

- A. Product Data: For each preformed joint seal product.
- B. Samples for Verification: For each type and color of preformed joint seal required.

1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Sample warranties.

1.4 WARRANTY

- A. Special Manufacturer's Warranty: Manufacturer agrees to furnish preformed joint seals to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PREFORMED, FOAM JOINT SEALS

- A. Preformed, Foam Joint Seals: Manufacturer's standard joint seal manufactured from urethane or EVA (ethylene vinyl acetate) foam with minimum density of 10 lb/cu. ft. and impregnated with a nondrying, water-repellent agent. Factory produce in precompressed sizes in roll or stick form to fit joint widths based on design criteria indicated, with factory- or field-applied adhesive for bonding to substrates.
 - 1. Manufacturers:
 - a. EMSEAL Joint Systems Ltd.
 - b. PECORA Corp.
 - c. Architect's approved equal.
 - 2. Design Criteria:
 - a. Nominal Joint Width: As indicated on Drawings.
 - b. Minimum Joint Width: As indicated on Drawings.
 - c. Maximum Joint Width: As indicated on Drawings.
 - 3. Joint Seal Color: As selected by Architect from full range of industry colors.

2.2 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by preformed-joint-seal manufacturer for joint substrates indicated.

- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to preformed joint seal manufacturer, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces and formulated to promote best adhesion to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with preformed joint seals and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing preformed joint seals to comply with preformed joint seal manufacturer's written instructions and the following requirements:
 - 1. Remove laitance and form-release agents from concrete.
 - 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion.
- B. Joint Priming: Prime joint substrates where recommended by preformed joint seal manufacturer or as indicated by tests or prior experience.
- C. Masking Tape: Use masking tape where required to prevent contact of adhesive or primer with adjoining surfaces.

3.2 INSTALLATION

- A. General: Comply with preformed joint seal manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
- B. Installation of Preformed, Foam Joint Seals:
 - 1. Install each length of seal immediately after removing protective wrapping.
 - 2. Firmly secure compressed joint seals to joint gap side to obtain full bond using exposed pressure-sensitive adhesive or field-applied adhesive as recommended by manufacturer.
 - 3. Do not pull or stretch material. Produce seal continuity at splices, ends, turns, and intersections of joints.
 - 4. For applications at low ambient temperatures, heat foam joint seal material in compliance with manufacturer's written instructions.

END OF SECTION 079100

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Silicone joint sealants.
 - 2. Nonstaining silicone joint sealants.
 - 3. Polyurethane joint sealants.
 - 4. Latex joint sealants.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.7 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 - 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 - 2. Disintegration of joint substrates from causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
 - 1. MAPEI – Mapesil T.
 - 2. Laticrete International – Latisil.
 - 3. Dow Corning 790 or 795.
- B. Silicone, S, NS, 25, T, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Uses T and NT.
 - 1. MAPEI – Mapesil T

2. Laticrete International - Latisil

2.3 NONSTAINING SILICONE JOINT SEALANTS

- A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.

2.4 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 25, T, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Uses T and NT.

2.5 POLYURETHANE JOINT SEALANTS

- A. Mapeflex PU 40 or approved equal.

2.6 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.

2.7 LATEX JOINT SEALANTS

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

2.8 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) Type O (open-cell material) Type B (bicellular material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Polyurethane Sealant Backing: Closed cell expended polyurethane flexible cord – Mapefoam or Architect's approved equal.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.9 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - d. Exterior insulation and finish systems.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
 - 4. Provide flush joint profile at locations indicated on Drawings according to Figure 8B in ASTM C 1193.
 - 5. Provide recessed joint configuration of recess depth and at locations indicated on Drawings according to Figure 8C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
 - 1. Extent of Testing: Test the completed and cured sealant joints as follows:
 - a. Perform 10 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
 - b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.
 - 2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

- a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 3. Inspect tested joints and report on the following:
 - a. Whether sealants filled joint cavities and are free of voids.
 - b. Whether sealant dimensions and configurations comply with specified requirements.
 - c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
 4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
 5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOOR FRAMES (FOR WOOD DOORS)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:
 - 1. Interior standard steel door frames.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include the following:
 - 1. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
- C. Product Schedule: For hollow-metal door frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Dean Steel Manufacturing
- B. Ceco Corp.
- C. Architect's approved equal.

2.2 INTERIOR STANDARD STEEL DOOR FRAMES

- A. Construct hollow-metal door frames to comply with standards indicated for materials, fabrication, hardware locations, tolerances, and clearances, and as specified.
- B. Standard-Duty Door Frames: SDI A250.8, Level 1;
 - 1. Frames:
 - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.042 inch.
 - b. Sidelite Frames: Fabricated from same thickness material as adjacent door frame.
 - c. Construction: Full profile welded.

2.3 BORROWED LITES

- A. Fabricate of metallic-coated steel sheet, minimum thickness of 0.042 inch.
- B. Construction: Full profile welded.
- C. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

2.4 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
 - 2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.
- B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.
- C. Material: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

2.5 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.

2.6 FABRICATION

- A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections.
 - 1. Sidelite Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding.
 - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

2.7 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

- B. Drill and tap door frames to receive non-templated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION

- A. Hollow-Metal Frames: Comply with SDI A250.11.
 - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.
 - a. Install frames with removable stops located on secure side of opening.
 - 2. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

3.3 FIELD QUALITY CONTROL

- A. Inspection Agency: Owner may engage a qualified inspector to perform inspections and to furnish reports to Architect.
- B. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
- C. Reinspect repaired or replaced installations to determine if replaced door assembly installations comply with specified requirements.

3.4 CLEANING AND TOUCHUP

- A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- B. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113

SECTION 081210 - INTERIOR ALUMINUM OFFICE FRONTS

PART 1 GENERAL

1.1 SUMMARY

- A. Related Documents:
 - 1. Provisions established within the General and Supplementary Conditions of the Contract, Division 01 - General Requirements, and the Drawings are collectively applicable to this Section.
- B. Section Includes:
 - 1. Aluminum Office Front framing system for interior use.
 - 2. Set of sliding glass doors (Type E).
 - 3. Aluminum stile and rail doors (Type B).
- C. Related Sections:
 - 1. Section 088000 - Glazing.
 - 2. Section 081416 – Flush Wood Doors.
 - 3. Section 087100 - Finish Hardware.

1.2 SUBMITTALS

- A. Product Data: Submit for Office Front frames.
 - 1. Include information for factory finish, glazing gaskets, accessories and other required components.
- B. Shop Drawings: Submit schedule indicating opening identification number, frame types, dimensions, and label. Use same reference numbers for openings as Contract Drawings.
- C. Include elevations and details indicating frame types, profiles, conditions at openings, methods and locations of anchoring, glazing requirements, details of connections to special construction and other custom features.
- D. Samples: Submit following:
 - 1. Samples indicating quality of finish used for Work.
- E. Informational Submittals: Submit manufacturer's instructions.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver frames and doors in cartons to provide protection during transit and storage at project site.
- B. Inspect frames and doors upon delivery for damage.
 - 1. Repair minor damage to pre-finished products by means as recommended by manufacturer
 - 2. Replace frames and doors that cannot be satisfactorily repaired.
- C. Store frames and doors at project site and as near as possible to final installation location.

1.4 ENVIRONMENTAL REQUIREMENTS

- A. Do not begin installation of frames until area of work has been completely enclosed and interior is protected from the elements.
- B. Maintain temperature and humidity in areas of installation within reasonable limits, as close

as possible to final occupancy. If necessary, provide temperature control and ventilation to maintain required environmental conditions.

1.5 WARRANTY

- A. Warrant against defects in manufacturing of materials for a period of 2 years from date of substantial completion.
- B. Warrant framing finish against defects, including cracking, flaking, blistering, peeling, and excessive fading, chalking and non-uniformity in color for a period of 5 years.
- C. Warrant aluminum and glass doors for life of door against corner construction failure, causing wracking of door beyond acceptable tolerances.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS AND PRODUCTS

- A. Manufacturers:
 - 1. Meet or exceed standards of manufacture, appearance, performance, function, and design, of RACO Interior Products, Inc., Houston, TX; tel: 713-882-6100
 - 2. Substitutions: architect's approved equal.
- B. Acceptable Products:
 - 1. Interior Office Front Framing: RACO Classic as indicated on Drawings;
 - a. Provide non fire rated with adjustable bottom rails for field adjustment.]
 - b. Provide with custom horizontal and vertical mullion pattern as indicated on Drawings

2.2 MATERIALS

- A. Aluminum: Meeting requirements of ASTM B221, 6063T5 alloy, and as otherwise required to assure compliance with dimensional tolerances and maintain color uniformity. Billets shall be composed of at least 33% recycled aluminum.
- B. Anchorage Devices, Clips and Fasteners: Manufacturer's standard type, compatible with materials being secured.
- C. Accessories: As necessary for complete system.

2.3 FINISHES

- A. Factory finish extruded frame and door components so that all parts exposed to view upon completion of installation are uniform in finish and color. Exposed surfaces shall be free of scratches and other serious blemishes.
- B. Clear Anodized: AA-M12C22A21, etched, medium matte, clear anodic coating.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine project conditions and verify that project is ready for work of this section to proceed.

3.2 INSTALLATION

- A. Comply with frame manufacturer's printed installation instructions and approved shop drawings. Do not attempt installation in areas where wall thickness exceeds tolerances of specified throat size.
- B. Install frames plumb and square, free from warp or twist, securely anchored to substrates with fasteners recommended by frame manufacturer. Maintain dimensional tolerances and alignment with adjacent work. Ensure joints are hairline tight and surfaces flush with adjacent components.
- C. Set all doors in correct locations as shown on the drawings, level, square, plumb and in alignment with other work in accordance with the manufacturer's installation instructions and approved shop drawings.
- D. Install glass in accordance with Section 08800.

3.3 ADJUSTING AND CLEANING

- A. Protect exposed portions of aluminum surfaces from damage by plaster, lime, acid, cement, and other contaminants.
- B. Touch up marred areas so that touch-up is not visible from a distance of 4 feet. Remove and replace frames that cannot be satisfactorily adjusted.

3.4 PROTECTION

- A. Protect as required to assure that frames will be without damage until Substantial Completion.

END OF SECTION

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Solid-core doors with wood-veneer faces. (Door Type A)
 - 2. Factory finishing flush wood doors.
 - 3. Factory fitting flush wood doors to frames.
 - 4. Wood doors with glass lites (Door Type C).
 - 5. Fire rated wood doors.
- B. Related Requirements specified elsewhere:
 - 1. Section 088000 "Glazing" for glass view panels in flush wood doors.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of door. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:
 - 1. Dimensions and locations of blocking.
 - 2. Dimensions and locations of mortises and holes for hardware.
 - 3. Dimensions and locations of cutouts.
 - 4. Undercuts.
 - 5. Requirements for veneer matching.
 - 6. Doors to be factory finished and finish requirements.
 - 7. Fire-protection ratings for fire-rated doors.
- C. Samples for Verification:
 - 1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.
 - 2. Corner sections of doors, approximately 8 by 10 inches, with door faces and edges representing actual materials to be used.
 - a. Provide Samples for each species of veneer and solid lumber required.
 - b. Finish veneer-faced door Samples with same materials proposed for factory-finished doors.
 - 3. Frames for light openings, 6 inches long, for each material, type, and finish required.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For special warranty.
- B. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting.
- C. Mark each door on bottom rail with opening number used on Shop Drawings.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during remainder of construction period.

1.8 WARRANTY

- A. A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
 - b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
 - 2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 - 3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS (Refer to Section 019000 "Finish Legend")

- A. Flush Wood Doors Manufacturers: Subject to compliance with requirements, manufacturers offering acceptable doors include, but are not limited to, the following:
 - 1. VT Industries
 - 2. Graham, Inc.
 - 3. Buell Door Company
 - 4. Marshfield Door Systems, Inc. (Weyerhaeuser Company)

2.2 FLUSH WOOD DOORS, GENERAL

- A. Quality Standard: In addition to requirements specified, comply with AWI's, "Architectural Woodwork Standards."
 - 1. Provide AWI Quality Certification Labels indicating that doors comply with requirements of grades specified.

2. Contract Documents contain selections chosen from options in quality standard and additional requirements beyond those of quality standard. Comply with those selections and requirements in addition to quality standard.
- B. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252.
1. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
 2. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
 3. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
- C. Particleboard-Core Doors:
1. Particleboard: ANSI A208.1, Grade LD-2.
 2. Provide doors with glued-wood-stave cores instead of particleboard cores for doors indicated to receive exit devices.

2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH

- A. Interior Solid-Core Doors AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" requires Grade AA faces for Premium-grade doors; WDMA I.S.1-A requires Grade A faces for Premium-grade doors. Both standards require Grade A faces for Custom-grade doors unless Grade B is specified. See Evaluations.
1. Grade: Premium, with Grade A faces.
 2. Species: select white oak.
 3. Cut: rift cut.
 4. Match between Veneer Leaves: Book match.
 5. Room Match: Provide door faces of compatible color and grain within each separate room or area of building.
 6. Exposed Vertical and Top Edges: Same species as faces - edge Type A.
 7. Core: Particleboard.
 8. Construction: Five or seven plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering. Faces are bonded to core using a hot press.
 9. WDMA I.S.1-A Performance Grade: Heavy Duty.

2.4 LIGHT FRAMES

- A. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads unless otherwise indicated.
1. Wood Species: Same species as door faces.
 2. Profile: Flush rectangular beads.
 3. At wood core doors with 20-minute fire protection ratings, provide wood beads and metal glazing clips approved for such use.
- B. Wood-Veneered Beads for Light Openings in Fire-Rated Doors: Manufacturer's standard wood-veneered noncombustible beads matching veneer species of door faces and approved for use in doors of fire-protection rating indicated. Include concealed metal glazing clips where required for opening size and fire-protection rating indicated.

2.5 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
1. Comply with NFPA 80 requirements for fire-rated doors.

- B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.
- C. Openings: Factory cut and trim openings through doors.
 - 1. Light Openings: Trim openings with moldings of material to match door and profile indicated.
 - 2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 "Glazing."

2.6 FACTORY FINISHING

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.
- B. Factory finish doors that are indicated to receive transparent finish.
- C. Transparent Finish:
 - 1. Grade: Premium.
 - 2. Finish: WDMA TR-4 conversion varnish
 - 3. Staining: Match Architect's sample.
 - 4. Effect: Filled finish.
 - 5. Sheen: Matte.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
 - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Section 087100 "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
 - 1. Install fire-rated doors according to NFPA 80.
- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - 1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold unless otherwise indicated.
 - a. Comply with NFPA 80 for fire-rated doors.

- b. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
- 2. Bevel fire-rated doors 1/8 inch in 2 inches at lock edge; trim stiles and rails only to extent permitted by labeling agency.
- D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081416

SECTION 083113 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes access doors and frames for walls and ceilings.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, fire ratings, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Samples: For each type of access door and frame and for each finish specified, complete assembly minimum 6 by 6 inches in size.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing and inspecting agency.
 - 1. Fire-Rated Door Inspector: Submit documentation of compliance with NFPA 80, section 5.2.3.1.

1.5 CLOSEOUT SUBMITTALS

- A. Record Documents: For fire-rated doors, list of applicable room name and number in which access door is located.

1.6 QUALITY ASSURANCE

- A. Fire-Rated Door Inspector Qualifications: Inspector for field quality control inspections of fire-rated door assemblies shall meet the qualifications set forth in NFPA 80, section 5.2.3.1 and the following:
 - 1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Access Doors and Frames: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection and temperature-rise limit ratings indicated, according to NFPA 252 or UL 10B.

2.2 FIRE-RATED ACCESS DOORS AND FRAMES

- A. Fire-Rated, Flush Access Doors with Concealed Flanges:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Acudor Products, Inc.
 - b. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - c. Nystrom, Inc.
 - 2. Description: Door face flush with frame, with a core of mineral-fiber insulation enclosed in sheet metal; with concealed flange for gypsum board installation, self-closing door, and concealed hinge.
 - 3. Locations: Wall.
 - 4. Door Size: As indicated.
 - 5. Fire-Resistance Rating: Not less than that of adjacent construction.
 - 6. Uncoated Steel Sheet for Door: Nominal 0.036 inch, 20 gage, factory primed.
 - 7. Frame Material: Same material, thickness, and finish as door.
 - 8. Latch and Lock: Self-closing, self-latching door hardware, operated by knurled-knob.

2.3 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A879/A879M, with cold-rolled steel sheet substrate complying with ASTM A1008/A1008M, Commercial Steel (CS), exposed.
- C. Frame Anchors: Same material as door face.
- D. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.

2.4 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.
 - 1. For concealed flanges with drywall bead, provide edge trim for gypsum panels securely attached to perimeter of frames.

2.5 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 - 1. Factory Primed: Apply manufacturer's standard, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

2. Paint in accordance with Section 09 90 00 Painting. Color to match adjacent wall.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.

3.3 FIELD QUALITY CONTROL

- A. Inspection Agency: Engage a qualified inspector to perform inspections and to furnish reports to Architect.
- B. Inspections:
 1. Fire-Rated Door Inspections: Inspect each fire-rated access door in accordance with NFPA 80, section 5.2.
- C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
- D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.
- E. Prepare and submit separate inspection report for each fire-rated access door indicating compliance with each item listed in NFPA 80 and NFPA 101.

3.4 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION 083113

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Exterior storefront framing.
 - 2. Exterior manual-swing entrance doors.
 - 3. Insulated spandrel panels.
- B. Related Requirements specified elsewhere:
 - 1. Section 088000 "Glass and Glazing."
 - 2. Section 079200 "Joint Sealants".
 - 3. Section 085680 "Sliding Service Window".

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For aluminum-framed entrances and storefronts aluminum doors and fixed glass windows. Include plans, elevations, sections, full-size details, and attachments to other work.
 - 1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
 - 2. Include full-size isometric details of each vertical-to-horizontal intersection of aluminum-framed entrances and storefronts, and fixed window frames, showing the following:
 - a. Joinery, including concealed welds.
 - b. Anchorage.
 - c. Expansion provisions.
 - d. Glazing.
 - e. Flashing and drainage.
 - 3. Show connection to and continuity with adjacent, and vapor barriers.
 - 4. Indicate attachment of sliding service window (Section 085680) and show in elevations and sections.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

- E. Fabrication Sample: Of each vertical-to-horizontal intersection of assemblies, made from 12-inch lengths of full-size components and showing details of the following:
 - 1. Joinery, including concealed welds.
 - 2. Anchorage.
 - 3. Expansion provisions.
 - 4. Glazing.
 - 5. Flashing and drainage.
- F. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.
- G. Delegated-Design Submittal: For aluminum-framed entrances doors indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer, licensed in Texas, responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
 - 1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.8 MOCKUPS

- A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockup of typical wall area as shown on Drawings.
 - 2. Testing shall be performed on mockups according to requirements in "Field Quality Control" Article.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 WARRANTY

- A. Special Warranty: Manufacturer & Installer agrees to repair or replace components of the aluminum-framed entrances and storefronts doors that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Noise or vibration created by wind and thermal and structural movements.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - d. Water penetration through fixed glazing and framing areas.
 - e. Failure of operating components.
 - 2. Warranty Period: Five years from date of Substantial Completion.
- B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - 2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer to design aluminum-framed entrances and storefronts.
- B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 - 1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 - 2. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.
 - e. Failure of operating units.
- C. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:
 - 1. Fixed Framing and Glass Area:
 - a. Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft. when tested in accordance with ASTM 283.
 - 2. Entrance Doors:
 - a. Pair of Doors: Maximum air leakage of 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft when tested in accordance with ASTM 283.
 - b. Single Doors: Maximum air leakage of 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft when tested in accordance with ASTM 283.
- D. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:
 - 1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.

- E. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 MANUFACTURERS

- A. Kawneer Company, Inc. (2" x 4 ½") 350/500 Healy Wall Entrance
- B. YKK AP America 500 HW Wide Stile Series

2.3 FRAMING

- A. Framing Members: Manufacturer's extruded aluminum framing members of thickness required and reinforced as required to support imposed loads.
 - 1. Construction: Thermally improved.
 - 2. Finish: Kynar 500 – metallic color as selected by Architect.
- B. Backer Plates: Manufacturer's standard, continuous backer plates for framing members.
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- D. Materials:
 - 1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - 2. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.

2.4 ENTRANCE DOOR SYSTEMS

- A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.
 - 1. Door Construction: 2-inch overall thickness, with minimum 0.125-inch- thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
 - 2. Door Design: Wide stile; 6 ½ inch bottom and 3 ½ inch vertical stiles.
 - 3. Glazing Stops and Gaskets: Square, snap-on, extruded-aluminum stops and preformed gaskets.
 - a. Provide nonremovable glazing stops on outside of door.

2.5 ENTRANCE DOOR HARDWARE

- A. General: Provide entrance door hardware for each entrance door to comply with requirements in this Section.
 - 1. Entrance Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products equivalent in function and comparable in quality to named products.
 - 2. Opening-Force Requirements:
 - a. Egress Doors: Comply with Texas Accessibility Standards.
- B. Pivot Hinges: BHMA A156.4, Grade 1.
 - 1. Offset-Pivot Hinges: Provide top, bottom, and intermediate offset pivots at each door leaf.

- C. Mortise Auxiliary Locks: BHMA A156.5, Grade 1.
- D. Manual Flush Bolts: BHMA A156.16, Grade 1.
- E. Panic Exit Devices: BHMA A156.3, Grade 1, listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.
- F. Cylinders: As specified in Section 087100 "Door Hardware."
 - 1. Keying: Master key system. Permanently inscribe each key with a visual key control number and include notation "DO NOT DUPLICATE".
- G. Strikes: Provide strike with black-plastic dust box for each latch or lock bolt; fabricated for aluminum framing.
- H. Closers: BHMA A156.4, Grade 1, with accessories required for a complete installation, sized as required by door size, exposure to weather, and anticipated frequency of use; adjustable to comply with field conditions and requirements for opening force.
- I. Surface-Mounted Holders: BHMA A156.16, Grade 1.
- J. Door Stops: BHMA A156.16, Grade 1, floor or wall mounted, as appropriate for door location indicated, with integral rubber bumper.
- K. Weather Stripping: Manufacturer's standard replaceable components.
 - 1. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.
- L. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.
- M. Silencers: BHMA A156.16, Grade 1.
- N. Thresholds: BHMA A156.21, raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch.

2.6 GLAZING

- A. Glazing: Comply with Section 088000 "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Insulated Glass Spandrel Panels: Mapespan by Mapes Industries, Inc. 1" thick with 1/4" glass, R27.9 insulated core and interior skin as selected by Architect.

2.7 ACCESSORIES

- A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 - 2. Reinforce members as required to receive fastener threads.
 - 3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.

- B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
 - 1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- C. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- D. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

2.8 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 4. Provisions for field replacement of glazing from interior for vision glass and exterior for spandrel glazing or metal panels.
 - 5. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
- F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
 - 1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
 - 2. At exterior doors, provide weather sweeps applied to door bottoms.
- G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
- H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.9 ALUMINUM FINISHES

- A. Fluoropolymer Coating Finish: Kynar 500, AAM 605.2.
 - 1. Metallic Color and gloss as selected by Architect from manufacturer's colors.
 - 2. Warranty: 20-years against peeling, blistering, flaking, cracking, chipping or checking.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General:
 - 1. Comply with manufacturer's written instructions.
 - 2. Do not install damaged components.
 - 3. Fit joints to produce hairline joints free of burrs and distortion.
 - 4. Rigidly secure nonmovement joints.
 - 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
 - 6. Seal perimeter and other joints watertight unless otherwise indicated.
- B. Metal Protection:
 - 1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
 - 2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Set continuous sill members and flashing in full sealant bed as specified in Section 079200 "Joint Sealants" to produce weathertight installation.
- D. Install components plumb and true in alignment with established lines and grades.
- E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.
- F. Install glazing as specified in Section 088000 "Glazing."
- G. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.
 - 1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.

3.3 ERECTION TOLERANCES

- A. Erection Tolerances: Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:
 - 1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
 - 2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections.
- B. Field Quality-Control Testing: Perform the following test on representative areas of aluminum-framed entrances doors and fixed glass windows.

1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 503 and shall not evidence water penetration.
 - a. Perform tests in each test area as directed by Architect. Perform at least three tests, prior to 35 and 70 percent completion.
 - b. Failed tests: Retests and two additional tests will be added per occurrence at Contractor's expense.
- C. Aluminum-framed entrances and storefronts and fixed glass windows will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

3.5 MAINTENANCE SERVICE

- A. Entrance Door Hardware:
 1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of entrance door hardware.
 2. Initial Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of entrance door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper entrance door hardware operation at rated speed and capacity. Use parts and supplies that are the same as those used in the manufacture and installation of original equipment.

END OF SECTION 084113

SECTION 084114 – ALUMINUM FIXED WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Kawneer Architectural Aluminum Storefront Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of storefront units.
 - 1. Types of Kawneer Aluminum Storefront Systems include:
 - a. Trifab™ 451UT Framing – 2" x 4-1/2" nominal dimension; Thermal; Center Plane, Screw Spline Fabrication.
- B. Related Sections:
 - 1. 079200 "Joint Sealants"
 - 2. 084113 "Aluminum-Framed Entrances and Storefronts"
 - 3. 088000 "Glazing"

1.3 DEFINITIONS

- A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).

1.4 PERFORMANCE REQUIREMENTS

- A. Storefront System Performance Requirements:
 - 1. Air Leakage: The test specimen shall be tested in accordance with ASTM E 283. Air Leakage rate shall not exceed 0.06 cfm/ft² at a static air pressure differential of 6.2 psf (300 Pa) with interior seal, or, rate shall not exceed 0.06 cfm/ft² at a static air pressure differential of 1.6 psf without interior seal. CSA A440 Fixed Rating.
 - 2. Water Resistance: The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a minimum static air pressure differential of 10 psf as defined in AAMA 501.
 - 3. Uniform Load: A static air design load of 30 psf shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.
 - 4. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures:
 - a. Temperature Change (Range): 0 deg F; 180 deg F.
 - b. Test Interior Ambient-Air Temperature: 75 deg F.
 - c. Test Performance: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5 for a minimum 3 cycles.
 - 5. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than: 0.32 (low-e).
 - 6. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than 68frame and 68glass (low-e).
 - 7. Sound Transmission Class (STC) and Outdoor-Indoor Transmission Class (OITC): When tested to AAMA Specification 1801 and in accordance with ASTM E1425 and ASTM E90, the STC and OITC Rating shall not be less than 37 (STC).

1.5 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, finishes, and installation instructions for each type of aluminum-framed storefront system indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, operational clearances and installation details.
- C. Samples for Verification: For aluminum-framed storefront system and components required.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type of aluminum-framed storefront.
- E. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed systems, made from 12" lengths of full-size components and showing details of the following:
 - 1. Joinery.
 - 2. Anchorage.
 - 3. Expansion provisions.
 - 4. Glazing.
 - 5. Flashing and drainage.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.
- B. Manufacturer Qualifications: A manufacturer capable of providing aluminum framed storefront system that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
- C. Source Limitations: Obtain aluminum-framed storefront system through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum-framed windows and are based on the specific system indicated.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockup for type(s) of storefront elevation(s) indicated, in location(s) shown on Drawings.
- F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of aluminum-framed window openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

1.8 WARRANTY

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.
 - 1. Warranty Period: Two (2) years from Date of Substantial Completion of the project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product:
 - 1. Kawneer Company Inc.
 - 2. Trifab™ 451UT Framing (Thermal)
 - 3. System Dimensions: 2" x 4-1/2".
 - 4. Glass: Center Plane
- B. Subject to compliance with requirements, provide a comparable product by the following:
 - 1. Manufacturer: YKK
 - 2. Profile dimension: 2" x 4- 1/2".

2.2 MATERIALS

- A. Aluminum Extrusions: Alloy and temper recommended by aluminum storefront manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.
- B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.
- C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or zinc-coated steel complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- E. Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
- F. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.

2.3 STOREFRONT FRAMING SYSTEM

- A. Thermal Barrier (Trifab™ 451UT):
 - 1. Kawneer DUAL IsoLock™ Thermal Break with two (2) 1/4" separations consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections.
 - a. Thermal Break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.
- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposes shall be stainless steel.
- D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- E. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

- F. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.

2.4 GLAZING SYSTEMS

- A. Glazing: As specified in Division 08 Section "Glazing".
- B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
- D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.

2.5 ENTRANCE DOOR SYSTEMS

- A. Entrance Doors: As specified in Division 084113 Section "Aluminum-Framed Entrances and Storefronts".

2.6 ACCESSORY MATERIALS

- A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 07 Section "Joint Sealants".

2.7 FABRICATION

- A. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fit joints; make joints flush, hairline and weatherproof.
 - 3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.
 - 5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 6. Provisions for field replacement of glazing.
 - 7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- B. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- C. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Factory Finishing:
 - 1. Manufacturer Kynar 500; 2 coats;
 - a. color: metallic as selected by Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight aluminum-framed storefront installation.
 - 1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
 - 2. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing aluminum-framed storefront system, accessories, and other components.
- B. Install aluminum-framed windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill members in bed of sealant, as indicated, for weather tight construction.
- D. Install aluminum-framed windows system and components to drain condensation, water penetrating joints, and moisture migrating within aluminum-framed window to the exterior.
- E. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 FIELD QUALITY CONTROL

- A. Field Tests: Architect shall select window units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present. Tests not meeting specified performance requirements and units having deficiencies shall be corrected as part of the contract amount.
 - 1. Testing: Testing shall be performed by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements. Testing Standard per AAMA 503, including reference to ASTM E 783 for Air Infiltration Test and ASTM E 1105 Water Infiltration Test.
 - a. Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft², whichever is greater.
 - b. Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 6.2 psf.
- B. Manufacturer's Field Services: Upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

3.4 ADJUSTING, CLEANING, AND PROTECTION

- A. Clean aluminum surfaces immediately after installing aluminum framed storefronts. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

ALUMINUM FIXED WINDOWS 084114 - 6
UTRGV SOM TBL CENTER
100% CD

- B. Clean glass immediately after installation. Comply with glass manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 084113

SECTION 085680 - SLIDING SERVICE WINDOW

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes aluminum, heavy-duty commercial sliding service windows as indicated in drawings and in sections.
- B. Related Requirements:
 - 1. Section 084113 "Aluminum-Framed Entrances and Storefronts", for incorporation of service window into storefront.
 - 2. Section 088000 "Glazing", for glass requirements applicable to work of this Section.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for sliding service window.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Detail fabrication and assembly of sliding service window.
- C. Samples: For each type of exposed finish.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Sliding service window and counter, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Aluminum Framed Entrances and Storefronts.
- B. Qualification Data: For Installer.
- C. Product Test Reports: For tests performed by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sliding service window to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
 - 1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.8 WARRANTY

- A. Special Warranty: Manufacturer & Installer agrees to repair or replace components of the aluminum-framed entrances and storefronts doors that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Noise or vibration created by wind and thermal and structural movements.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - d. Water penetration through fixed glazing and framing areas.
 - e. Failure of operating components.
 - 2. Warranty Period: Five years from date of Substantial Completion.
- B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - 2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Provide products by the following manufacturer or submit product comparable in characteristics and described components for approval:
 - 1. (DW) series, sliding service window manufactured by C.R. Laurence Co., Inc.

2.2 ASSEMBLY DESCRIPTION

- A. Manually-operated, heavy duty (100 to 200 openings per day), sliding service window with shelf.
- B. Provide top-hung sliding panel with recessed vinyl bottom track.
- C. Hardware: Self-latching handle. Keyed lock cylinder. Polyester-pile weatherstripping.

2.3 PERFORMANCE REQUIREMENTS

- A. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 - 1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 - 2. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.
 - e. Failure of operating units.
- B. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:
 - 1. Sliding Windows:
 - a. Single Windows: Maximum air leakage of 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft when tested in accordance with ASTM 283.
- C. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:
 - 1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.
- D. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.4 MATERIALS

- A. Frames: 4" Aluminum frame modules shall be constructed of 6063-T5 extruded aluminum. Replacement and servicing of glass shall be from the clerk side of the window by means of an access panel in the top header and does not require the removal of the frame from the opening. Window glides on top-hung heavy-duty ball bearing slides. Poly-pile weather stripping and self-latching handle. Overall frame sizes are to be in accordance with the contract drawings.
- B. Glazing: The glazing is 1/2" in thickness. Clear tempered, insulating glass.
- C. Counter: Stainless steel shelf, keyed lock, full bottom track, and burglar bar.
- D. Color: Match Storefront.

2.5 FABRICATION

- A. Shop Assembly: Assemble sliding service window in the shop to the fullest extent possible for installation into storefront system.

2.6 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General:
 - 1. Comply with manufacturer's written instructions.
 - 2. Do not install damaged components.
 - 3. Fit joints to produce hairline joints free of burrs and distortion.
 - 4. Rigidly secure nonmovement joints.
 - 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
 - 6. Seal perimeter and other joints watertight unless otherwise indicated.
- B. Metal Protection:
 - 1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
 - 2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Set continuous sill members and flashing in full sealant bed as specified in Section 079200 "Joint Sealants" to produce weathertight installation.
- D. Install components plumb and true in alignment with established lines and grades.
- E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.
- F. Install glazing as specified in Section 088000 "Glazing."
- G. Sliding service windows: Install windows to produce smooth operation and tight fit at contact points.
 - 1. Install to produce weathertight enclosure and tight fit at weather stripping.

3.3 ERECTION TOLERANCES

- A. Erection Tolerances: Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:
 - 1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
 - 2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections.
- B. Field Quality-Control Testing: Perform the following test on representative areas of aluminum-framed entrances doors and fixed glass windows.

1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 503 and shall not evidence water penetration.
 - a. Perform tests in each test area as directed by Architect. Perform at least three tests, prior to 35 and 70 percent completion.
 - b. Failed tests: Retests and two additional tests will be added per occurrence at Contractor's expense.
- C. Sliding service windows and fixed glass windows will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

3.5 MAINTENANCE SERVICE

- A. Service Window Hardware:
 1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of entrance door hardware.
 2. Initial Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of entrance door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper sliding window hardware operation at rated speed and capacity. Use parts and supplies that are the same as those used in the manufacture and installation of original equipment.

END OF SECTION 085680

SECTION 08 71 00 FINISH HARDWARE

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Work under this section comprises of furnishing hardware specified herein and noted on drawings for a complete and operational system, including any electrified hardware components, systems, controls and hardware for aluminum entrance doors. Any door shown on the drawing and not specifically referenced in the hardware sets shall be provided with identical hardware as specified on other similar openings and shall be included in the General Contractor's base bid. All fire rated door shall be provided with fire rated hardware as required by local code Authority as part of the General Contractor's base bid. The hardware supplier shall verify all cylinder types specified for locking devices supplied as part of the door system with the door manufacturer and/or door supplies.
- B. The General Contractor shall notify the Architect in writing of any discrepancies (five (5) days prior to bid date) that could and/or would result in hardware being supplied that is none functional, hardware specified and/or hardware that has not been specified that will result in any code violations and any door that is not specifically covered in this specification. Failure of the General Contractor to address any such issue could be considered acceptance of the hardware specified and all discrepancies could be corrected at the General Contractor's expense.
- C. Items include but are not limited to the following:
 - 1. Hinges - Pivots
 - 2. Flush Bolts
 - 3. Exit Devices
 - 4. Locksets and Cylinders
 - 5. Push Plates - Pulls
 - 6. Coordinators
 - 7. Closers
 - 8. Kick, Mop and Protection Plates
 - 9. Stops, Wall Bumpers, Overhead Controls
 - 10. Electrified Hold Open Devices
 - 11. Thresholds, Seals and Door Bottoms
 - 12. Silencers
 - 13. Miscellaneous Trim and Accessories

1.02 RELATED DOCUMENTS, drawings and general provisions of contract, including General and Supplementary Conditions, and Division 1 Specification sections, apply to this section.

1.03 RELATED WORK specified elsewhere that should be examined for its effect upon this section:

- A. Section 06 20 00 - Finish Carpentry
- B. Section 08 11 13 – Steel Doors and Frames
- C. Section 08 14 16 – Flush Wood Doors
- D. Sections within 08 31 13 – Access Doors
- E. Section within 08 41 13 – Aluminum Entrances, Storefront and Window Framing
- F. Sections within 08 80 00 – Glass and Glazing
- G. Sections within 09 91 00 - Painting
- H. Division 26 – Electrical
- I. Division 28 – Access Control

1.04 REFERENCES SPECIFIED in this section subject to compliance as directed:

- A. NFPA-80 - Standard for Fire Doors and Windows

- B. NFPA-101 - Life Safety Code
- C. ADA - The Americans with Disabilities Act - Title III - Public Accommodations
- D. ANSI-A 117.1 - American National Standards Institute - Accessible and Usable Buildings and Facilities
- E. ANSI-A 156.5 - American National Standards institute -Auxiliary Locks and Associated Products
- F. UFAS - Uniform Federal Accessibility Standards
- G. UL - Underwriter's Laboratories
- H. WHI - Warnock Hersey International, Testing Services
- I. State and Local Codes including Authority Having Jurisdiction
- J. UL10C – Positive Pressure
- K. IBC-2015 – International Building Code
- L. NFPA-70 – International Electrical Code

1.05 SUBMITTALS

- A. HARDWARE SCHEDULES submit copies of schedule in accordance with Division 1, General Requirements. Schedule to be in vertical format, listing each door opening, including: handing of opening, all hardware scheduled for opening or otherwise required to allow for proper function of door opening as intended, and finish of hardware. At doors with door closers or door controls include degree of door opening. Supply the schedules all Finish Hardware within two (2) weeks from date purchase order is received by the hardware supplier.
- B. Submit manufacturer's cut/catalog sheets on all hardware items and any required special mounting instructions with the hardware schedule.
- C. Certification of Compliance:
 - 1. Submit any information necessary to indicate compliance to these specifications as required.
 - 2. Submit a statement from the manufacturer that electronic hardware and systems being supplied comply with the operational descriptions exactly as specified.
- D. Submit any samples necessary as required by the Architect.
- E. Templates for finish hardware items to be sent to related door and frame suppliers within three (3) working days of receipt of approved hardware schedule.
- F. Doors and Frames used in positive pressure opening assemblies shall meet UL10C in areas where this specification includes Seals for smoke door.

1.06 QUALITY ASSURANCE

- A. Hardware supplier to be a qualified, Factory Authorized, direct distributor of the products to be furnished. In addition, the supplier to have in their regular employment an A.H.C. or person of equivalent experience who will be made available at reasonable times to consult with the Architect/Contractor and/or University of Texas Rio Grande Valley regarding any matters affecting the finish hardware on this project.
- B. All hardware used in labeled fire or smoke rated openings to be listed for those types of openings and bear the identifying label or mark indicating UL. (Underwriter's Laboratories) approved for fire. Exit devices in non-labeled openings to be listed for panic.

1.07 DELIVERY, HANDLING AND PACKAGING

- A. Furnish all hardware with each unit clearly marked and numbered in accordance with the hardware schedule. Include door and item number for each.

- B. Pack each item of hardware completes with all necessary parts and fasteners.
- C. Properly wrap and cushion each item to prevent scratches and dents during delivery and storage.

1.08 SEQUENCING AND SCHEDULING

Any part of the finish hardware required by the frame or door manufacturers or other suppliers that is needed to produce doors or frames is to be sent to those suppliers in a timely manner, so as not to interrupt job progress.

1.09 WARRANTY

All finish hardware shall be supplied with a Two- (2) year warranty against defects in materials and workmanship, commencing with substantial completion of the project except as follows:

1. All Closers shall have a thirty- (30) year written warranty
2. All Exit Devices shall have a three- (3) year written warranty
3. All "ND" Locksets shall have a ten- (10) year written warranty
4. All "L9000" Locksets shall have a three- (3) year written warranty
5. All Continuous are to have a ten- (10) year written warranty

PART 2 – PRODUCTS

2.01 FASTENERS

- A. Furnish with finish hardware all necessary screws, bolts and other fasteners of suitable size and type to anchor the hardware in position for a long life under hard use.
- B. Furnish fastenings where necessary with expansion shields, toggle bolts and other anchors designated by the Architect according to the material to which the hardware is to be applied and the recommendations of the hardware manufacturer. All closers and exit devices on labeled wood doors shall be through-bolted if required by the door manufacturer. All thresholds shall be fastened with wood screws and plastic anchors. Where specified in the hardware sets, security type fasteners of the type called for are to be supplied.
- C. Design of all fastenings shall harmonize with the hardware as to material and finish.
- D. All hardware shall be installed with the Manufacturers standard screws as provided. Use of any type of fasteners shall not be permitted.

2.02 ENVIRONMENTAL CONCERN FOR PACKAGING

Hardware shipped to the project job site shall be packaged in biodegradable packs such as paper or cardboard boxes and wrapping.

2.03 HINGES

- A. All hinges to be of one manufacturer as hereafter listed for continuity and consideration of warranty. Provide one of the following manufacturers Ives, Hager or Stanley.
- B. Unless otherwise specified provide five-knuckle, heavy-duty, button tip, full mortise template type hinges with non-rising loose pins. Provide non-removable pins for out swinging doors at secured areas or as called for in this specification.
- C. Exterior Door Hinges

Provide out-swinging door hinges of solid bronze, steel or stainless steel with non-removable pins or security studs as called for in the hardware sets.

D. Interior Door Hinges

Wrought steel, polished and plated to match specified finish. Furnish three (3) hinges up to 90 inches high and one (1) additional hinge for every 30 inches or fraction thereof.

E. Provide size 4½" x 4½" for all 1¾" thick doors up to and including 36 inches wide. Doors over 1¾" through 2¼" thick, use 5" x 5" hinges. Doors over 36 inches use 5" x 4½" unless otherwise noted in the hardware sets.

F. Were required to clear the trim and/or to permit the doors to swing 180 degrees furnish hinges of sufficient throw.

G. Provide heavy weight hinges on all doors over 36 inches in width.

H. At labeled door's steel or stainless steel, bearing-type hinges shall be provided. For all doors equipped with closers provide bearing-type hinges.

I. Finishes

1. At wood doors, hinges are to be plated to match adjacent hardware or as called for in Hardware Sets.
2. At hollow metal doors, hinges are to be brass, bronze or stainless steel at exterior out-swinging doors, unless otherwise specified in Hardware Sets.

J. Continuous hinges shall be Ives and ABH as specified or equal products manufactured by Select Products.

2.04 LOCK AND LOCK TRIM

A. All the locksets, latch sets, and trim to be of one manufacturer as hereafter listed for continuity of design and consideration of warranty. Locksets specified are Schlage "ND" and "L9000" (required for one motion egress) series with the Rhodes lever (No Substitutions).

B. Provide metal wrought box strike boxes and curved lip strikes with proper lip length to protect trim of the frame, but not to project more than 1/8 inch beyond frame trim or the inactive leaf of a pair of doors.

C. Mechanical Locks shall meet ANSI Operational Grade 1, Series 1000 (required for one motion egress) & 4000 as specified.

1. Hand of lock is to be field reversible or non-handed.
2. All lever trim is to be through-bolted through the door.
3. Provide ¾" latch bolt projection 14-042 at all pairs of doors specified with locks.

2.05 CYLINDERS AND KEYING

A. Provide locks and Exit devices requiring cylinders with Schlage Primus Level 4 Quad key System and comply with performance requirements of ANSI A156.5. All keys shall be of nickel silver material only. All locks are to be keyed to the Existing Schlage Primus (Level 4 Quad) master key system as directed by the University of Texas Rio Grande Valley and the Architect. The hardware supplier and contractor shall meet with UTRGV on site to obtain permanent keying requirements and complete all required paper work.

B. Furnish all locks with temporary cylinders and all Mortise and/or Rim cylinders with temporary FSIC construction cores to the general contractor. Ship all permanent cylinders to UTRGV.

C. Permanent cylinders shall be keyed as directed by the UTRGV and the Architect. Provide four- (4) keys per cylinder, two- (2) master keys per master used. Note that permanent

keys shall be cut keys and some blank keys (Verify Qty. of each with UTRGV). All permanent keys shall be shipped directly from Schlage to the University of Texas Rio Grande Valley. Edinburg. All Primus Cores and Cylinders shall be installed by UTRGV Lock Shop.

- D. Stamp all keys "Do not duplicate" as directed by the University of Texas Rio Grande Valley and Architect.

2.06 EXIT DEVICES

- A. All exit devices and trim, including electrified items, to be of one manufacturer as hereafter listed and in the hardware sets for continuity of design and consideration of warranty; electrified devices and trim to be the same series and design as mechanical devices and trim.
- B. Exit Devices to be "UL" listed for life safety. All exit devices for labeled doors shall have "UL" label for "Fire Exit Hardware". All devices mounted on labeled wood doors are to be through-bolted or per the manufacturer's listing requirements. All devices shall conform to NFPA 80 and NFPA 101 requirements.
- C. All exit devices to be of a heavy duty, chassis mounted design, with one-piece removable covers, eliminating necessity of removing the device from the door for standard maintenance and keying requirements.
- D. All trims to be through-bolted to the lock stile case. Lever design to be the same as specified with the lock sets.
- E. Exit Devices to be the modern push rail design.
- F. All devices shall carry a three- (3) year warranty against manufacturing defects and workmanship.
- G. Exit Devices shall be Von Duprin 99 series (No Substitutions).

2.07 SURFACE MOUNTED DOOR CLOSERS AND AUTOMATIC OPERATORS

- A. All closers for this project shall be the products of a single manufacturer for continuity of design and consideration of warranty. All door closers shall be mounted as to achieve the maximum degree of opening (trim permitting).
- B. All closers to be heavy duty, surface-mounted, fully hydraulic, rack and pinion action with high strength cast iron cylinder to provide control throughout the entire door opening cycle. All closers shall have been tested and passed a ten million-cycle test.
- C. Size all closers in accordance with the manufacturer's recommendations at the factory.
- D. All closers to have adjustable spring power sizes 1 through 6 and separate tamper resistant, brass, non-critical regulating screw valves for closing speed, latching speed and back-check control as a standard feature unless specified otherwise.
- E. All closer covers to be rectangular, full cover type of non-ferrous, non-corrosive material painted to match closer.
- F. Closers shall have heavy-duty arms. All closer arms shall be of sufficient length to accommodate the reveal depth and to insure proper installation. The hardware supplier shall provide all required brackets, spacers or filler plates as required by the manufacture for a proper and functional installation as part of their base bid.

- G. Supply appropriate arm assembly for each closer so that closer body and arm are mounted on non-public side of door opening and on the interior side of exterior openings, except where required otherwise in the hardware sets.
 - 1. All parallel arm mounted closers to be factory indexed to insure proper installation.
 - 2. Furnish heavy-duty cold forged parallel arms for all parallel arm mounted closers.
- H. Provide closers with special application and heavy-duty arms as specified in the hardware sets or as otherwise called for to insure a proper operating, long lasting opening. Drop plates and any additional brackets required for the proper installation of the door closer shall be included in the hardware supplier's base bid.
- I. Finish: Sprayed enamel Finish shall match other hardware.
- J. Closers and Automatic Operators shall be LCN 4040XP, 1461 FC & Senior Swing 9500 series as specified (No Substitutions).

2.08 DOOR STOPS AND HOLDERS

- A. Door stops are to be furnished for every door leaf. Every door is to have a floor, wall, or an overhead stop.
- B. Place doorstops in such a position that they permit maximum door swing, but do not present a hazard of obstruction. Furnish floor strikes for floor holders of proper height to engage holders of doors.
- C. Where overhead stops and holders are specified, or otherwise required for proper door operation, they are to be heavy duty and of extruded brass, bronze or stainless steel with no plastic parts as specified. The General Contractor shall provide wood blocking in all stud walls specified and scheduled to receive wall stops.
- D. Finish: Same as other hardware where available.
- E. Acceptable Products
 - 1. Floor and wall stops as listed in hardware sets. Equivalent products as manufactured by Ives, Hager and Rockwood are acceptable.

2.09 PUSH PLATES, DOOR PULLS, AND KICKPLATES

- A. All push plates, door pull, kick plates and other miscellaneous hardware as listed in hardware sets. Equivalent products as manufactured by Ives, Hager and Rockwood are acceptable.
- B. Kick plates to be 10 inches high and Mop plates to be 4 inches high, both by 1-1/2 inches or 1 inch less than door width (LDW) as specified. They are to be of 16 gauge (.050 inches) thick stainless steel. For door with louvers or narrow bottom rails, kick plate height to be 1 inch less dimension shown from the bottom of the door to the bottom of the louver or glass.
- C. Where required armor plates, edge guards and other protective hardware shall be supplied in sizes as scheduled in the hardware sets.
- D. Finish: Same as other hardware.

2.10 FLUSH BOLTS AND COORDINATORS

- A. Provide Flush bolts with Dust Proof Strikes as indicated in the individual hardware sets by Ives, Hager and Rockwood are acceptable. Finish shall match adjacent hardware.

2.11 THRESHOLDS AND SEALS

- A. Provide materials and finishes as listed in hardware sets and manufactured by Zero. Equivalent product by National Guard Products and Reese are acceptable. All thresholds must be in accordance with the requirements of the ADA and ANSI A117.1.
- B. Provide thresholds with wood screws and plastic anchors. Supply all necessary anchoring devices for weather strip and sound seal.
- C. Seals shall comply with requirements of UL10C.
- D. Seals shall comply with the requirements of the Wood Door Manufacturer's certification requirements.

2.12 FINISHES

- A. Finishes for all hardware are as required in this specification and the hardware sets.
- B. Special care is to be taken to make uniform the finish of all various manufactured items.

2.13 DOOR SILENCERS

- A. Provide door silencers at all openings without gasket. Provide two- (2) each at each pair of doors and three- (3) or four- (4) each for each single door (coordinate with the frame manufacturer).

2.14 PROPRIETARY PRODUCTS

- A. References to specific products are used to establish quality standards of utility and performance. Unless otherwise approved provide only the specified product.
- B. All other materials, not specifically described, but required for a complete and proper finish hardware installation, are to be selected by the Contractor, subject to the approval of the Architect and UTRGV Edinburg.
- C. Architect and UTRGV Edinburg reserve the right to approve all the substitutions proposed for this specification. All requests for substitution to be made prior to bid in accordance with Division 1, General Requirements, and are to be in writing, hand delivered to the Architect. Two (2) copies of the manufacturer's brochures and a physical sample of each item in the appropriate design and finish shall accompany requests for substitution.

PART 3 - EXECUTION

3.01 INSTALLATION OF FINISH HARDWARE

- A. All finish hardware shall be installed by an experienced finish hardware installer with at least ten (10) years of experience after a pre-installation meeting between the contractor, hardware Manufacturers representative, the hardware supplier, the hollow metal supplier and the wood door supplier. The finish hardware installer shall be responsible for the proper installation and function of all doors and hardware.
- B. Check hardware against the reviewed hardware schedule upon delivery. Store the hardware in a dry and secure location to protect against loss and damage.

FINISH HARDWARE 087100 - 8
UTRGV SOM TBL CENTER
100% CD

- C. Install finish hardware in accordance with approved hardware schedule and manufacturers' printed instructions. Pre-fit hardware before finish is applied to door; remove and reinstall after finish is complete and dry. Install and adjust hardware so that parts operate smoothly, close tightly, and do not rattle.
- D. Mortise and cutting to be done neatly, and evidence of cutting to be concealed in the finished work. Protect all Finish hardware from scratching or other damage.

3.02 HARDWARE SETS:

SPEXTRA: 430780
HARDWARE GROUP NO. 01 - OFFICE & CONFERENCE/STUDY
FOR USE ON MARK/DOOR #(S):

1.122	1.123	1.124	1.125	1.126	1.127
1.128	1.129	1.130	1.131	2.101	2.102
2.103	2.104	2.105	2.106	2.107	2.108
2.109	2.110	2.111	2.112	2.113	2.114
2.115	2.116	2.117	2.118	2.119	2.120
2.121	2.122	2.123	2.124	2.124A	1.115
2.127	2.149	2.130	2.132	2.136	2.137
2.138	2.139	2.140	2.141	2.142	2.143
2.144	2.145	2.146	2.147	2.148	

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRANCE LOCK	ND53TD RHO	626	SCH
1	EA	LFIC PRIMUS CORE	20-740	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
		SEAL/SILENCERS	PROVIDED BY THE FRAME MFG		

HARDWARE GROUP NO. 02 - FIRE RATED

FOR USE ON MARK/DOOR #(S):

1.118 2S2A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	626	SCH
1	EA	LFIC PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	1461 SCUSH FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	8145SBK PSA-HEAD & JAMBS	BK	ZER
1	EA	DOOR SWEEP	50MAA-DOOR WIDTH	AA	ZER
1	EA	THRESHOLD	655A-FRAME WIDTH	A	ZER

HARDWARE GROUP NO. 03 - MECHANICAL

FOR USE ON MARK/DOOR #(S):

2.100M

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE

1	EA	ELECTRIC HINGE	5BB1 4.5 X 4.5 TW8 CON	652	IVE
1	EA	STOREROOM LOCK	ND80TDEU RHO RX CON	626	SCH
1	EA	LFIC PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	1461 SCUSH FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	8145SBK PSA-HEAD & JAMBS	BK	ZER
1	EA	DOOR BOTTOM	369AA-DOOR WIDTH	AA	ZER
1	EA	THRESHOLD	655A-FRAME WIDTH	A	ZER
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		

-ENTRANCE BY CARD READER OR OUTSIDE KEY OVERRIDE.
-FREE EGRESS GRANTED AT ALL TIMES.

HARDWARE GROUP NO. 04

FOR USE ON MARK/DOOR #(S):

1.101A	1.123A	1.112A	1.119	1.120	1.102B
2.122A	2.134				

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80TD RHO	626	SCH
1	EA	LFIC PRIMUS CORE	20-740	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	FLOOR STOP	FS410 (DOOR 1.102B ONLY)	626	IVE
		SEAL/SILENCERS	PROVIDED BY THE FRAME MFG		

HARDWARE GROUP NO. 04A – ACCESS CONTROLLED

FOR USE ON MARK/DOOR #(S):

1.112	2.128	2.126
-------	-------	-------

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ELECTRICAL HINGE	5BB1 4.5 X 4.5 TW8 CON	652	IVE
1	EA	STOREROOM LOCK	ND80TDEU RHO CON	626	SCH
1	EA	LFIC PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	1461 FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	SEAL	8145S-BK-HEAD & JAMBS (DOOR 2.128 ONLY)	BK	ZER
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		

		SEAL/SILENCERS	PROVIDED BY THE FRAME MFG		
--	--	----------------	---------------------------	--	--

-ENTRANCE BY CARD READER OR OUTSIDE KEY OVERRIDE.
-FREE EGRESS GRANTED AT ALL TIMES.

FINISH HARDWARE 087100 - 10
UTRGV SOM TBL CENTER
100% CD

HARDWARE GROUP NO. 05 - ROOF ACCESS -ACCESS CONTROLLED

FOR USE ON MARK/DOOR #(S):

2.135

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	HINGE	5BB1HW 4.5 X 4.5 TW8 CON	652	IVE
1	EA	STOREROOM LOCK	ND80TDEU RHO RX CON	626	SCH
1	EA	LFIC PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	1461 SCUSH FC TBSRT	689	LCN
		SEAL/SILENCERS	PROVIDED BY THE FRAME MFG		

HARDWARE GROUP NO. 06 - UNISEX

FOR USE ON MARK/DOOR #(S):

1.110 2.133

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY	ND40S RHO	626	SCH
1	EA	SURFACE CLOSER	1461 HD FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
		SEAL/SILENCERS	PROVIDED BY THE FRAME MFG		

HARDWARE GROUP NO. 07 MECHANICAL – ACCESS CONTROLLED

FOR USE ON MARK/DOOR #(S):

1.100J

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8 CON	652	IVE
1	EA	STOREROOM LOCK	ND80TDEU RHO RX CON	626	SCH
1	EA	LFIC PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	1461 SCUSH FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	8145SBK PSA-HEAD & JAMBS	BK	ZER
1	EA	DOOR SWEEP	50MAA-DOOR WIDTH	AA	ZER
1	EA	THRESHOLD	655A-FRAME WIDTH	A	ZER
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		

-ENTRANCE BY CARD READER OR OUTSIDE KEY OVERRIDE.
-FREE EGRESS GRANTED AT ALL TIMES.

HARDWARE GROUP NO. 08 – FIRE RISER - ACCESS CONTROLLED

FOR USE ON MARK/DOOR #(S):

1.100F

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGES	5BB1HW 5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 TW8 CON	652	IVE
1	EA	STOREROOM LOCK	ND80TDEU RHO RX CON	626	SCH
1	EA	LFIC PRIMUS CORE	20-740	626	SCH
1	EA	LOCK GUARD	LG12	630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH SRI	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA SRI	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30	689	LCN
1	EA	RAIN DRIP	142AA-FRAME WIDTH PLUS 4"	AA	ZER
1	EA	DOOR SWEEP	50MAA-DOOR WIDTH	AA	ZER
1	EA	THRESHOLD	65A-223-FRAME WIDTH	A	ZER
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		
		WEATHER STRIP	PROVIDED BY THE DOOR MFG		

HARDWARE GROUP NO. 09 (NOT USED)

FOR USE ON MARK/DOOR #(S):

EACH TO HAVE:

NOT USED

HARDWARE GROUP NO. 10 CORRIDOR – ACCESS CONTROLLED

FOR USE ON MARK/DOOR #(S):

1.100B 1.100E

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8 CON	652	IVE
1	EA	PANIC HARDWARE	QEL-RX-99-L-NL-06-CON	US28	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	1461 HDPA FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		

FINISH HARDWARE 087100 - 12
UTRGV SOM TBL CENTER
100% CD

SEAL/SILENCERS

PROVIDED BY THE FRAME MFG

HARDWARE GROUP NO. 10A – CLASSROOM & OPEN OFFICE – ACCESS CONTROLLED

FOR USE ON MARK/DOOR #(S):

1.102 2.100A 2.100N

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8 CON	652	IVE
1	EA	ELEC PANIC HARDWARE	RX-QEL-99-L-NL-06 CON	US28	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	1461 EDA FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		
		SEAL/SILENCERS	PROVIDED BY THE FRAME MFG		

-ENTRANCE BY CARD READER OR OUTSIDE KEY OVERRIDE.

-FREE EGRESS GRANTED AT ALL TIMES.

HARDWARE GROUP NO. 10B (ROUGH IN FOR FUTURE ACCESS CONTROL)

FOR USE ON MARK/DOOR #(S):

1.102A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8 CON	652	IVE
1	EA	PANIC HARDWARE	QEL-RX-99-L-NL-06-CON	US28	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	1461 HDPA FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
		SEAL/SILENCERS	PROVIDED BY THE FRAME MFG		

HARDWARE GROUP NO. 11 - ELECTRICAL

FOR USE ON MARK/DOOR #(S):

1.100K

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8 CON	652	IVE
1	EA	PANIC HARDWARE	QEL-RX-99-L-NL-06-CON	US28	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	1461 SCUSH FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	8145SBK PSA-HEAD & JAMBS	BK	ZER
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		
		SEAL/SILENCERS	PROVIDED BY THE FRAME MFG		

ENTRANCE BY CARD READER OR OUTSIDE KEY OVERRIDE.
-FREE EGRESS GRANTED AT ALL TIMES.

HARDWARE GROUP NO. 12 – ELECTRICAL – ACCESS CONTROLLED

FOR USE ON MARK/DOOR #(S):

2.106A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8 CON	652	IVE
1	EA	PANIC HARDWARE	QEL-RX-99-L-NL-06-CON	US28	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	1461 SCUSH FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	8145SBK PSA-HEAD & JAMBS	BK	ZER
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		
		SEAL/SILENCERS	PROVIDED BY THE FRAME MFG		

HARDWARE GROUP NO. 13 - EXTERIOR - EXIT ONLY

FOR USE ON MARK/DOOR #(S):

1S1A

1S2A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGES	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	LD-99-EO	US28	VON
1	EA	SURFACE CLOSER	4040XP SCUSH SRI	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA SRI	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30	689	LCN
1	EA	RAIN DRIP	142AA-FRAME WIDTH PLUS 4"	AA	ZER
1	EA	DOOR SWEEP	50MAA-DOOR WIDTH	AA	ZER
1	EA	THRESHOLD	65A-223-FRAME WIDTH	A	ZER
		SEAL/SILENCERS	PROVIDED BY THE FRAME MFG		

FINISH HARDWARE 087100 - 14
 UTRGV SOM TBL CENTER
 100% CD

HARDWARE GROUP NO. 14 - FIRE RATED STAIRWELL - HOLD OPEN

FOR USE ON MARK/DOOR #(S):

1S1 1S2 2S1

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	FIRE EXIT HARDWARE	99-L-BE-F-06-SNB	US28	VON
1	EA	SURFACE CLOSER	1461 HD FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MAGNETIC HOLDER	SEM7850	689	LCN
1	EA	GASKETING	8145SBK PSA-HEAD & JAMBS	BK	ZER

HARDWARE GROUP NO. 15 - MEN & WOMEN

FOR USE ON MARK/DOOR #(S):

1.116 1.117 2.131A 2.131B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	DEADBOLT	B663T	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	PUSH PLATE	8200 8" X 16"	630	IVE
1	EA	PULL PLATE	8305 8" 3.5" X 15"	630	IVE
1	EA	SURFACE CLOSER	1461 HD FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
		SEAL/SILENCERS	PROVIDED BY THE FRAME MFG		

HARDWARE GROUP NO. 16 - INTERIOR - ACCESS CONTROLLED

FOR USE ON MARK/DOOR #(S):

1.103 1.105 1.106 1.107 1.108 1.109
 1.113 1.114

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	5BB1 4.5 X 4.5 TW8 CON	652	IVE
1	EA	STOREROOM LOCK	ND80TDEU RHO RX CON	626	SCH
1	EA	LFIC PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	1461 HD FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		
		SEAL/SILENCERS	PROVIDED BY THE FRAME MFG		

-ENTRANCE BY CARD READER OR OUTSIDE KEY OVERRIDE.

-FREE EGRESS GRANTED AT ALL TIMES.

HARDWARE GROUP NO. 17 – EXTERIOR - MECHANICAL - ACCESS CONTROLLED

FOR USE ON MARK/DOOR #(S):

1.100G

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
5	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 TW8 CON	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458 (24" TOP & 12" BOTTOM)	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	ND80TDEU RHO RX CON	626	SCH
1	EA	LFIC PRIMUS CORE	20-740	626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH SRI	689	LCN
2	EA	PA MOUNTING PLATE	4040XP-18PA SRI	689	LCN
2	EA	CUSH SHOE SUPPORT	4040XP-30	689	LCN
1	EA	RAIN DRIP	142AA-FRAME WIDTH PLUS 4"	AA	ZER
2	EA	DOOR SWEEP	50MAA-DOOR WIDTH	AA	ZER
1	EA	THRESHOLD	65A-223-FRAME WIDTH	A	ZER
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		
		WEATHER STRIP	PROVIDED BY THE DOOR MFG		

-ENTRANCE BY CARD READER OR OUTSIDE KEY OVERRIDE.

-FREE EGRESS GRANTED AT ALL TIMES.

HARDWARE GROUP NO. 18 - EXTERIOR - ACCESS CONTROLLED - ELECTRICAL

FOR USE ON MARK/DOOR #(S):

1.100H

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 TW8 CON	652	IVE
1	EA	ELEC PANIC HARDWARE	RX-QEL-99-NL-CON	US28	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH SRI	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA SRI	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30	689	LCN
1	EA	RAIN DRIP	142AA-FRAME WIDTH PLUS 4"	AA	ZER
1	EA	DOOR SWEEP	50MAA-DOOR WIDTH	AA	ZER
1	EA	THRESHOLD	65A-223-FRAME WIDTH	A	ZER
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		
		WEATHER STRIP	PROVIDED BY THE DOOR MFG		

-ENTRANCE BY CARD READER OR OUTSIDE KEY OVERRIDE.

-FREE EGRESS GRANTED AT ALL TIMES.

HARDWARE GROUP NO. 19 - EXTERIOR - ACCESS CONTROLLED

FOR USE ON MARK/DOOR #(S):

FINISH HARDWARE 087100 - 16
UTRGV SOM TBL CENTER
100% CD

1.121

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 TW8 CON	652	IVE
1	EA	ELEC PANIC HARDWARE	RX-QEL-9949-EO CON	US28	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-9949-NL-OP-110MD CON	US28	VON
1	EA	CYLINDER	20-079	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
2	EA	OFFSET PULL	8190EZHD 12" O	630-316	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH SRI	689	LCN
2	EA	PA MOUNTING PLATE	4040XP-18PA SRI	689	LCN
2	EA	CUSH SHOE SUPPORT	4040XP-30	689	LCN
1	EA	RAIN DRIP	142AA-FRAME WIDTH PLUS 4"	AA	ZER
2	EA	DOOR SWEEP	50MAA-DOOR WIDTH	AA	ZER
1	EA	THRESHOLD	65A-223-FRAME WIDTH	A	ZER
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		
		WEATHER STRIP	PROVIDED BY THE DOOR MFG		

-ENTRANCE BY CARD READER OR OUTSIDE KEY OVERRIDE.

-FREE EGRESS GRANTED AT ALL TIMES.

HARDWARE GROUP NO. 20 - EXTERIOR - ACCESS CONTROLLED

FOR USE ON MARK/DOOR #(S):

1.100

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
2	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 TW8 CON	652	IVE
1	EA	ELEC PANIC HARDWARE	RX-QEL-9949-NL-OP-110-CON	US28	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-9949-EO-CON	US28	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
2	EA	OFFSET PULL	8190EZHD 12" O	630-316	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH SRI	689	LCN
2	EA	PA MOUNTING PLATE	4040XP-18PA SRI	689	LCN
2	EA	CUSH SHOE SUPPORT	4040XP-30	689	LCN
1	EA	RAIN DRIP	142AA-FRAME WIDTH PLUS 4"	AA	ZER
2	EA	DOOR SWEEP	50MAA-DOOR WIDTH	AA	ZER
1	EA	THRESHOLD	65A-223-FRAME WIDTH	A	ZER
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		
		WEATHER STRIP	PROVIDED BY THE DOOR MFG		

-ENTRANCE BY CARD READER OR OUTSIDE KEY OVERRIDE.

-FREE EGRESS GRANTED AT ALL TIMES.

HARDWARE GROUP NO. 20A – EXTERIOR – ROUGH IN FOR FUTURE ACCESS CONTROL

FOR USE ON MARK/DOOR #(S):

1.101

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGES	5BB1HW 5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 5 X 4.5 TW8 CON	652	IVE
1	EA	PANIC HARDWARE	HD-RX-99-NL-OP-110-CON	US28	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	OFFSET PULL	8190EZHD 12" O	630-316	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH SRI	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA SRI	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30	689	LCN
1	EA	RAIN DRIP	142AA-FRAME WIDTH PLUS 4"	AA	ZER
1	EA	DOOR SWEEP	50MAA-DOOR WIDTH	AA	ZER
1	EA	THRESHOLD	65A-223-FRAME WIDTH	A	ZER
		WEATHER STRIP	PROVIDED BY THE DOOR MFG		

HARDWARE GROUP NO. 21 - SLIDING ALUMINUM DOOR SYSTEM

FOR USE ON MARK/DOOR #(S):

1.101B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PRIMUS MORT. CYL.	20-706	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
		BALANCE HARDWARE	PROVIDED BY THE DOOR MFG		

HARDWARE GROUP NO. 22 – STUDY CARRELS - ACCESS CONTROLLED

FOR USE ON MARK/DOOR #(S):

1.104

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	5BB1 4.5 X 4.5 TW8 CON	652	IVE
1	EA	STOREROOM LOCK	ND80TDEU RHO RX CON	626	SCH
1	EA	LFIC PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	1461 HD FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		
		SEAL/SILENCERS	PROVIDED BY THE FRAME MFG		

-ENTRANCE BY CARD READER OR OUTSIDE KEY OVERRIDE.

-FREE EGRESS GRANTED AT ALL TIMES.

HARDWARE GROUP NO. 23 – MOTHERS NURSING SUITE - ACCESS CONTROLLED

FINISH HARDWARE 087100 - 18
UTRGV SOM TBL CENTER
100% CD

FOR USE ON MARK/DOOR #(S):
2.131

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	FACULTY RESTROOM	L9485T 06A L583-363 L283-722	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6216 FSE DS EB CON	630	VON
1	EA	SURFACE CLOSER	1461 HD FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		
		SEAL/SILENCERS	PROVIDED BY THE FRAME MFG		

-ENTRANCE BY CARD READER OR OUTSIDE KEY OVERRIDE.
-FREE EGRESS GRANTED AT ALL TIMES.

HARDWARE GROUP NO. 24 - FIRE RATED STAIRWELL - ACCESS CONTROLLED

FOR USE ON MARK/DOOR #(S):
2S2

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8 CON	652	IVE
1	EA	ELEC PANIC HARDWARE	RX-QEL-99-L-NL-06 CON	US28	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	1461 HD FC TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	8145SBK PSA-HEAD & JAMBS	BK	ZER
		MULTITECH READER	PROVIDED BY OTHER (MTMS-15)		
		POWER SOURCE	PROVIDED BY OTHER		

-ENTRANCE BY CARD READER OR OUTSIDE KEY OVERRIDE.
-FREE EGRESS GRANTED AT ALL TIMES.

HARDWARE GROUP NO. 25 – MISCELLANEOUS MATERIALS TO BE PROVIDED

PROVIDE THE FOLLOWING

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	KEY CABINET	1208		LUND

HARDWARE GROUP NO. 26 - VESTIBULE

FOR USE ON MARK/DOOR #(S):

1.121A

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
2	EA	PUSH PULL BARS	9190HD-12" X 33"	630-316	IVE
2	EA	SURFACE CLOSER	4040XP EDA SRI	689	LCN
2	EA	PA MOUNTING PLATE	4040XP-18PA SRI	689	LCN
2	EA	FLOOR STOPS	FS410	626	IVE
		WEATHER STRIP	PROVIDED BY THE DOOR/FRAME MFG		

NOTE:

- A) ALL ELECTRIC HINGES, LOCKSETS, ELECTRIC EXIT DEVICES & CARD READERS SHALL BE PART OF THE ADD ALTERNATE. BASE BID SHALL INCLUDE ALL NONE ELECTRIFIED HARDWARE

UTRGV School of Medicine Team Based Learning Center
Door & Hardware Set Index

Door #	Hardware Set #
1.100	20
1.100B	10
1.100E	10
1.100F	08
1.100G	17
1.100H	18
1.100J	07
1.100K	11
1.101	20A
1.101A	04
1.101B	21
1.102	10A
1.102A	10B
1.102B	04
1.103	16
1.104	22
1.105	16
1.106	16
1.107	16
1.108	16
1.109	16
1.110	06
1.112	04A
1.112A	04
1.113	16
1.114	16
1.115	01

FINISH HARDWARE 087100 - 20
 UTRGV SOM TBL CENTER
 100% CD

Door #	Hardware Set #
1.116	15
1.117	15
1.118	02
1.119	04
1.120	04
1.121	19
1.121A	26
1.122	01
1.123	01
1.123A	04
1.124	01
1.125	01
1.126	01
1.127	01
1.128	01
1.129	01
1.130	01
1.131	01
1S1	14
1S1A	13
1S2	14
1S2A	13
2.100A	10A
2.100M	03
2.100N	10A
2.101	01
2.102	01
2.103	01
2.104	01
2.105	01
2.106	01
2.106A	12
2.107	01
2.108	01
2.109	01
2.110	01
2.111	01
2.112	01
2.113	01
2.114	01
2.115	01
2.116	01
2.117	01
2.118	01
2.119	01
2.120	01

Door #	Hardware Set #
2.121	01
2.122	01
2.122A	04
2.123	01
2.124	01
2.124A	01
2.126	04A
2.127	01
2.128	04A
2.130	01
2.131	23
2.131A	15
2.131B	15
2.132	01
2.133	06
2.134	04
2.135	05
2.136	01
2.137	01
2.138	01
2.139	01
2.140	01
2.141	01
2.142	01
2.143	01
2.144	01
2.145	01
2.146	01
2.147	01
2.148	01
2.149	01
2S1	14
2S2	24
2S2A	02

END OF SECTION

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section

1.2 SUMMARY

- A. Provide glass and glazing, glazing sealants, and accessories for glazing applications which include, but are not necessarily limited to:
 - 1. Windows.
 - 2. Glazed curtain walls.
 - 3. Doors.
 - 4. Interior borrowed lights and partitions.
 - 5. Translucent film.
- B. Related work specified elsewhere:
 - 1. Section 081113 "Hollow Metal Doors and Frames".
 - 2. Section 081416 "Flush Wood Doors".
 - 3. Section 084313 "Aluminum-Framed Storefronts".
 - 4. Section 085680 "Sliding Service Window".

1.3 DEFINITIONS

- A. Fenestration: Openings in building's envelope including windows, doors, and skylights.
- B. Framing System: Basic rigid supporting structure of window.
- C. Glazing System: Soft material used in framing system.
- D. Bite: Dimension by which edge of glass product is engaged into glazing channel.
- E. IGU: Insulating Glass Unit.
- F. 2-ply Laminated Glass: 2-sheets of monolithic glass bonded together with plastic interlayer by heat and pressure.
- G. Inboard Lite: Pane of IGU that faces interior of building.
- H. Outboard Lite: Pane of IGU that faces exterior of building.
- I. Performance Characteristics:
 - 1. Center-of-Glass Characteristics: Performance values that take only center portion of IGU into account and not framing members.
 - 2. Fenestration Performance: Performance based on total fenestration (glass and framing members). Values that can be validated and certified by National Fenestration Rating Council (NFRC).
- J. IECC: International Energy Conservation Code.
- K. IBC: International Building Code.

1.4 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.
- C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- D. Submit written certificates indicating that glass installed meets with the specified requirements. Manufacturer's permanent labels will not be acceptable.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample Warranties: For special warranties.

1.7 QUALITY ASSURANCE

- A. Insulating Glass Certification Council: www.igcc.org
- B. Safety Glazing Certification Council: www.sgcc.org
- C. Safety glass standard: CPSC 16 CFR 1201.
- D. ANSI Z97.1, Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test

1.8 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

1.9 PROJECT/SITE CONDITIONS

- A. Meet with other trades affected by glass installation, prior to beginning of installation. Do not perform work under adverse weather or job conditions. Install liquid sealants when temperatures are within lower or middle third of temperature range recommended by manufacturer.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

2.2 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

2.3 GLASS PRODUCTS

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
- B. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
 - 2. Where indicated as "Free of Tong Marks", provide tempered glass produced by manufacturer's special process which eliminates tong marks.

2.4 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
 - 1. Sealing System: Dual seals with spacer manufacturer's primary and secondary sealants.
 - a. Color: Black.
 - b. Perimeter Spacer: Warm-edge high-performance hybrid plastic and stainless steel
 - c. Manufacturers: Subject to compliance with requirements, provide products by PPG Industries, Inc.

2.5 TRANSLUCENT FILM

- A. Translucent Film: Solyx – SXJ – 0550 – white dusted matte.

2.6 MISCELLANEOUS GLAZING MATERIALS

- A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

- C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

2.7 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
 - 1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
 - a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Site Verification and Conditions
 - 1. Verify that site conditions are acceptable for glass installation.
 - 2. Verify openings for glazing are correctly sized and within tolerance.
 - 3. Verify that functioning weep system is present.
 - 4. Verify that minimum required face and edge clearances are being met.
 - 5. Verify that glazing channels and recesses are clear and free of obstructions, weeps are clear, and channels and recesses are ready for glazing.
 - 6. Verify that framing system is appropriately sized for IGU thickness and that precautions are taken to not over compress the edge seals of the IGU when the glass is installed.
- B. Do not proceed with glazing until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect glass from edge damage during handling and installation, and subsequent operation of glazed components of the work. During installation, discard units with significant edge damage or other imperfections
- B. Clean glazing channel and other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to substrate.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
 - 1. Verify that IGU secondary seal is compatible with glazing sealants.
 - 2. tolerances are as recommended by GANA Glazing Manual and as approved by glass manufacturer.

- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- H. Prevent glass from contact with contaminating substances that result from construction operations, such as weld spatter, fireproofing, or plaster.
- I. Install translucent film on Room Side as per manufacturer's written instructions.

3.4 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces. Clean and trim excess glazing materials from glass and stops or frames promptly after installation and eliminate stains and discolorations.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 - 1. If, despite such protection, contaminating substances come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Protect exterior glass from breakage immediately upon installation. Do not apply markers to surfaces of glass. Remove labels and clean surfaces. Cure sealants as recommended by sealant manufacturer for high early strength and durability.
- D. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.
- E. Wash and polish glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Comply with glass product manufacturer's recommendations for final cleaning.

3.5 INSULATING GLASS SCHEDULE

- A. Glass Type: Low-E-coated, clear insulating glass.
 - 1. Basis-of-Design Product: Solar Control Low-E Insulating Glass Solarban® 70 XL (2) Solarblue® + Clear by PPG Industries.
 - 2. Overall Unit Thickness: 1 inch.
 - 3. Minimum Thickness of Each Glass Lite: ¼ inch.
 - 4. Outdoor Lite: Solar Blue Sputter Coated float glass.

GLAZING 08 8000 - 6
UTRGV SOM TBL CENTER
100% CD

5. Interspace Content: Argon.
6. Indoor Lite: Ultraclear annealed float glass.
7. Low-E Coating: Sputtered on second surface.
8. Safety glazing required. Provide fully tempered glass where indicated on elevation and glass schedule.

END OF SECTION 088000

SECTION 088300 - MIRRORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes the following types of silvered flat glass mirrors:
 - 1. Film-backed glass mirrors qualifying as safety glazing.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include mirror elevations, edge details, mirror hardware, and attachment details.
- C. Samples: For each type of the following:
 - 1. Mirrors: 12 inches square, including edge treatment on two adjoining edges.
 - 2. Mirror Clips: Full size.

1.3 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For special warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For mirrors to include in maintenance manuals.

1.5 PRECONSTRUCTION TESTING

- A. Preconstruction Mirror Mastic Compatibility Test: Submit mirror mastic products to mirror manufacturer for testing to determine compatibility of mastic with mirror backing.

1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to replace mirrors that deteriorate within specified warranty period. Deterioration of mirrors is defined as defects developed from normal use that are not attributed to mirror breakage or to maintaining and cleaning mirrors contrary to manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

2.2 SILVERED FLAT GLASS MIRRORS

- A. Mirrors, General: ASTM C 1503; manufactured using copper-free, low-lead mirror coating process.
- B. Annealed Monolithic Glass Mirrors: Mirror Select Quality, clear.
 - 1. Nominal Thickness: 1/4 inch or as indicated.

2.3 MISCELLANEOUS MATERIALS

- A. Edge Sealer: Coating approved by mirror manufacturer.
- B. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors.

2.4 MIRROR HARDWARE

- A. Mirror Bottom Clips: As indicated.
- B. Mirror Top Clips: As indicated.

2.5 FABRICATION

- A. Fabricate cutouts for notches and holes in mirrors without marring visible surfaces. Locate and size cutouts so they fit closely around penetrations in mirrors.
- B. Mirror Edge Treatment: Flat polished. Seal edges of mirrors with edge sealer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, over which mirrors are to be mounted, with Installer present, for compliance with installation tolerances, substrate preparation, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected and surfaces are dry.

3.2 PREPARATION

- A. Comply with mastic manufacturer's written installation instructions for preparation of substrates, including coating substrates with mastic manufacturer's special bond coating where applicable.

3.3 INSTALLATION

- A. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.
- B. Install mirrors with mastic and mirror hardware. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors.
 - 1. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.
- C. Clean exposed surface of mirrors not more than four days before date scheduled for inspections that establish date of Substantial Completion. Clean mirrors as recommended in writing by mirror manufacturer.

END OF SECTION 088300

SECTION 089000 – ARCHITECTURAL LOUVERS AND DOORS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Furnish and install louvers, bird screens, blank-off panels, structural supports and attachment brackets as shown on the drawings, as specified, and as needed for a complete and proper installation.
- B. The louvers to be furnished include the following:
 - 1. Fixed extruded storm-resistant louvers.
 - 2. Louver doors (Room 1.100F, 1.00G, 1.00H)
- C. Related sections include:
 - 1. Division 7 Section "Joint Sealants" for sealants installed in perimeter joints between louver frames and adjoining construction.

1.3 REFERENCES

- A. Air Movement and Control Association International, Inc.
 - 1. AMCA Standard 500-L-99 Laboratory Methods of Testing Louvers for Rating
 - 2. AMCA Publication 501 Application Manual for Louvers
- B. The Aluminum Association Incorporated
 - 1. Aluminum Standards and Data
 - 2. Specifications and Guidelines for Aluminum Structures
- C. American Society of Civil Engineers
 - 1. Minimum Design Loads for Buildings and Other Structures
- D. American Society for Testing and Materials
 - 1. ASTM B209
 - 2. ASTM B211
 - 3. ASTM B221
 - 4. ASTM E90-90
- E. Architectural Aluminum Manufacturers Association
 - 1. AAMA 800 Voluntary Specifications and Test Methods for Sealants
 - 2. AAMA 605.2 Voluntary Specification for High Performance Organic Coatings on Aluminum Extrusions and Panels.
 - 3. AAMA TIR Metal Curtain Wall Fasteners
 - 4. AAMA 2605-98 Superior Performing Organic Coatings on Aluminum Extrusions and Panels
- F. Canadian Standards Association
 - 1. CAN3-S157-M83 Strength Design in Aluminum
 - 2. S136 94 Cold Formed Steel Structural Members

1.4 SUBMITTALS

- A. Product Data
 - 1. Air flow and water entrainment performance test results.
 - 2. Material types and thickness.

- B. Shop Drawings
 - 1. Include elevations, sections and specific details for each louver.
 - 2. Show anchorage details and connections for all component parts.
 - 3. Include signed and sealed structural calculations.
- C. Samples
 - 1. Submit color chips for approval.

1.5 QUALITY ASSURANCE

- A. Single subcontract responsibility: Subcontract the work to a single firm that has had not less than six years experience in the design and manufacturing of work similar to that shown and required.
- B. Performance Requirements: Provide AMCA and BSRIA test data as required to confirm that the louvers have the specified air and water performance characteristics.
- C. Acoustical Performance: Where applicable, submit test reports to confirm that the louvers meet the specified STC and Noise Reduction requirements.
- D. Structural Requirements: Design all materials to withstand wind and snow loads as required by the applicable building code. Maximum allowable deflection for the louver structural members to be $l/180$ or 0.75 inch, whichever is less. Maximum allowable deflection for the louver blades to be $l/120$ or 0.50 inch across the weak axis, whichever is less.
- E. Professional Engineer Requirements: Drawings and structural calculations to be signed and sealed by a professional engineer licensed to practice in the state of Texas.
- F. Warranty: Provide written warranty to the owner that all products will be free of defective materials or workmanship for a period of one year from date of installation.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Delivery: At the time of delivery all materials shall be visually inspected for damage. Any damaged boxes, crates, louver sections, etc. shall be noted on the receiving ticket and immediately reported to the shipping company and the material manufacturer.
- B. Storage:
 - 1. Material may be stored flat, on end or on its side.
 - 2. Material may be stored indoors only.
- C. Handling:
 - 1. Material shall be handled in accordance with sound material handling practices and in such a way as to minimize racking.
 - 2. Louver sections may be hoisted by attaching straps to the jambs and lifting the section while it is in a vertical position.
 - 3. Louver sections should only be lifted and carried by the jambs. Heads, sills and blades are not to be used for lifting or hoisting louver sections.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. The louvers and related materials herein specified and indicated on the drawings shall be as manufactured by:
 - Construction Specialties, Inc.
 - 49 Meeker Avenue
 - Cranford, New Jersey 07016
 - Telephone: 800-631-7379
 - Texas: Design Assist- Jon Salis
 - Telephone: 940 445-1845

- B. Products equal to the C/S materials may be offered providing that they are approved by the Architect.

2.2 MATERIALS

- A. Aluminum Extrusions: ASTM B211, Alloy 6063-T5, 6063-T6 or 6061-T6.
B. Aluminum Sheet: ASTM B3209, Alloy 1100, 3003 or 5005.

2.3 FABRICATION, GENERAL

- A. Provide C/S louver models, bird screens, blank-off panels, structural supports and accessories as specified and/or shown on the drawings. Materials, sizes, depths, arrangements and material thickness to be as indicated or as required for optimal performance with respect to strength; durability; and uniform appearance.
B. Louvers to be mechanically assembled using stainless steel or aluminum fasteners.
C. Include supports, anchorage, and accessories required for complete assembly.

2.4 LOUVER MODELS

A. **Active Louver: C/S 7" (177.8mm) Storm Resistant Fixed Horizontal Louver Model RS-7705**

1. **Material:** Heads, sills, jambs and mullions to be one-piece structural aluminum members with integral caulking slot and retaining beads. Architectural Line Drainable Sight proof Storm Resistant Fixed-Blade designed to collect and drain water to exterior at sill by means of multiple gutters in blades and channels in jambs and mullions Louvers to be supplied with 4" (101.6mm) high by full depth sill flashings formed from minimum 0.050" (1.27mm) thick aluminum. Sill flashings to have welded side panels. Louvers and sill flashings to be installed in accordance with the manufacturer's recommended procedures to ensure complete water integrity performance of the louver system. At locations indicated on drawings requiring removable louver sections for equipment replacement, provide fasteners, clips and supports that facilitate easy removal of sections.
2. **AMCA Performance:** A 4' x 4' unit shall conform to the following:

Free Area	8.09 sq. ft. (0.75 sq. m.)
Free Area Velocity at Beginning Point of Water Penetration	1,240 FPM (6.30 m/s)
Intake Pressure drop at 900 fpm free area velocity (274 m/min)	0.22 in. H ₂ O (5.58 mm)
Exhaust pressure drop at 900 fpm free area velocity (274 m/min)	0.19 in. H ₂ O (4.82 mm)
3. **Wind Driven Rain Performance:** AMCA certified and licensed to bear the AMCA seal. The louver test was based on a 39.370" (1.00m) x 39.370" (1.00 m) core area. Unit tested at a rainfall rate of 3.0 inches per hour (75 mm/hr) and with a wind directed to the face of the louver at a velocity 29.1-mph (13 m/s). The test data shall show the water penetration effectiveness rating at each corresponding ventilation rate.

B. **Louver Door: CS 7" (177.8mm) Storm Resistant Fixed Horizontal Louver Model RS-7705 OutSwing Door.**

1. **Material:** Heads, sills, jambs and mullions to be one-piece structural aluminum members with integral caulking slot and retaining beads. Architectural Line Drainable Sightproof Storm Resistant Fixed-Half Blade. Doors supplied with Butt Hinges and Lock Box as indicated on drawings. All Locks, Handles and other Door Hardware by others. Rear of Half -Blades are sealed off with Aluminum Sheet Blank Off 0.050" thick.

2.5 FINISHES

- A. General: Comply with NAAMM "Metal Finishes Manual" for finish designations and application recommendations, except as otherwise indicated. Apply finishes in factory. Protect finishes on exposed surfaces prior to shipment. Remove scratches and blemishes from exposed surfaces that will be visible after completing finishing process. Provide color as indicated or, if not otherwise indicated, as selected by architect.
- B. Two Coat Metallic Fluorocarbon Coating
 1. Louvers to be finished with a minimum 1.0 mil (0.025mm) thick full strength 70% resin, 2 coat Fluoropolymer system.
 2. All aluminum shall be thoroughly cleaned, etched and given a chromated conversion pre-treatment before application of the MICA II coating. The coating shall consist of a primer and a pearlescent pigmented PFV₂ topcoat. It shall receive a bake cycle of 17 minutes at 450°F. All finishing procedures shall be one continuous operation in the plant of the manufacturer.
 3. Manufacturer to furnish an extended 20 limited warranty for the Kynar/Hylar coating. This limited warranty shall begin on the date of Substantial Completion.

2.6 BIRD SCREENS

- A. Unless otherwise indicated, all louvers to be furnished with mill finish bird or insect screens.
- B. Screens to be 5/8" (15.9mm) mesh, 0.050" (1.27mm) thick expanded and flattened aluminum bird screen secured within 0.055" (1.40mm) thick extruded aluminum frames. Frames to have mitered corners and corner locks.

2.7 BLANK OFFS

- A. Furnish where indicated on the drawings blank-off panels fabricated by the louver manufacturer.
- B. Blank-off panels to be 0.050" (1.27mm) thick aluminum sheet. Panels to be finished with Kynar 500 minimum 1 mil (0.025mm) thick full strength 70% resin Fluoropolymer coating. Color to be selected by the architect.

PART 3 EXECUTION

3.1 EXAMINATION:

Examine openings to receive the work. Do not proceed until any unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's instructions and recommendations for installation of the work.
- B. Verify dimensions of supporting structure at the site by accurate field measurements so that the work will be accurately designed, fabricated and fitted to the structure.

- C. Anchor louvers to the building substructure as indicated on architectural drawings.
- D. Erection Tolerances:
 - 1. Maximum variation from plane or location shown on the approved shop drawings: 1/8" per 12 feet of length, but not exceeding 1/2" in any total building length or portion thereof (non-cumulative).
 - 2. Maximum offset from true alignment between two members abutting end to end, edge-to-edge in line or separated by less than 3": 1/16" (shop or field joints). This limiting condition shall prevail under both load and no load conditions.
- E. Cut and trim component parts during erection only with the approval of the manufacturer or fabricator, and in accordance with his recommendations. Restore finish completely. Remove and replace members where cutting and trimming has impaired the strength or appearance of the assembly.
- F. Do not erect warped, bowed, deformed or otherwise damaged or defaced members. Remove and replace any members damaged in the erection process as directed.
- G. Set units level, plumb and true to line, with uniform joints.
- H. Louvers shall be installed with drainable sill pan to insure water is maintained to exterior face of building.

3.3 PROTECTION

- A. Protect installed materials to prevent damage by other trades. Use materials that may be easily removed without leaving residue or permanent stains.

3.4 ADJUSTING AND CLEANING

- A. Immediately clean exposed surfaces of the louvers to remove fingerprints and dirt accumulation during the installation process. Do not let soiling remain until the final cleaning.
- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to the material finishes. Thoroughly rinse surfaces and dry.
- C. Restore louvers and accessory components damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by the Architect, remove damaged materials and replace with new materials.
 - 1. Touch up minor abrasions in finishes with a compatible air-dried coating that matches the color and gloss of the factory applied coating.

End of Section

SECTION 092116.23 - GYPSUM BOARD SHAFT-WALL ASSEMBLIES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Requirements of Drawings, General and Supplementary Conditions and DIVISION 01 apply to this Section.

1.2 SCOPE

- A. Provide all gypsum board shaft wall assemblies work including but not necessarily limited to:
 - 1. Shaft enclosures.
- B. Related work specified elsewhere:
 - 1. Gypsum Board Assemblies SECTION 092900

1.3 DEFINITIONS

- A. Gypsum Board Construction Terminology: Refer to ASTM C 11 for definitions of terms for gypsum board construction not defined in this Section or in other referenced standards.

1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance:
 - 1. Provide gypsum board shaft-wall assemblies capable of withstanding the full air-pressure loads indicated for maximum heights of partitions without failing and while maintaining an airtight and smoke-tight seal. Evidence of failure includes deflections exceeding limits indicated, bending stresses causing studs to break or to distort, and end-reaction shear causing track (runners) to bend or to shear and studs to become crippled.

1.5 SUBMITTALS

- A. Product Data: For each gypsum board shaft-wall assembly indicated.
- B. Fire-Test-Response Reports: From a qualified independent testing and inspecting agency substantiating each gypsum board shaft-wall assembly's required fire-resistance rating.
- C. Include data substantiating that elevator entrances and other items that penetrate each gypsum board shaft-wall assembly do not negate fire-resistance rating.
- D. Research/Evaluation Reports: Evidence of compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction that substantiate required fire-resistance rating for each gypsum board shaft-wall assembly.

1.6 QUALITY ASSURANCE

- A. Fire-Resistance-Rated Assemblies: Provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

- B. **STC-Rated Assemblies:** For gypsum board shaft-wall assemblies indicated to have STC ratings, provide assembly materials and construction complying with requirements of assemblies whose STC ratings were determined according to ASTM E 90 and classified according to ASTM E 413 by a qualified independent testing agency.
- C. **Pre-installation Conference:** Conduct conference at Project site to comply with requirements of Division 1 Section "Project Management and Coordination." Review methods and procedures for installing work related to gypsum board shaft-wall assemblies including, but not limited to, the following:
 - 1. Fasteners proposed for anchoring steel framing to building structure.
 - 2. Elevator equipment, including hoistway doors, elevator call buttons, and elevator floor indicators.
 - 3. Wiring devices in shaft-wall assemblies.
 - 4. Doors and other items penetrating shaft-wall assemblies.
 - 5. Items supported by shaft-wall-assembly framing.
 - 6. Mechanical work enclosed within shaft-wall assemblies.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, and bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat on leveled supports off the ground to prevent sagging.

1.8 PROJECT CONDITIONS

- A. Comply with requirements for environmental conditions, room temperatures, and ventilation specified in Division 9 Section "Gypsum Board Assemblies."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. **Basis-of-Design Product:** The design for gypsum board shaft-wall assemblies is based on products named in Part 2 "Gypsum Board Shaft Wall" Article. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
 - 1. G-P Gypsum Corp.
 - 2. National Gypsum Company.
 - 3. United States Gypsum Co.
 - 4. Architects approved equal.

2.2 ASSEMBLY MATERIALS

- A. **General:** Provide materials and components complying with requirements of fire-resistance-rated assemblies indicated.
- B. Provide panels in maximum lengths available to eliminate or minimize end-to-end butt joints.
- C. Provide auxiliary materials complying with gypsum board shaft-wall assembly manufacturer's written recommendations.

- D. Steel Framing: ASTM C 645.
- E. Protective Coating: ASTM A 653, G40, hot-dip galvanized coating.
- F. Gypsum Liner Panels: Manufacturer's proprietary liner panels in 1-inch thickness and with moisture-resistant paper faces.
- G. Gypsum Wallboard: ASTM C 36, core type as required by fire-resistance-rated assembly indicated.
- H. Edges: Tapered and featured (rounded or beveled) for prefilling.
- I. Water-Resistant, Gypsum Backing Board: ASTM C 630/C 630M, core type as required by fire-resistance-rated assembly indicated.
- J. Accessories: Cornerbead, edge trim, and control joints of material and shapes specified in Division 9 Section "Gypsum Board Assemblies" that comply with gypsum board shaft-wall assembly manufacturer's written recommendations for application indicated.
- K. Gypsum Wallboard Joint-Treatment Materials: ASTM C 475 and as specified in Division 9 Section "Gypsum Board Assemblies."
- L. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
- M. Track (Runner) Fasteners: Power-driven fasteners of size and material required for withstand loading conditions imposed on shaft-wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.
- N. Powder-Actuated Fasteners: Provide powder-actuated fasteners with capability to sustain, without failure, a load equal to 10 times that imposed by shaft-wall assemblies, as determined by testing conducted by a qualified independent testing agency according to ASTM E 1190.
- O. Acoustical Sealant: As recommended by gypsum board shaft-wall assembly manufacturer for application indicated.
- P. Sound Attenuation Blankets: ASTM C 665 for Type I, unfaced mineral-fiber-blanket insulation produced by combining thermosetting resins with mineral fibers manufactured from slag or rock wool.

2.3 GYPSUM BOARD SHAFT WALL

- A. Basis-of-Design Product: As indicated on Drawings by design designation of a qualified testing and inspecting agency.
- B. Sustained Air-Pressure Loads: 10 lbf/sq. ft.
- C. Deflection Limit: L/240.
- D. Studs: Manufacturer's standard profile for repetitive members and corner and end members and for fire-resistance-rated assembly indicated.
- E. Depth: As indicated.
- F. Minimum Base Metal Thickness: Manufacturer's standard thicknesses that comply with structural performance requirements for stud depth indicated.

- G. Track (Runner): Manufacturer's standard J-profile track with long-leg length as standard with manufacturer, but at least 2 inches, in depth matching studs.
- H. Minimum Base Metal Thickness: Manufacturer's standard thicknesses that comply with structural performance requirements for stud depth indicated.
- I. Jamb Struts: Manufacturer's standard J-profile strut with long-leg length of 3 inches, in depth matching studs, and not less than 0.0329 thick.
- J. Room-Side Finish: Gypsum Board.
- K. Shaft-Side Finish: As indicated by fire-resistance-rated assembly design designation.
- L. STC Rating: 42.
- M. Cavity Insulation: Sound attenuation blankets.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to which gypsum board shaft-wall assemblies attach or abut, with Installer present, including hollow-metal frames, elevator hoistway door frames, cast-in anchors, and structural framing. Examine for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install gypsum board shaft-wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated, manufacturer's written installation instructions, and the following:
 - 1. ASTM C 754 for installing steel framing.
 - 2. Division 9 Section "Gypsum Board Assemblies" for applying and finishing panels.
- B. Do not bridge building expansion joints with shaft-wall assemblies; frame both sides of joints with furring and other support.
- C. Install supplementary framing in gypsum board shaft-wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, and similar items that cannot be supported directly by shaft-wall assembly framing.
- D. At elevator hoistway door frames, provide jamb struts on each side of door frame.
- E. At penetrations in shaft wall, maintain fire-resistance rating of shaft-wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.
- F. Isolate gypsum finish panels from building structure to prevent cracking of finish panels while maintaining continuity of fire-rated construction.
- G. Install control joints to maintain fire-resistance rating of assemblies.

- H. Seal gypsum board shaft walls with acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly. Install acoustical sealant to withstand dislocation by air-pressure differential between shaft and external spaces; maintain an airtight and smoke-tight seal; and comply with manufacturer's written instructions or ASTM C 919, whichever is more stringent.
- I. In elevator shafts where gypsum board shaft-wall assemblies cannot be positioned within 2 inches of the shaft face of structural beams, floor edges, and similar projections into shaft, install 1/2- or 5/8-inch- thick, gypsum board cants covering tops of projections.
- J. Slope cant panels at least 75 degrees from horizontal. Set base edge of panels in adhesive and secure top edges to shaft walls at 24 inches o.c. with screws fastened to shaft-wall framing.
- K. Where steel framing is required to support gypsum board cants, install framing at 24 inches o.c. and extend studs from the projection to the shaft-wall framing.

END OF SECTION

SECTION 092900 - GYPSUM DRYWALL ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Requirements of Drawings, General and Supplementary Conditions and DIVISION 1 apply to this Section.

1.2 SCOPE

- A. Provide all gypsum drywall assemblies work including but not necessarily limited to:
 - 1. Drywall on screw-type supports systems
 - 2. Drywall on solid (continuous) substrates
 - 3. Drywall backing boards for applications of other finishes
 - 4. Drywall finish (joint tape and compound treatment)
 - 5. Drywall accessories
- B. Related work specified elsewhere:
 - 1. Cold-formed metal framing SECTION 054000
 - 2. Painting SECTION 099100
 - 3. Weather barrier DIVISION 07

1.3 QUALITY ASSURANCE

- A. Gypsum board standard: GA-216 by Gypsum Association and ASTM C 840.
- B. Metal support standard: ASTM C 754.
- C. Where gypsum drywall systems with fire resistance ratings are indicated or are required to comply with governing regulations, provide materials and installations identical with applicable assemblies which have been tested and listed by recognized authorities, including UL.
 - 1. Comply with FM "APPROVAL GUIDE" where applicable.
- D. Obtain gypsum board products from a single manufacturer, or from manufacturers recommended by the prime manufacturer of gypsum boards.
- E. Allowable tolerances: 1/8" offsets between planes of board faces, and 1/4" in 8'-0" for plumb, level, warp and bow.

1.4 SUBMITTALS

- A. Submit manufacturer's product specifications and installation instructions for each gypsum drywall component, including other data as may be required to show compliance with these specifications.
- B. Submit locations of control joints in gypsum drywall for locations required by ASTM C840 in addition to those indicated.

1.5 PRODUCT HANDLING

- A. Deliver, identify, store and protect gypsum drywall materials to comply with referenced standards.

1.6 JOB CONDITIONS

- A. Comply with referenced standards regarding environmental conditions.

PART 2 - PRODUCTS

2.1 CEILING SUPPORT MATERIALS & SYSTEMS

- A. Size ceiling support components to comply with ASTM C 754 unless indicated otherwise.
- B. Main runners: steel channels with rust inhibitive paint finish, hot or cold-rolled.
- C. Hanger Wire: ASTM A 641, soft, Class 1 galvanized.
- D. Hanger anchorage devices: screws, clips, bolts, cast-in-place concrete inserts or other devices applicable to the indicated method of structural anchorage for ceiling hangers and whose suitability for use intended has been proven through standard construction practices or by certified test data. Size devices for 3 x calculated load supported except size direct pull-out concrete inserts for 5 x calculated loads.
- E. Furring members: ASTM C 645; 25 ga., hat-shaped.
1. Where shown as "Resilient", provide manufacturer's special type designed to reduce sound transmission.
- F. Furring members: ASTM C 645; 25 ga. "Cee"-shaped studs.
- G. Furring anchorage: 16 ga. galvanized wire ties, manufacturer's standard wire-type clips, bolts, nails or screws as recommended by furring manufacturer and complying with C 754.
- H. Direct suspension systems: Manufacturer's standard zinc-coated furring tees, and accessories designed for concealed support of gypsum drywall ceilings; of proper type for use intended. Manufacturers with products which meet the requirements include:
1. United States Gypsum Co.
2. Chicago Metallic Corp.
3. Donn Corporation
4. National Rolling Mills Co.

2.2 WALL/PARTITION SUPPORT MATERIALS

- A. Studs: ASTM C 645; 22 ga. unless otherwise indicated. Provide minimum thickness requirements as designated by the referenced standards. Provide heavier gauge studs at high wall per GA-216/ASTM 2840.
1. Depth of section: as indicated on plans.
2. Runners: 18 gauge bottom track; type recommended by stud manufacturer for floor and ceiling support of studs, and for vertical abutment of drywall work at other work. Provide deflection track at top.
3. Stud system accessories: provide stud manufacturer's standard clips, shoes, ties, reinforcements, fasteners and other accessories as needed for a complete stud system.
- B. Furring members: ASTM C 645; 25 ga., hat-shaped.

1. Resilient Channels - provide manufacturer's special type designed to reduce sound transmission.
- C. Z-furring members: manufacturer's standard screw-type zee-shaped furring members; of not thinner than 26 ga. galvanized steel, ASTM A 525, G90; of depth indicated; designed for mechanical attachment of insulation boards or blankets to monolithic concrete and masonry walls. Manufacturers offering products to comply with requirements include:
 1. United States Gypsum Co.
 2. Allied Structural Industries
 3. Dale Industries, Inc.
 4. Marino Industries
- D. Fasteners for furring members: type and size recommended by furring manufacturer for the substrate and application indicated.

2.3 GYPSUM BOARD PRODUCTS

- A. Exposed gypsum board: regular type with tapered long edges.
 1. Thickness: 5/8", except where otherwise indicated.
 2. Sheet size: maximum length available which will minimize end joints.
- B. Gypsum backing board: regular type, with V-groove or square edges, except provide exposed gypsum board with tapered edges where joint treatment is required.
 1. Thickness: 5/8", except where otherwise indicated.
 2. Sheet size: 4' x 8' or longer.
 3. Type X: provide where indicated (fire-resistive).
 4. Water-resistant type: provide at wet areas, or where recommended by GA-216.
- C. Exterior glass-mat gypsum sheathing board: Manufacturer's special water-resistant glass-mat gypsum board for exterior use, rounded or beveled edges. Sheathing board shall conform to ASTM C 1177. Product: Provide "Dens-Glass Gold" by G-P Gypsum Corporation or Architect's approved equal. Provide 5/8" thickness.
- D. Tile backer board: Durock (U.S. Gypsum Co.) Tile Backer Board in 1/2" thickness with 2" wide glass fiber joint tape.

2.4 TRIM ACCESSORIES

- A. Provide manufacturer's standard trim accessories of types indicated for drywall work, formed of galvanized steel unless otherwise indicated, with either knurled and perforated or expanded flanges for nailing and beaded for concealment of flanges in joint compound. Provide corner beads, edge trim-beads, and one-piece control joint beads of types to meet the conditions.

2.5 JOINT TREATMENT MATERIALS

- A. General: ASTM C 475; type recommended by the manufacturer for the application indicated, except as otherwise indicated.
- B. Joint tape: perforated type.
- C. Interior joint compound: provide chemical-hardening-type for bedding and filling, ready-mixed vinyl-type or vinyl-type powder-type for topping.

2.6 MISCELLANEOUS MATERIALS

- A. Provide auxiliary materials for gypsum drywall work of the type and grade recommended by the manufacturer of the gypsum board.
- B. Laminating adhesive: special adhesive or joint compound specifically recommended for laminating gypsum boards.
- C. Fastening adhesive (for wood): ASTM C 557.
- D. Gypsum board fasteners: comply with GA-216.
- E. Concealed acoustical sealant: mastic type; non-shrinking, non-drying, non-migrating and non-staining.
- F. Exposed acoustical sealant: latex, acrylic, or acrylic-latex type; permanently elastic and paintable.
- G. Sound attenuation blankets: FS HH-I-521, Type I; semi-rigid mineral fiber blanket without membrane, Class 25 flame-spread, thicknesses as indicated. Minimum 3" or as indicated.

PART 3 - EXECUTION

3.1 INSTALLATION OF METAL SUPPORT SYSTEMS

- A. Coordinate work with structural ceiling work to ensure that inserts and other structural anchorage provisions have been installed to receive ceiling hangers.
- B. Furnish concrete inserts, steel deck hanger clips and similar devices for installation well in advance of time needed for coordination with other work.
- C. Do not bridge building expansion joints with support system, frame both sides of joints with furring and other support as indicated.
- D. Nail or screw furring members to wood framing as indicated.

3.2 CEILING SUPPORT SUSPENSION SYSTEMS

- A. Secure hangers to structural support by connecting directly to structure where possible, otherwise connect to inserts, clips or other anchorage devices or fasteners as indicated.
- B. Space main runners 4'-0" o.c. and space hangers 4'-0" o.c. along runners, except as otherwise shown.
- C. Level main runners to a tolerance of 1/4" in 12'-0", measured both lengthwise on each runner and transversely between parallel runners.
- D. Wire-tie or clip furring members to main runners and to other structural supports as indicated.
- E. At Contractor's option, provide direct-hung metal support system, attach perimeter wall track or angle wherever support system meet vertical surfaces. Mechanically join support members to each other and butt-cut to fit into wall track.
- F. Space furring member 16" o.c., except as otherwise indicated.

- G. Install auxiliary framing at termination of drywall work, and at openings for light fixtures and similar work, as required for support of both the drywall construction and other work indicated for support thereon.

3.3 WALL/PARTITION SUPPORT SYSTEMS

- A. Install supplementary framing, blocking and bracing to support fixtures, equipment, services, heavy trim, furnishings and similar work which cannot be adequately supported on gypsum board alone.
- B. Isolate stud system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading.
- C. Install runner tracks at floors, ceilings and structural walls and columns where stud system abuts other work, except as otherwise indicated.
- D. Extend partition stud system through acoustical ceilings and elsewhere as indicated to the structural support or substrate above the ceiling.
- E. Terminate partition stud system at ceilings, except where indicated to be extended to structural support or substrate above.
- F. Space studs 16" o.c., except as otherwise indicated.
- G. Do not bridge building expansion and control joints with steel framing or furring members. Independently frame both sides of joints with framing or furring members.
- H. Frame door openings with vertical studs securely attached by screws at each jamb either directly to frames or to jamb anchor clips on door frame; install runner track sections (for jack studs) at head and secure to jamb studs.
- I. Provide runner tracks of same gauge as jamb studs. Space jack studs same as partition studs.
- J. Install double 20 ga. studs back to back at door jamb. Screw attach web of back-to-back studs direct to jamb anchor clips nested between flange of stud.
- K. Frame openings other than door openings in similar manner as required for door openings; and install framing below sills of openings to match framing required above door heads.
- L. Space wall furring members 16" o.c., except as otherwise indicated.
- M. Erect thermal insulation vertically and hold in place with 2-furring members spaced 24" o.c. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails or power-drive fasteners spaced 24" o.c. At exterior corners, attach with flange of furring members to wall with short flange extending beyond corner; start from this furring member with 3" wide strip of insulation followed by furring member in the normal manner. At interior corners, space second member no more than 12" from corner and cut insulation to fit. Until gypsum board is installed hold insulation in place with 10" stapes fabricated from 18 ga. tie wire and inserted through slot in web of member, or by an equally acceptable method.
- N. Install supplementary framing, runners, furring, blocking and bracing at opening and terminations in the work, and at locations required to support fixtures, equipment, services, heavy trim, furnishings and similar work which cannot be adequately supported directly on gypsum board alone.

3.4 GENERAL GYPSUM BOARD INSTALLATION REQUIREMENTS

- A. Meet at the project site with the installers of related work and review the coordination on sequencing of work to ensure that everything to be concealed by gypsum drywall has been accomplished, and that chases, access panels, openings, supplementary framing and blocking and similar provisions have been completed.
- B. Install sound attenuation blankets prior to gypsum board unless readily installed after board has been installed.
- C. Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less than 1'-0" in alternate courses of board.
- D. Install ceiling boards in the direction and manner which will minimize the number of end-butt joints, and which will avoid end joints in the central area of each ceiling. Stagger end joints at least 1'-0".
- E. Install wall/partition boards vertically to avoid end-butt joints wherever possible. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs.
- F. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16" open space between boards. Do not force into place.
- G. Located either edge or end joints over supports, except in horizontal applications or where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that both tapered edge joints abut, and mill-cut or field-cut end joints abut. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
- H. Attach gypsum board to framing and blocking as required for additional support at openings and cutouts.
- I. Form control joints and expansion joints with space between edges of boards, prepared to receive trim accessories.
- J. Cover both faces of steel stud partition framing with gypsum board in concealed spaces (above ceilings, etc.), except in chase walls which are properly braced internally.
- K. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4" to 1/2" space and trim edge with finishing edge trim. Seal joints with acoustical sealant. Do not fasten drywall directly to stud systems runner tracks.
- L. Where sound-rated drywall work is indicated, including double-layer work and work on resilient furring, seal the work at perimeters, control and expansion joints, openings and penetrations with a continuous bead of acoustical sealant including a bead at both faces of partitions. Comply with manufacturer's recommendations for location of beads, and close off sound-flanking paths around or through the work, including sealing of partitions above acoustical ceilings.
- M. Space fasteners in gypsum boards in accordance with referenced standards and manufacturer's recommendations, except as otherwise indicated.

3.5 SINGLE LAYER DRYWALL APPLICATION

- A. Install exposed gypsum board.

- B. On ceilings apply gypsum board prior to wall/partition board application to the greatest extent possible.
- C. On partitions/walls apply gypsum board vertically (parallel), unless otherwise indicated, and provide sheet lengths which will minimize end joints.
- D. On partitions/walls 8'-1" or less in height apply gypsum board horizontally (perpendicular); use maximum length sheets possible to minimize end joints.
- E. On Z-furring members apply gypsum board vertically (parallel) with no end joints. Locate edge joints over furring members.
- F. Where drywall is base for thinset ceramic tile and similar rigid applied wall finishes, install tile backer board.
- G. At "wet" areas, install water-resistant backing board. Apply with un-cut long edge at bottom of work, and space 1/4" above fixture lips. Seal ends, cut-edges and penetrations of each piece with water-resistant sealant before installation.

3.6 DOUBLE-LAYER DRYWALL APPLICATION

- A. Install gypsum backing board for base layer and exposed gypsum board for face layer.
- B. On ceilings apply base layer prior to base layer application on walls/partitions; apply face layers in same sequence. Offset joints between layers at least 10". Apply base layers at right angles to supports unless otherwise indicated.
- C. On partitions/walls apply base layer and face layers vertically (parallel) with joints of base layer over supports and face layer joints offset at least 10" with base layer joints.
- D. On Z-furring members apply base layer vertically (parallel) and face layer either vertically (parallel) or horizontally (perpendicular) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.

3.7 SINGLE-LAYER FASTENING METHODS

- A. Apply gypsum boards to supports as follows:
 - 1. Fasten with screws.

3.8 DOUBLE-LAYER FASTENING METHODS

- A. Apply base layer of gypsum board and face layer to base layer as follows:
 - 1. Fasten base layers with screws and face layer with adhesive and supplementary fasteners.

3.9 DIRECT-BONDING TO SUBSTRATE

- A. Where gypsum board is indicated to be directly adhered to a substrate (other than studs, joists, furring members or base layer of gypsum board), comply with gypsum board manufacturer's recommendations, and temporarily brace or fasten gypsum board until fastening adhesive has set.

3.10 EXTERIOR SOFFITS & CEILINGS

- A. Install exterior gypsum board at right-angles with supports, with end joints staggered over supports. Install with 1/4" open space where boards abut other work. Seal cut edges of each piece with water-resistant sealant before installation, and seal edges at penetration, and other cut-outs in each sheet.
- B. Fasten with zinc-coated screws, or with zinc-coated nails where supports are nailable.

3.11 INSTALLATION OF DRYWALL TRIM ACCESSORIES

- A. Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges in accordance with manufacturer's instructions and recommendations.
- B. Install metal corner beads at external corners of drywall work.
- C. Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed. Provide type with face flange to receive joint compound.
- D. Install J-type semi-finishing trim where exterior gypsum board edges are not covered by applied moldings.
- E. Install metal control joint (beaded-type) where indicated and where not indicated, install according to ASTM C 840. Review all locations with Architect for approval prior to framing walls.
- F. Install H-molding in exterior gypsum drywall work where control joints are indicated.

3.12 INSTALLATION OF DRYWALL FINISHING

- A. Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fasteners heads, surface defects and elsewhere as required to prepare work for decoration. Prefill open joints and rounded or beveled edges, using type of compound recommended by manufacturer.
- B. Drywall finishing is not required on concealed surfaces above ceilings or in unoccupied areas unless otherwise indicated.
- C. Apply joint tape at joints between gypsum boards, except where a trim accessory is indicated.
- D. Apply joint compound in 3 coats (not including prefill of openings in base), and sand between last 2 coats and after last coat.
- E. Where gypsum board is indicated as a base for adhesively-applied acoustical tile, install tape and 2-coat compound treatment, without sanding.
- F. Tape joints only where thinset ceramic finish over water-resistant gypsum board is indicated.
- G. Leave exposed board free of any imperfection which could be detected after applied finishes are placed.

3.13 LEVEL OF FINISH:

- A. Provide one of the following levels of drywall finish that are established by as a guide for specific final decoration.

3.14 STANDARDS:

- A. AWCI, Painting and Decorating Contractors of America, Gypsum Association and CISCA.
- B. Provide Level 3 where finished surfaces are visible unless indicated otherwise. The minimum requirements for each level shall be as described as follows:
1. LEVEL 0:
 - a. No taping, finishing, or accessories required.
 - b. Use for temporary construction only.
 2. LEVEL 1:
 - a. All joints and interior angles shall have tape set in joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.
 - b. Use in plenum areas above ceilings, in attics, in areas where the assembly would generally be concealed or in building service corridors, and other areas not normally open to public view. Use where some degree of sound and smoke control is required; or where "fire-taping" is indicated or required.
 - c. Where a fire-resistance rating is required for the gypsum board assembly, provide construction in accordance with fire rated assemblies subject to compliance with requirements.
 - d. Tape and fastener heads need not be covered with joint compound.
 3. LEVEL 2:
 - a. All joints and interior angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles.
 - b. Fastener heads and accessories shall be covered with a coat of joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.
 - c. Joint compound applied over the body of the tape at the time of tape embedment shall be considered a separate coat of joint compound and shall satisfy the conditions of this level.
 - d. Provide Level 2 finish where water-resistant gypsum backing board (ASTM C 630) is used as a substrate for other finish materials.
 4. LEVEL 3:
 - a. All joints and interior angles shall have tape embedded in joint compound and one additional coat of joint compound applied over all joints and interior angles.
 - b. Fastener heads and accessories shall be covered with two separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges.
 - c. The prepared surface shall be coated with a drywall primer prior to the application of final finishes where required by painting/wall covering specifications.
 - d. Provide Level 3 finish in appearance areas which are to receive heavy- or medium-texture (spray or hand applied) finishes before final painting, or where heavy-grade wall coverings are to be applied as the final decoration.
 - e. This level of finish shall not be used where smooth painted surfaces or light- to medium-weight wall coverings are specified.
 5. LEVEL 4:
 - a. All joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound.

- b. All joint compound shall be smooth and free of tool marks and ridges. Sand tool marks as required to provide smooth finish. Provide Level 4 finish when the prepared surface is to be coated with a drywall primer prior to the application of final finishes as required by painting/wall covering specifications.
 - c. Provide Level 4 finish where flat paints, light textures, or wall coverings are to be applied and in critical lighting areas, or where flat paints are to be applied over light textures. Level 4 finish is required to reduce joint photographing.
 - d. Where gloss, semi-gloss, and enamel paints are indicated, Level 4 finish is not recommended.
 - e. The weight, texture, and sheen level of wall coverings applied over this level of finish should be carefully evaluated by this contractor and reviewed by the Architect prior the use of Level 4 finish to establish where there may be the need for a higher level of finish.
 - f. Joints and fasteners must be adequately concealed if the wall covering material is lightweight, contains limited pattern, has a gloss finish, or where any combination of these is present. Level 4 finish shall not be used where unbacked vinyl wall coverings are indicated.
6. LEVEL 5:
- a. All joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound.
 - b. A thin skim coat of joint compound or a material manufactured especially for this purpose shall be applied to the entire surface.
 - c. The surface shall be smooth and free of tool marks and ridges. The prepared surface shall be coated with a drywall primer prior to the application of finish paint where the painting specification indicates that such a primer is required.
 - d. Provide Level 5 finish where gloss, semi-gloss, enamel, or non-textured flat paints are specified or where severe lighting conditions occur.

Note: Critical (severe) lighting areas are defined as wall and ceiling areas abutting window mullions or skylights, long hallways, or atriums with large surface areas flooded with artificial and/or natural lighting or other surfaces indicated on the drawings, or where not indicated, such conditions shall be as defined by the Architect.

3.15 APPLICATION OF TEXTURE FINISH

- A. Provide smooth finish (Level 3) on all exposed drywall work.
- B. Prepare drywall surfaces in strict accordance with texture finish manufacturer's instructions.
- C. Mix and apply finish to drywall surfaces in strict accordance with manufacturer's instructions to produce a uniform texture matching approved sample without starved spots or other evidence of thin application, and free of application patterns.
- D. Remove any texture from surfaces of adjoining construction.

3.16 PROTECTION

- A. Provide final protection and maintain conditions which ensures gypsum drywall construction being without damage or deterioration at time of substantial completion.
- B. All non-water resistant and non-tile backer board gypsum board subject to wetting during the construction period, whether from interior or exterior water sources, shall be removed and replaced.

3.17 PROTECTION OF WORK

- A. Protect gypsum drywall work from damage and deterioration during remainder of construction period.

END OF SECTION

SECTION 093013 - CERAMIC TILING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Porcelain tile.
 - 2. Glazed wall tile.
 - 3. Tile backing panels.
 - 4. Waterproof membrane for thinset applications.
 - 5. Crack isolation membrane.
 - 6. Metal edge strips.
- B. Related Requirements:
 - 1. Section 079200 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
 - 2. Division 23 – Floor Drains.
 - 3. Section 083113 – "Access Doors and Frames"

1.3 DEFINITIONS

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in its "Specifications for Installation of Ceramic Tile."
- C. Module Size: Actual tile size plus joint width indicated.
- D. Face Size: Actual tile size, excluding spacer lugs.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Samples for Verification:
 - 1. Full-size units of each type and composition of tile and for each color and finish required.
 - 2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required. Make samples at least 12 inches square, but not fewer than four tiles. Use grout of type and in color or colors approved for completed Work.
 - 3. Full-size units of each type of trim and accessory for each color and finish required.
 - 4. Metal edge strips in 6-inch lengths.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.
- C. Product Certificates: For each type of product.
- D. Product Test Reports: For tile-setting and -grouting products.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.
 - 2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Installer is a Trowel of Excellence member of the Tile Contractors' Association of America.
 - 2. Installer's supervisor for Project holds the International Masonry Institute's Foreman Certification.
 - 3. Installer employs Ceramic Tile Education Foundation Certified Installers.
- B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockup of each type of floor tile installation.
 - 2. Build mockup of each type of wall tile installation.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.

- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
- D. Store liquid materials in unopened containers and protected from freezing.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Tile: Obtain tile of each type and color or finish from single source or producer.
 - 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.
 - 1. Obtain setting and grouting materials, waterproof membrane, and crack isolation membrane, from single manufacturer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer:
 - 1. Cementitious backer units.
 - 2. Metal edge strips.

2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
 - 1. Provide tile complying with Standard grade requirements unless otherwise indicated.
- B. ANSI A118 Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.
- C. ISO 13007 Standards for Ceramic Tiles, Grouts, and Adhesives: Provide materials complying with ISO 13007 Standards.
- D. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- E. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.

1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

2.3 TILE PRODUCTS (refer to Section 019000 – Finish Legend)

2.4 THRESHOLDS

- A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
 1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to 1/16 inch above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to 1/2 inch or less above adjacent floor surface.
- B. Marble Thresholds: ASTM C 503/C 503M, with a minimum abrasion resistance of 10 according to ASTM C 1353 or ASTM C 241/C 241M and with honed finish.
 1. Description: Match Architect's sample.

2.5 TILE BACKING PANELS

- A. Cementitious Backer Units: ANSI A118.9 or ASTM C 1325, Type A, in maximum lengths available to minimize end-to-end butt joints.
 1. Subject to compliance with requirements, by one of the following:
 - a. Durock.
 - b. Hardy Board
 - c. Georgia-Pacific Building Products.
 - d. United State Gypsum Company.
 2. Thickness: 1/2 inch.

2.6 WATERPROOF MEMBRANE

- A. General: Manufacturer's standard product that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

2.7 CRACK ISOLATION MEMBRANE

- A. General: Manufacturer's standard product that complies with ANSI A118.12 for standard performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. Fluid-Applied Membrane: Liquid-latex rubber or elastomeric polymer.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide MAPEI Corporation; Mapelastic CI or a comparable product by one of the following:
 - a. Custom Building Products.
 - b. Laticrete International, Inc. Blue 92

2.8 SETTING MATERIALS

- A. Modified Dry-Set Cement Mortar: ANSI A118.4 and ISO 13007 C1E.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide MAPEI Corporation; Ultraflex LFT or a comparable product by one of the following:
 - a. Custom Building Products. Versabond Flex
 - b. Laticrete International, Inc. 253 Gold

- c. TEC; H.B. Fuller Construction Products Inc.
- 2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
- 3. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4 and ISO 13007; C2TE.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide MAPEI Corporation; MAPEI Ultraflex LFT or a comparable product by one of the following:
 - 1) Custom Building Products. Prolite
 - 2) Laticrete International, Inc. 255 Multimax

2.9 GROUT MATERIALS

- A. Ready to Use Grout: ANSI A118.6 and ASTM C267.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide MAPEI Corporation; Flexcolor CQ or a comparable product by one of the following:
 - a. Custom Building Products.
 - b. Laticrete International, Inc.
- B. Standard Sanded Cement Grout: ASNI A118.6.
 - 1. Basis for Design Product: Subject to compliance with requirements, provide MAPEI Corp. TLTRACOLOR PLUS FA or a compatible product by one of the following:
 - a. Custom Building Products
 - b. Laticrete Inc.

2.10 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, Portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide MAPEI Corporation; Mapecem Quickpatch.
- B. Vapor-Retarder Membrane: Polyethylene sheeting, ASTM D 4397, 4.0 mils thick.
- C. Metal Edge Strips: Angle or L-shaped, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications;] stainless-steel, ASTM A 666, 300 Series exposed-edge material.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Blanke Corporation.
 - b. Ceramic Tool Company, Inc.
 - c. Schluter Systems L.P.
- D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide MAPEI Corporation; UltraCare Concentrated Tile & Grout Cleaner or a comparable product by one of the following:
 - a. Aquamix by Custom Building Products

2.11 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
 - 2. Verify that concrete substrates for tile floors installed with thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
 - 3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
 - 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.
- C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 CERAMIC TILE INSTALLATION

- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation

methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
 - a. Tile floors in wet areas.
 - b. Tile floors consisting of tiles 8 by 8 inches or larger.
- B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- E. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.
- F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
 2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
- G. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
 1. Glazed Wall Tile: 1/16 inch or as instructed by Architect.
 2. Porcelain Tile: 1/4 inch or as instructed by Architect.
- H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- I. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
 1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
- J. Stone Thresholds: Install stone thresholds in same type of setting bed as adjacent floor unless otherwise indicated.
- K. Metal Edge Strips: Install at locations indicated.

3.4 TILE BACKING PANEL INSTALLATION

- A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use latex-Portland cement mortar for bonding material unless otherwise directed in manufacturer's written instructions.

3.5 WATERPROOFING INSTALLATION

- A. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.
- B. Allow waterproofing to cure and verify by testing that it is watertight before installing tile or setting materials over it.

3.6 CRACK ISOLATION MEMBRANE INSTALLATION

- A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely to substrate.
- B. Allow crack isolation membrane to cure before installing tile or setting materials over it.

3.7 ADJUSTING AND CLEANING

- A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.
- B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove grout residue from tile as soon as possible.
 - 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3.8 PROTECTION

- A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- B. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.9 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

- A. Interior Floor Installations, Concrete Subfloor:
 - 1. Ceramic Tile Installation: TCNA F113; thinset mortar.
 - a. Ceramic Tile Type:
 - b. Thinset Mortar: Medium-bed, latex- Portland cement mortar.
 - c. Grout: Standard unsanded cement grout.
 - 2. Ceramic Tile Installation: TCNA F122; thinset mortar on waterproof membrane.
 - 3. Ceramic Tile Installation: TCNA F125-Full; thinset mortar on crack isolation membrane.

SECTION 095113 - ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Requirements of Drawings, General and Supplementary Conditions and DIVISION 1 apply to this Section.

1.2 SCOPE

- A. Provide all acoustical ceiling work including but not necessarily limited to:
 - 1. Refer to Section 019000 – FINISH LEGEND.
- B. Related work specified elsewhere:
 - 1. Building insulation SECTION 072100
 - 2. Acoustic treatment of mechanical installations DIVISION 23

1.3 QUALITY ASSURANCE

- A. Installer: Firm with not less than three years of successful experience in installation of acoustical ceilings similar to requirements for this project and which is acceptable to manufacturer of acoustical units, as shown by current written statement from manufacturer.
- B. Provide acoustical ceiling components that are identical to those tested for the following fire performance characteristics, according to ASTM E 84 test method or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify acoustical ceiling components with appropriate marking of applicable testing and inspecting agency.

Flame spread: 25 or less
Smoke developed: 50 or less
- C. Provide units with fire-resistance ratings as indicated; tested per ASTM E 119. Provide protection materials for lighting fixtures and air ducts to comply with requirements indicated for rated assembly.
- D. Coordinate layout and installation of acoustical ceiling units and suspension system components with other work supported by or penetrating through, ceilings.

1.4 SUBMITTALS

- A. Submit manufacturer's product specifications and installation instructions for each acoustical ceiling material required, and for each suspension system, including certified laboratory test reports and other data as required to show compliance with these specifications.
- B. Submit set of 12" square samples for each acoustical unit required, showing full range of exposed color and texture to be expected in completed work.
- C. Submit set of 12" long samples of each exposed runner and molding.

1.5 DELIVERY, STORAGE & HANDLING

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from all causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and stabilized moisture content.
- C. Do not install acoustical ceiling units which have chipped edges or are otherwise damaged in any way.
- D. Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

PART 2 - PRODUCTS

2.1 ACOUSTICAL CEILING UNITS, GENERAL

- A. Provide manufacturer's standard units of configuration indicated which are prepared for mounting method designated and which comply with FS SS-S-118 requirements. Provide 24" x 24" panel sizes unless otherwise indicated. Provide thickness as required to provide specified characteristics.
 - 1. Mounting method for measuring NRC: No. 7 (mechanically mounted on special metal support), FS SS-S-118; or Type E-400 mounting as per ASTM E 795.
- B. Acceptable Manufacturers:
 - 1. United States Gypsum Co.
 - 2. Armstrong Corp.
 - 3. Hunter-Douglas Inc.
 - 4. CertainTeed Inc.

2.2 ACOUSTICAL PANELS (REFER TO SECTION 019000)

2.3 METAL SUSPENSION SYSTEMS – GENERAL (REFER TO SECTION 019000)

- A. Provide metal suspension systems of type, structural classification and finish indicated which comply with applicable ASTM C 635 requirements.
- B. Provide manufacturer's standard finish for type of system indicated, unless otherwise required. For exposed suspension members and accessories with painted finish, provide color indicated or, if not otherwise indicated, as selected by Architect.
 - 1. Comply with ASTM C 635 requirements for "Coating Classification for Severe Environment Performance" where high humidity finishes are indicated.
- C. Attachment devices for five times design load indicated in ASTM C 635, Table 1, Direct Hung.
 - 1. Provide concrete inserts formed from hot-dipped galvanized sheet steel and designed for attachment to concrete forms and for embedment in concrete, with holes or loops for attachment at hanger wires.
- D. Provide hangers of galvanized carbon steel wire, ASTM A 641, soft temper, prestretched, Class 1 coating, sized so that stress at three-times hanger design load (ASTM C 635, Table 1, Direct Hung), will be less than yield stress of wire, but provide not less than 12 gauge.

- E. Provide edge moldings and trim of galvanized metal of types and profiles indicated or, if not indicated, provide manufacturer's standard molding for edges and penetrations of ceiling which fits with type of edge detail and suspension system indicated.
 - 1. For lay-in panels with reveal edge details, provide stepped edge molding which forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
 - 2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
- F. Provide hold-down clips for non-fire-rated, interior ceilings composed of lay-in panels weighing less than 1 lb. per sq. ft., spaced 2'-0" o.c. on all cross tees.
- G. Subject to compliance with requirements, manufacturer's offering acceptable suspension systems include:
 - 1. Manufacturers of Steel Suspension Systems: Same as acoustical unit manufacturer.

2.4 EXPOSED METAL DIRECT (OR INDIRECT) HUNG SUSPENSION SYSTEMS

- A. Structural classification: intermediate-duty system
 - 1. Finish: Refer to Section 019000.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Furnish layouts for inserts, clips, or other supports required to be installed by other trades for support of acoustical ceilings.
 - 1. Furnish steel deck hanger clips and similar devices to other trades for installation well in advance of time needed for coordination of other work.
- B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half width units at borders, and comply with reflected ceiling plans wherever possible. If variation is found between field conditions and reflected ceiling plans, review grid pattern with Architect prior to installation.

3.2 INSTALLATION

- A. Install materials in accordance with manufacturer's printed instructions, and to comply with governing regulations, fire-resistance rating requirements as indicated, and industry standards applicable to work.
- B. Arrange acoustical units and orient directionally-patterned units (if any) in manner shown by reflected ceiling plans.
 - 1. Install tile with pattern as directed by Architect.
- C. Install suspension systems to comply with ASTM C 636, with hangers supported only from building structural members. Locate hangers not less than 6" from each end and spaced 4'-0" along each carrying channel or direct-hung runner, unless otherwise indicated, leveling to tolerance of 1/8" in 12'-0".
 - 1. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other devices which are secure and appropriate for substrate, and which will not deteriorate or fail with age or elevated temperatures.
 - 2. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum which are not part of supporting structural or ceiling suspension system. Splay

hangers only where required to miss obstructions and offset resulting horizontal force by bracing, countersplaying or other equally effective means.

- D. Provide mechanical attachment for each carrying member at each intersection with other carrying member.
- E. Install edge moldings of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical units.
 - 1. Screw-attach moldings to substrate at intervals not over 16" o.c. and not more than 3" from ends, leveling with ceiling suspension system to tolerance of 1/8" in 12'- 0". Miter corners accurately and connect securely. Do not use exposed pop riveted.
- F. Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations.

3.3 ADJUST & CLEAN

- A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage or sag.

SECTION 095433 - WOOD VENEER PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section

1.2 SUMMARY

- A. Section Includes
 - 1. Solid Wood and Wood veneer ceiling panels and guard rail at Lobby (for vertical and horizontal surfaces).
 - 2. Exposed grid suspension system
 - 3. Wire hangers, fasteners, main runners, wall angle moldings and accessories.
- B. Related Sections:
 - 1. Section 09 5113 "Acoustical Panel Ceilings"
 - 2. Division 23 - HVAC
 - 3. Division 26 - Electrical

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
 - 2. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
 - 3. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
 - 4. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
 - 5. ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
 - 6. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
 - 7. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
 - 8. ASTM E 580 Installation of Metal Suspension Systems in Areas Requiring Moderate Seismic Restraint
 - 9. ASTM E 1264 Classification for Acoustical Ceiling Products
- B. Hardwood Plywood & Veneer Association (HPVA)
- C. International Building Code
- D. ASHRAE Standard 62.1-2004 Ventilation for Acceptable Indoor Air Quality
- E. NFPA 70 National Electrical Code
- F. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures

- G. International Code Council-Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components
- H. International Code Council-Evaluation Services Report - Seismic Engineer Report
 - 1. ESR 1308 - Armstrong T-Bar or Dimensional Suspension
- I. California Air Resources Board (CARB) compliant
- J. LEED - Leadership in Energy and Environmental Design is a set of rating systems for the design, construction, operation, and maintenance of green buildings

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each type of ceiling unit and suspension system required.
- B. Installation Instructions: Submit manufacturer's installation instructions as referenced in Part 3, Installation.
- C. Samples: Minimum 3-1/2 inch or 5-1/2-inch samples of specified panel; 8-inch-long samples of exposed wall molding and suspension system, including main runner.
- D. Shop Drawings: Illustrating the layout and details of the ceilings. Show locations of items that are to be coordinated with, or supported by the ceilings.
- E. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.
- F. All products not conforming to manufacturer's current published values must be removed and dispose. Replace with complying product at the expense of the Contractor performing the work.

1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide ceiling panel units and grid components by a single manufacturer.
- B. Fire Performance Characteristics: Identify ceiling components with appropriate markings of applicable testing and inspecting organization.
 - 1. Surface Burning Characteristics: As follows, tested by HPVA (Hardwood Plywood and Veneer Association) under the test standard ASTM E-84 tunnel test and complying with ASTM E 1264 for Class A products.
 - a. Flame Spread: 25 or less
 - b. Smoke Developed: 50 or less
- C. Woodworking Standards: Manufacturer must comply with specified provisions of Architectural Woodworking Institute quality standards.
- D. Woodwork Panels: As with other architectural features located at the ceiling, may obstruct or skew the planned fire sprinkler water distribution pattern through possibly delay or accelerate the activation of the sprinkler or fire detection systems by channeling heat from a fire either toward or away from the device. Designers and installers are advised to consult a fire protection engineer, NFPA 13, or their local codes for guidance where automatic fire detection and suppression systems are present.

- E. Coordination of Work: Coordinate ceiling work with installers of related work including, but not limited to building insulation, wet work i.e. gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Store the wood veneer ceiling panels in a dry interior location in their cartons prior to installation to avoid damage. Store the ceiling panel cartons in a flat, horizontal position. Do not remove the protectors between the panels until installation.
- B. Do not store in unconditioned spaces with humidity greater than 55 percent or lower than 25 percent relative humidity and temperatures lower than 50 degrees F or greater than 86 degrees F. Do not expose the wood veneer ceiling panels to extreme temperatures, for example, close to a heating source or near a window with direct sunlight.
- C. Handle ceiling units carefully to avoid chipped edges or damage to units in any way.

1.7 PROJECT CONDITIONS

- A. Prior to installation, the wood veneer materials are required to reach room temperature and have stabilized moisture content for a minimum of 72 hours.
- B. Do not install the wood veneer panels in spaces where the temperature or humidity conditions vary greatly from the temperatures and conditions that will be normal in the occupied space.
- C. As interior finish products, the wood veneer panels are designed for installation in temperature conditions between 50 degrees F and 86 degrees F, in spaces where the building is enclosed and HVAC systems are functioning and will be in continuous operation. Relative humidity should not fall below 25 percent or exceed 55 percent.

1.8 WARRANTY

- A. Wood Veneer Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to:
 - 1. Ceiling Panels: Defects in materials or factory workmanship
 - 2. Grid System: Rusting and manufacturing defects
- B. Warranty Period:
 - 1. Wood veneer panels: Two (2) years from date of Substantial Completion
 - 2. Grid: One (1) year from date of Substantial Completion
- C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.9 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
 - 1. Ceiling and Wall Units: Furnish quantity of full-size units equal to 5.0 percent of amount installed.

2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Ceiling Panels: Refer to Section 019000 Finish Legend.
- B. Suspension Systems: Refer to Section 019000 Finish Legend.

2.2 METAL SUSPENSION SYSTEMS

- A. Components:
 1. Main beams and cross tees, base metal and end detail, fabricated from commercial quality hot dipped galvanized steel complying with ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping prefinished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.
 - a. Structural Classification: ASTM C 635 Heavy Duty
 - b. Color: Silver Satin and match the actual color of the selected ceiling tile, unless noted otherwise.
 - c. Acceptable Product: SUPRAFINE XL 9/16" Exposed Tee as manufactured by Armstrong World Industries
- B. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft annealed, with a yield stress load of at least time three design load, but not less than 12 gauge.
- D. Wood Works Edge Moldings and Trim: 1. 7800 - 12' Wall Molding
- E. Wood Works Suspension Accessories: Provide manufacturer's system for installation of vertical wood panels.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out.
- B. Proper designs for both supply air and return air, maintenance of the HVAC filters and building interior space are essential to minimize soiling. Before starting the HVAC system, make sure supply air is properly filtered and the building interior is free of construction dust.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

3.3 INSTALLATION

- A. Install suspension system and panels in compliance with ASTM C636; CISCA Seismic Guidelines; approved construction drawings; with the authorities having jurisdiction; and in accordance with the manufacturer's installation instructions.
- B. Install wall moldings at intersection of suspended ceiling and vertical surfaces.
- C. Install guard rail panels as indicated on drawings.

3.4 ADJUSTING AND CLEANING

- A. Replace damaged and broken panels.
- B. Clean exposed surfaces of ceilings panels, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095433

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Luxury Vinyl Plank. (refer to Section 019000 – Finish Legend).
 - 2. Resilient Base.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 1. Show details of special patterns.
- C. Samples: Full-size units of each color and pattern of floor tile required.
- D. Samples for Initial Selection: For each type of floor tile indicated.
- E. Samples for Verification: Full-size units of each color and pattern of floor tile required.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.

1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.
- B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 1. Build mockups for floor tile including resilient base and accessories.
 - a. Size: Minimum 100 sq. ft. for each type, color, and pattern in locations directed by Architect.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.9 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than, in spaces to receive floor tile during the following time periods:
 1. 48 hours before installation.
 2. During installation.
 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
- B. Flooring products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.2 LUXURY VINYL PLANK (refer to Section 019000 Finish Legend)

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Mohawk Group.
 2. Architect approved equal.
- B. Tile Standard: ASTM F 1700.
1. Class: Class III, printed film vinyl tile.
 2. Type: as selected.
- C. Thickness: 0.100 inch or 2.5 mm
- D. Wear layer Thickness: 20 mils.
- E. Size: 12' x 24".
- F. Colors and Patterns: As selected by Architect.
- G. Warranty: 10 Year Commercial Wear Warranty

2.3 RESILIENT BASE (Refer to Section 019000 – Finish Legend).

2.4 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.
1. Adhesives shall have a VOC content of 50 g/L or less.
 2. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- C. Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
 3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
 4. Contractor shall be responsible for the cost of any floor storing required to provide a flat surface. Note: A Level 1 floor flatness test shall be conducted by Owner's testing lab.
 5. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
 - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until they are the same temperature as the space where they are to be installed.
1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
1. Lay tiles square with room axis.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
1. Lay tiles with grain running as selected by Architect.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.
 - 1. Apply two coats and buff floors as per manufacturer's recommendations.
- E. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 096813 - CARPET TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Requirements of Drawings, General and Supplementary Conditions and DIVISION 1 apply to this Section.

1.2 SCOPE

- A. Provide all carpet tile work including but not necessarily limited to:
 - 1. Carpet tile and installation.
- B. Related work specified elsewhere:
 - 1. Resilient Flooring SECTION 096500

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance. Include installation methods.
- B. Shop Drawings: Show the following:
 - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
 - 2. Carpet tile type, color, and dye lot.
 - 3. Type of installation.
 - 4. Pattern of installation.
 - 5. Pattern type, location, and direction.
 - 6. Pile direction.
 - 7. Type, color, and location of insets and borders.
 - 8. Type, color, and location of edge, transition, and other accessory strips.
 - 9. Transition details to other flooring materials.
- C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
- D. Carpet Tile: Full-size Sample.
- E. Exposed Edge Stripping and Accessory: 12-inch- long Samples.
- F. Product Schedule: Use same room and product designations indicated on Drawings and in schedules.
- G. Maintenance Data: For carpet tile to include in maintenance manuals specified in Division 1. Include the following:
- H. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
- I. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.
- B. Product Options: Products and manufacturers named in Section 019000 establish requirements for product quality in terms of appearance, construction, and performance. Other manufacturers' products comparable in quality to named products and complying with requirements may be considered. Refer to Division 1 Section "Substitutions."
- C. Mockups: Before installing carpet tile, install mockups for each type of carpet tile installation required to demonstrate aesthetic effects and qualities of materials and execution. Install mockups to comply with the following requirements, using materials indicated for the completed Work:
 - D. Install mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
 - E. Notify Architect seven days in advance of dates and times when mockups will be installed.
 - F. Demonstrate the proposed range of aesthetic effects and workmanship.
 - G. Obtain Architect's approval of mockups before starting work.
 - H. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - I. Remove mockups when directed.
 - J. Approved mockups may become part of the completed Work if undamaged at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. General: Comply with CRI 104, Section 5, "Storage and Handling."

1.6 PROJECT CONDITIONS

- A. General: Comply with CRI 104, Section 6.1, "Site Conditions; Temperature and Humidity."
- B. Environmental Limitations: Do not install carpet tile until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Do not install carpet tile over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet tile, install carpet tile before installing these items.

1.7 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

- B. Special Carpet Tile Warranty: Written warranty, signed by carpet tile manufacturer agreeing to replace carpet tile that does not comply with requirements or that fails within specified warranty period. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, and delamination.
- C. Warranty Period: 10 years from date of Substantial Completion.

1.8 EXTRA MATERIALS

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- B. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.

PART 2 - PRODUCTS – REFER TO SECTION 019000 FINISH LEGEND

2.1 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided by or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and that is recommended by carpet tile manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Verify that substrates and conditions are satisfactory for carpet tile installation and comply with requirements specified.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
- C. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet tile manufacturer.
- D. Subfloor finishes comply with requirements specified in Division 3 Section "Cast-in-Place Concrete" for slabs receiving carpet tile.
- E. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.

- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.
- D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. General: Comply with CRI 104, Section 13, "Carpet Modules (Tiles)."
- B. Installation Method: Glue-down; install every tile with releasable adhesive.
- C. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- D. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.
- F. Install pattern parallel to walls and borders.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
 - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 - 2. Remove yarns that protrude from carpet tile surface.
 - 3. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile to comply with CRI 104, Section 15, "Protection of Indoor Installations."
- C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION

09 77 00 – FIBERGLASS REINFORCED PANELS

PART 1 – GENERAL

1.1 SCOPE:

- A. Pre-finished FRP (Fiberglass Reinforced Plastic) wall panels for sanitary environments.

1.2 QUALIFICATIONS:

- A. Basis of Design are products offered by Sequentia Structo Décor FRP. Comparable products meeting exact criteria are acceptable.

1.3 ENVIRONMENTAL CONDITIONS:

- B. Building should be fully enclosed prior to installation with sufficient heat (70°) and ventilation consistent with good working conditions for finish work

1.4 DELIVERY AND STORAGE OF MATERIALS:

- A. Materials are to be factory packaged on strong pallets. All materials are to be stored lying flat, under cover and protected from the elements. Panels should be allowed to acclimate to room temperature (70°) for 48 hours prior to installation.

1.5 WARRANTY

- A. All products shall be warranted to be free from defects for a period of 1 YEAR after delivery.

PART 2 - PRODUCTS

2.1 MANUFACTURER:

- A. Subject to approval by the Architect, acceptable products are, but, not limited to:
 - 1. FRP panels – Refer to Section 019000.

2.2 ACCESSORIES

- A. All trim specified shall be extruded aluminum or extruded rigid PVC.
- B. Extruded PVC Trim Profiles for .090" thick panels.
 - 1. Inside Corner
 - 2. Outside Corner
 - 3. Division
 - 4. Edge
- C. Trim Finish: Trim shall have factory finish colors to coordinate with FRP panels.
- D. Extruded PVC to be color-thru and selected by the Architect from the manufacturer's available choices.

- E. Outside Corner Guard Finish: Stainless Steel
- F. All PVC Base Molding shall be rigid extruded PVC with integral color.
- G. Base Profiles for .090" thick panels
 - 1. FRP Base Molding
 - 2. Inside Corner
 - 3. Outside Corner
 - 4. LH End Cap
 - 5. RH End Cap

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Open cartons and carefully inspect all panels.
- B. Contact manufacturer with questions or problems

3.2 PREPARATION

- A. Panels must be applied over a smooth, solid, flat, clean subwall such as drywall or plywood.

3.3 CONDITIONING

- A. Panels should be opened and allowed to acclimate for 48 hours prior to installation. Room temperature should be approximately 70° F.

3.4 INSTALLATION

- A. Install all panels in strict accordance with manufacturer's installation instructions.
- B. All moldings must provide for a minimum 1/8 inch expansion joint to insure proper installation.
- C. Provide a strong, flexible, water-resistant, solvent based adhesive formulated for fast, easy application that meets ASTM Specification C557.

3.5 SEALANT

- A. Apply manufacturer's Clear Silicone Sealant

3.6 MAINTENANCE

- A. Wipe down using a damp cloth and mild soap solution or cleaner. Refer to manufacturer's specific cleaning recommendations Do not use abrasive cleaners.

END OF SECTION

SECTION 099010 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General provisions of the Contract, including General and Supplementary Conditions and DIVISION 01 apply to this Section.

1.2 SUMMARY

- A. Provide exterior and interior coating and painting work including but not necessarily limited to:
 - 1. Painting and finishing of interior and exterior exposed items and surfaces throughout project, which normally receive such applied finishes except as otherwise indicated. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections of work.
 - 2. Include field painting of exposed bare and covered pipes and ducts (including color coding), and of hangers, exposed steel and iron work, and primed metal surfaces of all mechanical and electrical installations except as otherwise indicated.
 - 3. "Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.
 - 4. Paint exposed surfaces except where natural finish of material is specifically noted as a surface not to be painted. Where items or surfaces are not specifically mentioned, paint same as adjacent similar materials or areas.
 - 5. Repair/touch-up/repainting of existing painted work disturbed by construction operations and as necessary to conform with construction requirements.
- B. Following categories of work are not included as part of field-applied finish work.
 - 1. Unless otherwise indicated, do not include painting when factory-finishing or manufacturer-finishing is specified.
 - 2. Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation underfloor spaces, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts.
 - 3. Unless otherwise indicated, metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting.
 - a. Unless otherwise indicated, do not paint "Galvalume" or coil coated metal surfaces ('Kynar').
 - 4. Unless otherwise indicated, moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting.
 - 5. Unless otherwise indicated, factory primed metal surfaces will require a barrier coat or equivalent surface preparation prior to application of finish coats. The following categories of work are included under other sections of these specifications:
 - 6. Unless otherwise specified, shop priming of ferrous metal items is included under various sections for structural steel, metal fabrications, hollow metal work and similar items.
 - 7. Unless otherwise specified, shop priming of shop-fabricated or factory-built mechanical and electrical equipment or accessories is included under other sections of these specifications.

8. Painting of mechanical and electrical equipment is specified in applicable sections of the specifications.
- C. Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

1.3 QUALITY ASSURANCE

- A. Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.
- B. Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information or characteristics of finish materials provided for use, to ensure compatible prime coats are used.
- C. Color scheme may involve the use of multi-colors on contiguous non-planar surfaces which share edges/corners and/or on contiguous planar surfaces divided by joints or trim members.

1.4 SUBMITTALS

- A. Submit manufacturer's technical information including paint label analysis and application instructions for each material proposed for use.
- B. Prior to beginning work, Architect will furnish color chips for surfaces to be painted. Use representative colors when preparing samples for review. Submit samples for Architect's review of color and texture only. Provide a listing of material and application for each coat of each finish sample.
 1. On 12" X 12" hardboard, provide two (2) samples of each color and material, with texture to simulate actual conditions. Resubmit samples as requested by Architect until acceptable sheen, color, and texture is achieved.
 2. On actual wood surfaces, provide two 4" X 8" samples of natural and stained wood finish. Label and identify each as to location and application.
 3. On concrete masonry, provide two 4" square samples of masonry for each type of finish and color, defining filler, prime and finish coat.
 4. On actual wall surfaces and other exterior and interior building components, duplicate painted finishes of prepared samples. Provide full-coat finish samples on at least 100 sq. ft. of surface, as directed, until required sheen, color and texture is obtained; simulate finished lighting conditions for review of in-place work.
 5. Final acceptance of colors will be from samples applied on the job.
- C. Product List: For each product indicated, include the following:
 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
 2. Printout of current "Master Painter's Institute (MPI) Approved Products List" for each coating system specified in Part 3, with the proposed product highlighted.
 3. VOC content.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and following information, incorporating the following information:
 - 1. Product name and type (description).
 - 2. Batch date.
 - 3. Color name and number.
 - 4. VOC content.
 - 5. Environmental handling requirements.
 - 6. Surface preparation requirements.
 - 7. Application instructions.
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.
 - 1. Protect from freezing where necessary.
 - 2. Keep storage area neat and orderly.
 - 3. Remove contaminated rags and waste daily.
 - 4. Take all precautions to ensure that workers and work areas are adequately protected from fire hazards and health hazards resulting from handling, mixing and application of paints.

1.6 FIELD CONDITIONS

- A. Apply water-based paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50 deg. F and 90 deg. F, unless otherwise permitted by paint manufacturer's printed instructions.
- B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 deg. F and 95 deg. F, unless otherwise permitted by paint manufacturer's printed instructions.
- C. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 85%, or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.
- E. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide best quality trade sale paint materials of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying

manufacturer's identification as a standard, best quality trade sale product will not be acceptable.

1. Proprietary names used to designate colors or materials are not intended to imply that products of named manufacturers are required to exclusion of equivalent products of other manufacturers.
- B. Master Painter's Institute (MPI) Standards: Provide products that comply with MPI Standards indicated and that are listed in "MPI Approved Products List". All such material shall be from a single manufacturer for each system used to the maximum extent commercially feasible.
1. Unless specifically indicated as 'Budget', provide MPI 'Premium' grade equivalent systems and products.
- C. Accessory materials such as linseed oil, shellac, thinners, solvents, etc. shall be the highest quality product of an MPI listed manufacturer and shall be compatible with paint materials being used as required.
- D. All materials used shall be lead and mercury free.
- E. Where required by the authorities having jurisdiction, use only materials having a minimum MPI "Environmentally Friendly" E1 rating based on VOC (EPA Method 24) content levels.
- F. Where odor-less coatings are indicated, use only MPI listed materials having a minimum E2 rating.
- G. All paint materials shall have good flowing and brushing properties and shall dry or cure free of blemishes, sags, air entrapment, etc.
- H. Where required, paints and coatings shall meet flame spread and smoke developed ratings designated by Code officials and authorities having jurisdiction.
1. Gloss: As indicated in Paint Schedule. If not indicated, as selected by Architect from manufacturer's full range of gloss level available for system indicated.
 2. Colors: Match Architect's color board.
- I. Provide color pigments of pure, non-fading materials and to suit substrates and service indicated.
- J. Material Compatibility:
1. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a coating system, provide products recommended in writing by manufacturers of topcoat for use in coating system and on substrate indicated.
 3. Provide products of same manufacturer for each coat in a coating system to the maximum extent commercially feasible.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Applicator must examine areas and conditions under which painting work is to be applied. Do not proceed with work until unsatisfactory conditions have been corrected. Starting of painting work will be construed as Applicator's acceptance of surfaces and conditions within any particular area.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.
- C. Report in writing conditions that may affect application, appearance, or performance of paint.

3.2 PREPARATION

- A. Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.
- B. Provide barrier coats over incompatible primers or remove and reprime as required. Notify Architect in writing of any anticipated problems in using the specified coating systems with substrates primed by others.
- C. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.
- D. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly-painted surfaces.
- E. Prepare cementitious surfaces of concrete, concrete block, and cement plaster to be painted by removing efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze. Determine alkalinity and moisture content of surfaces to be painted by performing appropriate tests. If surfaces are found to be sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application of paint. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
- F. Clean concrete floor surfaces scheduled to be painted with a commercial solution of muriatic acid, or other etching cleaner. Flush floor with clean water to neutralize acid, and allow to dry before painting.
- G. Clean wood surfaces to be painted of dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view, and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer, before application of priming coat. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood-filler. Sandpaper smooth when dried.
 - 1. Prime, stain, or seal wood required to be job-painted immediately upon delivery to job. Prime edges, ends, faces, undersides, and backsides of such wood, including cabinets, counters, cases, paneling.
 - 2. When transparent finish is required, use spar varnish for backpriming.
 - 3. Backprime paneling on interior partitions only where masonry, plaster, or other wet wall construction occurs on backside.
 - 4. Seal tops, bottoms, and cut-outs of unprimed wood doors with a heavy coat of varnish or equivalent sealer immediately upon delivery to job.

- 5. Raised grain or unsanded substrates not smooth to touch will be cause for replacement of paint finishes by the Contractor.
- H. Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.
- I. Touch-up shop-applied prime coats wherever damaged or bare, where required by other sections of these specifications.
 - 1. Clean and touch-up with same type of shop primer unless a barrier coat is required to resolve compatibility issue.
- J. Clean galvanized surfaces to be free of oil and surface contaminants with non-petroleum based solvent.
- K. Aluminum Substrates: Remove loose surface oxidation.
- L. Prepare existing surfaces which are to be re-painted in manner equivalent to that required for new work.

3.3 MATERIALS PREPARATION

- A. Mix and prepare painting materials in accordance with manufacturer's directions.
- B. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

3.4 APPLICATION

- A. Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. Provide finish coats which are compatible with prime paints used.
- C. Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
- D. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.
- E. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
- F. Paint back sides of access panels, and removable or hinged covers to match exposed surfaces.
- G. Paint all surfaces of loose steel lintels and steel masonry relief angles which are exposed to view, prior to setting masonry upon them.

- H. Finish exterior doors on tops, bottoms and side edges same as exterior faces, unless otherwise indicated. Finish interior doors on tops and edges same as faces.
- I. Sand lightly between each succeeding enamel or varnish coat.
- J. Apply first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
- K. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- L. Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer.
- M. Mechanical and electrical work: painting of mechanical and electrical work is limited to those items exposed in mechanical equipment rooms and in occupied spaces.
- N. Paint exposed mechanical and electrical installations using specified painting systems which are appropriate for protection of the substrate involved.
- O. Apply prime coat of material which is required to be painted or finished, and which has not been prime coated by others. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.
- P. For stipple enamel finish, roll and redistribute paint to an even and fine texture. Leave nonevidence of rolling such as laps, irregularity in texture, skid marks, or other surface imperfections.
- Q. Apply pigmented (opaque) finishes to completely cover and provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.
- R. Apply transparent (clear) finishes in multiple coats to produce glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.
- S. Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

3.5 FIELD QUALITY CONTROL

- A. The right is reserved by Owner to invoke the following material testing procedure at any time, and any number of times during period of field printing:
 - 1. Engage services of an independent testing laboratory to sample paint being used. Samples of materials delivered to project site will be taken, identified and sealed, and certified in presence of Contractor.
 - 2. Testing laboratory will perform appropriate tests for any or all of following characteristics: Film thickness, abrasion resistance, apparent reflectivity, flexibility, washability, absorption, accelerated weathering, dry opacity, accelerated yellowness, recoating, skinning, color retention, alkali resistance and quantitative materials analysis.

- B. If test results show that material being used does not comply with specified requirements, Contractor may be directed to stop painting work, and remove non-complying paint; pay for testing; repaint surfaces coated with rejected paint; remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are non-compatible.

3.6 CLEANING AND PROTECTION

- A. During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each work day.
- B. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- C. Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
- D. Provide "Wet Paint" signs as required to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
- E. At completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

EXTERIOR PAINT SCHEDULE

E-1: CONCRETE

Flat Acrylic Finish – 2 coats with total dry film thickness not less than 2.5 mils. (MPI EXT 3.1K)
Primer One coat S-W Loxon Concrete & Masonry Primer (A24W8300).
Finish: Two coats S-W A-100 Exterior Satin Flat (A6 series)

E-2: GENERAL PAINTED WOOD

Gloss finish – 2 finish coats over primer with total dry film thickness not less than 3.5 mils (MPI EXT 6.3B).
Primer: One coat S-W Exterior Oil Base Wood Primer (Y24W8020).
Finish: Two coats S-W A-100 Exterior Latex Gloss (A8 series).

Low Luster finish – 2 finish coats over primer (MPI EXT 6.3B)
Primer: One coat S-W Exterior Oil Base Wood Primer (Y24W8020)
Finish: Two coats S-W Exterior Latex Satin (A82 series)

E-3: PAINTED WOOD TRIM

Gloss Finish – 2 finish coats over primer (MPI EXT 6.3A)
Primer: One coat S-W Exterior Oil Base Wood Primer (Y24W8020)
Finish: Two coats S-W A-100 Exterior Latex Gloss (A8 series).

Low Luster Finish – 2 finish coats over primer (MPI EXT 6.3A)
Primer: One coat S-W Exterior Oil Base Wood Primer (Y24W8020)
Finish: Two coats S-W Exterior Latex Satin (A82 series)

E-4: PAINTED PLYWOOD

Flat Acrylic Finish – 2 finish coats over primer and sealer (MPI EXT 6.3B)
Primer: One coat S-W Exterior Latex Wood Primer (B42W8041)
Finish: Two coats S-W A-100 Exterior Latex Flat (A6 series)

E-5: STAINED WOOD

Stained Finish – 2 finish coats (MPI EXT 6.2J)
Finish: Two coats S-W WoodScapes Semi-Transparent Polyurethane Exterior Stain (A15T5).

E-6: NATURAL FINISH WOOD

Gloss Varnish Finish – 3 coats (MPI EXT 6.2K).
Finish: three coats Minwax Helmsman Exterior Spar Varnish Gloss.

E-7: FERROUS METAL (Hollow Metal Doors and Frames)

Semi-gloss Alkyd Enamel – 2 finish coats over primer (MPI EXT 5.1D).
Primer: One coat S-W Kem Kromik Universal Metal Primer (B50Z series).
Finish: Two coats Direct-to-Metal Enamel (B55 series).

E-7A: FERROUS METAL (Structural and all exterior exposed non-hollow metal steel).

Semi-gloss Polyurethane Coating – 2 finish coats over primer with total dry film thickness not less than 7.5 mils (MPI EXT 5.1H)
Primer: One coat S-W Macropoxy 646 Fast Cure Epoxy (B58-610)
Finish: Two coats S-W Acrolon 218 HS Acrylic Polyurethane (B65-650).

E-7B: FERROUS METAL

Gloss Alkyd Enamel – 2 finish coats over primer (MPI EXT 5.1C).
Primer: One coat S-W Kem Kromik Universal Metal Primer (B50Z series).
Finish: Two coats S-W WB Acrylic-Alkyd Industrial Enamel (B53-1050 series).

E-8: ZINC-COATED METAL (GALVANIZED HOLLOW METAL DOORS AND FRAMES NOT CHROMATE PASSIVATED).

Semi-gloss Alkyd Enamel – 2 finish coats over primer (MPI EXT 5.3J)
Primer: One coat Pro Industrial Pro-Cryl Universal Primer (B66-310).
Finish: Two coats Direct-to-Metal Enamel (B55 series).

Semi-gloss Alkyd Enamel – 2 finish coats over primer (MPI EXT 5.3J)
Primer: One coat Pro Industrial Pro-Cryl Universal Primer (B66-310).
Finish: Two coats S-W WB Acrylic-Alkyd Industrial Enamel (B53-300 series).

E-8A: ZINC-COATED METAL (STRUCTURAL AND ALL NON-HOLLOW METAL GALVANIZED STEEL NOT CHROMATE PASSIVATED).

Semi-gloss Polyurethane Coating – 2 finish coats over primer with total dry film thickness not less than 7.5 mils (MPI EXT 5.3L).
Primer: One coat Pro Industrial Pro-Cryl Universal Primer (B66-310).
Finish: Two coats Pro Industrial Waterbased Alkyd Urethane Enamel (B53-1150 Series)

E-9: ALUMINUM (NOT ANODIZED)

- Semi-gloss Alkyd Enamel – 2 finish coats over primer (MPI EXT 5.4G)
Primer: One coat Pro Industrial Pro-Cryl Universal Primer (B66-310).
Finish: Two coats Direct-to-Metal Enamel (B55 series).
- Gloss Alkyd Enamel – 2 finish coats over primer (MPI EXT 5.4G)
Primer: One coat Pro-Cryl Universal Primer (B66-310).
Finish: Two coats S-W WB Acrylic-Alkyd Industrial Enamel (B53-3000 series)

INTERIOR PAINT SCHEDULE

I-1: CONCRETE

- Flat Latex Finish – 2 coats over primer (MPI INT 3.1A)
Primer: One coat S-W Loxon Concrete & Masonry Primer (A24W8300).
Finish: Two coats S-W ProMar 200 Interior Latex Flat (B30W200).
- Semi-Gloss Latex Finish – 2 coats over primer (MPI INT 3.1A)
Primer: One coat S-W Loxon Concrete & Masonry Primer (A24W8300).
Finish: Two coats S-W ProMar 200 Interior Latex Semi-Gloss (B31W2200).
- Gloss Epoxy Finish – 2 coats over primer with a total dry film thickness not less than 4.0 mils, excluding primer (MPI INT 3.1P)
Primer: One coat S-W Loxon Concrete & Masonry Primer (A24W8300).
Finish: Two coats S-W Water based Catalyzed Epoxy Gloss (SWB70/B63V15 pro Industrial H-Bild WB Catalyzed Epoxy).

I-2: GYPSUM DRYWALL

- Eggshell Emulsion Finish – 2 finish coats over primer coat with total dry film thickness of not less than 4.0 mils (MPI INT 9.2B).
Primer: One coat S-W High Build Interior Latex Primer (B28W8601).
Finish: Two coats S-W ProMar 200 Interior Latex Eg-Shel (B20W2200).
- Flat Emulsion Finish – 2 finish coats over primer coat with total dry film thickness of not less than 4.0 mils (MPI INT 9.2B).
Primer: One coat S-W High Build Interior Latex Primer (B28W8601).
Finish: Two coats S-W ProMar 200 Interior Latex Flat (B30W200).
- Semi-Gloss Emulsion Finish – 2 finish coats over primer coat with total dry film thickness no not less than 4.0 mils (INT 9.2B).
Primer: One coat S-W High Build Interior Latex Primer (B28W8601).
Finish: Two coats S-W ProMar 200 Interior Latex Semi-Gloss (B31W2200).
- Gloss Epoxy Finish – 2 finish coats over primer coat with total dry film thickness of not less than 4.0 mils (MPI INT 9.2F).
Primer: One coat S-W High Build Interior Latex Primer (B28W8601).
Finish: Two coats S-W Water based Catalyzed Epoxy Gloss (B71-200).

I-3: FERROUS METAL

Semi-Gloss Enamel Finish – 2 coats over primer, with total dry film thickness not less than 2.5 mils (INT 5.1R OR INT 5.1RR).

Primer: One coat S-W Pro-Cryl Universal Primer (B66W310).

Finish: Two coats S-W DTM Acrylic Semi-Gloss coating (B66-200).

Gloss Enamel Finish – 2 coats over primer with total dry film thickness not less than 2.5 mils (INT R.1R or INT 5.1 RR).

Primer: One coat S-W Pro-Cryl Universal Primer (B66W310).

Finish: Two coats S-W DTM Acrylic Gloss coating (B66-100).

Semi-Gloss Polyurethane Coating – 2 finish coats over primer with total dry film thickness not less than 7.5 mils (MPI INT 5.1F).

Primer: One coat S-W Macropoxy 646 Fast Cure Epoxy (B58-610).

Finish: Two coats Acrolon 218 HS Acrylic Polyurethane (B65-650).

I-4: ZINC-COATED METAL (NOT CHROMATE PASSIVATED)

Semi-Gloss Finish – 2 coats over primer, with total dry film thickness not less than 2.5 mils (MPI INT 5.3J).

Primer: One coat S-W Pro-Cryl Universal Primer (B66W310).

Finish: Two coats S-W DTM Acrylic Semi-Gloss Coating (B66-200).

Gloss Enamel Finish – 2 coats over primer with total dry film thickness not less than 2.5 mils (MPI INT 5.3J).

Primer: One coat S-W Pro-Cryl Universal Primer (B66W310).

Finish: Two coats S-W DTM Acrylic Gloss Coating (B66-100).

I-5: PAINTED WOODWORK AND HARDBOARD

Semi-Gloss Enamel Finish – 3 coats (MPI INT 6.4B)

Primer: One coat S-W E-Z Sand Interior Oil Base Primer (B49W8040).

Finish: Two coats S-W ProMar 200 Interior Alkyd Semi-Gloss (B34W200)

Gloss Enamel Finish – 3 coats (MPI INT 6.4B)

Primer: One coat S-W E-Z Sand Interior Oil Base Primer (B49W8040).

Finish: Two coats S-W ProMar 200 Interior Alkyd Gloss (B35W200)

I-6: TRANSPARENT FINISH WOODWORK

Stained Varnish Rubbed Finish – 3 Finish Coats over stain plus filler on open grain wood (MPI INT 6.4D).

Stain Coat: One coat S-W Wood Classics Interior Oil Stain (A49 series)

Filler Coat on Open Grain Wood: One coat Sher-Wood Natural Filler (C70T1)

Finish coat: Two coats S-W Wood Classics Fast Dry Varnish (A66 series)

Transparent Finish Woodwork – Natural Finish (MPI INT 6.4G)

Filler Coat on Open Grain Wood: One coat Sher-Wood Natural Filler (C70T1)

Finish coat: Two coats S-W Wood Classics Fast Dry Varnish (A66 series)

I-7: FABRIC COVERING OVER INSULATION

Flat Latex Emulsion "Size" – 2 coats (MPI INT 10.1A)

Finish: Two coats S-W ProMar 200 Interior Latex Flat (B30W200).

Add fungicidal agent to render fabric mildew-proof.

END OF SECTION

SECTION 099110 - CONCRETE FLOOR SEALER

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Furnish and install the sealer flooring system as specified and indicated. Prior to installation, provide decontamination and cleaning as specified. The term "sealer flooring system" as used in this section will include the first coat, second coat, and any related materials for the project.
- B. Complete the sealer flooring system installation in strict accordance with these specifications, the coating system manufacturer's most current requirements for surface preparation, application and inspection, and the instructions for safety. In the event of a conflict between these specifications and the manufacturer's instructions, the more stringent requirements will apply.
- C. The Contractor shall be responsible for providing ventilation, initial cleaning, inspection, supervision, dust control and equipment protection as specified herein and related sections for the work associated with this Section. The Contractor is responsible for all other work associated with this Section including protection of existing equipment and structures in the work area, surface preparation, sealer flooring application, curing, coating repair, rework, inspection and supervision.

1.3 REFERENCES:

- A. Society for Protective Coatings (SSPC) Specifications and Standards:
 - 1. SSPC-SP-13: "Surface Preparation of Concrete".
- B. NACE (National Association of Corrosion Engineers)
 - 1. NACE Publication 6D-173, "A Manual for Painter Safety".
 - 2. NACE Publication 6G-164, "Surface Preparation Abrasives for Industrial Maintenance Painting".
- C. ASTM (American Society for Testing and Materials)
 - 1. ASTM D4541 - L.R. "Standard Method for Pull-Off Strength of Coatings using Portable Adhesion Testers".
 - 2. ASTM E337 - L.R. "Standard Practice Test Method for Measuring Humidity with a Psychrometer".
 - 3. ASTM D4263-83 (1999), "Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method".
 - 4. ASTM F1869-98, "Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride".
 - 5. ASTM D4414-95, "Standard Practice for Measurement of Wet Film Thickness by Notched Gages".
 - 6. ICRI Guide No. 03732, "Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays," International Concrete Repair Institute, Sterling, VA.
 - 7. ASTM 4262, "Standard Test Method for Measuring Surface pH of Acid Etched Concrete".
 - 8. ASTM D4259, "Standard Practice for Abrading Concrete".

1.4 DEFINITIONS

- A. Terms used in this Section are defined as follows:
1. Concrete Sealer Flooring Work - The aspects involved with proper application of the specified sealer flooring system, including but not limited to cleaning, surface preparation, mixing, application, curing, and quality control.
 2. Approved Materials - The coating system and other specified materials for this coating work.
 3. Wet Film Thickness - The coating films' actual thickness immediately following application. Wet film thickness is measured in mils or thousandths of an inch (0.001") and is abbreviated WFT.
 4. Dry Film Thickness - The coating films' actual thickness following curing and drying. Dry film thickness is measured in mils or thousandths of an inch (0.001") and is abbreviated DFT.
 5. Coating System Manufacturer - Refers to the approved coating Manufacturer, abbreviated as CSM in this Section.
 6. Manufacturer's Technical Representative(s) - Refers to the technical representative(s) of the approved CSM.

1.5 QUALITY ASSURANCE

- A. The Contractor shall meet the following requirements:
1. The Contractor is ultimately responsible for the workmanship and quality of the sealer flooring system installation. Inspections by the Owner, the Engineer, or others do not limit the Contractor's responsibility.
 2. Do not use or retain contaminated, outdated, or diluted materials for flooring. Do not use materials from previously opened containers.
 3. Use only products of the approved CSM. Provide the same products for repairs as for the original coating.
 4. If any requirements of this specification are contradicted by a referenced standard or vice-versa, the matter shall be resolved in writing by the Architect or its representative.
 5. Make available at all times all locations and phases of the work for access and inspection by the Architect, the Owner, or other personnel designated by the Owner. The Contractor shall provide ventilation, egress, and whatever other means are required for the Owner, Architect, or designated personnel to access and exit the work areas safely.
 6. Conduct work so that the sealer flooring system is installed as specified herein. Inspect work continually to ensure that the coating system is installed as specified herein. The Architect shall inspect the work to determine conformance with the contract documents.
 7. The Contractor's Supervisor shall be on site at all times and will be thoroughly familiar with the work in progress. This Supervisor shall have authority to receive and execute all direction provided by the Architect or the Owner.
 8. The methods of construction shall be in accordance with all requirements of this specification and the best trade practices. Any changes in sealer flooring system installation requirements shall be allowed only with the written approval of the A/E.
 9. Installation shall be performed by an applicator having satisfactory experience in the application of these or similar materials or with on-site consultation by a qualified field service representative of the CSM.

1.6 SUBMITTALS

- A. Submit the following prior to commencing with any phase of the work covered by this Section:
 - 1. Manufacturer's current printed recommendations and product data sheets for all sealer flooring system products including performance criteria, surface preparation and applications, volatile organic compound (V.O.C.) data, and safety requirements.
 - 2. Material Safety Data Sheets (MSDS) for any materials brought on-site including all floor coating system materials, solvents, and abrasive blast media.
 - 3. Contractor's written verification that the personnel who will perform this work have the required experience as specified. This document must list the names of all the Contractor's supervisors and trades people who will perform work on the project covered by this Section.
 - 4. List of cleaning and thinner solutions allowed by the CSM.
 - 5. Storage requirements including temperature, humidity, and ventilation for Coating System Materials.
- B. Owner, contractor, and manufacturer's representative shall review and mutually agree upon color, grade, and final texture of coating system before starting installation. The acceptance of a sample will constitute the job standard by which installation will proceed.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Material shall be delivered to project site in manufacturer's original unopened containers.
- B. Materials shall be stored indoors, protected from damage, moisture, direct sunlight and temperatures below 40 degrees F or above 90 degrees F.
- C. Store all materials only in area or areas designated by the Owner solely for this purpose. Confine mixing, thinning, clean-up and associated operations, and storage of coating materials related debris before authorized disposal, to these areas. All materials are to be stored on pallets or similar storage/handling skids off the ground.
- D. Mix all coating materials in a designated enclosed mixing area. This enclosed area must protect the mixing operation and materials from direct sunlight, inclement weather, freezing, or other means of damage or contamination. Protect all other concrete and metallic surfaces and finishes from any spillage of material(s) within the mixing area.
- E. Do not use drain piping for disposal of coating materials.
- F. The Contractor shall take all precautions and implement all measures necessary to avert potential hazards associated with the sealer flooring system materials as described on the pertinent Material Safety Data Sheets or container labels.
- G. Deliver all materials to the job site in new, unopened containers. Each container shall bear the CSM's name and label.
 - 1. Labels on all material containers must show the following information:
 - a. Name or title of product.
 - b. Manufacturer's batch number.
 - c. Manufacturer's name.
 - d. Generic type of material.
 - e. Application and mixing instructions.
 - f. Hazardous material identification label.
 - g. Shelf life date.

2. All containers shall be clearly marked indicating any personnel safety hazards associated with the use of or exposure to the materials.
3. All materials shall be handled and stored to prevent damage or loss of label.
4. Do not use or retain contaminated, outdated, prematurely opened, diluted materials, or materials which have exceeded their shelf life.

1.8 ENVIRONMENTAL CONDITIONS

- A. Surfaces and surrounding air temperatures must exceed 55 degrees F, but must be less than 90 degrees F, with materials at not less than 70 degrees F during application.
- B. Do not apply coating materials when dust is being generated.
- C. If existing facility lighting is not adequate for flooring system application, the Contractor shall provide all temporary lighting during the work equivalent to one 200-watt explosion proof incandescent lamp per 100 square feet of work area.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Concrete Densified (if required by manufacturer).
- B. Topcoats: 2 coats of concrete sealer.

2.2 MANUFACTURER

- A. Super Seal 2000M by Concrete Coating, Inc.; 800-443-2871.
- B. Type X-2 Concrete Sealer by Stone Technologies Corp.; 423-503-4490.
- C. Sure Seal Concrete Sealer CP-1523 LV5 by Global Ind.; 888-978-7759.
- D. Architect approved equal.

PART 3 - EXECUTION

3.1 GENERAL

- A. Protection: Mask, cover, or otherwise protect all surfaces, equipment, and finishes not to receive the sealer flooring system specified in this Section.
- B. Strictly follow the approved CSM's written instructions and the requirements of this specification regarding all aspects of sealer flooring work including: mixing, application, recoat times and curing.
- C. Mock-up: Prior to commencing the installation, the Contractor shall install with the owner's approval, a mutually agreed upon mock-up test sample to show final color and appearance of the sealer flooring system.

3.2 PREPARATION

- A. Allow new concrete to cure for 28 days. Verify dryness by testing for moisture with a "plastic film tape-down test". (Reference ASTM D4263)
- B. Vacuum clean concrete to remove all dirt, dust, and other loose materials.
- C. After mechanically abrading, verify that all surfaces are clean, dry and free of any contaminants, which could adversely affect the adhesion of the flooring system.
- D. If between final surface preparation work and sealer flooring system application, contamination of the prepared and cleaned substrates occurs, re-cleaning shall be required until the requirements of this Section are met.

3.3 INSTALLATION (Where indicated on Finish Schedule)

- A. Primer: The sealer shall be mechanically mixed, applied and cured in strict accordance with manufacturer's printed instructions. Apply uniformly as to "wet out" the concrete.
- B. Topcoats: The sealer shall be mechanically mixed, applied and cured in strict accordance with manufacturer's printed instructions. Apply uniformly as to "wet out" the concrete.

3.4 CLEANUP

- A. Remove waste materials, rubbish, and debris and dispose of them at the owner's direction. Leave work areas in a clean and tidy condition.

3.5 PROTECTION

- A. Protect the completed work from water, airborne particles or other surface contaminants until cured for a minimum of 24 hours after application.
- B. Protect from traffic, physical abuse, immersion and chemical exposure until the complete system has thoroughly cured for 24 hours at 75 degrees F. For different temperatures, consult the manufacturer's representative about curing times.

3.06 FIELD QUALITY CONTROL INSPECTION AND TESTING

- A. Inspection by the Architect, Owner or others does not limit the Contractor's responsibilities for quality as specified herein or as required by the CSM's instructions.
- B. The Contractor shall perform the Q.C. procedures listed below in conjunction with the requirements of this Section. The Engineer will inspect the work to determine conformance to the contract documents.
 - 1. Degree of Cleanliness:
 - a. Visually inspect the degree of cleanliness of substrates to meet the requirements of this Section. The pH of the concrete substrates will be measured using pH indicating papers. pH testing is to be performed once every 100-sq. ft. of surface area to be coated.
 - b. Acceptable pH values shall be between 8.0 and 11.0 as measured by a full-range (1-12) color indicating pH paper with readable color calibrations and a scale at whole numbers (minimum). Use Hydrion

- Insta-Chek Jumbo 0-13 or 1-12 or equal. The paper shall be touched to the surface once using moderate finger pressure. The surface shall not be wiped or moved laterally to disturb the surface during pH testing. Following the one touch, lift the paper vertically to not "wipe" the surface. Compare the color indicated with the scale provided and record the pH.
- c. Note: If the surface of the concrete is dry, it is not possible to take a pH measurement. However, pH values are still important on dry surfaces. When a dry concrete substrate is encountered for a pH test, the surface where the pH test is to be performed shall be sprayed lightly with distilled, deionized water from a commercially available spray bottle that has been properly rinsed to remove any dissolved solids. The spray shall just wet the surface to a "shiny" appearance. Wait 60 seconds to allow chemical equilibria to be established and then test the pH of the water on the surface. Perform this test in accordance with ASTM D4262.
2. Concrete Surface Profile: Using the replicate rubber specimens, inspect the concrete surface profile in accordance with ICRI Guide No. 03732. This should be performed once for every 100 square feet of surface area to be coated.
 3. Measure and record ambient air temperature once every two hours of each shift, using a thermometer and measure and record substrate temperature once every two hours using a surface thermometer.
 4. Measure and record relative humidity every two hours of each shift using a sling psychrometer in accordance with ASTM E337.
 5. Inspect correct mixing of coating materials in accordance with the CSM's instructions.
 6. Inspect and record that the "pot life" of coating materials used are not exceeded during installation.
 7. Measure and record the thickness of the coating system using a notched gauge in accordance with ASTM D4414 for Wet Film Thickness at least once every 10-sq. ft. of coating area.
 8. Perform moisture tests on concrete as follows:
 - a. Once for every 500 square feet of surface area to be coated, perform the plastic sheet test in accordance with ASTM D4263. If moisture is indicated, proceed to step 2 below.
 - b. Perform calcium chloride moisture tests in accordance with ASTM D1869 once for every 1000 square feet of surface area to be coated. The maximum limit for moisture vapor emissions rate should be 3.0 lbs. per 24 hours per 1000 sq. ft. If tests indicate rates higher than 3.0, consult with manufacturer's Technical Service for further evaluation.
 9. Inspect to verify proper curing of the sealer flooring system as recommended by the CSM.

END OF SECTION

SECTION 100100 - MISCELLANEOUS SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Requirements of Drawings, General and Supplementary and DIVISION 1 apply to this Section.

1.2 SCOPE

- A. Provide all miscellaneous specialty work including but not necessarily limited to:
1. Specialty signs
 2. Vinyl applique signage
 3. Metal wall corner guards
 4. Fire extinguishers, cabinets and accessories
 5. Toilet and bath accessories
- B. Related work specified elsewhere:
1. Metal fabrications SECTION 055000
 2. Painting SECTION 099000
 3. Ships Ladder SECTION 055150

1.3 QUALITY ASSURANCE

- A. Provide first class materials and assemblies in every respect and at least equal to grade or quality specified.
- B. Manufacture of complete units and assemblies shall reflect the highest type of craftsmanship and supervision and shall be done with precision type tools and equipment to produce items reflecting first class manufacturing methods.
- C. Installation shall be done in a careful and substantial manner by skilled craftsmen and mechanics especially trained for type of work required.
- D. Installer must examine the substrates and conditions under which the items are to be installed. Do not proceed with the work until unsatisfactory conditions have been corrected.
- E. Provide all rods, plates, hangers, bars, bolts, nuts, screws, anchors, brackets, rivets, welds, lugs and like accessories and fastenings of every kind or nature as may be required to complete work of this Section in each and every detail and to join work of others. Exposed parts shall be of same metal and finish as that metal to which it is applied, except and unless noted otherwise. Do all bracing, blocking, cutting, fitting, drilling, tapping, etc., to complete the work of this Section and to join work of others.
- F. Provide templates and patterns with necessary accessories for work of this Section and duplicates to other trades when required for proper coordination.
- G. Manufacturer's catalog numbers may be shown on Drawings for convenience in identifying certain miscellaneous items. Unless modified by notation on Drawings or otherwise specified, catalog descriptions for the indicated number constitutes the minimum requirements for each such unit.
- H. Use of catalog numbers, and specific requirements set forth in Drawings and Specifications, are not intended to preclude the use of any other acceptable manufacturer's product or procedures

which may be equivalent, but are given for the purpose of establishing a standard of design and quality for materials, construction and workmanship.

1.4 SUBMITTALS

- A. Submit manufacturer's specifications and installation instructions indicating compliance with Specification requirements. Include technical data for materials, fabrication, anchors, hardware, fastenings and accessories.
- B. Submit shop drawings on all items specified in this Section except for bulk materials requiring no shop fabrication or installation connection with other work. Show details of manufacture and installation details including connections with and relations to adjacent materials. Take field measurements where possible to assure proper fitting of the work.
- C. Submit samples as required for color and material selection by Architect. Architect's review will be for color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.
- D. Submit other items as required under the various headings.

PART 2 - PRODUCTS - (INCLUDING PART 3 - EXECUTION)

2.1 MATERIALS

- A. Provide materials as described under the various headings, which may be of manufacturer's standards where applicable to requirements given herein.

2.2 SPECIALTY SIGNS (REFER TO DRAWINGS)

- A. General: All Signage shall comply with The UTRGV "Signage and Wayfinding Master Plan", dated 19 August 2016.
- B. Submittals: In addition to manufacturer's product data and installation instructions, submit the following:
 - 1. Shop drawings for each type of specialty sign required. Include plans, elevations, and sign lettering layout; show anchorages and accessory items.
 - 2. Full-size spacing template for metal letters and numbers.
 - 3. Samples of each sign form and material showing finishes, colors, surface textures and qualities of manufacturer.
- C. Manufacturers: Subject to compliance with requirements, provide manufacturers with acceptable products include:
 - 1. Aetna Sign Group, San Antonio, TX.
 - 2. ASI Sign Systems, Inc.
 - 3. Poco Signs.
- D. Materials:
 - 1. Cast Acrylic sheet, in sizes and thickness indicated, and of the following general types:
 - a. P 95 cast acrylic sheet in colors and finishes indicated or as selected.
- E. Metals:

1. Aluminum Extrusions: Alloy and temper recommended for type of use and finish indicated, and with the strength and durability properties specified in ASTM B 221 for 6063-T5.
- F. Fasteners: Concealed metal fasteners, non-corrosive to sign material or mounting surface.
 1. Anchors and Inserts: Non-ferrous metal or hot-dipped galvanized for exterior installations and where required for corrosion resistance. Toothed steel or lead expansion bolt devices for drilled-in-place anchors. Inserts for concrete or masonry work.
- G. Colored Coatings for Acrylic Plastic Sheet: Non-fading, colored coatings, including inks and paints for copy and background colors, recommended by manufacturers.
- H. Fabricate brackets and fittings for bracket-mounted signs from extruded aluminum to suit sign construction and mounting conditions indicated.
- I. Cast Letters and Numbers and Graphics: Produce cast characters from metal indicated with smooth, flat faces, sharp corners, precisely-formed lines and profiles, free from pits, scale, sand holes or other defects. Cast lugs into the back of the characters and tap to receive threaded mounting studs.
 1. Metal: Aluminum. (Dark Bronze anodized)
- J. Fabricated Letters and Numbers: Fabricate letters to required sizes and styles, using metals and thicknesses indicated. Form exposed faces and sides of characters to produce surfaces free from warp and.
- K. Installation:
 1. Locate sign units and accessories where shown and scheduled, using mounting method of the type described and to comply with manufacturer's instructions. Install sign units level, plumb and at the height indicated.
 2. Metal Letters and Numbers and Graphics: Mount letters and numbers and graphics using standard fastening methods recommended by the manufacturer and heavy paper template to establish letter spacing and to locate holes for fasteners.
 - a. Mount letters at the projection distance from the wall surface indicated.
- L. Finishes:
 1. Colors and Surface Textures: For exposed sign material that requires selection of materials with applied colors, surface textures or other characteristics related to appearance, provide color matches indicated, or if not indicated, as selected by the Architect from the manufacturer's standards.
 2. Metal Finishes: Comply with NAAMM "Metal Finishes Manual" for finish designations and applications recommendations.
 3. Aluminum Finishes: Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.

2.3 VINYL APPLIQUE SIGNAGE

- A. General: Custom pressure sensitive graphics applied directly to GWB substrate.
- B. Manufacturers: Provide products from the following manufacturer or submit products comparable in characteristics described for approval:
 1. 3M "Contoltac".
 - a. Low-tac adhesive applied to minimum 2 mil calendered vinyl film.
 - b. Manufacturer's standard film lamination for UV protection and scratch resistance.
- C. Size and color(s) as indicated. Architect to provide digital artwork.

2.4 METAL WALL CORNER GUARDS

- A. Submittals: in addition to product data and installation instructions, provide samples of each color and finish required.
- B. Provide corner guard on all interior walls as indicated on drawings.
- C. Corner guards to be 1-1/2" x 1-1/2" x 1/8" stainless steel. Height: as indicated on the drawings .
- D. Installed with continuous adhesive.

2.5 FIRE EXTINGUISHERS, CABINETS AND ACCESSORIES

- A. UL-Listed Products: Provide new UL-listed fire extinguishers bearing UL "Listing Mark" for type, rating, and classification of extinguishers indicated.
- B. Submittals: Submit product data and finish samples.
- C. Manufacturers: Subject to compliance with requirements, manufacturers offering acceptable products include:
 - 1. J. L. Industries
 - 2. Johnson-Lee, Div. of W. F. Lee Corp.
 - 3. Larsen's Manufacturing Co.
 - 4. Muckle Manufacturing, Division of Technico, Inc.
 - 5. Watrous, Inc.
- D. Fire Extinguishers: Provide fire extinguishers of types indicated for each fire extinguisher cabinet and other locations indicated.
 - 1. Multi-purpose dry chemical type: UL-rated 4-A; 60-BC, 10 lb. nominal capacity in enameled steel container.
- E. Mounting brackets: manufacturer's standard, of proper size for type and capacity of extinguisher indicated. Provide brackets for extinguishers not located in cabinet.
- F. Fire extinguisher cabinets: manufacturer's standard units of suitable size for housing fire extinguishers of type and capacity indicated and as follows:
 - 1. Recessed cabinet type: cabinet fully recessed in wall
 - 2. Rolled-edge trim: square edges with 1-1/4" backbend
 - 3. Door material: stainless steel
 - 4. Door style: solid doors
- G. Factory finishing of fire extinguisher cabinets: comply with NAAMM "METAL FINISHES MANUAL" to provide uniformly finished products. Provide color as selected from manufacturer's standard colors.
- H. Installation: in accordance with manufacturer's directions for type of mounting required at height and locations indicated, or if not indicated, to comply with applicable regulations of governing authorities.
- I. Identify fire extinguisher in cabinets with lettering spelling "FIRE EXTINGUISHER" printed on door and on wall above the cabinet by silk-screen process indicated below, as selected by Architect from manufacturer's standard letter sizes, styles, colors and layouts.
 - 1. Application Process: Silk-screen
- J. Identify bracket-mounted extinguishers with red letter decals spelling "FIRE EXTINGUISHER" applied to wall surface. Letter size, style and location selected by Architect.

2.6 TOILET AND BATH ACCESSORIES (Refer to Schedule on drawings)

- A. Provide samples of units when requested by Architect. Acceptable samples will be returned and may be used in work.
- B. Subject to compliance with requirements, manufacturers offering acceptable products include:
 - 1. Bobrick Washroom Equipment, Inc.
 - 2. American Specialties, Inc.
 - 3. Bradley Corp.
- C. Provide non-electric toilet accessories as scheduled on drawings. Locate units as shown in accordance with manufacturer's instructions. Catalog numbers on Drawings refer to BOBRICK WASHROOM EQUIPMENT, INC. products.
- D. Electric Hand Dryer: Provide Xlerator electric hand dryers, as manufactured by Excel Dryer Inc., 357 Chestnut St. P. O. Box 365; East Longmeadow, MA 01028. ASD. Tel: 413-525-4531; Fax: 413-525-2853; Email: sales@exceldryer.com; Web: www.exceldryer.com .
 - 1. Model: XL-SB, heated with HEPA filtration system and noise reduction nozzle.
 - a. Brushed Stainless Steel
 - 2. Provide recessed with manufacturer's standard ADA compliant mounting option and anti-microbial wall guard. Finish to match hand dryer.
 - 3. Power Source: 208-277 Volts, 6.2 Amps, 60 Hz., 1500 Watts
 - 4. Motor: 5/8 HP, 50 Hz, universal brush, 1/10 HP, 4200 RPM; sealed ball bearings; insulated by resilient mounting and thermally protected.
 - 5. Blower Fan: Single inlet centrifugal, 150 cubic feet per minute.
 - 6. Heater: Nichrome wire element, side mounted on blower housing to be vandal proof.
 - a. Safeguard: Automatic resetting thermostat to open when airflow is restricted and closed when airflow is resumed.
 - b. Air Temperature: 145 degrees F.
- E. Stamped names or labels on exposed faces of units are not permitted. Wherever locks are required for particular type of accessory, provide same keying throughout project. Furnish two keys for each lock, properly identified.
- F. For surface-mounted accessories provide concealed anchorage wherever possible.
- G. For recessed accessories provide anchorage which is fully concealed when unit is closed.
- H. Install toilet accessory units in accordance with manufacturer's instructions, using fasteners appropriate to substrate and recommended by manufacturer of unit. Install units plumb and level, firmly anchored in locations indicated.
- I. Install toilet accessories to meet handicap accessibility requirements of State and ADA regulations. Review all requirements prior to installation.
- J. Adjust accessories for proper operation and verify that mechanisms function smoothly.
- K. Clean and polish all exposed surfaces after removing protective coatings.

2.7 SAFETY NOSINGS

- A. Provide nosings at all tread surfaces on stairs, steps and platforms.
- B. Subject to compliance with requirements, manufacturers with acceptable products include:

MISCELLANEOUS SPECIALTIES 10 0100 - 6
UTRGV SOM TBL CENTER
100% CD

1. American Abrasive Metals
1. American Safety Tread Co., Inc.
2. Safe-T-Metal
3. Wooster Products

- C. Provide extruded aluminum nosings of type, sizes and configuration as shown.
1. If not shown, provide extruded aluminum treads with abrasive filler.
 2. Provide anchors for embedding in concrete, either integral or applied trade, as standard with manufacturer.
 3. Drill for mechanical anchors, with countersunk holes located not more than 4" from ends, and at not more than 12" o.c., evenly spaced between ends, unless otherwise shown. Provide closer spacing if recommended by tread manufacturer.
 4. Provide flat surface abrasive-filled treads, unless ribbed, abrasive filled type as indicated.
- D. Install nosings as indicated and as recommended by the manufacturer with permanent anchorage.

END OF SECTION

SECTION 101100 - VISUAL DISPLAY UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Glass markerboards.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, and accessories for visual display units.
 - 2. Include electrical characteristics for motorized units.
- B. Shop Drawings: For visual display units.
 - 1. Include plans, elevations, sections, details, and attachment to other work.
 - 2. Show locations of panel joints. Show locations of field-assembled joints for factory-fabricated units too large to ship in one piece.
 - 3. Include sections of typical trim members.
- C. Samples: For each type of visual display unit indicated.
 - 1. Visual Display Panel: Not less than 8-1/2 by 11 inches, with facing, core, and backing indicated for final Work. Include one panel for each type, color, and texture required.
 - 2. Trim: 6-inch-long sections of each trim profile.
 - 3. Accessories: Full-size Sample of each type of accessory.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each visual display unit, for tests performed by a qualified testing agency.
- C. Sample Warranties: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For visual display units to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
 - 1. Build mockup of typical visual display unit as shown on Drawings. Include accessories.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver factory-fabricated visual display units completely assembled in one piece. If dimensions exceed maximum manufactured unit size, or if unit size is impracticable to ship in one piece, provide two or more pieces with joints in locations indicated on approved Shop Drawings.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install visual display units until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.10 WARRANTY

- A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Surfaces lose original writing and erasing qualities.
 - b. Surfaces exhibit crazing, cracking, or flaking.
 - 2. Warranty Period: 50 years from date of Substantial Completion.
 - 3. Warranty Period: Life of the building.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 50 or less.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 GLASS MARKERBOARDS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. AARCO Products, Inc.
 - 2. Best-Rite; Moore Co, Inc.
 - 3. Claridge Products and Equipment, Inc.
- B. Glass Markerboards: Fabricated of 6-mm tempered glass with steel backing for use with magnets.
 - 1. Edge Treatment: Smooth polished edge with eased corners.
 - 2. Frame: Frameless.
 - 3. Surface: Matte.
 - 4. Color: White.
- C. Mounting: Concealed, Z-shaped brackets.
- D. Marker Tray: Aluminum, attached with stainless steel clips.
- E. Size: As indicated on the drawings.

2.3 MATERIALS

- A. Clear Tempered Glass: ASTM C 1048, Kind FT, Condition A, Type I, Class 1, Quality Q3, with exposed edges seamed before tempering.

2.4 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.
- B. Examine roughing-in for electrical power systems to verify actual locations of connections before installation of motorized, sliding visual display units.
- C. Examine walls and partitions for proper preparation and backing for visual display units.

- D. Examine walls and partitions for suitable framing depth where sliding visual display units will be installed.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions for surface preparation.
- B. Clean substrates of substances, such as dirt, mold, and mildew, that could impair the performance of and affect the smooth, finished surfaces of visual display boards.
- C. Prepare surfaces to achieve a smooth, dry, clean surface free of flaking, unsound coatings, cracks, defects, projections, depressions, and substances that will impair bond between visual display units and wall surfaces.
- D. Prepare recesses for sliding visual display units as required by type and size of unit.

3.3 INSTALLATION

- A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.
- B. Factory-Fabricated Visual Display Board Assemblies: Attach concealed clips, hangers, and grounds to wall surfaces and to visual display board assemblies with fasteners at not more than 16 inches o.c. Secure tops and bottoms of boards to walls.
- C. Visual Display Board Assembly Mounting Heights: Install visual display units at mounting heights indicated on Drawings, or if not indicated, at heights indicated below.
 - 1. Mounting Height: 36 inches above finished floor to top of chalk tray.

3.4 CLEANING AND PROTECTION

- A. Clean visual display units in accordance with manufacturer's written instructions. Attach one removable cleaning instructions label to visual display unit in each room.
- B. Touch up factory-applied finishes to restore damaged or soiled areas.
- C. Cover and protect visual display units after installation and cleaning.

END OF SECTION 101100

SECTION 102113.19 - PLASTIC TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Solid-plastic toilet compartments configured as toilet enclosures and urinal screens.
- B. Related Requirements:
 - 1. Section 061053 "Miscellaneous Rough Carpentry" for blocking.
 - 2. Section 102800 "Toilet, Bath, and Laundry Accessories" for accessories mounted on toilet compartments.

1.2 ACTION SUBMITTALS

- A. Product Data:
 - 1. Solid-plastic toilet compartments:
 - a. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for toilet compartments.
- B. Shop Drawings: For solid-plastic toilet compartments.
 - 1. Include plans, elevations, sections, details, and attachment details.
 - 2. Show locations of cutouts for compartment-mounted toilet accessories.
 - 3. Show locations of centerlines of toilet fixtures.
 - 4. Show locations of floor drains.
- C. Samples: Actual sample of finished products for each type of toilet compartment indicated.
 - 1. Size: 6-inch-square, of same thickness indicated for Work.
 - 2. Include each type of hardware and accessory.
- D. Product Schedule: For toilet compartments, prepared by or under the supervision of supplier, detailing location and selected colors for toilet compartment material.

1.3 INFORMATIONAL SUBMITTALS

- A. Certificates:
 - 1. Product Certificates: For each type of toilet compartment by manufacturer.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For toilet compartments.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Extra Stock Material: Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Door Hinges: One hinge(s) with associated fasteners.
 - 2. Latch and Keeper: One latch(es) and keeper(s) with associated fasteners.
 - 3. Door Bumper: One bumper(s) with associated fasteners.
 - 4. Door Pull: One door pull(s) with associated fasteners.

5. Fasteners: 10 fasteners of each size and type.

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements, and coordinate before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire Performance: Tested in accordance with, and pass the acceptance criteria of, NFPA 286.
- B. Regulatory Requirements: Comply with applicable provisions in the U.S. Department of Justice "2010 ADA Standards for Accessible Design" and Texas Accessibility Standards for toilet compartments designated as accessible.

2.2 SOLID-PLASTIC TOILET COMPARTMENTS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following or products comparable in characteristics and described components:
 1. Scranton Products.
- B. Toilet-Enclosure Style: Overhead braced.
- C. Urinal-Screen Style: Floor anchored.
- D. Door, Panel, and Pilaster Construction: Solid, high-density polyethylene (HDPE) panel material, not less than 1 inch thick, seamless, with eased edges, and with homogenous color and pattern throughout thickness of material.
 1. Integral Hinges: Configure doors and pilasters to receive integral hinges.
 2. Heat-Sink Strip: Manufacturer's standard continuous, extruded-aluminum or stainless steel strip fastened to exposed bottom edges of solid-plastic components to hinder malicious combustion.
 3. Color and Pattern: "Stainless – Grip Ex"; as manufactured by Scranton or equal.
- E. Pilaster Shoes and Sleeves (Caps): Manufacturer's standard design; polymer or stainless steel.
 1. Polymer Color and Pattern: Matching pilaster.
- F. Urinal-Screen Post: Manufacturer's standard post design of material matching the thickness and construction of pilasters; with shoe and sleeve (cap) matching that on the pilaster.
- G. Brackets (Fittings):
 1. Stirrup Type: Ear or U-brackets, chrome-plated brass.

2.3 HARDWARE AND ACCESSORIES

- A. Hardware and Accessories, Standard Duty: Manufacturer's standard operating hardware and accessories.
 1. Material: Chrome-plated brass.
 2. Hinges: Manufacturer's standard paired, self-closing type that can be adjusted to hold doors open at any angle up to 90 degrees, allowing emergency access by lifting door.

3. Latch and Keeper: Manufacturer's standard surface-mounted latch unit, designed for emergency access, and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.
 4. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent inswinging door from hitting compartment-mounted accessories.
 5. Door Bumper: Manufacturer's standard rubber-tipped bumper at outswinging doors.
 6. Door Pull: Manufacturer's standard unit at outswinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible.
- B. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel compatible with related materials.

2.4 MATERIALS

- A. Aluminum Castings: ASTM B26/B26M.
- B. Aluminum Extrusions: ASTM B221.
- C. Brass Castings: ASTM B584.
- D. Brass Extrusions: ASTM B455.
- E. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher-leveled standard of flatness.
- F. Stainless Steel Castings: ASTM A743/A743M.
- G. Zamac: ASTM B86, commercial zinc-alloy die castings.

2.5 FABRICATION

- A. Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories where required for attachment of toilet accessories.
- B. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.
- C. Urinal-Screen Posts: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at bottoms of posts. Provide shoes at posts to conceal anchorage.
- D. Door Size and Swings: Unless otherwise indicated, provide 24-inch-wide, inswinging doors for standard toilet compartments and 36-inch-wide, outswinging doors with a minimum 32-inch-wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.
 - 1. Confirm location and adequacy of blocking and supports required for installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF PLASTIC TOILET COMPARTMENTS

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
 - 1. Maximum Clearances:
 - a. Pilasters and Panels: 1/2 inch.
 - b. Panels and Walls: 1 inch.
 - 2. Stirrup Brackets: Secure panels to walls and to pilasters with no fewer than three brackets attached at midpoint and near top and bottom of panel.
 - a. Locate wall brackets, so holes for wall anchors occur in masonry or tile joints.
 - b. Align brackets at pilasters with brackets at walls.
- B. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two fasteners. Hang doors to align tops of doors with tops of panels and adjust, so tops of doors are parallel with overhead brace when doors are in closed position.
- C. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

3.3 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on inswinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on outswinging doors to return doors to fully closed position.

END OF SECTION 102113.19

SECTION 107310 – PROTECTIVE COVERS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Design and installation of extruded aluminum canopies.

1.2 REFERENCES

- A. The Aluminum Association- Aluminum Design Manual 2010 American Welding Society- AWS D1.2/D1.2M: 2008

1.3 SUBMITTALS

- A. Manufacturer's brochures, manuals and literature.
- B. Shop drawings of the complete canopy layout, includes sections and details specific to project and bearing the seal of a registered structural engineer licensed to practice in Texas.
- C. Samples of canopy finishes.

1.4 QUALITY ASSURANCE

- A. Canopy shall be designed to comply with local building codes.
- B. Canopy manufacturer shall have a minimum of 10 years' experience in designing and installing the specified system.
- C. The installation of the canopy shall be performed by the manufacturer to assure single source responsibility.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Avadek Walkway Covers & Canopies

2.2 MATERIALS

- A. All components shall be 6063; T6 alloy extruded aluminum.
- B. Components shall be sized to comply with live load and wind load requirements of the project and shall not be less than the dimensions shown on the plan.
- C. The thickness of the aluminum deck panels shall be at least .080" thick.
- D. Flashing shall be .040" thick.
- E. All bolts and fasteners shall be stainless steel and sized by canopy engineer.

2.3 FINISHES

- A. The finish shall be Kynar 500 in colors as selected by the Architect.

PART 3 – EXECUTION

3.1 FABRICATION

- A. All welding shall be in compliance with AWS 1.2. The certification of each welder shall be available to verify compliance.

3.2 INSTALLATION

- A. Install the canopy in strict accordance with the manufacturer's recommendations.
- B. Install flashing as required.
- C. Care shall be taken to prevent damage or scratching during installation.
- D. Thoroughly clean canopy after installation.

END OF SECTION

SECTION 122413 - ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Manually operated roller shades with single rollers.
 - 2. Manually operated roller shades with double rollers.
 - 3. Motor-operated roller shades with single rollers.
- B. Related Requirements:
 - 1. Section 061053 "Miscellaneous Rough Carpentry" for wood blocking and grounds for mounting roller shades and accessories.
 - 2. Section 079200 "Joint Sealants" for sealing the perimeters of installation accessories for light-blocking shades with a sealant.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.
- B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.
 - 1. Motor-Operated Shades: Include details of installation and diagrams for power, signal, and control wiring.
- C. Samples: For each exposed product and for each color and texture specified, 10 inches long.
- D. Product Schedule: For roller shades. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of shadeband material.
- C. Product Test Reports: For each type of shadeband material, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For roller shades to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Roller Shades: Full-size units equal to 5 percent of quantity installed for each size, color, and shadeband material indicated, but no fewer than two units.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
 - 1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain roller shades from single source from single manufacturer.

2.2 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Draper.
 - 2. Hunter Douglas Contract.
 - 3. MechoShade Systems, Inc.
- B. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.

1. Bead Chains: Nickel-plated metal.
 - a. Loop Length: Full length of roller shade.
 - b. Limit Stops: Provide upper and lower ball stops.
 - c. Chain-Retainer Type: Clip, jamb mount.
- C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
 1. Roller Drive-End Location: Right side of interior face of shade.
 2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller.
 3. Shadeband-to-Roller Attachment: Manufacturer's standard method.
- D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.
- E. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.
- F. Shadebands:
 1. Shadeband Material: Light-filtering fabric.
 2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
 - a. Type: Enclosed in sealed pocket of shadeband material.
 - b. Color and Finish: In accordance with Section 01 90 00 "Finish Legend".
- G. Installation Accessories:
 1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
 - a. Shape: L-shaped.
 - b. Height: Manufacturer's standard height required to conceal roller and shadeband assembly when shade is fully open, but not less than 4 inches.

2.3 MANUALLY OPERATED SHADES WITH DOUBLE ROLLERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Draper Inc.
 2. Hunter Douglas Contract.
 3. MechoShade Systems, Inc.
- B. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.
 1. Bead Chains: Nickel-plated metal.
 - a. Loop Length: Full length of roller shade.
 - b. Limit Stops: Provide upper and lower ball stops.
 - c. Chain-Retainer Type: Clip, jamb mount <.
 2. Spring Lift-Assist Mechanisms: Manufacturer's standard for balancing roller shade weight and for lifting heavy roller shades.
 - a. Provide for shadebands that weigh more than 10 lb or for shades as recommended by manufacturer, whichever criterion is more stringent.
- C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
 1. Double-Roller Mounting Configuration: Offset, outside roller over and inside roller under.
 2. Inside Roller:

- a. Drive-End Location: Right side of interior face of shade.
 - b. Direction of Shadeband Roll: Regular, from back (exterior face) of roller.
 - 3. Outside Roller:
 - a. Drive-End Location: Right side of interior face of shade.
 - b. Direction of Shadeband Roll: Regular, from back (exterior face) of roller.
 - 4. Shadeband-to-Roller Attachment: Manufacturer's standard method
- D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller mounting configuration, roller assemblies, operating mechanisms, installation accessories, and installation locations and conditions indicated.
- E. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.
- F. Inside Shadebands:
 - 1. Shadeband Material: Light-filtering fabric.
 - 2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
 - a. Type: Enclosed in sealed pocket of shadeband material.
 - b. Color and Finish: In accordance with Section 01 90 00 "Finish Legend".
- G. Outside Shadebands:
 - 1. Shadeband Material: Light-blocking fabric.
 - 2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
 - a. Type: Exposed with endcaps and integral light seal at bottom where it meets the sill.
 - b. Color and Finish: In accordance with Section 01 90 00 "Finish Legend".
- H. Installation Accessories:
 - 1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
 - a. Shape: L-shaped.
 - b. Height: Manufacturer's standard height required to conceal roller and shadeband assembly when shade is fully open, but not less than 4 inches.
 - 2. Side Channels: With light seals and designed to eliminate light gaps at sides of shades as shades are drawn down. Provide side channels with shadeband guides or other means of aligning shadebands with channels at tops.
 - 3. Bottom (Sill) Channel or Angle: With light seals and designed to eliminate light gaps at bottoms of shades when shades are closed.
 - 4. Installation Accessories Color and Finish: In accordance with Section 01 90 00 "Finish Legend".

2.4 MOTOR-OPERATED, SINGLE-ROLLER SHADES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Draper Inc.
 - 2. Hunter Douglas Contract.
 - 3. MechoShade Systems, Inc.
- B. Motorized Operating System: Provide factory-assembled, shade-operator system of size and capacity and with features, characteristics, and accessories suitable for conditions indicated, complete with electric motor and factory-prewired motor controls, power disconnect switch, enclosures protecting controls and operating parts, and accessories required for reliable operation without malfunction. Include wiring from motor controls to motors. Coordinate operator wiring requirements and electrical characteristics with building electrical system.
 - 1. Electrical Components: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. Electric Motor: Manufacturer's standard tubular, enclosed in roller.
 - a. Electrical Characteristics: 110-V ac.

- b. Maximum Total Shade Width: As required to operate roller shades indicated.
 - c. Maximum Shade Drop: As required to operate roller shades indicated.
 - d. Maximum Weight Capacity: As required to operate roller shades indicated.
- 3. Remote Control: Electric controls with NEMA ICS 6, Type 1 enclosure for recessed or flush mounting. Provide the following for remote-control activation of shades:
 - a. Group Control Station: Momentary-contact, three-position, rocker-style, wall-switch-operated control station with open, close, and center off functions for single-switch group control.
 - b. Color: In accordance with Section 01 90 00 "Finish Legend".
- 4. Crank-Operator Override: Crank and gearbox operate shades in event of power outage or motor failure.
- 5. Limit Switches: Adjustable switches interlocked with motor controls and set to stop shades automatically at fully raised and fully lowered positions.
- 6. Operating Features:
 - a. Group switching with integrated switch control; single faceplate for multiple switch cutouts.
 - b. Override switch.
- C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
 - 1. Roller Drive-End Location: Right side of interior face of shade.
 - 2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller.
 - 3. Shadeband-to-Roller Attachment: Manufacturer's standard method.
- D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.
- E. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers that are operated by one roller drive-end assembly.
- F. Shadebands:
 - 1. Shadeband Material: Light-filtering fabric.
 - 2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
 - a. Type: Enclosed in sealed pocket of shadeband material.
 - b. Color and Finish: In accordance with Section 01 90 00 "Finish Legend".
- G. Installation Accessories:
 - 1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
 - a. Shape: L-shaped.
 - b. Height: Manufacturer's standard height required to conceal roller and shadeband assembly when shade is fully open, but not less than 4 inches.
 - 2. Endcap Covers: To cover exposed endcaps.

2.5 SHADEBAND MATERIALS

- A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- B. Light-Filtering Fabric: Woven fabric, stain and fade resistant. In accordance with Section 01 90 00 "Finish Legend".
- C. Light-Blocking Fabric: Opaque fabric, stain and fade resistant. In accordance with Section 01 90 00 "Finish Legend".

2.6 ROLLER SHADE FABRICATION

- A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:
 - 1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch. Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch, plus or minus 1/8 inch.
 - 2. Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, locations of connections to building electrical system, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER SHADE INSTALLATION

- A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.
 - 1. Opaque Shadebands: Located so shadeband is not closer than 2 inches to interior face of glass. Allow clearances for window operation hardware.
- B. Electrical Connections: Connect motor-operated roller shades to building electrical system.
- C. Roller Shade Locations: As indicated on Drawings.

3.3 ADJUSTING

- A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

- A. Clean roller shade surfaces, after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain motor-operated roller shades.

END OF SECTION 122413

SECTION 12 36 61 QUARTZ SURFACING COUNTERTOPS

PART 1- GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including general and supplementary conditions and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes quartz surfacing for (includes, but not limited to): Countertops.

1.3 REFERENCES

- A. American National Standards Institute (ANSI): ANSI Z124.6 Stain Resistance

1.4 SUBMITTALS

- A. Product Data:
 - 1. Quartz Surfacing - Submit manufacturer's product data.
 - 2. Quartz Surfacing - Submit manufacturer's care and maintenance data.
- B. Samples: Submit two 6X10 inch quartz samples.
- C. Adhesive: Submit two samples of adhesive joint for each color quartz surface selected.
- D. Shop Drawings: Drawings to include countertop layout, dimensions, required locations of support and blocking members, edge profiles, cutouts and attachments.
- E. Fabricator Qualifications: Work of this section shall be performed by an approved fabricator/installer by the manufacturer.

1.5 QUALITY ASSURANCE

- A. Mockup:
 - 1. Construct mockup 2 feet wide, full depth backsplash, skirt.
- B. Packaging, Shipping, Handling and Unloading; Observe manufacturer's recommendations and handle in a manner to prevent breakage. Brace parts if necessary. Transport in the near vertical position with finished face toward finished face. Do not allow finished surfaces to rub during shipping and handling.
- C. Storage and Protection: Store in racks in near vertical position. Prevent warpage and breakage. Store inside away from direct exposure to sunlight. Store between 25 and 130° F.

1.6 WARRANTY

- A. Closeout Submittals: Provide manufacturer's completed warranty form.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer:
 - 1. Wilsonart
 - 2. Cambria
 - 3. Architect's approved equal.

2.2 MATERIALS

A. Material:

1. Homogeneous mixture containing 93% pure quartz with additions of high performance polyester resin, pigments and special effects. Cambria is licensed to utilize Bretonstone™ technology and equipment used to compact and polish mixture, and is the only producer of quartz surfaces in the United States.
2. Thickness: 1 inch
3. Identification: Material shall be labeled with manufacturer's identifying mark.
4. Color: to be selected.
5. Finish: to be selected.
6. Exposed Edges and Corners: Countertops profile as selected by Architect
7. Backsplash profile:

B. Performance:

1. Moisture Absorption: typical results 0.02%; ASTM C97
2. Modulus of Rupture: typical results 6,800 psi; ASTM C99
3. Compressive Strength: typical results 24,750 psi; ASTM C170
4. Moisture Expansion: typical results <0.01; ASTM C370
5. Abrasion Resistance: typical results 223; ASTM C501
6. Bond Strength: typical results 205 psi; ASTM C482
7. Thermal Shock: passes 5 cycles: ASTM 484
8. Coefficient of Thermal Expansion: typical results 1.2×10^{-5} inch/°F; ASTM C531
9. Breaking Strength of Tile: typical results 3,661 lbf; ASTM C648
10. Resistance to Freeze Thaw Cycling: unaffected 15 cycles; ASTM C1026
11. Coefficient of Friction Pull Method: .75 avg. dry / .55 avg. wet; ASTM C1028
12. Surface Burning Characteristics: typical results 17; ASTM E84
13. Smoke Density: flaming 196, non-flaming 69; ASTM E662
14. Stain Resistance: Unaffected; ANSI Z124.6

2.3 ACCESSORIES

A. Mounting Adhesive: Provide structural grade '50 year' silicone or epoxy adhesive.

1. Acceptable epoxy manufacturers:
 - a. Manufacturer's Two-Part Acrylic Adhesive.

B. Quartz Surface Adhesive: Provide epoxy or polyester adhesive of a type recommended by manufacturer for application and conditions of use.

1. Acceptable manufacturers:
 - a. Manufacturer's Two-Part Acrylic Adhesive.
2. Adhesive which will be visible in finished work shall be tinted to match quartz surface.

C. Joint Sealant:

1. Provide anti-bacterial type.
2. Acceptable manufacturers:
 - a. Dow Corning.
 - b. GE Sealants.

D. Solvent: Denatured alcohol for cleaning quartz surfacing to assure adhesion of adhesives and sealants.

E. Cleaning Agents: Mild soap and water.

2.4 FABRICATION

A. Layout: Layout surface to minimize joints and avoid L-shaped pieces of quartz surfacing. Layout and fabricate with 'hairline' joints.

B. Inspection of Materials: Inspect materials for defects prior to fabrication.

C. Tools: Cut and polish with water cooled powered tools.

- D. Cutouts:
 - 1. Cutouts shall have a minimum of 3/8-inch radius.
 - 2. Where edges of cutouts will be exposed in finished work; polish edges.

PART 3 - EXECUTION

3.1 INSTALLER

- A. Installation shall be by a certified Installer, certified in writing.
- B. Site Verification:
 - 1. Verify dimensions by field measurements prior to installation.
 - 2. Verify that substrates supporting quartz surfaces are plumb, level and flat to within 1/8 inch in 10 feet and that all necessary supports and blocking are in place.
 - 3. Inspection of Quartz Surfaces: Inspect materials for defects prior to installation.

3.2 PREPARATION

- A. Prepare Surface: Clean surfaces prior to installation.
- B. Protection of Quartz Surfaces: Protect finished surfaces from scratches. Apply masking where necessary. Take necessary precautions to prevent dirt grit dust and debris from other trades from contacting the surface.

3.3 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions and approved shop drawings.
- B. Preliminary Installation:
 - 1. Position materials to verify the correct size.
 - 2. If size adjustments, or additional fabrication is necessary, use water cooled tools. Protect jobsite and surface from dust and water. Perform work away from installation site if possible.
 - 3. Allow gaps for expansion of not less than 1/8 inch(1.5mm) per ten feet when installed between walls or other fixed structure.
- C. Permanent Installation:
 - 1. After verification of fit and finish, clean substrate; remove loose and foreign matter which may interfere with adhesion. Clean quartz surface backside & joints with denatured alcohol.
 - 2. Horizontal surface: Apply continuous bead of mounting adhesive around perimeter of structural substrate and supports.
 - 3. Vertical surface: Apply continuous bead of mounting adhesive around perimeter. In addition, apply ¼ inch mounting adhesive bead every 8 inches on vertical center.
 - 4. Install quartz surfacing plumb, level, square and flat to within 1/8 inch in ten Feet, non-cumulative.
 - 5. Align adjacent pieces in same plane.
- D. Joints:
 - 1. Joints Between Adjacent Pieces of Quartz Surfacing:
 - a. Joints shall be flush, tight fitting, level and neat.
 - b. Securely join adjacent pieces with Two Part Acrylic Adhesive.
 - c. Fill joints level to polished surface.
 - d. Secure adjacent quartz surfaces with vacuum clamps until adhesive hardens.
 - 2. Joints Between Quartz Surface and back splash wall: Seal joints with '50' year silicone sealant.

3.4 REPAIR

- A. Repair or replace damaged material in a satisfactory manner.

QUARTZ SURFACING COUNTERTOPS 123661 - 4
UTRGV SOM TBL CENTER
100% CD

3.5 CLEANING

- A. Remove masking, excessive adhesive and sealants. Clean exposed surfaces with denatured alcohol.

3.6 PROTECTION

- A. Protect installed fabrications with non-staining sheet coverings.

END OF SECTION

SECTION 123661.16 - SOLID SURFACING COUNTERTOPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Solid surface material countertops.
 - 2. Solid surface material backsplashes.
 - 3. Solid surface material end splashes.
 - 4. Solid surface material apron fronts.

1.3 ACTION SUBMITTALS

- A. Product Data: For countertop materials and sinks.
- B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.
 - 1. Show locations and details of joints.
 - 2. Show direction of directional pattern, if any.
- C. Samples for Verification: For the following products:
 - 1. Countertop material, 6 inches square.
 - 2. One full-size solid surface material countertop, with front edge and backsplash, 8 by 10 inches, of construction and in configuration specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For solid surface material countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate countertops similar to that required for this Project, and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Fabricator of countertops.

- C. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for fabrication and execution.
 - 1. Build mockup of typical countertop as shown on Drawings.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete.

1.8 COORDINATION

- A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 SOLID SURFACE COUNTERTOP MATERIALS

- A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.
 - 1. Refer to Section 019000 – Finish Legend.
 - 2. Colors and Patterns: As selected by Architect.
- B. Particleboard: ANSI A208.1, Grade M-2.
- C. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

2.2 COUNTERTOP FABRICATION

- A. Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."
 - 1. Grade: Custom.
- B. Configuration:
 - 1. Front: Straight, slightly eased at top with separate apron, 6 inches high, recessed 1/4-inch behind front edge.
 - 2. Backsplash: Straight, slightly eased at corner.
 - 3. End Splash: Matching backsplash.
- C. Countertops: 3/4-inch- thick, solid surface material with front edge built up with same material.
- D. Backsplashes: 1/2-inch- thick, solid surface material.
- E. Fabricate tops with shop-applied edges and backsplashes unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
 - 1. Fabricate with loose backsplashes for field assembly.
- F. Joints: Fabricate countertops without joints.
- G. Cutouts and Holes:
 - 1. Undercounter Plumbing Fixtures: Make cutouts for fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.

- a. Provide vertical edges, slightly eased at juncture of cutout edges with top and bottom surfaces of countertop and projecting 3/16 inch into fixture opening.
2. Counter-Mounted Plumbing Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.
3. Fittings: Drill countertops in shop for plumbing fittings and similar items.

2.3 INSTALLATION MATERIALS

- A. Adhesive: Product recommended by solid surface material manufacturer.
- B. Sealant for Countertops: Comply with applicable requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install countertops level to a tolerance of 1/8 inch in 8 feet, 1/4 inch maximum. Do not exceed 1/64-inch difference between planes of adjacent units.
- B. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill holes for screws as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- C. Fasten subtops to cabinets by screwing through subtops into corner blocks of base cabinets. Shim as needed to align subtops in a level plane.
- D. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.
- E. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Predrill holes for screws as recommended by manufacturer.
- F. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
 1. Seal edges of cutouts in particleboard subtops by saturating with varnish.
- G. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants."

SECTION 142400 – HYDRAULIC ELEVATORS

PART 1 – PROJECT INFORMATION

1.1 SYSTEM DESCRIPTION

- A. Elevator Requirements:
1. Quantity & Elevator Number: 1 Passenger Elevator
 2. ASME A17.1 Code Year: 2007
 3. Model: Endura
 4. Application: In-Ground – Direct acting hydraulic cylinder in well-hole.
 5. Loading Class: Passenger
 6. Machine Room Location: Adjacent at 1st floor
 7. Car Speed: 100 FPM
 8. Main Power Supply:
 - a. Voltage: 480
 - b. Phase: Voltage: 3
 - c. Hertz: 60
 9. Entrance Size: Front - 3' 6" wide x 7' 0" high
 10. Entrance Type: Center Opening, Stainless Steel no. 4 brushed finish 3 - Front
 11. Number of Stops: 2
 12. Number of Openings: 2 - Front
 13. Minimum Clear Car Inside: 6'8" wide x 5' 5" deep
 14. Cab Height: 8'0" (standard is 8'-0")
 15. Capacity: 3500 Lbs.
 16. Clear hoistway size: 8'4" wide x 6' 11" deep
 17. Total Travel: 14' – 0"
 18. Clear Overhead: minimum 12'–8"
 19. Pit Depth: minimum 4'0"
 20. Seismic Zone: 1
 21. Operation: Simplex
Simplex Collective: Using a Non-Proprietary microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Vertical Express
B. MCE Freedom
C. ThyssenKrupp Elevator
D. Approved Equal

2.2 JACK & PIT EQUIPMENT

- A. Each cylinder shall be constructed of steel pipe of sufficient thickness and suitable for the operating pressure. The top of each cylinder shall be equipped with a cylinder head with a drip ring to collect any oil seepage as well as an internal guide ring and self-adjusting packing. Each plunger shall be constructed of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. Each plunger shall be provided with a stop ring electrically welded to it to prevent the plunger from leaving the cylinder. Each plunger and cylinder shall be installed plumb and shall operate freely with minimum friction.

1. A steel packing gland with a guide bearing, wiper ring and packing especially designed for hydraulic elevator service shall be provided.
 2. Multiple section jacks, if provided, shall have machined threaded couplings with O-Ring seals to prevent leakage.
- B. Buffer Spring Assembly: Attached to the pit floor with removable helical coil springs with internal stop pipes.
- C. A hole shall be excavated to accommodate the plunger and cylinder. A 24" in diameter casing shall be installed to keep ground dirt from caving back into hole. A suitable top shall be placed over casing to keep debris from falling into hole until cylinder is installed.
- D. Sealed PVC or HDPE cylinder protection system shall be installed. The system shall provide a means to monitor the space between the PVC sleeve and cylinder wall and evacuate unwanted fluids, so as to prevent such fluids from remaining in contact with the cylinder.

2.3 MACHINE ROOM COMPONENTS

- A. The hydraulic power unit shall be of compact design suitable for operation under the required pressure. The pump and motor shall be connected by direct coupled (submersible type). The control valve shall control flow for up and down directions hydraulically and shall include an integral check valve. A control section including control solenoids shall direct the main valve and control: up and down starting, acceleration, transition from full speed to leveling speed, up and down stops, pressure relief and manual lowering. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. Design shall be based on 80 elevator starts per hour.
1. The power unit shall be provided with a muffler to reduce pulsation and noise, which may be present in the flow of the hydraulic fluid.
 2. The power unit shall be mounted on vibration sound dampeners designed to isolate the unit from the building structure. The power unit shall also contain a low-pressure switch (as required) and a tank shut-off valve (with non-submersible power units).
- B. A Non-Proprietary microprocessor-based controller shall be provided along with a solid state starter. Include necessary starting switches together with all relays, switches, solid-state components and hardware required for operation, including door operation, as described herein. A three (3) phase overload device shall be provided to protect the motor against overloading.
- C. A manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.
- D. Oil Line & Fittings - Schedule 80 pipe shall be installed between the pumping unit and the cylinder. The oil line shall be supported with an adequate number of pipe supports. Oil of a proper grade for this service shall be provided.
- E. A ball valve shall be provided in the machine room and in the elevator pit for maintenance and adjusting purposes.
- F. Oil Cooler – The cooling unit shall be thermostatically controlled and use forced-air (external radiator) to help maintain the oil at a proper operating temperature. The minimum heat dissipation shall be 26,100 BTU/HR @40 F Temp Delta).
- G. Battery Lowering – Provide automatic battery powered lowering for the elevator. In the case of normal power outage, an emergency operation shall be activated, lowering the elevator to the lowest landing and open the doors to discharge the passengers. The

elevator shall remain parked with the doors in the closed position with the door open button operative until normal power is restored.

- H. Iso-unions – Install minimum of (2) isolating couplings, which will be provided in the machine room and in the elevator pit.

2.4 HOISTWAY COMPONENTS

- A. Platform: The car platform shall be constructed of structural steel members welded or fastened securely together. The underside of the platform shall be properly fireproofed. A toe guard shall be properly fastened to the platform per code.
 - 1. Sub-Flooring: Plywood (2) Layers of 1/2" (standard)
 - 2. Finished Flooring: To be selected by Architect and installed by others.
- B. Car Frame: A car frame, manufactured of structural steel members, shall be provided with adequate bracing to support the platform and car enclosure. All members are to be securely fastened together and reinforced to form a unitized section. The buffer striking plate on the underside of the car-frame platform assembly must fully compress the spring buffer mounted in the pit before the plunger reaches its lower limit of travel.
- C. Guide Shoes - The top and bottom of the car frame shall be provided with suitable slide guide shoes of the self-aligning swivel type. A removable polyethylene gib shall be provided with each guide shoe.
- D. Guide Rails & Brackets: Steel, omega shaped, fastened to the building structure with steel brackets.
- E. Limits & Leveling Switches - Limit switch package to consist of switches and brackets that mount to the back of the rail. Switches include top and bottom slowdown, top and bottom directional and top and bottom final. The elevator will be provided with an automatic leveling device which will bring the car to a stop within 3/8" of the landing level regardless of load or direction of travel. Landing level will be maintained within the leveling zone irrespective of the hoistway doors being open or closed.
- F. Wiring: Insulated wiring shall have a flame retarding and moisture resisting outer cover and shall run in a metal conduit, metallic tubing or wire ducts. All insulated conduction and conduit, or tubing, as well as fittings including metal boxes, troughs and ducts, shall comply with the requirements of the National Electric Code.
- G. Pit Stop Switch - An emergency stop switch will be located in the pit.
- H. Where pit access is by means of the lowest hoistway entrance, a vertical ladder of steel extending 42" minimum shall be provided at the same height, above sill of access door or handgrips.
- I. Top of Car Inspection – The elevator shall be provided with an operating device mounted above the cab which will permit slow speed operation for purposes of adjustment, inspection, maintenance, and repair.
- J. When heat, smoke or combustion sensing devices are required, connect to elevator control cabinet terminals. Contacts on the sensors should be sided for 12 volt D.C.
- K. Finished floors and entrance walls are not to be constructed until after sills and door frames are in place. Consult elevator contractor for rough opening size. The general contractor shall supply the drywall framing so that the wall fire resistance rating is maintained, when drywall construction is used.

- L. Where sheet rock or drywall construction is used for front walls, it shall be of sufficient strength to maintain the doors in true lateral alignment. Drywall contractor to coordinate with elevator contractor.
- M. Before erection of rough walls and doors; erect hoistway sills, headers, and frames. After rough walls are finished; erect fascia and toe guards. Set sill level and slightly above finished floor at landings.
- N. The elevator wall shall interface with the hoistway entrance assembly and be in strict compliance with the elevator contractor's requirements.
- O. General Contractor shall fill and grout around entrances, as required.
- P. All walls and sill supports must be plumb where openings occur.
- Q. Locate a light fixture (200 lx / 19 fc) and convenience outlet in pit with switch located adjacent to the access door.
- R. For car light and fan: provide a feeder and branch wiring circuits to elevator control cabinet.
- S. Cutting, patching and recesses to accommodate hall button boxes, signal fixtures, etc.

2.5 HOISTWAY ENTRANCES

- A. Passenger Entrances - Each entrance shall include unit frames, flush design door panels, sight guards, sills, strut angles, headers, hanger covers, fascia plates, toe guards, dust covers and necessary hardware.
 - 1. Frames: 14 gauge entrance frames shall be of bolted construction for complete one-piece unit assembly. All frames shall have a UL 1-1/2 hour fire protection rating.
 - a. Frame Finish: Stainless Steel no. 4 brushed finish
 - 2. Sills: Aluminum
 - 3. Sight Guards: Stainless Steel no. 4 brushed finish sight guards will be furnished.
 - 4. Doors: Single Center Opening, 14 gauge entrance doors. All doors shall have a UL 1-1/2 hour fire protection rating.
 - a. Door Finish: Stainless Steel no. 4 brushed finish
 - 5. Fascia, hanger covers, toe guards, dust covers, and structural members will be fabricated and finished in accordance with standard finishes and materials.

2.6 CAB ENCLOSURE

- A. Walls: Cab type TKAP, durable wood core finished on both sides with high pressure plastic laminate. Reveals: Stainless Steel no. 4 brushed finish.
- B. Canopy: Cold-rolled steel with hinged exit.
- C. Ceiling: Downlight type, metal pans with suspended LED downlights.
- D. Cab Fronts, Return Transom, Soffit and Strike: Provided panels faced with Stainless Steel no. 4 brushed finish.
- E. Doors: Horizontal center opening car doors reinforced with steel for panel rigidity. Hang doors on sheave type hangers with polyurethane tires that roll on a polished steel track and are guided at the bottom by non-metallic sliding guides.
 - 1. Door Finish: Stainless Steel no. 4 brushed finish
 - 2. Cab Sills: Extruded Aluminum, mill finish.

- F. Handrail: Provide 1.5" diameter cylindrical metal on side walls. Handrails shall have a Stainless Steel no. 4 brushed finish.
- G. Ventilation: Manufacturer's standard exhaust fan, mounted on car top.
- H. Protection Pads: Protection Pads and Buttons (all walls)

2.7 DOOR EQUIPMENT

- A. Passenger Door Equipment
 - 1. Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call. Door operation will be automatic at each landing with door opening being initiated as the car arrives at the landing and closing taking place after expiration of a time interval. A car door electric contact will prevent starting the elevator away from the landing unless the car door is in the closed position. Doors will be arranged to remain open for a time period sufficient to meet disability requirements.
 - 2. Elevator doors shall be provided with a reopening device that will stop and reopen the car door(s) and hoistway door(s) automatically should the door(s) become obstructed by an object or person. Primary door protection shall consist of a two dimensional, multi-beam array projecting across the car door opening.

2.8 SIGNAL DEVICES AND FIXTURES

- A. Car Operating Panel: A fixed car operating panel shall be provided which all push buttons, key switches, and message indicators for elevator operation. All buttons to be located per ADA.
 - 1. Fixture Finish: Stainless Steel no. 4 brushed finish
 - 2. The car operating panel shall be equipped with the following features including those as required by ASME A.17. 2007 Code
 - a. Illuminated LED push buttons
 - b. Raised markings and Braille
 - c. Digital car position indicator
 - d. Door open and door close buttons
 - e. Light key-switch
 - f. Fan key-switch
 - g. Access key-switch
 - h. Independent service key-switch
 - i. Illuminated alarm button with raised markings
 - j. In car stop switch (toggle or key unless local code prohibits use)
 - k. Firefighter's jewel
 - l. Firefighter's phase II key-switch
 - m. Emergency light
 - n. Call cancel button
 - o. ADA hands-free phone located behind a perforated speaker pattern
 - p. Push to call button – Shall initiate the hands-free phone between the car and a location inside the building, switching over to another location if the call is unanswered, where personnel are available who can take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.
 - q. Firefighter's phase II locked cabinet and emergency in-car operating instructions, worded according to code.
- B. Car Lantern(s) – One lantern per car opening shall be supplied with one gong stroke up and two gong strokes down. As soon as the car has reached a predetermined distance from a landing and is set to stop at that landing, the corresponding lantern shall be illuminated and the gong shall sound and the lantern shall remain illuminated until the car has left that landing.

- C. Hall Stations: Hall stations shall be provided with necessary push buttons and key switches for elevator operation. When a button is pressed, it shall illuminate, signaling to the waiting passenger that the call has been registered. Each button shall remain illuminated until the call has been answered. All buttons to be located per ADA.
 - 1. The designated fire return floor shall include a fireman's emergency key switch that meets state and local requirements.
 - 2. Hoistway access shall be provided as per applicable code.
- D. Handicap Markings - Braille plates shall be furnished for car buttons, car controls, and hoistway entrance jams in compliance with NEII and ADA handicap requirements.
- E. Hall Position Indicator centered above the entrance frame at 1st floor only.
- F. Utility Outlet: A 110 VAC utility outlet shall be furnished in the cab enclosure.

PART 3 - EXECUTION

3.1 PREPERATION

- A. Take field dimensions and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.2 SUBMITTALS

- A. Shop Drawings: Submit approval layout drawings. Include the following:
 - 1. Car, guide rails, buffers and other components in hoistway.
 - 2. Maximum rail bracket spacing.
 - 3. Maximum loads imposed on guide rails requiring load transfer to building structure.
 - 4. Clearances and travel of car.
 - 5. Clear inside hoistway and pit dimensions.
 - 6. Location and sizes of access doors, hoistway entrances and frames.
 - 7. Cab enclosure drawings
 - 8. Signal fixture drawings
- B. Operations and Maintenance Manuals: Provide manufacturer's standard operations and maintenance manual after the project is released into production.

3.3 QUALITY ASSURANCE

- A. Manufacturer: Provide the car frame, platform, power unit, and jack from by a firm with a minimum of 20 years' experience in fabrication of elevators equivalent to those specified.
- B. Regulatory Requirements: Elevator system design and installation shall comply with the applicable versions of ASME A17.1 2007 Code based on the project city and state.
 - 1. The elevator shall be designed in response to Americans with Disabilities Act Accessibility Guidelines (ADAAG).
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

3.4 DELIVERY, STORAGE AND HANDLING

- A. Should the building or the site not be prepared to receive the elevator equipment at the agreed upon date, the General Contractor will be responsible to provide a proper and suitable storage area on or off the premises.
- B. Should the storage area be off-site and the equipment not yet delivered, then the elevator contractor, upon notification from the General Contractor, will divert the elevator equipment to the storage area. If the equipment has already been delivered to the site, then the General Contractor shall transport the elevator equipment to the storage area. The cost of elevator equipment taken to storage by either party, storage, and redeliver to the job site shall not be at the expense of the elevator contractor.

3.5 WARRANTY

- A. The elevator contractor's acceptance is conditional on the understanding that their warranty covers defective material and workmanship. The guarantee period shall not extend longer than one (1) year from the date of Substantial Completion. The guarantee excludes ordinary wear and tear or improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the elevator contractor and this express warranty is in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.
- B. Elevator contractor shall include a basic inspection within 1-year warranty period.

3.6 INSTALLATION

- A. Install elevator systems components and coordinate installation of hoistway wall construction.
 - 1. Work shall be performed by competent elevator installation personnel in accordance with ASME A17.1 manufacturer's installation instructions and approved shop drawings.
 - 2. Comply with the National Electrical Code for electrical work required during installation.
- B. Coordination: Coordinate elevator work with the work of other trades, for proper time and sequence to avoid construction delays. Use benchmarks, lines, and levels designated by the Contractor, to ensure dimensional coordination of the work.
- C. The elevator contractor shall make a final check of elevator operation with the Owner or Owner's representative present prior to turning elevator over for use. The elevator contractor shall determine that control systems and operating devices are functioning properly.

3.7 TRADES BY OTHERS

- A. Related Sections: The following sections contain requirements that relate to this section and are performed by other trades.
 - 1. Construction Facilities and Temporary Controls: protection of floor openings and personnel barriers; temporary power and lighting.
 - 2. Earthwork: excavation for cylinder well casing.
 - 3. Cast-In-Place Concrete: elevator pit, elevator motor and pump foundation, and grouting thresholds.

4. Metal Fabrications: pit ladder, divider beams, support for entrances and rails, hoisting beam at top of hoistway.
5. Waterproofing: waterproofing of elevator pit.
6. Heating, Ventilating, and Air Conditioning: ventilation and temperature control of elevator equipment room. Machine room temperature must be maintained between 55° and 90°F.
7. Electrical: electrical service to main disconnect in elevator machine room; electrical power for elevator installation and testing; electrical-disconnecting device to elevator equipment prior to activation of sprinkler system; electrical service for machine room; machine room and pit receptacles with ground-fault current protection; lighting in machine room and pit; wiring for telephone service to machine room.
8. Standby Power Supply Systems: emergency generator for elevator operation.
9. Fire Alarm Systems: fire and smoke detectors and interconnecting devices; fire alarm signal lines to contacts in the machine room.
10. Telephone Systems: ADAAG-required emergency communications equipment.
11. Pit Sump Pump: Shall be installed below pit floor with a metal grate installed over pump hole. Pump must flow 3,000 gallons per hour.
12. Permits and Inspections: Provide licenses and permits and perform required inspections and tests.

3.8 MAINTENANCE SERVICE

- A. Furnish maintenance and call back service for a period of 12 months for each elevator after completion of installation or acceptance thereof by beneficial use, whichever is earlier, during normal working hours, excluding callbacks. Service shall consist of no less than a quarterly examination of the equipment, adjustment, lubrication, cleaning, supplies and parts to keep the elevators in proper operation.
 1. Manufacturer shall have a service office and full time service personnel within a 100 mile radius of the project site.

END OF SECTION