

James E. Darling, Mayor

Aida Ramirez, Javier Villalobos, Joaquin J. Zamora, Julian Omar Quintanilla, John Ingram, Veronica Whitacre, Mayor Pro-Tem, Commissioner – District 4 Commissioner – District 1 Commissioner – District 2 Commissioner – District 3 Commissioner – District 5 Commissioner – District 6

Roel "Roy" Rodriguez, P.E., City Manager

Yvette Barrera, P.E., CFM, City Engineer

Gerardo Noriega, CTPM, Director of Purchasing & Contracting

### Specifications, Forms of Contract, Bond and Proposal For

### FMCSA SOUTHERN BORDER PROGRAM BUILDING CONSTRUCTION REBID PROJECT NO. 10-18-C01-487

McAllen, Texas

DATED: October 2018

#### INDEX

A. Notice to Bidders	A-1 - A-2
B. Information to Bidders	B-1 - B-5
C. Bid Proposal Form	C-1 – C-6
D. Special Provisions	D-1
E. Equal Employment Opportunity	E-1
F. Wage Rate Certification	F-1 - F-3
G. Subcontractor Equal Employment	G-1 - G-2
H. (Subcontractor Wage Rate Certification	Н-1 - Н-3
I. Contract Agreement	I-1 - I-5
J. Performance Bond	J-1 - J-2
K. Payment Bond	K-1 - K-2
L. General Conditions	L-1 - L-37
M. Index of General Conditions (By Subject)	M-1 - M-3
N. Supplemental General Conditions	N-1 - N-28
O. General Construction & Specifications	O-1 - O-4
P. Attachment to Federal Labor Standards Provisions	Р
Q. Wage Rates	Q
R. Affidavit and Waiver of Lien Prime Contractor	R-1
S. Release and Waiver of Claims by Subcontractors and Product Vendors	S-1
T. Contractor's Affidavit as to Status of Liens	T-1
U. Technical Specifications	U



<u>Solicitation Type and Name</u>: Invitation to Bid for FMCSA Southern Border Program Construction Project Rebid

Solicitation Number: 10-18-C01-487

**Summary of Work**: 1,854 Sq. Ft. of new Office and 390 Sq. Ft. of new restroom facility, pre-fabricated modular building with metal roof panel & brick veneer on concrete slab with crawl space, a 1,920 Sq. ft. new inspection concrete pit with metal canopy and 600 sq. ft. passenger waiting area with metal canopy & fixed furniture.

**Bid Opening:** Sealed electronic bids addressed to Mr. Roel "Roy" Rodriguez P.E. will be received on **Friday, October 19, 2018 until 4:00 p.m., Central Standard Time (CST)** at which time they shall be unlocked in a public meeting to be held in Conference Room 2A (2<sup>nd</sup> floor) of McAllen City Hall. All electronic bid submittals must be posted on the City of McAllen's bidding portal (https://mcallen.procureware.com) on or before the aforementioned dated and time. **Hard copy and/or late bids shall not be accepted.** 

**<u>Pre-Submittal Conference</u>**: City of McAllen, City Hall, 2<sup>nd</sup> Floor, Conference Room 2a, 1300 Houston Ave, McAllen, Texas 78501 on **<u>Thursday October 11, 2018 at 11:00 a.m. CST,</u> all prospective respondents are encouraged to be in attendance.** 

Plans and Specifications may be obtained by visiting our bidding portal at <u>https://mcallen.procureware.com.</u> We are asking that vendors/contractors register online. Plans & specs may be viewed electronically. Once on the portal, after you have logged in you can click on the button titled "Documents" for details.

A Bidder's Bond from a reliable surety company licensed to operate in the State of Texas or certified Cashier's Check, payable without recourse to the City of McAllen, for the amount of not less than five (5) percent (%) of the total bid shall be submitted via a sealed envelope as a guaranty that, if awarded the contract, the bidder will enter into a contract with the City of McAllen. The Bidder's Bond shall be submitted before the above-mentioned, electronic bid opening date and time. Failure to submit shall be grounds for disqualification.

Hand-deliver Bid Bond:	1300 Houston Avenue, Purchasing & Contracting Department
If using Land Courier (e.g., FedEx, UPS):	1300 Houston Avenue, Purchasing & Contracting Department
	McAllen, Texas 78501
Mail Bid Bond:	P.O. Box 220, McAllen, TX 78505-0220

Bid Bond shall be delivered in a sealed envelope and clearly marked as follows:

# BID BOND FOR PROJECT NO. 10-18-C01-487 FMCSA Southern Border Program Construction Project Rebid

Potential bidders are asked to post their questions on our bidding portal under the tab labeled "Clarifications" under the relative project number.

The City of McAllen reserves the right to refuse and reject any or all Bids and to waive any or all formalities or technicalities, or to accept the Bid considered the best and most advantageous to the City and to hold the bids for a period of one-hundred and twenty (<u>120</u>) days without taking action thereon.

<u>Applicable Product Categories</u>: 15553 Parking Structures, 90921 Building Construction ,90922 Building Construction Non Residential ,91394 Paving Resurfacing

CITY OF MCALLEN – PURCHASING & CONTRACTING DEPARTMENT.

#### **INFORMATION FOR BIDDERS**

#### 1. RECEIPT AND OPENING OF BIDS

CITY OF McALLEN (hereinafter called "Owner") invite bids on the attached hereto; all blanks must be appropriately filled in. Electronic Bids will be received by the Owner no later than date and time given below, and publicly opened and read aloud.

PROJECT:	FMCSA SOUTHERN BODER PROGRAM CONSTRUCTION PROJECT
<b>BID DATE AND TIME:</b>	October 18, 2018 at 4:00 p.m.
PLACE OF BID OPENING:	Conference Room 2A (2 <sup>nd</sup> floor) McAllen City Hall

The Owner may consider any bid not prepared and submitted in accordance with the provisions hereof and may waive any formalities or reject any or all bids. Any bid withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof shall not be considered. Any bids received after the time and date specified shall not be considered. No bidder may withdraw a bid within thirty (30) days after the actual date of the opening thereof. **Hard copy and/or late bids shall not be accepted.** 

#### 2. PREPARATION OF BID

Sealed bids will be submitted electronically through the City of McAllen's bidding portal: https://mcallen.procureware.com. Each bid must be completely filled out and include all required supporting documentation. Bids submitted by facsimile (fax) will NOT be accepted. Submittal of a bid in response to this solicitation constitutes an offer by the Bidder, and if accepted by the City of McAllen/McAllen Public Utility, a binding contract. Bids which do not comply with these specifications may be rejected at the option of the City. The term "City" shall include The City of McAllen and/or McAllen Public Utility (MPU). Bids must be electronically received by the City of McAllen Public Utility, on or before bid opening date and time

#### **3. ELECTRONIC BID INSTRUCTIONS**

Bidders must go online to the City's Bidding Portal (<u>https://mcallen.procureware.com</u>) to submit bid prices. Bidders are asked to read the Welcome Screen (PDF document) and register if they have not done so previously. Once on the bidding portal, follow the steps below to enter the **electronic bid**:

- I. Click on, "Bids" located on left-hand column.
- II. Find the applicable project and click the, "Project Number"
- III. Click on, "Response" tab.
- IV. In the, "Questions" tab, upload required scanned documents into the bid portal by clicking "Browse" for each item.
- V. Click on, "**Pricing**" tab and enter a Unit Price for each pricing item. A "**Comment**" field is available if needed.
- VI. Once both the Questions and Pricing information has been entered, the yellow "Question **Response and Pricing Response**" information messages will change from incomplete to complete. Then the "Submit" button will become available.
- VII. Click "Submit Bid" button and review the terms and agreements, Popup Window that appears. If you agree to the terms and conditions, click the "I Accept and Submit this Bid" button.

- VIII. Click "**Submit Bid**" button and review the terms and agreements, Popup Window that appears. If you agree to the terms and conditions, click the "**I Accept and Submit this Bid**" button.
  - IX. If you want to remove your bid, click the red, "**Withdraw Bid**" button in the "**Response**" tab.

The City may consider non-responsive any bid not prepared and submitted in accordance with the provisions herein and may waive any formalities and/or technicalities, or reject any and all bids

#### 4. SUBCONTRACTORS

The bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this contract must be approved by the Owner

#### 5. INVESTIGATIONS

The Owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish the Owner all such information and dates for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations if the contract and to complete the work contemplated therein. Conditional bids will not be accepted.

#### 6. LIQUIDATED DAMAGES FAILURE TO ENTER INTO CONTRACT

The successful bidder, upon his failure or refusal to execute and deliver the contract and bonds required within ten (10) days after he has received notice of the acceptance of his bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with his bids.

#### 7. LIQUIDATED DAMAGES

Bidder must agree to commence work on or before a date to be specified in written "Notice to Proceed" by the Owner, and to fully complete the project within the time stated on proposal. As failure to complete project within the stated time, bidder agrees to pay as liquidated damages, the sums indicated on page F-2 for each working day of delay until work is completed and accepted.

Delays because of strikes, fire, weather, or any cause beyond the contractors control shall be granted, but claims for extension shall be in writing within a reasonable time after the occurrence.

Contractor shall submit request for delay on a monthly basis in a letter form indicating reason and date of delay. Failure to do so on a monthly basis means contractor will forfeit those delay days.

#### A. Liquidated Damages.

Liquidated damages in the amount per day shown in the "Time of Completion and Liquidated Damages" section of the Instructions to Bidders will be assessed against the Contractor for each calendar day or portion thereof that: (1) the Contractor has not fully and timely completed the specific portion or part of the work to be completed by the end of the current month as provided in the detailed description of work and/or schedule previously submitted by the Contractor on the first day of that particular month, after accounting for any agreed-upon changed orders, which

will entitle the Owner to or not to withhold the liquidated damages from the payment otherwise owed to the Contractor for work completed in that particular month; (2) the Contractor has not substantially completed all work following the expiration of the number of calendar days to complete the work referenced in the "Time of Completion and Liquidated Damages" section of the Instructions to Bidders, after accounting for any agreed-upon changed orders; or (3) all items listed as incomplete and attached to the Certificate of Substantial Completion are not completed or corrected after expiration of the agreed time allotted for completion and correction, including any approved extensions of time granted. These liquidated damages are cumulative.

The sum of the liquidated damages will be deducted from any monies due the Contractor. If no money is due the Contractor, said sum may be recovered by the Owner from the Contractor or the Contractor's surety, or from both combined.

These deductions are to cover liquidated damages to the Owner for losses to Owner that include, but are not limited to, additional expenses of Contract administration, overhead and other costs resulting from failure of the Contractor to complete the Work within the designated time, and are not to be considered as penalties. The Owner shall not be considered liable for any extra or additional payment to the Contractor as a bonus or premium for early completion. Any failure on the part of the Owner to request or require payment or withholding of liquidated damages in any particular month shall not constitute a waiver of Contractor's requirement to pay, or the Owner's ability to withhold from payments owed to Contractor, any liquidated damages for work performed or completed in that particular month, in any prior or subsequent month, or at the time all work has been completed.

#### 8. **Conditions of Work**

Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions of his contract. Insofar as possible the contractor, in carrying out his work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

#### 9. **Contractor Requirement**

Contractor is advised that it shall be a requirement of this contract to submit the following forms, properly executed, along with their final Request for Payment: "AFFIDAVIT AND WAIVER OF LIEN-PRIME CONTRACTOR", "RELEASE AND WAIVER OF CLAIMS BY SUBCONTRACTORS AND PRODUCT VENDORS", "CONTRACTOR 'S AFFIDAVIT AS TO STATUS OF LIENS". Failure to submit these forms as required will cause a delay in payment to the contractor.

#### 10. Security for Faithful Performance

Simultaneously with his delivery of the executed contract, the successful bidder must furnish a performance bond and a payment bond upon the forms which are attached hereto in the amount of 100% of the contract price from an approved surety company holding a permit from the State of Texas to act as surety (and acceptable according to the latest list of companies holding certificates of authority from the Secretary of the Treasury of the United States) or other surety or sureties acceptable to Owner within ten (10) days from date of award of contract.

On all contracts that will equal to or exceed \$100,000.00, the performance bond and the payment bond must be provided from a surety that has a rating of "A" from AM BEST, MOODY'S or STANDARD & POOR'S.

In the event that the total amount bid is \$50,000 or less, the successful contractor has the option to enter into a single payment contract with the City of McAllen, in lieu of a Performance Bond (Payment Bond shall be required), provided that no money shall be paid to the contractor until completion of the work by the contractor and acceptance of same by the City of McAllen. In the event that the total amount bid is \$25,000 or less, the successful contractor has the option to enter into a single payment contract with the City of McAllen, in lieu of a Payment and Performance Bond, provided that no money shall be paid to the contractor until completion of the work by the City of McAllen.

#### 11. **Power of Attorney**

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

#### 12. Notice of Special Conditions

Attention is particularly called to those parts of the contract documents and specifications which deal with the following:

- (a) Inspection and testing of materials.
- (b) Insurance requirements.
- (c) Wage rates.
- (d) Stated allowances.

#### 13. Laws and Regulations

The bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

#### 14. Method of Award-Lowest Qualified Bidder

If at the time this contract is to be awarded, the lowest base bid submitted by a responsible bidder does not exceed the amount of funds than estimated by the Owner as available to finance the contract, the contract will be awarded on the base bid only. If such bid exceeds such amount, the Owner may reject all bids or may award the contract on the base bid combined with such deductible

#### 15. Method of Award-Lowest Qualified Bidder Continued:

alternates applied in numerical order in which they are listed in the Form of bid, as produces a net amount which is within the available funds.

#### 16. **Obligation of Bidder**

At the time of the opening of bids each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and contract documents (including all addenda). The failure or omission of any bidder to examine any form, instrument or document shall in no way relieve any bidder from any obligation in respect of his bid. It shall be the responsibility of the successful contractor to pick up all contract documents for execution, in a timely manner, at the Purchasing and Contracting Department after notification of award of contract. Contract documents will not be sent to contractor via regular mail. If the contractor elects to have the contract documents sent via overland carrier, an account number must be provided to the City of McAllen or the contract documents shall be sent "collect" to the contractor.

- 17. Where in this contract the words "consecutive working days" are made reference to their meaning shall be Mondays through Fridays except Saturdays, Sundays, and holidays observed by the City of McAllen.
- 18. The City of McAllen encourages the hiring of Minority, Female Minority Contractors and or Suppliers whenever and wherever feasible.
- 19. General Guaranty refer to Supplemental General Conditions.
- 20. General and/or Prime Contractors submitting bids and/or proposals to the City of McAllen shall be refunded their deposits upon return of plans and specs in good condition. All other recipients of plans and specs shall be reimbursed their deposit only if they return plans and specs in good condition to the Purchasing and Contracting Department no later than the 5<sup>th</sup> working day after bid opening.

#### 21. Safety Standards and Accident Prevention

With respect to all work performed under this contract, the contractor shall:

1. Comply with the safety standards provisions of applicable laws, building and construction codes and the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America the requirements of the Occupational Safety and Health Act of 1970 (Public Law 91-596), and the requirements of Title 29 of the Code of Federal Regulations, Section 1518 as published in the "Federal Register", Volume 36, No. 75, Saturday, April 17, 1971.

2. Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees) and property.

3. Maintain at his office or other well known place at the job site, all articles necessary for giving first aid to the injured, and shall make standing arrangements for the immediate removal to a hospital or a doctor's care of persons (including employees), who may be injured on the job site. In no case shall employees be permitted to work at a job site before the employer has made a standing arrangement for removal of injured persons to a hospital or a doctor's care.

#### 22. HOUSE BILL (HB) 1295 (Certificate of Interested Parties – Form 1295)

In 2015, the Texas Legislature adopted House Bill 1295 (H.B. 1295). For contracts entered into on or after January 1, 2016, Texas Government Code Chapter §2252.908 (H.B. 1295) provides that a Texas governmental entity or state agency may not enter into a contract that either (1) requires an action or vote by the governing body of the entity or agency or (2) has a value of at least \$1 million, unless the business entity submits a disclosure of interested parties to the governmental entity or state agency. The time the business entity submits the signed contract to the governmental entity or state agency. The Texas Ethics Commission (Commission) has adopted a certificate of interested parties form (Form 1295) and adopted rules requiring the business entity to file Form 1295 electronically with the Commission. Information from the Commission regarding the requirements, including rules and filing information, are available on the Commission's website at the following links:

https://www.ethics.state.tx.us/tec/1295-Info.htm https://www.ethics.state.tx.us/whatsnew/FAQ\_Form1295.html https://www.ethics.state.tx.us/whatsnew/elf\_info\_form1295.html

As a business entity under this law, it is your firm's responsibility to comply with all disclosure laws including Chapter 2252. The City of McAllen as the governmental entity must ensure compliance of the same.

Note: You will be required to register and create an account. Once registered, you will receive an email containing a password setup link. Click on the link to set your password. After you have established an account, you will use your email address, password, and user type (Business Entity) to log in to the filing application to enter the required information on Form 1295. Print a copy of the completed form which includes a unique certification of filing number assigned by the application. An authorized agent of the business entity must sign the form affirming under the penalty of perjury that the completed form is true and correct. The completed, printed, and signed Form 1295 bearing the unique certification of filing number must be submitted at the time the signed contract is submitted to the City of McAllen. Failure to comply may result in contract revocation and award to the next compliant contractor/vendor.

#### 23. Addenda and Interpretations

No interpretation of the meaning of the plans, specifications or other pre-bid documents will be made to any bidder orally.

Every request for such interpretation should be in writing addressed to \_\_\_\_\_\_\_ and to be given consideration must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be mailed by certified mail with return receipt requested to all prospective bidders (at the respective addresses furnished for such purposes), not later than three days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.

#### **BID PROPOSAL FORM**

#### TO: OWNER

The undersigned, as bidders, declares that the only person or parties interested in this proposal as principals are those named herein, that this proposal is made without collusion with any other person, firm or corporation; that he has carefully examined the form of contract, Notice to Contractors, specifications and the plans thereon referred to, and has carefully examined the locations, and conditions and classes of materials of the proposed work; and agrees that he will provide all the necessary labor, machinery, tools, and apparatus, and other items incidental to construction, and will do all the work and furnish all the materials called for in the contract and specifications in the manner prescribed therein and according to the requirements of the Engineer/Architect as therein set forth.

It is understood that the following descriptions and quantities of work to be done at unit prices are **approximate only** and are intended principally to serve as a guide in evaluating bids.

It is further agreed that the quantities of work to be done at unit price and materials to be furnished, may be increased or diminished as may be considered necessary, in the opinion of the Engineer/Architect, to complete the work fully as planned and contemplated, and that all quantities of the work, whether increased or decreased, are to be performed at the unit prices set forth below except as provided for in the specifications.

It is further agreed that lump sum prices may be increased to cover additional work ordered by the Engineer/Architect, but not shown on the plans or required by the specifications, in accordance with the provisions of the General Conditions. Similarly, they may be decreased to cover deletion of work so ordered.

**NOT APPLICABLE** - The bid security accompanying this proposal shall be returned to the bidder, unless in case of the acceptance of the proposal the bidder shall fail to execute a contract and file a performance bond and payment bond within the ten (10) days after its acceptance and notification of acceptance has been transmitted to successful bidder via telephone, fax, e-mail or letter sent with return receipt requested, in which case the bid security shall become the property of the OWNER, and shall be considered as payment for damages due to delay and other inconveniences suffered by the Owner on account of such failure of the bidder. It is understood that the Owner reserves the right to reject any or all bids.

It is understood that the Owner reserves the right to reject any or all bids

#### **BID PROPOSAL FORM Continued:**

#### BID PROPOSAL FORM MUST BE SUBMITTED IN DUPLICATE FORM

Bidders are advised that <u>only</u> an Electronic Bid submittal shall be required.

**ELECTRONIC BID INSTRUCTION**. Bidders must go online to submit their bid prices by following the instructions on the Instructions to Bidders. Bidding Portal: <u>http://mcallen.procureware.com</u>. All supporting documents such as signature pages, attachments, and/or additional information may be uploaded into the portal as previously instructed on the Notice to Bidders and Instructions to Bidders.

#### ITEM DESCRIPTIONS & ESTIMATE OF QUANTITIES ARE APPROXIMATE ONLY

Note: This table describes the various bid items and estimated quantities reflected on the official bid form maintained on the City's bidding portal. Refer to the Instructions to Bidders for step-by-step instructions for submitting electronic bids. DO NOT ENTER BID PRICES ON THIS FORM – ONLY ON THE BID PORTAL.

	Internal Ref.	External Ref.			Unit Of	
Number	Number	Number	Туре	Description	Measure	Quantity
				1,854 Square Feet of new Office & 390 Sq. Ft. of new restroom facility, Pre-fabricated modular building with metal roof panel & brick veneer on concrete slab with crawl space, a 1,920 Square Feet New Inspection Concrete Pit with Metal Canopy and 600 Square Feet Passenger Waiting Area with		
1	909-21		BASE	Metal Canopy & fixed furniture	LS	1
2	909-21		ALT	DIVISION 28. Electronic Safety & Security	LS	1

#### **BID PROPOSAL FORM Continued:**

**BIDDER'S MUST FILL-IN AND SUBMIT WITH FORMAL BID RESPONSE.** 

Number of working days to complete contract\_\_\_\_\_. (not to exceed 180 working days)

The undersigned agrees, unless hereinafter stated otherwise to furnish all materials as shown and specified in the Plans and Specifications.

Bidder hereby agrees to commence work under this contract within <u>10</u> days after notice to PROCEED is issued and complete the work within <u>180</u> working days, and City recognized holidays.

Receipt is acknowledged of the following addenda:

No.\_\_\_\_ Dated\_\_\_\_\_ No.\_\_\_ Dated\_\_\_\_\_

Bidder agrees that the Owner has the right to accept or reject any or all bids and to waive any or all formalities.

DATE:\_\_\_\_\_

Respectfully submitted,

BY: \_\_\_\_

(Signature)

(Type or Print Name)

(Title)

(Company)

(Address)

(Phone Number)

(Seal - If bidder is a Corporation)

(Fax Number)

#### SUPPLEMENT TO BID PROPOSAL

**<u>NONRESIDENT BIDDER</u>**: Means a bidder whose principal place of business is not in this state, but excludes a contractor whose ultimate parent company or majority owner has its principal place of business in this state.

Nonresident Bidder: Yes \_\_\_\_ No \_\_\_\_

If yes, does your state have a preference law?

Yes No

Percent (%) of preference

(Date)

(Type or Print Name)

(Title)

(Company)

(Address)

(Phone Number)

(Fax Number)

**BIDDER'S MUST FILL-IN AND SUBMIT WITH FORMAL BID RESPONSE.** 

#### BOND INFORMATION

#### (Form to Be Executed & Submitted with Proposal)

On all contracts that will equal to or exceed \$100,000.00, the performance bond and the payment bond must be provided from a surety that has a rating of "A" from AM BEST, MOODY 'S or STANDARD & POOR 'S.

#### **MAIN COMPANY**

AGENT'S NAME:	PLEASE TYPE/PRINT NAME
COMPANY NAME:	
ADDRESS:	
MAIN OFFICE TELEPHONE NO.:	
	LOCAL COMPANY
AGENT'S NAME:	PLEASE TYPE/PRINT NAME
COMPANY NAME:	
ADDRESS:	
LOCAL MAIN OFFIC TELEPHONE NO.:	CE
PROJECT NO.:	
PROJECT NAME:	
CONTRACTOR:	SIGNATURE
	PLEASE TYPE/PRINT NAME

#### **COMPANY NAME**

#### SUPPLEMENT NO. 3 TO THE BID PROPOSAL FORM – NON-COLLUSION AFFIDAVIT

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

\_\_\_\_\_\_, of lawful age, being first duly sworn, on oath says, that (s)he is the agent authorized by the bidder to submit the attached proposal. Affiant further states that the respondent/bidder has not been a party to any collusion among bidders in restraint of freedom of competition by agreement to purpose at a fixed price or to refrain from proposing; or with any state official, city employee, Board Trustee, or benefit consultant as to quantity, quality, or price in the prospective contract, or any other terms of said prospective contact; or in any discussions or actions between bidders, city employee, Board Trustee, or benefit consultant concerning exchange of money or other things of value for special consideration in the letting of this contract.

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 2018.

Notary Public State of \_\_\_\_\_\_ My Commission Expires: \_\_\_\_\_

#### SPECIAL PROVISIONS

#### SECURITY REQUIREMENTS

Clearance checks are required for all individuals performing work on federal properties, both governmental or non-governmental.

Clearance submittals must be submitted to GSA by the contractor approximately fourteen (14) calendar days prior to start date in order to avoid delays.

Security Badges/Passes must be clearly visible at all times when on the work site. Contract employees should not enter the building without the security badge/pass. The contractor shall certify at project completion that all badges/passes have been accounted for and returned to GSA.

#### **CLEARANCE SUBMITTALS REQUIRED**

Completed original GSA 176 – Statement of Personal History for Contract Employees (GSA furnished). Two (2) original FD 258 Fingerprint Cards (GSA furnished). Copy of Driver's License or State Identification, Copy of Social Security Card, Copy of INS I-9 form (employment Eligibility Verification

#### **<u>Certification of Bidder Regarding Equal Employment Opportunity</u></u>**

#### INSTRUCTIONS

This certification is required pursuant to Executive Order 11246 (30F.R. 12319-25). The implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause and, of so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the bidder has not filed a compliance report due under applicable instructions, such bidder shall be required to submit a compliance report within seven calendar days after bid opening. No contract shall be awarded unless such report is submitted.

#### **CERTIFICATION BY BIDDER**

NAME AND ADDRESS OF BIDDER (include ZIP CODE)

1.	Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Lause. YesNo	
2	Compliance reports were required to be filed in connection with such contract	

2.	Compliance repor	ts were require	d to be fi	led in conne	ection with	such co	ontract
	or subcontract.						
	Ves	No					

3.	Bidder has filed	d all compliance re	ports due under applicable instructions
	including EEO-	-1 (http://www.eeo	<u>c.gov/eeo1survey</u> )
	Yes	No	None Required

4. Have you ever been or are you being considered for sanction due to violation of Executive Order 11246 as amended? Yes No

NAME AND TITLE OF SIGNER (please type)

SIGNATURE

DATE

#### CONTRACTOR'S CERTIFICATION CONCERNING LABOR STANDARDS AND PREVAILING WAGE REQUIREMENTS

TO (Appropriate Recipient): CITY OF McALLEN	DATE:
c/o	PROJECT NUMBER (if any)
	**
	PROJECT NAME

1. The undersigned, having executed a contract with <u>CITY OF MCALLEN</u> for the construction of the above identified project, acknowledges that:

(a) The Labor Standards provisions are included in the aforesaid contract.

(b) Correction of any infractions of the aforesaid conditions, including infractions by any of his subcontractors and any lower tier subcontractors, is his responsibility;

2. He certifies that:

(a) Neither he nor any firm, partnership or association in which he has substantial interest is designated as an ineligible contractor by the Comptroller General of the United States pursuant to Section 5.6(b) of the Regulations of the Secretary of Labor, Part 5 (29 CFR, Part 5) or pursuant to Section 3(a) of the Davis-Bacon Act, as amended (40 U.S.C. 276a-2(a).

(b) No part of the aforementioned contract has been or will be subcontracted to any subcontractor if such subcontractor or any firm, corporation, partnership or association in which such subcontractor has a substantial interest is designated as an ineligible contractor pursuant to any of the aforementioned regulatory or statutory provisions.

3. He agrees to obtain and forward to the aforementioned recipient within ten days after the execution of any subcontract, including those executed by his subcontractors and any lower tier subcontractors, a Subcontractor's Certification Concerning Labor Standards and Prevailing Wage Requirements executed by the subcontractors.

#### 4. He certifies that:

(a) The legal name and the business address of the undersigned are:

<ul> <li>A Partnership</li> <li>The name, title and address of the of the undersigned are:</li> <li>NAME</li> </ul>	(4) Other Organization (describe)
The name, title and address of the of the undersigned are:	e owner, partners or officers
NAME TIT	
	TLE ADDRESS

(d) The names and addresses of all other persons, both natural and corporate, having a substantial interest in the undersigned, and the nature of interest are (if none, so state):

NAME	ADDRESS	TRADE CLASSIFICATION

(e) The names, addresses and trade classifications of all other building/heavy & highway construction contractors in which the undersigned has a substantial interest are (if none, so state):

NAME	ADDRESS	TRADE CLASSIFICATION
		(Contractor)
		(Contractor)
		By

#### <u>WARNING</u>

U.S. Criminal Code, Section 1010, Title 18, U.S.C., provides in part: "Whoever, .... makes, passes, utters or publishes any statement, knowing the same to be false .... shall be fined not more than \$5,000 or imprisoned not more than two years, or both."

#### CERTIFICATION BY PROPOSED SUBCONTRACTOR REGARDING EQUAL EMPLOYMENT OPPORTUNITY

NAME OF PRIME CONTRACTOR

PROJECT NUMBER

#### INSTRUCTIONS

This certification is required pursuant to Executive Order 11246 (30 F.R. 12319-25). The implementing rules and regulations provide that any bidder or prospective contractor or any of their proposed subcontractors shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instruction.

Where the certification indicates that the subcontractor has not filed a compliance report due under applicable instructions. Such subcontractor shall be required to submit a compliance report before the owner approves the subcontract or permits work to begin under the subcontract.

#### SUBCONTRACTOR'S CERTIFICATION

#### NAME AND ADDRESS OF SUBCONTRACTOR (include ZIP Code)

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause.

\_\_\_Yes \_\_\_No

2. Compliance reports were required to be filed in connection with such contract or subcontract.

\_\_\_Yes \_\_\_No

3. Bidder has filed all compliance reports due under applicable instructions, including SF-100.

\_\_\_Yes \_\_\_No

4. Have you ever been or are you being considered for sanction due to violation of Executive Order 11246, as amended?

\_\_\_Yes \_\_\_No

NAME AND TITLE OF SIGNER (Please type)

SIGNATURE

DATE

#### SUBCONTRACTOR'S CERTIFICATION

FO (Appropriate Recipient): CITY OF MCALLEN	DATE
	**
	PROJECT NUMBER (if any)
c/o	
	**
	PROJECT NAME
1. The undersigned, having executed	a contract with
	(Contractor/Subcontractor)
	(Contractor/Subcontractor)
	(Contractor/Subcontractor) for (Nature of work)

CONCERNING LABOR STANDARDS AND PREVAILING WAGE REQUIREMENTS

in the construction of the above-identified project, certifies that:

- (a) The Labor Standards Provisions of the Contract for Construction are included in the aforesaid contract.
- (b) Neither he nor any firm, corporation, partnership or association in which he has a substantial interest is designated as an ineligible contractor by the Comptroller General of the United States pursuant to Section 5.6(b) of the Regulations of the Secretary of Labor, Part 5 (29 CFR, Part 5) or pursuant to Section 3(a) of the Davis-Bacon Act, as amended (40 U.S.C. 276a-2(a)).
- (c) No part of the aforementioned contract has been or will be subcontracted to any subcontractor if such subcontractor or any firm, corporation, partnership or association in which such subcontractor has a substantial interest is designated as an ineligible contractor pursuant to the aforesaid regulatory or statutory provisions.
- 2. He agrees to obtain and forward to the contractor, for transmittal to the recipient, within ten days after the execution of any lower subcontract, a Subcontractor's Certification concerning Labor Standards and Prevailing Wage Requirements, executed by the lower tier subcontractor, in duplicate.
  - (a) The workmen will report for duty on or about \_\_\_\_\_

(Date)

#### 3. He certifies that:

(a) The legal name and the business address of the undersigned are:

(b)	The undersigned is:				
(1)	A single proprietorship:	(3)	A C	orporation Organized in the State of	
(2)	A partnership:		(4)	Other Organization (Describe)	
(c)	The name, title and addres the undersigned are:	ss of the owner,	partne	rs or officers of	
	Name	Title		Address	

(d) The names and addresses of all other persons, both natural and corporate, having a substantial interest in the undersigned, and the nature of the interest are (if none, so state):

	Name	Address	Nature of Interest
(e	e) The names, address in which the unders	es and trade classifications o igned has a substantial intere	f all other building construction contractors est are (if none, so state):
_			
(S	Subcontractor)		
(S	Signature)	(Typed Na	me and Title)

#### WARNING

U. S. Criminal Code, Section 1010, Title 18, U.S.C., provides in part "Whoever, .... makes, passes, utters, or publishes any statement, knowing the same to be false .... shall be fined not more than \$5,000 or imprisoned not more that two years, or both.

#### FORM OF AGREEMENT FOR ENGINEERING/ARCHITECTURAL CONSTRUCTION

THIS AGREEMENT, made this \_\_\_\_\_ day of \_\_\_\_\_\_, \_\_\_\_, by and between

<u>CITY OF McALLEN</u>, herein called "Owner", acting herein through its <u>BOARD OF COMMISSION</u>, and (Title of Authorized Official)

STRIKE OUT	(a corporation)	(a partnership)	
INAPPLICABLE (	an individual doing business as _		

#### TERMS

of \_\_\_\_\_\_. County of \_\_\_\_\_\_, and State of \_\_\_\_\_\_ hereinafter called "Contractor."

#### It is understood ENGINEER/ARCHITECT representing OWNER shall be <u>MILNET</u> <u>ARCHITECTS, 608 S. 12<sup>th</sup> Street, McAllen, Texas 78501.</u>

WITNESSETH, That the Contractor and the Owner, for the consideration hereinafter named, agree as follows:

#### **ARTICLE I - SCOPE OF THE WORK.**

The Contractor hereby agrees to furnish all of the materials and all of the equipment and labor necessary and to perform all of the work shown on the drawings and described in the specifications for the **Project No. 10-18-C01-** entitled FMCSA SOUTHERN BORDER PROGRAM CONSTRUCTION PRPOJECT REBID for the contract amount of **\$\_\_\_\_\_**.

- (a) Drawings prepared for same by MILNET ARCHITECTS
- (b) Specifications consisting of:
  - 1. "Standard General Specifications" issued by the <u>CITY OF McALLEN and as issued in</u> the contract documents.
  - 2. "Special Provisions" as prepared by <u>Yvette Barrera, P.E., City Engineer, City of</u> <u>McAllen, Engineering Department,</u>
  - 3. The "General Conditions for Engineering/Architectural Construction".
  - 4. Addenda <u>NO.</u> <u>DATED</u> <u>NO</u> <u>DATED</u>

# FORM OF AGREEMENT FOR ENGINEERING/ARCHITECTURAL CONSTRUCTION Continued:

#### **ARTICLE II - TIME OF COMPLETION.**

"If the contractor fails to complete this contract in the working days specified, the time charge will be made for each working day thereafter".

The time set forth in the proposal for the completion of the work is an essential element of the contract. For each working day in addition to the working days herein before stated as extended by the Owner, the amount per day given in the following schedule will be deducted from the money due or to become due to the Contractor not as a penalty, but as added expense for Engineering/Architectural supervision.

FC	DR AMOUNT	OF CO	NTRAC	Г	COST PEI	R DAY
\$	5,000.00	to	\$ 25,	00.000	\$100.00	
\$	25,001.00	to	\$ 100,	000.00	\$200.00	
\$	100,001.00	to	\$ 500,	000.00	\$250.00	
\$	500,001.00	and	over		\$300.00	

#### ARTICLE III - THE CONTRACT SUM.

(a) The Owner shall pay to the Contractor for the performance of the work the amounts determined for the total number of each of the following units of work completed at the unit price stated thereafter. The total number of units contained in this schedule is approximate only, and the final payment shall be made for the actual number of units that are incorporated in or made necessary by the work covered by the contract.

When and where applicable the original contract price may be increased or decreased as contemplated to complete construction as called for in the plans and specifications and in accordance with Texas Local Government Code Chapter 252 (Formerly Article 2368a V.T.C.S. Section 2a).

(b) Changes in the work made under Section 18 of the General Conditions, and not included in Article I, that cannot be classified as coming under any of the Contract units may be done at mutually agreed-upon unit price, or under the provisions of Article V "Extra Work".

#### **ARTICLE IV - PROGRESS PAYMENTS**

The owner shall make payments on account of the Contract as follows:

(a) On not later than the first day of every month the Contractor shall present to the Engineer/Architect an invoice covering the total quantities under each item of work that has been completed from the start of the job to and including the last day of the preceding month, and the value of the work so completed determined in accordance with the schedule of unit prices for such items together with such supporting evidence as may be required by the Engineer/Architect.

#### **ARTICLE IV - PROGRESS PAYMENTS Continued:**

Measurements of units for payment shall be made in accordance with the Special Conditions of the contract.

(b) On not later than the 30<sup>th</sup> of the month, the Owner shall pay by mail to the Contractor <u>90%</u> Percent of the amount of the invoice--less previous payments made. The <u>10%</u> percent retained percentage may be held by the Owner until the value of the work completed at the end of any month equals 50 percent of the total amount of the Contract after which, if the Engineer/Architect finds that satisfactory progress is being made he shall recommend that all of the remaining monthly payments be paid at a percentage of retainage less than stated above. Payments for work under, Subcontracts of the General Contractor, shall be subject to the above conditions applying to the General Contract after the work under a Subcontract has been 50 percent completed.

(c) Final payment of all moneys due on the contract shall be made within 30 days of completion and acceptance of the work.

(d) If the Owner fails to make payment as herein provided, or as provided in Article V (d), in addition to those remedies available to the Contractor under Section 23 of the General Conditions, there shall be added to each such payment daily interest at the rate of 6 percent per annum commencing on the first day after said payment is due and continuing until the payment is delivered or mailed to the Contractor.

#### **ARTICLE V - EXTRA WORK**

If the Engineer/Architect orders, in writing, the performance of any work not covered by the Drawings or included in the Specifications, and for which no items in the contract are provided, and for which no unit price or lump sum basis can be agreed upon, then such extra work shall be done on a fixed-fee basis of payment as follows:

(b) The "Cost of the Work" shall be determined as the net sum of the following items:

- 1. Job Office and all necessary temporary facilities such as buildings, use of land not furnished by the Owner, access roads and utilities. The costs of these items include construction, furnishings and equipment, maintenance during the period that they are needed, demolition and removal. Salvage valued agreed on or received by the Contractor shall be credited to the Owner.
- 2. All materials used on the work whether for temporary or permanent construction.

# FORM OF AGREEMENT FOR ENGINEERING/ARCHITECTURAL CONSTRUCTION Continued:

#### **ARTICLE V - EXTRA WORK Continued:**

- 3. All small tools and supplies; all fuel, lubricants, power, light, water and telephone service.
- 4. All plant and equipment at specified rental rates and terms of use. If the rental rates do not include an allowance for running repairs and repair parts needed for ordinary maintenance of the plant and equipment, then such items of cost are to be included in the Cost of the Work.
- 5. All transportation costs on equipment, material and men.
- 6. All labor for the project and including the salaries of superintendents, foremen, engineers, inspectors, clerks and other employees or officers, who do not devote their full time to their work.
- 7. All payroll charges such as Social Security payments, unemployment insurance, workmen's compensation insurance premiums, pension and retirement allowances, and social insurance premiums, vacation and sick leave allowances applicable to wages or salaries paid to employees for work done in connection with the contract.
- 8. All premiums on fire, public liability, property damage or other insurance coverage authorized or required by the Engineer/Architect or the Owner or regularly paid by the Contractor in the conduct of his business.
- 9. All sales, use, excise, privilege, business, occupation, gross receipt and all other taxes paid by the Contractor in connection with the work, but excluding state income derived from this contract and Federal Income taxes.
- 10. All travel or other related expense of general supervisory employees for necessary visits to the job excluding expenses of such employees incurred at the Home Office of the contractor.
- 11. All Subcontracts approved by the Engineer/Architect or Owner.
- 12. (Insert other costs proper for inclusion in this contract).
  - a. b.
  - D.
    - c.
- 13. Any other cost incurred by the Contractor as a direct result of executing the Order, subject to approval by the Engineer/Architect

LEGAL COMPANY NAME (Contractor)

ROEL RODRIGUEZ, P.E.,

TYPE/PRINT NAME (Authorized Company Representative)

BY:

SIGNATURE & TITLE

(CORPORATE SEAL)

FORM OF AGREEMENT FOR ENGINEERING/ARCHITECTURAL CONSTRUCTION Continued:

#### **ARTICLE V - EXTRA WORK Continued:**

- 14. Credit to the Owner for the following items:
  - a. Such discounts on invoices as may be obtained provided that the Owner advances sufficient funds to pay the invoices within the discount period.
  - b. The mutually agreed salvage value of materials, tools or equipment charged to the Owner and taken over by the Contractor for his use or sale at the completion of the work.
  - c. Any rebates, refunds, returned deposits or other allowances properly credited to the Cost of the work.

(c) The cost of the work done each day shall be submitted to the Engineer/Architect in a satisfactory form on the succeeding day, and shall be approved by him or adjusted at once.

(d) Monthly payments of all charges for the Extra Work in any one month shall be made in full on or before the 15th day of the succeeding month. Those payment shall include the full amount of fee earned on the cost of the work done.

IN WITNESS WHEREOF the parties hereto have executed this Agreement, the day and year first above written.

#### CITY OF McALLEN OWNER

CITY MANAGER

BY:\_\_\_\_\_

GERARDO NORIEGA, CTPM DIRECTOR PURCHASING & CONTRACTING

WITNESS:

#### PERFORMANCE BOND

#### 

KNOW ALL MEN BY THESE PRESENTS, THAT \_\_\_\_\_

(hereinafter called the Principal(s), as Principal(s), and \_\_\_\_\_

(hereinafter called the Surety(s), as Surety(s), are held and firmly bound unto \_\_\_\_\_

(hereinafter called the Obligee), in the amount of \_\_\_\_\_\_

Dollars (\$\_\_\_\_\_)

for the payment whereof the said Principal and Surety bind themselves, and their heirs,

administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Obligee, dated the

\_\_\_\_\_day of \_\_\_\_\_\_, 20\_\_\_\_\_, for the \_\_\_\_\_

which contract is hereby referred to and made a part hereof as fully and to the same extent as if copies at length herein.

#### PERFORMANCE BOND Continued:

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall faithfully perform the work in accordance with plans, specifications and contract documents, during the original term of said contract and any extension thereof that may be granted by the City of McAllen with or without notice to the surety and during the life of any guaranty required under the contract, and shall also truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of any and all authorized modifications of said contract that may hereafter be made, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Statutory Performance Bond Pursuant To Article 2253 of the Texas Local Government Code as Amended by Acts of the 1993, 73<sup>rd</sup> Legislature, Ch. 268, § 1, Eff. Sept. 1, 1993, Amended By Acts 1999, 76<sup>th</sup> Legislature, Ch. 62, Section 8.20, Eff. Sept. 1, 1999, and all liabilities on this bond shall be determined in accordance with the provisions of said Article to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, this instrumer	nt is executed in four counterpa	rts, each one of which shall
be deemed an original, this the	day of	A.D.,
20	-	

ATTEST:	Principal
(Principal) Secretary (SEAL)	Signature
Witness as to Principal	(Print/Type Name)
(Address)	(Address)
ATTEST:	Surety
(Surety) Secretary (SEAL)	Attorney-in-Fact (Signature)
Witness as to Surety	(Print/Type Name)
(Address)	(Address)

NOTE: Date of Bond must not be prior to date of Contract

(1) Correct name of Contractor; (2) A Corporation, a Partnership or an Individual, as case may be; (3) Correct name of Surety; (4) Correct name of Owner; (5) County or Parish and State; (6) Owner; (7) If Contractor is Partnership, all partners should execute bond.

#### PAYMENT BOND

OF THE TE 73 <sup>RD</sup> LEGIS *******	STATUTORY PAY XAS LOCAL GOV SLATURE, CH. 268 LEGISLATURE	MENT BOND PURSUANT TO ARTICLE 2253 ERNMENT CODE AS AMENDED BY ACTS OF THE 1993, , § 1, EFF. SEPT. 1, 1993, AMENDED BY ACTS 1999, 76 <sup>TH</sup> , CH. 62, SECTION 8.20, EFF. SEPT. 1, 1999 *****
KNOV	W ALL MEN BY T	HESE PRESENTS, that
(hereinafter c	alled the Principal(s	), as Principal(s), and
(hereinafter ca	alled the Surety(s),	as Surety(s), are held and firmly bond unto
(horoinaftor o	allod the Obliger)	a the amount of
	aned the Obligee), I	Dollars (\$)
for the payme	ent whereof, the said	Principal and Surety bind themselves, and their heirs,
administrator	s, executors, success	ors and assigns, jointly severally, firmly by these presents.
WHE	REAS, the Principal	has entered into a certain written contract with the Obligee,
dated the	day of	, 20, to

#### PAYMENT BOND Continued:

which contract is hereby referred to and made a part hereof as fully and to the same extent as if copies at length herein.

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall pay all claimants supplying labor and material to him or a subcontractor in the prosecution of the work provided for in said contract, and any extension thereof that may be granted by the City of McAllen with or without notice to the surety and during the life of any guaranty required under the contract, and shall also truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of any and all authorized modifications of said contract that may hereafter be made, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Statutory Payment Bond Pursuant To Article 2253 of the Texas Local Government Code as Amended by Acts of the 1993, 73<sup>rd</sup> Legislature, Ch. 268, § 1, Eff. Sept. 1, 1993, Amended By Acts 1999, 76<sup>th</sup> Legislature, Ch. 62, Section 8.20, Eff. Sept. 1, 1999, and all liabilities on this bond shall be determined in accordance with the provisions of said Article to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, this instrument is executed in four counterparts, each one of which shall be deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_ A.D., 20 .

ATTEST:	Principal
(Principal) Secretary (SEAL)	Signature
Witness as to Principal	(Print/Type Name)
(Address)	(Address)
ATTEST:	Surety
(Surety) Secretary (SEAL)	Attorney-in-Fact (Signature)
Witness as to Surety	(Print/Type Name)
(Address)	(Address)

(Address)

(Address)

NOTE: Date of Bond must not be prior to date of Contract

(1) Correct name of Contractor; (2) A Corporation, a Partnership or an Individual, as case may be; (3) Correct name of Surety; (4) Correct name of Owner; (5) County or Parish and State; (6) Owner; (7) If Contractor is Partnership, all partners should execute bond.

#### **GENERAL CONDITIONS**

#### 1. Contract and Contract Documents

This project to be constructed pursuant to this contract will be financed with assistance from the General Service Administration and is subject to all applicable Federal laws and regulations.

The Plans, Specifications and Addenda, hereinafter enumerated in Paragraph 1 of the Supplemental General Conditions shall form part of this Contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The table of contents, titles, headings, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or cast light on the interpretation of the provisions to which they refer:

#### CONTENTS\*

- 1. Contract and Contract Documents
- 2. Definitions
- 3. Additional Instructions and Detail Drawings
- 4. Shop or setting Drawings
- 5. Materials, Services, and Facilities
- 6. Contractor's Title to Materials
- 7. Inspection and Testing of Materials
- 8. "Or Equal" Clause
- 9. Patents
- 10. Surveys, Permits and Regulations
- 11. Contractor's Obligations
- 12. Weather Conditions
- 13. Protection of Work and Property Emergency
- 14. Inspection
- 15. Reports, Records and Data
- 16. Superintendence by Contractor
- 17. Changes in Work
- 18. Extras
- 19. Time for Completion and Liquidated Damages
- 20. Correction of Work
- 21. Subsurface Conditions Found Different
- 22. Claims for Extra Cost
- 23. Right of Owner to Terminate Contract
- 24. Construction Schedule and Periodic Estimates
- 25. Payments to Contractor
- 26. Acceptance of Final Payments as Release
- 27. Payments by Contractor

#### (General Conditions Contents Continued)

- 28. Insurance
- 29. Contract Security
- 30. Additional or Substitute Bond
- 31. Assignments
- 32. Mutual Responsibility of Contractors
- 33. Separate Contracts
- 34. Subcontracting
- 35. Architect/Engineer's Authority
- 36. Stated Allowances
- 37. Use of Premises and Removal of Debris
- 38. Quantities of Estimate
- 39. Lands and Rights-of-Way
- 40. General Guaranty
- 41. Conflicting Conditions
- 42. Notice and Service Thereof
- 43. Required Provisions Deemed Inserted
- 44. Protection of Lives and Health
- 45. Subcontracts
- 46. Equal Employment Opportunity
- 47. Interest of Member of Congress
- 48. Other Prohibited Interests
- 49. Use Prior to Owner's Acceptance
- 50. Photographs
- 51. Suspension of Work
- 52. Minimum Wages
- 53. Underpayment of Wages
- 54. Anticipated Fringe Benefits
- 55. Overtime Compensation
- 56. Apprentices
- 57. Employment Prohibited
- 58. Compliance with Anti-Kickback Act
- 59. Classifications Not Listed
- 60. Fringe Benefits Not Expressed
- 61. Posting Wage Rates
- 62. Complaints, Proceedings or Testimony
- 63. Claims and Disputes
- 64. Questions Concerning Regulations
- 65. Payrolls and Records
- 66. Specific Coverage
- 67. Ineligible Subcontractors
- 68. Provisions to be Included
- 69. Breach of Labor Standards
- 70. Employment Practices
- 71. Contract Termination; Debarment
- 72. Indemnity and Hold Harmless Agreement
- \*\* Attachment to Federal Labor Standards Provisions
- 73. Chapter 2270, Texas Government Code
# 2. Definitions

The following terms as used in this contract are respectively defined as follows:

- (a) "Contractor": A person, firm or corporation with whom the contract is made by the Owner.
- (b) "Subcontractor": A person, firm or corporation supplying labor and materials or only labor for work at the site of the project for, and under separate contract or agreement with, the Contractor.
- (c) "Work on (at) the project": Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the Contractor and any Subcontractor.

# 3. Additional Instructions and Detail Drawings

The Contractor will be furnished additional instructions and detail drawings as necessary to carry out the work included in the contract. The additional drawings and instructions thus supplied to the Contractor will coordinate with the Contract Documents and will be so prepared that they can be reasonably interpreted as part thereof. The Contractor shall carry out the work in accordance with the additional detail drawings and instructions. The Contractor and the Architect/Engineer will prepare jointly (a) a schedule, fixing the dates at which special detail drawings will be required, such drawings, if any, to be furnished by the Architect/Engineer in accordance with said schedule, and (b) a schedule fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment, and the completion of the various parts of the work: each such schedule to be subject to change from time to time in accordance with the progress of the work.

# 4. Shop or Setting Drawings

The Contractor shall submit promptly to the Architect/Engineer two copies of each shop or setting drawing prepared in accordance with the schedule predetermined as aforesaid. After examination of such drawings by the Architect/Engineer and the return thereof, the Contractor shall make such corrections to the drawings as have been indicated and shall furnish the Architect/Engineer with two corrected copies. If requested by the Architect/Engineer the Contractor must furnish additional copies. Regardless of corrections made in or approval given to such drawings by the Architect Engineer, the Contractor will nevertheless be responsible for the accuracy of such drawings and for their conformity to the Plans and Specifications, unless he notifies the Architect/Engineer in writing of any deviations at the time he furnished such drawings.

# 5. Materials, Services, and Facilities

(a) It is understood that except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every nature whatsoever necessary to execute, complete, and deliver the work within the specified time. UNLESS OTHERWISE STIPULATED, THE CITY WILL NOT PAY FOR MATERIALS STORED ON HAND.

# 5. Materials, Services, and Facilities Continued:

(b) Any work necessary to be performed after regular working hours, on Sundays or Legal Holidays, shall be performed without additional expense to the Owner.

# 6. Contractor's Title to Materials

No materials or supplies for the work shall be purchased by the Contractor or by any Subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies used by him in the work, free from all liens, claims or encumbrances.

# 7. Inspection and Testing of Materials

- (a) All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Owner. The Owner will pay for all laboratory inspection service direct, and not as a part of the contract.
- (b) Materials of construction, particularly those upon which the strength and durability of the structure may depend, shall be subject to inspection and testing to establish conformance with specifications and suitability for uses intended.

# 8. "Or Equal" Clause

Whenever a material, article or piece of equipment is identified on the plans or in the specifications by reference to manufacturers' or vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard: and, any material, article, or equipment of other manufacturers and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or equipment so proposed, is, in the opinion of the Architect/Engineer, of equal substance and function. It shall not be purchased or installed by the contractor without the Architect/Engineer's written approval.

# 9. Patents

- (a) The Contractor shall hold and save the Owner and its officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents.
- (b) License or Royalty Fees: License and/or Royalty Fees for the use of a process which is authorized by the Owner of the project must be reasonable, and paid to the holder of the patent, or his authorized licensee, direct by the Owner and not by or through the Contractor.

## 9. Patents (Continued)

(c) If the Contractor uses any design, device or materials covered by letters, patent or copyright, he shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, device or material. It is mutually agreed and understood, that, without exception, the contract prices shall include all royal ties or costs work. The Contractor and or his Sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract, and shall indemnify the Owner for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

#### 10. Surveys, Permits, and Regulations

Unless otherwise expressly provided for in the specifications, the Owner will furnish to the Contractor all surveys necessary for the execution of the work.

The Contractor shall procure and pay all permits, licenses and approvals necessary for the execution of his contract.

The Contractor shall comply with all laws, ordinances, rules, orders and regulations relating to performance of the work the protection of adjacent property, and the maintenance of passageways, guard fences or other protective facilities.

# **11.** Contractor's Obligations

The Contractor shall and will, in good workmanlike manner, do and perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary or proper to perform and complete all work required by this contract, within the time herein specified, in accordance with the provisions of this contract and said specifications and in accordance with the plans and drawings covered by this contract any and all supplemental plans and drawings, and in accordance with the directions of the Architect/Engineer as given from time to time during the progress of the work. He shall furnish, erect, maintain, and remove such construction plant and such temporary works as may be required.

The Contractor shall observe, comply with, and subject to all terms, conditions, requirements, and limitations of the contract and specifications, and shall do, carry on, and complete the entire work to the satisfaction of the Architect/Engineer and the Owner.

#### **12.** Weather Conditions

In the event of temporary suspension of work, or during inclement weather, or whenever the Architect/Engineer shall direct, the Contractor will and will cause his subcontractors to protect carefully his and their work and materials against damage or injury from the weather.

# 12. Weather Conditions (Continued)

If, in the opinion of the Architect/ Engineer, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any of his Subcontractors so to protect his work, such materials shall be removed and replaced at the expense of the Contractor.

# 13. Protection of Work and Property -- Emergency

The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this contract. He shall at all times safely guard and protect his own work, and that of adjacent property from damage. The Contractor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in the contract or by the Owner, or his duly authorized representatives.

In case of an emergency which threatens loss or injury of property, and/or safety of life, the Contractor will be allowed to act, without previous instructions from the Architect/Engineer, in a diligent manner. He shall notify the Architect/Engineer immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted to the Architect/Engineer for approval. Where the Contractor has not taken action but has notified the Architect/Engineer of an emergency threatening injury to persons or damage to the work or any adjoining property he shall act as instructed or authorized by the Architect/Engineer.

The amount of reimbursement claimed by the Contractor on account of an emergency action shall be determined in the manner provided in Paragraph 17 of the General Conditions.

# 14. Inspection

The authorized representatives and agents of the Department of Housing and Urban Development shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.

# 15. Reports, Records and Data

The Contractor shall submit to the Owner such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this contract.

# 16. Superintendence By Contractor

At the site of the work, the Contractor shall employ a construction superintendent or foreman who shall have full authority to act for the Contractor. It is understood that such representative shall be acceptable to the Architect/Engineer and shall be one who can be continued in that capacity for the particular job involved unless he ceases to be on the Contractor's payroll.

# 17. Changes in Work

No changes in the work covered by the approved Contract Documents shall be made without having prior written approval of the Owner. Charges or credits for the work covered by the approved change shall be determined by one or more, or a combination of the following methods:

- (a) Unit bid prices previously approved
- (b) An agreed lump sum
- (c) The actual cost of:
  - 1. Labor, including foremen:
  - 2. Materials entering permanently into the work
  - 3. The ownership or rental cost of construction plant and equipment during the time of use on the extra work;
  - 4. Power and consumable supplies for the operation of power equipment;
  - 5. Insurance;
  - Social Security and old age and unemployment contributions.
    To the cost under (c) there shall be added a fixed fee to be agreed upon but not to exceed fifteen percent (15%) of the actual cost of the work. The fee shall be compensation to cover the cost of supervision, overhead, bond, profit and any other general expenses.

#### 18. Extras

Without invalidating the contract, the Owner may order extra work or make changes by altering, adding to or deducting from the work, the contract sum being adjusted accordingly, and the consent of the Surety being first obtained where necessary or desirable. All the work of the kind bid upon shall be paid for at the price stipulated in the proposal, and no claims for any extra work is ordered in writing by the Owner or its Architect/Engineer, acting officially for the Owner, and the price is stated in such order.

#### **19.** Time for Completion and Liquidated Damages

It is hereby understood and mutually agreed, by and between the Contractor and the Owner, that the date of beginning and the time for completion as specified in the contract of the work to be done hereunder are ESSENTIAL CONDITIONS of this contract; and it is further mutually understood and agreed that the work embraced in this contract shall be commended on a date to be specified in the "Notice to Proceed."

The Contractor agrees that said work shall be prosecuted regularly, diligently, and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

If the said Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as a part consideration for the awarding of this contract, to pay to the Owner

# **19.** Time for Completion and Liquidated Damages (Continued)

the amount specified in the contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every working day that the Contractor shall be in default after the time stipulated in the contract for completing the work.

The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.

It is further agreed that time is of the essence of each and every portion of this contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the contract an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this contract. <u>Provided</u>, that the Contractor shall not be charged with liquidated damages or any excess cost when the Owner determines that the Contractor is without fault and the Contractor shall not be charged with liquidated damages or any excess for the time extension are acceptable to the Owner; <u>Provided</u>, further, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

- (a) To any preference, priority or allocation order duly issued by the Government;
- (b) To unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and severe weather: and
- (c) To any delays of Subcontractors or suppliers occasioned by any of the causes specified in subsections (a) and (b) of this article:

<u>Provided, further</u>, that the Contractor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay, and notify the Contractor within a reasonable time of its decision in the matter.

# 20. Correction of Work

All work, all materials, whether incorporated in the work or not, all processes of manufacture, and all methods of construction shall be at all times and places subject to the inspection of the Architect/Engineer who shall be the final judge of the quality and suitability of the work, materials, processes of manufacture, and methods of construction for the purposes for which they are used. Should they fail to meet his approval they shall be forthwith reconstructed, made good, replaced and/or corrected, as the case may be, by the Contractor at his own expense. Rejected material shall immediately be removed from the site. If, in the opinion of the Architect/Engineer,

## 20. Correction of Work (Continued)

it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as in the judgment of the Architect/Engineer shall be equitable.

#### 21. Subsurface Conditions Found Different

Should the Contractor encounter subsurface and/or latent conditions at the site materially differing from those shown on the plans or indicated in the specifications, he shall immediately give notice to the Architect/ Engineer of such conditions before they are disturbed. The Architect/ Engineer will thereupon promptly investigate the conditions, and if he finds that they materially differ from those shown on the plans or indicated in the specifications, he will at once make such changes in the plans and/or specifications as he may find necessary, any increase or decrease of cost resulting from such changes to be adjusted in the manner provided in Paragraph 17 of the General Conditions.

#### 22. Claims for Extra Cost

No claim for extra work or cost shall be allowed unless the same was done in pursuance of a written order of the Architect/Engineer approved by the Owner, as aforesaid, and the claim presented with the first estimate after the changed or extra work is done. When work is performed under the terms of subparagraph 17(c) of the General Conditions, the Contractor shall furnish satisfactory bills, payrolls and vouchers covering all items of cost and when requested by the Owner, give the Owner access to accounts relating thereto.

#### 23. Right of the Owner to Terminate Contract

In the event that any of the provisions of this contract are violated by the Contractor, or by any of his subcontractors, the Owner may serve written notice upon the Contractor and the Surety of its intention to terminate the contract, such notices to contain the reasons for such intention to terminate the contract and unless within ten (10) days after the serving of such notice upon the Contractor, such violation or delay shall cease and satisfactory arrangement of correction be made, the contract shall, upon the expiration of said ten (10) days, cease and terminate. In the event of any such termination, the Owner shall immediately serve notice thereof upon the Surety and the Contractor and the Surety shall have the right to take over and perform the contract: Provided, however, that if the Surety does not commence performance thereof within ten (10) days from the date of the mailing to same to complete by contractor or by force account and at the expense of the Contractor and the Contractor and his Surety shall be liable to the Owner for any excess cost occasioned the Owner thereby, and in such event the Owner may take possession of and utilize in completing the work, such materials, appliances, and plant as may be on the site of the work and necessary therefore.

#### 24. Construction Schedule and Periodic Estimates

Immediately after execution and delivery of the contract, and before the first partial payment is made, the Contractor shall deliver to the Owner an estimated construction progress

# 24. Construction Schedule and Periodic Estimates Continued:

schedule in form satisfactory to the Owner, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the progress schedule. The Contractor shall also furnish on forms to be supplied by the Owner (a) a detailed estimate giving a complete breakdown of the contract price and (b) periodic itemized estimates of work done for the purpose of making partial payments thereon. The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

# 25. Payments to Contractor

- (a) Not later than the 30th day of each calendar month, the Owner shall make a progress payment to the Contractor on the basis of a duly certified and approved estimate of the work performed during the preceding calendar month under this contract, but to insure the proper performance of this contract, the Owner shall retain \_\_\_\_\_\_(%) of the amount of each estimate until final completion and acceptance of all work covered by this contract: <u>Provided</u>, that the Contractor shall submit his estimate not later than the first day of the month. <u>Provided</u>, further, that the Owner at any time after fifty percent (50%) of the work has been completed, if it finds that satisfactory progress is being made, may make any of the remaining progress payments in full: <u>Provided further</u>, that on completion and acceptance of each separate building, public work, or other division of the contract, on which the price is stated separately in the contract, payment may be made in full, including retained percentages thereon, less authorized deductions.
- (b) In preparing estimates, the material delivered on the site and preparatory work done may be taken into consideration.
- (c) All material and work covered by partial payments made, shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of materials and work upon which payments have made or the restoration of any damaged work or as a waiver of the right of the Owner to require the fulfillment of all of the terms of the contract.
- (d) Owner's Right to Withhold Certain Amounts and Make Application Thereof: The Contractor agrees that he will indemnify and save the Owner harmless from all claims growing out of the lawful demands of subcontractors, laborers, workmen, mechanics, material-men, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this contract. The Contractor shall, at the Owner's request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged, or waived. If the Contractor fails so to do, then the Owner may after having served written notice on the said Contractor, either pay unpaid bills of which the Owner has written notice direct, or withhold from the Contractor's unpaid compensation.

# 25. Payments to Contractor (Continued)

(d) Owner's Right to Withhold Certain Amounts and Make Application Thereof (Continued): a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed, in accordance with the terms of this contract, but in no event shall the provisions of this sentence be construed to impose any obligations upon the Owner to either the Contractor or his Surety, in paying any unpaid bills of the Contractor, the Owner shall be deemed the agent of the Contractor, and any payment so made by the Owner shall be considered as a payment made under the contract by the Owner to the Contractor and the Owner shall not be liable to the Contractor for any such payments made in good faith.

#### 26. Acceptance of Final Payment Constitutes Release

The acceptance by the Contractor of final payment shall be and shall operate as a release to the Owner of all claims and all liability to the Contractor for all things done or furnished in connection with this work and for every act and neglect of the Owner and others relating to or arising out of this work. No payment, however, final or otherwise, shall operate to release the Contractor or his sureties from any obligations under this contract or the Performance and Payment bond.

#### 27. Payments by Contractor

The Contractor shall pay (a) for all transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered, (b) for all materials, tools, and other expendable equipment to the extent of ninety percent (90%) of the cost thereof, not later than the 20th day of the calendar month following that in which such materials, tools, and equipment are delivered at the site of the project, and the balance of the cost thereof, not later than the 30th day following the completion of that part of the work in or on which such materials, tools, and equipment are incorporated or used, and (c) to each of his subcontractors, not later than the 5th day following each payment to the Contractor, the respective amount allowed the Contractor on account of the work performed by his subcontractors the extent of each subcontractor's interest therein.

# 28. Insurance

The Contractor shall not commence work under this contract until he has obtained all the insurance required under this paragraph and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on his subcontract until the insurance required of the subcontractor has been so obtained and approved.

(a) <u>Compensation Insurance</u>: The Contractor shall procure and shall maintain during the life of this contract Worker's Compensation Insurance as required by applicable State or territorial law for all of his employees to be engaged in work at the site of the project under this contract and, in case of any such work sublet, the Contractor shall require the subcontractor similarly to provide Worker's Compensation Insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the Contractor=s Worker=s

#### 28. Insurance

(a) <u>Compensation Insurance Continued</u>: Compensation Insurance. In case any class of employees engaged in hazardous work on the project under this contract is not protected under the Worker's Compensation Statute, the Contractor shall provide and shall cause each subcontractor to provide adequate employer's liability insurance for the protection of such of his employees as are not otherwise protected.

## PREAMBLE TO RULE 110.110

The Texas Workers' Compensation Commission adopts new '110.110, concerning requirements for governmental entities awarding a contract for a building or construction project, and for persons providing services on a building or construction project for a governmental entity. The new rule is adopted with changes to the proposed text published in the April 26, 1994 issue of the Texas Register (19 TexReg 3131). Subsections (a)(7) and (c)(7) were amended by adding language to further clarify who is covered by the rule. Subsections (c)(7)(J) and (e)(3) were added to clarify that a contractor or subcontractor is representing to the governmental entity that workers' compensation coverage is provided. Subsections (d)(8)(C) were added to require specific language regarding representations of coverage to be added to contracts to provide services on the project. Subsections (c)(7)(F), and (c)(7)(I)(5), (d)(5), (d)(8)(F), (e)(6), and (e)(8)(F) were amended to reduce the retention period for contractors and other persons providing services on the project for contract (g) was changed to state that this rule applies to contract advertised for bid after September 1, 1994, rather than awarded after September 1, 1994.

The Texas Labor Code, '406.096, requires workers' compensation insurance coverage for all persons providing services on a building or construction project for a governmental entity. The commission is aware that this statutory requirement is not being met, and this rule is designed to achieve compliance and to implement a recordkeeping process which will enable oversight of compliance. The rule does this by placing requirements on the governmental entity and on contractors and other persons providing services on a project. These requirements include coverage, certificates of coverage, posted notices of coverage, and notification of changes in coverage status. The rule does not create any duty or burden on anyone which the law does not establish.

The rule defines terms which apply to governmental entity building or construction projects and sets up a clear procedure for governmental entities and contractors that bid for building and construction projects to follow in complying with the requirements of the Texas Labor Code '406.096. It also defines "persons who provide services on a project" who are subject to the statutory requirement of coverage, and sets forth their requirements to comply with the statute and the rule. It specifically excludes persons such as food/beverage vendors whose deliveries and labor are not permanently incorporated into the project. The rule puts persons on notice that providing false or misleading certificates of coverage, or failing to provide or maintain required coverage, or failing to report any change that materially affects the provision of coverage may subject the contractor or other persons providing services on the project to administrative penalties, civil penalties, or other civil actions.

The rule requires a governmental entity to timely obtain certificates of coverage, retain them for the duration of the project plus three years, and provide them to the commission upon request and to others entitled to them by law. It also requires the governmental entity, as a prerequisite to awarding a contract, and as part of the contract, to require that the contractor: provide coverage and certificates of coverage for the contractor's employees; timely obtain and provide the governmental entity all required certificates of coverage for all persons providing services on the project; retain certificates of coverage on file for the duration of the project and for one year thereafter; notify the governmental entity in writing by certified mail or person 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; post notices on each project site; and contractually require persons with whom it contracts to do the same, with the certificates of coverage to be provided to the person for whom they are providing services. The rule also sets out the language to be included in bid specifications and in contracts awarded by a governmental entity and the information required to be in the posted notice to employees. It further establishes a method for obtaining the certificates from persons providing services on the project and providing them to the governmental entity.

It requires a contractor awarded a building or construction contract to: provide workers' compensation coverage to the contractor's employees for the duration of the project; file a certificate of coverage of the contractor's employees wit the governmental entity prior to being awarded a contract; obtain and provide to the governmental entity, certificates of coverage from each other person with whom it has contracted to provide services on the project, prior to that person beginning work on the project; obtain and provide new certificates of coverage for the duration of the project; obtain and provide new certificates of coverage for the duration of the project; notify the governmental entity of material changes in coverage; contractually require each other person with whom it contracts to provide a certificate of coverage; and post notices on each project site.

All other persons providing services on a project have the same requirements as a contractor, with the exception of posting notices and with the exception that the certificate of coverage is given to the person for whom they contracted to provide services on the project. The rule uses the term "persons providing services on the project" in lieu of the statutory term "subcontractor" because the term "subcontractor" as used in the statute ('406.096) and in this rule is broader than standard industry usage. The use of the different terminology will prevent confusion.

The rule does not create any duty or burden on anyone which the law does not establish.

The new rule is adopted under the Texas Labor Code, '402.061, which authorizes the commission to adopt rules necessary to administer the Act, and Teas Labor code, '406.096, which establishes requirements for governmental entities, contractors, and subcontractors ("persons providing services on the project") regarding workers' compensation coverage for workers on compensation coverage for workers on public building or construction projects.

- Rule 110.110 Reporting Requirements for Building or Construction Projects for Governmental Entities
- (a) The following word and terms, when used in this rule, shall have the following meanings, unless the context clearly indicates otherwise. Terms not defined in this rule shall have the meaning defined in the Texas Labor code, if so defined.
  - (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 (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees (including those subject to a coverage agreement) providing services on a project, for the duration of the project.
  - (2) Building or construction Has the meaning defined in the Texas Labor Code, (e)(1).
  - (3) Contractor A person bidding for or awarded a building or construction project by a governmental entity.
  - (4) Coverage Workers' compensation insurance meeting the statutory requirements of the Texas Labor Code, '401.011(44).
  - (5) Coverage agreement A written agreement on form TWCC-81, form TWCC-82, form TWCC-83, or form TWCC-84, filed with the Texas Workers' Compensation Commission which establishes a relationship between the parties for purposes of the Workers' Compensation Act, pursuant to the Texas Labor Code, Chapter 406, Subchapters F and G as one of employer/employee and establishes who will be responsible for providing workers' compensation coverage for person providing services on the project.
  - (6) Duration of the project Includes the time from the beginning of work on the project until the work on the project has been completed and accepted by the governmental entity.
  - (7) Persons providing services on the project ("subcontractor" in '406.096 of the Act) 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 but is not limited to independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity furnishing persons to perform services on the project. "Services" includes but is not limited to providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other services 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.
  - (8) Project Includes the provision of all services related to a building or construction contract for a governmental entity.

- (b) Providing or causing to be provided a certificate of coverage pursuant to this rule is a representation by the insured that all employees of the insured who are providing services on the project are covered by workers' compensation coverage, that the coverage is based on proper reporting of classification codes and payroll amounts, and that all coverage agreements have been 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 certificates of coverage, or failing to provide or maintain required coverage, or failing to report any change that materially affects the provision of coverage may subject the contractor or other person providing services on the project to administrative penalties, criminal penalties, civil penalties, or other civil actions.
- (c) A governmental entity that enters into a building or construction contract on a project shall:
  - (1) include in the bid specifications, all the provisions of subsection (d) of this rule, using the language required by paragraph (7) of this subsection;
  - (2) as part of the contract, using the language required by paragraph (7) of this subsection, require the contractor to perform as required in subsection (d) of this rule;
  - (3) obtain from the contractor a certificate of coverage for each person providing services of the project, prior to that person beginning work on the project;
  - (4) obtain from the contractor a new certificate of coverage showing extension of coverage:

(A) before the end of the current coverage period, if the contractor's current certificate of coverage shows that the coverage period ends during the duration of the project; and

(B) no later than seven days after the expiration of the coverage for each other person providing services on the project whose current certificate shows that the coverage period ends during the duration of the project;

- (5) retain certificates of coverage on file for the duration of the project and for three years thereafter;
- (6) provide a copy of the certificates of coverage to the commission upon request and to any person entitled to them by law; and
- (7) use the following language for bid specifications and contacts, without any additional words or changes, except those required to accommodate the specific document in which they are contained or to impose stricter standard of documentation in Figure 1:

Article \_\_\_\_. Worker's Compensation Insurance Coverage.

# A. Definitions:

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 (TWCC-81, TWCC-82, TWCC-83, or TWCC-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.

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.

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.

B. The contractor shall provide coverage, based on proper reporting a 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.

C. The contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.

D. 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.

E. 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 certificate 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.

F. The contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.

G. 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.

H. The contractor shall post on each project site a notice, in the text, form and manner prescribed by the Texas Workers' Compensation Commission, 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.

I. 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.

J. 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, or other civil actions.

K. 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 (10) days after receipt of notice of breach from the governmental entity.

- (d) A contractor shall:
  - (1) provide coverage for its employees providing services on a project, for the duration of the project based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements;
  - (2) provide a certificate of coverage showing workers' compensation coverage to the governmental entity prior to beginning work on the project;
  - (3) provide the governmental entity, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project;
  - (4) obtain from each person providing services on a project, and provide to the governmental entity:
    - (A) 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
    - (B) 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) 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 contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project;
- (7) post a notice on each project site informing all persons providing services on the project that they are required to be covered, and stating how a person may verify current coverage and report failure to provide coverage. This notice does not satisfy other posting requirements imposed by the Act or other commission rules. This notice must be printed with a title in at least 30 point bold type and text in at least 19 point normal type, and shall be in both English and Spanish and any other language common to the worker population. The text for the notices shall be the following text in Figure 2 provided by the commission on the sample notice, without any additional words or changes:

(Figure 2)

#### REQUIRED WORKERS' COMPENSATION COVERAGE

"The law requires that each person working on this site or providing services related to this construction project must be covered by workers' compensation insurance. This includes persons providing, hauling, or delivering equipment or materials, or providing labor or transportation or other service related to the project, regardless of the identity of their employer or status as an employee."

"Call the Texas Workers' Compensation Commission at 512-440-3789 to receive information on the legal requirements of coverage, to verify whether your employer has provided the required coverage, or to report an employer's failure to provide coverage." and

- (8) contractually require each person with whom it contracts to provide services on a project, to:
  - (A) provide coverage based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements for all of its employees providing services on the project, for the duration of the project;
  - (B) provide a certificate of coverage to the contractor prior to that person beginning work on the project;
  - (C) include in all contracts to provide services on the project the language insubsection
    (e)(3) of this rule;

- (D) 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;
- (E) obtain from each other person with whom it contracts, and provide to the contractor:

(i) a certificate of coverage, prior to the other person beginning work on the project; and

(ii) prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

- (F) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;
- (G) 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
- (H) contractually require each other person with whom it contracts, to perform as required by paragraphs (A) (H), wit the certificate of coverage to be provided to the person for whom they are providing services.
- (e) A person providing services on a project, other than a contractor, shall:
  - (1) provide coverage for its employees providing services on a project, for the duration of the project based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements;
  - (2) provide a certificate of coverage as required by its contract to provide services on the project, prior to beginning work on the project;

(3) have the following language in its contract to provide services on the project:

"By signing this contract or providing or causing to be provided a certificate of coverage, the person signing this contract is representing to the governmental entity that all employees of the person signing this contract 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 Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions."

- (4) provide the person for whom it is providing services on the project, prior to the end of the coverage period shown on its current certificate of coverage, a new certificate showing extension of coverage, if the coverage period shown on the certificate of coverage ends during the duration of the project;
- (5) obtain from each person providing services on a project under contract to it, and provide as required by its contract:

(A) a certificate of coverage, prior to the other person beginning work on the project; and

(B) prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

- (6) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;
- (7) notify the governmental entity in writing by certified mail or personal delivery, of any change that materially affects the provision of coverage of any person providing services on the project and send the notice within 10 days after the person knew or should have known of the change; and
- (8) contractually require each other person with whom it contracts to:
  - (A) provide coverage based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements for all of its employees providing services on the project, for the duration of the project;
  - (B) provide a certificate of coverage to it prior to that other person beginning work on the project;

- (C) include in all contracts to provide services on the project the language in subsection (e)(3) of this rule;
- (D) provide, prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;
- (E) obtain from each other person under contract to it to provide services on the project, and provide as required by its contract;
- (F) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;
- (G) 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
- (H) contractually require each person with whom it contracts, to perform as required by paragraphs (A) (H), with the certificate of coverage to be provided to the person for whom they are providing services.
- (f) If any provision of this rule or its application to any person or circumstance is held invalid, the invalidity does not affect other provisions or applications of this rule that can be given effect without the invalid provision or application, and to this end the provisions of this rule are declare to be severable.
- (g) This rule is applicable for building or construction contracts advertised for bid by a governmental entity on or after September 1, 1994.

# 28. Insurance Continued:

- (b) <u>Contractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance</u>: The Contractor shall procure and shall maintain during the life of this contract Contractor's Public Liability Insurance, Contractor's Property Damage Insurance and Vehicle Liability Insurance in the amounts specified in the Supplemental General Conditions.
- (c) <u>Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability</u> <u>Insurance</u>: The Contractor shall either (1) require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and the amounts specified in the Supplemental General Conditions specified in subparagraph (b) hereof or, (2) insure the activities of his policy, specified in subparagraph (b) hereof.
- (d) Scope of Insurance and Special Hazards: The insurance required under subparagraph (b) and (c) hereof shall provide adequate protection for the Contractor and his subcontractors, respectively, against damage claims which may arise from operations under this contract, whether such operations be by the insured or by anyone directly or indirectly employed by him and, also against any of the special hazards which may be encountered in the performance of this contract as enumerated in the Supplemental General Conditions.
- (e) <u>Builder's Risk Insurance (Fire and Extended Coverage)</u>: Until the project is completed and accepted by the Owner, the Owner, or Contractor (at the Owner's option as indicated in the Supplemental General Conditions, Form HUD-4238-N) is required to maintain Builders Risk Insurance (fire and extended coverage) on a 100 percent completed value basis on the insurable portion of the project for the benefit of the Owner, the Contractor, subcontractors as their interests may appear. The Contractor shall not include any costs for Builder's Risk Insurance (fire and extended coverage) premiums during construction unless the Contractor is required to provide such insurance; however, this provision shall not release the Contractor from his obligation to complete, according to plans and specifications, the project covered by the contract, and the Contractor and his Surety shall be obligated to full performance of the Contractor's undertaking.
- (f) <u>Proof of Carriage of Insurance</u>: The Contractor shall furnish the Owner with certificates showing the type, amount, class of operations covered, effective dates and date of expiration of policies. Such certificates shall also contain substantially the following statement: "The insurance covered by this certificate will not be canceled or materially altered, except after ten (10) days written notice has been received by the Owner."

# 29. Contract Security

The Contractor shall furnish a performance bond in an amount at least equal to one hundred percent (100%) of the contract prices as security for the faithful performance of this contract and also a payment bond in an amount not less than one hundred percent (100%) of the contract price or in a penal sum not less than that prescribed by State, territorial or local law, as security for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract. The performance bond and the payment bond may be in one or in separate instruments in accordance with the local law.

## 30. Additional or Substitute Bond

If at any time the Owner for justifiable cause shall be or become dissatisfied with any surety or sureties, then upon the Performance or Payment Bonds, the Contractor shall within five (5) days after notice from the Owner so to do, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premium on such bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished such an acceptable bond to the Owner.

#### 31. Assignments

The Contractor shall not assign the whole or any part of this contract or any part of this contract or any moneys due or to become due hereunder without written consent of the Owner. In case the Contractor assigns all or any part of any moneys due or to become due under this contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to the Contractor shall be subject to prior claims of all persons, firms and corporation of services rendered or materials supplied for the performance of the work called for in this contract.

# **32.** Mutual Responsibility of Contractors

If, through acts of neglect on the part of the Contractor, any other Contractor or any subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other Contractor or subcontractor by agreement or arbitration if such other Contractor or subcontractor will so settle. If such other Contractor or subcontractor shall assert any claim against the Owner on account of any damage alleged to have been sustained, the Owner shall notify the Contractor, who shall indemnify and save harmless the Owner against any such claim.

#### **33.** Separate Contract

The Contractor shall coordinate his operations with those of other Contractors. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work. The Contractor, including his subcontractors, shall keep informed of the progress and the detail work of other contractors and shall notify the Architect/Engineer immediately of lack of progress or defective workmanship on the part of other Contractors.

# **33.** Separate Contract Continued:

Failure of a contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by him of the status of the work as being satisfactory for proper coordination with his own work.

## 34. Subcontracting

- (a) The Contractor may utilize the services of specialty subcontractors on those parts of the work which, under normal contracting practices, are performed by specialty subcontractors.
- (b) The Contractor shall not award any work to any subcontractor without prior written approval of the Owner, which approval will not be given until the Contractor submits to the Owner a written statement concerning the proposed award to the subcontractor, which statement shall contain such information as the Owner may require.
- (c) The Contractor shall be as fully responsible to the Owner for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.
- (d) The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and other contract documents insofar as applicable to the work of subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Contractor under any provision of the contract documents.
- (e) Nothing contained in this contract shall create any contractual relation between any subcontractor and the Owner.

# 35. Architect/Engineer's Authority

The Architect/Engineer shall give all orders and directions contemplated under this contract and specifications, relative to the execution of the work. The Architect Engineer shall determine the amount, quality, acceptability, and fitness of the several kinds of work and materials which are to be paid for under this contract and shall decide all questions which may arise in relation to said work and the construction thereof. The Architect/Engineer estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties hereto relative to said contract or specifications, the determination or decision of the Architect/Engineer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this contract affected in any manner or to any extent by such question.

The Architect/Engineer shall decide the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found obscure or be in dispute. Any differences or conflicts in regard to their work which may arise between the

# 35. Architect/Engineer's Authority Continued:

Contractor under this contract and other Contractors performing work for the Owner shall be adjusted and determined by the Architect/Engineer.

## **36.** Stated Allowances

The Contractor shall include in his proposal the cash allowances stated in the Supplemental General Conditions. The Contractor shall purchase the "Allowed Materials" is more or less than the "Cash Allowance," the contract price shall be adjusted accordingly. The adjustment in contract price shall be made on the basis of the purchase price without additional charges for overhead, profit, insurance or any other incidental expenses. The cost of installation of the "Allowed Materials" shall be included in the applicable sections of the Contract Specifications covering this work.

# **37.** Use of Premises and Removal of Debris

The Contract expressly undertakes at his own expense:

- (a) to take every precaution against injuries to persons or damage to property;
- (b) to store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or the work of any other contractors;
- (c) to place upon the work or any part thereof only such loads as are consistent with the safety of that portion of the work;
- (d) to clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the work shall present a neat, orderly and workman like appearance;
- (e) before final payment to remove all surplus material, false work, temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from his operations, and to put the site in a neat, orderly condition;
- (f) to effect all cutting, fitting or patching of his work required to make the same to conform to the plans and specifications and, except with the consent of the Architect/Engineer, not to cut or otherwise alter the work of any other Contractor.

# **38.** Quantities of Estimate

Wherever the estimated quantities of work to be done and materials to be furnished under this contract are shown in any of the documents including the proposal, they are given for use in comparing bids and the right is especially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this contract, and such increase or diminution shall in no way vitiate this contract, nor shall any such increase or diminution give cause for claims or liability for damages.

#### 39. Lands and Rights-of-Way

Prior to the start of construction, the Owner shall obtain all lands and rights-of-way necessary for the carrying out and completion of work to be performed under this contract.

## 40. General Guaranty

Neither the final certificate of payment nor any provision in the Contract Documents nor partial or entire occupancy of the premises by the Owner shall constitute an acceptance of work not done in accordance with the Contract Document or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall guarantee all materials and equipment furnished and work performed for a period of one (1) year from the date of Substantial Completion. The Contractor warrants and guarantees for a period of one (1) year from the date of faulty materials or workmanship and the Contractor shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system or other work resulting from such defects.

The Owner will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments, or other work that may be made necessary by such defects, the Owner may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in full force and effect through the guarantee period.

#### 41. Conflicting Guaranty

Any provision in any of the Contract Documents which may be in conflict or inconsistent with any of the paragraphs in these General Conditions shall be void to the extent of such conflict or inconsistency.

# 42. Notice and Service Thereof

Any notice to any Contractor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted, by certified or registered mail, to the said Contractor at his last given address, or delivered in person to the said Contractor or his authorized representative on the work.

# 43. Provisions Required by Law Deemed Inserted

Each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and the contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party the contract shall forthwith be physically amended to make such insertion or correction.

# 44. Protection of Lives and Health

"The Contractor shall exercise proper precaution at all times for the protection of persons and property, either on or off the site, which occur as a result of his prosecution of the work. The safety provisions of applicable laws and building and construction codes, in addition to specific safety and health regulations described by Chapter XIII, Bureau of Labor Standards, Department of Labor, Part 1518, Safety and Health Regulations for Construction, as outlined in the Federal Register, Volume 36, No. 75, Saturday, April 17, 1971. Title 29 - LABOR, shall be observed and the Contractor shall take or cause to be taken, such additional safety and health measures as the Contracting Authority may determine to be reasonably necessary."

# 45. Subcontracts

"The Contractor will insert in any subcontracts the Federal Labor Standards Provisions contained herein and such other clauses as the Department of Housing and Urban Development may, by instructions require and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made."

# 46. Equal Employment Opportunity

During the performance of this contract the Contractor agrees as follows:

- (1) The Contractor will not discriminate against any employee or applicant for employment because of race, religion, sex, color or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, or national origin. Such action shall include, but not limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- (2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, religion, sex, color, or national origin.
- (3) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the labor union or workers's representative of the Contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (4) The Contractor will comply with the provisions of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

# 46. Equal Employment Opportunity Continued:

- (5) The Contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the Department of Housing and Urban Development and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (6) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, and orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or Federally-assisted construction contracts, in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- (7) The Contractor will include the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Department of Housing and Urban Development may direct as a means of enforcing such provisions, including sanctions for noncompliance. Provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Development of Housing and Urban Development, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

#### 47. Interest of Member of or Delegate to Congress

No member of or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of this contract or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

# 48. Other Prohibited Interests

No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve, or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection, construction or material supply contract or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part hereof. No officer, employee, architect, attorney, engineer or inspector of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall become directly interested personally in this contract

#### 48. Other Prohibited Interests Continued:

or in any part thereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

## 49. Use and Occupancy Prior to Acceptance by Owner

The Contractor agrees to the use and occupancy of a portion or unit of the project before formal acceptance by the Owner, provided the Owner:

- (a) Secures written consent of the Contractor except in the event, in the opinion of the Architect/Engineer, the Contractor is chargeable with unwarranted delay in final cleanup of punch list items or other contract requirements.
- (b) Secures endorsement from the insurance-carrier and consent of the surety permitting occupancy of the building or use of the project during the remaining period of construction, or,
- (c) When the project consists of more than one building, and one of the building is occupied, secures permanent fire and extended coverage insurance, including a permit to complete construction. Consent of the surety must also be obtained.
  - (1) The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, or origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
  - (2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, or national origin.

# 50. Photographs of the Project

If required by the Owner, the Contractor shall furnish photographs of the project, in the quantities and as described in the Supplemental General Conditions.

# 51. Suspension of Work

Should the Owner be prevented or enjoined from proceeding with work either before or after the start of construction by reason of any litigation or other reason beyond the control of the Owner, the Contractor shall not be entitled to make or assert claim for damage by reason of said delay, but

## 51. Suspension of Work Continued:

time for completion of the work will be extended to such reasonable time as the Owner may determine will compensate for time lost by such delay with such determination to be set forth in writing.

#### 52. Minimum Wages

All laborers and mechanics employed upon the work covered by this Contract shall be paid unconditionally and not less often than once each week, and without subsequent deduction or rebate on any account (except such payroll deductions as are made mandatory by law and such other payroll deductions as are permitted by the applicable regulations issued by the Secretary of Labor, United States Department of Labor, pursuant to the Anti-Kickback Act hereinafter identified), the full amount due at time of payment computed at wage rates not less than those contained in the wage determination decision of said Secretary of Labor (a copy of which is attached and herein incorporated by reference), regardless of any contractual relationship which may be alleged to exist between the Contractor or any subcontractor and such laborers and mechanics. All laborers and mechanics employed upon such work shall be paid in cash, except that payment may be by check if the employer provides or secures satisfactory facilities approved by the Local Public Agency or Public Body for the cashing of the same without cost or expense to the employee. For the purpose of this clause, contributions made or costs reasonably anticipated under Section 1 (b) (2) of the Davis-Bacon Act on behalf of laborers or mechanics, subject to the provisions of Section 5.5 (a) (1) (iv) of Title 29. Code of Federal Regulations. Also for the purpose of this clause, regular contributions made or costs incurred for more than a weekly period under plans, funds or programs, but covering the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

# 53. Underpayments of Wages or Salaries

In case of underpayment of wages by the Contractor or by any subcontractor to laborers or mechanics employed by the Contractor subcontractor upon the work covered by this Contract, the Local Public Agency or Public Body in addition to such other rights as may be afforded it under this Contract shall withhold from the Contractor, out of any payments due to the Contractor, so much thereof as the Local Public Agency or Public Body may consider necessary to pay such laborers or mechanics the full amount of wages required by this Contract. The amount so withheld may be disbursed by the Local Public Agency or Public Body, for and on account of the Contractor or the subcontractor (as may appropriate), to the respective laborers or mechanics to whom the same is due or on their behalf to plans, funds, or programs for any type of fringe benefit prescribed in the applicable wage determination.

# 54. Anticipated Costs of Fringe Benefits

If the Contractor does not make payments to a trustee or other third person, he may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing fringe benefits under a plan or program of a type, expressly listed in the wage determination decision of the Secretary of Labor which is a part of this Contract: Provided, however, the Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations

# 54. Anticipated Costs of Fringe Benefits Continued:

under the plan or program. A copy of any findings made by the Secretary of Labor in respect to fringe benefits being provided by the Contractor must be submitted to the Local Public Agency or Public Body with the first payroll filed by the Contractor subsequent to receipt of the findings.

# 55. Overtime Compensation Required by Contract Work Hours and Safety Standards Act (76 Stat. 357-360: Title 40 U.S.C., Sections 327-332)

- (a) <u>Overtime-requirements.</u> No Contractor or subcontractor contracting for any part of the Contract work which may require or involve the employment of laborers or mechanics, shall require or permit any laborers or mechanics in any workweek in which he is employed on such work week to work in excess of 40 hours in such workweek unless such laborer or mechanic received compensation at a rate not less than 1 1/2 times his basic rate of pay for all hours worked in excess of 40 hours in such workweek (29 CFR 5.5(c) (1)).
- (b) Violation: Liability for unpaid wages liquidated damages.

In the event of any violation of the clause set forth in paragraph

(a), the Contractor and any subcontractor responsible therefore shall be liable to any affected employee for his unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic employed in violations of the clause set forth in paragraph (a), in the sum of \$10 for each calendar day on which such employee was required of permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in paragraph (a).

- (c) <u>Withholding for liquidated damages</u>. The Local Public Agency or Public Body shall withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor, such sums as may administratively be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for liquidated damages as provided in the clause set forth in paragraph (b).
- (d) <u>Subcontracts</u>. The Contractor shall insert in any subcontracts the clauses set forth in paragraphs
  (a), (b), and (c) of this Section and also a clause requiring the subcontractors to include these clauses a clause requiring this insertion in any further subcontracts that may in turn be made.

# 56. Employment of Apprentices/Trainees

a. <u>Apprentices</u> will be permitted to work at less than the predetermined rate for the work they performed when they are employed and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Manpower, Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his first 90 days of probationary employment as an apprentice in

# 56. Employment of Apprentices/Trainees Continued:

- Apprentices Continued: such an apprenticeship program, who is not individually registered in a. the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeyman in any craft classification shall not be greater than the ratio permitted to the contractor as to his entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not a trainee as defined in subdivision (b) of this subparagraph or is not registered or otherwise employed as stated above, shall be paid the wage rate determined by the Secretary of Labor for the classification of work he actually performed. The contractor or subcontractor will be required to furnish to the contracting officer or a representative of the Wage-Hour Division of the U.S. Department of Labor written evidence of the registration of his program and apprentices as well as the appropriate ratios and wage rates (expressed in percentages of the journeyman hourly rates), for the area of construction prior to using any apprentices on the contract work. The wage rate paid apprentices shall be not less than the appropriate percentage of the journeyman's rate contained in the applicable wage determination.
- b. Trainees. Except as provided in 29 CFR 5.15 trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department Training. The ratio of trainees to journeymen shall not be greater than permitted under the plan approved by the Bureau of Apprenticeship and Training. Every trainee must be paid at not less than the rate specified in the approved program for his level of progress. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Bureau of Apprenticeship and Training shall be paid not less than the wage rate determined by the Secretary of Labor for the classification of work he actually performed. The contractor or subcontractor will be required to furnish the contracting officer or a representative of the Wage-Hour Division of the U.S. Department of Labor written evidence of the certification of his program, the registration of the trainees, and the ratios and wage rates prescribed in that program. In the event the Bureau of Apprenticeship and Training withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

<u>Equal Employment Opportunity</u>. The utilization of apprentices trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

# 57. Employment of Certain Persons Prohibited

No person under the age of sixteen years and no person who, at the time, is serving sentence in a penal or correctional institution shall be employed on the work covered by this Contract.

# 58. Regulations Pursuant To So-Called "Anti-Kickback Act"

The Contractor shall comply with the applicable regulations (a copy of which is attached and herein incorporated by reference) of the Secretary of Labor, United States Department of Labor, made pursuant to the so-called "Anti-Kickback Act" of June 13, 1934 (48 Stat. 948: 62 Stat. 862; Title U. S. C., Section 874: and Title 40 U. S. C., Section 276c), and any amendments or modifications thereof, shall cause appropriate provisions to be inserted in subcontracts to insure compliance therewith by all subcontractors subject thereto, and shall be responsible for the submission of affidavits required by subcontractors thereunder, except as said Secretary of Labor may specifically provide for reasonable limitations, variations, tolerances, and exemptions from the requirements thereof.

# 59. Employment of Laborers Or Mechanics Not Listed In Aforesaid Wage Determination Decision

Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the Contract will be classified or reclassified conformably to the wage determination by the Local Public Agency or Public Body, and a report of the action taken shall be submitted by the Local Public Agency or Public Body, through the Secretary of Housing and Urban Development, to the Secretary of Labor, U.S. Department of Labor. In the event the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers and mechanics to be used, the question accompanied by the recommendation of the Local Public Agency or Public Body shall be referred, through the Secretary of Housing and Urban Development, to the Secretary of Labor for final determination.

# 60. Fringe Benefits Not Expressed As Hourly Wage Rates

The Local Public Agency or Public Body shall require, whenever the minimum wage rate prescribed in the Contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly wage rate and the Contractor is obligated to pay cash equivalent of such a fringe benefit, an hourly cash equivalent thereof to be established. In the event the interested parties cannot agree upon a cash equivalent of the fringe benefit, the question, accompanied by the recommendation of the Local Public Agency or Public Body, shall be referred, through the Secretary of Housing and Urban Development, to the Secretary of Labor for determination.

# 61. Posting Wage Determination Decisions And Authorized Wage Deductions

The applicable wage poster of the Secretary of Labor, United States Department of Labor, and the applicable wage determination decisions of said Secretary of Labor with respect to the various classification of laborers and mechanics employed and to be employed upon the work covered by this Contract and a statement showing all deductions if any, in accordance with the provisions of this Contract to be made from wages actually earned by persons so employed or to be employed in such classifications, shall be posted at appropriate conspicuous points at the site of the work.

# 62. Complaints, Proceedings, or Testimony by Employees

No laborer or mechanic to whom the wage, salary, or other labor standard provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

# 63. Claims and Disputes Pertaining to Wage Rates

Claims and disputes pertaining to wage rates or to classifications of laborers and mechanics employed upon the work covered by this Contract shall be promptly reported by the Contractor in writing to the Local Public Agency or Public Body for referral by the latter through the Secretary of Housing and Urban Development to the Secretary of Labor, United States Department of Labor, whose decision shall be final with respect thereto.

# 64. Questions Concerning Certain Federal Statutes and Regulations

All questions arising under this Contract which relate to the application or interpretation of (a) the aforesaid Anti Kickback Act, (b) the Contract Work Hours and Safety Standards Act, (c) the aforesaid Davis- Bacon Act, (d) the regulations issued by the Secretary of Labor, United States Department of Labor, pursuant to said Acts, or (e) the labor standards provisions of any other pertinent Federal statute, shall be referred, through the Local Public Agency or Public Body and the Secretary of Housing and Urban Development, to the Secretary of Labor, United States Department of Labor, for said Secretary's appropriate ruling or interpretation which shall be authoritative and may be relied upon for the purposes of this Contract.

# 65. Payrolls and Basic Payroll Records of Contractor and Subcontractors

The Contractor and each subcontractor shall prepare his payrolls on forms satisfactory to and in accordance with instructions to be furnished by the Local Public Agency or Public Body. The Contractor shall submit weekly to the Local Public Agency or Public Body two certified copies of all payrolls of the Contractor and of the subcontractors, it being understood that the contractor shall be responsible for the submission of copies of payrolls of all subcontractors. Each such payroll shall contain the "Weekly Statement of Compliance" set forth in Section 3.3 of Title 29, Code Federal Regulations. The payrolls and basic payroll records of the Contractor and each subcontractor covering all laborers and mechanics employed upon the work covered by this Contract shall be maintained during the course of the work and preserved for a period of 3 years thereafter. Such payrolls and basic payroll records shall contain the name and address of each such employee, his correct classification, rate of pay (including rates of contributions or costs anticipated of the types described in Section 1 (b) (2) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. In addition, whenever the Secretary of Labor has found under Section 5.5 (a) (l) (iv) of Title 29, Code of Federal Regulations, that the wages of any laborer and mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1 (b) (2) (B) of the Davis-Bacon Act, the Contractor or subcontractor shall maintain records which

## 65. Payrolls and Basic Payroll Records of Contractor and Subcontractors Continued:

show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. The Contractor and each subcontractor shall make his employment records with respect to persons employed by him upon the work covered by this Contract available for inspection by authorized representatives of the Secretary of Housing and Urban Development, the Local Public Agency or Public Body, and the United States Department of Labor. Such representatives shall be permitted to interview employees of the Contractor or of any subcontractor during working hours on the job.

#### 66. Specific Coverage Of Certain Types of Work By Employees

The transporting of materials and supplies to or from the site of the Project or Program to which this Contract pertains by the employees of the Contractor or of any subcontractor, and the manufacturing or furnishing of materials, articles, supplies, or equipment on the site of the Project or Program to which this Contract pertains by persons employed by the Contractor or by any subcontractor, shall, for the purposes of this Contract, and without limiting the generality of the foregoing provisions of this Contract, be deemed to be work to which these Federal Labor Standards Provisions are applicable.

#### 67. Ineligible Subcontractors

The Contractor shall not subcontract any part of the work covered by this Contract or permit subcontracted work to be further subcontracted without the Local Public Agency's or Public Body's prior written approval of the subcontractor. The Local Public Agency or Public Body will not approve any subcontractor for work covered by this Contract who is at the time ineligible under the provisions of any applicable regulations issued by the Secretary of Labor or the Secretary of Housing and Urban Development, to receive an award of such subcontract.

# 68. Provisions To Be Included In Certain Subcontracts

The Contractor shall include or cause to be included in each subcontract covering any of the work covered by this Contract, provisions which are consistent with these Federal Labor Standards Provisions and also a clause requiring the subcontractors to include such provisions in any lower tier subcontracts which they may enter into, together with a clause requiring such insertion in any further subcontracts that may in turn be made.

# 69. Breach of Foregoing Federal Labor Standards

In addition to the causes for termination of this Contract as herein elsewhere set forth, the Local Public Agency or Public Body reserves the right to terminate this Contract if the Contractor or any subcontractor whose subcontract covers any of the work covered by this Contract shall breach any of these Federal Labor Standards Provisions may also be grounds for debarment as provided by the

## 69. Breach of Foregoing Federal Labor Standards Continued:

applicable regulations issued by the Secretary of Labor, United States Department of Labor.

#### 70. Employment Practices

The Contractor (1) shall, to the greatest extent practicable, follow hiring and employment practices for work on the project which will provide new job opportunities for the unemployed and underemployed.., and (2) shall insert or cause to be inserted the same provision in each construction subcontract.

#### 71. Contract Termination: Debarment

A breach of Section 45 and the Federal Labor Standards Provisions, may be grounds for termination of the contract, and for debarment as provided in 29 CFR 5.6.

#### 72. Indemnity and Hold Harmless Agreement

The Contractor will indemnify and hold harmless the owner and the engineer and their agents and employees from any and all claims, damages, losses and expenses, including attorneys fees such attorneys fees shall include the duty to defend, arising out of or resulting from the performance of the WORK, and provided that any such claims, damage, loss or expenses attributable to bodily injury, sickness, death or to any injury to destruction of tangible property, including the loss of use resulting therefrom, is caused in whole or in part by any negligent or willful act or admission of the CONTRACTOR, SUBCONTRACTOR, anyone directly or indirectly employed by them or anyone for whose acts any of them may be liable.

# 73. Chapter 2270, Texas Government Code

# **CHAPTER 2270, TEXAS GOVERMENT CODE**

"In accordance with Chapter 2270, Texas Government Code, a government entity may not enter into a contract with a company for goods and services unless the contract contains a written verification from the company that it: (1) does not boycott Israel; and (2) will not boycott Israel during the term of this contract.

# 74. CHAPTER 2252 TEXAS GOVERNMENT CODE

In accordance with Chapter 2252 of the Texas Government Code, that (a) Bidder does not engage in business with Iran, Sudan or any foreign terrorist organization and (b) Bidder is not listed by the Texas Comptroller as a terrorist organization.

#### <u>Bidder's Acknowledgement of Prohibition on Contracts with Foreign Terrorist Organizations</u> and with the Boycotting of Israel

The signatory executing this contract on behalf of company hereby verifies that the company is not on the Texas Comptroller's list of terrorist organizations, is not engaged in business with Iran, Sudan or any foreign terrorist organization and will not boycott Israel throughout the term of this contract."

# Index of General Conditions

<u>SUBJECT</u>	<b>SECTION</b>
Accident Prevention	44
Additional Bond	30
Additional Instructions	3
*Anti-Kickback Act	58
Apprentices	56
Architect's Authority	35
Assignments	31
Bond, Security	29
Bond, Security, Additional	30
Changes in Work	17
Claims for Extra Cost	22
Completion time	19
Complaints, Proceedings or Testimony	62
Condition, Subsurface	21
Conflicting Conditions	41
Construction Schedule	24
Contract Documents	1
Contract Security	29
Contractor's Insurance	28
Contract Termination	71
Contractor's Mutual Responsibility	32
Contractor's Obligations	11
Claims and Disputes	63
Contractor's Title to Materials	6
Classifications Not Listed	59
Correction of Work	20
Damages, Liquidated	19
Data, Reports and Records	15
Debarment Breach of Labor Standards	69
Debris Removal	37
Definitions	2
Detail Drawings	3
Different Subsurface	21
Discrimination, employment	46
Drawings detail	3
Emergencies	13
Employment Practices	70
*Equal Employment Opportunity	46
Estimated Quantities	38
Extras	18
Final Payment	26
*Guaranty, general	40
Inspection	14
Inspection of Materials	7
-	
### Index of General Conditions (Continued)

<u>SUBJECT</u>	<b>SECTION</b>
Insurance	28
Lands and Rights-of-Way	39
Legal Provisions, Implied	43
Liquidated damages	19
Materials	5
Member of Congress	47
Minimum Wages	52
Non-discrimination in Employment	46
Notice and Service	42
Obligations of Contractor	11
"Or Equal" Clause	8
Overtime Compensation	55
Owner's right to terminate	23
Patents	9
Payment of Employees	52
Payments by Contractor	27
Payments to Contractor	25
Payrolls and Records	65
Periodic Estimates	24
Permits, Surveys, Regulations	10
Photographs	50
Posting Minimum wage rates	61
Prohibited Interests	48
Protection of lives and health	44
Protection of work, property	13
*Provisions required by law	43
Quantities of Estimate	38
Question Concerning Regulations	64
Release of Contractor	26
Removal of Debris	37
Reports, Records and Data	15
Responsibility of Contractor	32
Right of Owner to terminate	23
Rights-of-Way	39
Schedule of Construction	24
Security	29
Separate contracts	33
Services, materials, facilities	5
Shop drawings	4
Specific Coverage	66
Stated Allowances	36
Subcontracting	34and35
Subcontractor's Insurance	28
Subcontractors Ineligible	67
Substitute Bond	30

# SUBJECTSECTIONSubsurface conditions21Superintendence by contractor16Surveys, permits10Suspension of work51Termination of contract23 and 71

Suspension of work	51
Termination of contract	23and71
Testing of Materials	7
Time for completion	19
Title to materials	6
Use and Occupancy	49
Use and Premises	37
Underpayments of Wages	53
Wages, Minimum	52
Weather Conditions	12
Withholding of Payments	53
*Anticipated Fringe Benefits	54
*Employment Prohibited	57
*Fringe Benefits Not Expressed	60
*Provisions to be Included	68
*Attachment to Federal Labor Standards Provisions	

#### SUPPLEMENTAL GENERAL CONDITIONS

- 1. Enumeration of Plans, Specifications and Addenda
- 2. Stated Allowances
- 3. Special Hazards
- 4. Public Liability and Property Damage Insurance
- 5. Photographs of Project
- 6. Schedule of Minimum Hourly Wage Rates
- 7. Builder's Risk Insurance
- 8. Special Equal Opportunity Provisions
- 9. Certification of Compliance with Air and Water Acts
- 10. Special Conditions Pertaining to Hazards, Safety Standards and Accident Prevention
- 11. Types and amounts of insurance coverages required.
- 12. General Guaranty
- 13. Retainage
- 14. Payment Schedule
- 15. Overtime
- 16. Forms to be Executed prior to Pre-Construction Conference
- 17. Section 109 of Pub. L. 100-202 THE PROHIBITIONS

#### 1. **Enumeration of Plans, Specifications and Addenda**

Following are the Plans, Specifications and Addenda which for a part of this contract, as set forth in Paragraph 1 of the General Conditions, "Contract and Contract Documents":

DRAWINGS			
General Construction:	Nos		
Heating and Ventilating:	"		
Plumbing:	"		
Electrical:	"		
	"		
SPECIFICATIONS: (Standard Public Department)	e Works Specific	ations, Engi	neering
General Construction:	Page	to	, incl.
Heating and Ventilating:	"	to	, incl.
Plumbing:	"	to	, incl.
Electrical:	"	to	, incl.
	"	to	, incl.
	"	to	, incl.
ADDENDA:			
No Date No	o I	Date	

No. \_\_\_\_\_ Date \_\_\_\_\_ No. \_\_\_\_ Date \_\_\_\_\_

#### 2. **Stated Allowances**

Pursuant: to Paragraph 36 of the General Conditions, the contractor shall include the following cash allowances in his proposal:

- For \_\_\_\_\_\_ (Page \_\_\_\_\_ of Specifications) \$\_\_\_\_\_ (a)
- For \_\_\_\_\_\_ of Specifications) \$\_\_\_\_\_ (b)
- For \_\_\_\_\_\_ Of Specifications) \$\_\_\_\_\_ (c)
- For
   (Page \_\_\_\_\_\_ of Specifications) \$\_\_\_\_\_

   For
   (Page \_\_\_\_\_\_ of Specifications) \$\_\_\_\_\_

   (d)
- (e)

#### 3. Special Hazards

The Contractor's and his Subcontractor's Public Liability and Property Damage Insurance shall provide adequate protection against the following special hazards:

#### 4. Contractor's and Subcontractor's Public Liability, Vehicle Liability, and <u>Property Damage</u> <u>Insurance (SEE PARAGRAPH 11)</u>

As required under paragraph 28 of the General Conditions, the Contractor's Public Liability Insurance and Vehicle Liability Insurance shall be in an amount not less than <u>\$</u> for injuries, including accidental death, to any one person, and subject to the same amounts as specified in the preceding paragraph, or (2) insure the activities of his subcontractors in his own policy.

#### 5. <u>Photographs of Project</u>

As provided in paragraph 50 of the General Conditions, the Contractor will furnish photographs in the number, type, and stage as enumerated below:

#### 6. Schedule of Occupational Classifications and Minimum Hourly Wage Rates as <u>Required Under</u> <u>Paragraph 52 of the General Condition</u>

Given on the following page.

#### 7. <u>Builder's Risk Insurance</u>

As provided in the General Conditions, paragraph 28 (e), the Contractor will/ will not\* maintain Builder's Risk Insurance (fire and extended coverage) on annual percent completed value basis on the insurable portions of the project for the benefit of the Owner, the Contractor, and all subcontractors, as their interests may appear. (SEE PARAGRAPH 11)

#### **\*STRIKE OUT ONE.**

#### 8. <u>Special Equal Opportunity Provisions</u>

#### A. Activities and Contracts Not Subject to Executive Order 11246, as Amended

(Applicable to Federally assisted construction contracts and related subcontractors under \$10,000)

During the performance of this contract, the contractor agrees as follows:

(1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor shall take affirmative action to ensure that applicants for employment are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

#### 8. <u>Special Equal Opportunity Provisions Continued</u>:

- (2) The Contractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by Contracting Officer setting forth the provisions of this nondiscrimination clause. The Contractor shall state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.
- (3) Contractors shall incorporate foregoing requirements in all subcontracts.

#### B. Contracts Subject to Executive Order 11246, as Amended

(Applicable to Federally assisted construction contracts and related subcontracts exceeding \$10,000)

During the performance of this contract, the contractor agrees as follows:

- (1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor's affirmative action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.
- (2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.
- (3) The Contractor will send to each labor union or representative workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided by the Contract Compliance Officer advising the said labor union or workers' representatives of the Contractor's commitment under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (4) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations and relevant orders of the Secretary of Labor.
- (5) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the Department and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (6) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract, or with any of such rules, regulations, or orders, this contract may be canceled, terminated or suspended in whole or in part, and the Contractor may be declared ineligible for

#### B. Contracts Subject to Executive Order 11246, as Amended Continued:

- (6) further Government contracts or federally assisted construction contract procedures authorized in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- (7) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraph (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Department may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Department, the Contractor may request the United States to enter into such litigation to protect the interest of the United States.
- C. <u>Hometown or Imposed Plans</u>

In areas where a hometown plan or imposed plan is operative, the Community Development Block Grant Recipients must contact the appropriate HUD Equal Opportunity Office for specific instruction.

D. "Section 3" Compliance in the Provision of Training, Employment and Business Opportunities:

During the performance of this contract, the contractor agrees as follows:

- (1) The contractor agrees to comply with the requirements of Section 3 of the Housing and Urban Development Act of 1968 (12 USC 170 (u), as amended, the HUD regulations issued pursuant thereto at 24 CFR Part 135, and any applicable rules and order of HUD issued thereunder.
- (2) The "Section 3 clause " set forth in 24 CFR 135.20 (b) shall form part of this contract, as set forth in Paragraph 1 of the General Conditions, "Contract and Contract Documents".
- (3) Contractors shall incorporate the "Section 3 clause" shown below and the foregoing requirements in all subcontracts.

#### Section 3 Clause as Set Forth in 24 CFR 135.20(b)

A. The work to be performed under this contract is on a project assisted under a program providing direct Federal financial assistance from the Department of Housing and Urban Development and is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u, Section 3 requires that to the greatest extent feasible opportunities for training and employment be given lower income residents of the project area and contracts for work in connection with the project be awarded to business concerns which are

#### Section 3 Clause as Set Forth in 24 CFR 135.20(b) Continued:

- A. **Continued:** located in, or owned in substantial part by persons residing in the area of the project.
- B. The parties to this contract will comply with the provisions of said section 3 and the regulations issued pursuant thereto by the Secretary of Housing and Urban Development set forth in 24 CFR \_\_\_\_\_\_, and all applicable rules and orders of the Department issued thereunder prior to the execution of this contract. The parties to this contract certify and agree that they are under no contractual or other disability which would prevent them from complying with these requirements.
- C. The contractor will send to each labor organization or representative of workers with which he has a collective bargaining agreement or other contract or understanding if any, a notice advising the said labor organization or workers' representative of his commitments under this section 3 clause and shall post copies of the notice in conspicuous places available to employees and applicants for employment or training.
- D. The contractor will include this section 3 clause in every subcontract for work in connection with the project and will, at the direction of the applicant for or recipient of Federal financial assistance, take appropriate action pursuant to the subcontract upon a finding that the subcontractor is in violation of regulations issued by the Secretary of Housing and Urban Development, 24 CFR---. The contractor will not subcontract with any subcontractor where it has notice or knowledge that the latter has been found in violation of regulations under 24 CFR---- and will not let any subcontract unless the subcontractor has first provided it with a preliminary statement of ability to comply with the requirements of these regulations.
- E. Compliance with the provisions of section 3, the regulations set forth in 24 CFR----, and all applicable rules and orders of the Department issued thereunder prior to the execution of the contract, shall be a condition of the Federal financial assistance provided to the project, binding upon the applicant or recipient for such assistance, its successors and assigns. Failure to fulfill these requirements shall subject the applicant or recipient, its contractors and subcontractors, its successors, and assigns to those sanctions specified by the grant or loan agreement or contract through which Federal assistance is provided, and to such sanctions as are specified by 24 CFR----, 135.

#### 9. <u>Certification of Compliance with Air and Water Acts</u>

(Applicable to Federally assisted construction contracts and related subcontracts exceeding <u>\$100,000</u>)

#### Compliance with Air and Water Acts

During the performance of this contract, the contractor and all subcontractors shall comply with the requirements of the Clean Air Act, as amended, 42 USC 1857 et seq., the Federal Water Pollution Control Act, as amended, 33 USC 1251 et seq., and the regulations of the Environmental Protection Agency with respect thereto, at 40 CFR Part 15, as amended.

In addition to the foregoing requirements, all nonexempt contractors and subcontractors shall

#### 9. <u>Certification of Compliance with Air and Water Acts Continued</u>:

furnish to the owner, the following:

- (1) A stipulation by the Contractor or subcontractors, that any facility to be utilized in the performance of any nonexempt contract or subcontract, is not listed on the List of Violating Facilities issued by the Environmental Protection Agency (EPA) pursuant to 40 CFR 15.20.
- (2) Agreement by the contractor to comply with all the requirements of Section 114 of the Clean Air Act, as amended, (42 USC 1857c-8) and Section 308 of the Federal Water Pollution Control Act, as amended, (33 USC 1318) relating to inspection, monitoring, entry, reports and information, as well as all other requirements specified in said Section 114 and Section 308, and all regulations and guidelines issued thereunder.
- (3) A stipulation that as a condition for the award of the contract, prompt notice will be given of any notification received from the Director, Office of Federal Activities, EPA, indicating that a facility utilized, or to be utilized for the contract, is under consideration to be listed on the EPA List of Violating Facilities.
- (4) Agreement by the Contractor that he will include, or cause to be included, the criteria and requirements in paragraph (1) through (4) of this section in every nonexempt subcontract and requiring that the Contractor will take such action as the Government may direct as a means of enforcing such provisions.

#### 10. Special Conditions Pertaining to Hazards Safety Standards & Accident Prevention

#### (A) Lead-Based Paint Hazards

(Applicable to contracts for construction or rehabilitation of residential structures)

The construction or rehabilitation of residential structures is subject to the HUD Lead-Based Paint regulations, 24 CFR Part 35. The Contractor and Subcontractors shall comply with the provisions for the elimination of lead-based paint hazards under sub-part B of said regulations. The Owner will be responsible for the inspections and certifications required under Section 35.14 (f) thereof.

#### (B) <u>Use-of Explosives</u> (Modify as Required)

When the use of explosives is necessary for the prosecution of the work, the Contractor shall observe all local, state and Federal laws in purchasing and handling explosives. The Contractor shall take all necessary precaution to protect completed work, neighboring property, water lines, or other underground structures. Where there is danger to structures or property from blasting, the charges shall be reduced and the material shall be covered with suitable timber, steel or rope mats.

The Contractor shall notify all owners of public utility property of intention to use explosives at least eight hours before blasting is done, close to such property. Any supervision or direction of use of explosives by the Engineer, does not in any way

#### 10. Special Conditions Pertaining to Hazards Safety Standards & Accident Prevention

#### (B) <u>Use-of Explosives Continued</u>:

reduce the responsibility of the Contractor or his Surety for damages that may be caused by such use.

(C) <u>Danger Signals and Safety Devices</u> (Modify as Required)

The Contractor shall make all necessary precautions to guard against damages to property and injury to persons. He shall put up and maintain in good condition, sufficient red or warning lights at night, suitable barricades and other devices necessary to protect the public. In case the Contractor fails or neglects to take such precautions, the Owner may have such lights and barricades installed and charge the cost of this work to the Contractor. Such action by the Owner does not relieve the Contractor of any liability incurred under these specifications or contract.

#### 11. Types and Amounts of Insurance Coverages Required

The successful bidder, to whom the contract is awarded, will be required to carry the hereinafter listed types and amounts of insurance, which will protect the Owner, and furnish acceptable proof of payment of premiums thereon:

1.	Water Lines	3.	Sanitary Sewer
2.	Storm Drainage	4.	Excavation
Comr	nercial General Liability \$500,000 Occur	rrence L	imit
	Broad Form Endorsement		
	Combined Single Limit (Bodily Injury & Prop	erty Dar	nage)
	Personal Injury	-	
	Products/Completed Operations		
Blank	tet "XCU" - Explosion, Collapse, & Undergroun	nd	
	Independent Contractors		
	Care, Custody and Control		
	Contractual Liability		

\*\*Successful contractor must provide the City of McAllen with proof of worker's compensation insurance prior to award of contract as stated in Sections L-12 through L-22 "Insurance":

Worker's CompensationStatutory LimitsBusiness Automobile Liability\$500,000Bodily InjuryPersonal Injury ProtectionHired/Non-Owned\$250.000Property Damage\$250.000

#### 5. **Commercial Buildings**

Same coverage as above to include <u>Builders Risk</u> Coverage to construction limit.

#### 11. Types and Amounts of Insurance Coverages Required Continued:

#### 6. **Paving**

Commercial General Liability \$500,000 Occurrence Limit Combined Single Limit - CSL - (Bodily Injury and Property Damage) Personal Injury Premises - Completed Operations Independent Contractors Worker's Compensation Statutory Limits Business Automobile Liability \$500,000 Bodily Injury Hired/Non-Owned Property Damage \$250,000

#### 7. Trucking - Loading/Hauling

The following coverage is applicable as long as no fragile or perishable products are transported; otherwise Cargo Insurance must be required.

Commercial General Liability	\$500,000 Occurrence Limit
Premises/Operations	
Business Automobile Liability	\$500,000 Occurrence Limit
Bodily Injury	
Hired/Non-Owned	
Property Damage	\$250,000
Trailers	

Fifteen (15) day cancellation provision on all policies.

#### Insurance

The City of McAllen will accept the accord form as the Certificate of Insurance only. It shall be the responsibility of the contractor to have his/her insurance carrier name the City of McAllen as "an additional insured" and include a "waiver of subrogation endorsement" in favor of the City of McAllen. These documents are to accompany the certificate of insurance at time of execution of contracts.

#### Requirements

Bidders shall carefully examine the plans, specifications and other documents, visit the site of the work, and fully inform themselves as to all conditions and matters which can in any way affect the work or the cost thereof. Should the bidder find discrepancies in, or omissions from the plans, specifications or other documents, or should he be in doubt as to their meaning, he should at once notify the Engineer and obtain clarification by addendum prior to submitting any bid.

The City of McAllen encourages the hiring of minority and minority women-subcontractors and/or suppliers whenever and wherever feasible.

#### **Requirements Continued:**

General and/or Prime Contractors submitting bids and/or proposals to the City of McAllen shall be refunded their deposits upon return of plans and specs in good condition. All other recipients of plans and specs shall be reimbursed their deposit **only** if they return plans and specs in good condition to the Purchasing and Contracting Department no later than the 5th working day after bid opening.

The bidder is specifically advised that the bid must be accompanied by a certified cashier's check or a bid bond from a reliable surety company totaling five percent (5%) of the greatest amount bid, as a guaranty that if awarded the bid, the successful contractor will enter into a contract with the City of McAllen. Cashier checks and/or bid bonds will be returned to all except the three lowest bidders within five (5) days after opening of bids. The remaining cashier checks and/or bid bonds will be returned promptly after the successful contractor has entered into a contract with the City of McAllen. If no award has been made within sixty (60) days after opening of bids, cashier checks and/or bid bonds will be returned accordingly.

#### 12. General Guaranty

Neither the final certificate of payment nor any provision in the Contract Documents nor partial or entire occupancy of the premises by the Owner shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall guarantee all materials and equipment furnished and work performed for a period of one (1) year from the date of Substantial Completion. The Contractor warrants and guarantees for a period of one (1) year from the date of faulty materials or workmanship and the Contractor shall make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system or other work resulting from such defects.

The Owner will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments, or other work that may be necessary by such defects, the Owner may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in full force and effect through the guarantee period.

#### 13. <u>Retainage</u>

Contracts equaling a total amount of \$400,000.00 or over will bear a retainage of five (5) percent (%) on each partial disbursements.

Contracts totaling less than \$400,000.00 will bear a retainage of ten (10) percent (%) on each partial disbursement.

#### 14. Payment Schedule

Contractor to submit to the City, Certificate for payment on or before 1st of the month. City will reciprocate with payment by mail on or before the 30th of the same month. [Supplement]

#### 15. <u>Overtime</u>

Time and one half will be paid for all hours, worked in excess of (40) hours in one work week.

#### 16. Forms to be Executed Prior to Start of Construction

The attached forms (identified below) are for your review and execution. All of these forms have to be completed and returned to the office of <u>Al Garcia, CPPB</u>, <u>Administrator of Internal Services</u>, <u>with the executed contract documents</u>.

#### FORMS:

Construction Schedule

Approval of Sub-Contractors

Sub-Contractors Notice - Start/End of Construction

Attachment #1 Anticipated and actual Subcontracts

Attachment #2 Current Employment

Attachment #3 Projected Workforce Needs

Suggested Quarterly Report

Affirmative Action Plan

EEO Clause

Sample Section 3 and AAP

Affirmative Action Plan

# 17. This contract is subject to all the conditions and requirements of "Section 109 <u>of Pub. L. 100-202" THE PROHIBITIONS</u>

Section 109 provides in part that-

None of the funds appropriated for fiscal year 2004 by this resolution or by any other law may be obligated or expended to enter into any contract for the construction, alteration, or repair of any public building or public work in the United States or any territory or possession of the United States with any contractor or subcontractor of a foreign country, or any supplier of products of a foreign country, during any period in which such foreign country is listed by the United States Trade Representative under subsection (c) of this section.

#### 17. This contract is subject to all the conditions and requirements of "Section 109 <u>of Pub. L. 100-</u> 202" THE PROHIBITIONS Continued:

Section 109 provides in part that-

Paragraph (c)(1) describes this "listing" and provides:

The United States Trade Representative shall maintain a list of each foreign country which-

(A) denies fair and equitable market opportunities for products and services of the United States in procurement or

(B) denies fair and equitable market opportunities for products and services of the United States in bidding, for construction projects that cost more than \$500,000 and are funded (in whole or in part) by the government of such foreign country or by an entity controlled directly or indirectly by such foreign country.

Paragraph (c)(2) provides, in part:

Such list shall include-

(B) the country of Japan and any other country which has expressed a policy of denying fair and equitable market opportunities for products and services of the United States in procurement or bidding for projects described in paragraph (1) of this subsection.

A copy of "Federal Register/Vol. 53, No. 116/Thursday, June 16, 1988/Notice" may be obtained upon request from the office of Al Garcia, CPPB, Administrator of Internal Services, McAllen City Hall, 1300 Houston Avenue, McAllen, Texas 78501.

#### CONSTRUCTION SCHEDULE

CONTRACTOR	PROJECT NAME
ADDRESS	LOCATION
PHONE	TO BE FILLED OUT BY CITY OF MCALLEN
PROJECT ENGINEER	
ADDRESS	Source of Fund
PHONE	Contact Person
	Date Awarded

### STARTING DATE OF PROJECT:

	STATE DATE	DESCRIPTION OF WORK	PAYMENT <u>SCHEDULE</u>
Month #1			\$
Month #2			\$
Month #3			\$
Month #4			\$
Month #5			\$
Month #6			\$
Month #7			\$

## COMPLETION DATE OF PROJECT: \_\_\_\_\_

\_\_\_\_

**REMARKS**:

#### APPROVAL OF SUB-CONTRACTORS

#### NAME AND ADDRESS OF PRIME CONTRACTOR

#### CONTRACT DESCRIPTION

 

 SUB-CONTRACT DATA

 NUMBER
 TYPE
 SUB-CONTRACTORS CONTRACTORS
 CONTRACT
 ANTICIPATED
 COMPLETION

 OF WORK
 NAME & ADDRESS
 AMOUNT
 START DATE
 DATE

 Image: Image:

RE: Prime contractors will not permit any Sub-contractor to start work on the project until the Sub-contractor has been approved by the project owner.

#### **CERTIFICATION BY PRIME CONTRACTOR**

Each Sub-contractor listed above has established his ability and responsibility to perform the work to which the sub-contract relates. The applicable provisions of the contract, including labor and equal opportunity provisions, shall govern the work to which the subcontract relates, and each subcontractor has been advised as to the necessary contract provisions and the requirement to incorporate them in each subcontract. All Sub-contractors holding contracts exceeding \$10,000 and performing work at the construction site are subject to the equal employment opportunity clause, and each such Sub-contractor is designated by an asterisk placed after his/her name.

CONTRACTOR	DATE
APPROVED:	CONCUR:

#### CITY OF McALLEN SUB-CONTRACTORS NOTICE - START/END OF CONSTRUCTION (TO BE SUBMITTED BY PRIME CONTRACTOR)

RE:	PROJECT NAME:			
	PROJECT LOCATIO	N:		
	U.S. DEPARTMENT	OF LABOR WAGE DEC		
This	is to inform the City of M	IcAllen that the		
		of		
N	ame of Company		Address	
		,, has	started/completed work on	
	Town/City	State		
the a	bove referenced project c	overed by our contract wit	h you, as of	
			Date	
NAN	AE OF PRIME CONTR	ACTOR:		
SIG	NATURE:			
ТҮР	E OR PRINT NAME:			
TITI	LE:			
DAT	`E:			

#### ATTACHMENT #1

#### ANTICIPATED AND ACTUAL SUB-CONTRACTS

PROJECT NO.

SPONSOR: \_\_\_\_\_

The following list is intended to provide information on anticipated sub-contracts and to provide a record of actual sub-contracts, (to reflect affirmative compliance by this company).

COMPLETE FOR SUBMISSION TO THE CITY OF MCALLEN		
SUB-CONTRACTOR'S NAME:		
ADDRESS:	CRAFT/SPECIALTY:	
APPROX. AMOUNT:	APPROX. DATE:	
PROJECT AREA BUSINESS YES:	NO:	
MINORITY OWNED: YES: NO:	SEX RACE CODE:	
SUB-CONTRACTOR'S NAME:		
ADDRESS:	CRAFT/SPECIALTY:	
APPROX. AMOUNT:	APPROX. DATE:	
PROJECT AREA BUSINESS YES:	NO:	
MINORITY OWNED: YES: NO:	SEX RACE CODE:	
SUB-CONTRACTOR'S NAME:		
ADDRESS:	CRAFT/SPECIALTY:	
APPROX. AMOUNT:	APPROX. DATE:	
PROJECT AREA BUSINESS YES:	NO:	
MINORITY OWNED: YES: NO:	SEX RACE CODE:	

#### ATTACHMENT #1 ANTICIPATED AND ACTUAL SUB-CONTRACTS Continued:

COMPLETE FOR SUBMISSION TO THE CITY OF MCALLEN Continued:		
SUB-CONTRACTOR'S NAME:		
ADDRESS:	CRAFT/SPECIALTY:	
APPROX. AMOUNT:	APPROX. DATE:	
PROJECT AREA BUSINESS YES:	NO:	
MINORITY OWNED: YES: NO:	SEX RACE CODE:	
SUB-CONTRACTOR'S NAME:		
ADDRESS:	CRAFT/SPECIALTY:	
APPROX. AMOUNT:	APPROX. DATE:	
PROJECT AREA BUSINESS YES:	NO:	
MINORITY OWNED: YES: NO:	SEX RACE CODE:	

#### GOALS FOR SUBCONTRACTS

#### RACIAL CODES:

I - Indian	<b>M</b> - Male	*	Total \$\$ to Area Business
<b>B</b> - Black	<b>F</b> - Female	**	Total \$\$ to Minority/Women
M/A - Mexican American	1	Businesses	
W - White			
<b>O</b> - Other			

\* Set dollar amount goals for awarding of contracts to small or disadvantaged area businesses.

\*\* Also set dollar goals for awarding of contracts to businesses owned by minorities and/or women.

APPROX. DATE - APPROXIMATE START AND ENDING DATE OF CONSTRUCTION. (START/END)

#### ATTACHMENT #2

#### CURRENT EMPLOYMENT

COMPANY:	 
PROJECT #:	 -
SPONSOR:	 
CONTRACT#:	

Our Company is/is not located in and is/is not owned by residents of the Project Area.

The positions and employees reflected below represent the present employment of the company. As vacancies occur or new positions are established, we will attempt to maintain at least \_\_\_\_% of the workforce from the Project Area. (Use figures arrived at, on Attachment #3.)

POSITION	NAME & ADDRESS	PROJEC	T AREA	SEX/RACE
		<u>RESIDENT</u>		(CODE)
		YES	NO	

#### **RACIAL CODES:**

I - Indian	<b>M</b> - Male	<b>CONTRACTOR:</b>	
<b>B</b> - Black	<b>F</b> - Female		
M/A - Mexican Amer	rican	SIGNATURE:	
W - White			
<b>O</b> - Other		TITLE:	

INCLUDE <u>ALL</u> EMPLOYEES RELATED TO THIS JOB INCLUDING ADMINISTRATIVE AND CLERICAL STAFF.

#### ATTACHMENT #3 PROJECTED WORKFORCE NEEDS

 COMPANY:	
PROJECT#:	
SPONSOR:	
CONTRACT#:	

#### <u>AFFIRMATIVE RECRUITMENT AND UTILIZATION OF LOWER INCOME PROJECT AREA RESI-DENTS, MINORITIES AND WOMEN:</u>

The list of crafts (by classification or specialty) below reflects anticipated numbers of employees which will be required to complete this Company's part of the project. In accordance with Section 3 of the Housing and Urban Development Act of 1968 and Executive Order 11246, the Company submits the following anticipated workforce needs and hereby establishes the following goals: (Include <u>all</u> projected positions including administrative and clerical.)

#### COMPLETE THIS SECTION FOR SUBMISSION TO THE CITY OF MCALLEN

CRAFT	*TOTAL READ	JOURNEY MAN	APPRENTICE	TRAINEE	NO. FROM PROJECT AREA (GOALS) JOURNEYMAN APPRENTICE TRAINEE					
					RACE	SEX	RACE	SEX	RACE	SEX X

\* Anticipated & Approximate

#### **RACIAL CODES:**

DATE:

I - Indian M - Male
B - Black F - Female
M/A - Mexican American
W - White
O - Other
SET GOALS AS INDICATED ABOVE.

NOTE: See Attachment 3A example of notification to recruitment sources

\* Minority & Women Goals

\* Low Income Resident Goals

#### SUGGESTED QUARTERLY REPORT

NAME OF COMPANY:	DATE:
ADDRESS:	PROJECT #:
PROJECT NAME:	
TELEPHONE:	LOCATION:

A quarterly report will be submitted to the City of McAllen, three months <u>after</u> start of construction and <u>every</u> <u>three months</u> thereafter. Number in each block will represent a three months accumulation.

The report should also include the payroll records for the week the report is submitted, with designations of employees' race, color, national origin, or sex.

#### **APPLICANT FLOW:**

M - Male F - Female	White Non-Minority		Mexican- American		Negro		Other		Total	
	Μ	F	М	F	М	F	М	F	М	F
APPLICATIONS										
HIRED										

#### **TERMINATION DATA**:

M - Male F - Female	White Non-Minority		Mex Ame	ican- rican	Ne	gro	Ot	her	То	tal
	М	F	М	F	М	F	М	F	М	F

#### **REASON FOR TERMINATION:**

<u>REMARKS</u>:

#### **AFFIRMATIVE ACTION PLAN**

#### I. INTRODUCTION

These guidelines are designed to assist applicants, sponsors, and contractors subject to affirmative action requirements to develop and implement policy and procedures to comply with the mandates of Executive Order 11246 and other applicable statutes and regulations.

In accordance with Section 202 of the Executive Order 11246, September 24, 1965, Section 3, of the Housing and Urban Development Act of 1968, as amended by Section 404 of the Housing and Urban Development Act of 1969, and other applicable statutes and regulations, the Affirmative Action Plan must be geared to enable management to formulate policy and procedures designed to promote employment, training, and entrepreneurship for low income and minority persons.

The guidelines are divided in six main parts, namely identification, policy statement, employment, training, entrepreneurship and responsibility.

Each part must be thoroughly explained and if not applicable, it must be indicated accordingly. These guidelines are illustrative and not inclusive. If you have any further ideas, you need not limit your Affirmative Action Plan to our suggestions.

#### **RESPONSIBILITY**

The following are required to write and to submit Affirmative Action Plans:

- 1. Prime contractor with contract of \$10,000 or more.
- 2. Sub-contractors with contract of \$10,000 or more.
- 3. Lower-tier Sub-Contracts with a contract of \$10,000 or more.

The Attached forms (Identified Below) are to be executed at the contractors, sub-contractors, and/or lower-tier sub-contractors discretion:

#### FORMS:

WH-Publication 1321, Notice to Employees (to be posted at Job-Site along with Wage Rates).
WH-347 Payroll
WH-348 Statement of Compliance
No Work Performed Form
SAAO-LR-CPD-3, Certificate from Contractor Appointing Officer or Employees to Supervise Payment of Employees.
Payroll Deduction Authorization
Employee Statement of Work Verification
U.S. Dept. of Labor Bureau of Apprenticeship
Certification by Contractor of Labor Standards Compliance by Sub-Contractors

#### ATTACHMENT TO FEDERAL LABOR STANDARDS PROVISIONS

#### SO-CALLED "ANTI-KICK ACT" AND REGULATIONS PROMULGATED PURSUANT THERETO BY THE SECRETARY OF LABOR, UNITED STATES DEPARTMENT OF LABOR

#### TITLE 18 U.S.C., Section 874

(Replaces section 1 of the Act of June 13, 1934 (48 Stat. 945.40 U.S.C., sec. 276b) pursuant to the Act of June 25, 1948.62 Stat. 862)

#### KICKBACKS FROM PUBLIC WORKS EMPLOYEES

Whomever, by force, intimidation, or threat of procuring dismissal from employment, or by any other manner whatsoever induces any person employed in the construction, prosecution, completion or repair of any public building, public work, or building or work financed in whole or in part by loans or grants from the United States to give up any part of the compensation to which he is entitled under his contract of employment, shall be fined not more than \$5,000 or imprisoned not more than five years, or both.

SECTION 2 OF THE ACT OF JUNE 13, 1934. AS AMENDED (48 STAT. 948, 62 STAT. 262, 63 STAT. 108, 72 STAT. 968.40 U.S.C., xc. 276C)

The Secretary of Labor shall make reasonable regulations for contractors and subcontractors in the construction, prosecution, completion or repair of public buildings, public works or buildings or works financed in whole or in part by loans or grants from the United States, including a provision that each contractor and subcontractor shall furnish weekly a statement with respect to the wages paid each employee during the preceding week. Section 1001 of Title 18 (United States Code) shall apply to such statements.

#### ----X X X----

Pursuant to the aforesaid Anti-Kickback Act, the Secretary of Labor, United States Department of Labor, has promulgated the regulations hereinafter set forth, which regulations are found in Title 29, Subtitle A, Code of Federal Regulations Part 3. The term "this part," as used in the regulations hereinafter set forth, refers to Part 3 last above mentioned. Such regulations are as follows:

#### Title 29 - LABOR

#### Subtitle A-Office of the Secretary of Labor

# PART 3-CONTRACTORS AND SUBCONTRACTORS ON PUBLIC BUILDING OR PUBLIC WORK FINANCED IN WHOLE OR IN PART BY LOANS OR GRANTS FROM THE UNITED STATES

#### Section 3.1 Purpose and Scope.

This part prescribes "anti-kickback" regulations under section 2 of the Act of June 13, 1934, as amended (40 U.S.C. 276c), popularly known as the Copeland Act. This part applies to any contract which is subject to Federal wage standards and which is for the construction, prosecution, completion, or repair of public buildings, public works or buildings or works financed in whole or in part by loans or grants from the United States. The part is intended to aid in the enforcement of the minimum wage provisions of the Davis-Bacon Act and the various statutes dealing with Federally assisted construction that contain similar minimum wage provisions, including those provisions which are not subject to Reorganization Plan No. 14 (e.g., the College Housing Act of 1950, the Federal Water pollution Control Act, and the Housing Act of 1959), and in the enforcement of the overtime provisions of the Contract Work Hours Standards Act whenever they are applicable to construction work. The part details the obligation of contractors and subcontractors relative to the weekly submission of statements regarding the wages paid on work covered thereby; sets forth the circumstances and procedures governing the making of payroll deductions from the wages of those employed on such work; and delineates the methods of payment permissible on such work.

#### Section 3.2 Definitions.

As used in the regulations in this part:

(a) The terms "building" or "work" generally include construction activity as distinguished from manufacturing, furnishing of materials, or servicing and maintenance work. The terms include, without limitation, buildings, structures, and improvements of all types, such as bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, powerlines, pumping stations, railways, airports, terminals, docks, pier, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, and canals; dredging, shoring, scaffolding, drilling, blasting, excavating, cleaning, and landscaping. Unless conducted in connection with and at the site of such a building or work as is described in the foregoing sentence, the manufacture of furnishing of materials, articles, supplies, or equipment (whether or not manufacture or furnishing, or owns the materials from which they are manufactured of furnished) is not a "building" or "work" within the meaning of the regulations in this part.

(b) The terms "construction," "prosecution," "completion," or "repair" mean all types of work done on a particular building or work at the site thereof, including, without limitation, altering, remodeling, painting and decorating, the transporting of materials and supplies to or from the building or work by the employees of the construction contractor or construction subcontractor, and the manufacturing or furnishing of materials, articles, supplies, or equipment on the site of the building or work, by persons employed at the site by the contractor or subcontractor.

#### **Section 3.2 Definitions Continued:**

(c) The terms "public building" or "public work" include building or work for whose construction, prosecution, completion, or repair as defined above, a Federal agency is a contracting party, regardless of whether title thereof is in a Federal agency.

(d) The term "building or work financed in whole or in part by loans or grants from the United States" includes building or work for whose construction, prosecution, completion, or repair, as defined above, payment or part payment is made directly or indirectly from funds provided by loans or grants by a Federal agency. The term does not include building or work for which Federal assistance is limited solely to loan guarantees or insurance.

(e) Every person paid by a contractor or subcontractor in any manner for his labor in the construction, prosecution, completion, or repair of a public building or public work or building or work financed in whole or in part by loans or grants from the United States is "employed" and receiving "wages," regardless of any contractual relationship alleged to exist between him and the real employer.

(f) The term "any affiliated person" includes a spouse, child, parent, or other close relative of the contractor or subcontractor, a partner or officer of the contractor or subcontractor, a corporation closely connected with the contractor or subcontractor as parent, subsidiary or otherwise, and an officer or agent of such corporation.

(g) The term "Federal agency" means the United States, the District of Columbia, and all executive departments, independent establishments, administrative agencies, and instrumentalities of the United States and of the District of Columbia, including corporations, all or substantially all of the stock of which is beneficially owned by the United States, by the District of Columbia, or any of the foregoing departments, establishments, agencies, and instrumentalities.

#### Section 3.3 Weekly Statement With Respect to Payment of Wages

(a) As used in this section, the term "employee" shall not apply to persons in classifications higher than that of laborer or mechanic and those who are the immediate supervisors of such employees.

(b) Each contractor or subcontractor engaged in the construction prosecution, completion, or repair of any public building or public work, or building or work financed in whole or in part by loans or grants from the United States, shall furnish each week a statement with respect to the wages paid each of its employees engaged on work covered by 29 CFR Parts 3 and 5 during the preceding weekly payroll period. This statement shall be executed by the contractor or subcontractor or by an authorized officer or employee of the contractor or subcontractor who supervises the payment of wages and shall be on form WH 348, "Statement of Compliance", or on an identical form on the back of WH 347, "Payroll (1 or Contractors Optional Use)" or on any form with identical working. Sample copies of WH 347 and WH 348 may be obtained from the Government contracting or sponsoring agency, and copies of these forms may be purchased at the Government Printing Officer.

(c) The requirements of this section shall not apply to any contract of \$2,000 or less.

#### Section 3.3 Weekly Statement With Respect to Payment of Wages Continued:

(d) Upon a written finding by the head of a Federal agency, the Secretary of Labor may provide reasonable limitations, variations, tolerances, and exemptions form the requirements of the section subject to such conditions as the Secretary of Labor may specify.

(29 F. R. 93, Jan. 4, 1964, as amended at 33 F. R. 10186, July 17, 1968)

## Section 3.4 Submission of weekly statements and the preservation and inspection of weekly payroll records.

(a) Each weekly statement required under section 3.3 shall be delivered by the contractor or subcontractor, within seven days after the regular payment date of the payroll period, to a representative of a Federal or State agency contracting for or financing the building or work. After such examination and check as may be made, such statement, or a copy thereof, shall be kept available, or shall be transmitted together with a report of any violation, in accordance with applicable procedures prescribed by the United States Department of Labor.

(b) Each contractor or subcontractor shall preserve his weekly payroll records for a period of three years from date of completion of the contract. The payroll record shall set out accurately and completely the name and address of each employer and mechanic, his correct classification, rate of pay, daily and weekly number of hours worked, deductions made and actual wages paid. Such payroll records shall be made available at all times for inspection by the contracting officer or his authorized representative, and by authorized representatives of the Department of Labor.

## Section 3.5 Payroll deductions permissible without application to or approval of the Secretary of Labor.

Deductions made under the circumstances or in the situations described in the paragraphs of this section may be made without application to and approval of the Secretary of Labor.

(a) Any deduction made in compliance with the requirements of Federal, State, or local law, such as Federal or State withholding income taxes and Federal social security taxes.

(b) Any deduction of sums previously paid to the employee as a bona fide prepayment of wages when such prepayment is made without discount or interest. A "bona fide prepayment of wages" is considered to have been made only when cash or its equivalent has been advanced to the person employed in such manner as to give him complete freedom of disposition of the advanced funds.

(c) Any deduction of amounts required by court process to be paid to another, unless the deduction is in favor of the contractor, subcontractor or any affiliated person, or when collusion or collaboration exists.

(d) Any deduction constituting a contribution on behalf of the person employed to funds established by the employer or representatives of employees, or both, for the purpose of providing either from principal or income, or both, medical or hospital care, pensions or annuities on retirement, death benefits, compensation for injuries, illness, accidents, sickness, or disability, or for insurance to provide any of the foregoing, or unemployment benefits, vacation pay, savings accounts, or similar payments for the benefit of employees, their families and dependents: Provided,

## Section 3.5 Payroll deductions permissible without application to or approval of the Secretary of Labor Continued:

(d) however, that the following standards are met: (1) The deduction is not otherwise prohibited by law, (2) it is either: (i) Voluntarily consented to by the employee in writing and in advance of the period in which the work is to be done and such consent is not a condition either for the obtaining of or for the continuation of employment, or (ii) provided for in a bona fide collective bargaining agreement between the contractor or subcontractor and representatives of its employees. (3) no profit or other benefit is otherwise obtained, directly or indirectly, by the contractor or subcontractor or any affiliated person in the form of commission, dividend, or otherwise; and (4) the deductions shall serve the convenience and interest of the employee.

(e) Any deduction contributing toward the purchase of United States Defense Stamps and Bonds when voluntarily authorized by the employee.

(f) Any deduction requested by the employee to enable him to repay loans to or to purchase shares in credit unions organized and operated in accordance with Federal and State credit union statutes.

(g) Any deduction voluntarily authorized by the employee for the making of contributions to governmental or quasi-governmental agencies, such as the American Red Cross.

(h) Any deduction voluntarily authorized by the employee for the making of contributions to community Chests, United Givers Funds, and similar charitable organizations.

(i) Any deductions to pay regular union initiation fees and membership dues, not including fines or special assessments: Provided, however, that a collective bargaining agreement between the contractor or subcontractor and representatives of its employees provides for such deductions and the deductions are not otherwise prohibited by law.

(j) Any deduction not more than for the "reasonable cost" of board, lodging, or other facilities meeting the requirements of section 3(m) of the Fair Labor Standards Act of 1938, as amended, and Part 5.31 of this title. When such a deduction is made the additional records required under Section 516.27 (a) of this title shall be kept.

#### Section 3.6 Payroll deductions permissible with the approval of the Secretary of Labor.

Any contractor or subcontractor may apply to the Secretary of Labor for permission to make any deduction not permitted under Section 3.5. The Secretary may grant permission whenever he finds that.

- (a) The contractor, subcontractor, or any affiliated person does not make a profit or benefit directly or indirectly from the deduction either in the form of a commission, dividend, or otherwise;
- (b) The deduction is not otherwise prohibited by law;

#### Section 3.6 Payroll deductions permissible with the approval of the Secretary of Labor Continued:

- (c) The deduction is either (1) voluntarily consented to by the employee in writing and in advance of the period in which the work is to be done and such consent is not a condition either for the obtaining of employment or its continuance, or (2) provided for in a bona fide collective bargaining agreement between the contractor or subcontractor and representatives of its employees, and
- (d) The deduction serves the convenience and interest of the employee.

#### Section 3.7 Applications for the approval of the Secretary of Labor.

Any application for the making of payroll deductions Section 3.6 shall comply with the requirements prescribed in the following paragraphs of this section:

- (a) The application shall be in writing and shall be addressed to the Secretary of Labor.
- (b) The application shall identify the contract or contracts under which the work in question is to be performed. Permission will be given for deductions only on specific, identified contracts, except upon a showing of exceptional circumstances.
- (c) The application shall state affirmatively that there is compliance with the standards set forth in the provisions of Section 3.6. The affirmation shall be accompanied by a full statement of the facts indicating such compliance.
- (d) The application shall include a description of the proposed deduction, the purpose to be served thereby, and the classes of laborers or mechanics from whose wages the proposed deduction would be made.
- (e) The application shall state the name and business of any third person to whom any funds obtained from the proposed deductions are to be transmitted and the affiliation of such person, if any, with the applicant.

#### Section 3.8 Action by the Secretary of Labor upon applications.

The Secretary of Labor shall decide whether or not the requested deduction is permissible under provisions of Section 3.6, and shall notify the applicant in writing of his decision.

#### Section 3.9 Prohibited payroll deductions.

Deductions not elsewhere provided for by this part and which are not found to be permissible under Section 3.6 are prohibited.

#### Section 3.10 Methods of payment of wages.

The payment of wages shall be by cash, negotiable instruments payable on demand, or the additional forms of compensation for which deductions are permissible under this part. No other methods of payment shall be recognized on work subject to the Copeland Act.

#### Section 3.11 Regulations part of contract.

All contracts made with respect to the construction, prosecution, completion, or repair of any public building or public work or building or work financed in whole or in part by loans or grants from the United States covered by the regulations in this part shall expressly bind the contractor or subcontractor to comply with such of the regulations in this part as may be applicable. In this regard, see Section 5.5 (a) of this subtitle.

#### **GENERAL CONSTRUCTION AND SPECIFICATIONS**

#### **INTENT OF PLANS AND SPECIFICATIONS:**

The intent of the plans and specifications is to prescribe a complete work or improvement which the Contractor undertakes to do, in full compliance with the plans, specifications, special provisions, proposal and contract. The Contractor shall do all work as provided in the plans, specifications, special provisions, proposal and contract and shall do such additional work as may be considered necessary to complete the work in a satisfactory and acceptable manner. The Contractor shall furnish all labor, tools, materials, machinery, equipment and incidentals necessary to the prosecution of the work.

#### FINAL CLEAN-UP:

Upon the completion of the work and before acceptance and final payment will be made, the Contractor shall clean and remove from the site of the work, surplus and discarded materials, temporary structures and debris of every kind. He shall leave the site of the work in a neat and orderly condition equal to that which originally existed. Surplus and waste materials removed from the site of the work shall be disposed of at locations satisfactory to the Engineer/Architect. Grounds around any structure shall be dressed to final grade as shown on plans.

#### **EXISTING STRUCTURES**:

The plans show the locations of all known surface and sub-surface structures. However, the exact location of gas mains, water mains, conduits, sewers, etc., is unknown and the Owner assumes no responsibility for failure to show any or all of these structures on the plans or to show them in their exact location. It is mutually agreed that such failure will not be considered sufficient basis for claims for additional compensation for extra work or for increasing the pay quantities in any manner whatsoever, unless the obstruction encountered is such as necessitates, or requires the building of special work, provision for which is not made in the plans and proposal, in which case the provisions in these specifications for extra work shall apply.

#### **COORDINATION OF PROJECT:**

The plans, these specifications, the proposal, special provisions and all supplementary documents are intended to describe a complete work and are essential parts of the contract. A requirement occurring in any of them is binding. In case of discrepancies, figured dimensions shall govern over specifications; special provisions shall govern over both general and standard specifications; and plans and quantities shown on the plans shall govern over those shown in the proposal. The Contractor shall not take advantage of any apparent error or omission in the plans and specifications and the Engineer/Architect shall be permitted to make such corrections or interpretations as may be deemed necessary for the fulfillment of the intent of the plans and specifications. In the event the Contractor discovers an apparent error or discrepancy, he shall immediately call this to the attention of the Engineer/Architect.

#### **COOPERATION OF CONTRACTOR:**

The Contractor shall give to the work the consistent attention necessary to facilitate the progress thereof, and he shall cooperate with the Engineer/Architect, his inspectors, and with other contractors in every way possible.

#### WAGES:

All employees directly employed on the work shall be paid the prevailing wage scale for work of a similar character in this locality. Minimum wage scale is also included in these specifications.

#### MATERIALS - GENERAL:

The materials shall be the best procurable, as required by the plans, specifications and special provisions. The Contractor shall not start delivery of materials until the Engineer/Architect has approved the source of supply. Only materials conforming to these specifications shall be used in the work and such materials shall be used only after approval has been given by the Engineer/Architect and only so long as the quality of said materials remains equal to the requirements of the specifications. The Contractor shall furnish approved materials from other sources, if for any reason the product from any source at any time before commencement or during the prosecution of the work proves unacceptable. After approval, any material which has become mixed with or coated with dirt or any other foreign substances during its delivery and handling will not be permitted to be used in the work.

#### **MATERIAL STORAGE**:

Any and all materials, such as cement, lime, mill work, or other materials or equipment subject to deterioration by exposure to weather or other factors, shall be stored in such a manner to protect them from deterioration or damage preceding the time they become a permanent part of final structures.

#### "OR EQUAL" CLAUSE:

Whenever a material, or article required is specified or shown on the plans by using the name of the proprietary product, or of a particular manufacturer or vendor, any material or article which will perform adequately the duties imposed by the general design will be considered equal and satisfactory, provided the material or article so proposed is of equal substance and function, and only after written approval by the Engineer/Architect.

#### **CONSTRUCTION JOINTS:**

Construction joints are to be kept to a minimum number, but when necessary they shall be designated in the plans or upon the approval of the Engineer/Architect.

Construction joints in walls shall be horizontal, unless otherwise allowed by the Engineer/Architect.

#### WALL AND FLOOR OPENINGS:

Openings may be left in walls and floors while forms are being built, so that piping or wall sleeves may later be inserted in the openings when piping is put in place. Provision shall be made in these openings for concreting the piping and thimbles securely in place so that water tight joints will be secured.

All wall and floor openings are to be closed by general Contractor regardless of whether piping or fittings are furnished or installed by others.

#### **PAINTING**:

All exposed metal surfaces of every nature, such as pumps, piping, general equipment, window frames, valves, fittings, gratings, etc., shall receive one rust inhibitive primer coat followed by two coats of machinery enamel. Colors for enamel finish coats to be selected by Owner or Engineer/Architect.

All wood surfaces are to receive one primer coat and two coats of first grade outside oil paint. Colors to be selected by Owner or Engineer/Architect.

Any specific structure, or portions of structure, which provides for occupancy or use by operations, or houses general equipment or supplies; whether structure is masonry or concrete; shall be painted inside and outside as directed by Engineer/ Architect. An alkali resisting primer coat shall be first applied followed by two coats of first class oil paint especially prepared for concrete or masonry surfaces. Any questions regarding foregoing shall be clarified to his satisfaction by bidding Contractor before submitting a bid on project. Colors to be selected by Owner or Engineer/Architect.

#### HARDWARE:

All hardware must be strictly standard first grade, Contractor's choice, and approved by Engineer/Architect.

#### **TELEPHONE CABLES:**

Contractor shall notify Telephone Co. 24 hours in advance of work in the vicinity of buried telephone cables. No work shall be performed in vicinity of cable except in presence of telephone company representatives.

#### GAS LINES:

Contractor shall notify Gas Co. 24 hours in advance or work in the vicinity of gas distribution lines and the proper transmission company in the case of transmission gas lines.

#### **RAILROAD CROSSINGS:**

Construction methods and materials for railroad crossings shall be in strict compliance with railroad company requirements. No work shall be started on railroad crossings until properly coordinated with the roadmaster 48 hours prior to beginning work.

#### **CANAL CROSSINGS**:

Construction methods and materials for canal crossings shall be in strict compliance with water district requirements. No work shall be started on canal right-of-ways until properly coordinated with the water district.

#### FEDERAL LABOR STANDARDS PROVISIONS

#### Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

**A. 1. (i) Minimum Wages.** All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR Part 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)(a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage rate and fringe benefits therefore only when the following criteria have been met.

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140).
(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee and Budget under OMB Control Number 1215-0140).

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of an laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140).

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract, in the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

**3.** (i) **Payrolls and basic records**. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the

name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates or contributions or costs anticipated for bona fide fringe benefits or cash equivalents there of the types described in Section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017).

(ii)(a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR Part 5.5(a)(3)(i). This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-0014-1), U. S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149).

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be maintained under 29 CFR Part 5.5(a)(3)(i) and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph A.3.(ii)(b) of this section.

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph A.3.(i) of this section available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR Part 5.12.

## (4) Apprentices and Trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration. Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage Apprentices shall be paid fringe benefits in accordance with the provisions of the determination. apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) **Trainees.** Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. the ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training

Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable program, the contractor will no longer be permitted to utilize trainees at less than the applicable program.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

**5.** Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract.

**6.** Subcontracts. The contractor or subcontractor will insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as HUD or its designee may be appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5(a).

**7. Contract termination; debarment.** A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

**8.** Compliance with Davis-Bacon and Related Act Requirements. All rulings and interpretations of the David-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.

**9. Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

10. (i) Certification of Eligibility. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1010, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part "Whoever, for the purpose of ... influencing in any way the action of such Administration... makes, utters or publishes any statement, knowing the same to be false... shall be fined not more than \$5,000 or imprisoned not more than two years, or both."

**11. Complaints, Proceedings, or Testimony by Employees.** No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

**B.** Contract Work Hours and Safety Standards Act. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of eight hours or in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in subparagraph (1) of this paragraph.

(3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) **Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

## C. Health and Safety

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 (formerly part 1518) and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act (Public Law 91-54, 83 Stat.96).

(3) The Contractor shall include the provisions of this Article in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontract as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

WAGE RATES

General Decision Number: TX180305 09/14/2018 TX305

Superseded General Decision Number: TX20170305

State: Texas

Construction Type: Building

County: Hidalgo County in Texas.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.35 for calendar year 2018 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.35 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2018. The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number 0 1	Publication Date 01/05/2018 09/14/2018	
BOIL0074-003 01/01/20	17	
	Rates	Fringes
BOILERMAKER	\$ 28.00	22.35
ENGI0178-005 06/01/20	14	
	Rates	Fringes
POWER EQUIPMENT OPERAT (1) Tower Crane (2) Cranes with F Driving or Caisso Attachment and Hy	10.60	
Crane 60 tons and (2) Undrouble and	l above\$ 28.75	10.60
Tons and under	\$ 27.50	10.60
* IRON0084-011 06/01/2018		
	Rates	Fringes
IRONWORKER, ORNAMENTAL	\$ 23.77	7.12
PLUM0412-004 04/01/20	13	
	Rates	Fringes
PLUMBER	\$ 31.14	12.43
SUTX2014-031 07/21/2	2014	

	Rate	S	Fringes	
BRICKLAYER.	\$	16.17	0.00	)
CARPENTER	\$	14.21	2.22	?
CEMENT MASC	DN/CONCRETE FINISHER\$	12.46	0.00	)
ELECTRICIAN	1\$	18.44	4.53	}
INSULATOR -	- MECHANICAL			
System Insu	alation)\$	11.54	2.17	,
IRONWORKER,	REINFORCING\$	12.01	0.00	)
IRONWORKER,	STRUCTURAL\$	15.04	4.34	F
LABORER: (	Common or General\$	8.00	0.00	)
LABORER: N	Mason Tender - Brick\$	10.00	0.00	)
LABORER: N Cement/Conc	Mason Tender - crete\$	10.89	0.96	- >
LABORER: I	pipelayer\$	11.00	3.47	1
LABORER: F	Roof Tearoff\$	10.06	0.00	)
OPERATOR: Backhoe/Exc	cavator/Trackhoe\$	14.04	1.01	-
OPERATOR: Steer/Skid OPERATOR:	Bobcat/Skid Loader\$ Bulldozer\$	13.93 18.29	0.00	)
OPERATOR:	Drill\$	16.22	0.34	F
OPERATOR:	Forklift\$	14.83	0.00	)
OPERATOR:	Grader/Blade\$	10.00	0.00	)
OPERATOR:	Loader\$	12.87	0.70	)
OPERATOR:	Mechanic\$	17.00	0.00	)
OPERATOR: Aggregate,	Paver (Asphalt, and Concrete)\$	16.03	0.00	)
OPERATOR:	Roller\$	12.70	0.00	)
PAINTER (Br Spray)	rush, Roller, and	11.27	0.00	)
PIPEFITTER. ROOFER	\$ \$	15.22 11.42	3.16 0.00	; )
SHEET METAI Installatio	WORKER (HVAC Duct on Only)\$	18.40	2.12	2
SHEET METAI HVAC Duct ]	WORKER, Excludes Installation\$	21.13	6.53	}

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TILE FINISHER.	\$ 11.22	0.00
TILE SETTER	\$ 12.15	0.00
TRUCK DRIVER:	Dump Truck\$ 12.39	1.18
TRUCK DRIVER:	Flatbed Truck\$ 19.65	8.57
TRUCK DRIVER: Truck	Semi-Trailer \$ 12.50	0.00
TRUCK DRIVER:	Water Truck\$ 12.00	4.11

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

\_\_\_\_\_

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate weighted union average rate).

#### Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number,005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014. Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

\_\_\_\_\_

#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations Wage and Hour Division U.S. Department of Labor 200 Constitution Avenue, N.W. Washington, DC 20210 2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator U.S. Department of Labor 200 Constitution Avenue, N.W. Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board U.S. Department of Labor 200 Constitution Avenue, N.W. Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

\_\_\_\_\_

END OF GENERAL DECISION

\_\_\_\_\_

## **AFFIDAVIT AND WAIVER OF LIEN PRIME CONTRACTOR**

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

Personally appeared before me, the undersigned Notary Public for said County and St	ate	
(Name of Individual),(Title) of		
(Prime Contractor), who being duly sworn by me states on c	bath that all product	
suppliers and Subcontractors, payrolls, sales tax, privilege tax or license, old age benefits tax, state and		
federal unemployment insurance, and other liabilities incurred in the performance of		
(Type of Contract) Contract for the construction of improvements at	(Name of Project),	
have been paid in full and that the above named Prime Contractor waives any claims and releases		
(Owner) from any rights or claims (including lien right	s) for debts due and	
owing by virtue of the furnishing of any labor, products, and supplies furnished for su	ch improvements.	

The above named Prime Contractor agrees to indemnify the Owner and save him harmless on account of any loss he may sustain in reliance upon this Affidavit and Waiver of Lien including the amount of any lien he may be compelled to pay all costs relating thereto and a reasonable attorney's fee.

(Prime Contractor)

By: \_\_\_\_\_\_\_ Type/Print Name

Title: \_\_\_\_\_

Date:

Sworn to and subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

Notary Public

My Commission Expires:

## **RELEASE AND WAIVER OF CLAIMS BY** SUBCONTRACTORS AND PRODUCT VENDORS

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

Personally appeared before me the undersigned authority in and for said County and State

\_\_\_\_\_ (Name of Individual), \_\_\_\_\_ (Title) of (Company), who, being duly sworn by me states on oath that all bills for labor and products, sales tax, privilege tax or license, old age benefits tax, state and federal unemployment insurance and other liabilities have been paid in full, or that funds are in hand to discharge such liabilities when due, incurred in the performance of its Subcontract for furnishing labor or products in the construction of improvement at \_\_\_\_\_ (Name of Project), \_\_\_\_\_ (Location), upon receipt of check in the amount of \$\_\_\_\_\_, the undersigned company waives any claims and releases \_\_\_\_\_ (Owner) (Contractor) from any rights or claims for debts due and owing by virtue of the furnishing of any labor or products and any lien therefor.

(Name of Company)

By: \_\_\_\_\_ Type/Print Name

Title:

Date:

Sworn to and subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

Notary Public

My Commission Expires:

## **CONTRACTOR'S AFFIDAVIT AS TO STATUS OF LIENS**

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

Personally appeared before me, the undersigned Notary Public for said County and State, (Name of Individual), \_\_\_\_\_ (Title), of (Prime Contractor), who being duly sworn by me states on oath that to the best of his knowledge and belief, except as listed below, the Releases and Waivers of Claim attached hereto include all Subcontractors and all suppliers of labor, products, and equipment provided by all persons who may have liens against the property of (Owner), located at (location of Project), arising out of the construction of improvements thereon.

Exceptions: (If none, write "NONE." Any exception listed shall be bonded by the Contractor to indemnify the Owner, and a copy of each such bond shall be attached hereto.)

1	
I	•

- 2.
- 3.

4

By: \_\_\_\_\_\_ Type/Print Name

Title:

Date:

Sworn to and subscribed before me this day of , 20

Notary Public

My Commission Expires: \_\_\_\_\_

## **TECHNICAL SPECIFICATIONS**

# **PROJECT MANUAL**

Plans and Specifications – Project No. 216022 For

> City of McAllen McAllen – Hidalgo International Bridge FMCSA Southern Border Program Hidalgo, Texas



TEXAS BOARD OF ARCHITECTURAL EXAMINERS 333 Guadalupe, Suite 2-350, AUSTIN, TX 78701-3942 (Tel: 512/305-9000) HAS JURISDICTION OVER INDIVIDUALS LICENSED UNDER THE ARCHITECT'S REGISTRATION LAW ARTICLE 249a, VERNON'S CIVIL STATUTES".

MILNET ARCHITECTURAL SERVICES 608 S. 12<sup>th</sup> St. McALLEN, TEXAS 78501 (956) 688-5656 - FAX (956) 687-9289

## FMCSA SOUTHERN BORDER PROGRAM MCALLEN-HIDALGO REYNOSA INTERNATIONAL BRIDGE

## CIVIL SPECIFICATIONS

- SECTION 02100 Site Preparation
- SECTION 02102 Clearing and Grubbing
- SECTION 02150 Temporary Erosion and Sediment Control During Construction
- SECTION 02202 Earthwork
- SECTION 02230 Excavation
- SECTION 02514 Concrete Flatwork, Curbs, & Approaches
- SECTION 02660 Concrete curb and Gutter and Valley Gutter
- SECTION 03300 Concrete Work



## CITY OF MCALLEN Federal Motor Carrier Safety Administration Southern Border Program Hidalgo, Texas

MAS Project No. 216022

Division	Section Title	Pages
SEDIES	DIDDING DEGLIDEMENTS AND CONTDACT FORMS	
00 31 32	GEOTECHNICAL INVESTIGATION	48
00 51 52		-10
DIVISIO	N 1 - GENERAL REQUIREMENTS	
01 11 00	SUMMARY	1
01 20 00	PRICE AND PAYMENT PROCEDURES	2
01 21 00	ALLOWANCES	1
01 25 00	SUBSTITUTION PROCEDURES	3
01 30 00	ADMINISTRATIVE REQUIREMENTS	3
01 33 00	SUBMITTALS	4
01 35 16	ALTERATIONS PROJECT PROCEDURES	3
01 40 00	QUALITY REQUIREMENTS	2
01 50 00	TEMPORARY FACILITIES AND CONTROLS	5
01 73 29	CUTTING AND PATCHING	3
DIVISIO	N 2 – EXISTING CONDITIONS	
02 41 19	SELECTIVE SITE DEMOLITION	2
DIVISIO	N 3 – CONCRETE	
03 30 00	CAST-IN-PLACE CONCRETE	5
03 50 00	CONCRETE FLOOR FINISHING	7
DIVISIO	N 4 - MASONRY	
04 05 13	MORTAR	3
04 21 13	BRICK MASONRY	5
DIVISIO	N 5 - METALS	
05 12 00	STRUCTURAL STEEL	6
05 21 00	STEEL JOISTS	4
05 31 00	STEEL FORM FLOOR DECK AND STRUCTURAL ROOF DECK	2
05 41 00	LIGHT GAGE METAL FRAMING SYSTEMS AND GYPSUM SHEATHING	4
05 50 00	METAL FABRICATIONS	3
05 52 00	STEEL HANDRAILS	4
DIVISIO	N 6 - WOOD AND PLASTICS	
06 10 00	ROUGH CARPENTRY	3
06 40 23	INTERIOR ARCHITECTURAL WOODWORK	12
06 61 16	SOLID SURFACING	5

DIVISIO	N 7 - THERMAL AND MOISTURE PROTECTION	
07 10 00	DAMPPROOFING AND WATERPROOFING	4
07 21 00	BUILDING INSULATION	2
07 22 00	ROOF AND DECK INSULATION	3
07 25 00	WEATHER BARRIER	6
07 26 16	UNDER SLAB VAPOR BARRIER	3
07 60 00	SHEET METAL AND MISCELLANEOUS ACCESSORIES	7
07 61 13	NEW STANDING SEAM METAL ROOF SYSTEM	16
07 92 00	JOINT SEALANTS	2
DIVISIO	N 8 - DOORS AND WINDOWS	
08 11 13	HOLLOW METAL DOORS AND FRAMES	10
08 14 16	FLUSH WOOD DOORS	6
08 33 23	OVERHEAD COILING SERVICE DOOR	5
08 41 13	STOREFRONT	8
08 71 00	DOOR HARDWARE	17
08 81 00	GLASS AND GLAZING	4
DIVISIO	N 9 - FINISHES	
09 21 16	INTERIOR DRYWALL SYSTEMS	8
09 30 00	WALL AND FLOOR TILE	5
09 51 00	ACOUSTICAL TILE CEILINGS	4
09 65 00	RESILIENT FLOORING AND BASE	4
09 65 19	RESILIENT TILE FLOORING. SOLID VINYL FLOOR TILE	5
09 91 00	PAINTING AND FINISHING	5
09 96 53	ELASTOMERIC COATING	2
DIVISIO	N 10 - SPECIALTIES	
10 14 00	GRAPHICS AND SIGNAGE	4
10 14 53	TRAFFIC STRIPPING AND PARKING SIGNAGE	2
10 21 13	TOILET COMPARTMENTS	5
10 28 13	TOILET & BATH ACCESSORIES	2
10 44 00	FIRE EXTINGUISHERS	3
10 51 13	STANDARD LOCKERS	4
10 51 53	LOCKER BENCHES	3
10 81 13	BIRD CONTROL DEVICES	4
DIVISIO	N 11 – EQUIPMENT	
DIVISIO	N 12 – FURNISHINGS	
12 21 13	HORIZONTAL LOUVER BLINDS	3
12 93 43	BENCHES	9
DIVISIO	N 13 - SPECIAL CONSTRUCTION	
13 34 19	PRE-ENGINEERED METAL BUILDING	5
13 34 23	MODULAR BUILDING	10
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# DIVISION 28 – ELECTRONIC SAFETY & SECURITY28 51 00INFORMATION MANAGEMENT & PRESENTATION14

## **DIVISION 31 – EARTHWORK**

31 10 00	SITE CLEARING, GRADING AND FILLING	3
31 31 16	TERMITE CONTROL	2
32 11 00	FLEXIBLE BASE	8
32 12 00	PRIME COAT	4
32 12 16	HOT MIX ASPHALT CONCRETE PAVEMENT	14
32 13 13	CONCRETE PAVING, CURBS AND SIDEWALKS	10
33 05 00	SITE DRAINAGE	3

## SPECIAL PROVISIONS

## **Specifications which Apply**

All work under this contract shall conform to the requirements of these specifications.

In cases where the standard specifications are in conflict with either Plans and Specifications or the Special Provisions, the order of supersede shall be Special Provisions and Specifications and Plans.

All labor, materials, equipment, supervision and other services required for this demolition will be furnished in accordance with plans and specifications as prepared by the Engineering Department personnel of the City of McAllen, Texas.

All work to be performed in close association with project engineer or designer. Before demolition proceeds, verify site requirements with Engineering staff.

City of McAllen has delineated work areas. Any damaged property not otherwise mentioned within plans or specifications to be demolished, shall be the responsibility of the Contractor to correct with no additional compensation.

The City of McAllen is a franchised area for sanitation and debris removal. Materials and debris can be disposed of by means of a dump truck or pickup truck. Should a roll-off container be needed due to the amount discarded a roll-off container would need to be set up through the City of McAllen Engineering Department (956-681-1151). Outside roll-off companies are not permitted on city projects.

Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

## Security Measures

A contractor's superintendent shall be on the job at all times that construction/demolition workers are present at the construction site.

## <u>Testing</u>

All testing will be made by an independent laboratory designated and paid by the owner, unless otherwise stated in the specifications of the items to be tested. Any costs associated with retesting of materials shall be the responsibility of the contractor as required by the City of McAllen. Any construction materials not meeting specifications may be rejected at contractor's expense or may be accepted by the city provided a deduction is granted. The Engineering Department must be notified <u>24 hours</u> in advance of materials testing.

## Schedule and Sequence of Construction

The Contractor shall, prior to beginning work, prepare and submit a proposed schedule of work to the Owner for his approval. Work schedule to be planned in coordination with McAllen personnel and performed such that minimal interference to City of McAllen staff. Recommended construction hours are between 6:00am and 6:00 pm.

## **Utilities**

Contractor to provide for his own utility requirements.

## **Building Permit and Taxes**

A building permit will be required for the demolition of this project. A project for the City of McAllen is exempt from sales taxes. Contractor is responsible for obtaining any required building permits. Associated fees are subsidiary to the construction cost.

## Material Deliveries

Engineering staff shall explain how material deliveries are to arrive and where materials and workman tool boxes may be stored at the pre-construction meeting (as required).

## Inspection of Work

The Owner will provide sufficient competent personnel, working under the supervision of a qualified Engineer, for the inspection of the work while such work is in progress to ascertain that the completed work will comply in all respects with the standards and requirements set forth in the Specifications. Contractor will be responsible for payment of city inspection personnel if major work related issues are scheduled outside of the normal business hours, as is required by the City of McAllen. Notwithstanding such inspection, the Contractor will be held responsible for the acceptability of the finished work.

The Engineer and his representatives shall at all times have access to the work whenever it is in preparation or progress, and the Contractor shall provide proper facilities for such access, and for inspection.

If the Specifications, the Engineer's instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the Engineer timely notice of its readiness for inspection. Inspections by the Engineer shall be made promptly, and where practicable at the source of supply. If any work should be covered up without approval or consent of the Engineer, it must be uncovered at the Contractor's expense, unless the Engineer has unreasonably delayed inspection.

Re-examination of the work may be ordered by the Engineer, and, if so ordered, the work must be uncovered by the Contractor. If such work is found to be in accordance with the Contract Documents, the Owner shall pay the cost of re-examination and replacement. If such work is not in accordance with the Contract Documents, the Contractor shall pay such cost.

## Changes in the Work

The Owner may make changes in the Drawings and Specifications of scheduling of the Contract within the general scope at any time by a written order. If such changes add to or deduct from the contractor's cost of the work, the Contract shall be adjusted accordingly. All such work shall be executed under the conditions of the original Contract except that any claim for extension of time caused thereby shall be adjusted at the time of ordering such change. In giving instructions, the Engineer shall have authority to make minor changes in the work not involving cost, and not inconsistent with the purposes of the work, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order by the Engineer, an no claim for an addition to the Contract Sum shall be valid unless the additional work was so ordered.

## **Competency of Bidders**

The Bidder must be capable of performing each of the various items of work bid upon. Upon request, the successful Bidder shall submit a complete statement of his financial resources and his previous experience in similar work.

## **Guarantee of Work**

All workmanship, equipment and materials, furnished or installed by the Contractor shall be guaranteed for a period represented in the applicable specification of system in question against faulty workmanship or defective materials.

## <u>Final Clean Up</u>

Upon completion of the work and before acceptance and final payment is made, the Contractor shall clean and remove from the site of the work <u>all brush</u>, <u>trash</u>, <u>surplus and discarded</u> <u>materials</u>, <u>temporary services</u>, <u>materials and debris of every kind</u>. The Contractor shall leave the site of the work in a neat and orderly condition equal to that which originally existed. Waste materials removed from the site shall be disposed of at locations satisfactory to the project engineer and shall be considered incidental to the bid.

## **Correction of Work Before Final Payment**

The City is responsible for Texas Department of State Health Services (TDSHS) assessment notification fees based upon the quantity of asbestos removed.

The Contractor shall promptly remove from the premises all materials and work condemned by the Owner/Designer as failing to meet Contract requirements, whether incorporated in the work or not. The Contractor shall promptly replace and re-execute his own work in accordance with the Contract and without expense to the Owner and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.

If the Contractor does not take action to remove such condemned materials and work within 10 days after written notice, the Owner may remove them and may store the material at the expense of the Contractor. If the Contractor does not pay the expense of such removal and storage within ten days' time thereafter, the Owner may, upon ten days', written notice, sell such materials at auction or at private sale and shall pay the Contractor any net proceeds thereof, after deducting all the costs and expenses that should have been borne by the Contractor.

#### SECTION 02100 - SITE PREPARATION

#### PART 1 - GENERAL

- 1.01 SECTION INCLUDES:
  - A. Demolition of existing site elements per Demolition Plan and/or as required for installation of new work.
  - B. Clearing of site.
- 1.02 RELATED SECTIONS:
  - A. Temporary erosion and sediment control during construction Section 02150.
  - B. Earthwork Section 02200 or Section 02202 and/or Section 02222
- 1.03 NOTIFICATION TO OWNERS OF UTILITY LINES AND EQUIPMENT:
  - A. Notify any corporation, company, individual or local authority owning conduits, wires, pipes

or equipment on site that is affected by work.

B. Arrange for removal or relocation of indicated items and pay any fees or costs in conjunction

with removal or relocation, except as otherwise noted.

- C. Cap lines in accordance with instructions of governing authorities or Owners.
- 1.04 **PROTECTIONS**:
  - A. Protect trees, plants and other landscape features designated to remain.
- 1.05 EXPLOSIVES:

A. Use of explosives is strictly prohibited.

## PART 2 - PRODUCTS - NONE IN THIS SECTION

#### PART 3 - EXECUTION

- 3.01 PREPARATION:
  - A. Verify that abandoned utilities have been properly disconnected and capped.
  - B. Verify that barricades and other protective measures are in place.

## 3.02 CLEARING:

- A. Remove existing scrub trees and shrubs, including root systems.
- B. Strip and clear building areas, or areas requiring cutting or filling, free of vegetation. Leave construction areas clean, free of vegetation and debris, and ready for earthwork.

C. Remove debris and trash from site.

END OF SECTION

#### SECTION 02102-CLEARING AND GRUBBING

#### PART 1 - GENERAL

#### 1.01 GENERAL DESCRIPTION OF WORK

- A. Cleaning and grubbing shall consist of the removal of trees, stumps, brush, roots, vegetation, logs, rubbish, and other objectionable matter within the project site limits described in the specifications or as shown on plans.
- B. Cleaning and grubbing shall be done in advance of grading operation. Grubbing may be done simultaneously with excavation, if the cuts are over 3 feet in depth and objectionable matter is removed as specified.
- C. Clearing and Grubbing shall consist of the disposal of all debris resulting from the work specified herein.

#### 1.02 PROTECTION OF ADJACENT WORK:

- A. Provide protection necessary to prevent injury or damage to existing improvements, adjacent property, utilities and other facilities, and trees and plants, indicated to remain in place.
- B. Protect improvements on adjoining properties and all areas outside indicated construction areas from injury or damage.
- C. Restore damaged improvements to their original condition, as acceptable to the Engineer and property owners.
- D. Conduct site clearing and grubbing operations to ensure minimum interference with road, streets, walks, and other adjacent, occupied or used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction.

#### PART 2 - PRODUCTS

- 2.01 MATERIALS:
  - A. Provide all required personnel, equipment, and materials required to perform the work as specified.

#### PART 3 - EXECUTION

- 3.01 CLEARING:
  - A. Clear all areas covered by dikes, roads, structures and embankments within project limits unless otherwise shown in plans.
  - B. Remove all saplings, brush, down-timber and debris unless shown or directed otherwise.
  - C. Use tree wound paint to treat scars, gashes or limbs stubs on trees not removed.

#### 3.02 GRUBBING:

- A. Trees, stumps, root systems, rocks and other obstructions shall be removed to the depths shown when they fall within the construction templates for the following items:
  - 1. Footings 18-inches below bottom of footing.
  - 2. Sidewalks (or other 12-inches below bottom of walk. types of walks)
  - 3. Roadways or 24-inches below bottom of base material. Streets
  - 4. Parking Areas 24-inches below bottom of base material.
  - 5. Grassed Areas 18-inches below top soil.
  - 6. Fills 24-inches below bottom of fill.
- B. Blasting not permitted.

## 3.03 REMOVAL OF DEBRIS AND CLEANUP

- A. Burn as permitted by regulating agencies or the Engineer as work progresses.
- B. Unguarded fires will not be permitted.
- C. Permits will be obtained, where required, for necessary burning or disposal sites.
- D. Dispose of all waste materials not burned by removal from site.
- E. Materials cleared and grubbed shall be the property of the Contractor and shall be his responsibility for disposal.

## PART 4 - MEASUREMENT AND PAYMENT

- 4.01 CLEARING AND GRUBBING:
  - A. Clearing and Grubbing shall be measured for payment either in <u>acres</u> or <u>by lump sum</u> only for areas indicated on the plans, or as provided in the proposal and contract.
  - B. When not listed as separate contract pay item, Clearing and Grubbing shall be considered as incidental work, and the cost thereof shall be included in such contract pay items as are provided in the proposal contract.
  - C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor equipment, tools and in incidentals required for the work, all in accordance with the plans and these specifications.

## END OF SECTION

## SECTION 02150

#### TEMPORARY EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION

#### PART 1 - GENERAL

#### 1.01 SECTION INCLUDES:

- A. Temporary measures required to control erosion and sediment during construction. This includes measures to meet the requirements of the National Pollution Discharge Elimination System (NPDES) administered by the Environmental Protection Agency (EPA).
- B. Temporary hay bale dike.
- C. Stabilized construction entrance.
- D. Silt fence.
- E. Rock check dam.
- F. Sediment basin with stone and pipe outlet
- G. Diversion dike.
- H. Storm Water Pollution Prevention Plan (SWP3).

#### 1.02 RELATED SECTIONS:

- A. Grass seeding for slope protection and erosion control Section 02270.
- B. Site Preparation Section 02100.
- C. Earthwork Section 02200 or Section 02202 and/or 02222

#### 1.03 REFERENCES:

- A. ASTM D3786 Hydraulic Bursting Strength of Knitted Goods and Non-woven Fabrics. (Mullen Burst)
- B. ASTM D3787 Bursting Strength of Knitted Goods; Constant Rate of Traverse (CRT) Ball Burst Test
- C. ASTM D4355 Deterioration of Geotextiles From Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus).
- D. ASTM D4491 Water Permeability of Geotextiles by Permittivity.
- E. ASTM D4533 Index Trapezoidal Tearing Strength of Geotextiles.F. ASTM D4632 Grab Breaking Load and Elongation of Geotextiles. (Tensile Strength).

- F. ASTM D4751 Determining the Apparent Opening Size of a Geotextile.
- H. ASTM Al 16, Zinc Coated (Galvanized) Steel Woven Wire Fence Fabric.
- I. ASTM D698 Test for Moisture Density Relations for Soils (Standard).
- J. Texas Department of Transportation (TXDOT) 1993 Standard Specifications for Construction of Highways, Streets, and Bridges. Measurement and payment sections do not apply. Item 432 - Rip Rap.

#### 1.04 SUBMITTALS:

- A. Procedures for Submittals: Section 01300.
- B. Product Data:
  - 1. Sift fencing.
  - 2. Non-woven filter fabric.
  - 3. Erosion control and revegetation mat
- C. Prepare and submit a Storm Water Pollution Prevention Plan (SWP3).
- D. Inspection Reports and Certificates:
  - 1. Submit period inspection reports and certificates required for SWP3.
  - 2. Submit Contractor/Subcontractor certifications required for SWP3.
- E. Submit revisions or modifications to the erosion and sediment control plan and SWP3.

#### 1.05 MAINTENANCE:

A. Maintain erosion control devices as necessary to comply with NPDES. This includes any revisions or modifications to the plan. Any work required for modifications, revisions and maintenance shall be the responsibility of the Contractor and shall -not be a basis for additional compensation.

#### PART 2 - PRODUCTS

#### 2.1 MATERIALS:

- A. Hay bales, if used, shall weigh a minimum of (50) pounds and shall be at least thirty (30) inches in length. Bales shall be composed entirely of vegetable matter and be free of seeds. Binding shall be either wire or nylon string, jute or cotton binding is unacceptable. Bales shall be used for not more than two months before being replaced. However, if weather conditions cause biological degradation of the hay bales, they shall be replaced sooner than the two month time period to prevent a loss of structural integrity of the hay bale dike.
- B. Stone material at all drainage structures shall consist of stone rip-rap conforming to TXDOT Standard Specification Item 432 and shall have gradation and be placed as shown on the plans and in a layer of at least 24 inches thick. Stone material for rock check dams shall

consist of only well graded crushed rock, 4-8 inches in diameter, and shall be placed as detailed on plans. Stone material for stabilized construction exit shall consist of 3" to 5" crushed rock mixed with Type "A"" Flexbase to create a drivable surface and shall be placed as shown on the plans.

- C. Geotextile Fabrics shall be a non-woven polypropylene fabric designed specifically. for use as a soil filtration media. Fabric shall have an approximate weight of 8 oztyd,2.
- D. Geotextile Silt Fence Fabric shall be a nylon reinforced polypropylene woven fabric having

a reinforcing cord running the entire length to the top edge of the fabric.

Representative Manufacturer Mirafi, Inc. sift fence, Amoco (2130) or owner approved equal.

E. Fence Posts for Sift Fence of sufficient length and strength to support the silt fence system.

#### PART 3 - EXECUTION

- 3.01 EXAMINATION AND PREPARATION:
  - A. Submit SWP3 and the erosion and sediment control plan and modify as required for the Contractor's construction sequence. Modifications shall maintain conformance with the Contractor's storm water pollution prevention plan and the requirements of NPDES. Work and materials required for installation, modification and maintenance of the Erosion Control System shall be incidental to the contract.
  - B. Locate and protect survey horizontal and vertical control.

#### 3.02 TEMPORARY HAY BALE DIKE:

- A. Install where shown on the plans or as needed for erosion control.
- B. Hay bales shall be embedded a minimum of four (4) inches and securely anchored using 3/8. inch diameter steel stakes or 2" x 2" wood stakes driven through the bales into the ground a minimum of six (6) inches. Hay bales are to be placed end to end directly adjacent to one another leaving no gap between them.
- C. Hay bale dikes are to be used in locations receiving overland sheet flow only.

#### 3.03 STABILIZED CONSTRUCTION EXIT

A. A temporary construction exit shall be installed at any point where traffic will be leaving the construction site to a public right-of-way, street, alley, sidewalk or parking area. The purpose of a stabilized construction exit is to reduce or eliminate the tracking or flowing of sediment onto public rights-of-way. The exit must be properly graded or incorporate a drainage swale to prevent runoff from leaving the construction site. The length of the exit shall be as required, but not less than 100 feet and the width shall be at least 20 feet. The stabilized exit shall be constructed of rock as described in 2.1.B. and shall be completely underlined with geotextile filter fabric described in 2.1.C, Value 1.

- B. The temporary construction exit shall be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or clean out of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately by the Contractor.
- C. When necessary, wheels must be washed or brushed to remove sediment prior to entrance

onto public right-of-way. When washing is required, it shall be done on an area stabilized with crushed stone which drains into an approved sediment trap or sediment basin. All sediment shall be prevented from entering any storm drain, ditch or watercourse using approved methods.

#### 3.04 SILT FENCE:

A. Silt Fence: Shall consist of nylon reinforced polypropylene woven fabric supported by posts set a minimum depth of 18 inches and spaced not more than 6 feet on center. A 6-inch wide trench is to be cut 6 inches deep at the toe of the fence on the uphill side to allow the fabric to be laid below the surface and back filled with gravel. Fabric shall have a 6-inch, double overlap securely fastened at a post at abutting ends, and shall be joined such that no leakage or bypass occurs. Remove accumulated sediment when the depth of sediment reaches 6 inches.

#### 3.05 ROCK CHECK DAM:

A. Rock Check Dams shall be constructed at locations shown on the plans and in swales as needed to reduce velocity in swales. Geotextile fabric as described in 2.1.C., Value I shall be placed beneath the rock and shall conform to these specifications. Rock shall conform to these specifications.

#### 3.06 DIVERSION DIKE:

A. Diversion dikes, if used by the Contractor, shall be installed prior to and maintained for the duration of construction and shall intercept no more than five (5) acres of runoff. Dikes shall have a minimum top width of 2'-0" and a minimum height Of Compacted fill of 18" measured from the top of the existing ground at the upslope toe to top of the dike and having side slopes of 3:1 or flatter. The channel which is formed by the dike must have a minimum slope of one (1) percent for the entire length to an outlet. When the slope exceeds three (3) percent, or velocities exceed one foot per second (regardless of slope), stone stabilization (Type "Am rip-rap) is required. Plant grass on dikes not requiring stone stabilization.

#### 3.07 STORM WATER POLLUTION PREVENTION PLAN (SWP3):

- A. The Contractor is required to prepare the SWP3 required for this project.
- 3.08 NOTICE OF INTENT (NOI), NOTICE OF TERMINATION (NOT):

- A. Contractor shall submit a Notice of Intent (NOI) at least 48 hours prior to the start of construction.
- B. Contractor shall submit a Notice of Termination (NOT) as required by the NPDES regulations.
- 3.09 At the close of this contract the Contractor shall remove the temporary erosion control devices when permanent facilities are in place.

END OF SECTION

## SECTION 02202 - EARTHWORK

#### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work of this section.

#### 1.02 DESCRIPTION OF WORK

- A. Clearing and Grubbing as required in order to perform earthwork as shown within contract drawings.
- B. Stripping 6" of existing topsoil, stockpiling on-site and re-spreading topsoil as directed by Owner's Representative
- D. Excavation and Fills to grades represented within drawings.
- E. Compaction of Embankments and Fills to specified densities.
- F. Definitions:

"Excavation" consists of removal of material encountered to subgrade elevations indicated and subsequent disposal of materials removed.

"Density" is referred to as a percentage of the ASTM D698. Standard Proctor Density

#### 1.03 QUALITY ASSURANCE

- A. Codes and Standards: Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.
- B. Testing and Inspection Service: At Contractor's expense, testing laboratory to perform soil testing and inspection service for quality control testing during earthwork operations. Testing laboratory to be selected by Owner.

#### 1.04 SUBMITTALS

- A. Test Reports: Submit following reports directly to Owner's Representative from the testing laboratory with a copy to the Owner.
  - 1. Test reports on borrow material (as applicable)
  - 2. Field density test reports.
  - 3. One optimum moisture-maximum density curve for each type of soil encountered.
- 4. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.
- B. Site Information: Data on indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil bearings. It is expressly understood that Owner will not be responsible for interpretations or conclusions drawn therefrom by Contractor. Data is made available for convenience of Contractor.
  - 1. Additional test borings and other exploratory operations may be made by Contractor at no cost to Owner.
- C. Existing Utilities: Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.
  - 1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult Utility Owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of Utility Owner.
  - 2. Do not interrupt existing utilities serving facilities occupied and used by Owner or others during occupied hours except when permitted in writing by Owner or Owner's Representative and then only after acceptable temporary utility services have been provided.

Provide a minimum of forty eight (48) hour notice to Owner and receive written notice to proceed before interrupting any utility.

- 3. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of services if lines are active.
- D. Use of Explosives: The use of explosives is not permitted.
- E. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.
  - 1. Operate warning lights as recommended by authorities having jurisdiction.
  - 2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
  - 3. Perform excavations within drip line of large trees to remain by hand and protect root system from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with burlap. Paint root cuts of 1" diameter and larger with emulsified asphalt tree paint.

# PART 2 - PRODUCTS

#### 2.01 SOIL MATERIALS

- A. Definitions:
  - 1. Satisfactory soil materials: are those complying with ASTM D2487 soil classification groups GW, GP, GM, SM, SW, and SP.
  - 2. Select Backfill : Satisfactory soil materials free of clay, rock, or gravel larger than 2" in any dimension, debris, waste, frozen materials, and other deleterious matter and having a PI < 25.

## PART 3 - EXECUTION

#### 3.01 EXCAVATION

- A. Excavation is Unclassified and includes excavation to subgrade elevations indicated regardless of character of materials and obstruction encountered.
- B. Unauthorized Excavation:
  - 1. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Owner's Representative. Unauthorized excavation, as well as remedial work directed by the Owner's Representative, shall be at Contractor's expense.
  - 2. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position when acceptable to Owner's Representative.
  - 3. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavation of same classification, unless otherwise directed by Owner's Representative.
- D. Additional Excavation:
  - 1. When excavation has reached required subgrade elevations, notify the Owner's Representative who will make an inspection of conditions.
  - 2. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by Owner's Representative.

- 3. Removal of unsuitable material and its replacement as directed will be paid per contract cost.
- 4. Stability of Excavations:
  - A. Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
  - B. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- E. Trench Safety Systems:

A trench shoring safety plan shall be required complying with latest OSHA standards for all trench excavations exceeding 5' in depth.

- F. Temporary Drainage / Dewatering:
  - 1. Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding property.
  - 2. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well pints, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavation.
  - 3. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavation to collecting or run-off areas. Do not use trench excavations as temporary drainage ditches.
- G. Material Storage:
  - 1. Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade, and shape stockpiles for proper drainage.
  - 2. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.
  - 3. Dispose of excess soil material at locations on site as directed by Owner's Representative.
- H. Cold Weather Protection: Protect excavation bottoms against freezing when atmosphere temperature is less than 35° F. (1° C.).

# 3.02 COMPACTION

- A. General: Control soil compaction during construction providing minimum percentage of density specified for each area classification indicated below.
- B. Percentage of Density Requirements:
  - 1. Structures, Building Slabs and Steps: in accordance with Structural Drawings. (as applicable)
  - 2. Roadways, parking areas, sidewalks or tracks: Compact subgrade and each layer of backfill or fill material at 95% standard Proctor ASTM D-698-91 at a moisture content of no more than 3% above optimum moisture for cohesive material or 95% maximum density for cohesionless material.
  - 3. Open areas, landscapes, sport fields: Compact subgrade and each layer of backfill or fill material at 90% standard Proctor ASTM D-698-91 at a moisture content of no more than 3% above optimum moisture for cohesive material or 90% maximum density for cohesionless material.
- C. Moisture Control:
  - 1. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material to prevent free water appearing on surface during or subsequent to compaction operations.
  - 2. Remove and replace or scarify and air dry soil material that is too wet to permit compaction to specified density.
  - 3. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture contact is reduced to a satisfactory value.

#### 3.03 BACKFILL AND FILL

A. Under grassed or open areas: Onsite excavated or borrow material free of: clay, rock or gravel larger than 2" in any dimension, site debris, frozen material and deleterious matter and vegetation.

- B. Under roadway, parking and sidewalk: Select backfill. In the event the excavated material or "cuts" do not meet the requirements of select backfill, Engineer shall determine suitability of onsite excavated material. Additional borrow material as required shall be paid for by owner.
- C. Under Buildings: (See Structural Drawings as applicable)
- D. Ground Surface Preparation:
  - 1. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.
  - 2. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture condition to optimum moisture content, and compact to required depth and percentage of maximum density.
- E. Placement and Compaction:
  - 1. Place backfill and fill materials in layers not more than 8" in loose depth for material compacted by heavy compaction equipment, and not more than 4" in loose depth for material compacted by hand operated tampers.
  - 2. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture contact. Compact each layer to required percentage of maximum density. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
  - 3. Place backfill and fill materials evenly adjacent to structures, piping, or conduit to required elevations. Take care to prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping or conduit to approximately same elevation in each lift.

#### 3.04 GRADING

A. General:

1. Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within 0.10' above or below required subgrade elevation.

2. Grade areas to prevent ponding

#### 3.05 FIELD QUALITY CONTROL

- A. Quality Control Testing During Construction: Allow and coordinate with testing service to inspect and approve subgrades and fill layers before further construction work is performed.
  - 1. Roadways, Parking Areas and Building Slab Subgrade: In each compacted fill layer, make at least one (1) field density test of subgrade for every 50,000 sq. ft. of paved area or building slab, but in no case less than three (3) tests.
  - All other areas: In each compacted fill layer, make at least one (1) field density test for every 75,000 sq. ft. of fill area, but in no case less than two (2) tests.
  - 3. In the event any field density test fail, subsequent density test within this area on this compacted fill layer shall be at the expense of the Contractor.

If in the opinion of the Owner's Representative based on testing labratory reports or inspection, subgrade or fills which have been placed that do not meet the requirements of this specification, Contractor shall provide additional compaction and testing at his expense.

#### 3.06 MAINTENANCE

- A. Protection of Graded Areas:
  - 1. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
  - 2. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- B. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.
- C. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn, or other finish), add backfill material, compact and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

## 3.07 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. Removal from Owner's Property: Remove waste materials, including unacceptable excavated material, trash and debris, and dispose of it off Owner's property.

END OF SECTION

## SECTION 02230-EXCAVATION

#### PART I - GENERAL

#### 1.01 GENERAL DESCRIPTION OF WORK

- A. This work shall consist of excavating and properly utilizing, or otherwise satisfactorily disposing of, all excavated materials, of whatever character, within the limits of work.
- B. Excavation shall also consist of constructing, compacting, shaping and finishing of all earthwork in designated areas on the plans, as specified herein, and in conformity with the required line grades and typical cross sections or as directed by the Engineer.
- C. When not otherwise included, this items shall include the work described in Section 2101 -<u>Preparation of Right of Way</u>, Section 2102 - <u>Clearing and Grubbing</u>, Section 2236 -<u>Embankment</u>, Section 2238 - <u>Removal of Concrete</u>, and Section 2210 - <u>Subgrade Preparation</u>.

## PART II - PRODUCTS

#### 2.01 CLASSIFICATION

A. All excavations shall be unclassified and shall include all materials encountered regardless of their nature or the manner in which they are removed.

## PART III - EXECUTION

- 3.01 CONSTRUCTION METHODS
  - A. Prior to commencing this work, all erosion control and tree protection measures required shall be in place and all utilities located and protected.
  - B. Construction equipment shall not be operated within the drip line of trees, unless otherwise indicted.
  - C. Construction materials shall not be stockpiles under the canopies of trees. No excavation or embankment shall be placed within the drip line of trees until tree wells are constructed.
  - D. All excavation shall be performed as specified herein and shall conform to the established alignment, grades and cross sections.
  - E. Suitable excavated materials shall be utilized, insofar as practical, in constructing required embankments.
  - F. The construction of all embankments shall conform to Section 2236 <u>Embankment</u>. No material shall be stockpiled within the banks of a waterway.
  - G. Unsuitable excavated materials or excavation in excess of that needed for construction shall be known as "Waste" and shall become the property of the Contractor. It shall become his sole responsibility to dispose of this material off the limits of the right of way in an environmentally sound manner at a permitted disposal site.
  - H. Adequate dewatering and drainage of excavation shall be maintained throughout the time

required to complete the work.

#### PART IV - MEASUREMENT AND PAYMENT

- 4.01 MEASUREMENT:
  - A. Measurement of the volume of excavation in cubic yards by the average end areas. Cross sectional areas shall be computed from existing ground section to the established line of the subgrade, as shown on typical sections for the limits of the right-of-way or other work limits, including parkway slopes and sidewalk areas.
  - B. Measurement of the area in square yards of surface area excavated as shown on the typical sections included in the plans.
  - C. Measurement of the volume of excavation is in cubic yards, based upon the average end areas taken from pre-construction cross sections and planned grades. The planned quantities for excavation will be used as the measurement for payment for this item.
- 4.02 PAYMENT:
  - A. This item will be paid for at the contract unit price bid for "Excavation," as provided under the measurement method as included in the bid, which price shall be full compensation for all work herein specified: including dewatering, drainage, subgrade preparation, unless otherwise indicated and the furnishing of all materials, equipment, tools, labor and incidentals necessary to complete the work.
  - B. When not listed as a separate contract pay item, excavation shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.
  - C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

END OF SECTION

## SECTION 02514 - CONCRETE FLATWORK, CURBS, & APPROACHES

#### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections apply to work of this section.

## 1.02 DESCRIPTION OF WORK

- A. Extent of portland cement concrete paving is shown on drawings including walks, curbs, and approaches.
- 1.03 QUALITY ASSURANCE
  - A. Codes and Standards: Comply with local governing regulations.

## 1.04 JOB CONDITIONS

- A. Traffic Control:
  - 1. Maintain access for vehicular and pedestrian traffic as required for other construction activities.
  - 2. Utilize barricades and warning signs as required.

#### PART 2 - PRODUCTS

#### 2.01 MATERIALS

- A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.
  - 1. Use flexible spring steel forms or laminated boards to form radius bends as required.
  - 2. Coat forms with a nonstaining form release agent that will not discolor or deface surface of concrete.
- B. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM A185. Furnish in flat sheets, not rolls, unless otherwise acceptable to Architect.
- C. Reinforcing Bars: Deformed steel bars ASTM A615, Grade 40.
- D. Fabricated Bar Mats: Welded or clip assembled steel bar or rod mats, ASTM A184. Use ASTM A615, Grade 40 steel bars, unless otherwise indicated.
- E. Joint Dowel Bars: Plain steel bars, ASTM A615, Grade 40. Cut bars true to length with ends square and free of burrs.

- F. Concrete Materials:
  - 1. Portland Cement: ASTM C 150, Type I
    - a. Use one brand cement throughout project, unless otherwise acceptable to Architect.
  - 2. Normal Weight Aggregates: ASTM C33, and as herein specified. Provide aggregates from a single source for exposed concrete.
    - a. For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling causing deleterious substances.
    - b. Local aggregates not complying with ASTM C33 but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to Architect.
- G. Expansion Joint Materials: Contractor shall use pre-formed expansion joint fillers and sealers.
- H. Liquid Membrane Forming Curing Compound: Complying with ASTM C309, Type I, Class A unless other type acceptable to Architect. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal.
  - 1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
  - 2. Products: Subject to compliance with requirements, provide one of the following:
    - a. "Masterseal", Master Builders
    - b. "Clear Seal", A.C. Horn
    - c. "Sure Cure", Kaufman Products, Inc.
    - d. "Sealkure", Toch Div. Carboline
    - e. "Kure-N-Seal", Sonneborn-Contech
    - f. "Sonocrete", Sonneborn-Contech
    - h. "L&M Cure", L&M Construction Chemicals
- I. Bonding Compound: Polyvinyl acetate or acrylic base, rewettable type.
  - 1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
  - 2. Products: Subject to compliance with requirements, provide one of the following:
    - a. "Weldcrete", Larsen Products
    - b. "Everbond", L&M Construction Chemicals
    - c. "Hornweld", A.C. Horn
    - d. "Sonocrete", Sonneborn-Contech

e. "Acrylic Bondcrete", The Burke Co.

#### 2.02 CONCRETE MIX, DESIGN, AND TESTING

- A. Design mix to product normal weight concrete consisting of portland cement, aggregate, and water to produce the following properties.
  - 1. Compressive Strength: 3000 psi, minimum at 28 days, unless otherwise indicated.
  - 2. Slump Range: 5" for concrete containing HRWR admixture (superplasticizer); 3" for other concrete.
  - 3. Air Content: 5% to 8%.

# PART 3 - EXECUTION

#### 3.01 SURFACE PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.
- B. Proof roll prepared subbase surface to check for unstable areas and need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.

## 3.02 FORM CONSTRUCTION

- A. Set forms to required grades and lines rigidly braced and secured. Install sufficient quantity of forms to allow continuous progress of work and so that forms can remain in place at least twenty four (24) hours after concrete placement.
- B. Check completed formwork for grade and alignment to following tolerances:
  - 1. Top of forms not more than 1/8" in 10'.
  - 2. Vertical face on longitudinal axis, not more than 1/4" in 10'.
- C. Clean forms after each use and coat with form release agent as often as required to ensure separation from concrete without damage.

#### 3.03 REINFORCEMENT

- A. Locate, place, and support reinforcement as specified in this section unless otherwise indicated on plans.
- B. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as herein specified.

- C. Avoiding cutting or puncturing vapor retarder during reinforcement placement and concreting operations.
- D. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.
- E. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by Engineer.
- F. Place reinforcement to obtain at least minimum coverage's for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- G. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

# 3.04 CONCRETE PLACEMENT

- A. General: Comply with requirements of Division 3 sections for mixing and placing concrete and as herein specified.
  - 1. Do not place concrete until subbase and forms have been checked for line and grade. Moisten subbase if required to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
  - Place concrete using methods which prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices.
  - 3. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
  - 4. Deposit and spread concrete in a continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2 hour, place a construction joint.
- B. Fabricated Bar Mats:
  - 1. Keep mats clean and free from excessive rust and handle units to keep them flat and free of distortions. Straighten bends, kinks, or other irregularities or replace units as required before placement. Set mats for a minimum 2" overlap to adjacent mats.

- 2. Place concrete in 2 operations; strike-off initial pour for entire width of placement and to the required depth below finish surface. Lay fabricated bar mats immediately in final position. Place top layer of concrete, strike-off and screed.
  - a. Remove and replace portions of bottom layer of concrete which has been placed more than 15 minutes without being covered by top layer or use bonding agent if acceptable to Architect.
- C. Curbs and Gutters: Automatic machine may be used for curb and gutter placement at Contractor's option. If machine placement is to be used, submit revised mix design and laboratory test results which meet or exceed minimums specified. Machine placement must produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete as specified.

## 3.05 JOINTS

- A. General: Construct expansion, weakened-plane (contraction), and construction joints true-to-line with face perpendicular to surface of concrete. Construct transverse joints at right angles to the center line unless otherwise indicated.
  - 1. When joining existing structures, place transverse joints to align with previously placed joints unless otherwise indicated.
- B. Weakened-Plane (Contraction) Joints: Provide weakened-plane (contraction) joints sectioning concrete into areas as shown on drawings. Construct weakened-plane joints for a depth equal to at least 1/4 concrete thickness as follows:
  - 1. Tooled Joints: Form weakened-plane joints in fresh concrete by grooving top portion with a recommended cutting tool and finishing edges with a jointer.
  - 2. Sawed Joints: (Contractor's Option) Form weakened-plane joints using powered saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into hardened concrete as soon as surface will not be torn, abraded, or otherwise damaged by cutting action.
- C. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for a period of more than 1/2 hour, except where such placements terminate at expansion joints.
  - 1. Construct joints as shown or, if not shown, use standard metal keywaysection forms.
  - 2. Where load transfer slip dowel devices are used, install so that one end of each dowel bar is free to move.
- D. Expansion Joints: Provide premolded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects, unless otherwise indicated.

- 1. Locate expansion joints at 50' o.c. for each pavement lane, unless otherwise indicated.
- 2. Extend joint fillers full width and depth of joint and not less than 1/2" or more than 1" below finished surface where joint sealer is indicated. If no joint sealer, place top of joint filler flush with finished concrete surface.
- 3. Furnish joint fillers in one piece lengths for full width being placed wherever possible where more than one length is required, lace or clip joint filler sections together.
- 4. Protect top edge of joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.
- E. Fillers and Sealants: Comply with requirements of applicable Division 7 sections for preparation of joints, materials, installation, and performance.

# 3.06 CONCRETE FINISHING

- A. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.
- B. After floating, test surface for trueness with a 10' straightedge. Distribute concrete as required to remove surface irregularities and refloat repaired areas to provide a continuous smooth finish.
- C. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool and round to 1/2" radius unless otherwise indicated. Eliminate tool marks on concrete surface.
- D. After completion of floating and troweling when excess moisture or surface sheen has disappeared, complete surface finishing as follows:
  - 1. Broom finish by drawing a fine hair broom across concrete surface perpendicular to the line of traffic. Repeat operation, if required, to provide a fine line texture acceptable to Architect.
  - 2. On inclined slab surfaces, provide a coarse, non-slip finish by scoring surface with a stiff bristled broom perpendicular to the line of traffic.
- E. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point up any minor honeycombed areas. Remove and replace areas or sections with major defects as directed by Architect.

#### 3.07 CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply in accordance with manufacturer's instructions after screeding and bull floating, but before power floating and troweling. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.

- B. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.
  - 1. Provide moisture curing by one of the following methods.
  - 2. Keep concrete surface continuously wet by covering with water.
  - 3. Use continuous water-fog spray.
  - 4. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet.
  - 5. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4-inch lap over adjacent absorptive covers.
  - 6. Provide moisture-cover curing as follows:
    - a. Cover concrete surfaces with moisture-retarding cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by water proof tape or adhesive.
    - b. Immediately repair any holes or tears during curing period using cover material and water proof tape.
    - c. Provide curing and sealing compound to exposed interior slabs and to exterior slabs, walks, and curbs as follows:
      - i. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen as disappeared).
      - ii. Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's directions.
      - iii. Recoat areas subjected to heavy rainfall within 3 hours after initial application.
      - iv. Maintain continuity of coating and repair damage during curing period.
      - v. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied to concrete.

# 3.08 REPAIRS AND PROTECTIONS

- A. Repair or replace broken or defective concrete as directed by Architect.
- B. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- C. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just prior to final inspection.

## END OF SECTION

# SECTION 02660-CONCRETE CURB AND GUTTER AND VALLEY GUTTER

#### PART 1 - GENERAL

- 1.01 GENERAL DESCRIPTION OF WORK:
  - A. This work shall consist of the construction of concrete curb, concrete curb and gutter, concrete gutter or valley gutter, or combination thereof in compliance with the specifications, lines, grades, and details shown on the plans, or as directed by the ENGINEER.

#### PART 2 - PRODUCTS

- 2.01 MATERIALS:
  - A. Concrete and manufactured curb and gutter materials shall be subject to inspection and tests at plants and construction sites for compliance with quality requirements.
  - B. Concrete curb and gutter or concrete valley gutter shall be constructed with concrete conforming to the provisions of Section 02614 <u>Portland Cement Concrete Paving</u>, or Class "B" concrete conforming to the requirements of Section 03300 <u>Cast-In-Place Concrete</u>.
  - C. Preformed expansion Joint Filler shall conform to the requirements of AASHTO M-33 or M-153.
  - D. Linseed Oil shall conform to the requirements of AASHTO D-260.
  - E. Mineral Spirits shall conform to the requirements of AASHTO D-235.

#### 2.02 FOUNDATION:

- A. Concrete curb and gutter or concrete valley gutter shall be placed on an approved foundation conforming to the requirements of the following City of Los Fresnos Specifications:
  - 1. Section 02210 Subgrade Preparation,
  - 2. Section 02260 Flexible Base,
  - 3. Section 0223 Roadway Excavation, Borrow, and Embankment.

#### PART 3 - EXECUTION

- 3.01 EXCAVATION:
  - A. When required, excavation shall be made to the specified depth, and the base upon which the curb and gutter or valley gutter is to be placed shall be compacted to a firm, even surface conforming to the requirements of Subsection 2.02 above.
  - B. All soft and unacceptable material shall be removed and replaced with material approved by the ENGINEER in conformance with the requirements of Subsection 2.02 above.

## 3.02 FORMS:

- A. Forms shall be of wood or metal, straight, free from warp, and of such construction that facilitates the inspection of the grade and alignment for compliance with the approved plans and specifications.
- B. All forms shall extend for the entire depth of the curb and gutter and shall be braced and secured sufficiently so that no deflection from alignment or grade will occur during the placement of the concrete. Flexible forms shall be used in curved sections so that the top surface of the forms will form a smooth, continuous arc.

## 3.03 MIXING AND PLACING:

- A. Concrete shall be proportioned, mixed, and placed in accordance with the requirements of Section 02614 and Section 03300.
- B. Compaction of the concrete placed in forms shall be by vibration or other acceptable methods.
- C. Unless otherwise provided, the exposed surfaces of curbs and gutters shall be finished by belting or with wooden floats. Forms shall be left in place until the concrete has set sufficiently so that they can be removed without injury to the curb and gutter.

#### 3.04 SECTIONS:

A. Curb and gutter shall be constructed in sections having a uniform length of 20 feet, unless otherwise directed by the ENGINEER. Except at expansion joints, sections shall be separated by open joints 1/8 inch wide.

#### 3.05 EXPANSION JOINTS:

- A. Expansion joints shall be formed at the intervals shown on the plans using a preformed expansion joints filler having a thickness of 3/4 inch.
- B. When the curb and gutter or concrete valley gutter is constructed adjacent to an existing concrete pavement, an expansion joint shall be located between the curb and gutter section and the existing concrete pavement.
- 3.06 CURING
  - A. Immediately upon completion of the finishing, the curb and gutter shall be moistened and kept moist for 3 days, or the curb and gutter shall be cured by the use of a membrane-forming material. The method and details of curing shall be subject to the approval of the ENGINEER.
- 3.07 SURFACE TREATMENT:

## CONCRETE CURB AND GUTTER AND VALLEY GUTTER 02660 - 3

A. The surface of concrete curb and gutter or concrete valley gutter shall be treated with a solution of Linseed Oil and Mineral Spirits in accordance with the applicable requirements of Section 03300 - <u>Cast-In-Place Concrete</u>.

# 3.08 BACKFILLING:

- A. After the concrete has set sufficiently, the spaces in front and behind the curb and gutter section shall be refilled to the required elevation with material approved by the ENGINEER, and shall be thoroughly tamped in layers of not more than 6 inches.
- 3.09 SLIP-FORM CONCRETE CURB, CONCRETE CURB AND GUTTER OR CONCRETE VALLEY GUTTER:
  - A. Any concrete curb or concrete curb and gutter, except on structures, may be placed using a slip form machine provided that the finished concrete curb or concrete curb and gutter is true to line and grade, the concrete is dense, and of the required surface texture.
  - B. The concrete shall be of a consistency that it will maintain the shape of the concrete curb or concrete curb and gutter section without support after slip forming.
  - C. The top and face of the finished concrete curb or concrete curb and gutter shall be true an straight and the top surface of the concrete curb or concrete curb and gutter shall be of uniform width and free from humps, sags, or other irregularities.
  - D. The forming portion of the slip form machine shall be readily adjustable vertically during the forward motion of the slip form machine to provide a variable height of concrete curb or concrete curb and gutter grade when necessary. A grade line gauge or pointer shall be attached to the slip form machine in such a manner that a continual comparison can be made between the concrete curb or concrete curb and gutter grade as indicated by the offset guidelines.
  - E. Concrete shall be fed to the slip form machine at a uniform rate. The slip form machine shall be operated under sufficient uniform restraint to forward motion to produce a well compacted mass of concrete free from surface pits larger than 3/16 inch in diameter and requiring no further finishing, other than light brushing with a wet brush. Finishing with a brush application of grout will not be permitted.
  - F. Transverse weakened planes and expansion joints shall be constructed at right angles to the line of the concrete curb, concrete curb and gutter, or concrete valley gutter.
  - G. Expansion joints may be constructed by sawing through the concrete curb or concrete curb and gutter section to its full depth. The width of the cut shall be such as to admit the joint filler with a snug fit.
  - H. The operations of sawing and inserting the joint filler shall be completed before curing the concrete. At the conclusion of the curing period the filler in each joint shall be checked for tightness of fit. Loose filler in any joint shall be mortared in place and cured.
  - I. Excavation shall be as per Subsection 3.02 above.
  - J. All remaining provisions of Subsection 2.02 above also apply, unless otherwise specified.

## PART 4 - MEASUREMENT AND PAYMENT

#### 4.01 MEASUREMENT:

- A. Curb and gutter, curb, and valley gutter shall be measured by the linear foot.
  - 1. Curb shall be measured along the front face of the section at the finished grade elevation.
  - 2. Combination curb and gutter will be measured along the face of the curb at the flowline of the gutter.
  - 3. Valley gutter will be measured along the flowline of the gutter.
- B. A deduction in length shall be made for drainage structures, such as catch basins or inlets, in the curb, gutter, or combination thereof.
- C. There will be no direct measurement or payment of materials used to construct curb and gutter, curb, or valley gutter.
- D. Excavation or construction of embankment for foundation of curb, valley gutter, or combination curb and gutter will not be measured for payment.
- 4.02 PAYMENT:
  - A. The accepted quantities of curb, valley gutter, and curb and gutter will be paid for at the contract unit bid price per linear foot for each kind and type specified, complete and in place.
  - B. Foundation preparation by excavating or constructing embankment to the required subgrade elevation is considered incidental to the completion of the work and no direct payment will be made thereof.
  - C. Compensation will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

\* \* \* END OF SECTION \* \* \*

#### SECTION 03300 - CONCRETE WORK

#### GENERAL

#### **RELATED DOCUMENTS:**

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.

#### SUMMARY

Extent of concrete work is shown on drawings.

#### SUBMITTALS

Product Data: Submit data for non-proprietary materials and items, including admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, and others as requested by Architect.

Shop Drawings; Reinforcement: Submit original shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACT 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

#### QUALITY ASSURANCE

Codes and Standards: Comply with provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:

ACT 301 "Specifications for Structural Concrete for Buildings".

ACT 318 "Building Code Requirements for Reinforced Concrete".

Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice".

Materials and installed work may require testing and retesting at anytime during progress of work. Retesting of rejected materials for installed work, shall be done at Contractor's expense.

#### PROJECT CONDITIONS

Protect adjacent finish materials against spatter during concrete placement.

#### PRODUCTS

#### FORM MATERIALS

Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.

Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.

Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.

Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

Provide ties which, when removed, will leave holes not larger than 1" diameter in concrete surface.

## REINFORCING MATERIALS

Reinforcing Bars: ASTM A 615, Grade 60 deformed.

Steel Wire: ASTM A 82, plain, cold-drawn steel.

Welded Wire Fabric: ASTM A 185, welded steel wire fabric.

Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications.

For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs. Brick scrap is acceptable.

#### CONCRETE MATERIALS

Portland Cement: ASTM C 150, Type I, "Alamo Cement" or equal. Use one brand of cement throughout project, unless otherwise acceptable to Architect.

Normal Weight Aggregates: ASTM C 33, and as herein specified. Provide aggregates from a single source for exposed concrete.

For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling-causing deleterious substances.

Local aggregates not complying with ASTM C 33 but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to Architect.

Water: Drinkable.

Water-reducing Admixture: ASTM C 194, Type A, and containing not more than 0.1 percent chloride ions.

Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

"WRDA Hycol"; W.R. Grace.

"PSI N"; Gifford-Hill/American Admixtures "Eucon WR-75"; Euclid Chemical Co. "Pozzolith Normal"; Master Builders. "Plastocrete 160"; Sika Chemical Corp. "Chemtard"; Chem-Masters Corp. "Pro-Kete-N"; Protex Industries, Inc.

Water-Reducing, Non-Chloride Accelerator Admixture: ASTM C 494, Type E, and containing not more than 0.1 percent chloride ions.

Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

"Accelguard 80"; Euclid Chemical Co. "Pozzolith High Early"; Master Builders. "Gilco Accelerator"; Gifford-Hill/America Admixtures

Water-Reducing, Retarding Admixture: ASTM C 494, Type D, and containing not more than 0.1 percent chloride ions.

Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

"Edoco 20006"; Edoco Technical Products. "Pozzolith Retarder"; Master Builders. "Eucon Retarder 75"; Euclid Chemical Co. "Daratard"; W.R. Grace. "PSI R"; Gifford-Hill/American Admixtures. "Plastiment"; Sika Chemical Co. "Protard"; Protex Industries, Inc.

Prohibited Admixtures: Calcium chloride thyocyanates or admixtures containing more than 0.1 percent chlorine ions are not permitted.

#### RELATED MATERIALS

Vapor Retarder: Provide vapor retarder cover over prepared base material where indicated below slabs on grade. Use only materials which are resistant to decay when tested in accordance with ASTM E 154, as follows:

Polyethylene sheet not less than 10 mils thick.

Liquid Membrane-Forming Curing Compound: Liquid type membrane-forming curing compound complying with ASTM C 309. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq ft./gal.

Products: Provide the following:

"Sonosil': Sonneborn.

Bonding Compound: Polyvinyl acetate or acrylic base.

Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

Polyvinyl Acetate (Interior Only):

"Euco Weld"; Euclid Chemical Co. "Weldcrete"; Larsen Products Corp.

Acrylic or Styrene Butadiene:

"J-40 Bonding Agent"; Dayton Superior Corp. "Everbond"; L & M Construction Chemicals. "Hornweld': A.C. Horn, Inc. "Sonocrete"; Sonneborn-Rexnord. "Acrylic Bondcrete"; The Burke Co. "SBR Latex"; Euclid Chemical Co. "Daraweld C"; W.R. Grace

#### PROPORTIONING AND DESIGN OF MIXES:

Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACT 301. If trial batch method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.

Submit written reports to Architect and Structural Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect.

Design mixes to provide normal weight concrete with the following properties, as indicated on drawings and schedules:

3000 psi 28-day compressive strength; W/C ratio, 0.58 maximum (non-airentrained), 0.46 maximum (air-entrained). For structural slabs.

Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.

Admixtures:

Use water-reducing admixture in concrete as required for placement and workability.

Use non-chloride accelerating admixture in concrete slabs placed at ambient temperatures below 50 deg F (10 deg C).

Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:

Ramps, slabs, and sloping surfaces: Not more than 5".

Reinforced foundation systems: Not less than 3" and not more than 5".

Other concrete: Not less than 3" nor more than 5".

#### CONCRETE MIXING

Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified.

During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.

# EXECUTION

#### GENERAL:

Coordinate the installation of joint materials and vapor retarders with placement of forms and reinforcing steel.

#### FORMS:

Design, erect, support, brace, and maintain formwork to support vertical and lateral, static and dynamic loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances complying with ACT 347.

Design formwork to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent materials.

Construct forms to sizes, shapes, lines, and dimensions shown, and to obtain accurate alignment, location, grades level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorage insets, and other features required in work. Use selected materials to obtain required finishes. Solidly but joints and provide back-up at joints to prevent leakage of cement paste.

Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.

Provide temporary openings where interior of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.

Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

Provisions for Other Trades: Provide openings is concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.

Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before concrete is placed. Retightening forms and bracing after concrete placement is required to eliminate mortar leaks and maintain proper alignment.

#### VAPOR RETARDER INSTALLATION

Following leveling, tamping, and termite treatment of granular base for slabs on grade, place vapor retarder sheeting with longest dimension parallel with direction of pour.

Lap joints 6" and seal with appropriate tape.

#### PLACING REINFORCEMENT

Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.

Avoid cutting or puncturing vapor retarder during reinforcement placement and concreting operations.

Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.

Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.

Place reinforcement to obtain at least minimum coverages for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

#### JOINTS:

Construction Joints: Locate and install construction joints as indicated or, if not indicated, located so as not to impair strength and appearance of the structure, as acceptable to Architect.

Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints, except as otherwise indicated.

#### INSTALLATION OF EMBEDDED ITEMS

General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.

Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.

#### PREPARATION OF FORM SURFACES

Clean re-used forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.

Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.

Thin form-coating compounds only with thinning agent of type, amount, and under conditions of formcoating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

Coat steel forms with, if used, a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

#### CONCRETE PLACEMENT

Replacement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or casting. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.

Apply temporary protective covering to lower 2' of finished walls adjacent to poured floor slabs and similar conditions, and guard against spattering during placement.

General: Comply with ACT 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete", and as herein specified.

Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.

Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACT 309.

Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly space locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.

Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.

Bring slab surfaces to correct level within straightedge and strike off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

Maintain reinforcing in proper position during concrete placement operations.

Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACT 306 and as herein specified.

When air temperature has fallen to or is expected to fall below 40 deg F (4deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C), and not more than 80 deg F (27 deg C) at point of placement.

Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix design.

Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACT 305 and as herein specified.

Cool ingredients before mixing to maintain concrete temperature at time of placement below 95° deg F (32 deg C). Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.

Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.

Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.

Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions.

#### FINISH OF FORMED SURFACES

Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with the holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off.

#### MONOLITHIC SLAB FINISHES:

Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo, and other bonded applied cementitious finish flooring material, and as otherwise indicated.

After placing slabs, plane surface to tolerances for floor flatness (F) of 25 and floor levelness (F1) of 20. Slope surfaces uniformly to drains where requires. After leveling, roughen surface before final set, with stiff brushes, brooms, or rakes.

Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo, and as otherwise indicated.

After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Check and level surface plane to tolerances of F 18 - F 15. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin firm finish coating system.

After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface procedures a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances of F 20 - F 25. Grind smooth surface defects which would telegraph through applied floor covering system.

Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.

Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

Immediately after float finishing, slightly roughen concrete surface by brooming with fiber bristly broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

#### CONCRETE CURING AND PROTECTION

General: Protect freshly placed concrete from premature drying and excessive cold or hot temperature.

Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing.

Provide curing and sealing compound to exposed interior slabs and to exterior slabs, walks, and curbs, as follows:

Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in

accordance with manufacturer's directions. Recoat areas subjected to heave rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.

Sealer and Dustproofer: Apply a second coat of specified curing and sealing compound only to surfaces given a first coat.

#### REMOVAL OF FORMS

Formwork not supporting weight of concrete, such as sides of beams and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.

## **RE-USE OF FORMS**

Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated, or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.

When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Architect.

#### MISCELLANEOUS CONCRETE ITEMS

Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.

#### CONCRETE SURFACE REPAIRS:

Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect.

Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

For exposed-to-view surfaces blend white portland cement and standard portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

Repair of Formed Surfaces: Removed and replaced concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.

Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.

Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness using a template having required slope.

Correct high area in unformed surfaces by grinding, after concrete has cured at least 4 days.

Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect.

Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part portland cement to 2-1/2" parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

Perform structural repairs with prior approval of Architect or Structural Engineer for method and procedure, using specified epoxy adhesive and mortar.

Repair methods not specified above may be used, subject to acceptance of Architect.

#### QUALITY CONTROL TESTING DURING CONSTRUCTION

The Contractor will employ a testing laboratory to perform test and to submit test reports.

Sampling and testing for quality control during placement of concrete shall include the following, as directed by Architect.

Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.

Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.

Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure method for normal weight concrete; one for each day's pour of each type of airentrained concrete.

Concrete Temperature: Test hourly when air temperature is 40 deg F (4 deg C) and below, and when 80 deg F (27 deg C) and above; and each time a set of compression test specimens are required.

Compression Test Specimen: ASTM C 31, one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.

Compressive Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu yds. plus additional sets for each 50 cu yds. over and above the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required. When frequency of testing will provide less than 5 strength test for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.

When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.

Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.

Test results will be reported in writing to Architect, Structural Engineer, and Contractor within 24 hours after tests. Reports of compressive strength test shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.

Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.

See Structural Plans for additional requirements.

END OF SECTION 03300

# **Geotechnical Engineering Report**

# FMCSA Buildings - Hidalgo LPOE

# Hidalgo, Texas

June 30, 2017 Terracon Project No. 88175111

# **Prepared for:**

City of McAllen McAllen, TX

# Prepared by:

Terracon Consultants, Inc. Pharr, TX


June 30, 2017



City of McAllen Engineering Department 1300 Houston Avenue McAllen, Texas 78501

- Attn: Mr. Zef Mendoza
  - P: (956) 681-1155
  - E: <u>zmendoza@mcallen.net</u>
- Re: Geotechnical Engineering Report FMCSA Buildings – Hidalgo Land Port of Entry (LPOE) Hidalgo, Texas Terracon Project Number: 88175111

Dear Mr. Mendoza:

Terracon Consultants, Inc. (Terracon) is pleased to submit this Geotechnical Engineering Report for the project referenced above in Hidalgo, Texas. We trust that this report is responsive to your project needs.

We appreciate the opportunity to work with you on this project and look forward to providing Materials Testing services in the future. Please contact us if you have any questions or if we can be of further assistance.

Sincerely,

**Terracon Consultants, Inc.** (Firm Registration: TX F-3272)

Stephany Chacón, E.I.T. Staff Engineer



Alfonso A. Soto, P.E., D.GE. Principal

Copies To: Addressee: (1) Electronic

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Facilities

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Geotechnical

				Page			
EXE		SUMM	AKY	اا			
1.0		ODUCI		1			
2.0	PRO			1			
	2.1	Projec		1			
	2.2	Site L	ocation and Description	2			
3.0	SUB	SURFAC	E CONDITIONS	2			
	3.1	Geolo	gy	2			
	3.2	l ypica	al Profile	3			
	3.3	Groun					
4.0	REC	OMMEN	DATIONS FOR DESIGN AND CONSTRUCTION	4			
	4.1	Geote	chnical Considerations	4			
	4.2	Earth	vork	4			
		4.2.1	Site Preparation	5			
		4.2.2	Material Requirements	5			
		4.2.3	Compaction Requirements	6			
		4.2.4	Wet Weather/Soft Subgrade Considerations	7			
		4.2.5	Grading and Drainage	7			
		4.2.6	Earthwork Construction Considerations	7			
	4.3	Found	lations	8			
		4.3.1	Design Recommendations – Slab-on-grade Foundation System	8			
		4.3.2	Design Recommendations – Strip / Spread Footing Foundation Sys	tem10			
		4.3.3	Drilled Pier Foundation	12			
		4.3.4	Canopy Structure	16			
		4.3.5	Foundation Construction Monitoring	17			
	4.4	4.4 Floor Slab					
		4.4.1	Floor Slab Design Recommendations	17			
	4.5	Latera	al Earth Pressures - Inspection Pits	18			
	4.6	Seismic Considerations					
	4.7	Paver	nents	21			
		4.7.1	Subgrade Preparation	21			
		4.6.2	Design Considerations	22			
		4.6.3	Estimated Minimum Pavement Thickness	23			
		4.6.4	Pavement Drainage	27			
		4.6.5	Pavement Maintenance	27			
5.0	GEN	ERAL C	OMMENTS	28			

### TABLE OF CONTENTS

### **TABLE OF CONTENTS (continued)**

#### TABLES

Table 1Lateral and Axial Capacity Analyses - Design Soil Parameters for<br/>Undrained Conditions

### **APPENDIX A – FIELD EXPLORATION**

Exhibit A-1	Site Location Plan
Exhibit A-2	Boring Location Plan
Exhibit A-3	Field Exploration Description
Exhibits A-4 and A-5	Boring Logs

### **APPENDIX B – SUPPORTING INFORMATION**

Exhibit B-1 Laboratory Testing

### **APPENDIX C – SUPPORTING DOCUMENTS**

Exhibit C-1	General Notes
Exhibit C-2	Unified Soil Classification System



# EXECUTIVE SUMMARY

A geotechnical exploration was performed for Gensler under Terracon project No. 88145016A and a preliminary geotechnical engineering report was submitted on March 15, 2014 for the proposed FMCSA Buildings to be located within the Hidalgo LPOE in Hidalgo, Texas. Two (2) borings, designated B-1 and B-2, were performed to depths of approximately 25 feet below existing grade within the proposed development area.

Based on the information obtained from our subsurface exploration, the site can be developed for the proposed project. A summary of our findings and recommendations are provided below:

- Groundwater was not observed in the borings during drilling (borings were drilled on February 21, 2014).
- The subsurface soils at this site generally consist of Lean Clay (CL) with Fat Clay (CH) and Clayey Sand (SC) seams underlain by Silty Sand (SM).
- A shallow or deep foundation system would be appropriate to support the structural loads of the proposed structures, provided the structure areas are prepared as recommended in this report.
- The existing Potential Vertical Rise (PVR) of the soils within the proposed buildings and canopy areas in present condition is about 1 to 1½ inches. However, this value may be higher if water is allowed to infiltrate beneath the structures.
- The subsurface conditions within the site are consistent with the characteristics of Site Class D as defined in the International Building Code (IBC) Site Classification.
- Flexible and rigid pavement systems may be considered for this project.
- Close monitoring of the construction operations discussed herein will be critical in achieving the design subgrade support. We therefore recommend that Terracon be retained to monitor this portion of the work.

This summary should be used in conjunction with the entire report for design purposes. It should be recognized that details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. The section titled **GENERAL COMMENTS** should be read for an understanding of the report limitations.

# GEOTECHNICAL ENGINEERING REPORT FMCSA BUILDINGS - HIDALGO LPOE HIDALGO, TEXAS Terracon Project No. 88175111 June 30, 2017

# **1.0 INTRODUCTION**

Terracon Consultants, Inc. (Terracon) is pleased to submit this geotechnical engineering report for the proposed FMCSA Buildings to be located within the Hidalgo LPOE in Hidalgo, Texas. This project was authorized by Mr. Zef Mendoza with City of McAllen through issuance of Purchase Oder No. PO00102421 dated June 23, 2017. The project scope was performed in general accordance with Terracon Proposal No. P88175111 dated June 23, 2017.

Terracon performed geotechnical engineering services for this project for Gensler and submitted a preliminary geotechnical engineering report (88145016A) on March 5, 2014. The original geotechnical engineering data was used to develop this report. No additional borings or laboratory testing were performed. This report supersedes the previous report for this project.

The purpose of this geotechnical engineering report is to describe the subsurface conditions observed at the test borings drilled for this project, analyze and evaluate the test data, and provide recommendations with respect to:

- subsurface soil conditions
- groundwater conditions
- earthwork
- foundation design and construction
- floor slab design and construction
- seismic considerations
- pavements
- lateral earth pressures

# 2.0 **PROJECT INFORMATION**

### 2.1 Project Description

ltem	Description	
Site layout	See Appendix A, Exhibit A-2: Boring Location Plan	

#### Geotechnical Engineering Report





ltem	Description		
	The project will include the construction of the following:		
	<ul> <li>Admin Building – 1,800 sf</li> </ul>		
Structure / Pavements	<ul> <li>Restrooms - 390 sf</li> </ul>		
Structure / Pavements	<ul> <li>Passenger waiting area Canopy – 600 sf</li> </ul>		
	<ul> <li>Inspection Pit – 1,920 sf</li> </ul>		
	Associated parking areas		
Construction Type	The buildings are expected to be single-story pre-engineered metal structure with brick veneer exterior walls supported by a shallow or deep foundation system.		
	Admin. Building, restrooms and passengers waiting area canopy:		
Finished Floor Elevation (FFE)	El. 109.0 feet.		
	Inspection pit: El. 97.0 feet.		
Grading	Proposed grading was not available at the time of this report.		

### 2.2 Site Location and Description

Item	Description			
Location	The project site is located within the grounds of the existing Hidalgo land Port of Entry (LPOE) in Hidalgo, Texas.			
	Latitude: 26.09752°, Longitude: -98.26889°			
Existing Improvements	Existing pavements and sidewalks.			
Current Ground Cover	The site is vacant and covered with existing pavements and native grasses.			
Existing Topography	Elevations unknown; relatively flat and level.			

# 3.0 SUBSURFACE CONDITIONS

### 3.1 Geology

Based on the Geologic Atlas of Texas, McAllen – Brownsville prepared by The University of Texas, the site is located on the Alluvium Formation of the Holocene (Recent) Period of the Quaternary Age. Floodplain deposits, lower course of Rio Grande, are divided into areas dominantly mud, Qam, and areas dominantly silt and sand, Qas. All other areas are alluvium undivided, Qal, except for some areas where tidal flat areas are mapped.

The soils are mostly composed of clay, silt, sand, gravel and organic matter. The silt and sand are described as calcareous and dark gray to dark brown in color. The sand is mostly quartz



and the gravel along Rio Grande include sedimentary rocks from the Cretaceous and Tertiary and a wide variety of igneous and sedimentary rocks from Trans-Pecos Texas, Mexico, and New Mexico including agate. The gravel in side streams of the Rio Grande is mostly Tertiary rocks and chert derived from Uvalde Gravel which caps divide.

### 3.2 Typical Profile

Conditions encountered at each boring locations are indicated on the individual boring logs. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in-situ, the transition between materials may be gradual. Details for each of the borings can be found on the boring logs in Exhibits A-4 and A-5 of Appendix A.

Based on the results of the borings, subsurface conditions on the project site can be generalized as shown in the following table;

Description	Depth (ft)	Plasticity Index	In-situ Moisture Content	Moisture content vs. Plastic limit <sup>1</sup> (%)		SPT N-Value <sup>2</sup>	Fines <sup>3</sup> (%)
		(%)	(%)	Dry	Wet	(tqd)	
Asphalt and Base Material	0 – 1	_	_	_	_	_	-
Lean Clay (CL) <sup>4</sup>	1 – 15	13 – 42	18 – 30	3	4 – 12	5 – 16	71 – 79
Silty Sand (SM)	12 – 25	_	6 – 21	_	_	8 – 41	-

<sup>1</sup> The difference between a soil sample's in-situ moisture content and its corresponding plastic limit.

<sup>2.</sup> bpf = blows per foot.

<sup>3.</sup> Percent passing the No. 200 sieve.

<sup>4.</sup> With Fat Clay (CH) and Clayey Sand (SC) seams.

### 3.3 Groundwater

The borings were advanced using dry drilling techniques to the termination depths of the borings (about 25 feet below existing grade) in an effort to evaluate groundwater conditions at the time of our field program. Groundwater was not observed in the borings during or upon completion of drilling. These groundwater measurements are considered short-term, since the borings were open for a short time period. On a long-term basis, groundwater may be present within the explored depths. Additionally, groundwater will fluctuate seasonally with weather changes and should be evaluated just prior to construction.

The Silty Sand (SM) soils may transmit water easily during rainfall seasons. Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. The possibility of groundwater level



fluctuations should be considered when developing the design and construction plans for the project. The boreholes were backfilled with cuttings and patched with an asphalt cold mix.

# 4.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

### 4.1 Geotechnical Considerations

Borings for the proposed development encountered lean clay with interbedded fat clay and clayey sand underlain by silty sand. The lean clay will form the subgrade for the proposed foundation and pavements. Our findings indicate the proposed structures (buildings and canopy) can be supported on a shallow or deep foundation system bearing on the native soils.

The suitability and performance of a soil supported foundation for a structure depends on many factors including the magnitude of soil movement expected, the type of structure, the intended use of the structure, the construction methods available to stabilize the soils, and our understanding of the owner's expectations of the completed structure's performance.

This report provides recommendations to help mitigate the effects of soil settlement, shrinkage and expansion. However, even if these procedures are followed, some movement and at least minor cracking in the structure should be anticipated. Eliminating the risk of movement and cosmetic distress may not be feasible, but it may be possible to further reduce the risk of movement if significantly more expensive measures are used during construction. We would be pleased to discuss other construction alternatives that could further reduce the potential for movement with you upon request.

Recommendations to minimize excessive movements and to improve the soils strength and load carrying capacity are discussed in the **"4.2 Earthwork"**.

Geotechnical engineering recommendations for foundation systems and other earth connected phases of the project are outlined below. The recommendations contained in this report are based upon the results of data presented herein, engineering analyses, and our current understanding of the proposed project.

### 4.2 Earthwork

We recognize the uncertainty of knowing what will be encountered during site excavation as a result of the previous structures or underground construction. All existing above and below grade structures including footings, slabs and grade beams, and utilities should be removed during the demolition of the existing structure. Any debris or utilities that are present within recommended cut or fill zones must be removed. If these elements are below any cut/fill, they may remain in place provided they do not interfere with the pipelines. However, if the utility is a



sewer line, we recommend that it be filled with a cementitious grout material as part of the abandonment.

The following presents recommendations for site preparation, excavation, subgrade preparation and placement of engineered fills on the project. The recommendations presented for design and construction of earth supported elements including foundations, and slabs are contingent upon following the recommendations outlined in this section.

Earthwork on the project should be observed and evaluated by Terracon. The evaluation of earthwork should include observation and testing of engineered fill, subgrade preparation, foundation bearing soils, and other geotechnical conditions exposed during the construction of the project.

### 4.2.1 Site Preparation

We anticipate construction will be initiated by stripping vegetation, existing pavements, construction debris (if any), or other unsuitable materials. Stripped materials consisting of vegetation and organic materials should be wasted off site or used for landscaped areas.

Once final subgrade elevations have been achieved, the exposed subgrade should be carefully proofrolled with a 15-ton pneumatic roller or a fully loaded dump truck to detect weak zones in the subgrade. A geotechnical engineer or his representative should observe proofrolling to aid in locating unstable subgrade materials.

Proofrolling should be performed after a suitable period of dry weather to avoid degrading an otherwise acceptable subgrade and to reduce the amount of undercutting / remedial work required. Unstable materials located should be stabilized as directed by the engineer based on conditions observed during construction. Undercut and replacement and densification in place are typical remediation methods.

Subsequent to proofrolling, and just prior to placement of fill, the exposed subgrade within the construction area should be evaluated for moisture and density. If the moisture, density, and/or the requirements do not meet the criteria described in the table below, the subgrade should be scarified to a minimum depth of 8 inches, moisture adjusted and compacted to at least 95 percent of the Standard Effort (ASTM D 698) maximum dry density.

### 4.2.2 Material Requirements

Engineered fill should consist of approved materials, free of organic material, debris and particles larger than about 2 inches. The maximum particle size criteria may be relaxed by the geotechnical engineer of record depending on construction techniques, material gradation, allowable lift thickness and observations during fill placement. Soils for use as engineered fill material should conform to the following specifications:

#### Geotechnical Engineering Report



FMCSA Buildings - Hidalgo LPOE - Hidalgo, Texas June 30, 2017 - Terracon Project No. 88175111

Fill Type <sup>1</sup>	USCS Classification	Acceptable Location for Placement	
Aggregate Base Course <sup>2</sup>	SC, GC, Caliche, Crushed Limestone, Crushed Concrete	Top 6 inches of building pad (if needed).	
Select Fill	CL and/or SC (7≤PI≤20)	Must be used to construct the building pad and all grade adjustments within the structure area.	
On-Site Soils	CL	May be suitable for use as fill within the structure and pavement areas as long as they are free from organics and debris and have a PI between 7 and 20.	

- Prior to any filling operations, samples of the proposed borrow and on-site materials should be obtained for laboratory moisture-density testing. The tests will provide a basis for evaluation of fill compaction by inplace density testing. A qualified soil technician should perform sufficient in-place density tests during the filling operations to evaluate that proper levels of compaction, including dry unit weight and moisture content, are being attained.
- 2. Crushed limestone and crushed concrete material should meet the requirements of 2014 TxDOT Item 247, Type A, or D, Grades 1 through 3. The select fill materials should be free of organic material and debris, and should not contain stones larger than 2 inches in the maximum dimension. The clayey gravel and caliche materials should meet the gradation requirements of Item 247, Type B, Grades 1 through 3 as specified in the 2014 TxDOT Standard Specifications Manual and a Plasticity Index between 7 and 20.

### 4.2.3 Compaction Requirements

Recommended compaction and moisture content criteria for engineered fill materials are as follows:

Item	Description
Fill Lift Thickness	All fill should be placed in thin; loose lifts of about 8 inches, with compacted thickness not exceeding 6 inches.
Compaction Requirements (on-site soils, subgrade, select fill and aggregate base course)	The select fill should be compacted to at least 95 percent of the Standard Effort (ASTM D698) maximum dry density within 2 percentage points of the optimum moisture content.

- 1. Where light compaction equipment is used, as is customary within a few feet of retaining walls and in utility trenches, the lift thickness may need to be reduced to achieve the desired degree of compaction. Soils removed which will be used as engineered fill should be protected to aid in preventing an increase in moisture content due to rain.
- 2. We recommend that engineered fill be tested for moisture content and compaction during placement. Should the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified moisture and compaction requirements are achieved.
- 3. Specifically, moisture levels should be maintained low enough to allow for satisfactory compaction to be achieved without pumping when proofrolled.



### 4.2.4 Wet Weather/Soft Subgrade Considerations

Construction operations may encounter difficulties due to the wet or soft surface soils becoming a general hindrance to equipment due to rutting and pumping of the soil surface, especially during and soon after periods of wet weather. If the subgrade cannot be adequately compacted to minimum densities as described above, one of the following measures will be required: 1) removal and replacement with select fill, 2) chemical treatment of the soil to dry and increase the stability of the subgrade, or 3) drying by natural means if the schedule allows. In our experience with similar soils in this area, chemical treatment is the most efficient and effective method to increase the supporting value of wet and weak subgrade. Terracon should be contacted for additional recommendations if chemical treatment of the soils is needed.

Prior to placing any fill, all vegetation, topsoil, possible fill material and any otherwise unsuitable materials should be removed from the construction area. Wet or dry material should either be removed or moisture conditioned and recompacted. After stripping and grubbing, the subgrade should be proof-rolled where possible to aid in locating loose or soft areas. Proof-rolling can be performed with a 15-ton roller or fully loaded dump truck. Soft, dry and low-density soil should be removed or compacted in place prior to placing fill.

### 4.2.5 Grading and Drainage

Positive drainage should be provided during construction and maintained throughout the life of the development. Infiltration of water into utility trenches or foundation excavations should be prevented during construction. Planters and other surface features which could retain water in areas adjacent to the building should be sealed or eliminated. In areas where sidewalks or paving do not immediately adjoin the structure, we recommend that protective slopes be provided with a minimum grade of approximately 3 percent for at least 10 feet from perimeter walls, except in areas where ADA ramps are required, these areas should comply with state and local regulations. Backfill against exterior walls, and in utility and sprinkler line trenches, should be well compacted and free of all construction debris to reduce the possibility of moisture infiltration. Downspouts, roof drains or scuppers should discharge into extensions when the ground surface beneath such features is not protected by exterior slabs or paving. Consideration should be given to extending drainage piping to day light at the face of curbs then empty onto pavement surfaces. Sprinkler systems should not be installed within 5 feet of foundation walls. Landscaped irrigation adjacent to the foundation systems should be minimized or eliminated.

### 4.2.6 Earthwork Construction Considerations

It is anticipated that excavations for the proposed construction can be accomplished with typical earthmoving equipment. Upon completion of filling and grading, care should be taken to maintain the subgrade moisture content prior to construction of floor slab. Construction traffic



over the completed subgrade should be avoided to the extent practical. The site should also be graded to prevent ponding of surface water on the prepared subgrade or in excavations.

If the subgrade should become desiccated, saturated, or disturbed, the affected material should be removed or these materials should be scarified, moisture conditioned, and recompacted prior to floor slab construction and observed by Terracon.

Surface water should not be allowed to pond on the site and soak into the soil during construction. Construction staging should provide drainage of surface water and precipitation away from the structure area. Any water that collects over or adjacent to construction area should be promptly removed, along with any softened or disturbed soils. Surface water control in the form of sloping surfaces, drainage ditches and trenches, and sump pits and pumps will be important to avoid ponding and associated delays due to precipitation and seepage.

All excavations should be sloped or braced as required by OSHA regulations to provide stability and safe working conditions. Temporary excavations will probably be required during grading operations. The grading contractor, by his contract, is usually responsible for designing and constructing stable, temporary excavations and should shore, slope or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. All excavations should comply with applicable local, state and federal safety regulations, including the current Occupational Health and Safety Administration (OSHA) Excavation and Trench Safety Standards.

Construction site safety is the sole responsibility of the contractor who controls the means, methods and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean that Terracon is assuming any responsibility for construction site safety or the contractor's activities; such responsibility shall neither be implied nor inferred.

### 4.3 Foundations

Design recommendations for slab-on-grade, strip/spread footings and drilled pier foundation systems for the proposed buildings and canopy structures are presented in the following paragraphs.

### 4.3.1 Design Recommendations – Slab-on-grade Foundation System

The foundation design parameters presented below are based on our evaluation using published theoretical and empirical design methods.



These were developed based on our understanding of the proposed project, our interpretation of the information and data collected as a part of this study, our area experience and the results of our evaluation. The structural engineer should select the appropriate slab design method and code for the amount of anticipated slab movement indicated.

The slab-on-grade foundation may be designed using the following parameters provided the subgrade is prepared as outlined in the "4.2 Earthwork" and "4.4.1 Design Recommendations" sections of this report:

Description	Design Parameters	
Select Fill Pad	Minimum 1½ feet of select fill over 6 inches of moisture conditioned and compacted on-site soils.	
Allowable Bearing Pressure <sup>1</sup>	Net Total Load 2 500 pat	
Compacted select fill	ivet i otal Load - 2,500 pst	
Climatic Rating	15	
Design Plasticity Index	30	
Soil Support Index	0.84	
Estimated PVR <sup>2</sup>	About 1 inch	
Approximate total settlement <sup>3</sup>	About 1 inch	
Estimated differential settlement <sup>3</sup>	Approximately 1/2 of total settlement	
Min. perimeter grade beam embedment <sup>4</sup>	24 inches below finished grade	

1. The net allowable bearing pressure provided above include a factor of safety of at least 2.

2. The slab-on-grade foundation system should be designed to tolerate the anticipated soil movement and provide satisfactory support to the proposed structures. The foundation should have adequate exterior and interior grade beams to provide sufficient rigidity to the foundation system such that the slab deflections that result are considered tolerable to the supported structures.

- 3. This estimated post-construction settlement is assuming proper construction practices are followed.
- 4. To bear within the select fill or moisture conditioned and recompacted on-site soils. The grade beams may be thickened and widened where necessary to support column loads.

### 4.3.1.1 Slab-on-grade Foundation Construction Considerations

Excavations for grade beams should be performed with equipment capable of providing a relatively clean bearing area. The bottom 6 inches of the excavations should be completed with a smooth-mouthed bucket or by hand labor. The excavations should be neatly excavated and properly formed. Debris in the bottom of the excavation should be removed prior to reinforcing steel placement. Water should not be allowed to accumulate at the bottom of the excavation.

To reduce the potential for groundwater seepage into the excavations and to minimize disturbance to the bearing area, we recommend that concrete and reinforcing steel be placed as soon as possible after the excavations are completed. Excavations should not be left open for



more than 36 hours. The bearing surface of the grade beams should be evaluated after excavation is completed and immediately prior to placing concrete.

### 4.3.2 Design Recommendations – Strip / Spread Footing Foundation System

Strip/spread footings may be considered in the design of the foundations to support the buildings. If settlement of about 1 inch is acceptable for this project, a strip/spread footing foundation system bearing upon modification of these soils is recommended for support of the proposed exterior (perimeter) and interior loads of the structures. However, settlement is usually the controlling factor in the decision to use spread footings. Settlement may increase depending on the type of soils, moisture content, and the applied stress. The strip/spread footing foundation system may be designed using the following parameters provided the subgrade is prepared as outlined in this section and the "**4.2 Earthwork**" sections of this report.

Lateral loads transmitted to the footings should be resisted by a combination of soil-concrete friction on the base of the footing and passive pressure on the side of the footing. To resist lateral forces, a net allowable passive resistance may be utilized for portions of footings extending at least 36 inches below the finished grade elevation. If the footing is formed during construction, the open space between the footing and the in-situ soils should be backfilled with concrete. Also, care should be taken to avoid disturbance of the footing bearing area since loose material could increase settlement and decrease resistance to lateral loading.

The spread footings can provide some uplift resistance for those structures subjected to wind or other induced structural loading. The uplift resistance of a spread footing may be computed using the effective weight of the soil above the spread footing along with the weight of the spread footing and structure. A soil unit weight of 120 pcf may be assumed for the on-site soils placed above the footing, provided the fill is properly compacted. Design values for the footings are presented below.

Description	Column	Wall	
Minimum embedment below finished grade <sup>1</sup> <ul> <li>Perimeter</li> <li>Interior</li> </ul>	3 feet 2 feet	2 feet	
Minimum dimensions	30 inches	18 inches	
Net Allowable bearing pressure <sup>1, 2</sup>	2,500 psf	2,500 psf	
Approximate total settlement <sup>3, 4</sup>	About 1 inch	About 1 inch	
Estimated differential settlement <sup>3, 4</sup>	1 inch between columns	1 inch over 40 feet	
Allowable passive pressure <sup>5</sup>	500 psf		
Ultimate coefficient of sliding friction <sup>6</sup>	0.40		
Uplift Resistance <sup>7</sup>	Foundation Weight (150 pcf) & Soil Weight (120 pcf)		



#### Continued from page 10

- 1. To bear within the select fill or native soils.
- 2. The bearing pressures include a factor of safety against a bearing capacity failure of approximately 2.
- 3. This estimated post-construction settlement of the shallow footings is without considering the effect of stress distribution from adjacent foundations and assuming proper construction practices are followed. A clear distance between the footings of one footing size should not produce overlapping stress distributions and would essentially behave as independent foundations.
- 4. Differential settlement may result from variances in subsurface conditions, loading conditions and construction procedures. The settlement response of the footings will be more dependent upon the quality of construction than upon the response of the subgrade to the foundation loads. We estimate that the differential settlement should be approximately one-half of the total settlement.
- 5. The passive pressure along the exterior of the footings should be neglected unless pavement is provided up to the edge of the structure. For interior footings, the allowable passive pressure may be used for the entire depth of the footing.
- 6. Lateral loads transmitted to the footings will be resisted by a combination of soil-concrete friction on the base of the footings and passive pressure on the side of the footings.
- 7. The ultimate uplift capacity of shallow footings should be reduced by an appropriate factor of safety to compute allowable uplift capacity.

### 4.3.2.1 Strip / Spread Footing Foundation Construction Considerations

Excavations for shallow footings should be performed with equipment capable of providing a relatively clean bearing area. The bottom 6 inches of the excavations should be completed with a smooth-mouthed bucket or by hand labor. The excavations should be neatly excavated and properly formed. Debris in the bottom of the excavation should be removed prior to reinforcing steel placement.

To reduce the potential for groundwater seepage into the excavations and to minimize disturbance to the bearing area, we recommend that concrete and reinforcing steel be placed as soon as possible after the excavations are completed. Excavations should not be left open for more than 36 hours. The bearing surface of the footings should be evaluated after excavation is completed and immediately prior to placing concrete.

If the footing foundations are overexcavated and formed, the backfill around the foundation sides should be achieved with compacted select fill, lean concrete, compacted cement stabilized sand (two sacks cement to one cubic yard of sand) or flowable fill. Compaction of select fill should be as described later in this section of the report.

The bearing surface should be excavated with a slight slope to create an internal sump for runoff water collection and removal. If surface runoff water in excess of 2 inches accumulates at the bottom of the excavation, it should be pumped out prior to concrete placement. Under no circumstances should water be allowed to adversely affect the quality of the bearing surface.

If the spread footing is buried, backfill above the foundation may be the excavated on-site soils or select fill soils. Backfill soils should be compacted to at least 95 percent of the maximum dry density as determined by the standard moisture/density relationship test (ASTM D 698) and



moisture conditioned between optimum and 4 percentage points above of optimum moisture content for on-site soils and imported select fill should be within 2 percent of the optimum moisture content. The backfill should be placed in thin, loose lifts of about 8 inches, with compacted thickness not to exceed 6 inches.

The overexcavation and backfill procedure is described in the following figure.



NOTE: Excavations in sketches shown vertical for convenience. Excavations should be sloped as necessary for safety.

### 4.3.3 Drilled Pier Foundation

Principal loads for the buildings and canopy structures may be supported by a pier foundation system, which consist of straight-sided piers bearing at a minimum depth of 20 feet below existing grade at time of drilling operations. This depth would allow adequate development of bearing capacity, resisting lateral loading conditions and to install the piers into competent soil layer.

Due to the presence of loose to medium dense sand soils, underreamed piers may be difficult to construct. Recommendations for straight sided piers are provided below.

### 4.3.3.1 Design Recommendations - Straight-Sided Drilled Pier Foundation System

Drilled pier foundations may be designed using the following design parameters for the planned structures.

Description	Design Parameters
Minimum Embedment Below Existing Grade <sup>1</sup>	20 feet
Maximum Embedment Below Existing Grade (for uplift loads only) <sup>1, 8</sup>	25 feet
Net Allowable Bearing Pressures (Total Load) <sup>1,2,4</sup>	
20 feet	10,000 psf

#### **Geotechnical Engineering Report**



FMCSA Buildings - Hidalgo LPOE - Hidalgo, Texas June 30, 2017 - Terracon Project No. 88175111

Description	Design Parameters			
Net Allowable Side-Shear <sup>4</sup>				
4 - 20 feet	350 psf			
Minimum Percentage of Reinforcing Steel <sup>3</sup>	As required by structural engineer			
Approximate Total Settlement <sup>4, 5</sup>	1 inch			
Estimated Differential Settlement <sup>5, 6</sup>	Approximately ½ of total settlement			
Allowable Passive Pressure <sup>6</sup>	750 psf			
Estimated Uplift Pressure (kips) <sup>6, 7</sup>	Negligible			
Estimated Uplift Resistance (kips) <sup>6</sup>	2.5 • d • D <sub>p</sub> + 0.9W <sub>p</sub> + P <sub>DL</sub>			
Uplift Resistance <sup>6</sup>	Foundation Weight (150 pcf) & Soil Weight (120 pcf)			

1. For drilled piers to bear into the native soils.

- 2. The bearing pressures include a factor of safety against a bearing capacity failure of approximately 3.
- 3. The structural engineer should determine the required reinforcing steel throughout the entire shaft length of drilled pier to resist the axial and lateral forces.
- 4. A minimum center-to-center spacing between the piers equal to three times the pier diameter should be provided to develop the recommended allowable capacities for a single pier and to control settlements of the pier. If this clearance cannot be maintained for a given pair or within a single line of piers, the above allowable capacities for a single pier may need to be reduced. Also, large concentrated of group of piers may have a reduced efficiency (decrease in load carrying capacity) even with the minimum pier spacing recommended previously. It is not recommended to have pier groups with elements closer than 2½ times the pier diameter (center-to-center). The final foundation plan should be reviewed by Terracon to re-evaluate, if applicable, load carrying capacity and settlements, including the efficiency of pier groups. These allowable skin friction values include a minimum factor of safety of 2. The side shear should be neglected for the upper 4 feet of soil in contact with the pier shaft.
- 5. Will result from variances in subsurface conditions, loading conditions and construction procedures, such a cleanliness of the bearing area or flowing water in the shaft. Settlements provided for single, isolated piers only.
- 6. For piers placed against an undisturbed vertical face of the in-situ soils. Lateral resistance of the drilled piers is primarily developed by passive resistance of the soils against the side of the pier. Due to surface effects, the lateral resistance of the upper 4 feet from existing grade of the soils at the surface for exterior piers should be neglected unless area paving is provided around the piers.
- 7. The magnitude of uplift is difficult to predict and will vary with in-situ moisture contents. Additionally, structural uplift loads on the piers will be resisted by the dead weight of the piers and supported structure. For uplift resistance, we recommend total unit weights of 120 pounds per cubic foot (pcf) for soil and 150 pcf for reinforced concrete be utilized. The diameter of the pier shaft in feet should be used in place of "d".
- 8. Piers for the structures should bear no deeper than 23 feet below existing grades without contacting our office.

The drilled pier parameters provided above are for calculating single pier capacities only.

For single, isolated drilled piers, total settlements, based on the indicated bearing pressures, should be about 1 inch for properly designed and constructed drilled piers. Settlement beneath individual piers will be primarily elastic with most of the settlement occurring during construction. Differential settlement may also occur between adjacent piers. The amount of differential



settlement between adjacent piers could approach 50 to 75 percent of the total pier settlement. Settlement response of drilled piers is impacted more by the quality of construction than by soil-structure interaction. Improper pier installation could result in differential settlements significantly greater than we have estimated. In addition, larger magnitudes of settlement should be expected if the soil is subjected to bearing pressures higher than the allowable values presented in this report.

### 4.3.3.2 Drilled Pier Installation

Groundwater was not encountered in the borings during or upon completion of drilling activities. Groundwater levels are influenced by seasonal and climatic conditions, which result in fluctuations in groundwater elevations. Prior to any excavation, the contractor should verify the groundwater levels. The contractor should consider performing a "test" pier excavation to determine the constructability of a drilled pier with the dry auger process. Under no circumstances should the pier excavations remain open overnight. The contractor should be prepared to remove water from the drilled piers, if necessary. We recommend that slurry or casing drilling techniques be used to control sloughing of the subsurface soils during pier construction. Casing should only be used in drilled piers terminating in the Clay soils. Slurry drilling techniques are appropriate for piers terminating in all soil types encountered in the boring.

<u>Slurry Method-</u> Water or a weighted drilling fluid may be considered to install the pier foundations. Slurry displacement drilling can only prevent sloughing and water influx but cannot control sloughing once it has occurred. Therefore, slurry displacement drilling techniques must begin at the ground surface, not after sloughing materials are encountered.

Typical drilling fluids include those which contain polymers or bentonite. If a polymer is used with "hard" mixing water, a water softening agent may be required to achieve intimate mixing and the appropriate viscosity. The polymer manufacturer should be consulted concerning proper use of the polymer. If bentonite slurry is used, the bentonite should be mixed with water several hours before placing in the pier excavation. Prior mixing gives the bentonite sufficient time to hydrate properly. The drilling fluid should only be of sufficient viscosity to control sloughing of the excavation walls and subsurface water flow into the excavation. Care should be exercised while extracting the auger so that suction does not develop and cause disturbance or create "necking" in the excavation walls as described above. Casing should not be employed in conjunction with the slurry drilling technique due to possible trapping of loose soils and slurry between the concrete and natural soil.

The use of weighted drilling fluid when installing drilled pier foundations requires extra effort to ensure an adequate bearing surface is obtained. A clean-out bucket



should be used just prior to pier completion in order to remove any cuttings and loose soils which may have accumulated in the bottom of the excavation. Reinforcing steel and concrete should be placed in the excavation immediately after pier completion. A closed-end tremie should be used to place the concrete completely to the bottom of the excavation in a controlled manner to effectively displace the slurry during concrete placement.

When the pier excavation depth is achieved and the bearing area has been cleaned, steel and concrete should then be placed immediately in the excavation. The concrete should be placed completely to the bottom of the excavation with a closed-end tremie in the pier excavation if more than 3 inches of water is ponded on the bearing surface or the slurry drilling technique is used. A short tremie may be used if the excavation has less than 3 inches of ponded water or if the water is pumped out prior to concrete placement. The fluid concrete should not be allowed to strike the pier reinforcement, temporary casing (if required) or excavation sidewalls during concrete placement.

Casing Method - Casing will provide stability of the excavation walls and will reduce water influx; however, casing may not completely eliminate subsurface water influx potential. In order for the casing to be effective, a "water tight" seal must be achieved between the casing and surrounding soils. The drilling subcontractor should determine casing depths and casing procedures. Water that accumulates in excess of 3 inches in the bottom of the pier excavation should be pumped out prior to reinforcing steel and concrete placement. If the water is not pumped out, a closed-end tremie should be used to place the concrete completely to the bottom of the pier excavation in a controlled manner to effectively displace the water during concrete placement. If water is not a factor, concrete should be placed with a short tremie so the concrete is directed to the bottom of the pier excavation. The concrete should not be allowed to ricochet off the walls of the pier excavation nor off the reinforcing steel. If this operation is not successful or to the satisfaction of the foundation contractor, the pier excavation should be flooded with fresh water to offset the differential water pressure caused by the unbalanced water levels inside and outside of the casing. The concrete should be tremied completely to the bottom of the excavation with a closed-end tremie.

Removal of casing should be performed with extreme care and under proper supervision to reduce mixing of the surrounding soil and water with the fresh concrete. Rapid withdrawal of casing or the auger may develop suction that could cause the soil to intrude into the excavation. An insufficient head of concrete in the casing during its withdrawal could also allow the soils to intrude into the wet concrete. Both of these conditions may induce "necking", a section of reduced diameter, in the pier.

#### **Geotechnical Engineering Report**

FMCSA Buildings - Hidalgo LPOE = Hidalgo, Texas June 30, 2017 = Terracon Project No. 88175111



All aspects of concrete design and placement should comply with the American Concrete Institute (ACI) 318-14 Code Building Code Requirements for Structural Concrete; ACI 336.1-01 entitled Reference Specification for the Construction of Drilled Piers, and ACI 336.3R-14 entitled Report on Design and Construction of Drilled Piers. Concrete should be designed to achieve the specified 28-day strength when placed at a 7 inch slump with a  $\pm 1$  inch tolerance. Adding water to a mix that has been designed for a lower slump does not meet the intent of this recommendation. If a high range water reducer is used to achieve this slump, the span of slump retention for the specific admixture under consideration should be thoroughly investigated. Compatibility with other concrete admixtures should also be considered. A technical representative of the admixture supplier should be consulted on these matters.

Successful installation of drilled piers is a coordinated effort involving the general contractor, design consultants, subcontractors and suppliers. Each must be properly equipped and prepared to provide their services in a timely fashion. Several key items of major concern are:

- Proper drilling rig with proper equipment (including casing and augers);
- Reinforcing steel cages tied to meet project specifications;
- Proper scheduling and ordering of concrete for the piers; and
- Monitoring of installation by design professionals.

Pier construction should be carefully monitored to assure compliance of construction activities with the appropriate specifications. Particular attention to the referenced publication is warranted for pier installation. A number of items of concern for pier installation include those listed below.

Pier locations

Concrete properties and placement

- Vertical alignment
- Competent bearing

- Proper casing seal for groundwater control
- Casing removal (if needed)
- Reinforcement steel placement
- Slurry viscosity (if needed)

If the contractor has to deviate from the recommended foundations, Terracon should be notified immediately so additional engineering recommendations can be provided for an appropriate foundation type.

### 4.3.4 Canopy Structure

We understand that a canopy structure will be considered for this project. Since lateral loads often control the design of this type of structures, drilled piers are often an effective foundation option for their support. The foundations will need to be designed to resist high loads due to the structure height and the imposed forces from wind loading. Generally, four (4) load cases are

#### **Geotechnical Engineering Report** FMCSA Buildings - Hidalgo LPOE Hidalgo, Texas June 30, 2017 Terracon Project No. 88175111



applied to this type of structure; axial compressive loading, axial uplift (tensile) loading, lateral loading, and rotational. The foundations experience high lateral and rotational loading, which nearly always controls the foundation design. Axial loading of the foundation is relatively low and seldom controls the foundation design. However, the foundation should always be analyzed for the four (4) load cases to establish the controlling load case.

We anticipate that the piers supporting the structure will be subjected to large lateral loads due to wind. The piers should be analyzed for this load case using a soil-structure interaction program such as LPILE. Parameters for use in this type of lateral analysis and axial loading analysis are presented in **Table 1** at the end of this report. If you do not have this software to analyze the shafts for lateral loading, we can be contracted to analyze the piers provided that the structural engineer provides the foundation loads to us.

### 4.3.5 Foundation Construction Monitoring

The performance of the foundation system for the proposed structure will be highly dependent upon the quality of construction. Thus, we recommend that fill pad compaction and foundation installation be monitored full time by an experienced Terracon soil technician under the direction of our Geotechnical Engineer. During foundation installation, the base should be monitored to evaluate the condition of the subgrade. We would be pleased to develop a plan for compaction and foundation installation monitoring to be incorporated in the overall quality control program.

### 4.4 Floor Slab

Based on information provided, the proposed Finished Floor Elevation (FFE) for the buildings and canopy areas was set at El. 109.0 feet.

### 4.4.1 Floor Slab Design Recommendations

The subsurface soils at this site generally exhibit moderate expansion potential. Based on the information developed from our field and laboratory programs and on method TEX-124-E in the Texas Department of Transportation (TxDOT) Manual of Testing Procedures, we estimate that the subgrade soils at this site exhibit a Potential Vertical Rise (PVR) of about 1 to  $1\frac{1}{2}$  inches in present condition.

We anticipate construction will be initiated by stripping vegetation, construction debris, or other unsuitable materials. Stripped materials consisting of vegetation, organic materials and debris should be wasted off site or used for landscaped areas and should also extend a minimum of 3 feet beyond the edge of the proposed building areas. The final exterior grade adjacent to the buildings should be sloped to promote positive drainage away from the structures.



The subgrade and select fill soils should be prepared as outlined in the "4.2 Earthwork" section of this report, which contains material and placement requirements for select fill, as well as other subgrade preparation recommendations. These recommendations are intended to improve the subgrade soils strength and load carrying capacity.

Item	Description				
Excavation	Minimum 6 inches				
Minimum Floor Slab Support	Min. 6 inches of moisture conditioned native soils plus additional select fill (as needed to achieve Finished Building Pad Elevation at El. 109.0 feet). This recommendation applies to buildings, canopy area and flatwork that abuts the structure such as sidewalks.				
Modulus of Subgrade Reaction	125 pounds per cubic inch (psi/in).				
Estimated Potential Vertical Rise (PVR)	About 1 inch.				

The subgrade and select fill soils should be prepared as outlined in the "4.2 Earthwork" section of this report, which contains material and placement requirements for select fill, as well as other subgrade preparation recommendations.

in this report.

### 4.4.1.1 Floor Slab Construction Considerations

The use of a vapor retarder should be considered beneath concrete slabs on grade that will be covered with wood, tile, carpet or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer and slab contractor should refer to ACI 302 and ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

### 4.5 Lateral Earth Pressures - Inspection Pits

The lateral earth pressure recommendations given in the following paragraphs are applicable to the design of rigid retaining walls subject to slight rotation, such as cantilever, or gravity type concrete walls. These recommendations are not applicable to the design of modular block - geogrid reinforced backfill (MSE) walls.

Reinforced concrete walls with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to those indicated in the following table. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The "at-rest" condition



assumes no wall movement. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls.



Earth Pressure Coefficients

Earth Pressure	Earth Pressure Coefficient for		Surcharge	Earth Pressure,		
Conditions	Backfill Type	Density (pcf)	Pressure, p1 (psf)	p₂ (psf)		
Active (Ka)	Granular – 0.31	40	(0.31)S	(40)H		
Active (Na)	On-Site Soil – 0.45	55	(0.45)S	(55)H		
At-Rest (Ko)	Granular – 0.47	61	(0.47)S	(61)H		
Al-IVESI (IVO)	On-Site Soil – 0.63	75	(0.63)S	(75)H		
Passive (Kn)	Granular – 3.25	423				
r assive (np)	On-Site Soil – 2.2	264				

Granular fill may consist of clean sand or free draining clean crushed stone, such as ASTM C57 stone.

Applicable conditions to the above include:

- For active earth pressure, wall must rotate about base, with top lateral movements of about 0.002 H to 0.004 H, where H is wall height;
- For passive earth pressure to develop, wall must move horizontally to mobilize resistance;
- Uniform surcharge, where S is surcharge pressure;
- In-situ soil backfill weight a maximum of 120 pcf;
- Horizontal backfill, compacted between 95 and 98 percent of standard Proctor maximum dry density;
- Loading from heavy compaction equipment not included;
- No hydrostatic pressures acting on wall;
- No dynamic loading;

#### **Geotechnical Engineering Report**

FMCSA Buildings - Hidalgo LPOE = Hidalgo, Texas June 30, 2017 = Terracon Project No. 88175111



- No safety factor included in soil parameters;
- Ignore passive pressure to a depth of 2 feet; and
- See **Spread Footings** section of this report for the retaining wall footing design.

Backfill placed against structures should consist of granular soils or low plasticity cohesive soils. On-site soils are suitable for use as backfill behind walls. For the granular values to be valid, the granular backfill must extend out from the base of the wall at an angle of at least 45 and 60 degrees from vertical for the active and passive cases, respectively. To calculate the resistance to sliding, a value of 0.40 should be used as the ultimate coefficient of friction between the footing and the underlying soil.

To control the water level behind the wall, we recommend a perimeter drain be installed at the foundation level as shown on the adjacent figure and described in the following notes.



- Perforated pipe should be provided at the heel of the wall and consist of rigid PVC, sized to transport the expected water;
- Exterior ground surface should consist of a 24-inch clay cap sloped to drain from wall;
- The clay cap can be replaced by a pavement section; and
- Weep holes can be considered in lieu of perimeter drains for retaining walls if the water seepage will not impact adjacent structures.

If adequate drainage is not possible, then combined hydrostatic and lateral earth pressures should be calculated for <u>on-site soils</u> or <u>select backfill</u> using an equivalent fluid weighing 90 and 100 pcf for



active and at-rest conditions, respectively. For <u>granular backfill</u>, an equivalent fluid weighing 85 and 90 pcf should be used for active and at-rest, respectively. These pressures do not include the influence of surcharge, equipment or floor loading, which should be added. Heavy equipment should not operate within a distance closer than the exposed height of retaining walls to prevent lateral pressures more than those provided.

### 4.6 Seismic Considerations

Description	Value
2012 International Building Code Site Classification (IBC) <sup>1</sup>	D <sup>2</sup>
Mapped Spectral Acceleration for Short Periods (0.2-Second): (Ss) <sup>3</sup>	0.038g
Mapped Spectral Acceleration for a 1-Second Period: (S <sub>1</sub> ) <sup>3</sup>	0.014g

<sup>1</sup> The site class definition was determined using SPT N-values in conjunction with section 1613.3.2 in the 2012 IBC and Table 20.3-1 in the 2010 ASCE-7.

- <sup>2</sup> Section 20.1 in the 2010 ASCE-7 requires a site soil profile determination extending to a depth of 100 feet for seismic site classification. The current scope does not include the required 100 foot soil profile determination. Borings extended to a maximum depth of 25 feet, and this seismic site class definition considers that competent soil continues below the maximum depth of the subsurface exploration. Additional exploration to deeper depths would be needed to confirm the conditions below the current depth of exploration.
- <sup>3</sup> The Spectral Acceleration values were determined using publicly available information provided on the United States Geological Survey (USGS) website. The spectral acceleration values can be used to determine the site coefficients using Tables 1613.3.3 (1) and 1613.3.3 (2) in the 2012 IBC.

### 4.7 Pavements

As we understand, both flexible and rigid pavements will be considered for the access lanes and parking areas. Pavement subgrade preparations are included in this section to limit changes in soil moisture conditions to help mitigate the effects of soil movement. However, even if these recommendations are followed some pavement distress could still occur.

### 4.7.1 Subgrade Preparation

On most project sites, the site grading is accomplished relatively early in the construction phase. Fills are placed and compacted in a uniform manner. However, as construction proceeds, excavations are made into these areas, rainfall and surface water saturates some areas, heavy traffic from concrete trucks and other delivery vehicles disturbs the subgrade and many surface irregularities are filled in with loose soils to improve trafficability temporarily.

As a result, the pavement subgrades, initially prepared early in the project, should be carefully evaluated as the time for pavement construction approaches.



We recommend the moisture content and density of the top 6 inches of the subgrade be evaluated and the pavement subgrade be proofrolled within two days prior to commencement of actual paving operations. Areas not in compliance with the required ranges of moisture or density should be moisture conditioned and recompacted.

Particular attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas where backfilled trenches are located. Areas where unsuitable conditions are located should be repaired by removing and replacing the materials with properly compacted fills.

If a significant precipitation event occurs after the evaluation or if the surface becomes disturbed, the subgrade should be reviewed by qualified personnel immediately prior to paving. The subgrade should be in its finished form at the time of the final review.

Based on the subsurface conditions, we anticipate that the pavement subgrade will generally consist of the on-site soils. The top 6 inches of the finished subgrade soils directly beneath the pavements may be chemically treated. Chemical treatment will increase the supporting value of the subgrade and decrease the effect of moisture on subgrade soils. These 6 inches of treatment should be considered as required part of the pavement design and is not a part of site and subgrade preparation for wet/soft subgrade conditions.

We anticipate that the on-site surficial soils should be treated with about 3 percent of lime/cement. This percentage is given as application by dry weight and is typically equivalent to about 15 pounds modifier per square yard per 6-inch depth. The recommended percentage of modifier is for estimating and planning. The actual quantity of lime/cement required should be determined at the time of construction by laboratory tests on bulk samples of the subgrade soils. Specifications for treated subgrade are presented later in this section. An alternative pavement section without treated subgrade is also provided.

After proofrolling and repairing deep subgrade deficiencies, the entire subgrade should be scarified and developed as recommended in Section "**4.2 Earthwork**" section this report to provide a uniform subgrade for pavement construction. Areas that appear severely desiccated following site stripping may require further undercutting and moisture conditioning. If a significant precipitation event occurs after the evaluation or if the surface becomes disturbed, the subgrade should be reviewed by qualified personnel immediately prior to paving. The subgrade should be in its finished form at the time of the final review.

### 4.6.2 Design Considerations

Traffic patterns and anticipated loading conditions were not available at the time that this report was prepared. However, we anticipate that traffic loads will be produced primarily by light traffic, moderate to heavy traffic, delivery and trash removal trucks. Pavement thickness can be determined using AASHTO, Asphalt Institute and/or other methods if specific wheel loads, axle configurations, frequencies, and desired pavement life are provided.



Terracon can provide thickness recommendations for pavements subjected to loads other than the above mentioned traffic if this information is provided.

Pavement performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of pavements:

- Final grade adjacent to parking lots and drives should slope down from pavement edges at a minimum 2%:
- The subgrade and the pavement surface should have a minimum 1/4 inch per foot slope to promote proper surface drainage;
- Install pavement drainage surrounding areas anticipated for frequent wetting (e.g., garden centers, wash racks);
- Install joint sealant and seal cracks immediately;
- Seal all landscaped areas in, or adjacent to pavements to reduce moisture migration to subgrade soils;
- Place compacted, low permeability backfill against the exterior side of curb and gutter; and,
- Place curb, gutter and/or sidewalk directly on low permeability subgrade soils rather than on unbound granular base course materials.

### 4.6.3 Estimated Minimum Pavement Thickness

As a minimum, we recommend the following typical pavement section be considered.							
Pavement Area	Traffic Design Index	Description					
Automobile Parking Areas	DI-1	Light traffic (Few vehicles heavier than passenger cars, no regular use by heavily loaded two axle trucks). $(EAL^{(1)} < 6)$ .					
Driveways (Light to Medium Duty)	DI-2	Light to Medium traffic (Similar to DI-1 including not over 50 loaded two axle trucks or lightly loaded larger vehicles per day. No regular use by heavily loaded trucks with three or more axles). (EAL = 6-20).					
Driveways and Truck Traffic Areas (Medium to Heavy Duty)	DI-3	Medium to Heavy traffic (Including not over 300 heavily loaded two axle trucks plus lightly loaded trucks with three or more axles and no more than 30 heavily loaded trucks with more than three axles per day). (EAL = 21-75).					

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Listed below are pavement component thicknesses, which may be used as a guide for pavement systems at the site for the traffic classifications stated herein. These systems were derived based on general characterization of the subgrade.



Specific testing (such as CBR's, resilient modulus tests, etc.) was not performed for this project to evaluate the support characteristics of the subgrade.

Minimum Recommended Flexible Pavement Section Thickness, inches							
Component	DI-1	DI-2					
Hot Mix Asphaltic Concrete (HMAC)	2	21/2					
Granular Base Material	6	8					
Treated Subgrade	6	6					

Alternative Flexible Pavement System Thickness, inches							
Component	DI-1	DI-2					
Hot Mix Asphaltic Concrete (HMAC)	21/2	3					
Granular Base Material	8	10					
Moisture Conditioned Subgrade	6	6					

Minimum Recommended <u>Rigid</u> Pavement Section Thickness, inches									
Component	DI-1	DI-2	DI-3						
Reinforced Concrete	5	6	7						
Granular Base Material <sup>1</sup>	4	4	4						
Moisture-Conditioned Subgrade	6	6	6						

 Although not required for structural support of rigid pavement systems, a base course layer may be considered to help reduce potentials for slab curl, shrinkage cracking, and subgrade "pumping" through joints. Proper joint spacing will also be required to prevent excessive slab curling and shrinkage cracking. All joints should be sealed to prevent entry of foreign material and dowelled where necessary for load transfer.

The listed pavement component thicknesses should be used as a guide for pavement systems at the site for the traffic classifications stated herein. These recommendations assume a 20-year pavement design life. If pavement frequencies or loads will be different than that specified Terracon should be contacted and allowed to review these pavement sections.

We recommend a Portland Cement Concrete (PCC) pavement be utilized in the main access lanes, parking lots, dumpster pads or other areas where extensive wheel maneuvering are expected.

We recommend that waste dumpster areas be constructed of at least 7-inches of reinforced concrete pavement. The concrete pad areas should be designed so that the vehicle wheels of



the collection truck are supported on the concrete while the dumpster is being lifted to support the large wheel loading imposed during waste collection.

Although not required for structural support of rigid pavement systems, a base course layer may be considered to help reduce potentials for slab curl, shrinkage cracking, and subgrade "pumping" through joints.

Proper joint spacing will also be required to prevent excessive slab curling and shrinkage cracking. All joints should be sealed to prevent entry of foreign material and dowelled where necessary for load transfer.

Presented below are our recommended material requirements for the various pavement sections.

<u>Reinforced Concrete Pavement</u>: The materials and properties of reinforced concrete pavement shall meet applicable requirements in the ACI Manual of Concrete Practice. The Portland cement concrete mix should have a minimum 28-day compressive strength of 4,000 psi.

<u>Reinforcing Steel:</u> Reinforcing steel should consist of the following:

Automobiles only: #3 bars spaced at 18 inches or #4 bars spaced at 24 inches on centers in both directions.

Automobiles and Trucks: #3 bars spaced at 12 inches or #4 bars spaced at 18 inches on centers in both directions.

<u>Control Joint Spacing</u>: ACI recommendations indicate that control joints should be spaced at about 30 times the thickness of the pavement. Furthermore, ACI recommends a maximum control joint spacing of 12.5 feet for 5-inch pavements and a maximum control joint spacing of 15 feet for 6-inch or thicker pavements. Saw cut control joints should be cut within 6 to 12 hours of concrete placement.

Expansion Joint Spacing: ACI recommendations indicate that regularly spaced expansion joints may be deleted from concrete pavements. Therefore, the installation of expansion joints is optional and should be evaluated by the design team.

<u>Dowels at Expansion Joints:</u> The dowels at expansion joints should be spaced at 12-inch centers and consist of the following: Automobiles: 5/8-inch diameter, 12-inches long with 5-inch embedment Automobiles and Trucks: 3/4-inch diameter, 14-inches long with 6-inch embedment

<u>Hot Mix Asphaltic Concrete Surface Course</u>: The asphaltic concrete surface course should be plant mixed, hot laid Type C or D (Fine Graded Surface Course) meeting the specifications requirements in 2014 TxDOT Standard Specifications Item 340. Specific criteria for the job



specifications should include compaction to within an air void range of 5 to 9 percent calculated using the maximum theoretical gravity mix measured by TxDOT TEX-227-F. The asphalt cement content by percent of total mixture weight should be within  $\pm$  0.5 percent asphalt cement from the job mix design.

<u>Granular Base Material:</u> Base material should be composed of crushed limestone or crushed concrete meeting the requirements of 2014 TxDOT Standard Specifications Item 247, Type A or D, Grade 1.

As an alternate to the Type A base, "caliche" material meeting the requirements of 2014 TxDOT Standard Specification Manual Item 247, Type B, Grade 1 or 2 may be used.

The base should be compacted to at least 95 percent of the maximum dry density determined in accordance with the modified moisture-density relationship (ASTM D 1557) within 2 percentage points of the optimum moisture content.

<u>Treated Subgrade:</u> The subgrade soils should be treated with lime in accordance with 2014 TxDOT Standard Specifications Items 260 and/or 275. The recommended percentage of lime/cement is for estimating and planning. The actual quantity of lime/cement required should be determined at the time of construction by laboratory tests on bulk samples of the subgrade soils.

We anticipate that the on-site surficial soils be treated with about 3 percent of lime/cement. This percentage is given as application by dry weight and is typically equivalent to about 15 pounds of lime/cement per square yard per 6-inch depth.

The subgrade should be compacted to a minimum of 95 percent of the Standard Effort (ASTM D 698) maximum dry density within 2 percentage points of the optimum moisture content. Preferably, traffic, should be kept off the treated subgrade for about 3 to 5 days to facilitate curing of the soil – chemical mixture; in addition, the subgrade is not suitable for heavy construction traffic prior to paving.

Post-construction subgrade movements and some cracking of the pavements are not uncommon for subgrade conditions such as those observed at this site. Although chemical treatment of the subgrade will help to reduce such movement/cracking, this movement/cracking cannot be economically eliminated.

<u>Moisture Conditioned Subgrade:</u> The subgrade should be scarified to a depth of 8 inches and moisture conditioned within 2 percentage points of the optimum moisture content. The subgrade should then be compacted to at least 95 percent of the maximum dry density determined in accordance with ASTM D 698. This should result in a compacted, moisture conditioned layer about 6 inches thick.



### 4.6.4 Pavement Drainage

Pavements should be sloped to provide rapid drainage of surface water. Water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration. In addition, the pavement subgrade should be graded to provide positive drainage within the granular base section. Appropriate sub-drainage or connection to a suitable daylight outlet should be provided to remove water from the granular subbase.

### 4.6.5 Pavement Maintenance

The pavement sections provided in this report represent minimum recommended thicknesses and, as such, periodic maintenance should be anticipated. Therefore preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Maintenance consists of both localized maintenance (e.g. crack and joint sealing and patching) and global maintenance (e.g. surface sealing). Preventive maintenance is usually the first priority when implementing a pavement maintenance program. Additional engineering observation is recommended to determine the type and extent of a cost effective program. Even with periodic maintenance, some movements and related cracking may still occur and repairs may be required.

### **4.7 Preconstruction Meeting**

Every project and construction site is unique, making it vitally important that all construction drawings, specifications, change orders, and related documents be reviewed by the respective design professionals participating in the project. The performance of the foundations for this project will depend on correct interpretation of our geotechnical engineering report and proper compliance of construction activities with regard to our geotechnical recommendations and to the construction drawings and specifications. We highly recommend that a preconstruction meeting be conducted. One of the purposes of the meeting is to discuss the Special Inspections required on the plan documents.

The following are among those that should be discussed at the meeting:

- Lines of Communication/Authority;
- Reporting (both verbal and written); and
- Special Inspections. In particular; what is required; who will perform the inspections; what are the specified frequencies; how should the inspections be scheduled; and, reporting requirements.



## 5.0 GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide observation and testing services during grading, excavation, foundation construction and other earth-related construction phases of the project. The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of construction or weather.

The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others.

In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

TABLES

# TABLE 1 LATERAL AND AXIAL CAPACITY ANALYSES DESIGN SOIL PARAMETERS FOR UNDRAINED CONDITIONS FMCSA BUILDINGS - HIDALGO LPOE HIDALGO, TEXAS TERRACON PROJECT NO.: 88175111

Layer		Depth to Bottom of	Total Unit	Effective Unit	Undrained Shear	Soil Strain		Friction Angle	Adhesion Factor	Horizontal Stress	Subgrade Modulus,	Bearing Capacity Factors		
		Layer (feet)	Weight (pcf)	Weight (pcf)	Strength (psf)	Factor (ɛ₅₀)	lypes '	(degrees)	(α)	Coefficient	k (pci)	Nc ⁵	Nq	Νγ
	1	4	118	118	1,500	0.008	3	0			525	6	1	0
	2	12	115	115	1,000	0.010	3	0	0.72		428	6	1	0
	3	25	118	118	0		4	31		0.75	110	33	21	26
1	Desig	n depth to grou	undwater is b	elow 25 feet.								1		
2	For u	plift conditions,	the compute	d skin friction	should be multip	blied by 0.9	for clays and 0	7 for sands.						
3	Strati	graphy shown a	above is base	ed on our inter	pretation of soil	strength an	d may not corre	espond with the	descriptive cla	assifications show	wn on the boring	logs.		
4	The la	ateral load crite	ria shown ab	ove are for us	e in the compute	er programs	SLPILE.							
5	The d	lepth to diamet	er ratio must	exceed 4 to us	se $N_c = 9$ . Othe	rwise, use l	N <sub>c</sub> = 6.							
6	The u	init allowable e	nd bearing sh	nould not exce	ed 100 kips per	square foo	t.							
7	Ther	e are nine soi	l/rock types	available to	LPILE. These	are as fol	OWS:							
1. Soft Clay						6.	Vuggy Limestone (Strong Rock)							
	2. Stiff Clay with Free Water			7. \$	7. Silt (with cohesion and internal friction angle)									
	3. Stiff Clay without Free Water				8. /	API Sand (as recommended by API, 1987)								
		4. Sano	d (as recomi	mended by F	Reese et al, 19	74)	9. \	. Weak Rock (Reese, 1997)						
5. Linear Interpolation (any user specified p-y curves)														

# APPENDIX A FIELD EXPLORATION




#### **Geotechnical Engineering Report**

FMCSA Buildings - Hidalgo LPOE - Hidalgo, Texas June 30, 2017 - Terracon Project No. 88175111



Subsurface conditions were evaluated by drilling two (2) borings, designated B-1 and B-2, performed at a depth of approximately 25 feet below existing grade within the proposed development. The borings were drilled using truck-mounted drilling equipment at the approximate location shown on the Boring Location Plan, Exhibit A-2 of Appendix A. The borings were located by measuring from existing site features shown on the drawing provided to us without the use of surveying equipment. The boring depths were measured from the existing ground surface at the time of our field activities. At the completion of our field activities, the borings were backfilled with soil cuttings and patched with an asphalt cold mix.

The Logs of Borings, presenting the subsurface soil descriptions, type of sampling used, and additional field data, are presented on Exhibit A-4 and Exhibit A-5 of Appendix A. The General Notes, which defines the terms used on the log, are presented on Exhibit C-1. The Unified Soil Classification System is presented on Exhibit C-2 of Appendix C.

Cohesive and granular soils were sampled by means of the Standard Penetration Test (SPT). This test consists of measuring the number of blows (N) required for a 140-pound hammer free falling 30 inches to drive a standard split-spoon sampler 12 inches into the subsurface material after being seated six inches. This blow count or SPT N-value is used to evaluate the stratum. In the Shelby tube sampling procedure, a thin wall seamless steel tube with a sharp cutting edge is pushed into the soil by hydraulic pressure to obtain a relatively undisturbed sample of cohesive soil.

Samples were removed from samplers in the field, visually classified, and appropriately sealed in sample containers to preserve their in-situ moisture contents. Samples were returned to our laboratory in Pharr, Texas.



			BORING	i LO	OG	N	١C	<b>). B-</b> 1	1					F	Page 1 of	1
PR	PROJECT: FMCSA Building- Hidalgo Land Port of Entry					EN	NT:	Gensl 5420 I	sler I LBJ Freeway, Ste. 1100, Dallas, Texas							
SIT	E:	Hidalgo LPOE Hidalgo, Texas														
IC LOG	LOCATIO	N See Exhibit A-2 .09752° Longitude: 98.26889°		H (Ft.)	LEVEL	ALIONS	TYPE	TEST	LIS	STF		TEST	ER NT (%)	JNIT T (pcf)	ATTERBERG LIMITS	FINES
GRAPH				DEPTH	WATER	OBSERV	SAMPLE	FIELD	RESU	TEST TYI	OMPRES: STRENG: (tsf)	STRAIN (	WAT	DRY ( WEIGH	LL-PL-PI	PERCENT
	DEPTH 2½" 8	asphalt and 10" base material									0					
	1.0 LEAN	I CLAY (CL), brown, very stiff to mediun	n stiff		-		$\checkmark$	5-9	-7				18		31-14-17	
							$\left  \right\rangle$	N= 2-3	16 -2				10		31-14-17	
					_	Ł	Ą	N=	=5				31			79
				5	_	4	X	4-4 N=	4 =8				27		28-15-13	
	- with	Clayey Sand (SC) seams at 61/2 feet			-		X	3-4 N=	4 =8				29			41
	- with Fat Clay (CH) seams at 8½ feet			_		X	3-4 N=1	6 10				30		62-20-42		
				10	-	Z										
	12.0 SILT	Y SAND (SM), brown, loose to medium of	dense		_											
				4.5	_		X	5-4 N=	4 :8				9			
				15		ĺ										
					_											
	- der	nse below 18½ feet		20	_		X	15-18 N=4	8-23 41				7			
					-											
					_											
	25.0	Torrection for the Const		25	;		X	20-16 N=3	6-21 37				6			
	Болі	ig Terminaleo al 25 Feel														
	Stratificati	on lines are approximate. In-situ, the transition ma	ay be gradual.	1		I	1		Hammer	r Typ	e: Rope a	and Ca	thead		1	1
dvancement Method: See Exhibit A-3 for de Dry augered from 0 to 25 feet. See Annerdiv P for ce		or desc	cription	of f	ield	ratory	Notes: Cave-in o	depth	at 23 fee	t.						
band Bori	onment Methings backfille	od: d with soil cuttings upon completion.	procedures and a See Appendix C for abbreviations.	ddition or expl	al data lanatio	a (if n of	any) sym	bols and								
	WATE	R LEVEL OBSERVATIONS							Poring Ct-	rtod.	2/24/204	4	Dert	0.000	plotod: 2/24/2	014
	No free v	vater observed				Boring Started: 2/21/2014 Boring Compl			pieted: 2/21/2	014						
			1506	6 Mid C	Cities D	Drive	•							er: SVVL	,	
				Pharr,	lexas				Project No	).: 88°	145016		Exhi	dit:	A-1	

BORING LOG NO. B-2 Page 1 of 1															
PR	OJECT:	FMCSA Building- Hidalgo Land Entry	d Port of		CLIE	NT	Gens 5420	ler LBJ Fre	eew	ay, St	e. 11	00, D	allas	, Texas	
SIT	E:	Hidalgo LPOE Hidalgo, Texas													
<b>GRAPHIC LOG</b>	LOCATION	N See Exhibit A-2 .0977° Longitude: 98.26876°		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST	RESULTS	STR TYPE	OMPRESSIVE M STRENGTH D (tsf)	STRAIN (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	DEPTH 3" as	phalt and 12" base material			-					0					
	LEAN	I CLAY (CL), brown, stiff to medium stiff		-	_	$\mathbf{\mathbf{\nabla}}$	5-5	5-8				23			71
	- with	Fat Clay (CH) seams at 2½ feet		-	_	$\square$	 7-5 N=	5-7 :12				25		57-19-38	
				5 -		$\square$	3-4 N=	1-4 =8				27			
				-		$\square$	3-2 N=	2-3 =5				14		37-17-20	
	- with	Clayey Sand (SC) seams at 81/2 feet		- 10-	_	$\boxtimes$	3-5 N=	5-5 :10				26			35
				-	_										
	15.0			- 15-		$\square$	4-3 N=	3-2 =5				27		34-17-17	
	SILTY	<u>' SAND (SM)</u> , brown, loose to medium c	lense			$\times$	4-4 N=	1-5 =9				21			
	25.0			-	-	$\times$	7-5 N=	5-7				9			
	Borin	rg Terminated at 25 Feet		25-											
	Stratificatio	on lines are approximate. In-situ, the transition ma	ay be gradual.		1	I		Hamme	er Type	e: Rope a	and Cat	head			
Advancement Method:       See Exhibit A-3         Dry augered from 0 to 25 feet.       procedures.         See Appendix B       procedures and         Abandonment Method:       See Appendix C         Borings backfilled with soil cuttings upon completion.       See Appendix C		See Exhibit A-3 for procedures. See Appendix B for procedures and add See Appendix C for abbreviations.	descrij descri ditional r expla	ption of iption o I data (i nation o	field flabc fany of syn	pratory ). nbols and	Notes: Cave-in	depth	at 23 fee	t.					
	WATE	R LEVEL OBSERVATIONS				-		Boring Sta	arted:	2/21/201	4	Borin	ng Com	oleted: 2/21/20	014
No free water observed			ller	1	Drill Rig: CME 55 Driller: SWD					)					
			1506 P	1506 Mid Cities Drive					Project No : 88145016 Exhibit: 4-2						

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 88145016.GPJ

## APPENDIX B LABORATORY TESTING

#### **Geotechnical Engineering Report** FMCSA Buildings - Hidalgo LPOE - Hidalgo, Texas June 30, 2017 - Terracon Project No. 88175111



#### Laboratory Testing

Soil samples were tested in the laboratory to measure their natural water content. Selected samples were also classified using the results of Atterberg Limits and sieve analysis testing. The test results are provided on the boring logs included in Appendix A and in the **"3.2 Typical Profile"** section of this report.

Descriptive classifications of the soils indicated on the boring logs are in general accordance with the enclosed General Notes and the Unified Soil Classification System. Also shown are estimated Unified Soil Classification Symbols. A brief description of this classification system is attached to this report.

## APPENDIX C SUPPORTING DOCUMENTS

## GENERAL NOTES

#### DESCRIPTION OF SYMBOLS AND ABBREVIATIONS



#### DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

#### LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

	RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance Includes gravels, sands and silts.			CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance						
ERMS	Descriptive Term (Density)	Standard Penetration or N-Value Blows/Ft.	Ring Sampler Blows/Ft.	Descriptive Term (Consistency)	Unconfined Compressive Strength, Qu, psf	Standard Penetration or N-Value Blows/Ft.	Ring Sampler Blows/Ft.			
ΞF	Very Loose	0 - 3	0 - 6	Very Soft	less than 500	0 - 1	< 3			
IGT	Loose	4 - 9	7 - 18	Soft	500 to 1,000	2 - 4	3 - 4			
<b>IREN</b>	Medium Dense	10 - 29	19 - 58	Medium-Stiff	1,000 to 2,000	4 - 8	5 - 9			
S	Dense	30 - 50	59 - 98	Stiff	2,000 to 4,000	8 - 15	10 - 18			
	Very Dense	> 50	<u>&gt;</u> 99	Very Stiff	4,000 to 8,000	15 - 30	19 - 42			
				Hard	> 8,000	> 30	> 42			

#### RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

#### **RELATIVE PROPORTIONS OF FINES**

Descriptive Term(s)	Percent of
of other constituents	Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

#### GRAIN SIZE TERMINOLOGY

#### Major Component of Sample Boulders Cobbles Gravel Sand Silt or Clay

#### Particle Size

Over 12 in. (300 mm) 12 in. to 3 in. (300mm to 75mm) 3 in. to #4 sieve (75mm to 4.75 mm) #4 to #200 sieve (4.75mm to 0.075mm Passing #200 sieve (0.075mm)

#### PLASTICITY DESCRIPTION

<u>Term</u> Non-plastic Low Medium High

Plasticity Index

Exhibit C-1



						Soil Classification
Criteria for Assig	ning Group Symbols	s and Group Names	s Using Laboratory	Tests <sup>A</sup>	Group Symbol	Group Name <sup>B</sup>
	Gravels:	Clean Gravels:	$Cu \geq 4$ and $1 \leq Cc \leq 3^{E}$		GW	Well-graded gravel F
	More than 50% of	Less than 5% fines <sup>c</sup>	Cu < 4 and/or 1 > Cc > 3	E	GP	Poorly graded gravel F
	coarse	se Fines classify as ML or MH		1H	GM	Silty gravel F,G, H
Coarse Grained Soils: More than 50% retained	fraction retained on No. 4 sieve	More than 12% fines <sup>c</sup>	Fines classify as CL or CH		GC	Clayey gravel F,G,H
on No. 200 sieve	Sands:	Clean Sands:	$Cu \geq 6$ and $1 \leq Cc \leq 3^{E}$		SW	Well-graded sand <sup>1</sup>
	50% or more of coarse	or more of coarse Less than 5% fines <sup>D</sup> $Cu < 6$ and/or $1 > Cc > 3^{E}$		E	SP	Poorly graded sand <sup>1</sup>
	fraction passes	Sands with Fines:	Fines classify as ML or MH		SM	Silty sand G,H,I
	No. 4 sieve	More than 12% fines D	Fines Classify as CL or CH		SC	Clayey sand G,H,I
		Inergenie	PI > 7 and plots on or above "A" line <sup>J</sup> PI < 4 or plots below "A" line <sup>J</sup>		CL	Lean clay <sup>K,L,M</sup>
	Silts and Clays:	morganic:			ML	Silt <sup>K,L,M</sup>
	Liquid limit less than 50	Ormonia	Liquid limit - oven dried	0.75		Organic clay K,L,M,N
-ine-Grained Soils:		Organic:	Liquid limit - not dried	< 0.75	UL	Organic silt <sup>K,L,M,O</sup>
00% or more passes the		Incompation	PI plots on or above "A" I	ine	СН	Fat clay K,L,M
VO. 200 SICVC	Silts and Clays:	inorganic:	PI plots below "A" line		MH	Elastic Silt K,L,M
	Liquid limit 50 or more	Ormonia	Liquid limit - oven dried	. 0.75	011	Organic clay K,L,M,P
		Organic:	nic: < 0.75		UH	Organic silt K,L,M,Q
Highly organic soils:	Primaril	v organic matter, dark in o	color, and organic odor		PT	Peat

<sup>A</sup> Based on the material passing the 3-in. (75-mm) sieve

<sup>B</sup> If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

<sup>c</sup> Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

<sup>D</sup> Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

<sup>E</sup> Cu = D<sub>60</sub>/D<sub>10</sub> Cc = 
$$\frac{(D_{30})^2}{D_{10} \times D_{60}}$$

<sup>F</sup> If soil contains  $\geq$  15% sand, add "with sand" to group name.

<sup>G</sup> If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

- <sup>H</sup> If fines are organic, add "with organic fines" to group name.
- <sup>1</sup> If soil contains  $\geq$  15% gravel, add "with gravel" to group name.
- <sup>J</sup> If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
- <sup>K</sup> If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
- <sup>L</sup> If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
- $^{\rm M}$  If soil contains  $\geq$  30% plus No. 200, predominantly gravel, add "gravelly" to group name.
- $^{\sf N}$  PI  $\geq$  4 and plots on or above "A" line.
- <sup>o</sup> PI < 4 or plots below "A" line.
- <sup>P</sup> PI plots on or above "A" line.
- <sup>Q</sup> PI plots below "A" line.



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# 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.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you - assumedly a client representative - interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in 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.

# Geotechnical-Engineering 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 given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled.* No one except authorized client representatives 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 this Report in Full

Costly problems have occurred because those relying on a geotechnicalengineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full*.

# You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- 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. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.* 

#### This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

#### Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

#### This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmationdependent recommendations if you fail to retain that engineer to perform construction observation*.

#### This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnicalengineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

#### **Give Constructors a Complete Report and Guidance**

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

#### **Read Responsibility Provisions Closely**

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include 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.

#### **Geoenvironmental Concerns Are Not Covered**

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnicalengineering 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 subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.* 

# Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, *proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration*. Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. *Geotechnical engineers are not buildingenvelope or mold specialists*.



Telephone: 301/565-2733 e-mail: info@geoprofessional.org www.geoprofessional.org

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SECTION 01 11 00 - SUMMARY PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.2 SUMMARY OF WORK

- A. Project Identification: As follows:
  - 1. Project: FMCSA Southern Border Program
  - 2. Owner: City of McAllen
  - 3. Location: McAllen Hidalgo Bridge
- B. Contract Documents, dated September 26, 2017 were prepared by Milnet Architectural Services, 608 S. 12<sup>th</sup> St. McAllen, TX. 78501.
- C. The Work consists of the construction of one Concrete Inspection pit with Pre-Eng metal frame canopy, one Pre-Eng metal frame canopy as Waiting Area with anchored to floor benches, one 390 Sq. Ft. restroom building and one 1,854 Sq. Ft. administration office premanufactured building.

#### 1.3 WORK RESTRICTIONS

- A. Contractor's Use of Premises: During construction, Contractor shall have **limited** use of **site** indicated. Contractor's use of premises is limited only by Owner's right to perform work or employ other contractors on portions of Project.
- B. Assume full responsibility for the protection and safekeeping of Products under this Contract, stored on the site.
- C. Move any stored Products, under Contractor's control, which interfere with operations of the Owner and separate contractor.
- PART 2 PRODUCTS (Not Applicable)
- PART 3 EXECUTION (Not Applicable)

#### SECTION 01 20 00 - PRICE AND PAYMENT PROCEDURES

#### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.2 UNIT PRICES

A. Changes to the Work incorporating Unit Prices will be made by Change Order.

#### 1.3 CONTRACT MODIFICATION PROCEDURES

- A. On Owner's approval of a proposal from Contractor, Architect will issue a Change Order on AIA Document G701, for all changes to Contract Sum or Contract Time.
- B. When Owner and Contractor disagree on the terms of a proposal, Architect may issue a Construction Change Directive on AIA Document G714, instructing Contractor to proceed with the change. Construction Change Directive will contain a description of the change and designate the method to be followed to determine changes to Contract Sum or Contract Time.

#### 1.4 PAYMENT PROCEDURES

- A. Submit a Schedule of Values **at least 10 days before** the first Application for Payment. In Schedule of Values, break down Contract Sum into at least one line item for each Specification Section. Correlate the Schedule of Values with Contractor's Construction Schedule.
- B. Submit 3 copies of each application for payment on AIA Document G702/703, according to the schedule established in Owner/Contractor Agreement.
  - 1. For the second Application for Payment through the Application for Payment submitted at Substantial Completion, submit partial releases of liens from each subcontractor or supplier for whom amounts were requisitioned in the previous Application for Payment.
  - 2. Submit final Application for Payment after completion of Project closeout procedures with release of liens and supporting documentation. Include consent of surety to final payment and insurance certificates.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

## **PROJECT MANUAL**

Plans and Specifications – Project No. 216022 For

> City of McAllen McAllen – Hidalgo International Bridge FMCSA Southern Border Program Hidalgo, Texas



TEXAS BOARD OF ARCHITECTURAL EXAMINERS 333 Guadalupe, Suite 2-350, AUSTIN, TX 78701-3942 (Tel: 512/305-9000) HAS JURISDICTION OVER INDIVIDUALS LICENSED UNDER THE ARCHITECT'S REGISTRATION LAW ARTICLE 249a, VERNON'S CIVIL STATUTES".

MILNET ARCHITECTURAL SERVICES 608 S. 12<sup>th</sup> St. McALLEN, TEXAS 78501 (956) 688-5656 - FAX (956) 687-9289

#### SECTION 01 25 00 – SUBSTITUTION PROCEDURES

#### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.2 SUBSTITUTION REQUIREMENTS

- A. When material, article, or method is specified using name of proprietary product manufacturer, vendor, or method followed by phrase "or equal," specific item mentioned establishes basis upon which projects are to be built.
  - 1. Other manufacturers' materials, articles, and methods not named will be considered as substitutions provided required information is submitted on "SUBSTITUTION REQUEST FORM" and will not require substantial revisions of Contract Documents.
  - 2. This applies to specific construction methods when required by Contract Documents.
  - 3. Substitution Requests must be filled out on enclosed "Substitution Request Form".
- B. Whenever material, article, or method is specified or described without phrase "or equal," no substitutions will be allowed.
- C. Costs for redesigns due to substituted items are responsibility of Applicant.
- D. In making request for substitution, Applicant/Contractor represents that he:
  - 1. Has personally investigated proposed product or method and determined that it is equal in all respects to that specified.
  - 2. Will provide same guarantee for substitution as for product or method specified.
  - 3. Will coordinate installation of accepted substitution into work, making design and construction changes to complete work in all respects following the Contract Documents.

#### 1.3 SUBMITTAL OF DATA FOR PROPOSED SUBSTITUTIONS

- A. In order for substitutions that do not change design intent to be considered, submit no later than 10 days prior to bid date deadline, 3 copies of complete data set forth herein to permit complete analysis of proposed substitutions listed on submitted "SUBSTITUTION REQUEST FORM".
- 1. For Products:

- a. Identification including manufacturer's name and address.
- b. Manufacturer's literature, including but not necessarily limited to:
  - 1) Product description, performance, and test data.
  - 2) Reference standards.
- c. Samples where appropriate.
- d. Name and address of similar projects on which product was used and dates of installation with contact name and telephone number.
- 2. For Construction Methods:
  - a. Detailed description of proposed method.
  - b. Drawings illustrating methods.
  - c. Name and address of similar projects on which method was used and dates of use with contact name and telephone number.
- 3. Comparison of proposed substitution with product or method specified
- 4. Data relating to impact on construction schedule by proposed substitution.
- 5. Impact on other contracts.

#### 1.4 APPROVAL OF SUBSTITUTION

- A. Architect's decision regarding evaluation of substitutions will be final and binding.
- B. All approved substitutions will be incorporated into the Contract Documents by Addendum.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

## SUBSTITUTION REQUEST FORM

Project:	Substitution Request Number:
	From:
То:	Date:
	A/E Project Number:
Re:	Contract For:
Specification Title:	Description:
Section: Page:	Article/Paragraph:
Proposed Substitution: Address: Manufacturer: Address: Trade Name:	Phone: Model No.:
Attached data includes product description, specifica	ations, drawings, photographs, and performance and test data adequate for evaluation
Attached data also includes a description of changes installation.	s to the Contract Documents that the proposed substitution will require for its proper
<ul> <li>Same warranty will be furnished for proposed su</li> <li>Same maintenance service and source of replace</li> <li>Proposed substitution will have no adverse effec</li> <li>Proposed substitution does not affect dimensions</li> <li>Payment will be made for changes to building substitution.</li> </ul>	ibstitution as for specified product. ment parts, as applicable, is available. t on other trades and will not affect or delay progress schedule. s and functional clearances. ng design, including A/E design, detailing, and construction costs caused by the
Signed by:	
Firm:	
Address:	
Telephone:	
A/E's REVIEW AND ACTION Substitution approved - Make submittals in accord Substitution approved as noted - Make submittals Substitution rejected - Use specified materials	dance with Specification Section 01340 Submittals in accordance with Specification Section 01340 Submittals
Substitution Request received too late - Use speci	fied materials.
Signed by:	Date:
Supporting Data Attached: Drawings	Product Data Samples Tests Reports
END OF SECTION	
RESTITUTION PROCEDURES	6/15/2017 01.25.00 2

#### SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

#### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.2 PROJECT MANAGEMENT AND COORDINATION

- A. Verify layout information shown on Drawings, in relation to property survey and existing benchmarks, before laying out the Work.
- B. Coordinate construction to ensure efficient and orderly execution of each part of the Work.
- C. Progress meetings will be held at Project site every two weeks. Notify Owner and Architect of meeting dates. Each subcontractor or other entity concerned with current progress or involved with planning or coordination of future activities, shall attend. The Contractor shall:
  - 1. Prepare a progress meeting agenda.
  - 2. Prepare a sign in sheet for each progress meeting.
  - 3. Prepare minutes of each meeting and distribute to parties present.

#### 1.3 CONSTRUCTION SCHEDULE

- A. Prepare a horizontal bar-chart construction schedule. Provide a separate time bar for each activity and a vertical line to identify the first workday of each week. Use same breakdown of Work indicated in the Schedule of Values. As Work progresses, mark each bar to indicate actual completion.
  - 1. Submit within twenty (20) days after date established for Commencement of the Work.
  - 2. Coordinate each element with other activities. Show each activity in proper sequence. Indicate sequences necessary for completion of related Work.
  - 3. Indicate Substantial Completion and allow time for Architect's procedures necessary for certifying Substantial Completion.
  - 4. Schedule Distribution: Distribute copies to Owner, Architect, subcontractors, and parties required to comply with dates.

5. Updating: Revise the schedule after each meeting or activity where revisions have been made. Distribute revised copies to Owner, Architect, subcontractors, and parties required to comply with dates.

#### 1.4 SUBMITTAL PROCEDURES

- A. Coordinate submittal preparation with construction schedule, fabrication lead-times, other submittals, and activities that require sequential operations.
  - 1. No extension of Contract Time will be authorized due to failure to transmit submittals in time to permit processing sufficiently in advance of when materials are required in the Work.
  - 2. Architect will not accept submittals from sources other than Contractor.
- B. Prepare submittals by placing a permanent label on each for identification. Provide a 4 by 5 inch space on the label or beside title block to record review and approval markings and action taken. Include the following information on the label:
  - 1. Project name.
  - 2. Date.
  - 3. Name and address of Contractor.
  - 4. Name and address of subcontractor or supplier.
  - 5. Number and title of appropriate Specification Section.
  - 6. Contractor's certification that materials comply with specified requirements.
- C. Coordinate each submittal with other submittals and with work that does not require submittals.
- D. Product Data: Mark each copy to show applicable choices and options. Include the following:
  - 1. Data indicating compliance with specified standards and requirements.
  - 2. Notation of coordination requirements.
  - 3. For equipment data, include rated capacities, dimensions, weights, required clearances, and furnished specialties and accessories.
- E. Shop Drawings: Submit newly prepared information drawn to scale. Do not reproduce Contract Documents or copy standard information. Submit 1 reproducible print and 1 blue- or black-line print on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches. Architect will return the reproducible print. Include the following:
  - 1. Dimensions, profiles, methods of attachment, coordination with adjoining work, large scale details, and other information, as appropriate for the Work.
  - 2. Identification of products and materials.
  - 3. Notation of coordination requirements.
  - 4. Notation of dimensions established by field measurement.
  - 5. Identification of deviations from Contract Documents.
- F. Samples: Submit Samples finished as specified and identical with the material proposed. Where variations are inherent in the material, submit sufficient units to show limits of the variations. Include product name or name of the manufacturer.
- G. Architect will review each submittal, mark as appropriate to indicate action taken, and return copies less those retained. Compliance with specified requirements remains Contractor's responsibility.

#### PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

#### SECTION 01 33 00 - SUBMITTALS

#### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.2 WORK INCLUDED

A. Provide shop drawings, product data, physical samples and color samples as indicated herein and in each technical section of these specifications.

#### 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Additional submittal requirements specific to the particular section of the specifications.

#### PART 2 - PRODUCTS

#### 2.1 SHOP DRAWINGS

- A. Prepare shop drawings using competent draftsmen, clearly and precisely showing the following:
  - 1. The size and gage of members.
  - 2. The method of anchoring and securing members of parts together.
  - 3. The quantity and location of each item.
  - 4. Other pertinent data necessary to show the Work to be done and where and how it is to be done.
- B. Prepare Drawings to scale, including full size details as required to fix and illustrate the Work required. Do not use Contract Documents or reproductions thereof as shop drawing submittals.
- C. Each sheet of Drawings shall be 30 x 40 inches maximum size with borders. Provide a title block in the lower right hand corner with the following information:
  - 1. Title of the sheet.
  - 2. Name and location of Project.
  - 3. Names of:
    - a. Architect/Engineer.
    - b. General Contractor.
    - c. Manufacturer of the specified materials and equipment.

- 4. The date of the Submittal.
- 5. The date of each correction or revision.
- 6. **Submittal number including Division No.** (such as submittal no. 3 under Division 11 is numbered "11-03").
- D. Fold drawings to 8-1/2x11 inch dimensions with title block exposed to top.
- E. Check the Drawings and add any corrections of field measurements needed. Stamp and sign the Contractor's approval, checker's signature, and date of approval before submitting to the Architect. Shop Drawings which do not bear the Contractor's stamp or have not been reviewed by the Contractor, will be returned by the Architect without review or approval.
- F. Number Shop Drawings consecutively. Indicate working and erection dimensions, arrangements, sectional views, necessary details including complete information for making connections with other Work, kinds of materials, and finishes.
- G. Provide a transmittal letter in duplicate, pointing out any deviations from items, methods or named manufacturers included in the Specifications or on the Drawings. Note submittal file number including Division.
- H. Submit <u>six (6)</u> blue line prints of each Shop Drawing sheet.
- I. Make such corrections, changes, resubmit bound sets of Shop Drawings prints, as required herein, until approved is obtained. Any corrections or changes indicated on Shop Drawings shall not be considered as an extra work order.

#### 2.2 PHYSICAL SAMPLES

- A. Provide duplicate samples of items as specified. Samples shall be 12 inches square or 12 inches long unless noted otherwise. Minimum liquid samples shall be 1 pint. Installed materials shall match approved samples.
- B. For Architect's permanent files provide one (1) 6" x 6" sample of all interior finishes, colors and materials (aluminum finish, glazing, plastic laminate, paint finish flooring materials, ceiling finish, etc.)
- C. Provide a transmittal letter with each sample, listing the following:
  - 1. Specification section title and paragraph specifying the material.
  - 2. Name and location of Project.
  - 3. Names of:
    - a. Architect/Engineer.
    - b. General Contractor.
    - c. Manufacturer of the specified materials and equipment.
  - 4. The date of the Submittal.
  - 5. Submittal file number including Division.
- D. If samples are not acceptable they will be returned directly to the Contractor for modification and resubmission.
- E. If samples are acceptable, notification will be sent directly to the Contractor, and the sample retained for comparison with the complete Work.

#### 2.3 MANUFACTURER'S PRODUCT DATA

- A. Provide <u>six (6)</u> copies of pre-printed Product Data of items as specified. Carefully mark out all items not applicable to the specified item.
- B. Standard catalogs, brochures, etc. including information not applicable to the project and not marked through, will be returned without review or approval.
- C. Provide a transmittal letter with the Product Data from each manufacturer, listing the following information:
  - Name and location of Project.
  - 2. Names of:

1.

- a. Architect/Engineer.
- b. General Contractor.
- c. Manufacturer of the specified materials and equipment.
- 3. The date of the Submittal.
- 4. Submittal file number including Division.
- D. If Product Data is not approved, one copy will be marked and returned directly to the Contractor for modification and resubmission.
- E. If Product Data is approved, notification and one copy of the acceptable Product Data will be sent directly to the Contractor.
- F. When requested by the Architect, provide six (6) copies of each ASTM Federal Specification, or other applicable documents referenced in the material Section.

#### PART 3 - EXECUTION

#### 3.1 REVIEW PROCEDURE

- A. Submittals will be reviewed with reasonable promptness so as to cause no delay, but only for conformance with the design concept of the project and with the information given in the Contract Documents. Architect shall be allowed a maximum review period of <u>fourteen (14)</u> calendar days. The review of a separate item shall not indicate a review of an assembly in which the item functions. Submittals that contain excessive errors or that are incomplete will be returned without review and approval and any delay caused thereby shall be the responsibility of the Contractor.
- B. If any submittals are not approved as submitted, all copies will be returned directly to the Contractor for revision. The reviewed submittals will be returned to the Contractor as soon as practicable.
- C. The Contractor shall make all revisions as noted and shall resubmit the required number of corrected copies of submittals, until no exceptions are taken. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, to revisions other than those requested on previous submissions.
- D. The review of submittals shall not relieve the Contractor of responsibility for deviations from the requirements of the Contract Documents unless the Contractor has submitted, in writing, such deviations and written approval has been given to each specific deviation. The review shall not relieve the Contractor from responsibility for errors and omissions in the Shop Drawings and samples.

- E. No portion of the Work requiring a submittal shall commence until the submittal has been approved as designated in the Conditions of the Contract. All such portions of the Work shall be in accordance with the submittal that has been stamped with final "Reviewed Without Exceptions" note, or "Approved" note.
- F. Materials and equipment specified or approved prior to beginning the Work are required to be used on the Project. Any proposed substitution resulting from no availability of specified items must be proven "better than" by the Contractor and approved in writing by the Architect. Substitutions included in submittals shall be so noted and brought to the Architect's attention in the submittal and on the transmittal. Failure to follow this procedure will render the substitution as not acceptable whether or not reviewed by the Architect.
- G. The Contractor shall have the approved shop drawings at the site at all times for use in the construction of the Work. Failure of the Contractor to supply such drawings will be deemed sufficient cause to delay the Work until such drawings are available for field use and reference.
- H. For submittals that will be reviewed by one of the Architect's consultants, these submittals shall be delivered directly to the Architect. The Architect will then be responsible to provide the Consultant with a copy of the submittal.
- I. For submittals that will be reviewed by one of the Architect's consultants, do not send to the Consultant as part of the package any items which will be reviewed by the Architect. As an example, do not provide a single submittal package combining Structural Steel and Miscellaneous Metal Fabrications.

#### SECTION 01 35 16 — ALTERATION PROJECT PROCEDURES

#### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.2 SECTION INCLUDES

- A. Products and installation for patching and extending Work.
- B. Transition and adjustments.
- C. Repair of damaged surfaces, finishes, and cleaning.

#### 1.3 RELATED SECTIONS

- A. Section 01 11 00 Summary: Work sequence and Phasing.
- B. Section 01 73 29 Cutting and Patching: Requirements and limitations for cutting and patching of work.
- C. Section 01 50 00 Temporary Facilities and Controls: Temporary enclosures, protection of installed work, and cleaning during construction.

#### PART 2 - PRODUCTS

#### 2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

- A. New Materials: As specified in product sections; match existing Products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing Products where necessary, referring to existing Work as a standard.

#### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Verify that demolition is complete and areas are ready for installation of new Work.
- B. Beginning of restoration Work means acceptance of existing conditions.

#### 3.2 PREPARATION

- A. Cut, move, or remove items as necessary for access to alterations and renovation Work. Store items scheduled for reinstallation. Replace and restore at completion.
- B. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.
- C. Remove debris and abandoned items from area and from concealed spaces.
- D. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.
- E. Close openings in exterior surfaces to protect existing work, salvaged, and stored items from weather and extremes of temperature and humidity. Temporarily seal wall cavities and substrates exposed by cutting, patching, and demolition work to prevent accumulation and trapping of moisture which will allow the development of mildew.

#### 3.3 INSTALLATION

- A. Coordinate work of alterations and renovations to expedite completion sequentially. Do not remove existing items which weatherproof buildings (windows, roofing, doors, exterior finishes etc.) until new materials and items are ready for installation.
- B. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring products and finishes to specified condition. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes, in accordance with Section 01 73 29 Cutting and Patching.
- C. Install Products as specified in individual sections.

#### 3.4 TRANSITIONS

- A. Where new Work abuts or aligns with existing, perform a smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division. Consult Architect for direction on making transitions.

#### 3.5 ADJUSTMENTS

- A. Where removal of partitions or walls result in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
- B. Fit work at penetrations of surfaces as specified in Section 01 73 29 Cutting and Patching.

#### 3.6 REPAIR OF DAMAGED SURFACES

- A. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- B. Repair substrate prior to patching finish.

#### 3.7 FINISHES

- A. Finish surfaces as specified in individual Product sections.
- B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

#### SECTION 01 40 00 - QUALITY REQUIREMENTS

#### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.2 SECTION REQUIREMENTS

- A. Quality-control services include inspections, tests, and related actions including reports. Quality-control services are further specified in other Sections of these Specifications and shall be performed by independent testing agencies provided by Contractor or Owner, as specified.
  - 1. Unless otherwise indicated, quality-control services required by authorities having jurisdiction will be provided by Owner.
- B. Contractor is responsible for scheduling inspections and tests.

#### C. Retesting: Contractor shall pay for retesting where results of inspections and tests prove unsatisfactory and indicate noncompliance with requirements.

- D. Auxiliary Services: Cooperate with agencies performing inspections and tests. Provide auxiliary services as requested. Notify agency in advance of operations requiring tests or inspections, to permit assignment of personnel. Auxiliary services include the following:
  - 1. Access to the Work.
  - 2. Incidental labor and facilities to assist inspections and tests.
  - 3. Adequate quantities of materials that require testing, and assisting in taking samples.
  - 4. Facilities for storage and curing of test samples.
  - 5. Security and protection of samples and test equipment.
- E. Duties of Testing Agency: Testing agency shall cooperate with Architect and Contractor in performing its duties. Agency shall provide qualified personnel to perform inspections and tests.
  - 1. Agency shall promptly notify Architect and Contractor of irregularities or deficiencies observed in the Work during performance of its services.
  - 2. Agency shall not release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.
  - 3. Agency shall not perform duties of Contractor.

- F. Submittals: Testing agency shall submit a certified written report of each inspection and test to the following:
  - 1. Owner.
  - 2. Architect.
  - 3. Contractor.
  - 4. Structural engineer.
  - 5. Authorities having jurisdiction, when authorities so direct.
- G. Report Data: Reports of each inspection, test, or similar service shall include at least the following:
  - 1. Name, address, and telephone number of testing agency.
  - 2. Project title and testing agency's project number.
  - 3. Designation (number) and date of report.
  - 4. Dates and locations where samples were taken or inspections and field tests made.
  - 5. Names of individuals taking the sample or making the inspection or test.
  - 6. Designation of the product and test method.
  - 7. Complete inspection or test data including an interpretation of test results.
  - 8. Ambient conditions at the time of sample taking and testing.
  - 9. Comments or professional opinion on whether inspected or tested Work complies with requirements.
  - 10. Recommendations on retesting or reinspection.
  - 11. Name and signature of laboratory inspector.
- H. Testing Agency Qualifications: Engage inspection and testing agencies that are prequalified as complying with the American Council of Independent Laboratories' "Quality Assurance Manual" and that specialize in the types of inspections and tests to be performed.
  - 1. Each testing agency shall be authorized by authorities having jurisdiction to operate in the state where Project is located.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

#### SECTION 01 50 00 — TEMPORARY FACILITIES AND CONTROLS

#### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.2 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone and fax service, water, and sanitary facilities.
- B. Temporary Controls: Barriers, enclosures and fencing, protection of the Work, and water control.
- C. Construction Facilities: Access roads, parking, progress cleaning, project signage and temporary buildings.

#### 1.3 TEMPORARY ELECTRICITY

- A. Cost: By General Contractor. Utilize existing power service if approved by Owner. Extend temporary outlets in NEC and OSHA approved manner to facilitate construction.
- B. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.
- C. Provide main service disconnect and over correct protection at convenient location.
- D. Provide sufficient and adequate distribution equipment, wiring, and outlets to ensure unimpeded progress of the Work.
- E. Permanent convenience receptacles may be utilized during construction.

#### 1.4 TEMPORARY LIGHTING

A. Provide and maintain lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft.

- B. Provide and maintain 1 watt/sq ft lighting to exterior staging and storage areas after dark for security purposes.
- C. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- D. Permanent building lighting may be utilized during construction.
- E. Maintain lighting and provide routine repairs.

#### 1.5 TEMPORARY HEAT

- A. Provide and pay for heating devices and heat as needed to maintain specified conditions for construction operations.
- B. Maintain minimum ambient temperature of 50 degrees F (10 degrees C) in areas where construction is in progress, unless indicated otherwise in product sections.

#### 1.6 TEMPORARY COOLING

A. If required for the proper installation of particular materials, systems, or equipment, provide and pay for cooling devices and cooling as needed to maintain specified conditions.

#### 1.7 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to assist cure of materials, to dissipate humidify, and to prevent accumulation of dust, fumes, vapors, or gases.
- B. Utilize existing ventilation equipment if approved by Owner. Extend and supplement equipment with temporary fan units as required to maintain clear air for construction operations.

#### 1.8 TELEPHONE SERVICE

A. Provide, maintain and pay for telephone service to field office.

#### 1.9 FACSIMILE SERVICE

A. Provide, maintain and pay for separate telephone line to be used solely for fax service to field office.

#### 1.10 TEMPORARY WATER SERVICE

- A. Utilize existing water service if approved by Owner for construction operations.
- B. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing as required.

#### 1.11 TEMPORARY SANITARY

A. Provide and maintain required facilities and enclosures. Existing facility use is **not** permitted. Provide at time of project mobilization.

#### 1.12 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas to protect existing facilities and adjacent properties from damage from construction operations and demolition. Barriers must isolate occupied use from construction activities. If and when needed, barriers must be capable of attenuating sound.
- B. Provide protection for existing plant life and landscaped. Maintain plant life and landscaped areas as necessary during construction operations. Replace damaged plant life.
- C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.
- D. Barrier plan and method subject to approval by the Architect and the Owner.

#### 1.13 FENCING

- A. Construction: Commercial grade chain link fence.
- B. Provide 6 foot high fence around construction site, equip with vehicular and pedestrian gates with locks. Fence must be capable of restricting entry by on-site facility users.

#### 1.14 WATER CONTROL

- A. Grade site to drain where additions are undertaken. Maintain excavations free of water. Provide, operate, and maintain pumping equipment and/or any other means, methods or techniques necessary to maintain excavation and site free of water.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

#### 1.15 EXTERIOR ENCLOSURES

- A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protect for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
- B. Provide temporary protection of existing wall cavities, substrates, and surfaces exposed to weather during cutting and minor demolition operations to prevent entrapment of moisture and development of mildew.

#### 1.16 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection to prohibit damage and where specified in individual specification sections.
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to minimize damage.

- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic in all landscaped areas.

#### 1.17 SECURITY

- A. Provide security and facilities to protect Work and existing facilities from unauthorized entry, vandalism, or theft.
- B. Coordinate project security program with Owner's existing security operations at project mobilization.
- C. Maintain program throughout construction period until Owner acceptance precludes the need for Contractor security.
- D. Restrict entrance of persons and vehicles into Project site and existing facilities, allowing entrance only to authorized persons and persons identified by the Contract Document and/or the Architect or Owner as authorized to visit Project site.

#### 1.18 ACCESS

- A. Provide and maintain temporary roads accessing public thoroughfares to serve construction area.
- B. Extend and relocate as work progress requires. Provide detours necessary for unimpeded traffic flow.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.
- E. Existing on-site roads may be used for construction traffic.

#### 1.19 PARKING

- A. Provide temporary surface parking areas to accommodate construction personnel. Existing site areas may be used if approved in advance by the Owner.
- B. Contractor to propose plan for Owner concurrence and approval.

#### 1.20 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and rubbish from site weekly and dispose off-site.

#### 1.21 PROJECT IDENTIFICATION

- A. Provide project sign. Refer to drawings for size and content.
- B. Erect on site at location established by Architect.
- C. No other signs are allowed without Owner permission except those required by law.

#### 1.22 FIELD OFFICES AND SHEDS

- A. Office: Weather tight with lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with sturdy furniture drawing rack, and drawing display table, phone and fax.
- B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.
- C. Provide storage sheds and facilities to accommodate Work. Size to storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and for inspection of products to requirements of Section 01 25 00.
- D. Designated existing covered and uncovered hard paved areas and facilities may be used for field storage areas. Protect and secure existing areas used for storage. Upon completion of Work, clean, repair, and restore all existing areas used for storage and restore to acceptable condition.

#### 1.23 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials prior to Substantial Completion.
- B. Remove underground installation to a minimum depth of 2 feet. Grade site to drain.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

#### SECTION 01 73 29 — CUTTING AND PATCHING

#### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.2 SECTION INCLUDES

A. Requirements and limitations for cutting and patching of Work.

#### 1.3 RELATED SECTIONS

- A. Section 01 10 00 Summary: Work by Owner or by separate Contractors.
- B. Section 01 35 16 Alteration Project Procedures.
- C. Section 01 25 00 Substitution Procedures.
- D. Individual Product Specification Sections:
  - 1. Cutting and patching incidental to work of the section.
  - 2. Advance notification to other sections of openings required in work of those sections.
  - 3. Limitations on cutting structural members.

#### 1.4 SUBMITTALS

- A. Submit written request in advance of cutting or alteration which affects:
  - 1. Structural integrity of any element of Project.
  - 2. Integrity of weather exposed or moisture resistant element.
  - 3. Efficiency, maintenance, or safety of any operational element.
  - 4. Visual qualities of sight exposed elements.
  - 5. Work of Owner or separate Contractor.
- B. Include in request:
  - 1. Identification of Project.
  - 2. Location and description of affected Work.
  - 3. Necessity for cutting or alteration.
  - 4. Description of proposed Work and Products to be used.
- 5. Alternatives to cutting and patching.
- 6. Effect on work of Owner or separate Contractor.
- 7. Written permission of affected separate Contractor.
- 8. Date and time work will be executed.

## PART 2 - PRODUCTS

# 2.1 MATERIALS

- A. Primary Products: Those required for original installation.
- B. Product Substitution: For any proposed change in materials, submit request for substitution in accordance with Section 01 25 00 Substitution Procedures.

### PART 3 - EXECUTION

# 3.1 EXAMINATION

- A. Examine existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.
- B. After uncovering existing Work, assess conditions affecting performance of work.
- C. Beginning of cutting or patching means acceptance of existing conditions.

#### 3.2 PREPARATION

- A. Provide temporary supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.
- B. Provide protection from elements for areas which may be exposed by uncovering work. Avoid unnecessary or extended exposure to weather of work exposed by cutting. Avoid entrapment of moisture or other deleterious mater between existing substrates and new work.
- C. Maintain excavations free of water.

#### 3.3 CUTTING

- A. Execute cutting and fitting including excavation and fill to complete the Work.
- B. Uncover work to install improperly sequenced work.
- C. Remove and replace defective or non-conforming work.
- D. Remove samples of installed work for testing when requested.
- E. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight-exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

## 3.4 PATCHING

- A. Execute patching to complement adjacent Work.
- B. Fit Products together to integrate with other Work.
- C. Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.
- D. Employ skilled installer to perform patching for weather exposed and moisture resistant elements, and sight-exposed surfaces.
- E. Restore work with new Products in accordance with requirements of Contract Documents.
- F. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- G. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

### SECTION 02 41 19 - SELECTIVE DEMOLITION

### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

### 1.2 SECTION REQUIREMENTS

- A. Unless otherwise indicated, demolished materials become Contractor's property. Remove from Project site.
- B. Items indicated to be removed and salvaged remain Owner's property. Remove, clean, and deliver to Owner's designated storage area.
- C. Comply with EPA regulations and disposal regulations of authorities having jurisdiction.
- D. Conduct demolition without disrupting Owner's use of the building.

#### PART 2 - PRODUCTS (Not Applicable)

#### PART 3 - EXECUTION

#### 3.1 DEMOLITION

- A. Maintain and protect existing utilities to remain in service before proceeding with demolition, providing bypass connections to other parts of the building.
- B. Locate, identify, shut off, disconnect, and cap off utility services to be demolished.
- C. Employ a certified, licensed exterminator to treat building and to control rodents and vermin.
- D. Conduct demolition operations and remove debris to prevent injury to people and damage to adjacent buildings and site improvements.
- E. Provide and maintain shoring, bracing, or structural support to preserve building stability and prevent movement, settlement, or collapse.

- F. Protect building structure or interior from weather and water leakage and damage.
- G. Protect remaining walls, ceilings, floors, and exposed finishes. Erect and maintain dustproof partitions. Cover and protect remaining furniture, furnishings, and equipment.
- H. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction.
- I. Promptly patch and repair holes and damaged surfaces of building caused by demolition. Restore exposed finishes of patched areas and extend finish restoration into remaining adjoining construction.
- J. Promptly remove demolished materials from Owner's property and legally dispose of them. Do not burn demolished materials.

### SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

### 1.2 WORK INCLUDED

- A. All concrete work, including sidewalks, exterior ramps, steps, miscellaneous concrete.
- B. All form work.
- C. Reinforcing steel.
- D. Installation of sleeves which are furnished by plumbing, heating and electrical contractors.
- E. Equipment bases are shown on architectural, mechanical, plumbing and electrical drawings.
- F. Provide and install waterstop material at below grade joints.

### 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Testing Laboratory services.
- B. Excavation and fill.
- C. Concrete paving, curbs, sidewalks and site concrete.
- 1.4 DRAWING REFERENCES: See drawings for reinforcing sizes and placement.
- 1.5 Submittals:
  - A. DESIGN MIX: Submit six (6) copies directly to the project Architect the proposed concrete mix(es). Include cement brand and type, aggregate identification, admixtures, proportions and anticipated strengths.

- B. PLASTIC CHAIR SUPPORTS: Submit manufacturer's literature indicating dimensions, configurations and performance data. Submit sample for approval by the Architect. Space at a maximum of 45" centers each way. Provide closer spacing where required to prevent excessive sag, where indicated on the drawings, or to support the weight of concrete pump hose.
- C. ADMIXTURES: Submit manufacturer's product data describing material and mix proportions.
- D. WATERSTOPS: Submit manufacturer's product data describing material and installation procedures.
- E. CURING COMPOUND: Submit Manufacturer's literature indicating composition and recommended application procedures.
- F. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.

# 1.6 SAMPLES

A. Plastic chair support.

# 1.7 WARRANTY

A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.

### 1.8 QUALITY ASSURANCE

- A. Cast-in-place concrete shall be installed by technicians specially trained in the proper handling, placing and protection of concrete and reinforcing steel. If required by the Architect, installer shall submit for approval a list of similar installations successfully completed.
- B. Comply with ASTM C 94; ACI 301, "Specification for Structural Concrete"; ACI 117, "Specifications for Tolerances for Concrete Construction and Materials"; and CRSI's "Manual of Standard Practice."
- C. Engage a qualified independent testing agency to design concrete mixes.

# PART 2 - PRODUCTS

# 2.1 MATERIALS

- A. GENERAL: All materials used in the Work shall be stored or handled in a manner that will prevent deterioration; any materials that have been damaged shall be immediately and completely removed from the Work. All manufactured materials, such as cement, shall be delivered and stored in their original packages that show marks or other evidence of damage shall be wholly rejected.
- B. Deformed Reinforcing Bars: ASTM A 615/A 615M, Grade 60.
- C. Plain Steel Wire: ASTM A 82, as drawn.
- D. Steel Welded-Wire Fabric: ASTM A 185, flat sheets not rolls. Use mesh for sidewalks and equipment pads, as indicated on the drawings.

- E. Portland Cement: ASTM C 150, Type I, latest edition.
- F. The use of Fly Ash in the concrete mix is not acceptable.
- G. Aggregates: ASTM C 33, uniformly graded.
- H. Fiber Reinforcement: ASTM C 1116, Type III, synthetic fibers, 1/2 to 1 inch.
- I. Air-Entraining Admixture: ASTM C 260.
- J. Chemical Admixtures:
  - 1. General: All admixtures shall be added only at the plant during mixing and must be prior approved by the Testing Laboratory. Admixtures shall comply with the requirements of ASTM C260 and C-494. Admixtures containing calcium chloride are not acceptable. Do not use admixtures in footings or seal slabs.
- K. Water Stops: Flat dumbbell or center-bulb type, of either rubber (CRD C 513) or PVC (CRD C 572).

# L. Vapor Barrier: Reference Spec Section 07 26 16 Under Slab Vapor Barrier.

- M. Liquid Membrane-Forming Curing Compound: ASTM C 309, clear, Type I, Class A or B, solvent borne, wax free.
- N. Liquid Membrane-Forming Curing and Sealing Compound: ASTM C 1315, clear, Type I, Class A, solvent borne.
- O. Slip-Resistive Aggregate: Factory-produced, rustproof, nonglazing, fused aluminum-oxide granules or crushed emery, unaffected by freezing, moisture, and cleaning materials.
- P. Joint-Filler Strips: ASTM D 1751, cellulosic fiber, or ASTM D 1752, cork.
- Q. Repair Underlayment: Factory-packaged, portland or blended hydraulic cement-based, polymermodified, self-leveling underlayment with minimum 28-day compressive strength of 4100 psi (29 MPa).
- R. Repair Topping: Factory-packaged, portland or blended hydraulic cement-based, polymer-modified, self-leveling traffic-bearing topping with minimum 28-day compressive strength of 5700 psi (39 MPa).

# 2.2 MIXES

- A. Proportion normal-weight concrete mixes to provide the following properties:
  - 1. Compressive Strength:
    - a. Ramps and sidewalks: 3000 psi at 28 days.
  - 2. Slump Limit: 5 inches at point of placement.
  - 3. Air Content: 5.5 to 7.0 percent for concrete exposed to freezing and thawing, 2 to 4 percent elsewhere.

# 2.3 FORMWORK

A. GENERAL: Forms shall conform to the shapes, lines, grade and dimensions of the concrete as indicated in the drawings. Lumber used in forms for exposed surfaces shall be dressed to a uniform thickness and shall be free of loose knots or other defects. Lumber once used in forms shall be thoroughly cleaned before another usage. Form **full depth** of outside face of perimeter grade beams without horizontal joints or cracks. Forms shall be substantial and sufficiently tight to prevent leakage. They shall be properly shored, braced or otherwise tied or supported to maintain the desired position and shape during and after placement of concrete. Use no formwork which may stain exposed concrete surfaces.

- B. FORM LINING: For exposed concrete the final finish shall be smooth, even and free of defects.
- C. FORM REMOVAL: Forms shall remain in place sufficient time for the concrete to obtain necessary strength to support its own weight and construction load.

### PART 3 - EXECUTION

### 3.1 CONCRETING

- A. Construct formwork and maintain tolerances and surface irregularities within ACI 117 limits of Class A for concrete exposed to view and Class C for other concrete surfaces.
- B. Set water stops where indicated to ensure joint water tightness.
- C. Place vapor retarder on prepared subgrade, with joints lapped 6 inches (150 mm) and sealed.
- D. Accurately position, support, and secure reinforcement.
- E. Install construction, isolation, and contraction joints where indicated. Install full-depth joint-filler strips at isolation joints.
- F. Place concrete in a continuous operation and consolidate using mechanical vibrating equipment.
- G. Protect concrete from physical damage, premature drying, and reduced strength due to hot or cold weather during mixing, placing, and curing.
- H. Formed Surface Finish: Smooth-formed finish for concrete exposed to view, coated, or covered by waterproofing or other direct-applied material; rough-formed finish elsewhere.
- I. Slab Finishes: Float finish for ramps and surfaces to receive waterproofing or other direct-applied material. Trowel and fine-broom finish for surfaces to receive thin-set tile. Nonslip-broom finish to exterior concrete platforms, steps, and ramps.
- J. Uniformly spread 25 lb/100 sq. ft. (12 kg/10 sq. m) of dampened slip-resistive aggregate over initially floated surfaces; tamp and float. Expose nonslip aggregate after curing.
- K. Uniformly spread 100 lb/100 sq. ft. (49 kg/10 sq. m) of mineral dry-shake floor hardener over initially floated surfaces, repeat float finishing to embed each application, and then apply a trowel finish.
- L. Cure formed surfaces by moist curing for at least seven days.
- M. Begin curing concrete slabs after finishing.
- N. Owner will engage a testing agency to perform field tests and to submit test reports.
- O. Protect concrete from damage. Repair surface defects in formed concrete and slabs.
- P. Repair slabs not meeting surface tolerances by grinding high areas and by applying a repair underlayment to low areas receiving floor coverings and a repair topping to low areas to remain exposed.

# 3.2 CLEANING AND PROTECTION

- A. CLEANING: Slabs are to be kept free of any foreign substances (wax, oil, paint, etc.) or surface irregularities that may affect the final appearance of the completed installation.
- B. Unless otherwise approved by the Architect, no vehicular traffic will be allowed on any concrete until after the 7 day concrete tests have been made by the laboratory indicating that the concrete has attained 3,000 psi compressive strength.
- C. Contractor shall coordinate with Architect and Owner to determine a suitable on-site "wash-out" area for concrete trucks. Contractor shall be responsible for clean-up of the area.
- D. Contractor shall keep clean all adjacent public streets and rights of way. Wash down daily or more often as needed to remove mud and maintain a safe condition at entrances/exits to job site.

### SECTION 03 50 00 - CONCRETE FLOOR FINISHING

### PART 1 – GENERAL

#### 1.0 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Finishing slabs-on-grade, monolithic floor slabs, and separate floor toppings.
- B. Related Sections include the following:
  - 1. Division 3 Section "Cast-in-Place Concrete" for concrete slab construction and finish and concrete topping slabs.
  - 2. Division 7 Section "Joint Sealers"

# 1.2 REFERENCES

- A. The latest adopted edition of all standards referenced in this section shall apply, unless noted otherwise.
  - 1. ACI 301 Specifications for Structural Concrete for Buildings
  - 2. ACI 302 Guide for Concrete Floor and Slab Construction
  - 3. ASTM E1155 Determining Floor Flatness and Levelness Using the F-Number System (Inch-Pound Units).

## 1.3 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
- B. Submittals
  - 1. Product Data: Submit manufacturer's data showing compliance with the specifications for the following products:

a. Sealer

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage, mixing with other components, and application.
- B. Store materials to comply with manufacturer's written instructions to prevent deterioration from moisture or other detrimental effects.

### PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

# 2.2 RELATED MATERIALS

- A. Semi rigid Joint Filler: Two-component, semi rigid, 100 percent solids, epoxy resin with a Type A Shore durometer hardness of 80 per ASTM D 2240.
- B. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- C. Saw cut joint filler: Euco 700 epoxy by The Euclid Chemical Company, or approved equal.

### PART 3 - EXECUTION

### 3.1 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Concrete slabs shall be finished as specified below, within the tolerances specified elsewhere in this Section.
  - 1. Highway straightedges are recommended for use in lieu of bull floats for all slab placement and finishing operations.
  - 2. Screeding: Immediately after placing, slab shall be vibrated and struck off true by double screeding to the required level, at or below the elevation or grade of the finished slabs as indicated on the Drawings. Vibrators shall not be used to spread the concrete. When camber is indicated for slabs supported on formwork, screed to the required camber. Fixed screed guides are recommended where specified surface tolerance exceeds FF25/FL20.
  - 3. Floating: Immediately after screeding, before any excess bleed water is present on the surface, float the surface using long-handled bull floats or darbies.

- 4. Straightedging: Immediately after screeding and before excess bleed water is present on the surface, straighten the surface using a highway straightedge.
- 5. Edging and jointing, where required, shall be done after bleed water has evaporated and before further finishing.
- 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 restraightening until surface is left with a uniform, smooth, granular texture.
  - 1. Apply float finish to surfaces to receive trowel finish.
  - 2. Locations: All concrete surfaces under waterproofing membrane, setting beds for brick, mudset tile, pavers, or terrazzo, and noncomposite topping slabs.
- 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. Locations: Exposed concrete floors not otherwise specified, concrete surfaces under carpets, vinyl tile, thin set tile, wood flooring, elastomeric coatings, and painted concrete floors, and roof slabs that are future floors.
- 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, and ramps, and elsewhere as indicated.
  - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiberbristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

#### 3.2 FINISHING CONCRETE TOPPING SLABS

- A. Place concrete floor topping continuously in a single layer, tamping and consolidating to achieve tight contact with bonding surface. Do not permit cold joints or seams to develop within pour strip.
  - 1. Screed surface with a straightedge and strike off to correct elevations.
  - 2. Slope surfaces uniformly where indicated.
  - 3. Begin initial floating using bull floats to form a uniform and open-textured surface plane free of humps or hollows.

- B. Finishing: Consolidate surface with power-driven floats as soon as concrete floor topping can support equipment and operator. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until concrete floor topping surface has a uniform, smooth, granular texture.
  - 1. Provide floor finish as described above.
    - a. Finish surfaces to specified overall values of flatness, F(F) 25; and levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and levelness, F(L) 15, and notify independent testing agency to permit measurement within 24 hours according to ASTM E 1155 for a randomly trafficked floor surface.
    - b. Finish and measure surface so gap at any point between surface and an unleveled freestanding 10-foot-long straightedge, resting on 2 high spots and placed anywhere on the surface, does not exceed 1/4 inch.

# 3.3 CONTROL JOINTS IN TOPPING SLABS

- A. Saw-cut Control Joints with Soff-Cut saw: After completion of finishing operation, cut control joints using a "Soff-Cut" brand electric saw along straight lines where called for on the Drawings. Follow manufacturer's instructions in using "Soff-Cut" saw. Sawcutting shall be done within 2 hours after the completion of finishing, but not so soon as to cause raveling of the joint. Cut to depth indicated on the Drawings.
  - 1. After completion of finishing operations, cut control joints along straight lines where called for on the Drawings. Saw cutting shall be done within 4 hours after the completion of finishing, but not so soon to cause raveling of the joint. Cut to the depth indicated on the Drawings.
- B. Form joints in concrete topping slabs at 8'-4" o.c. max.
- C. Construct control joints for a combined depth equal to <sup>1</sup>/<sub>4</sub> the topping thickness.

# 3.4 J OINT FILLING

- A. Prepare, clean, and install joint filler per manufacturer's written instructions.
  - 1. Defer joint filling until concrete has aged at least one month(s). Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semi rigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.
  - 1. Install joint-filler strips in lengths if practicable. Where more than one length is required, lace or clip sections together.

# 3.5 CONCRETE FINISH MEASUREMENT AND TOLERANCES

- A. All floors are subject to measurement for flatness and levelness and shall comply with the following:
  - 1. Measurement Standard: All floors are subject to measurement for flatness and levelness, according to ASTM E1155, "Standard Test Method for Determining Floor Flatness and Levelness Using the F-Number System."
- B. Two-Tiered Measurement Standard: Each floor test section and the overall floor area shall conform to the two-tiered measurement standard as specified herein.
  - 1. Minimum Local Value: The minimum local FF/FL values represent the absolute minimum surface profile that will be acceptable for any one test sample (line of measurements) anywhere within the test area.
  - 2. Specified Overall Value: The specified overall FF/FL values represent the minimum values acceptable for individual floor sections as well as the floor as a whole.
- C. Floor Test Sections
  - 1. A floor test section is defined as the smaller of the following areas:
    - a. The area bounded by column and/or wall lines.
    - b. The area bounded by construction and/or control joint lines.
    - c. Any combination of column lines and/or control joint lines.
  - 2. Test sample measurement lines within each test section shall be multidirectional along two orthogonal lines, as defined by ASTM E1155, at a spacing to be determined by the Owner's testing agency.
  - 3. The precise layout of each test section shall be determined by the Owner's testing agency.
- D. Concrete Floor Finish Tolerance
  - 1. The following values apply before removal of shores. Levelness values (FL) do not apply to intentionally sloped or cambered areas, nor to slabs poured on metal deck or precast concrete.

a.	Typical		
	i ypioui.	Overall Value	FF25/FL20
		Minimum Local Value	FF17/FL15

- E. Floor Elevation Tolerance Envelope:
  - 1. The acceptable tolerance envelope for absolute elevation of any point on the slab surface, with respect to the elevation shown on the Drawings, is as follows:
    - a. Slab-on-Grade Construction: +/- 3/4"
    - b. Top surfaces of formed slabs measured prior to removal of supporting shores: +/- 3/4"
    - c. Top surfaces of all other slabs: +/-3/4"

d. Slabs specified to slope shall have a tolerance from the specified slope of 3/8" in 10'-0" at any point, up to 3/4" from theoretical elevation at any point.

# 3.6 FIELD QUALITY CONTROL

- A. Concrete Floor Flatness and Levelness:
  - 1. Measurement Standard: Floors shall be measured for flatness and levelness according to ASTM E1155, "Standard Test Method for Determining Floor Flatness and Levelness Using the F-Number System." Tolerances are specified in Section 03 30 00.
  - 2. Time Period for Measuring and Reporting: All measurements shall be made by the testing laboratory or designated agency before the end of the next workday after the completion of finishing operations. For structural elevated floors, measurement shall also be made prior to removal of forms and shores. The Contractor shall be notified immediately after the measurements of any section are complete, and a written report of the floor measurement results shall be submitted within 72 hours after finishing operations are complete. The Contractor shall take immediate action to correct any work that is outside the specified tolerances.
  - 3. Measuring Equipment: The concrete surface profile shall be measured using equipment manufactured for the purpose, such as the Dipstick Floor Profiler, as manufactured by the Edward W. Face Company, Norfolk, Virginia, or by other methods specified in ASTM E1155.
  - 4. Floor Test Sections:
    - a. A floor test section is defined as the smaller of the following areas:
      - 1) The area bounded by column and/or wall lines.
      - 2) The area bounded by construction and/or control joint lines.
      - 3) Any combination of column lines and/or control joint lines.
    - b. Test sample measurement lines within each test section shall be multidirectional along two orthogonal lines.
    - c. The precise layout of each test section shall be determined by the testing agency and shall be submitted for the Architect's review and approval.

#### 3.7 REPAIRS

- A. Defective Topping: Repair and patch defective concrete floor topping areas, including areas that have not bonded to concrete substrate.
- B. Remedial Measures for Slab Finish Construction Not Meeting Specified Tolerances:
  - 1. Application of Remedial Measures. Remedial measures specified herein are required whenever either or both of the following occur:
    - a. The composite overall values of flatness or levelness of any test section or the entire floor installation measure less than specified values.

- b. Any individual test sample (line of measurements) measures less than the specified absolute minimum flatness or levelness value.
- 2. Modification of Existing Surface:
  - a. If, in the opinion of the Architect or Owner's representative, all or any portion of the substandard work can be repaired without sacrifice to the appearance or serviceability of the area, the Contractor shall immediately undertake the approved repair method.
  - b. The Contractor shall submit for review and approval a detailed work plan of the proposed repair showing areas to be repaired, method of repair, and time required to make the repair.
  - c. Repair method(s), at the sole discretion of the Architect or Owner's Representative, may include grinding (floor stoning), planing, retopping with specified floor leveling compound, or any combination of the above.
  - d. All repair work shall be performed at no additional cost to the Owner and with no extension to the construction schedule.
- 3. Removal and Replacement:
  - a. If, in the opinion of the Architect/Engineer or Owner's Representative, all or any portion of the substandard work cannot be satisfactorily repaired without sacrifice to the appearance or serviceability of the area, the Contractor shall remove and replace the defective work as directed.
  - b. Replacement sections may be retested for compliance at the discretion of the Architect/Engineer or Owner's Representative.
  - c. All replacement work shall be performed at no additional cost to the Owner and with no extension to the construction schedule.

### SECTION 04 05 13 — MORTAR

### PART 1 - GENERAL

### 1.01 COORDINATION

- A. The General Conditions of the Contractor for Construction and the Supplementary Conditions to the General Conditions of the Contract for the Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addendum issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the stringent requirements and the greater quantity shall apply.

#### 1.02 SCOPE:

- A. Perform all work required to furnish the Masonry Mortar indicated by the Contract Documents and furnish all supplementary items necessary for its proper installation.
- B. The requirements of Division 0 "Bidding and Contract Requirements" and Division 1 "General Requirements" of this Project Manual shall apply to all Work required for this Section.
- C. Application of Mortar used in the installation of masonry units is specified in each respective Unit Masonry Section and is not included in the work required for this Section.
- 1.03 SUBMITTALS:
  - A. Submit product data on all mortar and admixtures.
  - B. Submit certification that mortar and grout material meet ASTM standards.
- 1.04 PRODUCT DELIVERY AND STORAGE:
  - A. Delivery: Delivery materials to Project site dry and in unbroken containers.
  - B. Storage: Store materials above ground in waterproof shelters.

### PART 2 - PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURERS:

- A. Material manufactured by any of the following manufacturers is acceptable, provided it complies with the Contract Documents.
  - 1. PORTLAND CEMENT:
    - a. Capitol Lone Starb. Trinity Texas Industries

- c. Universal Atlas Cement
- 2. LIME:
  - a. Gibsonburg Lime Products Co., Tiger Limes
  - b. Texas Lime Company
  - c. United States Gypsum Company
  - d. National Gypsum Company
- 3. WATER PROOFING ADMIXTURE:
  - a. Master Builders-Omicron Mortarproofing
  - b. Sonneborn Building Products-Hydracide
  - c. W.R. Grace-Hydratite Plus
- 4. MORTAR COLOR: a. Gray-
- 5. DRY BLOCK-One pound per cubic foot of cementitious material, <sup>1</sup>/<sub>2</sub> sack per sack of 2 sacks of cement fluted, split –face CMU for warranty purposes
- B. Refer to Section 01 25 00 Substitutions Procedures for manufacturers not listed above.

# 2.02 MATERIALS:

A.	Portland Cement:	ASTM C150, TYPE I.
B.	Hydrated Lime:	ASTM C207, TYPE S.
C.	Fine Aggregate:	ASTM C144,
D.	Coarse Aggregate:	ASTM C404, Size No. 8
E.	Water:	Clean and free of deleterious acids, alkalies, or organic matter.
F.	Waterproofing Admixture:	Omicron Mortarproofing, manufactured by Master Builders.
G.	Grout Admixture:	"Fluidifier" by Master Builders.
H.	Sealer:	"DEFY" Block Water Repellant

### 2.03 PROPORTIONS AND MIXING:

- A. Meet requirements of ASTM C270 and proportion mortar types as specified.
- B. Meet requirements of ASTM C476 for masonry grout and proportion grout type as specified.
- C. Proportion material accurately and mix thoroughly by machine to a uniform consistency and color. Mix mortars with the maximum amount of water consistent with workability.
- D. Do not use mortar that has begun to set. Retemper mortar by adding water if mortar begins to stiffen from evaporation or absorption of a part of the mixing water. Use and place mortar in final position within 2-1/2 hours after mixing.

# PART 3 - EXECUTION

- 3.01 INSTALLATION:
  - A. See specific section of Masonry Materials for installation instructions.

# 3.02 MORTAR SCHEDULE:

- A. Exterior Masonry Walls:
  - 1. Mortar-Type S, ASTM C270.
  - 2. Waterproofing Admixture-dry block required to provide warranty.
- B. Interior Masonry Partitions:1. Mortar-Type N, ASTM C270.
- C. Interior Paving Tile:1. Mortar-Type S, ASTM C270.
- D. Exterior Paving Tile:1. Mortar-Type M, ASTM C270.

# 3.03 GROUT SCHEDULE:

- A. Paving Tile:
  - 1. Portland Cement-one part.
  - 2. Fine Aggregate-three parts.
  - 3. No lime.
  - 4. Sealer

### SECTION 04 21 13 — BRICK MASONRY

### PART 1 - GENERAL

### 1.1 COORDINATION:

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.2 SUBMITTALS:

- A. Within fifteen (15) calendar days after awarded of contract submit the following:
  - (1) Submit technical data for each type of masonry wall reinforcement, anchors, and ties.
  - (2) Submit sample panel of brick specified showing full color range.

# 1.3 MOCKUP:

- A. Lay up, where directed at Site, mock-up panel 4 feet high by 6 feet wide using range of brick selected for facing and mortar specified.
- B. **Do not proceed** with brickwork on Project until sample panel has been approved for color and shading. Approved panel shall be the standard of comparison for workmanship and materials. Do not destroy, alter, or move panel until brickwork is completed.

#### 1.4 STORAGE AND HANDLING:

- A. Handle materials in manner to prevent breakage and chipping.
- B. Store materials on platforms raised free of the ground and protect materials with tarpaulin covers.
- 1.5 EVIROMENTAL CONDITIONS:
  - A. Do not lay brick when the temperature of the outside air is 40°F or less, or will fall below 40°F twenty four (24) hours after laying.

# PART 2 - PRODUCTS

## 2.1 ACCEPTABLE MANUFACTURERS:

A. Material manufactured by any of the following manufacturers is acceptable provided it complies with the Contract Documents.

REINFORCEMENT, ANCHORS AND TIES:

- 1. AA Wire Products Company
- 2. Duro-O-Wall
- 3. Heckmann Building Products, Inc.
- 4. Hohmann and Barnard, Inc.
- 5. Masonry Reinforcing Corp. of America
- 6. National Wire Products Corp.

### 2.2 MATERIALS

- A. MANUFACTURERS:
  - 1. Hanson Brick Co.
  - 2. Acme Brick Co.
  - 3. Brick Selections
- B. Type: Comply with ASTM C-216, Grade SW, Type FBS for face brick. Comply with ASTM C902-87 for brick pavers. Provide letter for compliance from brick manufacturer or supplier.
- C. Shapes: Provide any special molded shapes required or as may be indicated in the drawings. All outside face brick corners other than 90° shall require shaped brick. All outside corners for soldier courses shall require shaped brick. Job cutting face brick shall not be acceptable where cut face is exposed. Provide shop drawings for Architect's approval.
- D. Solids: Provide solids as required to ensure against exposed cores or unfinished face on ends.
- E. Size: Modular (2-1/4" x 7-5/8" x 3-5/8") and as indicated in the drawings.
- F. Selections:
  - Brick Color, Field Color: Color to be selected by Architect.
  - Brick Color, Accent #1: Color to be selected by Architect.
  - Capstone, Accent #2: Color to be selected by Architect.
- G. CORRUGATED METAL TIES: DUR-O-WAL D/A 518 adjustable wall tie. Tie number as recommended by manufacturer for overall wall thickness. Zinc coating 1.50 oz. per sq. ft. of uncoated wire surface ASTM A 153- Class B-2.
- H. CLEANING AGENT: TRISODIUM PHOSPHATE (Calgon) and household detergent.
- I. WATER: Clean and free of deleterious acids, alkalies, or organic materials.
- J. CONTROL JOINT SPACER: As specified in the CONCRETE MASONRY Section.

- K. PREMOLDED NEOPRENE PAD: ASTM D 1056SCE-43, R431-N by RUBTEX CORP., 3" wide, by 1/8" thick.
- L. WEEPS: Plastics tubes, 3/8" diameter, AA Wire Products Co., AA223.
- M. REINFORCING BARS: ASTM A615, Grade 60 deformation per ASTM A305, number 4 bars unless otherwise indicated.
- N. MORTAR SCREENS: #84 Weep thru mortar deflector by Heckmann Building Products.

# PART 3 - EXECUTION

# 3.1 PREPARATION:

- A. Provide, install and maintain all scaffolding, staging and forms of protection necessary for execution of the work; substantially constructed, maintained, moved and dismantled as required to properly follow the sequence of the operation.
- B. Provide and install all shores and centering for the work, constructed true to required shape, size and form, well braced and made rigid in all parts, and capable of supporting and sustaining the loads to which subjected.
- C. Leave all shores and centering in place until the masonry has sufficiently set to safety carry its own weight and added loads of construction. Shore all free standing wall until protected from damage by windstorm.
- D. Examine surfaces to receive masonry and report and discrepancies before commencing work. Accept no former measurements, but layout work according to the plans and figures thereon.

# 3.2 ADJUSTING

- A. All brick having absorption rates determined in accordance with ASTM C67 in excess of 0.025 oz. per sq. ft. inch per minute shall be wetted sufficiently so that the rate of absorption when laid does not exceed this amount. Wetting shall be such as to insure that each unit is nearly saturated, surface dry when laid.
- B. Lay brick plumb, level and true to a line running bond or as indicated. Lay 3 courses to 8" vertically with uniform horizontal and vertical joints. Glaze brick and tile shall be laid stack bond
- C. Lay brick in full bed or mortar with head and edge joints completely filled. Spread mortar for bed joint only so far ahead of laying units that the mortar will be plastic when units are laid. Butter end of brick for head joints with ample mortar so the vertical joint is completely filled with mortar when brick is shoved into place.
- D. Rock closures into place with both head joints and closure space spread with ample mortar. Shove against the two adjacent bricks in place so that both horizontal and vertical joints are completely filled. Do not disturb previously laid brick.
- E. Avoid over-plumbing and pounding of the corner and jambs to fit stretcher units after setting in place. Where adjustments must be made after initial setting, remove mortar and replace with fresh mortar.
- F. Fill the vertical, longitudinal joint between brick and backup as the course is laid, by pouring or slushing the vertical joint full or grout with the same mortar as used for setting.

- G. Keep cavity clear by laving a board,  $\frac{3}{4}$ " x cavity width, across a level of the ties to catch the droppings. As masonry reaches the next level for placing ties, raise the board, clean it and lay it on ties at that level.
- H. Finish joints that will remain exposed with a tool slightly larger that he width of the joint, to form a concave surface. Tool joints after the mortar has taken its initial set and in such manner as to squeeze the mortar back into the joint. Tool vertical joint first.
- I. Fill all nail or line-pipe holes with fresh mortar immediately upon removal. Provide weeps in head joints 16" on centers, in first horizontal course above flashings. Keep cavity side of weep free from mortar or accumulated materials.
- J. Cut brick, where necessary for fitting or bonding, with a power saw to insure straight, evenly cuts edges.
- K. Cover tops of walls at end of day's work and when rain or is imminent with waterproof membrane. Overhang two feet on each side of wall and anchor securely. Protect masonry from weather or construction damage.
- L. Stop off longitudinal run of masonry where absolutely necessary by racking one-half length in each course. Remove loose mortar before new work is started and slightly wet old work.

### 3.2 ANCHORING:

- A. Space anchors not over 16" on center vertically and 24" on centers horizontally. Locate anchors at vertical and horizontal supports, and at other locations as indicated.
- B. Bond brick to backup with adjustable wall ties and joint reinforcing installed in adjacent masonry.
- C. Maintain a minimum of <sup>1</sup>/<sub>2</sub>" clearance between masonry and concrete or steel structure. Keep space free of mortar and other rigid material.

### 3.3 CONTROL AND EXPANSION JOINTS:

- A. Locate expansion joints where they occur in backup material. Locate control joints no to exceed 25'-0" on center. Keep vertical joints straight, true and continuous from top to bottom of masonry. Verify locations of control joints with Architect.
- B. Keep joints clean of mortar as work progresses. Build-in control joint spacer at control joints and flashings at expansion joints

# 3.4 EMBEDDED ITEMS:

A. Build in flashings, sleeves, anchors, clips and accessories as work progresses. Install loose lintels, as indicated, in full beds of mortar.

# 3.5 CLEANING:

- A. Keep face of brickwork free excess mortar while laying brick. Brush with dry fiber brush prior to wet cleaning.
- B. Clean brickwork that will remain exposed promptly with fiber brushes, clean water and cleaning agent. Use or wire brushes, commercial cleaner or acid permitted only with specific approval.

- C. Repair and repoint defective work. Replace broken, damaged or discolored brick.
- D. Pressure wash all exterior brick work prior to Owner occupying new building.

## SECTION 05 12 00 — STRUCTURAL STEEL

## PART 1 - GENERAL

### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

### 1.2 WORK INCLUDED

- A. Furnish and erect all structural steel.
- B. All cutting and fitting, welding and bolting of structural steel members.
- C. Loose linters and linters supported from structural members.
- D. Shop coat of paint on structural steel members and field touch-up.
- E. Temporary bracing of structural steel during erection.

### 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Steel joists.
- B. Miscellaneous metals.

## 1.4 SUBMITTALS

- A. Six (6) blueline prints of each sheet of shop drawings required. Contractor shall submit shop drawings directly to the project Architect.
  - 1. Indicate size, material, and strength of members.
  - 2. Show locations and installation procedures.
  - 3. Include details of shear heads, collar channels, camber, shop coats, joints, attachments, and clearances.
  - 4. Prepare setting Drawings, templates, and procedures indicating locations of structural bolts, and fastening holes for other Work.
- B. Submit mill certificates direct to Structural Engineer with shop drawings.
- C. Submit welder's qualification records.

- D. Miscellaneous metals shall be issued as a separate submittal directly to the Architect and not as part of the structural steel submittal.
- E. Where required submit proof of city approval for fabricator and erector.
- F. Submit written certification of domestic origin for bolts.
- G. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.

# 1.5 WARRANTY

A. Provide written warranty against defects in metals and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the Project.

# 1.6 QUALITY ASSURANCE

- A. Fabrication and erection of structural steel shall meet or exceed the minimum current requirements of the following standards except where more stringent requirements are indicated in the drawings or specifications:
  - 1. AISC "Code of Standard practice for Steel Buildings and Bridges".
  - 2. AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings" and including the "Commentary of the AISC Specification", Eighth Edition.
  - 3. AWS Dl.1, "Structural Welding Code Dl.1".
  - 4. ASTM A-6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use".
  - 5. ASTM A-36, Specification for Structural Steel.
  - 6. ASTM A-123, Specification for Zinc (Hot-Dip Galvanized Coatings on Iron and Steel Products.
  - 7. ASTM A-307, Specification for Carbon Steel Externally Threaded Standard Fasteners.
  - 8. ASTM A-325, Specification for High-Strength Bolts for Structural Steel Joints.
  - 9. ASTM A-436, Specification for Hardened Steel Washers.
  - 10. ASTM A-500, Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
  - 11. ASTM A-563, Specification for Carbon and Alloy Steel Nuts.
- B. Fabricators shall be currently approved by the local code authority for erection of steel structures. Contractor shall submit evidence of city approval with the list of proposed subcontractors for the project.
- C. Each welder performing work on this Project shall be qualified in accordance with American Welding Society Structural Welding Code, AWS Dl.1 within 12 months of the commencement of welding on this Project. Welders shall be certified for the position of weld which they are performing. Welding shall be tested as specified under Testing Laboratory Control below.

# PART 2 - PRODUCTS

# 2.1 MATERIALS

- A. GENERAL:
  - 1. All materials shall be new, clean and straight within allowable tolerances. Members damaged, warped or stressed prior to or after erection shall be replaced with new material.
  - 2. All structural steel shall conform to the Standard Specifications of the ASTM for Steel for Bridges and Buildings, A-36 (or ASTM A-500, grade B for square or rectangular tube shapes), unless otherwise indicated on the drawings.
  - 3. Purlins shall be precision roll-formed of 14 ga. or 16 ga. steel wity a minimum yield of 55,000 psi. Size and spacing of purlins shall be as indicated on the drawings.

- B. WELDING ELECTRODES: #E60 Series Submerged Arc Grade SA-1, #E70 Series Submerged Arc Grade SA-2.
- C. BOLTS: Comply@ASTMA-307for standard bolts and ASTMA-325 for high-strength bolts, sizes as indicated in the drawings and structural notes. Furnish certification that bolts are domestic origin.
- D. ANCHOR BOLTS:
  - 1. Furnish to the General Contractor all anchor bolts, setting templates and drawings required for complete and accurate installation.
  - 2. Coordinate delivery of anchor bolts for installation by other trades.
- E. GROUT: Premixed, non-shrink, non-metallic type providing a minimum compressive strength of 7,000 psi at 28 days and a maximum initial set time of one hour at 73 degrees F. "Masterflow 713" as manufactured by Master Builders or equivalent by Cormix Construction Chemicals or Sauereisen Cements Co.

# PART 3 - EXECUTION

# 3.1 FABRICATION

- A. Fabricate the various parts of the steel frame from the materials specified using welded shop connections and bolted field connections. Shop drawings shall be prepared accordingly.
- B. Splicing of members is prohibited without prior approval of the project structural engineer. A member having splice not specifically approved on the shop drawings will be rejected. Spliced members will not be permitted where steel is exposed in finished areas.
- C. Provide holes @ maximum 36" o.c. for 3/8" diameter bolts in all steel where wood nailers occur, unless closer spacing is indicated in the drawings or notations.
- D. All workmanship shall be in accordance with the requirements of the AISC. The workmanship in exposed rigid frames shall be in accordance with the AISC requirements for Architecturally Exposed Structural Steel.

# 3.2 GALVANIZING

- A. Hot dip galvanize all steel sections which are fully or partially exposed to weather or indicated in the drawings to be galvanized.
- B. All galvanizing shall be done after fabrication of members.
- C. Comply with requirements of ASTM A-384 to protect against warping.
- D. Do not apply silicone protective coating to galvanized steel.

# 3.3 SHOP PAINTING

- A. Structural steel shall be given one shop coat of the specified paint. Do not shop coat the following members when scheduled to receive sprayed fireproofing:
  - 1. Beam with flange width exceeding 12 inches.
  - 2. Column with flange width exceeding 16 inches.
  - 3. Beam or column with web depth exceeding 16 inches.
- B. Verify with the fireproofing manufacturer the compatibility of the specific proposed primer with the fireproofing material.
- C. All surfaces shall be clean, dry and free from mill scale or rust.

D. Fabricator shall exercise special care in painting those portions of structural steel which *will* be exposed to view when the building is complete. Sags, run, crawls, and other defects will not be permitted.

#### 3.4 DELIVERY AND HANDLING

- A. Contractor shall inspect all material when delivered and store on platforms or racks to keep material off the ground. Keep structural steel clean of dirt and other foreign matter.
- B. Clean all contact and bearing surfaces thoroughly before erection.

#### 3.5 ERECTION

- A. The structure shall be erected, plumbed and leveled to the lines and grades indicated on the drawings before final connections are made. Base plates shall be grouted using specified nonshrink grout in accordance with manufacturer's printed directions.
- B. If exposed to View, erection angles, seats, tags shall be removed, etc., plugged, welded and ground smooth.
- C. All welding shall be performed by experienced mechanics and in accordance with the requirements of the American Welding Society Code (A.W.S.).
- D. For cantilever beams, allowance shall be made for deflection when final loads are applied.
- E. No field cuts or holes shall be flame cut. Necessary field holes shall be punched or drilled and slotted. All field steel modifications shall be inspected and approved by the project structural engineer and cost of such modifications shall be the responsibility of the Contractor.
- F. No structural members shall be erected which have been bent or deformed in transit to the site or by storage and handling on the site.
- G. Installed work shall comply with AISC allowable tolerances.

#### 3.6 TEMPORARY BRACING

- A. Structural steel shall be temporarily braced as required to resist all wind loads and construction loading for which the structure has been designed.
- B. Structural steel shall be braced as the structure is erected and structure shall not be left overnight without adequate bracing.

# 3.7 WELDING

- A. All welds and the adjacent spattered areas shall be cleaned by sandblasting, wire brushing, chipping or other non-damaging means for removal of excess weld metal. Exposed welds shall be ground smooth. Welds in galvanized material shall be touched up after cleaning with "ZRC" cold galvanizing.
- B. Meet requirements of American Welding Society, "Code for Arc and Gas Welding in Building Construction".
- C. Meet requirements of American Welding Society, "Qualifications of Welding Procedures and Operators".

D. Meet requirements of American Safety of Testing Materials, "Specifications for Iron and Steel Arc Welding Electrodes", A233-43T.

### 3.8 TESTING LABORATORY CONTROL

- A. GENERAL:
  - 1. Three copies of mill certificates attesting to the physical and chemical characteristics of the steel shall be transmitted to the Owner's independent testing laboratory upon request. In the event that mill certificates are not submitted, the Owner's testing laboratory shall perform physical and chemical tests in accordance with ASTM requirements, all at the Contractor's expense.
  - 2. Contractor shall submit to the Owner's testing laboratory the certificates from an independent testing laboratory attesting to each welders' qualifications in accordance with A.W.S. requirements.
  - 3. Where structural steel is fabricated outside of the greater Houston area, fabricator shall pay the travel and daily subsistence expense of the Owner's laboratory technician.
  - 4. The Owner's independent testing laboratory shall be the sole judge as to whether materials and erection of structural steel meets the requirements of these specifications. Materials and installation not meeting specified requirements shall be removed and replaced at the Contractor's expense.
- B. TESTING OF WELDS:
  - 1. Shop Welds:
    - (a) An independent testing laboratory retained by the steel fabricator shall perform a visual inspection of a minimum of 10% of all structural steel shop welds. Any additional testing required by the Contractor shall be paid for by the Contractor. Any additional testing required by the fabricator shall be paid for by the fabricator.
    - (b) Where the structural drawings indicate shop welded connections to be tested, 100% of such welds shall be tested by the fabricators independent testing laboratory using ultrasonic or radiographic methods.
    - (c) Structural steel shall not be shipped until the laboratory testing reports have been reviewed by the structural engineer.
    - (d) Inspection of shop welding of bar joists is at the fabricator's option.
  - 2. Field <u>Welds:</u>
    - (a) All field welds to be tested shall be tested by the Owner's independent testing laboratory using ultrasonic or radiographic methods. Such testing shall be paid from the Testing Allowance.
    - (b) Test 100% of all field welds of the types indicated on the structural drawings to be tested.
    - (c) 100% of the following types of field welds shall be tested whether or not indicated on the drawings to be tested: full moment connections in rigid frames, welded beam splices, and welded column splices.
    - (d) 15%-20% of all other types of structural steel field welds shall be visually inspected by the Owner's testing laboratory. Any additional testing required by the Contractor shall be paid for by the Contractor.
    - (e) All field welds which are indicated on the Structural Drawings to be tested shall be identified with the welder's initials in chalk or wax crayon.
  - 3. <u>Retesting:</u>
    - (a) All welds rejected after testing shall be repaired and retested at the Contractors expense, whether shop welds or field welds. Shop weld retesting shall be performed by the fabricators independent testing laboratory and field weld retesting shall be performed by the Owner's independent testing laboratory.

(b) If more than 10% of the required numbers of tested shop welds fail testing, an additional 20% of the welds shall be tested. If more than 1 0% of these welds fail, another 20% of the welds shall be tested. This procedure shall continue until either all welds are tested, or less tan 10% of the welds fail in the last 20% tested.

# 3.9 FIELD TOUCHUP

- A. After erection, all structural steel shall be cleaned of rust and touched up with the specified shop coat paint.
- B. Steel shall be touched up wherever the shop coat has been damaged by handling, or during erection or by welding.
- C. All erection nuts and bolts shall be wire brushed and painted.
- D. Upon completion of this erection, any exposed structural steel shall be made ready for finish painting.

## SECTION 05 21 00 — STEEL JOISTS

#### PART 1 - GENERAL

### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

### 1.2 WORK INCLUDED

- A. Furnish and erect open web high strength steel joists, K-series, and long span joists produced of either cold formed or hot rolled sections as indicated in the drawings and as specified herein.
- B. Provide ceiling extensions where required, top and/or bottom chord extensions as detailed, top and bottom chord reinforcing as detailed, and all spacers, bridging, anchors, etc. required for complete installation.
- C. Provide shop primer coat on all steel joists and field touchup.
- D. Erection of all steel joists, all welding, boiling, cleaning and priming of welded areas, and all materials incidental to erection, including welding electrodes, temporary bracing, guy wires, bolts, washers, etc. as required for a complete installation.

# 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Steel floor and roof deck, cementitious wood fiber deck.
- B. Structural steel.
- C. Miscellaneous metals.

## 1.4 SUBMITTALS

- A. One (1) each reproducible sepia and four (4) blueline prints which include steel grades, weld size and grades for all steel joists. Contractor shall submit shop drawings directly to the project structural engineer.
- B. Submit mill certificates direct to Structural Engineer with shop drawings.
  - 1. Indicate size, material and strength of members.
  - 2. Show locations and installation procedures.
  - 3. Prepare templates and indicate locations of fastening holes for other work.

C. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.

# 1.5 WARRANTY

A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the Project.

### 1.6 QUALITY ASSURANCE

- A. Design, fabrication and erection of steel joists shall meet or exceed the minimum standards of the Steel Joist Institute except where more stringent requirements are indicated in the drawings or specifications:
- B. Each welder performing work at the site shall be qualified in accordance with America Welding Society Structural Welding Code, AWSD1.1 within 12months of the commencement of welding on this Project.
- C. Fabricators shall be currently approved by the local code authority for fabrication and erection of steel structures.

### PART TWO - PRODUCTS

### 2.1 MATERIALS

- A. The steel used in the manufacturer of chord and web sections shall conform to ASTM Specifications for Structural Steel, A-36, modified to eliminate the upper limit of tensile strength.
- B. Steel for spacers, bridging, bearing plates, anchors, etc., shall conform to ASTM A-7.
- C. Shop coat paint shall be primer meeting requirements of Federal Specification TT-P-636C.
- D. Members damaged, warped or stressed prior to or after erection shall be replaced with new material.
- E. Joist manufacturer shall review all U.L. designs as indicated in the drawings or specifications and comply wity all size and weight requirements stipulated. Reference Architectural drawings and Structural drawings for U.L. design indications.

### PART THREE - EXECUTION

# 3.1 FABRICATION

- A. Steel joists shall be fabricated in accordance with Standards of the Steel Joist Institute.
- B. Punching of chord members shall not be permitted.
- C. Steel joists shall be symmetrical about the Y-Y axis.
- D. Splicing of members may occur at any point in chord or web members, and shall be designed in accordance with Standards of the Steel Joist Institute. Spliced members will not be permitted where joists are exposed in finished areas.

# 3.2 SHOP PAINTING

- A. All joists shall receive one shop coat of primer except where scheduled to receive sprayed fireproofing.
- B. All surfaces shall be clean, dry and free from mill scale or rust.
- C. During and after erection clean and touch-up scratches and welds with specified primer.

# 3.3 DELIVERY AND HANDLING

A. Contractor shall inspect all material when delivered and store on platforms or racks to keep

all material off the ground. Clean all dirt, rust and other foreign matter from joists before erection.

# 3.4 ERECTION

- A. Joists shall be set level and plumb or sloped as indicated on the drawings. Joists shall be welded to their steel supporting members and bridging shall be welded in place as soon as joists are set. Construction loads shall not be applied to the joists until they are permanently secured at bearing points and the bridging installed. Extend joist ends a minimum of 2-1/2" over steel supports.
- B. Erect steel joists in accordance with AISC S326. Hoist by top chord only between third and quarter points.
- C. No joist shall be erected which has been bent or deformed from its original shape. Replace with new members.
- D. Install horizontal or diagonal bridging as indicated in the drawings and in accordance with SJI, AISC.
- E. No field cuts or holes shall be flame cut. Necessary field holes shall be drilled. All proposed field modifications must be approved by the Project Structural Engineer.

### 3.5 FIELD WELDING OF JOISTS

- A. All welds and the adjacent spattered areas shall be cleaned by sandblasting, wire brushing, chipping or other non-damaging means for removal of excess weld metal. Exposed welds shall be ground smooth. Welds in galvanized material shall be touched up after cleaning with "ZRC cold galvanizing".
- B. Meet requirements of American Welding Society, "Code for Arc and Gas Welding in Building Construction".
- C. Meet requirements of American Welding Society, "Qualifications of Welding Procedures and Operators".
- D. Meet requirements of American Safety of Testing Materials, "Specifications for Iron and Steel Arc Welding Electrodes", A233-43T.
- E. Shop welds shall be done in accordance with the Standards of the Steel Joist Institute.

#### 3.6 FIELD TOUCHUP

- A. After erection, all steel joists shall be cleaned of rust and touched up with the specified shop coat paint.
- B. Steel shall be touched up wherever the shop coat has been damaged by handling, or during erection or by welding.
- C. Coat any surfaces to be in contact with mortar, concrete, masonry or aluminum with bituminous paint.
- D. Upon completion of this erection, any exposed steel joists shall be made ready for finish painting.
- 3.7 TESTING LABORATORY CONTROL
  - A. A laboratory designated by the Owner will perform testing and inspection services in the shop and in the field. Contractor shall notify Testing Laboratory a minimum of 48 hours prior to beginning fabrication of members.

- B. Where defective work, or work not in accordance with these specifications is determined, the Contractor shall pay for correction of the work, re-testing and re-inspection of the work, and for X-ray testing of additional weldments.
- C. Three copies of mill certificates attesting to the physical and chemical characteristics of the steel shall be transmitted to the testing laboratory upon request. In the event that mill certificates are not submitted, the Owner's testing laboratory shall perform physical and chemical tests in accordance with ASTM requirements, all at the Contractor's expense.
- D. Contractor shall submit to the Owners testing laboratory for approval, <u>certificates</u> from an independent testing laboratory attesting to the welders qualifications in accordance with A.W.S. requirements. All welds shall be identifiable by the welder's mark.
- E. Where steel joists are fabricated outside of the greater Houston area, fabricator shall pay the travel and daily subsistence expense of the laboratory's technician.
- F. The Owners testing laboratory shall be the sole judge as to whether materials and erection of steel joists meets the requirements of these specifications. Materials and installation not meeting specified requirements shall be removed and replaced at the Contractors expense.

# SECTION 05 31 00 — STEEL FORM FLOOR DECK AND STRUCTURAL ROOF DECK

### PART 1 - GENERAL

### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

# 1.2 WORK INCLUDED

- A. Provide all labor, materials, equipment, and services necessary for the furnishing and installation of steel form floor and structural roof deck at above grade floors. For the purposes of this specification section, Structural Roof Deck is defined as any metal roof decking not integral with lightweight insulating concrete fill.
- B. Provide additional requirements as may be indicated on the structural drawings and notations.

# 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Light gauge metal roofing deck (less than 22 gauge) at insulating concrete fill.
- B. Concrete and reinforcing.
- C. Structural steel and steel joists.
- D. Miscellaneous metals supplementary framing.

### 1.4 SUBMITTALS

- A. Submit manufacturer's printed literature indicating material properties, loading criteria, and installation procedures.
- B. Submit drawings or printed illustrations showing deck profile and configuration.
- C. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.
- 1.5 DRAWING REFERENCES

A. Reference structural drawings and notes for gauge, depth and other requirements.

# PART 2 - PRODUCTS

- 2.1 MANUFACTURERS
  - A. Wheeling
  - B. Bowman
  - C. Merco
  - D. Roll Form
  - E. Vulcraft

#### 2.2 MATERIALS

- A. The steel floor deck and structural units shall be as manufactured by Roll Form Products, Inc., or equivalent by specified manufacturer. Type, finish, section modulus and gauge as shown on the structural drawings.
- B. The Units shall be formed from steel sheets conforming to ASTM A-611 Grade C or ASTM A446 Grade A with a minimum yield strength of 33 KSI, and shall be listed by Underwriter's Laboratories.
- C. Deformations shall be formed to provide a mechanical lock between concrete and steel.
- D. Unless noted otherwise, floor deck shall be galvanized to conform to ASTM A-525, G60. Provide field touch-up with "ZRC" zinc-rich primer at welds and where galvanizing is damaged.

#### E. ACCESSORIES:

- 1. <u>Weld Washers:</u> Mild steel, uncoated, 5/8 inch outside diameter, 1/8 inch thick. Use for light gauge non-composite decks.
- 2. Where metal closure strips, wet concrete stops, and related accessories are required, but not indicated in the drawings, provide and install 22 gauge galvanized sheet steel of profile and size required.

# PART 3 - EXECUTION

### 3.1 ERECTION

- A. Panels shall be secured to the steel framework at ends and at intermediate supports by welds spaced 12" o.c. and not less than <sup>3</sup>/<sub>4</sub>" diameter welds. Use welding washers at light gauge non composite decks. Side laps shall be nested and button punched 3'-0" maximum on centers. The erection of composite floor units shall be performed in accordance with manufacturer's printed instructions and approved erection drawings.
- B. Install sheet metal closures at ends of runs, penetrations and columns.
# SECTION 05 41 00 — LIGHT GAGE METAL FRAMING SYSTEMS AND GYPSUM SHEATHING

### PART 1 - GENERAL

# 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

# 1.2 WORK INCLUDED

- A. Furnish and install exterior metal stud framing as shown on the drawings and specified herein.
- B. Furnish and install water resistant gypsum board sheathing at exterior face of exterior metal studs.

# 1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. Masonry.
- B. Interior drywall systems.
- C. Wall Insulation.
- D. Dampproofing and Waterproofing.
- E. Exterior plaster (stucco).

# 1.4 SUBMITTALS

- A. Submit manufacturer's product data describing all materials.
- B. Submit manufacturer's certification of structural properties, only for products to be used in the project.

### 1.5 WARRANTY

A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.

# 1.6 DELIVERY, STORAGE AND HANDLING

- A. All materials shall be delivered in manufacturer's original packaging and stored flat in a covered, dry area providing protection from damage and exposure to the elements.
- B. Damaged or deteriorated materials shall be removed from the premises.

### PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. STUDS AND FRAMING: Unimast, Clark Dietrich, Maverick Steel Co., Dale Industries, Delta Metals, Bostwick, American Studco Inc.
- B. GYPSUM BOARD SHEATHING: United States Gypsum Co., National Gypsum Co., Domtar Gypsum, Inc. Georgia Pacific, Temple Inland.

#### 2.2 MATERIALS

A. STRUCTURAL STUDS AND RUNNERS: Galvanized "Cee" studs in sizes and gauges as indicated in the drawings. Unless otherwise indicated in the drawings, minimum gauge shall be 16 gauge and the following structural properties shall apply:

SIZE	ABOUT MAJOR AXIS X-X			ABOUT MINOR AXIS Y-Y		
	lx	Sx	rx	ly	Sy	ry
3-5/8"	.906	.500	1.430	.139	.142	.614
4"	1.145	.572	1.566	.147	.143	.615
6"	3.016	1.005	2.262	.180	.149	.595
8"	6.071	1.518	2.923	.201	.152	.565

- B. SHEATHING FASTENERS: Unimast self-drilling screw fasteners (bugle head).
- C. SHEATHING: Fire resistant gypsum board with treated water resistant gypsum core surfaced with water repellant paper both faces -1/2" x 4' x 8' with tongue and groove joint design at long edges. Meet requirements of ASTM C-79. Provide 5/8" thick rated X core where specifically indicated on the drawings.
- D. All metal studs, track, and bridging shall be formed from ASTM A-446 commercial grade steel having a minimum yield of 33,000 psi for 18 gauge and lighter members and 50,000 psi for 16 gauge and heavier members.
- E. All framing components shall be galvanized. Tracks, runners, bridging and bracing shall match grade and gauge of studs.

# PART 3 - EXECUTION

### 3.1 GENERAL

- A. Install studs plumb and in plane, without twist. System installation shall be in accordance with AISI Design Manual for "Light Gauge Cold Formed Steel".
- B. All framing components shall be cut tight against abutting members. Members shall be held firmly in position until properly fastened.
- C. All attachments of axial loaded framing components shall be welded in accordance with the American Welding Society's "Recommended Practices for Resistance Welding" and shall transfer the imposed load into the adjoining member. Use no splices in axial loaded members.
- D. Attachments of framing components not subject to axial loads may be welded or screw fastened.
- E. Members shall be braced as required to resist all wind loads and construction loading for which the system has been designed. System shall be braced as erected and shall not be left overnight without adequate bracing.
- F. Framing components used to frame openings shall be of a size and type to transfer any load imposed on the opening into the members adjacent to the opening. Additional framing shall be provided adjacent to the opening to carry the load imposed.
- G. Welds in galvanized material shall be coated with "ZRC" cold galvanizing after wire brushing.

#### 3.2 ERECTION

- A. TRACK FASTENING: Secure metal floor track to concrete floor slab with Type "A" or "B" fasteners spaced as scheduled in the table below. For determining unbraced wall height, ceiling does not qualify as bracing.
  - 1. Type "A" fastener minimum 5/32" diameter x 1-1/4" long powder actuated fasteners. Hilti #DS32P10 or Ramset #2335.
  - 2. Type "B" fastener minimum 1/4" diameter x 2" long drilled sleeve anchor. Hilti sleeve anchor or Ramset "Thunder Nail".
  - 3. Demonstrate to the Architect that fasteners can be driven full length into concrete slab tight to stud track.
  - 4. Use similar fasteners (and spacing) suitable for steel at overhead track or weld track to overhead steel at 12" o.c.
  - 5. At track splices use anchored channel inserts or fully weld.

MAX. SPACING OF	*MAX. UNBRACED WALL HEIGHT			
FASTENERS	ТҮРЕ А	TYPE B		
24"	7.4 FT.	8.3 FT.		
16"	11.1 FT.	12.4 FT.		
12"	14.8 FT.	16.5 FT.		
8"	24.9 FT.	24.9 FT.		
6"	29.7 FT.	33.2 FT.		

# Spacing Schedule for Type A & B Fasteners

\*NOTE: Ceiling at wall does not reduce unbraced wall height.

- B. STUD FASTENING: Each stud shall be fastened to top and bottom track (prior to gypsum board sheathing or interior wall finish) using one of the following two methods:
  - 1. Screw fastening: One self-drilling screw at the front and back faces of the top and bottom tracks for each stud (4 fasteners per stud.)
  - 2. Welding: One weld at the front face of the top and bottom tracks for each stud (2 welds per stud).
  - 3. Additional: The above minimum fasteners are required regardless of any additional bracing or intermediate fastening which may be indicated in the drawings or required.
- C. BRIDGING: Provide bridging at all exterior stud walls whether or not indicated in the drawings. Unless more stringent requirements are indicated in the drawings provide the following:
  - 1. Wind loading resistance only: Provide multiple bridging rows spaced 5'-0" o.c. vertically maximum.
  - 2. Axial loaded members: For stud lengths less than 10 feet, provide 2 rows of bridging at third points. For stud lengths 10 feet and grater, provide multiple bridging rows spaced 42" o.c. vertically maximum.
- D. SHEATHING INSTALLATION: Apply sheathing panels horizontally with the "v" edge turned up. Install with joints and penetrations tight and neatly fit. Stagger end joints over studs with screws spaced at maximum 12" centers at each stud and at 12" o.c. along top and bottom runners.

# SECTION 05 50 00 - METAL FABRICATIONS

#### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

# 1.2 WORK INCLUDED

- A. Work under this section shall include all labor, materials, equipment, and accessories necessary for the fabrication and installation of all miscellaneous metal work as indicated in the drawings and as specified herein.
- B. The items listed herein are not necessarily inclusive of all items required to be furnished.

#### 1.3 SECTION REQUIREMENTS

A. Submittals: Shop Drawings showing details of fabrication and installation.

### PART 2 - PRODUCTS

#### 2.1 METALS

- A. GENERAL: For the fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled or stamped trade names, and rough edges or finish.
  - 1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
  - 2. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304.
  - 3. Rolled Steel Floor Plate: ASTM A 786/A 786M.
  - 4. Steel Tubing: Cold-formed steel tubing complying with ASTM A 500.
  - 5. Round steel tubing and pipe are sized differently. Tubing is designated by OD and wall thickness. Pipe is designated by NPS and weight or schedule number.
  - 6. Steel Pipe: ASTM A 53, standard weight (Schedule 40), black finish.
  - 7. Shop Primer:
    - a. Typical: Red Oxide or Zinc Chromate Primer conforming to Federal Specification TT-P-664C (no lead). Verify compatibility with specified finish paint.

- 8. Galvanizing: Hot-dip process per ASTM A-123.
- 9. Bolts: Comply with ASTM A-307 for standard bolts and ASTM A-325 for high strength bolts. Furnish certification that bolts are domestic orgin.
- 10. Pipe: Conform to ASTM A-53, Schedule 40 for steel pipe and ASTM B-429, Schedule 40 for aluminum pipe.
- B. FABRICATED ITEMS: Items listed below represent principal items of miscellaneous metal fabrications required for the project. Contractor shall furnish items listed and all miscellaneous metal items indicated in the drawings or required for a complete installation.
  - 1. Steel Pipe Railings: Schedule 40 x 1-1/2" diameter steel pipe. Provide smooth radiused bends without deformation. Provide end caps at all wall returns. Grind all welds smooth. Provide top rails in continuous lengths. Provide shop primer coat of paint compatible with schedule finish coat. Provide with cast steel wall brackets as manufactured by Julius Blum & Co. or approved equivalent.

### 2.2 GROUT

A. Nonshrink, Nonmetallic Grout: ASTM C 1107; recommended by manufacturer for exterior applications.

#### 2.3 FABRICATION

- A. General: Shear and punch metals cleanly and accurately. Remove burrs and ease exposed edges. Form bent-metal corners to smallest radius possible without impairing work.
- B. Welding: Weld corners and seams continuously. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. At exposed connections, finish welds and surfaces smooth with contour of welded surface matching those adjacent.
- C. Fabricate steel pipe columns with steel base and top plates drilled for anchor and connection bolts and welded to pipe with continuous fillet weld same size as pipe wall thickness.
  - 1. Provide 1/2-inch (12-mm) base plates with four 5/8-inch (16-mm) anchor bolts and 1/4-inch (6-mm) top plates.

#### 2.4 STEEL AND IRON FINISHES

- A. Hot-dip galvanized steel fabrications at exterior locations.
- B. Prepare uncoated ferrous metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning," and paint with a rust-inhibitive primer complying with performance requirements of FS TT-P-664.

#### 2.5 PAINT AND FINISHES

A. Shop prime all metal fabrications, except aluminum or stainless steel items. Shop prime galvanized items only where scheduled for finish paint. Remove rust, scale, oil, grease and other deleterious materials before application of shop paint. Provide a uniform minimum dry film thickness of 2.0 mils. Provide full coverage of joints, corners, and edges.

B. Separate dissimilar metals to protect against electrolysis. Apply a bituminous coating o approximately 30 dry mils thickness, tape or other suitable permanent separator on concealed contact surfaces of dissimilar metals.

### PART 3 - EXECUTION

- 3.1 GENERAL: Install all items as indicated in the drawings and approved shop drawings. Coordinate installation with all affected trades. Attach members firmly in proper position that is level, plumb, and parallel to adjoining construction (except where slope is indicated).
- 3.2 EXPANSION JOINT COVERS: Where void is constructed in concrete slab for installation of joint cover assembly, provide reinforcing projecting from vertical walls of void into grout fill to prevent separation between concrete void and grout.

# SECTION 05 52 00 - HANDRAILS AND RAILINGS

#### PART 1 GENERAL

#### 1.0 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

### 1.2 SECTION INCLUDES

- A. Handrails and guardrails
- B. Guardrails for hatches and openings.

### 1.3 RELATED SECTIONS

- A. Section 05 50 00 Metal Fabrications: Associated metal supports.
- B. Section 07 50 00 Membrane Roofing: Coordination of roof edge protection installation.

#### 1.4 REFERENCES

- A. Americans with Disabilities Act Accessibility Guidelines (ADA).
- B. American National Standards Institute (ANSI) A21.1 Safety Requirements for Floor and Wall Openings, Railings and Toe Boards.
- C. American National Standards Institute (ANSI) A58.1 Minimum Design Loads in Buildings and Other Structures.
- D. American National Standards Institute (ANSI) Al 17.1 Accessible and Usable Buildings and Facilities.
- E. American Society of Testing and Materials (ASTM) A47 Standard Specification for Ferritic Malleable Iron Castings.
- F. American Society of Testing and Materials (ASTM) A53 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- G. American Society of Testing and Materials (ASTM) A153 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- H. Occupational Safety & Health Administration (OSHA): 1910.23 Guarding Floor and Wall Openings and Holes.

### 1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings: Drawings showing fabrication and installation of handrails and guardrails including plans, elevations, sections, details of components, anchor details, and attachment to adjoining units of work.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

### 1.6 QUALITY ASSURANCE

- A. Railings Structural Requirements:
  - 1. Handrail, wall rail and guardrail assemblies and attachments shall withstand a minimum concentrated load of 200 pounds (90719 g) applied horizontally or vertically down at any point on the top rail.
  - 2. Infill area of guardrail system capable of withstanding a horizontal concentrated load of 200 pounds (90719 g) applied to one square foot (8165 g/sm) at any point in the system. Load not to act concurrently with loads on top rail of system in determining stress on guardrail.
  - 3. Handrail assemblies and guards shall be designed to resist a load of 50 pounds per linear foot (0.73 kN/m) applied in any direction at the top and to transfer this load through the supports to the structure.
- B. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Install in areas designated by Architect.
  - 2. Do not proceed with remaining work until workmanship and installation are approved by Architect.
  - 3. Refinish mock-up area as required to produce acceptable work.

# 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Materials to be delivered to the job site in good condition and adequately protected against damage as handrails are a finished product.
- B. Store products in manufacturer's unopened packaging until ready for installation.

#### 1.8 PROJECT CONDITIONS

- A. 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.
- B. Field Measurements: Where handrails and railings are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication; show recorded measurements on final shop drawings.
  - 1. Where field measurements cannot be made without delaying the railing fabrication and delivery, obtain guaranteed dimensions in writing by the Contractor and proceed

with fabrication of products to not delay fabrication, delivery and installation.

C. Coordinate fabrication and delivery schedule of handrails with construction progress and sequence to avoid delay of railing installation.

### PART 2 PRODUCTS

# 2.1 MANUFACTURERS

A. Acceptable Manufacturer: Kee Industrial Products, Inc.,

100 Stradtman St. ; Buffalo, NY 14206; Toll Free Tel: 800-851-5181; Tel: 716-896-4949; Fax: 716-896-5696; Email: info@keeklamp.com; Web: www.keeklamp.com

B. Substitutions will be considered in accordance with provisions of Section 01 25 00.

### 2.2 SYSTEMS

- A. Handrails and Guardrails: Provide pipe, fittings, and accessories as indicated or required to match design indicated on the Drawings.
  - 1. Fittings: Aluminum.
  - 2. Fittings: Cast iron.
  - 3. Handrail Pipe Size:
    - a. 1-1/2 inches (38 mm) industry standard 1.90 inches (48 mm) O D.
    - b. 1-1/2 inches O D (38 mm).
  - 4. Infill Panels: As indicated. Refer to Drawings.
- B. Guardrails for Hatches and Openings: Railing system consisting of a top rail, mid rail, and chain or swinging gate, with the hatch curb acting as the toe plate. Extend railing system to a height of at least 42 inches (1067 mm) from the finished roof deck.
  - 1. Pipe: Galvanized pipe, 1-1/4 inches (32 mm).
  - 2. Pipe: Aluminum pipe 1-1/2 inches (38 mm).
  - 3. Base: Fixed base.
  - 4. Base: Ground socket base.
  - 5. Style: Three sided.
  - 6. Style: Two sided.
  - 7. Style: As indicated. Refer to drawings.
- C. Custom Design: Provide pipe, fittings, and accessories as indicated or required by Drawings to match design indicated.

# 2.3 MATERIALS

- A. Pipe:
  - 1. Steel Pipe: ASTM A53 Grade B seamed tube.
- B. Fittings, Including Elbows, Crossovers, Wall flanges, Tees, Couplings:
  - 1. Galvanized Malleable Cast Iron: Kee Klamp structural pipe fittings, ASTM A447 with ASTM A153 galvanizing.
  - 2. Aluminum Alloy: High grade aluminum silicon magnesium alloy.
- C. Finish: Powder coated finish
- D. Fasteners: Type 304 or 305 stainless steel.
- 2.4 FABRICATION

- A. Fit and shop assemble components in largest practical sizes for delivery to site.
- B. Upright tops shall be plugged with weather and light resistant material.
- C. Assemble components with joints tightly fitted and secured. Accurately form components to suit installation.

# PART 3 EXECUTION

# 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

# 3.2 PREPARATION

- A. Coordinate post setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as sleeves, concrete inserts, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete and masonry construction.
  - 1. Coordinate delivery of anchorages to project site.
  - 2. Coordinate that blocking is in place for all mounting fasteners.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

# 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Fit exposed connections accurately together to form tight joints. For all connections with Kee Klamp fittings, each set screw is to be tightened to 29 foot pounds (39 N-m) of torque.
- C. Perform cutting, drilling, and fitting required for installation of handrails. Set handrails and accurately in location, alignment, and elevation, measured from established lines and levels.
- D. Set posts plumb within a tolerance of 1/8 inch (3 mm).

#### 3.4 **PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

# SECTION 06 10 00 - ROUGH CARPENTRY

#### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

# 1.2 WORK INCLUDED

- A. Provide and install all rough carpentry, formwork, wood framing, blocking, wood furring, hardboard and related fasteners as indicated in the drawings or as required to complete the indicated construction.
- B. Install all related hardware and fasteners. Provide and install wood furring and/or trim for acoustical panels.

#### 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Cast-in place concrete
- B. Painting
- C. Finish hardware

#### 1.4 SECTION REQUIREMENTS

- A. Submittals manufacturer's printed literature describing wood preservatives treatment system and certifying that system meets all current requirements for applicable Federal, State and local governing agencies.
- B. Submittals manufacturer's printed literature describing fire retardant treatment system, any structural or usage limitations, and certifying that system meets all current requirements for applicable Federal, State and local governing agencies.

#### 1.5 WARRANTY

A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.

### 1.6 DELIVERY AND STORAGE

A. Deliver and store lumber, plywood and hardwood on sills and cover for protection.

#### 1.7 QUALITY ASSURANCE

- A. All lumber and plywood shall be grade marked by Southern Pine Inspection Bureau, West Coast Lumber Inspection Bureau, American Plywood Association, or Western Wood Products Association.
- B. All lumber and plywood shall be marked with producing manufacturer's trademark.
- C. Certificate of inspection issued by grading association for bundled lumber and plywood may substitute for individual piece marking.

#### PART 2 - PRODUCTS

# 2.1 LUMBER, GENERAL

A. Dressed lumber, S4S, [19] [15] percent maximum moisture content for 2-inch (38-mm) thickness or less, marked with grade stamp of inspection agency.

#### 2.2 TREATED MATERIALS

- A. Preservative-Treated Materials: AWPA C2 lumber and AWPA C9 plywood, labeled by an inspection agency approved by ALSC's Board of Review. After treatment, kiln-dry lumber and plywood to 19 and 15 percent moisture content, respectively. Treat indicated items and the following:
  - 1. Wood members in connection with roofing, flashing, vapor barriers, and waterproofing.
  - 2. Concealed members in contact with masonry or concrete.
  - 3. Wood framing members less than 18 inches (460 mm) above grade.
  - 4. Wood floor plates installed over concrete slabs directly in contact with earth.
- B. Fire-Retardant-Treated Materials: AWPA C20 lumber and AWPA C27 plywood, interior Type A treatment, labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Use treated lumber and plywood with bending strength, stiffness, and fastener-holding capacities that are not reduced below values published by manufacturer of chemical formulation under elevated temperature and humidity conditions.

# 2.3 LUMBER

A. Miscellaneous Lumber: No. 3 or Standard grade of any species for nailers, blocking, and similar members as indicated on drawings.

# 2.4 MISCELLANEOUS PRODUCTS

- A. Fasteners: Size and type indicated. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of Type 304 stainless steel.
  - 1. Power-Driven Fasteners: CABO NER-272.

- 2. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- B. Metal Framing Anchors: Hot-dip galvanized steel of structural capacity, type, and size indicated.

# PART 3 - EXECUTION

# 3.1 INSTALLATION

- A. COORDINATION: Coordinate work with other trades and provide cutting and patching required to accommodate the work. Verify all dimensions by taking field measurements to ensure proper fit. Accurately cut framing and blocking, and fit true to line and level, avoiding shims and wedges.
- B. Fit rough carpentry to other construction; scribe and cope for accurate fit. Correlate location of furring, blocking, and similar supports to allow attachment of other construction.
- C. ANCHORING AND FASTENTING: Use largest practicable fasteners for each type of work. Bolt nailers and blocking to steel, masonry or concrete members using bolts of proportionate strength to members attached. Unless otherwise noted in the drawings use <sup>3</sup>/<sub>4</sub>" diameter bolts at maximum 4'-0" centers. Use concealed fasteners in finish work, set nails and use flathead countersunk screws.
- WOOD BLOCKING: Install fire-retardant tread wood blocking between metal studs where wall-supported drinking fountains, casework, railings, and other equipment is attached. Install between studs for toilet partitions systems and toilet accessories where anchored to wall. Use minimum 2 x 4 dimension where not indicated otherwise in the drawings.

   1.

# SECTION 06 40 23 - INTERIOR ARCHITECTURAL WOODWORK

# PART 1- GENERAL

### 1.0 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

### 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

### 1.02 SUMMARY

- A. This Section includes the following:
  - 1. Interior standing and running trim and rails.
  - 2. Wood cabinets (casework).
  - 3. Laminate clad cabinets (plastic-covered casework).
  - 4. Cabinet tops (countertops) and plastic-covered chair rails.
  - 5. Flush wood paneling.
  - 6. Interior door frames (jambs).
- B. Related Sections: The following sections contain requirements that relate to this section:
  - 1. Division 6 Section 'Rough Carpentry' for furring, blocking, and other carpentry work that is not exposed to view.
  - 2. Division 6 Section 'Finish Carpentry' for carpentry exposed to view that is not specified in this section.
  - 3. Division 6 Section 'Exterior Architectural Woodwork' for exterior woodwork.
  - 4. Division 8 Section "Flush Wood Doors" for doors specified by reference to architectural woodwork standards.
  - 5. Division 9 Section "Painting" for final finishing of installed painted finish architectural woodwork.

# 1.03 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

- B. 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.
- C. Fire-retardant treatment data for material impregnated by pressure process to reduce combustibility. Include certification by treating plant that treated materials comply with requirements.
- D. Shop drawings showing location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
- E. Samples for initial selection purposes of the following in form of manufacturer's color charts consisting of actual units or sections of units showing full range of colors, textures, and patterns available for each type of material indicated.
  - 1. Plastic laminate (standard and premium selections).
- F. Samples for verification purposes of the following:
  - 1. Lumber with or for transparent finish, 50 square inches, for each species and cut, finished on one side and one edge.
  - 2. Veneer leaves representative of and selected from flitches to be used for transparent finished woodwork.
  - 3. Wood veneer faced panel products;, with or for transparent finish, 8-1/2 inches by 11 inches, for each species and cut with one half of exposed surface finished, with separate samples of unfaced panel product used for core.
  - 4. Lumber and panel products with factory-applied opaque finish, 8- 1/2 inches by 11 inches for panels and 50 square inches for lumber, for each finish system and color, with one half of exposed surface finished.
  - 5. Laminate clad panel products, 8-1/2 inches, by 11 inches for each type, color, pattern, and surface finish, with separate samples of unfaced panel product used for core.
  - 6. Corner pieces as follows:
    - a. Cabinet front frame joints between stiles and rail as well as exposed end pieces, 18 inches high by 18 inches wide by 6 inches deep.
    - b. Miter joints for standing trim.
  - 7. Exposed cabinet hardware, one unit of each type and finish.
- G. Product certificates signed by woodwork manufacturer certifying that products comply with specified requirements.
- H. 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.

# 1.04 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.
  - 1. Include the veneering of wood doors in the single-firm production, where veneer matching extends across wood doors.

- C. Single-Source Manufacturing and Installation Responsibility: Engage a qualified Manufacturer to assume undivided responsibility for woodwork specified in this section, including fabrication, finishing, and installation.
- D. Installer Qualifications: Arrange for installation of architectural woodwork by a firm that can demonstrate successful experience in installing architectural woodwork items similar in type and quality to those required for this project.
- E. AWI Quality Standard Comply with applicable requirements of "Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI) except as otherwise indicated.
- F. Hardware Coordination Distribute copies of approved schedule for cabinet hardware specified in Division 8 Section "Door Hardware" to manufacturer of architectural woodwork; coordinate cabinet shop drawings and fabrication with hardware requirements.

### 1.05 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.'

# 1.06 PROJECT CONDITIONS

- A. Environments1 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.
- B. Field Measurements: Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before manufacturing woodwork; show recorded measurements on final shop drawings. Coordinate manufacturing schedule with construction progress to avoid delay of Work.
  - 1. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with manufacture of woodwork without field measurements. Coordinate other construction to ensure that actual dimensions correspond to guaranteed dimensions.

# PART 2- PRODUCTS

# 2.01 HIGH PRESSURE DECORATIVE LAMINATE MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering high pressure decorative laminates (standard and premium selections) which may be incorporated in the work include:
  - 1. Formica Corp.
  - 2. Nevamar Corp.
  - 3. WilsonArt

# 2.02 MATERIALS

- A. General: Provide materials that comply with requirements of the AWl woodworking standard for each type of woodwork and quality grade indicated and, where the following products are part of woodwork, with requirements of the referenced product standards, that apply to product characteristics indicated:
  - 1. Hardboard ANSI/AHA A135.4
  - 2. High Pressure Laminate: NEMA LD 3.
  - 3. Medium Density Fiberboard: ANSI A208.2.
  - 4. Particleboard ANSI A208.1
  - 5. Softwood Plywood PS 1.
- B. Formaldehyde Emission Levels: Comply with formaldehyde emission requirements of each voluntary standard referenced below:
  - 1. Particleboard: NPA 8.
  - 2. Medium Density Fiberboard: NPA 9.
  - 3. Hardwood Plywood: HPMA FE.
- C. Fire-Retardant Particleboard: Where indicated, provide panels complying with the following requirements that have fire-retardant chemicals bonded to softwood particles at time of panel manufacture to achieve products identical to those tested for flame spread of 20 or less and for smoke developed of 25 or less per ASTM B 84 by UL or other testing and inspecting organization acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting organization.
  - 1. For 45-lb-density panels and thicknesses of 3/4 inch and less, comply with ANSI A208.1 for Grade 1-M-1 except that minimums for modulus of elasticity and screw-holding capacity on face and edge shall be 300,000 psi, 250 lb, and 225 lb, respectively.
  - 2. For 44-lb-density panels and thicknesses of 13/16 inch to 1-1/4 inch, comply with ANSI A208.1 for Grade 1-M-1 except that minimums for modulus of rupture, modulus of elasticity, internal bond, linear expansion, and screw-holding capacity on face and edge shall be 1300 psi, 250,000 psi, 60 psi, 0.50 percent, 250 lb, and 175 lb, respectively.
  - 3. Product: Subject to compliance with requirements, provide "Duraflake FR" by Duraflake Div.; Willamette Industries, Inc.

### 2.03 FABRICATION, GENERAL

- A. Wood Moisture Content: Comply with requirements of referenced quality standard for moisture content of lumber in relation to relative humidity conditions existing during time of fabrication and in installation areas.
- B. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
  - 1. Corners of cabinets and edges of solid wood (lumber) members less than 1 inch in nominal thickness: 1/16 inch.
  - 2. Edges of rails and similar members more than 1 inch in nominal thickness: 1/8 inch.
- C. Complete fabrication, including assembly, finishing, and hardware application, before shipment to project site to minimum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

D. Factory-cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Smooth edges of cutouts and, where located in countertops and similar exposures, seal edges of cutouts with a water-resistant coating.

### 2.04 FIRE-RETARDANT-TREATED LUMBER

- A. General: Where indicated, pressure impregnate lumber with fire-retardant chemicals of formulation indicated to produce materials with fire performance characteristics specified.
- B. Fire-Retardant Chemicals: Use chemical formulations specified that do not bleed through or otherwise adversely affect finishes. Do not use colorants in solution to distinguish treated lumber from untreated lumber.
  - 1. Organic Resin-Based Formulation: Exterior type per AWPA C20 consisting of organic-resin solution, relatively insoluble in water, thermally set in wood by kiln drying.
  - 2. Low-Hygroscopic Formulation: Interior Type A per AWPA C20.
- C. Fire Performance Characteristics: Provide materials identical to those tested for the following fire performance characteristics per ASTM test methods indicated by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify treated lumber with classification marking of inspecting and testing organization in the form of separable paper label or, where required by authorities having jurisdiction, of imprint on lumber surfaces that will be concealed from view after installation.
  - 1. Surface Burning Characteristics: Not exceeding values indicated below, tested per ASTM E 84 for 30 minutes with no evidence of significant combustion.
    - a. Flame Spread: 25.
    - b. Smoke Developed: 50.
- D. Mill lumber after treatment, within limits set for wood removal that does not affect listed fire performance characteristics, using a woodworking plant certified by testing and inspecting organization.
- E. Mill lumber before treatment and implement special procedures during treatment and drying processes that are needed to prevent lumber from warping and developing discolorations from drying sticks or other causes, marring, and other defects affecting appearance of treated woodwork.
- F. Kiln-dry woodwork after treatment to levels required for untreated woodwork. Maintain moisture content required by kiln drying before and after treatment.
- G. Discard treated lumber that does not comply with requirements of referenced woodworking standard. Do not use twisted, warped, bowed, discolored, or otherwise damaged or defective lumber.
- H. Products: Subject to compliance with requirements, provide one of the following:
  - 1. Low-Hygroscopic Formulation (Type A):
    - a. "Flameproof LHC"; Osmose Wood Preserving, Inc.
    - b. "Dricon"; Hickson Corporation.

# 2.05 STANDING AND RUNNING TRIM AND RAILS FOR TRANSPARENT FINISH

A. Quality Standard: Comply with AWI Section 300.

- B. Backout or groove backs of flat trim members and kerf backs of other wide flat members, except for members with ends exposed in finished work.
- C. Assemble casings in plant except where limitations of access to place of installation require field assembly.
- D. Grade: Premium.
- E. Lumber Species: Birdseye Maple, half round.

# 2.06 STANDING AND RUNNING TRIM AND RAILS FOR OPAQUE FINISH

- A. Quality Standard: Comply with AWI Section 300.
- B. Grade: Premium.
- C. Backout or groove backs of flat trim members and kerf backs of other wide flat members, except for members with ends exposed in finished work.
- D. Assemble casing in plant except where limitations of access to place of installation require field assembly.
- E. Lumber Species: Any dosed-grain hardwood listed in referenced woodworking standard.

### 2.07 WOOD CABINETS (CASEWORK) FOR TRANSPARENT FINISH

- A. Quality Standard: Comply with AWI Section 400 and its Division 400A Wood Cabinets."
- B. Grade: Premium.
- C. AWI Type of Cabinet Construction: Flush overlay.
- D. Wood Species for Exposed Surfaces: Maple, rotary cut veneer.
  - 1. Grain Matching: Run and match grain vertically for drawer fronts, doors, and fixed panels.
  - 2. Matching of Veneer Leaves: Slip match.
  - 3. Veneer Matching Within Panel Face: Balance match.
- E. Wood Species for Semiexposed Surfaces: Match species and cut indicated for exposed surfaces.

# 2.08 LAMINATE CLAD CABINETS (PLASTLC.COVERED CASEWORK)

- A. Quality Standard. Comply with AWI Section 400 and its Division 400B 'Laminate Clad Cabinets."
- B. Grade: Premium.
- C. AWI Type of Cabinet Construction: Flush overlay, unless otherwise indicated.
- D. Laminate Cladding High pressure decorative laminate complying with the following requirements:
  - 1. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
    - a. Provide selections made by Architect from laminate manufacturer's full range of standard and premium colors and finishes in the following categories:

- (1) Solid colors.
- (2) Patterns.
- 2. Laminate Grade for Exposed Surfaces: Provide laminate cladding complying with the following requirements for type of surface and grade.
  - a. Horizontal Surfaces Other Than Tops: GP-50 (0.050-inch nominal thickness).
  - b. Vertical Surfaces: GP-50 (0.050-inch nominal thickness).
  - c. Edges: GP-50 (0.050-inch nominal thickness).
- 3. Semiexposed Surfaces: Provide surface materials indicated below:
  - a. High pressure laminate, GP-28.

### 2.09 CABINET HARDWARE AND ACCESSORY MATERIAI.8

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets, except for items specified in Division 8 Section 'Door Hardware.'
- B. Cabinet Hardware and Miscellaneous Item Schedule:
  - 1. Adjustable Shelf Standard.
    - a. Manufacturer/Model No.: Knape & Vogt/No. 255.
    - b. Size/Type: 5/8" wide x 3/16" deep, recessed.
    - c. Finish: Bright zinc plate.
    - d. Remarks: 1/2" vertical adjustment.
  - 2. Adjustable Shelf Support:
    - a. Manufacturer/Model No.: Knape & Vogt/No. 256.
    - b. Finish: Bright zinc plate.
    - c. Remarks: For use with No. 255 standard.
  - 3. Slotted Shelf Standard:
    - a. Manufacturer/Model No.: Knape & Vogt/No. 51.
    - b. Size/Type: 3/4" x 3/8" x length shown, surface mount, heavy duty.
    - c. Finish: Bright nickel plate.
    - d. Remarks: 1-5/8" vertical adjustment.
  - 4. Adjustable Shelf Bracket:
    - a. Manufacturer/Model No.: Knape & Vogt/No. 52.
    - b. Size/Type: 112" wide x shelf depth.
    - c. Finish: Bright nickel plate.
    - d. Remarks: For use with No.51 standard.
  - 5. Drawer Slide: (Typical)
    - a. Manufacturer/Model No.: Grant/No. 329.
    - b. Size/Type: Full extension, length to suit drawer.
    - c. Finish: Zinc plate.
    - d. Remarks: 100 lb. rating.
  - 6. Drawer Slide: (To 4-1/2" drawer depth)

- a. Manufacturer/Model No.: Grant/No. 328.
- b. Size/Type: Full extension, length to suit drawer.
- c. Finish: Zinc plate.
- d. Remarks: 50 lb. rating.
- 7. Knobs (at Suites Level):
  - a. Forms + Surfaces Model No. HC430 Series, sizes as selected by Architect from manufacturers standards.
  - b. Finish: Anodized black matte.
- 8. Wire Pulls:
  - a. Manufacturer/Model No.: Stanley/No. 4483112
  - b. Size/Type: 3-1/2" center wire pulls.
  - c. Finish: US 28D.
- 9. Concealed Hinges:
  - a. Manufacturer/Model No.: Stanley/No. 1510.
- 10. Continuous Hinges:
  - a. Manufacturer/Model No.: Stanley/No. STS311-1/4.
  - b. Size/Type: 1-1/2" wide x height of door.
  - c. Finish: US 32.
  - d. Remarks: Provide matching countersunk screws, 2" o.c., both sides.
- 11. Door Catch (Magnetic type)
  - a. Manufacturer/Model No.: Stanley/No. SP4L
  - b. Size/Type: 2" x 1-1/4" case size.
  - c. Finish: Aluminum.
  - d. Remarks: One per leaf to 48", two per leaf to 84".
- 12. Cabinet Lock
  - a. Manufacturer/Modal No.: National/No. C-8053.
  - b. Size/Type: Disc tumbler cam lock.
  - c. Finish: US 26D or US 32D.
  - d. Remarks: Furnish two keys per lock; keyed to Building Standard.
- 13. Sliding Glass Door Locks: K&V 965NP, keyed to building system.
- 14. Track, Upper Guide & Sheaves: Stylmark Model No. 810005 Assembly, 204-Ri clear anodized finish.
- C. Hardware Standard Comply with ANSI/BEMA A156.9 "American National Standard for Cabinet Hardware" for items indicated by reference to BIIMA numbers or referenced to this standard.
- D. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for BHMA code number indicated.
  - 1. Dark Oxidized Satin Bronze, Oil Rubbed, on Bronze Base: BHMA 613 and matching Architect's sample.
  - 2. Satin Chromium Plated, Brass or Bronze Base: BHMA 626.

- 3. Satin Chromium Plated, Steel Base: BHMA 652.
- 4. Satin Stainless Steel, Stainless Steel Base: BHMA 630.
- E. For concealed hardware provide manufacturer's standard finish that complies with product class requirements of ANSJ/BHMA A156.9.
- F. Clear Tempered Float Glass for Shelves: ASTM C 1048, Condition A, style I, type I, quality q3, class 1, seamed at edges before tempering, 1/4-inch thick unless otherwise indicated.

### 2.10 ARCHITECTURAL CABINET TOPS (COUNTERTOPS) AND CHAIR RAILS:

- A. Quality Standard: Comply with AWI Section 400 and its Division 400C.
- B. Type of Top and Chair Rail: High pressure decorative laminate complying with the following:
  - 1. Grade: Custom.
  - 2. Laminate Cladding for Horizontal Surface: High pressure decorative laminate as follows:
    - a. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
      - (1) Provide selections made by Architect from manufacturer's full range of standard and premium colors and finishes in the following categories:
        - (a) Solid colors.
        - (b) Patterns.
    - b. Grade: GP-50 (0.050-inch nominal thickness).
    - c. Edge Treatments:
      - (1) Plastic Laminate Edge Treatment: Same as laminate cladding on horizontal surfaces.
      - (2) Wood Edge Treatment: Lumber edge for transparent finish, with matching wood species and cut to be determined.

# 2.11 FLUSH WOOD PANELING FOR TRANSPARENT FINISH

- A. Quality Standard: Comply with AWI Section 500 and its Division 500A.
- B. Grade: Premium.
- C. Veneer Species: Birdseye Maple half round.
- D. Matching of Adjacent Veneer Leaves: Slip match.
- E. Veneer Matching Within Panel Face: Best match.
- F. Fire Performance Characteristics: Provide paneling composed of panels of wood veneer density and fire-retardant particleboard that are identical in construction to units tested for the following surface burning characteristics per ASTM E 84 by UL or other testing and inspecting organization acceptable to authorities having jurisdiction. Identify panels with appropriate markings of applicable testing and inspecting organization on surfaces that will be concealed from view after installation.
  - 1. Flame Spread: 75 or less.
  - 2. Smoke Developed: 40 or less.

# 2.12 INTERIOR DOOR FRAMES FOR TRANSPARENT FINISH

- A. Quality Standard: Comply with AWI Section 900B.
- B. Grade: Premium.
- C. Lumber Species: Maple, rotary cut veneer.

# 2.13 CLOSET AND UTILITY SHELVING:

- A. Quality Standard: Comply with AWI Section 600.
- B. Shelving for Painted Finish (By Section 09 91 00): Comply with the following requirements:
  - 1. Grade: Economy.
  - 2. Shelving Material: Maple faced veneer core plywood.
  - 3. Lumber: Ponderosa Pine or Poplar.

# 2.14 FASTENERS AND ANCHORS

- A. Screws: Select material, type, size, and finish required for each use. Comply with FS FF-S-111 for applicable requirements.
  - 1. For metal framing supports, provide screws as recommended by metal framing manufacturer.
- B. Nails: Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.
- C. Anchors: Select material, type, size, and finish required by each substrate for secure anchorage. Provide nonferrous metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts and anchors, as required, to be set into concrete or masonry work for subsequent woodwork anchorage.

# 2.15 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.
  - 1. Factory Finishing: To the greatest extent possible, finish architectural woodwork at factory. Defer only final touch-up, cleaning, and polishing until after installation. Painted finish by Section 09 91 00 except prime coat.
- 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.
- D. Transparent Finish for Closed-Grain Woods: Comply with requirements indicated below for grade, finish system, staining, effect, and sheen.
  - 1. Grade: Premium.
  - 2. AWI Finish System #5: Catalyzed polyurethane.
  - 3. Staining for Cherry Only: Match approved sample for color.
  - 4. Effect: Open grain (not filled).
  - 5. Sheen: Dull satin 15-20 deg.

- E. Opaque Finish: Comply with requirements indicated below for grade, finish system, color, effect, and sheen:
  - 1. Grade: Premium.
  - 2. AWI Finish System #11: Catalyzed polyurethane.
  - 3. Color: Match Architect's sample.
  - 4. Sheen: Medium-gloss rubbed effect 35-45 deg.

# 2.16 MISCELLANEOUS ACCESSORIES

A. Steel Countertop Support Bracket: provide prefinished steel bracket supports at locations as shown on drawings. Brackets shall be by A&M Hardware (888) 647-0200 <u>info@aandmhardware.com</u> Other equal products may be provided if and as specifically approved by Architect by substitution request during bidding period.

### PART 3- EXECUTION

# 3.01 PREPARATION

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installing.
- B. Deliver concrete inserts and similar anchoring devices to be built into substrates well in advance of time substrates are to be built.
- C. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including back priming and removal of packing.

# 3.02 INSTALLATION

- B. 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.
- C. Install woodwork plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 118 inch in 8'-0" for plumb and level (including tops) and with no variations in flushness of adjoining surfaces.
- D. Scribe and cut woodwork to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.
- E. Fire-Retardant-Treated Wood. Handle, store, and install fire- retardant-treated wood to comply with recommendations of chemical treatment manufacturer including those for adhesives where are used to install woodwork.
- F. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fastener heads are required, use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork and matching final finish where transparent finish is indicated.
- G. Standing and Running Trim and Rails: Install with minimum number of joints possible, using fulllength pieces (from maximum length of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns and miter at corners.

- H. Cabinets: Install without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated. Maintain veneer sequence matching (if any) of cabinets with transparent finish
- I. Tops: Anchor securely to base units and other support systems as indicated.
- J. Paneling: Anchor paneling to supporting substrate with concealed panel-hanger clips and by blind nailing on backup strips, splined-connection strips, and similar associated trim and framing. Do not face nail unless otherwise indicated.
- K. Complete the finishing work specified in this section to whatever extent not completed at shop or before installation of woodwork.
- L. Refer to the Division 9 sections for finishing of painted architectural woodwork.

### 3.03 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, lubricate, and adjust hardware.
- C. Clean woodwork on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

### 3.04 **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.

# SECTION 06 61 16 - SOLID SURFACING

### PART 1 – GENERAL

### 1.0 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Gibraltar Solid Surface Material.
  - 2. Earthstone Solid Surface Material.
  - 3. Solid Surface Material Shaped Goods (Wilsonart Sinks).

#### B. Related Sections:

- 1. Finish Carpentry: Section 06 10 00.
- 2. Architectural Woodwork: Section 06 40 23.
- 3. Sealants: Section 07 92 00.
- 4. Door Thresholds at Ceramic Tile: Section 09 30 13.
- 5. Plumbing: Division 22.

# 1.2 SYSTEM DESCRIPTION

- A. Gibraltar Solid Surface Sheet: Homogenous sheet material composed of acrylic resins, fire-retardant filler materials, and coloring agents.
- B. Earthstone Solid Surface Sheet: Homogenous sheet material composed of acrylic resins, fire-retardant filler materials, and coloring agents.
- C. Solid Surface Shaped Goods (Wilsonart Sinks): Cast items of homogenous material composed of polyester and acrylic resins, fire-retardant filler materials, and coloring agents.

### 1.3 SUBMITTALS

- A. Comply with Section 01 33 00, unless otherwise indicated.
- B. Product Data:
  - 1. Detailed specification of construction and fabrication.
  - 2. Manufacturer's installation instructions.
  - 3. Manufacturer's detailed recommendations for handling, storage, installation, protection, and maintenance.

- C. Shop Drawings: Installation details including location and layout of each type of fabrication and accessory.
- D. Samples: Full range of standard colors and patterns.
- E. Contract Closeout Submittals: Comply with Contract Documents.

### 1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Wilsonart certified solid surface fabricator/installer.
- B. Installer Qualifications: Firm experienced in installation or application of systems similar in complexity to those required for this Project, including specific requirements indicated.
  - 1. Acceptable to or licensed by manufacturer.
- C. Source Limitations: Obtain materials and products from single source.

### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver fabrications appropriately wrapped in protective materials.
- B. Protect fabrications from damage.

#### 1.6 PROJECT CONDITIONS

A. Maintain relative humidity planned for building occupants and an ambient temperature between 65 and 75\_F<sup>□</sup> for 48 hours prior to and during installation. After installation, maintain relative humidity and ambient temperature planned for building occupants.

# 1.7 WARRANTY

A. Furnish manufacturer's limited 10 year warranty.

#### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. Wilsonart International, (800) 433-3222, <u>www.wilsonart.com</u>.
  - 1. Gibraltar Solid Surface, Type 051.
  - 2. Earthstone Solid Surface, Type 051.
- B. Substitutions: Permitted, in accordance with Section 01 25 00 Substitution Procedures.

### 2.2 GIBRALTAR SOLID SURFACE SHEET

- A. Nominal sheet thickness: 0.50 inch (13 mm)
- B. Surface burning characteristics in accordance with ASTM E 84: Class I or A, and as follows:
  - 1. Flame spread: < 25.
  - 2. Smoke developed: <25.
- C. Liquid Absorption, ISO 4586-2, for 1/2 inch material thickness: 0.4 percent after 2 hour period.
- D. Izod Impact, ASTM D 256, Method A: 0.3 foot pounds per inch.

- E. Tensile Modulus, ASTM D 638 Nominal: 1.2 million pounds per square inch.
- F. Thermal Expansion, ASTM D 696: 0.000018 inch per inch per degree F, maximum.
- G. Hardness, ASTM D 2583, Barcol Impressor: 57.
- H. Flexural Toughness, ASTM D 790: 3 (in.-lb,/in<sup>3</sup>).
- I. Deflection Temperature under load, ASTM D 648: 90 degrees C.
- J. Stain Resistance, ANSI Z-124.3 Modified; 3.4: No effect.
- K. Boiling Water Resistance, NEMA LD 3-3.05: No effect.
- L. High Temperature Resistance, NEMA LD 3-3.06: No effect.
- M. Radiant Heat Resistance, NEMA LD 3-3.10: No effect.
- N. Light Resistance, NEMA LD 3-3.03: No effect.
- O. Ball Impact Resistance, NEMA LD 3-3.08, one half pound ball, unsupported: 125 inches.
- P. Specific Gravity (Density ASTM D792): 1.60 grams per cubic centimeter.
- Q. Approximate weight: 4.20 pounds per square foot.
- R. Weatherability, ASTM D 2565: Pass.
- S. Fungus Resistance, ASTM G 21: Pass.
- T. Bacterial Resistance, ASTM G 22: Pass.
- U. Pittsburgh Protocol Toxicity: 66.9 grams.
- V. Patterns and Finishes: Selected from manufacturer's full range of available selections (*standard*) by Architect.

# 2.3 EARTHSTONE SOLID SURFACE SHEET

- A. Nominal sheet thickness: 0.50 inch (13 mm).
- B. Surface burning characteristics in accordance with ASTM E 84: Class II or B, and as follows:
  - 1. Flame spread: < 26.
  - 2. Smoke developed: < 35.
- C. Liquid Absorption, ISO 4586-2, for 1/2 inch material thickness: 0.4 percent after 2 hour period.
- D. Izod Impact, ASTM D 256, Method A: 0.3 foot pounds per inch.
- E. Tensile Modulus, ASTM D 638 Nominal: 1.1 million pounds per square inch.
- F. Thermal Expansion, ASTM D 696: 0.00002 inch per inch per degree F, maximum.
- G. Hardness, ASTM D 2583, Barcol Impressor: 57.
- H. Flexural Toughness, ASTM D 790: 5 (in.-lb,/in<sup>3</sup>).
- I. Deflection Temperature under load, ASTM D 648: 90 degrees C.
- J. Stain Resistance, ANSI Z-124.3 Modified; 3.4: No effect.
- K. Boiling Water Resistance, NEMA LD 3-3.05: No effect.
- L. High Temperature Resistance, NEMA LD 3-3.06: No effect.
- M. Radiant Heat Resistance, NEMA LD 3-3.10: No effect.
- N. Light Resistance, NEMA LD 3-3.03: No effect.
- O. Ball Impact Resistance, NEMA LD 3-3.08, one half pound ball, unsupported: 125 inches.
- P. Specific Gravity (Density ASTM D792): 1.56 grams per cubic centimeter.
- Q. Approximate weight: 4.10 pounds per square foot.
- R. Fungus Resistance, ASTM G 21: Pass.
- S. Bacterial Resistance, ASTM G 22: Pass.
- T. Pittsburgh Protocol Toxicity: 65.4 grams.
- U. Patterns and Finish: Selected from manufacturer's full range of available selections (standard) by Architect.

# 2.4 ACCESSORY MATERIALS

- A. Joint adhesive: Manufacturer's standard adhesive to create inconspicuous, nonporous joints, with a chemical bond (WA8215).
- B. Sealant: Standard mildew resistant, FDA/UL recognized silicone sealant in color matched or clear

formulations.

C. Sink/bowl mounting hardware: Manufacturer's approved bowl clips, brass inserts and fasteners for attachment of undermount sinks/bowls.

# 2.5 FABRICATION

- A. Fabrication to be performed by a Wilsonart certified solid surface fabricator/installer.
- B. Fabricate components in shop to greatest extent practical to size and shape indicated, in accordance with approved shop drawing and Wilsonart published requirements.
- C. Wilsonart Solid Surface Fabrication Manual (SS0319)
- D. Form joints between components using manufacture's standard joint adhesive. Joints shall be inconspicuous in appearance and without voids. Attach 4" (100mm) wide Gibraltar/Earthstone reinforcing strip under joints required by Deck Seam Section of the Wilsonart Solid Surface Fabrication Manual (SS0319).
- E. Provide holes and cutouts for plumbing and bath accessories as indicated on shop drawings.
- F. Rout and finish component edges to a smooth, uniform finish. Rout all cutouts then sand all edges smooth. Repair or reject defective or inaccurate work.
- G. Finish: Surfaces shall have a uniform finish.
  - 1. Matte: Standard finish for high traffic areas, requires the least amount of maintenance.
  - 2. Satin: Standard finish for darker Gibraltar and Earthstone patterns, requires minimal maintenance.
  - 3. Semi-gloss: Higher sheen with greater reflectance, suggested for lower traffic areas, requires increased maintenance
  - 4. Gloss: Maximum sheen and reflectance, recommended for light traffic areas or vertical applications.
- H. Thermoforming (optional): Comply with forming data from manufacturer.
  - 1. Construct matching molds to form components shape.
  - 2. Form pieces to shape prior to seaming and joining.
  - 3. Cut pieces larger than finished dimensions, sand edges, remove all nicks and scratches.
  - 4. Heat entire component uniformly between 280°–325°F during forming.
  - 5. Prevent blistering, whitening or cracking of Gibraltar/Earthstone during forming.

# PART 3 – EXECUTION

# 3.1 EXAMINATION

A. Examine substrates to receive solid surfacing. Identify conditions detrimental to proper or timely installation. Do not commence installation until conditions have been corrected.

# 3.2 PREPARATION

A. Precondition Wilsonart Solid Surfacing in accordance with manufacturer's printed installation instructions.

# 3.3 INSTALLATION

- A. Install components plumb and level, in accordance with approved shop drawings, project installation details and manufacturer's printed instructions.
- B. Form joints using manufacturer's approved adhesive, with joints inconspicuous in finished work.
- C. Adhere undermount sinks/bowls to countertop using manufacturer's recommended joint adhesive.

- D. Adhere topmount sinks/bowls to countertop using manufacturer's recommended adhesive/silicone sealant.
- E. Provide backsplashes and endsplashes as indicated on the drawings. Adhere to countertops using manufacturer's recommended silicone sealant.
- F. Remove excessive adhesive and sealants. Components shall be clean on Date of Substantial Completion.
- G. Coordinate plumbing installation with Division 22.

# 3.4 INSTALLATION OF WINDOW STOOLS

- A. Install window stools full length of window, set securely into place using only concealed fasteners and manufacturer's approved adhesive.
- B. Window stools shall be plumb, true and level.
- C. Provide minimum 1/8" expansion gaps on both sides of window stools, sealed with Manufacturer's approved sealant.
- D. Ease edges and sand smooth.

# 3.5 INSTALLATION OF VANITIES

- A. Install plumb, level, true and straight. Shim as necessary using concealed shims.
- B. Attach top securely to base unit or support brackets in accordance with manufacturer's printed instructions.
- C. Seal between wall and component with manufacturer's recommended silicone sealant.
- D. Attach backsplashes and endsplashes to countertops using manufacturer's recommended silicone sealant.

# 3.6 PROTECTION

- A. Protect surfaces from damage until Date of Substantial Completion. Repair or replace damaged components that cannot be repaired to architect's satisfaction.
- B. Fabricator/Installer to provide the Wilsonart® Care and Maintenance kit, review maintenance procedures and the Wilsonart warranty with the head of maintenance upon completion of project.

# SECTION 07 10 00 — DAMPPROOFING AND WATERPROOFING

#### PART 1 - GENERAL

# 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

# 1.2 WORK INCLUDED

- A. Provide and install below-grade waterproofing.
- B. Provide and apply dampproofing on weather side of inside wythe of all exterior masonry cavity walls.
- C. Provide and apply dampproofing and joint taping on weather side of gypsum board sheathing.
- D. Provide and install membrane waterproofing (flashing) at exterior walls as indicated in the drawings and specified herein.

#### 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Unit masonry.
- B. Gypsum sheathing.
- C. Flashing at roof.
- D. Plastic membrane under slab-on-grade.
- E. Waterstops.
- F. Metal thru-wall flashing.

# 1.4 SUBMITTALS

A. Submit manufacturer's printed literature describing each material, restrictions, and manufacturer's recommended procedures. Submit samples of each material.

B. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.

### 1.5 WARRANTY

A. Provide written warranty against defects in materials and workmanship for the Work under this section for a period of one year after the date of Substantial Completion of the Project.

### 1.6 QUALITY ASSURANCE

- A. Waterproofing company shall have a minimum of 3 years experience in the dampproofing and waterproofing of building structures of similar size and scope as this project.
- B. Retain at the job site a properly calibrated gauge for use by the Architect to verify applied thickness of materials.

### PART 2 - PRODUCTS

# 2.1 WALL MATERIALS

- A. MEMBRANE FLASHING: 40 mil thick polyethylene backed SBS modified bitumen self-adhering black membrane; "Protecto Flash" as manufactured by Protecto Wrap Co. or "Perm-A-Barrier" as manufactured by W.R. Grace and Co. or "Blueskin SA" as manufactured by Henry Company. Membrane shall comply with the following:
  - 1. Tensile Strength: ASTM D412; 1400 psi.
  - 2. Elongation: ASTM D412; 200% min.
  - 3. Water Absorption: ASTM D570; 0.1% max.
- B. DAMPPROOFING: Non-asbestos emulsion type coating No. 352 over No. 207 adhesive primer, as manufactured by Gulf States Asphalt or approved equivalent by Henry Company, Karnak, W.R. Meadows, Celotex, or Sonneborn. Comply with ASTM D1227, Type 1.
- C. SHEATHING TAPE: 4" wide glass fabric scrim complying with ASTM D1668 or 40 mil thick polyethylene backed SBS modified bitumen self-adhering tape as manufactured by Protecto Wrap Co. or equivalent by W.R. Grace and Co or Henry Company. Verify compatibility of tape with proposed dampproofing.

### 2.2 BELOW GRADE WATERPROOFING:

- A. WALLS: "Hydrocide Liquid Membrane 5000T", one part cold applied elastometric, modified urethane. Trowel applied, non-sag, as manufactured by Sonneborn or approved equivalent by Toch Bros. or Tremco or Henry Company.
- B. SLABS: "Hydrocide Liquid Membrane, HLM 5000" Cold Applied Seamless Elastomeric, Modified Urethane for use between concrete seal slab and concrete slab-on-grade as manufactured by Sonneborn or approved equivalent by Toch Bros. or Tremco or Henry Company.
- C. PROTECTION BOARD: Water-resistant, semi-rigid panel composed of a core of asphalt and inorganic mineral filler particles, bottom reinforcing cover of asphalt-saturated felt and top cover of fiber glass mat weather-coated with a bond-breaking film, as manufactured by W.R. Meadows, Inc or Henry Company.

- D. INSIDE ELEVATOR PIT: "Sonoblock" cementitious base slurry as manufactured by Sonneborn-Contech.
- E. WATERSTOPS: Reference concrete section.

### 2.3 SHOWER PANS:

A. MEMBRANE SHOWER PAN: 30 mil thick synthetic, heavy-duty, flexible membrane PVC sheet, Nervastral 300.

### PART 3 - EXECUTION

#### 3.1 INSPECTION

A. Contractor shall inspect exterior face of all masonry cavity walls to ensure that all penetrations and joints are completely filled prior to dampproofing operations beginning.

### 3.2 MEMBRANE FLASHING

- A. Prime concrete and masonry surfaces scheduled to receive membrane flashing using flashing manufacturer's recommended primer to ensure good adhesion.
- B. WALL FLASHINGS: Shall be installed above all openings occurring in an exterior wall, at base of exterior wall, and at wall interruptions by columns, beams, slabs, spandrels and other locations as indicated in the drawings. Flashing shall extend to within 1" of outside face of wall, shall be continuous and shall extend through cavity and be turned up to the top first course above finish floor on face of inner wythe, and to extend 1" minimum into back up or inner wythe. End laps to be 9" and side laps 6".
- C. STEEL STRUCTURE: Cover all steel columns or beams in exterior walls not protected by dampproofed concrete block or sheathing. Cover steel completely with membrane flashing lap 6" on to masonry on each side of columns. Conform and adhere to steel shapes not fireproofed. Cover all protruding angles or miscellaneous steel.
- D. FRAMES: Install at exterior window and door frames and other locations as indicated in the drawings.
- E. SHEATHING: Wrap all corners of gypsum board sheathing. See drawings for other details.
- 3.3 SHEATHING TAPE: Use one of the following systems:
  - A. Imbed and cover glass fabric scrim tape in dampproofing mastic at all joints, cracks and penetrations at gypsum board sheathing.
  - B. Apply specified self-adhering tape continuously over all joints, cracks and penetrations prior to beginning dampproofing operations.

#### 3.4 DAMPPROOFING

- A. Spray or brush apply dampproofing coating to weather side of all gypsum sheathing and primed concrete block back-up at exterior masonry cavity walls in accordance with the following:
  - 1. <u>Primer:</u> Minimum ½ gallon material per 100 sq. ft. of wall surface.
  - 2. <u>Coating:</u> Minimum 2/32" (62.5mils) dry film thickness and minimum 5 gallons material per 100 sq. ft.
- B. Cover all corners and work thoroughly into all joints, cracks, or crevices. Finished coating shall be monolithic and free of pin holes or cracks. Seal cracks, voids and joints at dissimilar materials with glass fabric embedded in dampproofing coating.
- C. Seal around penetrations including all masonry anchors.
- D. Dampproofing shall be applied only when temperature is at 50 degrees F. and rising or above, and when no rain is forecast for the 24 hour period following application. No dampproofing shall be covered by masonry prior to observation by the Architect. All dampproofing shall dry for a minimum of 24 hours prior to being covered by finish masonry.

# 3.5 BELOW GRADE WATERPROOFING

### A. LIQUID MEMBRANE:

- 1. Install liquid membrane systems at earth side of all below grade walls, between sub-slab ("mudslab") and structural slab, and all outside surfaces of elevator pit. Allow concrete work to cure a minimum of 14 days. All surfaces shall be smooth, dry, sound and free of honeycombs. Concrete shall be free of curing and parting compounds, wax or other foreign materials.
- 2. Static joints or cracks less than 1/8" wide shall be sealed with "HLM" as manufactured by waterproofing manufacturer. Material shall fill and over-lap the edges of the joint to a width of 4" on both sides and shall have a minimum surface thickness of 55 (+5) mils.
- 3. Immediately prior to application of membrane, remove all dust and dirt by use of high-pressure air, by brushing with a soft broom or vacuum cleaning.
- 4. Apply material at a rate of 4 gallons per 100 square feet of surface to produce a membrane of 55 (+5) mil thick. Carefully control application to avoid runs and sags of fresh material.
- 5. Apply membrane to prestripped areas at cracks, joints, intersections, penetrations, etc., to provide a minimum total thickness of 110 mils over these areas. Mask any membrane edge exposed to view to provide a straight clean edge.
- 6. Before the membrane attains a final set, verify the applied thickness by use of a mil-thickness gauge. Where readings indicate a thickness less than specified, immediately apply additional membrane to produce required thickness.
- 7. Following the application of the membrane, place protection boards over the membrane waterproofing at walls receiving backfill. Use membrane material as required to adhere protection boards. Boards shall be firmly in place with joints closely butted and sealed with gusset tape before backfilling is started.
- 8. Protect membrane during construction. Any punctures or cuts in the membrane shall be patched and sealed in the manner described above for sealing joints in the sheeting.

#### 3.6 SHOWER PANS

- 1. Ensure that surfaces receiving shower pan are clean, thoroughly dry and free from rough surfaces and sharp projections.
- 2. One-ply of 30 mil sheet shall be applied over concrete surface by embedding it in a coat of Nerva-Plast mastic trowel-applied at a rate of 40 sq. ft. per gallon. Turn up perimeter a minimum of 4".
- 3. Seal joints with 3" and final 2" wide strips of Nervastral tape in accordance with manufacturer's recommendations. Preform all corners and make without joints.
- 4. Roll entire horizontal area with 50 to 100 lb. Roller. Set corners and turn-ups with rubber roller.

# SECTION 07 21 00 — BUILDING INSULATION

#### PART 1 - GENERAL

# 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

# 1.2 WORK INCLUDED

- A. Provide and install fiberglass roll or batt insulation as indicated in the drawings.
- B. Provide and install rigid insulation board at exterior cavity walls as indicated in the drawings.
- C. Provide and install fiberglass batt insulation at certain exterior stud walls as indicated in the drawings.

### 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Unfaced acoustical insulation in drywall partitions.
- B. Piping and duct insulation.

#### 1.4 SUBMITTALS

- A. Submit manufacturer's product data describing materials and "R" values.
- B. Submit insulation manufacturer's written approval of proposed cavity wall insulation mastic to be used over specified dampproofing.
- C. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.
## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. BATT OR ROLL INSULATION: As manufactured by Certainteed, Owens-Corning, Manville, or Celotex.
  - 1. <u>General:</u> Insulation shall be fine fiber, flexible, resilient glass fiber blanket. Moisture absorption shall be less than .2% by volume.
  - 2. <u>Exterior Stud Walls:</u> 6" x 16" wide x 96" batts, "R" factor 19. Unfaced interior side. <u>Exterior side</u> shall be foil faced or Kraft paper faced.
  - 3. Interior Stud Walls: 4" x 16" wide x 96" sound attenuation batts "R" factor 11. Unfaced.
  - 4. <u>Above Acoustical Ceiling Panels:</u> Thermal Batt Insulation Kraft faced fiberglass. "R" factor 19.
- B. CAVITY WALL INSULATION: Rigid extruded polystyrene foam board in 1" thickness x 16" wide x length required. "R" value of 5 or greater per 1" thickness. Dow Corning "Styrofoam" or equivalent by Foamular or Amco. Minimum density 2.0 lbs. per cu. ft.

### PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. WALL INSULATION:
  - 1. <u>New Exterior Stud Walls:</u> Install between metal studs with snug fit. Install roll or batts continuous from floor to overhead structure. **Place vapor barrier face toward exterior of building.** Leave 1" space around electrical boxes. Where insulation is not covered on backside by gypsum board (above ceilings), cover with poultry mesh stretched across face of studs and screw fastened to studs.
  - 2. <u>Exterior Cavity Walls:</u>
    - a. Install insulation horizontally between wall ties on masonry backup, ends and edges butted tight. Install insulation according to manufacturer's printed instructions using mastic **compatible with insulation board and dampproofing.** Do not bend masonry anchors.
    - b. Saw cut insulation for tight fit around openings or other obstructions.
    - c. Keep stored insulation covered and protected from ultra-violet rays.
- B. ACOUSTICAL BATTS: Unfaced acoustical batts in interior partitions provided under Drywall Section 09 21 16.

#### END OF SECTION

## SECTION 07 22 00 - ROOF AND DECK INSULATION

### PART 1. GENERAL

#### 1.0 Coordination

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.
- 1.1 Scope of Work:
  - A. Provide all labor, equipment, and materials to install rigid thermal insulation and Dens Deck Prime recovery board over vented base sheets, ONLY where indicated on the drawings. Install cants, edge strips where indicated on drawings.
- 1.2 Related Sections:
  - A. Division 6 "Rough Carpentry"
  - B. Division 7 "Preparation for Re-roofing"
  - C. Division 7 "Coal Tar Modified Bitumen Roofing"

### 1.3 Submittals:

- A. Samples and product literature for all products listed.
- 1.4 Delivery Storage and Handling:
  - A. Deliver materials in manufacturer's original unopened packages, dry, undamaged, seals and labels intact.
  - B. Store all insulation delivered to the site in enclosed trailers.
- 1.5 Environmental Requirements:
  - A. Apply insulation only when the weather conditions are in compliance with the roof system limitations.
  - B. Protect the installed insulation from water penetration at the end of each day's work.
  - C. Application of the roof system shall immediately follow the installation of the roof insulation as it

is installed.

### PART 2. PRODUCTS

- 2.1 General: (Provide as listed or approved equal)
  - A. When a particular make or trade name is specified, it shall be indicative of a standard required.

### 2.2 Materials:

- A. Polyisocyanurate Insulation Board: 1.5 inch with fiberglass reinforced facers. Johns Manville, E'NRG'2, LTTR-value: 9.0. Size: Four feet by four feet(4'x4')
- B. Recoveryboard: 1/2-inch woodfiber as indicated on plans.
- C. Insulation Adhesive: Cold applied dual component polyurethane adhesive Insul-Loc HR.
- D. Roof Board Joint Tape: Six (6) inches wide glass fiber mat with adhesive compatible with insulation board facers.
- E. Steel Deck Fasteners: Olympic, CR334 CR-10 coated #10 fasteners with 3-inch steel plates.
- F. Cant Strips: Fiberglass, Glass Cant.
- G. Roof Sheathing: 5/8" PS1 Exp., 7/16" CDX Plywood.
- H. Insulation: Johns Manville R-19 unfaced between rafters, ISO-Board Rigid R-20 Between Plywood Sheathing.
- I. As required by the membrane manufacturer.

#### PART 3. EXECUTION

- 3.1 Examination:
  - A. Examine substrate surfaces to receive roof and deck insulation and associated work and conditions under which insulation will be installed. Do not proceed with roofing until unsatisfactory conditions have been corrected in a manner acceptable to Installer.
  - B. Verify deck and surfaces are clean, smooth, dry, free of depressions or irregularities prior to beginning installation of materials.
  - C. Verify roof openings, curbs, pipes, sleeves, ducts, penetrations or vents through roof are solidly set, wood nailing strips are in place.
  - D. Verify all specifications related to Carpentry, have been followed prior to beginning installation of insulation. Beginning installation means acceptance of substrate.

#### 3.2 Protection:

A. During execution of work covered by this Section, the Contractor shall provide protection for roof insulation from water and wind penetration at the end of each day's work.

- B. Protect the roof insulation in areas that will receive excessive traffic with a surface protection such as plywood.
- C. All workmen shall wear clean, soft rubber-soled shoes for any application work where they may be walking on the in-place insulation.

### 3.3 Installation:

- A. Ensure all surfaces are clean, dry, free of dirt, debris, oils, loose or embedded gravel and other contaminants that may inhibit adhesion.
- B. Over Steel Deck: Mechanically attach the first layer of rigid insulation to the substrate using specified fasteners and plates <u>applied at 3-ft<sup>2</sup> maximum contributory area per fastener</u>, in accordance with Factory Mutual Approval Guide.
- C. Over vented base sheet, apply insulation adhesive directly to the substrate using a ribbon pattern with one half (1/2) inch to three quarter (3/4) inch wide beads, using either the pail or an automatic applicator, at a rate of one (1) gallon per one hundred (100) square feet. Use two (2) gallons per one hundred (100) square feet to adhere to smooth BUR.
- D. Immediately place insulation boards into wet adhesive. Do not slide boards into place. Do not allow the adhesive to skin over before installing insulation boards.
- E. Briefly step each board into place to ensure contact with the adhesive. Substrates with irregular surfaces may prevent the insulation board from making positive contact with the adhesive. Relief cuts or temporary weights may be required to ensure proper contact.
- F. All boards shall be cut and fitted where the roof deck intersects a vertical surface. The boards shall be cut to fit a minimum of one quarter (1/4) inch away from the vertical surface.
- G. Embed recovery board in adhesive after first layer has been attached as recommended by insulation manufacturer. Stagger end joints of boards so all open joints will be eliminated. Walk in each piece of insulation and leave boards completely adhered to base felt or deck. Each insulation board shall be butt firmly against adjoining panels. All open joints shall be eliminated.
- H. Trim surface of insulation where necessary at roof drains so completed surface is flush with ring of drain.
- I. Cant Strips/Tapered Edge/Crickets: Install preformed 45-degree fiberglass cant strips at junctures of vertical surface. Provide preformed, tapered edge/crickets where indicated on the drawings.

END OF SECTION

## SECTION 07 25 00 - WEATHER BARRIERS

## PART 1 – GENERAL

## 1.0 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

### **1.1 SECTION INCLUDES**

- A. Weather barrier membrane
- B. Seam Tape
- C. Flashing
- D. Fasteners

## **1.2 REFERENCES**

- A. ASTM International
  - 1. ASTM C920; Standard Specification for Elastomeric Joint Sealants
  - 2. ASTM C1193; Standard Guide for Use of Joint Sealants
  - 3. ASTM D882; Test Method for Tensile Properties of Thin Plastic Sheeting
  - 4. ASTM D1117; Standard Guide for Evaluating Non-woven Fabrics
  - 5. ASTM E84; Test Method for Surface Burning Characteristics of Building Materials
  - 6. ASTM E96; Test Method for Water Vapor Transmission of Materials
  - 7. ASTM E1677; Specification for Air Retarder Material or System for Framed Building Walls
  - 8. ASTM E2178; Test Method for Air Permeance of Building Materials
- B. AATCC American Association of Textile Chemists and Colorists
  - 1. Test Method 127 Water Resistance: Hydrostatic Pressure Test
- C. TAPPI
  - 1. Test Method T-410; Grams of Paper and Paperboard (Weight per Unit Area)
  - 2. Test Method T-460; Air Resistance (Gurley Hill Method)

## 1.3 SUBMITTALS

- A. Refer to Section 01 33 00 Submittal Procedures.
- B. Product Data: Submit manufacturer current technical literature for each component.

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WEATHER BARRIERS
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- C. Samples: Weather Barrier Membrane, minimum 8-1/2 inches by 11 inch.
- D. Quality Assurance Submittals
  - 1. Design Data, Test Reports: Provide manufacturer test reports indicating product compliance with indicated requirements.
  - 2. Manufacturer Instructions: Provide manufacturer's written installation instructions.
  - 3. Manufacturer's Field Service Reports: Provide site reports from authorized field service representative, indicating observation of weather barrier assembly installation.
- E. Closeout Submittals
  - 1. Weather Barrier Warranty: Manufacturer's executed warranty form with authorized signatures and endorsements indicating date of Substantial Completion.

## 1.4 QUALITY ASSURANCE

- A. Qualifications
  - 1. Installer shall have experience with installation of weather barrier assemblies under similar conditions.
  - 2. Installation shall be in accordance with weather barrier manufacturer's installation guidelines and recommendations.
  - 3. Source Limitations: Provide weather barrier and accessory materials produced by single manufacturer.
- B. Mock-up
  - 1. Install mock-up using approved weather barrier assembly including fasteners, flashing, tape and related accessories per manufacturer's current printed instructions and recommendations.
    - a. Mock-up size: 10 feet by 10 feet.
    - b. Mock-up Substrate: Match wall assembly construction, including window opening.
    - c. Mock-up may not remain as part of the work.
  - 2. Contact manufacturer's designated representative prior to weather barrier assembly installation, to perform required mock-up visual inspection and analysis as required for warranty.
- C. Pre-installation Meeting
  - 1. Hold a pre-installation conference, two weeks prior to start of weather barrier installation. Attendees shall include Contractor, Architect, Engineer, Consultant, Installer, Owner's Representative, and Weather Barrier Manufacturer's Designated Representative.
  - 2. Review all related project requirements and submittals, status of substrate work and preparation, areas of potential conflict and interface, availability of weather barrier assembly materials and components, installer's training requirements, equipment, facilities and scaffolding, and coordinate methods, procedures and sequencing requirements for full and proper installation, integration and protection.

# 1.5 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 01 60 00 Product Requirements.
- B. Deliver weather barrier materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Store weather barrier materials as recommended by weather barrier manufacturer.

## 1.6 SCHEDULING

### WEATHER BARRIERS

- A. Review requirements for sequencing of installation of weather barrier assembly with installation of windows, doors, louvers and flashings to provide a weather-tight barrier assembly.
- B. Schedule installation of weather barrier materials and exterior cladding within nine months of weather barrier assembly installation.

## 1.7 WARRANTY

- A. Refer to Section 01 78 36 Warranties.
- B. Special Warranty
  - 1. Special weather-barrier manufacturer's warranty for weather barrier assembly for a period of ten (10) years from date of final weather barrier installation.
  - 2. Approval by weather barrier manufacturer for warranty is required prior to assembly installation.
  - 3. Warranty Areas: [Describe specific areas of work protected and areas of work excluded as required by project conditions].

## PART 2 - PRODUCTS

## 2.1 WEATHER BARRIER

- A. A non-perforated, nonwoven, non-absorbing, breathable membrane that resists air flow, bulk water and wind driven rain and channels water and moisture to the outside of the building envelope. It has microscopic pores that allow moisture vapor to escape from inside walls.
- **B.** Physical Properties
  - 1. Spunbonded polyolefin membrane.
- C. Performance Characteristics:
  - 1. Air Penetration: 0.001 cfm/ft<sup>2</sup> at 75 Pa, when tested in accordance with ASTM E2178. Type I per ASTM E1677.
  - 2. Water Vapor Transmission: 28 perms, when tested in accordance with ASTM E96, Method B.
  - 3. Water Penetration Resistance: Minimum 280 cm when tested in accordance with AATCC Test Method 127.
  - 4. Basis Weight: Minimum 2.7 oz/yd<sup>2</sup>, when tested in accordance with TAPPI Test Method T-410.
  - Air Resistance: Air infiltration at >1500 seconds, when tested in accordance with TAPPI Test Method T-460.
  - 6. Tensile Strength: Minimum 38/35 lbs/in., when tested in accordance with ASTM D882, Method A.
  - 7. Tear Resistance: 12/10 lbs., when tested in accordance with ASTM D1117.
  - 8. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E84. Flame Spread: 10, Smoke Developed: 10.

### **2.2 ACCESSORIES**

- A. Seam Tape: As recommended by the weather barrier manufacturer.
- B. Fasteners:
  - Steel Frame Construction

     1-5/8 inch rust resistant screw with 2-inch diameter plastic cap or manufacturer approved 1-1/4" or 2"
     metal gasketed washer

- Wood Frame Construction Nail Caps: #4 nails with large 1-inch plastic cap fasteners.
- 3. Masonry Construction Masonry tap-con fasteners with Caps: 2-inch diameter plastic cap fasteners.
- C. Sealants
  - 1. Provide sealants that comply with ASTM C920, elastomeric polymer sealant to maintain watertight conditions.
  - 2. Products: Sealants recommended by the weather barrier manufacturer.

## D. Adhesives:

- 1. Provide adhesive recommended by weather barrier manufacturer.
- 2. Products: Adhesives recommend by the weather barrier manufacturer.

## E. Primers:

- 1. Provide flashing manufacturer recommended primer to assist in adhesion between substrate and flashing.
- 2. Products: Primers recommended by the flashing manufacturer.

## F. Flashing

- 1. Flexible membrane flashing materials for window openings and penetrations recommended by manufacturer.
- 2. Straight flashing membrane materials for flashing windows and doors and sealing penetrations such as masonry ties, etc. recommended by manufacturer.

## PART 3 – EXECUTION

## 3.1 EXAMINATION

A. Verify substrate and surface conditions are in accordance with weather barrier manufacturer recommended tolerances prior to installation of weather barrier and accessories.

## 3.2 INSTALLATION – WEATHER BARRIER

- A. Install weather barrier over exterior face of exterior wall substrate in accordance with manufacturer recommendations.
- B. Install weather barrier prior to installation of windows and doors.
- C. Start weather barrier installation at a building corner, leaving 6-12 inches of weather barrier extended beyond corner to overlap.
- D. Install weather barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in a shingling manner to overlap lower layers. Maintain weather barrier plumb and level.
- E. Sill Plate Interface: Extend lower edge of weather barrier over sill plate interface 3-6 inches. Secure to foundation with elastomeric sealant as recommended by weather barrier manufacturer.

WEATHER BARRIERS

- F. Window and Door Openings: Extend weather barrier completely over openings.
- G. Overlap weather barrier
  - 1. Exterior corners: minimum 12 inches.
  - 2. Seams: minimum 6 inches.

H. Weather Barrier Attachment:

- 1. Steel or Wood Frame Construction: Attach weather barrier to studs through exterior sheathing. Secure using weather barrier manufacturer recommend fasteners, space 12-18 inches vertically on center along stud line, and 24 inch on center, maximum horizontally.
- Masonry Construction: Attach weather barrier to masonry. Secure using weather barrier manufacturer recommend fasteners, space 12-18 inches vertically on center and 24 inches maximum horizontally. Weather barrier may be temporarily attached to masonry using recommended adhesive, placed in vertical strips spaced 24 inches on center, when coordinated on the project site.
- I. Apply flashing to weather barrier membrane prior to installing cladding anchors.

### 3.3 SEAMING

- A. Seal seams of weather barrier with seam tape at all vertical and horizontal overlapping seams.
- B. Seal any tears or cuts as recommended by weather barrier manufacturer.

3.4 OPENING PREPARATION (for use with non-flanged windows - all cladding types)

- A. Flush cut weather barrier at edge of sheathing around full perimeter of opening.
- B. Cut a head flap at 45-degree angle in the weather barrier at window head to expose 8 inches of sheathing. Temporarily secure weather barrier flap away from sheathing with tape.
- 3.5 FLASHING (for use with non-flanged windows all cladding types)
  - A. Cut flexible flashing a minimum of 12 inches longer than width of sill rough opening.
  - B. Cover horizontal sill by aligning flexible flashing edge with inside edge of sill. Adhere to rough opening across sill and up jambs a minimum of 6 inches. Secure flashing tightly into corners by working in along the sill before adhering up the jambs.
  - C. Fan flexible flashing at bottom corners onto face of wall. Firmly press in place. Mechanically fasten fanned edges.
  - D. Apply 9-inch wide strips of flashing at jambs. Align flashing with interior edge of jamb framing. Start flashing at head of opening and lap sill flashing down to the sill.
  - E. Spray-apply primer to top 6 inches of jambs and exposed sheathing.
  - F. Install flexible flashing at opening head using same installation procedures used at sill. Overlap jamb flashing a minimum of 2 inches.
  - G. Coordinate flashing with window installation.
  - H. On exterior, install backer-rod in joint between window frame and flashed rough framing. Apply sealant at jambs and head, leaving sill unsealed. Apply sealants in accordance with sealant manufacturer's instructions and ASTM C1193.
  - I. Position weather barrier head flap across head flashing. Adhere using flashing over the 45-degree seams.
  - J. Tape top of window in accordance with manufacturer recommendations.
  - K. On interior, install backer rod in joint between frame of window and flashed rough framing. Apply sealant

WEATHER BARRIERS

around entire window to create air seal. Apply sealant in accordance with sealant manufacturer's instructions and ASTM C1193.

## 3.6 OPENING PREPARATION (for use with flanged windows)

- A. Cut weather barrier in a modified "I-cut" pattern.
  - 1. Cut weather barrier horizontally along the bottom of the header.
  - 2. Cut weather barrier vertically 2/3 of the way down from top center of window opening.
  - 3. Cut weather barrier diagonally from bottom of center vertical cut to the left and right corners of the opening.
  - 4. Fold side and bottom weather barrier flaps into window opening and fasten.
- B. Cut a head flap at 45-degree angle in the weather barrier at window head to expose 8 inches of sheathing. Temporarily secure weather barrier flap away from sheathing with tape.
- 3.7 FLASHING (for use with flanged windows)
  - A. Cut flexible flashing a minimum of 12 inches longer than width of sill rough opening.
  - B. Cover horizontal sill by aligning flexible flashing edge with inside edge of sill. Adhere to rough opening across sill and up jambs a minimum of 6 inches. Secure flashing tightly into corners by working in along the sill before adhering up the jambs.
  - C. Fan flexible flashing at bottom corners onto face of wall. Firmly press in place. Mechanically fasten fanned edges.
  - D. On exterior, apply continuous bead of sealant to wall or backside of window mounting flange across jambs and head. Do not apply sealant across sill.
  - E. Install window according to manufacturer's instructions.
  - F. Apply strips of flashing at jambs overlapping entire mounting flange. Extend jamb flashing 1-inch above top of rough opening and below bottom edge of sill flashing.
  - G. Apply strip of flashing as head flashing overlapping the mounting flange. Head flashing should extend beyond outside edges of both jamb flashings.
  - H. Position weather barrier head flap across head flashing. Adhere flashing over the 45-degree seams.
  - I. Tape head flap in accordance with manufacturer recommendations.
  - J. On interior, install backer rod in joint between frame of window and flashed rough framing. Apply sealant around entire window to create air seal. Apply sealant in accordance with sealant manufacturer's instructions and ASTM C 1193.

## 3.8 FIELD QUALITY CONTROL

A. Notify manufacturer's designated representative to obtain required periodic observations of weather barrier assembly installation.

# **3.9 PROTECTION**

A. Protect installed weather barrier from damage.

## END OF SECTION

## SECTION 07 26 16 - UNDER-SLAB VAPOR BARRIER

## PART 1 – GENERAL

### 1.0 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

### 1.1 SUMMARY

- A. Products supplied under this section:
  - 1. Vapor barrier and installation accessories for installation under concrete slabs.
- B. Related sections:
  - 1. Section 03 30 00 Cast-in-Place Concrete
  - 2. Section 07 26 00 Vapor Retarders

### 1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM E1745- 11Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
  - 2. ASTM E1643- 11Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- B. Technical Reference American Concrete Institute (ACI):
  - 1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

### 1.3 SUBMITTALS

- A. Quality control/assurance:
  - 1. Summary of test results per paragraph 9.3 of ASTM E 1745.
  - 2. Manufacturer's samples and literature.
  - 3. Manufacturer's installation instructions for placement, seaming and penetration repair instructions.
  - 4. All mandatory ASTM E1745 testing must be performed on a single production roll per ASTM E1745 Section 8.1.

## PART 2 – PRODUCTS

### 2.1 MATERIALS

- A. Vapor barrier shall have all of the following qualities:
  - 1. Maintain permeance of less than 0.01 Perms [grains/(ft<sup>2</sup> · hr · inHg)] as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).
  - 2. Other performance criteria:
    - a. Strength: ASTM E1745 Class A.
    - b. Thickness: 15 mils minimum

## B. Vapor barrier products:

- Basis of Design: Stego Wrap Vapor Barrier (15-mil) by Stego Industries LLC., (877) 464-7834 <u>www.stegoindustries.com</u>.
- 2. Tex-Trude Xtreme Vapor Barrier (15-mil) by Tex-Trude, LP. (281) 452-5961
- 3. Substitutions will be in accordance with Section 01 25 00.

## 2.2 ACCESSORIES

- A. Seams :
  - 1. Stego Tape by Stego Industries LLC, (877) 464-7834 <u>www.stegoindustries.com</u>.
- B. Penetrations of Vapor barrier:
  - 1. Stego Mastic by Stego Industries LLC, (877) 464-7834 <u>www.stegoindustries.com</u>.
  - 2. Stego Tape by Stego Industries LLC, (877) 464-7834 <u>www.stegoindustries.com</u>.
- C. Perimeter/edge seal:
  - 1. Stego Crete Claw by Stego Industries LLC, (887) 464-7834 <u>www.stegoindustries.com</u>.
  - 2. Stego Term Bar by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
  - 3. StegoTack Tape (double sided) by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.

## PART 3 – EXECUTION

## 3.1 PREPARATION

- A. Ensure that subsoil is approved by Architect or Geotechnical Engineer.
  - 1. Level and compact base material.

# 3.2 INSTALLATION

- A. Install vapor barrier in accordance ASTM E1643.
  - 1. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible.
  - 2. Extend vapor barrier over footings and grade beams to a distance acceptable to the structural engineer or stop at impediments such as dowels and waterstops.
  - 3a. Seal vapor barrier to slab perimeter/edge using Stego Crete Claw and remove dirt, debris, and mud from Crete Claw prior to concrete placement.

OR

- 3b. Seal vapor barrier to footing/grade beam with double sided tape, termination bar, or both.
- 4. Overlap joints 6 inches and seal with manufacturer's tape.
- 5. Apply tape/Crete Claw to a clean and dry vapor barrier.
- 6. Seal all penetrations (including pipes) per manufacturer's instructions.

- 7. No penetration of the vapor barrier is allowed except for reinforcing steel and permanent utilities.
- 8. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area 6 inches and taping all sides with tape.

END OF SECTION

### SECTION 07 60 00 - SHEET METAL AND MISCELLANEOUS ACCESSORIES

### PART 1 - GENERAL

### 1.00 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

### 1.01 SUMMARY

- A. Section Includes:
  - 1. Provide flashing and sheet metal components for moisture protection.
  - 2. Related accessories.

## 1.02 SUBMITTALS

- A. Product Data:
  - 1. Submit shop drawings, product data and mockups of all sheet metal.
  - 2. Reference Section 07 53 00 Coal-tar Elastomeric Roofing System

# 1.03 QUALITY ASSURANCE

- A. Comply with governing local, state, and federal regulations, safety standards, and codes. Provide products of acceptable manufacturers in satisfactory use in similar service for five years. Use experienced installers. Deliver, handle and store materials in accordance with manufacturer's instructions.
- B. Reference Standards: Applicable portions of SMACNA, ASTM and NAAMM publications.

#### 1.04 WARRANTIES

A. Manufacturer's Product Warranty: Submit manufacturer's standard limited product warranty signed by the manufacturer's authorized official, guaranteeing to correct failures in product which may occur during the warranty period, without reducing or otherwise limiting any other rights to correction which the Owner/Project Consultant may have under the contract documents. Failure is defined to include product failure which leads to interruption of a watertight installation. Correction may include repair or replacement of failed product.

- B. Contractor's Warranty period: For roofing flashing and sheet metal, provide a written warranty which shall warrant work to be free of leaks and defects in materials and workmanship for two (2) years, starting from date of substantial completion.
- C. Defects of the sheet metal occurring during the warranty period shall be promptly corrected by the contractor, and defects of the roofing shall be promptly corrected by the manufacturer at no additional cost to the Owner. Upon notification from the Owner or the Owner's representative that evidence of a defect exists, the responsible party shall immediately inform the Owner's representative of the date on which corrective work will be scheduled, and shall notify the Owner's representative when the corrective work has been completed.

## PART 2 - PRODUCTS

## 2.01 SHEET METAL MATERIAL

- A. Hot-dipped Galvanized Steel for use as counterflashings (where not visible from the ground), pitch pans and expansion joints: Minimum 24-gauge, G-90, hot-dipped galvanized metal, commercial quality, ASTM A 525.
- B. Hot-dipped Galvanized Steel for use as continuous clips: Minimum 22-gauge, G-90, hot-dipped galvanized metal, commercial quality, ASTM A 525.
- C. Prefinished Galvanized Sheet Steel (where visible from the ground): Shall be 24-gauge flat stock, prefinished with Kynar finish meeting ASTM A 446, forty-five and one-half inches to forty-eight inches width by one hundred twenty inches in length (45-1/2" 48" x 120") for use as new metal edge gravel guard, cover plates, downspouts, gutters, coping and miscellaneous metal. Standard color to be selected by Owner/Project Consultant.
- D. Stainless Steel: QQ-S-766, Class 301, 302, 304, or 316; or ASTM A 167, Type 301, 302, 304, or 316; form and condition most suitable for the purpose.
- E. Aluminum and Aluminum Alloy Plate and Sheet: QQ-A-250; form, alloy, and temper shall be that most suitable for the purpose.
- F. Sheet Lead: QQ-L-201, Grade B.
- G. All existing sheet metal shall be replaced with new metal of like gauge and type, or as specified on drawings.

### 2.02 FASTENERS

- A. Fasteners shall be same metal as flashing/sheet metal, or other non-corrosive metal as recommended by sheet manufacturer for the specific application. Match finish of exposed heads with material being fastened.
- B. Fasteners and fastening plates or bars shall be listed in the FM Global Approval Guide.
- C. Fastener for Brick: Shall be one-fourth inch by two inches (1/4" x 2"), zinc with plated steel or stainless steel nail, one piece unit, flat head.
- D. Screws: Self-taping sheet metal type with neoprene washer, as appropriate.
- E. Pop Rivets: Full stainless steel Series 42 or 44, as appropriate.

F. Continuous Clip: Concealed hold-down clip type; of same materials as coping, gravel guard, sized to suit application. Use a continuous clip, minimum 22-gauge G-90 galvanized.

### 2.03 RELATED MATERIAL

- A. Bituminous Paint: Acid and alkali resistant, black color.
- B. Plastic Cement: FS SS-C-153, cutback asphalt type.
- C. Solder: QQ-S-571 composition best suited for purpose; use high tin content, minimum 60/40, for stainless steel and monel alloy.
- D. Copper, Sheet, and Strip: QQ-C-576, ASTM B 370, light cold-rolled temper.
- E. Lead-coated Copper: ASTM B 101, Type I or II, Class A.
- F. Sealant (for Sheet Metal): One-component polyurethane, conforming to requirements of FS TT-S-230C, non-staining and non-bleeding.

## 2.04 FABRICATION - GENERAL

- A. Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer's instructions and recommendations. Form exposed sheet metal work without excessive oil-canning, buckling, and tool marks, true to line and levels as indicated, with exposed edges folded back to form hems.
- B. Fabricate gravel stops/fascia, gutters/downspouts, counterflashings, pitch pans, expansion joints, and copings with new galvanized sheet metal as specified. Fabricate gravel guard and fascia to size and dimensions as indicated on the drawings. Fabricate light metal coping, gutters and downspouts as indicated.
- C. Form sheet metal on bending brake.
- D. Shape, trim and hand seam metal on bench insofar as practicable.
- E. Form materials with straight lines, sharp angles and smooth curves.
- F. Fold back edges on concealed side of exposed edge to form hem (1/2" minimum).
- G. Weld or solder joints on parts that are to be permanently and rigidly assembled.
- H. Submit sheet metal models for approval by the Owner/Project Consultant.
- I. Limit single-piece lengths to ten feet (10').
- J. Fabricate corner pieces with eighteen inch (18") extensions, metered and sealed by forming as one piece.
- K. Surface sand flange prior to applying any primers on Kynar metal.
- L. Backpaint flashing in contact with masonry or dissimilar materials with bituminous paint.

- M. All sheet metal shall be sealed and watertight.
- N. Metal work should be secured so as to prevent damage from buckling or wind. Where clips are shown, these are to be continuous.
- O. All metal to receive bitumen or adhesive shall be first primed with asphalt primer.
- P. All prefinished metal shall be sanded and/or abraded prior to receiving primer.
- Q. Seams: Fabricate non-moving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges are to be seamed, form seams, and soldered.
- R. Expansion Provisions: Form expansion joints of intermeshing hooked flanges, not less than one inch (1") deep, filled with mastic sealant (concealed within joints).
- S. Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with industry standards.
- T. Separations: Provide for separation of metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.
- U. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.
- 2.05 FINISH
  - A. Backpaint concealed metal surfaces with bituminous paint where expected to be in contact with cementitious materials or dissimilar metals. Exposed surfaces to be provided with a factory applied fluorocarbon Kynar finish meeting ASTM A 446 and AAMA specification 605.2 for high performance coating.
  - B. New 24-gauge hot-dipped galvanized metal shall be painted on all locations visible from the ground with an industrial grade paint to match existing, or standard color selected by Owner/Project Consultant. Galvanized metal surface must be properly prepared by removing all oil, grease, and/or protective mill coatings by solvent cleaning surface in accordance with SSPC-SP1, and according to paint manufacturer's recommendation, to ensure proper adhesion of paint to metal.

## PART 3 - EXECUTION

### 3.01 INSPECTION

- A. Verify roof openings, curbs, pipes, sleeves, ducts or vents through roof are solidly set, cant strips and reglets in place, substrates are smooth and clean and nailing strips located.
- B. Verify membrane termination and base flashings are in place, sealed and secure.
- C. Beginning of installation means acceptance of conditions.

### 3.02 PREPARATION

- A. Field measure site conditions prior to fabricating work. Provide all shop drawings and mock-ups one month prior to installation to the Owner/Project Consultant for approval.
- B. Install starter and edge strips and cleats before starting installation.

## 3.03 INSTALLATION

- A. General: All sheet metal termination to vertical wall shall have a through-wall with receiver installed on masonry walls or prefabricated "Z" bar flashing pre-installed to fluid applied wall finished prior to installation of sheet metal termination. This applies to edge metal, base flashing closures and all vertical surface intersections. Refer to NRCA, SMACNA, and metal manufacturer's guidelines.
- B. Gravel Guard/Fascia:
  - 1. Shall be installed with expansion joints, ten feet (10') on center, one-fourth inch (1/4'') expansion leeway, with a cover plate.
  - 2. Secure metal flashings per specifications.
  - 3. Lock seams and end joints.
  - 4. Form sections identical to profiles as shown or approved similar, to match existing building.
  - 5. Fabricate corner pieces with minimum eighteen inch (18"), maximum forty-eight inch (48") extensions, formed and sealed with rivets and sealant, as one piece.
  - 6. Hem exposed edges three-fourths inch (3/4") minimum.
  - 7. Backpaint flashing in contact with masonry or dissimilar materials with bituminous paint. Surface sand before applying primers.
  - 8. Integrate flashing in a manner consistent with detailing.
  - 9. Provide and install continuous clip around perimeter.
  - 10. Shall be fabricated in accordance with all SMACNA provisions.
- C. Coping:
  - 1. All coping shall be manufactured with low profile standing seam metal.
  - 2. Shall be minimum 24-gauge prefinished Kynar installed in ten foot (10') sections maximum with cover plates.
  - 4. Vertical fascia shall extend minimum two and one-half inches (2-1/2") or be minimum one and one-half inches (1-1/2") below bottom of nailer, whichever is greater.
  - 5. Secure metal flashings per specifications.
  - 6. Lock seams and end joints.
  - 7. Form sections identical to profiles as shown or approved similar, to match existing building.
  - 8. Fabricate corner pieces with minimum eighteen inch (18"), maximum forty-eight inch (48") extensions, formed and sealed with rivets and sealant, as one piece.
  - 9. Hem exposed edges three-fourths inch (3/4") minimum.
  - 10. Backpaint flashing in contact with masonry or dissimilar materials with bituminous paint. Surface sand before applying primers.
  - 11. Integrate flashing in a manner consistent with detailing.
  - 12. Provide and install continuous clip, minimum 22-gauge.
  - 13. Shall be fabricated in accordance with all SMACNA provisions.
- D. Expansion Joint Field and at Wall:
  - 1. Shall be as outlined by details, and be in full compliance with all provisions of SMACNA and FM Global requirements for attachment, installation and recommendations.
  - 2. Secure metal flashings per specifications.
  - 3. Lock seams and end joints.

- 4. Form sections identical to profiles as shown or approved similar, to match existing building.
- 5. Fabricate corner pieces with minimum eighteen inch (18"), maximum forty-eight inch (48") extensions, formed and sealed with rivets and sealant, as one piece.
- 6. Hem exposed edges three-fourths inch (3/4") minimum.
- 7. Backpaint flashing in contact with masonry or dissimilar materials with bituminous paint. Surface sand before applying primers.
- 8. Integrate flashing in a manner consistent with detailing.
- 9. Provide and install continuous clip around perimeter.
- 10. Shall be fabricated in accordance with all SMACNA provisions.
- E. Counterflashing:
  - 1. Saw cut brick mortar joint to receive friction fit reglet and removable counterflashing as detailed and SMACNA Figure 4-3E.
- F. Gutter and Downspout:
  - 1. Fabrication:
    - a) Fabricate gutter and downspout of profile and size indicated.
    - b) Field measure site conditions prior to fabricating work.
    - c) Fabricate with required connection pieces.
    - d) Fabricate section square, true, and accurate in size, in maximum possible lengths and free of distortion or defects detrimental to appearance or performance.
    - e) Hem exposed edges of metal.
    - f) Form and seal all metal joints; provide for expansion joints per SMACNA.
  - 2. Installation:
    - a) Install collector head, downspout, and accessories.
    - b) Join lengths with seams pop riveted and sealed watertight. Flash and seal collector head to downspouts and accessories.
    - c) Seal all metal joints watertight for full metal surface contact.
    - d) Collector Head: SMACNA style profile; submit detail for approval.
    - e) Downspouts: Rectangular profile. Seal all joints, four inches by six inches (4" x 6").
    - f) Support Brackets, Joint Fasteners: Profiled to suit gutters and downspouts.
    - g) Anchorage Devices: SMACNA requirements. Type recommended by fabricator.
    - h) Collector Head Support: Kynar. Color and Finish to match, as recommended by SMACNA.
    - I) Downspout Supports: Straps, Kynar. Color and Finish to match.
- G. Overflow Scupper, Collector Head and Downspout:
  - 1. Fabrication:
    - a) Fabricate overflow scupper, collector head and downspout of profile and size indicated, taking care that the roof drain leader fits properly into the back of the collector head. Seal the pipe to the collector head for watertightness.
    - b) Field measure site conditions prior to fabricating work.
    - c) Fabricate with required connection pieces.
    - d) Fabricate section square, true, and accurate in size, in maximum possible lengths and free of distortion or defects detrimental to appearance or performance.
    - e) Hem exposed edges of metal.
    - f) Form and seal all metal joints; provide for expansion joints per SMACNA.
  - 2. Installation:
    - Install collector head, downspout, and accessories.
    - a) Join lengths with seams pop riveted and sealed watertight. Flash and seal collector head to downspouts and accessories.
    - b) Seal all metal joints watertight for full metal surface contact.
    - c) Collector Head: SMACNA style profile; submit detail for approval.

- d) Downspouts: Rectangular profile. Seal all joints, four inches by six inches (4" x 6").
- e) Support Brackets, Joint Fasteners: Profiled to suit gutters and downspouts.
- f) Anchorage Devices: SMACNA requirements. Type recommended by fabricator.
- g) Collector Head Support: Kynar. Color and Finish to match, as recommended by SMACNA.
- h) Downspout Supports: Straps, Kynar. Color and Finish to match.
- H. Pitch Pans:
  - 1. Install pitch pans of 24-gauge galvanized steel according to NRCA standards, minimum of six inches by six inches (6" x 6").
  - 2. Pitch pans shall be fabricated to minimum of four inches (4") above the finished roof membrane. Seams of pitch pans shall be soldered.
  - 3. Mastic shall be applied under pitch pan flange a minimum of one-half pound (1/2#) per linear foot.
  - 4. All metal flanges shall be primed with asphalt primer prior to flashing installation. Inside of pitch pan shall be cleaned and primed as required by pitch pan sealant manufacturer.
  - 5. All projections enclosed in pitch pans shall be cleaned in any manner suitable and coated with a rust inhibitive coating as approved by the Owner/Project Consultant. Coating shall be allowed to dry prior to pitch pan fill.
  - 6. Base of pitch pans shall be filled with grout or cementitious binder to proper height and allowed to cure.
  - 7. Top finish fill shall be self-leveling, one-part urethane, with maximum fill to within three-eighths inch (3/8") of top of pitch pan sides.
  - 8. Strip metal flange of pitch pan with one strip of Type IV fiberglass felt set in hot bitumen extending from the outer edge of the flange a minimum of three inches (3") inward to base of pitch pan.
  - 9. Strip in fiberglass felt with .060 inch coal-tar elastomeric membrane flashing set in hot asphalt extending from the outer edge of the Type IV fiberglass underlayment a minimum of three inches (3") inward to the base of the pitch pan.
- I. Bonnets/Hoods:
  - 1. Fabricate and install above all pitch pans, where necessary, or reinstall as applicable, metal bonnets over all pitch pans, NO EXCEPTIONS.
  - 2. Bonnets/Hoods shall be manufactured with metal compatible with metal to which bonnet is to be attached.
  - 3. On beams and other steel, weld in place bonnets fabricated from one-fourth inch (1/4") steel plate.
  - 4. Draw band bonnets fabricated from 22-gauge galvanized steel may be used on circular projections.

# 3.04 FINISH

A. Backpaint concealed metal surfaces with bituminous paint where expected to be in contact with cementitious materials or dissimilar metals. Exposed surfaces to be provided with a factory applied fluorocarbon Kynar finish meeting ASTM A 446 and AAMA specification 605.2 for high performance coating.

## END OF SECTION

## SECTION 07 61 13 - NEW STANDING SEAM METAL ROOF SYSTEM

## PART 1 – GENERAL

### 1.00 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

# 1.01 RELATED WORK

- A. Section 07 41 00 Roofing Panels
- B. Section 07 53 00 Coal-tar Elastomeric Roofing System
- C. Section 07 60 00 Sheet Metal and Miscellaneous Accessories

### 1.02 INSTALLER QUALIFICATIONS

- A. Roofing installer must be:
  - 1. Currently prequalified with the Owner in accordance with Owner's prequalification requirements.
  - 2. Currently in good standing with the manufacturer.
  - 3. Installer must be an experienced single firm specializing in the type of roofing repair and/or removal and replacement work required, employing only experienced workers for the class of work in which they are employed, having at least five (5) years successful experience on projects similar in size and scope and acceptable as applicators by the Owner's representative.
  - 4. Contractor must have successfully completed previous projects warranted by the manufacturer.
- B. It shall remain each Bidder's responsibility to determine his current status with the manufacturer's certification plan.

### 1.03 QUALITY ASSURANCE

- A. Applicator/Installer:
  - 1. Must be acceptable to roof material manufacturer for the manufacturer's warranty requirements.
  - 2. Must be an experienced single firm specializing in the type of roofing repair and/or removal and replacement work required, employing only experienced workers for the class of work in which they are employed, having at least five (5) years successful experience on projects similar in size and scope and acceptable as applicators by the Owner's representative.

- B. Testing Laboratory Services: Test results shall meet or exceed established standards.
- C. Underwriters Laboratories, Inc.; Roofing Covering: Class A fire hazard classification.
- D. Factory Mutual: Wind uplift requirements

### 1.04 REFERENCES (INCLUDING LATEST REVISIONS)

- A. American Society for Testing and Materials:
  - 1. ASTM A 792 Finish Application on Metal Wall Panels
  - 2. ASTM B 209 90, Specification for Aluminum and Aluminum Alloy Sheet and Plate
  - 3. ASTM C 719 86, Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cycle Movement (Hockman Cycle)
  - 4. ASTM C 794 80 (1986), Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
  - 5. ASTM C 920 87, Specification for Elastomeric Joint Sealants
  - 6. ASTM A 361 90, Sheet Steel, Zinc-Coated (Galv.) by the Hot-Dip Process for Roofing and Siding
  - 7. ASTM C 177, Test for Thermal Laboratory Services
  - 8. ASTM C 728, Perlite Thermal Insulation Board
  - 9. ASTM D 523 Reflective Finish on Metal Roof Panels
- B. Federal Specifications:
  - 1. LLL-I-535B
  - 2. SS-A-701B
  - 3. SS-C-153
  - 4. SS-C-153C
  - 5. SS-R-620B
  - 6. TT-C-498C
  - 7. TT-P-320D
  - 8. TT-S-00227E
  - 9. TT-S-00230C
  - 10. SS-S-001534 (GSA-FSS)
  - 11. L-P-375
- C. Industry Standards:
  - 1. The National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual
  - 2. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) -Architectural Sheet Metal Manual

# 1.05 SUBMITTALS

- A. Samples and Manufacturer's Submittals: Submit prior to delivery or installation.
  - 1. Samples of all roofing system components including all specified accessories.
  - 2. Submit samples of proposed warranty complete with any addenda necessary to meet the warranty requirements as specified.
  - 3. Submit latest edition of manufacturer's specifications and installation procedures. Submit only those items applicable to this project.
  - 4. A written statement from the roofing materials manufacturer approving the installer, specifications and drawings as described and/or shown for this project and stating the intent to guarantee the completed project.
- B. Shop Drawings: Provide manufacturer's approved details of all perimeter conditions, projection conditions, and any additional special job conditions which require details other than indicated in the drawings.

C. Maintenance Procedures: Within ten days of the date of Substantial Completion of the project, deliver to the Owner three copies of the manufacturer's printed instructions regarding care and maintenance of the roof.

### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original packaging with all labels intact and legible, including labels indicating storage conditions, lot numbers, and usage instructions. Materials damaged in shipping or storage shall not be used.
- B. Manufacturer's packaging and/or roll plastic is not acceptable for exterior storage. Tarpaulin with grommets shall be minimum acceptable for exterior coverings. All materials stored as above shall be minimum of four inches (4") off the substrate, and the tarpaulin tied off with rope.
- C. Deliver materials requiring fire resistance classification to the job with labels attached and packaged as required by labeling service.
- D. Deliver materials in sufficient quantity to allow continuity of work.
- E. Handle and store material and equipment in such a manner as to avoid damage. Liquid products shall be delivered sealed, in original containers.
- F. Handle rolled goods so as to prevent damage to edge or ends.
- G. Select and operate material handling equipment so as not to damage existing construction or applied roofing.
- H. Moisture-sensitive products shall be maintained in dry storage areas and properly covered. Provide continuous protection of materials against wetting and moisture absorption. Store roofing and flashing materials on clean raised platforms with weather protective covering when stored outdoors.
- I. Store rolled goods on end.
- J. Protect materials against damage by construction traffic.
- K. The proper storage of materials is the sole responsibility of the contractor and any wet or damaged roofing materials shall be discarded, removed from the project site, and replaced prior to application.
- L. Comply with fire and safety regulations, especially with materials which are extremely flammable and/or toxic. Use safety precautions indicated on labels.
- M. Products liable, such as emulsions, to degrade as a result of being frozen shall be maintained above 40° F in heated storage.
- N. No storage of materials shall be permitted on roof areas other than those materials that are to be installed the same day. Any exception must be in written form.

## 1.07 SITE CONDITIONS

- A. Job Condition Requirements:
  - 1. Apply roofing in dry weather.
  - 2. Do not apply roofing when ambient temperature is below  $40^{\circ}$  F ( $4^{\circ}$  C).
  - 3. Proceed with roofing work only when weather conditions are in compliance with manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with specifications.

- 4. For further information regarding roofing material manufacturer's recommendations for project conditions, refer to the manufacturer's published application manual.
- 5. All surfaces to receive new roofing shall be smooth, dry, and free from dirt, debris, and foreign material before any of this work is installed. Competent operators shall be in attendance at all times equipment is in use. Materials shall be stored neatly in areas designated by the Owner. Load placed on the roof at any point shall not exceed the safe load for which the roof is designed.
- 6. The contractor shall take all necessary precautions to protect the roof mat and deck from damage. The contractor shall be responsible for repairing all new areas of damage caused by the negligence of the contractor, at the contractor's expense. The Owner's on-site representative shall determine damage caused by contractor negligence.
- 7. Follow insurance underwriter's requirements acceptable for use with specified products or systems.
- 8. All kettles shall have an automatic thermostat control, and temperature gauge, all in working order.
- 9. Surface and air temperatures should be a minimum 45° F during applications of cleaner and waterproof coating and remain above 45° F for a minimum of four (4) hours following applications. Verify compatibility of cleaner with coatings, paints, primers and joint sealers specified. Advise Owner's representative of any problems in this regard prior to commencing cleaning operations.
- 10. Temporary Sanitary Facilities: The contractor shall furnish and maintain temporary sanitary facilities for employees' use during this project. These will be removed after the completion of the project. All portable facilities shall comply with local laws, codes, and regulations.
- B. Protection of Work and Property:
  - 1. Work: The contractor shall maintain adequate protection of all his work from damage and shall protect the Owner's and adjacent property from injury or loss arising from this contract. He shall provide and maintain at all times any OSHA required danger signs, guards, and/or obstructions necessary to protect the public and his workmen from any dangers inherent with or created by the work in progress. All federal, state, and city rules and requirements pertaining to safety and all EPA standards, OSHA standards, NESHAP regulations pertaining to asbestos as required shall be fulfilled by the contractor as part of his proposal.
  - 2. Twenty-four Hour Call: The contractor shall have personnel on call 24 hours per day, seven (7) days per week for emergencies during the course of a job. The Owner's project manager is to have the 24 hour numbers for the contact. Contractor must be able to respond to any emergency call and have personnel on-site within two (2) hours after contact. Numbers available to the Owner's project manager are to be both home and office numbers for:
    - a) Job Foreman
    - b) Job Superintendent
    - c) Owner or Company Officer
- C. Damage to Work of Others: The contractor shall repair, refinish, and make good any damage to the building or landscaping resulting from any of his operation. This shall include, but is not limited to, any damage to plaster, tile work, wall covering, paint, ceilings, floors, or any other finished work. Damage done to the building, equipment, or grounds must be repaired at the successful contractor's expense holding the Owner harmless from any other claims for property damage and/or personal injury.
- D. Measurements: It will be the contractor's responsibility to obtain and/or verify any necessary dimensions by visiting the job site, and the contractor shall be responsible for the correctness of same. Any drawings supplied are for reference only.
- E. Cleaning and Disposal of Materials:

1.

Contractor shall keep the job clean and free from all loose materials and foreign matter. Contractor shall take necessary precautions to keep outside walls clean and shall allow no roofing materials to remain on the outside walls.

- 2. All waste materials, rubbish, etc., shall be removed from the Owner's premises as accumulated. Rubbish shall be carefully handled to reduce the spread of dust. A suitable scrap chute or hoist must be used to lower any debris. At completion, all work areas shall be left broom clean and all contractor's equipment and materials removed from the site.
- 3. All bituminous or roofing related materials shall be removed from ladders, stairs, railings, and similar parts of the building.
- 4. Debris shall be deposited at an approved disposal site.

### 1.08 WARRANTY

- A. Roofing Manufacturer: Project shall be installed in such a manner that the material manufacturer will furnish a written twenty (20) year labor and materials watertight warranty from the date of substantial completion of the completed project.
- B. Project shall be completed in such a manner that the material manufacturer shall furnish a standard twenty (20) year warranty on the product finish against oxidation failure.
- C. Roofing Contractor: The contractor, jointly with any subcontractors employed by him, shall guarantee the work required and performed under this contract will be free from defects in workmanship and materials, and that the building will be and remain waterproof for a two (2) year warranty period, after the Owner accepts the work as substantially complete. The warranty shall be in approved notarized written form, to obligate the contractor and his subcontractors, if any, to make good the requirements of the warranty.
- D. Warranty repairs shall be performed by a certified installer. The repairs shall be performed in accordance with the manufacturer's written instructions and recommended procedures so as to not void the warranty. Repair of the system, including materials and labor, shall be done at no cost to the Owner.
- E. During the proposal period each Bidder shall make arrangements with the material manufacturer to provide the required warranty. Refer to paragraph 1.05 SUBMITTALS in this section for requirements concerning submittals of warranty.

## PART 2 - PRODUCTS

### 2.01 GENERAL

- A. All materials shall be furnished, specified, or approved in writing by the manufacturer issuing the warranty.
- B. Samples of all materials used on the project, which are not supplied by the membrane manufacturer, shall be submitted to the membrane manufacturer for written approval prior to work starting.
- C. All materials used on the project shall be asbestos free.

### 2.02 FELTS

A. Shall be Underwriters Laboratory approved and listed in the FM Global Approval Guide.

## 2.03 UNDERLAYMENT MEMBRANE

- A. Membrane shall be nominal sixty (60) mil in overall thickness consisting of forty-five (45) mil thick calendered coal-tar elastomeric membrane thickness with fifteen (15) mil thick backing of styrene butadiene styrene (SBS) adhesive with a selvage edge. The self-adhering membrane shall be a high-performance elastomeric membrane incorporating DuPont<sup>™</sup> Elvaloy KEE (ketone ethylene ester), extended with coal-tar pitch and reinforced with polyester fibers.
- B. The self-adhering membrane shall meet the following physical properties: Elongation 170%, ASTM D 412; Tensile Strength 1600 lbs/in<sup>2</sup>, ASTM D 412; Tear Strength 300 ppi, ASTM D 624; Density @ 70° F, 80 lbs/ft<sup>3</sup>; Low Temperature Flexibility, Pass, 37-GP-56M; and Water Absorption less than 0.1%, 37-GP-56M. Roll shall have one and one-half inch (1-1/2") wide dry lap for hot-air welding.

#### 2.04 UNDERLAYMENT FLASHING MEMBRANE

A. Flashing shall be same base material as the finish ply self-adhered coal-tar elastomeric membrane (CTEM) and be installed using the design principles set forth in the National Roofing Contractors Association Manual and attached details.

### 2.05 END LAP MEMBRANES

- A. Shall be a sixty (60) mil overall calendered thickness membrane. The membrane shall be a high performance elastomeric membrane incorporating a DuPont<sup>™</sup> Elvaloy □ KEE (ketone ethylene ester), extended with coal-tar pitch and reinforced with polyester fibers.
- B. End lap splice strip shall be the same type material as the finish ply membrane not to exceed nominal 60 mils in overall calendered thickness. Strips shall be nine inches (9") by forty-two inches (42") long. All four edges shall have a minimum one and one-half inch (1-1/2") wide dry lap for hot-air welding.

### 2.06 CAULKS

- A. Sealant for use at coping joints, reglet joints, etc., shall be a one-component urethane non-sag, gun grade sealant designed for use in active exterior joints, and shall meet or exceed Federal Specification No. 1 TT-S-00230C, Type II, Class A, ASTM C 920. Where joint surfaces are contained or are contaminated with bituminous materials, provide manufacturer's modified-type sealant (modified with coal-tar or asphalt as required).
- B. To seal the leading edge of the CTEM membrane, to bond CTEM at terminations with metal, and for open CTEM seam repair, sealant shall be a thermosetting, solvent free, non-slump, self-fixturing, multipurpose structural sealant which shall meet the following physical and performance properties.

<u>Properties</u>		
Specific Gravity	1.62 (13.5 lbs./gallon)	
Viscosity	800,000 cps Brookfield RTV, TF spindle, 4 rpm 70	
degrees F.		
Shear Strength (ASTM D-1002)	300 psi+ (7 day ambient cure)	
Elongation @ break (ASTM D-412)	300% (7 day ambient cure)	
Hardness Shore A (ASTM C-661)	50-55 (14 day ambient cure)	
Tack free time (ASTM C-679)	35 minutes	
Low temperature flex	Minus 20 degrees F: PASS	
Slump (sag) (ASTM C-639)	Zero slump	
Shrinkage (ASTM D-2453)	No measurable shrinkage (14 cay cure)	
Service temperature	-40 degrees F to 200 degrees F	
NEW STANDING SEAM METAL ROOF SYSTEM	9/26/2018	07 61 13 - 6

## 2.07 PITCH PAN SEALANT

A. Shall be one-part, self-leveling polyurethane sealant meeting Federal Specification No. TT-S-00230C, Type I, Class A, ASTM C 920, Type S, Grade P, Class 25, for use in new pitch pans.

## 2.08 CANT STRIP

A. Shall be wood fiber where used for non-structural purposes. Shall be treated solid wood where used for structural purposes meeting NRCA, Factory Mutual and Underwriters Laboratory guidelines. If solid wood cant is used where insulation exists, cant is to be toe nailed into treated solid wood nailer the same height as insulation.

### 2.09 FASTENERS

- A. Shall be Factory Mutual approved and as recommended by the manufacturer for the specific application.
- B. <u>Fastener for Brick:</u> Shall be one-fourth inch by two inch (1/4" x 2"), zinc with plated steel or stainless steel nail, one piece unit, flat head.
- C. <u>Fastener for Wood Deck:</u> Shall be a annular threaded shank with a galvanized round cap of appropriate length for use in attaching base sheets to wooden substrates.
- D. <u>Fastener for Miscellaneous Metal Roof Application</u>: Shall be a #12 fastener, fluorocarbon coated, with CR-10 coating. A minimum .200 diameter shank and .250 diameter thread. To be used with round pressure plates or bar, and having a fluorocarbon CR-10 coating, when subjected to thirty (30) Kesternich cycles (DIN 50018) shows less than 10% red rust which surpasses Factory Mutual Approval Standard 4470. Fasteners, plates, and/or bars shall be listed in the Factory Mutual Approval Guide.

#### 2.10 WOOD

A. All nailers, wooden cants and wooden curbs shall be treated lumber as required by NRCA, Factory Mutual and Underwriters Laboratory and installed according to NRCA and Factory Mutual guidelines.

#### 2.11 ASPHALT ROOF PRIMER

A. Quick-dry asphalt-based primer for priming of asphalt roof surfaces.

Applicable Federal Specification	SS-A-701B
ASTM	D 41
Flash Point	105° F
Viscosity at 80° F (ASTM D 217)	50-60 K.U.
Weight per gallon	7.4 pounds
Drying time (to touch)	Min. 4 hours

### 2.12 STYRENE, BUTADIENE, STYRENE (SBS) PRIMER

A. SBS primer made from natural resins, solvent and synthetic rubber. For application on concrete, metal or wooden substrate.

## 2.13 ASPHALT FLASHING CEMENT

A. Designed for laying-up cold process roof membrane flashings where fast-setting adhesive is required.

Applicable Federal Specification	SS-C-153C, Type I
ASTM	D 4586
Flash Point	105° F (41° C)
Weight per gallon (approximate)	10.8 lbs.
Viscosity @ 77° F (25° C) (ASTM D 217)	230-330
% Non-Volatile (Fed. Test Method 141)	68% Min.
% Specially Processed Bitumen	42% Min.
% Total Solids, by Volume	60% Min.
Cured film thickness of 1 gal./15 sq. ft.	75 Mils
Drying time	2 to 3 days
Service Temperature, Extended Exposure	-40° to +180° F
Resistance to Oils & Solvents	Poor
Resistance to Sunlight	Good
Resistance to Chemicals	Good
Effects of Weathering	Slight chalking
Water Resistance	
Under Good Drainage Conditions	Excellent
Under Continuous Submersion	Fair

### 2.14 KRAFT SHEATHING PAPER

A. Minimum 28-pound kraft sheathing or red rosin paper for use as separator sheet.

### 2.15 STANDING SEAM ROOF PANELS

- A. <u>Panels</u>:
  - Shall be prefinished Galvalume<sup>™</sup> UL 90 rated, 22-gauge, eighteen inch (18") seam sheet made up of 55% aluminum, 1.6% silicon and the balance zinc as described in ASTM specification A792.
  - 2. Factory fabricates panel with integral continuous interlocking standing seam without need for separate seam covers. Field formed panels will not be acceptable.
  - 3. Sealant shall be high grade, hot-melt elastomeric sealant in top edge of female seam cap, designed to seal against adjacent male panel leg.
  - 4. All held panels shall be continuous, no exceptions.
  - 5. <u>Panel Fabrication:</u>
    - a) Provide factory formed panel width of 18" with 1 3/4" high x 3/8" wide standing seam.
    - b) Provide panels in full length from ridge to eave.
    - c) Vertical striations (shadowline) to be furnished on all panels over sixteen inches (16") wide.
  - 6. <u>Seams</u>:
    - a) Panel cap shall have pitched bottom edge hook elements to ease installation of cap over clips.
    - b) Provide factory sealant inside female seam to aid in resistance of leaks and to provide panel-to-panel seal while allowing expansion and contraction movement.
  - 7. <u>Seam Size</u>:
    - a) Male leg: 1 1/2" high
    - b) Female cap:  $1 \frac{3}{4}$  high x  $\frac{3}{8}$  wide

# B. <u>Clip/Fastener Assemblies</u>:

- 1. UL 90 Requirements:
  - a) <u>Fasteners</u>: Manufacturer's standard #10 16 x 1" long self-drilling, self-tapping pancake head Phillips drive screws for metal; noncorrosive base material.
- 2. <u>Standard Clip</u>: 24-gauge galvanized steel, 33 ksi yield strength, and 2" long single fastener type.
- 3. <u>Standard Fasteners</u>: Same as UL 90 fasteners specified above.
- 4. <u>Clips</u>:
  - a) Provide UL listed (standard) clip designated to allow panels to thermally expand and contract.
  - b) Fabricate clips with embossments that raise underside of panels above substrate to allow underside ventilation and prevent clip deformation.
  - c) Fabricate clips with structurally embossed outstanding legs to prevent distortion to wind uplift forces.
- 5. <u>Nailable Substrate Fasteners</u>: #10 12 x 1" long A-Point fastener, pancake head Phillips drive screws for plywood; noncorrosive base material.
- C. <u>Accessories</u>:
  - 1. Provide manufacturer's standard accessories and other items essential to completeness of standing seam roof installation.
  - 2. Provide nylon seam end plugs for clean termination of panel.
  - 3. Gutters and downspouts will be fabricated to the same gauge and specification as panel and match metal profile of the details herein.
- D. <u>Field Sealant</u>:
  - 1. Color coordinated primerless silicone or high grade, nondrying butyl as recommended by panel manufacturer.
  - 2. Do not use sealant containing asphalt.
- E. Engineer panels to use concealed anchors that permit expansion and contraction. Exposed fasteners in roofing panels will not be permitted.
- F. Provide factory eave panel notch for eave termination (to be utilized with joggle cleat detail).
- G. <u>Panel Finish</u>:
  - 1. Full strength 70% Kynar 500<sup>®</sup> coating baked on for 15 minutes at 450° F to dry-film thickness of 1.0 mil.
  - 2. 15% reflective gloss (ASTM D 523). (Low Gloss).
  - 3. 0.3 mil baked on epoxy primer.
  - 4. <u>Standard Color</u>: Architect to select from manufacturer's KYNAR 500 standard palette of colors.

## 2.16 LEAD JACKS

A. Shall be four-pound (4#) lead, and of dimensions required to completely cover existing plumbing stack.

### 2.17 TERMINATION/PRESSURE BARS

A. Aluminum strip shall be extruded channel bar with a mill finish, width one-inch (1"), thickness  $0.100" \pm .008"$ , leg height one-fourth inch (1/4") top and bottom, leg angle ninety degrees (90°), for perimeter and curb anchorage, having predrilled holes six inches (6") on center, as manufactured by Olympic Fasteners, or approved equal.

### 2.18 DELIVERY AND STORAGE

A. All materials shall be delivered with appropriate carton and can labels indicating appropriate warnings, storage conditions, lot numbers, and usage instructions. Materials damaged in shipping or storage shall not be used.

## 2.19 PRECAUTIONS

A. Some of the indicated materials are extremely flammable and/or toxic. Use precautions indicated on can and carton labels.

## 2.20 MULTI-COMPONENT POLYURETHANE SEALANT

- A. Except as otherwise indicated, provide manufacturer's standard, non-modified, 2-or-more-part, polyurethane-based, elastomeric sealant; complying with either ASTM C 920, Type M, Class 25, or FS TT-S-00227E, Class A; self-leveling grade/type where used in joints of surfaces subject to traffic, otherwise non-sag grade/type.
- B. Durability: Less than 0.5 square inch adhesion/cohesion loss for three (3) samples of both mortar and aluminum; ASTM C 719 test procedure.
- C. Adhesion in Peel: Fifteen-pound (15#) peel strength and ten percent (10%) maximum loss of bond to substrate; ASTM C 794.
- D. Bituminous Modification: Where joint surfaces contain or are contaminated with bituminous materials, provide manufacturer's modified type sealant which is compatible with joint surfaces (modified with coal-tar or asphalt as required).

### 2.21 EXPANDED POLYETHYLENE JOINT FILLER

A. Provide flexible, compressible, closed-cell, polyethylene of not less than 10 psi compression deflection (25%); except provide higher compression deflection strength as may be necessary to withstand installation forces and provide proper support for sealants, surface water absorption of not more than 0.1 pounds per square foot.

#### 2.22 JOINT PRIMER/SEALER

A. Provide type of joint primer/sealer recommended by sealant manufacturer for joint surfaces to be primed or sealed.

### 2.23 BOND BREAKER TAPE

A. Provide polyethylene tape or other plastic tape as recommended by sealant manufacturer, to be applied to sealant-contact surfaces where bond to substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape where applicable.

### 2.24 SEALANT BACKER ROD

A. Provide compressible rod stack of polyethylene foam, polyurethane foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable, non-absorptive material as recommended by sealant manufacturer for back-up of and compatibility with sealant. Where used with hot-applied sealant, provide heat-resistant type which will not be deteriorated by sealant application temperature as indicated.

## 2.25 MISCELLANEOUS MATERIALS

A. Other materials shall be as specified or of the best grade for the proposed use as recommended by the manufacturer.

# PART 3 - EXECUTION

## 3.01 REFERENCE

- A. The manufacturer's Technical Specifications shall be considered a part of this specification and should be referred to for more specific application procedures and recommendations.
- B. Application of materials shall be in strict accordance with the manufacturer's recommendations except where more stringent requirements are shown or specified. In the instance of a conflict between these specifications and those of the manufacturer, the more stringent specifications shall take precedence.
- C. <u>General Installation:</u>
  - 1. Protect adjacent areas with tarpaulin or other durable materials.
  - 2. Contractor shall prevent overspray, and be responsible for parking lot areas and/or adjoining areas not part of this contract.
  - 3. Contractor shall be responsible for sealing, as required, all openings that may allow bitumen migration or drippage, i.e. pitch dams, envelopes, and filler strips.
  - 4. Prepare surfaces according to manufacturer's or applicator's published instructions. All metal that is to receive bitumen, or come in contact with bitumen or adhesive, shall be first primed with appropriate primer. Any prefinished galvanized sheet steel that is to receive bitumen, or come in contact with bitumen or adhesive, shall be scored, scuffed or abraded before receiving primer application.
  - 5. Use cleaning materials or primers necessary to render an acceptable surface/substrate.
  - 6. All surfaces/substrates shall be clean and dry prior to application of materials.
  - 7. Prior to application of membrane, all foreign matter, gravel, etc., shall be removed from the insulation and/or substrate. <u>Gravel or debris between the insulation/substrate and plies is not acceptable.</u>
  - 8. Ambient temperature shall be 50° F and rising.
  - 9. All plies shall be laid in the direction of maximum roof slope, working from bottom of slope toward ridge.
  - 10. Any self-adhered membranes shall be picture framed on all roof areas as the system is being applied. The outer edge of the picture frame sheet shall extend approximately two inches (2") above the top of the cant. All end laps of the field sheets of the self-adhered coal-tar elastomeric membrane shall lap the picture frame sheet a minimum of eight inches (8") or the picture frame sheet side laps shall lap the field sheet a minimum of eight inches (8").
  - 11. Wrinkles, buckles, kinks, and fishmouths are not acceptable when laying felt and membrane.
  - 12. Dry voids of felt on felt or membrane on membrane are not acceptable.
  - 13. Where deteriorated base flashing is removed, primed cant strips shall be installed at the intersection of the deck and the vertical surfaces. All flashings shall be mechanically top-fastened with a termination bar a minimum of six inches (6") on center at the top leading edge, and be a minimum of eight inches (8") in height from finished membrane.
  - 14. On slopes greater than one inch (1") in twelve inches (12"), refer to NRCA and/or manufacturer's guidelines for backnailing procedures and follow the more stringent guidelines for all specified materials.
  - 15. All base sheet applications and surfaces that are to receive the self-adhered membranes shall be primed with a fast drying asphaltic primer. Except when self-adhered membrane is to be installed over a CTEM surface.

NEW STANDING SEAM METAL ROOF SYSTEM 9/26/2018

## 3.02 NAILERS

- A. Wooden nailers shall be installed at gravel stops or drip edges on outside perimeter of building according to NRCA, Factory Mutual and Underwriters Laboratory guidelines.
- B. <u>All Construction</u>: Nailers shall be the <u>same height</u> as the new insulation being installed where required. Nailers shall be raised if necessary by anchoring an additional nailer of appropriate height to the existing nailer if the existing nailer is not to be replaced. All existing nailers and new nailers, if required, shall be installed according to Factory Mutual and Underwriters Laboratory Guidelines.

### 3.03 APPLICATION OF UNDERLAYMENT

- A. The fiberglass base sheet shall be primed with asphalt based primer in accordance with manufacturer's recommended procedures and allowed to thoroughly dry.
- B. Unroll self-adhered membrane and allow to relax a minimum of two hours at 70° F plus temperature or longer if temperature is below 70° F. If after the period of relaxation, the membrane is not to be immediately installed, cover the membrane with white polyethylene tarp or release paper until ready for installation. All membrane applications shall be applied parallel with slope, no exceptions.
- C. Slide the membrane in place aligning with three inch (3") lap line. Fold second half of relaxed roll over the first half of relaxed roll. Kiss cut the release paper at the fold, taking care not to cut the adhesive and/or membrane, install two feet (2') of self-adhered membrane pulling release paper low to roof line. Roll excess release paper on unused core and pull low to the roof surface removing the release paper while simultaneously setting the remainder of the self-adhered membrane in place. Upon completion, fold first half of membrane over installed second half and repeat procedure. The end laps of the finish ply membrane shall be a minimum of three inches (3").
- D. Immediately following the laying of the self-adhering membrane, it shall be rolled in the width direction using a minimum seventy pound (70#) linoleum roller. This will prevent excessive entrapment of air beneath the membrane. The rolling is in the width direction and with the laps so as <u>not</u> to buck the laps.
- E. Position the next roll of self-adhering membrane adjacent to the membrane already applied so that there is a three inch (3") side lap. The membrane has a one and one-half inch (1-1/2") dry lap; therefore, the three inch (3") side lap will comprise one and one-half inch (1-1/2") adhered lap and one and one-half inch (1-1/2") welded lap.
- F. End laps of membrane shall be a minimum three inches (3"). If possible, lay the end laps in line.
- G. Picture frame all roof areas with self-adhered coal-tar elastomeric membrane (CTEM) as finish membrane ply is being applied. Rectangular type projections should also be picture framed.

### 3.04 LAP SPLICE

- A. Self-adhered coal-tar elastomeric membrane (CTEM) shall be installed as above with three inch (3") side laps. End laps shall be a minimum three inches (3") and in line if possible.
- B. <u>Hot-Air or Solvent Welded Side Laps:</u>
  - 1. WELDING OF SIDE LAPS SHALL BE DONE DAILY.
    - 2. Clean the laps of any bituminous adhesive, dirt, or contaminants to ensure clean, dry, hot-air welded seams. All seams shall have a three inch (3") minimum width, with a one and one-half inch (1-1/2") hot-air weld, and welded the same day the membrane is laid.

- 3. Using either a Leister Variant hot air automatic welding machine or a Leister High Pressure 220/240, 42V double insulated hand-held blower with slot nozzle, weld the three inch (3") laps together. When using a hand-held hot-air welder, the seams should be pressed together using a hand-held roller. The speed and temperature settings of the welding equipment can be affected by the weather conditions at the site of application, therefore, these parameters should be set by the contractor by using two (2) pieces of self-adhered coal-tar elastomeric membrane (CTEM). Minimum width of hot-air weld one and one-half inches (1-1/2").
- 4. Lay the laps together and apply pressure to the welded seam to ensure full adhesion.
- 5. Allow the seams to set fully, and probe the entire length for voids. Reseam voids immediately with a hot-air gun and roller.
- C. <u>End Laps:</u> A piece of double sided adhesive tape two inches (2") wide shall be installed so that the end of the three inch (3") lap of the top roll is centered in the middle of the tape and the double sided adhesive tape extends two inches (2") beyond the sides edges of the membrane. A piece of coal-tar elastomeric membrane (CTEM) which is four inches (4") longer and four inches (4") wider than the double sided adhesive tape shall be applied so the coal-tar elastomeric membrane (CTEM) lap strip is centered over the double sided adhesive tape. The two inch (2") dry lap around the perimeter of the coal-tar elastomeric membrane (CTEM) lap strip shall be heat-welded to the field of the self-adhered coal-tar elastomeric membrane (CTEM).

## 3.05 PERIMETER FASTENING

A. Wood nailers are required for perimeter gravel stops or drip edges. Field membrane and all plies shall be mechanically fastened to nailer on twelve inch (12") centers maximum.

### 3.06 FLASHING - GENERAL

- A. Flashings shall be installed using the self-adhered coal-tar elastomeric membrane (CTEM) flashing, with length of run not to exceed the width of the material roll.
- B. Wooden nailers or curbs shall be installed at all edges and openings in the roof, mechanically fastened to the deck. The nailers should be of exterior grade timber, and of the same thickness as any insulation to be used on the roof.
- C. Cant strips shall be installed at the intersection of the deck and all vertical surfaces.
- D. The roofing field membrane shall extend up over and to the top of cant strips at all vertical intersections or out to the roof's edge.
- E. All existing substrates receiving flashing membrane shall be clean and primed with asphalt primer, prior to application.
- F. Flashing membrane shall always be installed with Type IV glass felt as an underlayment. The Type IV glass felt shall be set in hot asphalt.
- G. Self-adhered CTEM sheet shall always be installed with self-adhered CTEM as an underlayment.
- H. All flashings shall be mechanically fastened with a termination bar a maximum of six inches (6") on center, be a minimum of eight inches (8") above finished roof height, extend a minimum of nine inches (9") onto the field of horizontal roof membrane, and not exceed the width of the material roll.

- I. All surface mounted flashings terminated with a pressure bar shall have an additional surface mounted counterflashing installed immediately above the pressure bar. The counterflashing shall extend a minimum of two and one-half inches (2-1/2") below the pressure mounted termination bar. Both the top edge of the surface mounted termination bar and the surface mounted counterflashing shall be sealed with a liberal bead of sealant.
- J. All vertical flashing lap seams of the self-adhered coal-tar elastomeric membrane (CTEM) shall be hot-air welded. <u>NOTE:</u> Clean lap area of any bituminous adhesive prior to welding.
- K. The self-adhered ply sheet shall extend a minimum of two inches (2") beyond the top edge of the cant. The self-adhered flashing underlayment should then be applied from a minimum of eight inches (8") above the finished roof line down the vertical extending a minimum of nine inches (9") out onto the field of the roof. The finish ply membrane shall then be installed so as to extend from the field of the roof to a minimum of two inches (2") beyond the top edge of the cant. Following the installation of the finish ply membrane a minimum of two inches (2") above the cant, the top self-adhered flashing membrane shall be installed from a minimum of eight inches (8") above the finished roof line down the vertical extending a minimum of nine inches (8") above the finished roof line down the vertical extending a minimum of nine inches (9") out onto the field of the roof. All exposed vertical flashing and all exposed horizontal flashing laps shall be hot-air welded.
- L. All flashing membrane shall be hot mopped to the vertical flashing and to field of roof membrane; hot-air weld vertical laps. <u>NOTE</u>: All bitumen shall be removed from hot-air weld area.
- M. All flashing membrane shall be self-adhered to the vertical flashing, horizontal laps, and to field of roof membrane; hot-air weld vertical laps.
- N. Flashing laps shall be minimum three inch (3") width, no maximum.
- O. Hot-air weld of flashing lap shall be minimum one and one-half inch (1-1/2") width, no maximum.
- P. Any flashing extending further than eighteen inches (18") up onto a vertical surface shall be terminated at eighteen inch (18") height intervals and be mechanically fastened at the top with a termination pressure bar. The additional height needed to be flashed will have a second piece of self-adhered coal-tar elastomeric membrane (CTEM) and Type IV fiberglass felt underlayment installed in hot asphalt lapping the terminated lower sheet by six inches (6"). The new piece shall be properly fastened with a termination bar.
- Q. The self-adhered coal-tar elastomeric flashing sheets shall be run up the wall in three foot (3') widths and under the coping cap and terminated on the outside of the wall six inches (6") on center, then the coping cap reset. All side laps are to be hot-air welded. The underlayment ply shall be a self-adhered coal-tar elastomeric membrane (CTEM).
- R. <u>All hot-air welded seams/laps shall be tested daily with a probe for integrity</u>, no variance.
- S. Hot-air Welding Laps:
  - 1. When using a hand-held hot-air welder, the seams should be pressed together using a hand-held roller. The speed and temperature settings of the welding equipment can be affected by the weather conditions at the site of application, therefore, these parameters should be set by the contractor by using two (2) pieces of self-adhered coal-tar elastomeric membrane (CTEM). Minimum width of hot-air weld one and one-half inches (1-1/2").
  - 2. Lay the laps together and apply pressure to the welded seam to ensure full adhesion.
  - 3. Allow the seams to set fully, and probe the entire length for voids. Reseam voids immediately with a hot-air gun and roller.

## 3.07 PROJECTION FLASHINGS

- A. <u>Plumbing Vents:</u> Soil vent stack pipes shall receive new lead flashings installed in strict accordance with practices set forth in the NRCA Roofing Manual. The lead shall be carried up and over the top of the stack, and crimped down into the pipe to form a watertight seal. Projections that cannot be sealed thus should be boxed in and flashed as recommended by the roof membrane manufacturer.
- B. <u>Square Projections:</u> Lay the self-adhered coal-tar elastomeric membrane (CTEM) up to the projection, and cut membrane so that it will extend twelve inches (12") beyond the projection. Cut a slit in the membrane to correspond with the position of the projection, and lay the membrane in hot asphalt. Apply another layer of membrane in exactly the same fashion, but from the opposite direction. For metal flange-type projections, after doing above, strip in with six inch (6") strips of membrane.
- C. <u>Round Projections</u>: Cut membrane square and eighteen inches (18") from perimeter of projection. Slit square membrane with an "X" of proper size to ensure a close fit and positive seal. Place over projection, and adhere to clean membrane already on the roof. Cut a six inch (6") piece of membrane to apply as a collar, and secure with all stainless steel clamp.

# 3.08 STANDING SEAM METAL ROOF

- A. <u>General</u>:
  - 1. Examine substrate to ensure it is properly secured and prepared to receive metal roofing.
  - 2. Ensure substrate is installed flat, free from objectionable warp, wave and buckle.
  - 3. Do not proceed with installation until unsatisfactory conditions have been corrected.

## B. <u>Standing Seam Roof Installation</u>:

- 1. Comply with manufacturer's instructions for assembly, installation and erection in order to achieve weathertight installation. Install in accordance with approved shop drawings.
- 2. <u>Standing Seam System</u>:
  - a) Install panels in accordance with manufacturer's instructions and recommendations.
  - b) Prior to application of metal roof panels, all underlayment shall be covered with kraft sheathing separator sheet or similar, no exceptions.
  - c) Anchor securely in place using clips and fasteners spaced in accordance with manufacturer's recommendations for design and wind load criteria, minimum wind uplift of FM 1-90 is required or as per the most current published Factory Mutual windspeed map for the area for which the project is located.
  - d) Fully seat adjacent panel to achieve continuous engagement of standing seam joint.
  - e) All panels shall be installed in a workmanlike manner and panels true, straight and watertight.
- 3. <u>Dissimilar Metals</u>:
  - a) Where sheet metal is in contact with dissimilar metals, execute juncture to facilitate drainage and minimize possibility of galvanic action.
  - b) At point of contact with dissimilar metal, coat metal with protective paint or tape which can be placed between metals.
- 4. Field apply sealant to penetrations, transitions and other locations necessary (not standing seam) for airtight, waterproof installation.
- C. <u>Cleaning</u>: Clean exposed surfaces of work promptly after completion of installation.
- D. <u>Protection</u>: Protect work as required to ensure roofing will be without damage at time of final completion.

END OF SECTION
#### SECTION 07 92 00 - JOINT SEALANTS

#### PART 1 - GENERAL

### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.2 SECTION REQUIREMENTS

A. Submittals: Product Data and color Samples.

#### PART 2 - PRODUCTS

#### 2.1 JOINT SEALANTS

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under service and application conditions.
- B. Elastomeric Sealants: Comply with ASTM C 920.
  - 1. Single-component, neutral-curing silicone sealant, Type S; Grade NS; Class 25; Uses T, M, and O, with the additional capability to withstand [50 percent movement in both extension and compression for a total of 100 percent movement] [100 percent movement in extension and 50 percent movement in compression for a total of 150 percent movement]. Use for building expansion joints.
  - 2. Single-component, nonsag polysulfide sealant, Type S; Grade NS; Class 12-1/2; Uses NT, M, G, A, and O. For general exterior use.
  - 3. Single-component, neutral-curing silicone sealant, Type S; Grade NS; Class 25; Uses T, NT, M, G, A, and O. For general exterior use.
  - 4. Single-component, nonsag urethane sealant, Type S; Grade NS; Class 25; and Uses NT, M, A, and O. For general exterior use.
  - 5. Single-component, nonsag urethane sealant, Type S; Grade NS; Class 25; Uses T, NT, M, G, A, and O. Use for exterior traffic-bearing joints, where slope precludes use of pourable sealant.
  - 6. Single-component, pourable urethane sealant, Type S; Grade P; Class 25; Uses T, M, G, A, and O. Use for exterior traffic-bearing joints.

- 7. Single-component, mildew-resistant silicone sealant, Type S; Grade NS; Class 25; Uses NT, G, A, and O; formulated with fungicide. Use for interior sealant joints in ceramic tile, stone, and other hard surfaces in kitchens and toilet rooms and around plumbing fixtures.
- C. Latex Sealant: Single-component, nonsag, mildew-resistant, paintable, acrylic-emulsion sealant complying with ASTM C 834. For interior use only at perimeters of door and window frames.
- D. Acoustical Sealant for Exposed Joints: Nonsag, paintable, nonstaining, latex sealant complying with ASTM C 834. For interior use only at acoustical assemblies.
- E. Acoustical Sealant for Concealed Joints: Nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound. For interior use only at acoustical assemblies.

#### PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Comply with ASTM C 1193.
- B. Comply with ASTM C 919 for use of joint sealants in acoustical applications.

### END OF SECTION

# SECTION 081113 - HOLLOW METAL 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:
  - 1. Standard and custom hollow metal doors and frames.
  - 2. Steel sidelight, borrowed lite and transom frames.
- B. Related Sections:
  - 1. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
  - 2. Division 08 Section "Flush Wood Doors".
  - 3. Division 08 Section "Glazing" for glass view panels in hollow metal doors.
  - 4. Division 08 Section "Door Hardware".
  - 5. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.
- C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
  - 1. ANSI/SDI A250.8 Recommended Specifications for Standard Steel Doors and Frames.
  - 2. ANSI/SDI A250.4 Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
  - 3. ANSI/SDI A250.6 Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
  - 4. ANSI/SDI A250.10 Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
  - 5. ANSI/SDI A250.11 Recommended Erection Instructions for Steel Frames.
  - 6. ASTM A1008 Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
  - 7. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 8. ASTM A924 Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
  - 9. ASTM C 1363 Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
  - 10. ANSI/BHMA A156.115 Hardware Preparation in Steel Doors and Frames.
  - 11. ANSI/SDI 122 Installation and Troubleshooting Guide for Standard Steel Doors and Frames.

- 12. ANSI/NFPA 80 Standard for Fire Doors and Fire Windows; National Fire Protection Association.
- 13. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
- 14. NFPA 252 Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
- 15. UL 10C Positive Pressure Fire Tests of Door Assemblies.
- 16. UL 1784 Standard for Air Leakage Tests of Door Assemblies.

# 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
- B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
- C. Shop Drawings: Include the following:
  - 1. Elevations of each door design.
  - 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
  - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
  - 4. Locations of reinforcement and preparations for hardware.
  - 5. Details of anchorages, joints, field splices, and connections.
  - 6. Details of accessories.
  - 7. Details of moldings, removable stops, and glazing.
  - 8. Details of conduit and preparations for power, signal, and control systems.
- D. Samples for Verification:
  - 1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

# 1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".
- C. Fire-Rated Door Assemblies: Assemblies 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 UL10C (neutral pressure at 40" above sill) or UL 10C.
  - 1. Smoke Control Door Assemblies: Comply with NFPA 105.
    - a. Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.

- D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.
- E. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
  - 1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

## 1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

## 1.7 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

## 1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

# PART 2 - PRODUCTS

# 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:
  - 1. CECO Door Products (C).
  - 2. Curries Company (CU).
  - 3. Steelcraft (S).

## 2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

## 2.3 HOLLOW METAL DOORS

- A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.
- B. Exterior Doors (Energy Efficient): Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A924 A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model, ANSI/SDI A250.4 for physical performance level, and HMMA 867 for door construction.
  - 1. Design: Flush panel.
  - 2. Core Construction: Foamed in place polyurethane and steel stiffened laminated core with no stiffener face welds, in compliance with HMMA 867 "Laminated Core".
    - a. Provide 22 gauge steel stiffeners at 6 inches on-center internally welded at 5" oncenter to integral core assembly, foamed in place polyurethane core chemically bonded to all interior surfaces. No stiffener face welding is permitted.
    - b. Thermal properties to rate at a fully operable minimum U-Factor 0.29 and R-Value 3.4, including insulated door, thermal-break frame and threshold.
    - c. Kerf Type Frames: Thermal properties to rate at a fully operable minimum U-Factor 0.36 and R-Value 2.7, including insulated door, kerf type frame, and threshold.
  - 3. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053 inch 1.3-mm) thick steel, Model 2.
  - 4. Vertical Edges: Vertical edges to be mechanically interlocked with hairline seam. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).

- 5. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
- 6. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9".
- 7. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- C. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
  - 1. Design: Flush panel.
  - 2. Core Construction: Manufacturer's standard one-piece polystyrene core, securely bonded to both faces.
    - a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
  - 3. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), minimum 16 gauge (0.053-inch 1.3-mm) thick steel, Model 2.
  - 4. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
  - 5. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
  - 6. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- D. Manufacturers Basis of Design:
  - 1. CECO Door Products (C) Polystyrene Core Legion Series.
  - 2. Curries Company (CU) Polystyrene Core 707 Series.

### 2.4 HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.
  - 1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
  - 2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
  - 3. Manufacturers Basis of Design:
    - a. CECO Door Products (C) SQSR Series.

- C. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
  - 1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
  - 2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
  - 3. Manufacturers Basis of Design:
    - a. CECO Door Products (C) SQ Series.
- D. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.
- E. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

## 2.5 FRAME ANCHORS

- A. Jamb Anchors:
  - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
  - 2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
  - 3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.
- B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.
- C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

## 2.6 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

## 2.7 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.
- C. Hollow Metal Doors:

- 1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
- 2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
- 3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fireperformance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
- D. Hollow Metal Frames:

City of McAllen

- 1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
- 2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
  - a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
- 3. Sidelight and Transom Bar 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 butt welding.
- 4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
- 5. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
- 6. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
- 7. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
- 8. Jamb Anchors: Provide number and spacing of anchors as follows:
  - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
    - 1) Two anchors per jamb up to 60 inches high.
    - 2) Three anchors per jamb from 60 to 90 inches high.
    - 3) Four anchors per jamb from 90 to 120 inches high.
    - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
  - b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
    - 1) Three anchors per jamb up to 60 inches high.
    - 2) Four anchors per jamb from 60 to 90 inches high.
    - 3) Five anchors per jamb from 90 to 96 inches high.

- 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
- 5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
- 9. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
- E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
  - 1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
  - 2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
  - 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
  - 4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

# 2.8 STEEL FINISHES

- A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
  - 1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

# PART 3 - EXECUTION

# 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

# 3.2 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.

- B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.
- C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

# 3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
  - 1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
  - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
  - 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
  - 4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
  - 1. Non-Fire-Rated Standard Steel Doors:
    - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
    - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
    - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
    - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
  - 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

## 3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION 081113

## 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 1 Specification Sections, apply to this Section.

### 1.2 SUMMARY

- A. Section Includes:
  - 1. Solid core doors with wood veneer faces.
  - 2. Factory finishing wood doors.
  - 3. Factory fitting wood doors to frames and factory machining for hardware.

### B. Related Sections:

- 1. Division 08 Section "Door Schedule".
- 2. Division 08 Section "Hollow Metal Doors and Frames".
- 3. Division 08 Section "Glazing".
- 4. Division 08 Section "Door Hardware".
- C. Standards and References: Comply with the version year adopted by the Authority Having Jurisdiction.
  - 1. ANSI A117.1 Accessible and Usable Buildings and Facilities.
  - 2. ANSI A208.1 Wood Particleboard.
  - 3. Intertek Testing Service (ITS Warnock Hersey) Certification Listings for Fire Doors.
  - 4. NFPA 80 Standard for Fire Doors and Fire Windows; National Fire Protection Association.
  - 5. NFPA 252 Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
  - 6. UL 10C Positive Pressure Fire Tests of Door Assemblies; UL 1784 Standard for Air Leakage Tests of Door Assemblies.
  - 7. Window and Door Manufacturers Association WDMA I.S.1-A Architectural Wood Flush Doors.

## 1.3 SUBMITTALS

- A. Product Data: For each type of door indicated. Include details of core and edge construction, louvers, trim for openings, and WDMA I.S.1-A classifications. Include factory finishing specifications.
- B. Shop Drawings shall include:

- 1. Indicate location, size, and hand of each door.
- 2. Indicate dimensions and locations of mortises and holes for hardware.
- 3. Indicate dimensions and locations of cutouts.
- 4. Indicate requirements for veneer matching.
- 5. Indicate location and extent of hardware blocking.
- 6. Indicate construction details not covered in Product Data.
- 7. Indicate doors to be factory finished and finish requirements.
- 8. Indicate fire protection ratings for fire rated doors.
- C. Samples for Initial Selection: For factory finished doors.
  - 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 the finished work.
  - 2. Corner sections of doors, 8 by 10 inches, with door faces and edges representing actual materials to be used.
    - a. Provide samples for each species of veneer and core material.
    - 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.
- D. Warranty: Provide sample of manufacturer's warranty.

### 1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, latest edition, "Industry Standard for Architectural Wood Flush Doors'.
- C. Fire Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing at positive pressure according to NFPA 252 (neutral pressure at 40" above sill) or UL10C.
  - 1. Smoke Control Door Assemblies: Comply with NFPA 105.
    - 1) Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
- D. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for receiving, handling, and installing flush wood doors.

### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package pre-finished doors individually in plastic bags and wrap bundles of doors in plastic sheeting.
- C. Mark each door on top rail with opening number used on Shop Drawings.

## 1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weather tight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

## 1.7 WARRANTY

- A. Warranty: Manufacturer's standard form in which 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 wood face veneers exceeding 0.01 inch in a 3inch span.
  - 2. Warranty includes 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 DOOR CONSTRUCTION GENERAL
  - A. WDMA I.S.1-A Performance Grade: Extra Heavy Duty; Aesthetic Grade: Premium.
  - B. Fire Rated Doors: Provide construction and core as needed to provide fire ratings indicated.
    - 1. Category A Edge Construction: Provide fire rated door edge construction with intumescent seals concealed by outer stile (Category A) at 45, 60, and 90 minute rated doors. Comply with specified requirements for exposed edges.
    - 2. Pairs: Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.

- a. Provide fire retardant stiles that are listed and labeled for applications indicated without formed steel edges and astragals.
- b. Where required for concealed hardware, provide formed steel edges and astragals with intumescent seals. Finish steel edges and astragals with baked enamel.

# 2.2 CORE CONSTRUCTION

- A. Particleboard Core Doors:
  - 1. Particleboard: Wood fiber based materials complying with ANSI A208.1 Particleboard standard. Grade LD-2.
  - 2. Adhesive: Fully bonded construction using Polyurethane (PUR) glue.
  - 3. Blocking: As indicated under article "Blocking".

# 2.3 BLOCKING

- A. Non-Fire-Rated Doors:
  - 1. Provide blocking as indicated below:
    - a. HB3: 5 inch top and bottom rail blocking, in doors indicated to have closers and kick plates.

## 2.4 VENEERED DOORS FOR TRANSPARENT FINISH

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. ASSA ABLOY Wood Doors (GR): GPD Series.
  - 2. Eggers Industries (EG): Premium Series.
  - 3. Marshfield-Algoma (MF): Signature Series.
- B. Interior Solid Core Doors:
  - 1. Grade: Premium.
  - 2. Faces: Veneer grades as noted below; veneer minimum 1/50-inch (0.5mm) thickness at moisture content of 12% or less.
    - a. Plain Sliced Red Oak, A grade faces.
  - 3. Match between Veneer Leaves: Book match.
  - 4. Assembly of Veneer Leaves on Door Faces:

- a. Running Match.
- 5. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
- 6. Transom Match: Continuous match.
- 7. Vertical Edges: Matching same species as faces. Wood or composite material, one piece, laminated, or veneered. Minimum requirements per WDMA section P-1, Performance Standards for Architectural Wood Flush Doors.
- 8. Horizontal Edges: Solid wood or structural composite material meeting the minimum requirements per WDMA section P-1, Performance Standards for Architectural Wood Flush Doors
- 9. Construction: Five plies. Stiles and rails are bonded to core, then entire unit sanded before applying face veneers.
- 10. At doors over 40% of the face cut-out for lights and or louvers, furnish engineered composite lumber core.

## 2.5 FABRICATION

- A. Factory fit doors to suit frame opening sizes indicated.
  - 1. Comply with requirements in NFPA 80 for fire rated doors.
  - 2. Undercut: As required per manufacturer's templates and sill condition.
- B. Factory machine doors for hardware that is not surface applied. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
  - 1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
  - 2. Metal Astragals: Factory machine astragals and formed steel edges for hardware for pairs of fire rated doors.

## 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. Transparent Finish: Provide a clear protective coating over the wood veneer allowing the natural color and grain of the selected wood species to provide the appearance specified. Stain is applied to the wood surface underneath the transparent finish to add color and design flexibility.

- 1. Finish: Meet or exceed WDMA I.S. 1A TR8 UV Cured Acrylated Polyester finish performance requirements.
- 2. Staining:
  - a. Custom stain to match architect's sample.
- 3. Sheen: Satin.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine doors and installed door frames before hanging doors.
  - 1. Verify that 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 Division 8 Section "Door Hardware."
- B. Installation Instructions: Install doors and frames to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.
  - 1. Install fire rated doors in corresponding fire rated frames according to NFPA 80.
- C. Factory Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory Finished Doors: Restore finish before installation if fitting or machining is required at Project site.
- E. Field modifications to doors shall not be permitted, except those specifically allowed by manufacturer or fire rating requirements.

### 3.3 ADJUSTING

- A. Operation: Re-hang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors 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 08 33 23 - OVERHEAD COILING SERVICE DOORS

#### PART 1 GENERAL

#### 1.0 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.1 SECTION INCLUDES

A. Overhead coiling service doors.

#### 1.2 RELATED SECTIONS

- A. Section 05 50 00 Metal Fabrications: Support framing and framed opening.
- B. Section 06 20 00 Finish Carpentry: Wood jamb and head trim.
- C. Section 08 71 00 Door Hardware: Product Requirements for cylinder core and keys.
- D. Section 09 91 00 Painting: Field applied finish.
- E. Section 26 05 33 Raceway and Boxes: Conduit from electric circuit to door operator and from door operator to control station.
- F. Section 26 05 83 Wiring Connections: Power to disconnect.

#### 1.3 REFERENCES

- A. <u>ASTM A 653</u> Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. ASTM A 666 Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- C. <u>ASTM A 924</u> Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- D. <u>ASTM B 221</u> Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- E. <u>NEMA 250</u> Enclosures for Electrical Equipment (1000 Volts Maximum).

F. <u>NEMA MG 1</u> - Motors and Generators.

### 1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Overhead coiling service doors:
  - 1. Wind Loads: Design door assembly to withstand wind/suction load of 20 psf (958 Pa) without damage to door or assembly components.
  - 2. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.
- B. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.
- C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

### 1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Details of construction and fabrication.
  - 4. Installation instructions.
- C. Shop Drawings: Include detailed plans, elevations, details of framing members, anchoring methods, required clearances, hardware, and accessories. Include relationship with adjacent construction.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) long, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- G. Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.
- B. Installer Qualifications: Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Finish areas designated by Architect.
  - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
  - 3. Refinish mock-up area as required to produce acceptable work.
- 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.
- C. Store materials in a dry, warm, ventilated weathertight location.

#### 1.8 PROJECT CONDITIONS

A. 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.

#### 1.9 COORDINATION

A. Coordinate Work with other operations and installation of adjacent materials to avoid damage to installed materials.

#### 1.10 WARRANTY

- A. Warranty: Manufacturer's limited door and operator system, except the counterbalance spring and finish, to be free from defects in materials and workmanship for 3 years or 20,000 cycles, whichever occurs first.
- B. Warranty: Manufacturer's limited door warranty for 2 years for all parts and components.

#### PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: www.overheaddoor.com. E-mail: info@overheaddoor.com.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 25 00.

### 2.2 OVERHEAD COILING SERVICE DOORS

- A. Industrial Doors: Overhead Door Corporation Model 610 Service Door.
- В.
- 1. Curtain: Interlocking roll-formed slats as specified following. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.
- 2.
- a. Curved profile type C-187 for doors up to 15 feet 4 inches (4.67 m) wide, fabricated of:
  1) 22 gauge galvanized steel.
- 2) 3. Finish:
  - a. Galvanized Steel: Slats and hood galvanized in accordance with ASTM A 653 and receive rust-inhibitive, roll coating process, including 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester top coat.
  - b.
- 1) Powder coat: PowderGuard

4.

- (a) PowderGuard Weathered Finish: Industrial textured powder coat provides a thicker, more scratch resistant coat. Applied to entire door system including slats, guides, bottom bar and head plate.
- Weatherseals:
  - a. Vinyl bottom seal.

(b)

- b.
- 5. Bottom Bar:
  - a. Two galvanized steel angles.

b.

- 6. Guides: Three structural steel angles.
  - a. Finish: PowderGuard Weathered finish with iron/black powder.
- b. 7. Brackets:
  - a. Galvanized steel to support counterbalance, curtain and hood.
  - b.
- 8. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03 inch per foot of span. Counterbalance is adjustable by means of an adjusting tension wheel.

9.

- 10. Hood:
  - a. 24 gauge galvanized steel with intermediate supports as required. b.
- 11. Electric Motor Operation: Provide UL listed electric operator, size as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
  - a. Sensing Edge Protection:
    - 1) Pneumatic sensing edge.
  - b. Operator Controls:
    - 1) Push-button operated control stations with open, close, and stop buttons.
  - c. Motor Voltage: 115/230 single phase, 60 Hz.

d.

- 12. Windload Design:
  - a. Standard windload shall be 20 PSF.
  - b.
- 13. Locking:
  - a. Interior slide bolt lock for electric operation with interlock switch.
  - b.
- 14. Wall Mounting Condition:
  - a. Face-of-wall mounting.
  - b.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify opening sizes, tolerances and conditions are acceptable.
- B. Examine conditions of substrates, supports, and other conditions under which this work is to be performed.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Coordinate installation of electrical service with Section 16150. Complete wiring from disconnect to unit components.
- F. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07900.
- G. Install perimeter trim and closures.
- H. Instruct Owner's personnel in proper operating procedures and maintenance schedule.

### 3.4 ADJUSTING

- A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Adjust hardware and operating assemblies for smooth and noiseless operation.

### 3.5 CLEANING

- A. Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.
- B. Remove labels and visible markings.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

### 3.6 **PROTECTION**

A. Protect installed products until completion of project.

### END OF SECTION

### SECTION 08 41 13 – ALUMINUM STOREFRONT

#### PART 1 - GENERAL

#### 1.0 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.1 SUMMARY

- A. Related Documents: Conditions of the Contract, Division 1 General Requirements, and Drawings apply to Work of this Section.
- B. Section Includes:
  - 1. Entrance and storefront systems, complete with reinforcing, fasteners, anchors and attachment devices.
  - 2. Aluminum doors complete with hardware.
  - 3. Accessories necessary to complete work.
- C. Related Sections:
  - 1. Section 01 40 00 Quality Requirements.
  - 2. Section 05 50 00 Metal Fabrications.
  - 3. Section 06 10 00 Rough Carpentry.
  - 4. Section 07 92 00 Joint Sealants.
  - 5. Section 08 71 00 Door Hardware.
  - 6. Section 08 81 00 Glass and Glazing.

#### 1.2 REFERENCES

- A. Aluminum Association (AA):
  - 1. DAF-45 Designation System for Aluminum Finishes.

### B. American Architectural Manufacturers Association (AAMA):

- 1.503.1Test Method for Condensation Resistance of Windows,<br/>Doors and Glazed Wall Systems.
- 2. 701.2 Specifications for Pile Weatherstripping.
- 3. Manual #10 Care and Handling of Architectural Aluminum From Shop to Site.
- 4. SFM-1 Aluminum Storefront and Entrance Manual.
- C. American National Standards Institute (ANSI):
  - 1. A117.1 Safety Standards for the Handicapped.

D. American Society for Testing and Materials (ASTM):

American Society for Testing and Waterials (ASTW).		
1.	A36	Structural Steel.
2.	B209	Aluminum and Aluminum - Alloy Sheet and Plate.
3.	B221	Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and
		Tubes.
4.	B308	Aluminum-Alloy 6061-T6 Standard Structural Shapes,
		Rolled or Extruded.
5.	C509	Cellular Elastomeric Pre-formed Gasket and Sealing
		Material.
6.	C864	Dense Elastomeric Compression Seal Gaskets, Setting
		Blocks and Spacers.
7.	E283	Test Method for Rate of Air Leakage Through Exterior
		Windows, Curtain Walls and Doors.
8.	E330	Test Method for Structural Performance of Exterior
		Windows, Curtain Walls and Doors by Uniform Static Air
		Pressure Difference.
9.	E331	Test Method for Water Penetration of Exterior Windows,
		Curtain Walls and Doors by Uniform Static Air Pressure
		Difference.

- E. Federal Specifications (FS):
   1. TT-P-645A Primer, Paint, Zinc Chromate, Alkyd Type.
- F. Steel Structures Painting Council (SSPC):
  - 1. Paint 12 Cold-Applied Asphalt Mastic (Extra Thick Film).

## 1.3 SYSTEM REQUIREMENTS

- A. Design Requirements:
  - 1. Drawings are diagrammatic and do not purport to identify nor solve problems of thermal or structural movement, glazing, anchorage or moisture disposal.
  - 2. Requirements shown by details are intended to establish basic dimension of units, sight lines and profiles of members.
  - 3. Provide concealed fastening.
  - 4. Provide entrance and storefront systems, including necessary modifications, to meet specified requirements and maintaining visual design concepts.
  - 5. Attachment considerations are to take into account site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening or fracturing connection between units and building structure or between units themselves.
  - 6. Anchors, fasteners and braces shall be structurally stressed not more than 50% of allowable stress when maximum loads are applied.
  - 7. Provide for expansion and contraction without detriment to appearance or performance.
  - 8. Assemblies shall be free from rattles, wind whistles and noise due to thermal and structural movement and wind pressure.
- B. Performance Requirements:
  - 1. Air infiltration: Air leakage through fixed light areas of storefront shall not exceed 0.06 cfm per square foot (0.0003 m3/sm2) of surface area when tested in accordance with ASTM E283 at differential static pressure of 6.24 psf (300 Pa).
  - 2. Water infiltration: No uncontrolled water penetration when tested in accordance with ASTM E 331 at test pressure of 8.0 psf 380 Pa.

- C. Thermal Requirements:
  - 1. Framing systems shall accommodate expansion and contraction movement due to surface temperature differentials of 180 degrees Fahrenheit (82 degrees Celsius) without causing buckling, stress on glass, failure of joint seals, excessive stress on structural elements, reduction of performance, or other detrimental effects.
  - 2. Ensure doors function normally within limits of specified temperature range.
- D. Structural Requirements, as measured in accordance with ANSI/ASTM E330:
  - 1. Wind loads for exterior assemblies:
    - a. Basic loading:
      - 1) [\_\_\_\_] psf acting inward.
      - 2) [\_\_\_\_] psf acting outward.
  - 2. Deflection: Maximum calculated deflection of any framing member in direction normal to plane of wall when subjected to specified design pressures shall not exceed 1/175 of its clear span.
- E. Testing Requirements: Provide components that have been previously tested by an independent testing laboratory.
- 1.4 SUBMITTALS
  - A. General: Submit in accordance with Section 01 33 00.
  - B. Product Data:
    - 1. Submit manufacturer's descriptive literature and product specifications.
    - 2. Include information for factory finishes, hardware, accessories and other required components.
    - 3. Include color charts for finish indicating manufacturer's standard colors available for selection.
  - C. Shop Drawings:
    - 1. Submit shop drawings covering fabrication, installation and finish of specified systems.
    - 2. Include following:
      - a. Fully dimensioned plans and elevations with detail coordination keys.
      - b. Locations of exposed fasteners and joints.
    - 3. Provide detailed drawings of:
      - a. Composite members.
      - b. Joint connections for framing systems and for entrance doors.
      - c. Anchorage.
      - d. System reinforcements.
      - e. Expansion and contraction provisions.
      - f. Hardware, including locations, mounting heights, reinforcements and special installation provisions.
      - g. Glazing methods and accessories.
      - h. Internal sealant requirements as recommended by sealant manufacturer.
    - 4. Schedule of finishes.
  - D. Samples:
    - 1. Submit samples indicating quality of finish, in required colors, on alloys used for work, in sizes as standard with manufacturer.

2. Where normal texture or color variations are expected, include additional samples illustrating range of variation.

#### E. Test Reports:

- 1. Standard Systems: Submit certified copies of previous test reports substantiating performance of system in lieu of re-testing. Include other supportive data as necessary.
- F. Certificates:
  - 1. Submit manufacturer's certification stating that systems are in compliance with specified requirements.
- G. Qualification Data:
  - 1. Submit installer qualifications verifying years of experience.
  - 2. Include list of projects having similar scope of work identified by name, location, date, reference name and phone number.
- H. Manufacturer's Instructions: Submit manufacturer's printed installation instructions.

#### 1.5 QUALITY ASSURANCE

- A. Single Source Responsibility:
  - 1. To ensure quality of appearance and performance, obtain materials for each system from either a single manufacturer or from manufacturer approved by each system manufacturer.
- B. Installer Qualifications: Certified in writing by Contractor as qualified for installation of specified systems.
- C. Perform Work in accordance with AAMA SFM-1 and manufacturer's written instructions.
- D. Conform to requirements of ANSI A117.1 and local amendments.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Comply with requirements of Section 01 60 00.
- B. Protect finished surfaces as necessary to prevent damage.
- C. Do not use adhesive papers or sprayed coatings which become firmly bonded when exposed to sun.
- D. Do not leave coating residue on any surfaces.
- E. Replace damaged units.

#### 1.7 WARRANTY

- A. Provide warranties in accordance with the Contract General Conditions.
- B. Provide written manufacturer's warranty, executed by company official, warranting against defects in materials and products for two (2) years from date of Substantial Completion.
- C. Provide written installer's warranty, warranting work to be watertight, free from defective materials, defective workmanship, glass breakage due to defective design, and agreeing to replace components which fail within 1 year from date of Substantial Completion.

- 1. Warranty shall cover following:
  - a. Complete watertight and airtight system installation within specified tolerances.
  - b. Completed installation will remain free from rattles, wind whistles and noise due to thermal and structural movement and wind pressure.
  - c. System is structurally sound and free from distortion.
  - d. Glass and glazing gaskets will not break or "pop" from frames due to design wind, expansion or contraction movement.
  - e. Glazing sealants and gaskets will remain free from abnormal deterioration or dislocation due to sunlight, weather or oxidation.

### PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Manufacturers
  - 1. YKK AP America, Inc.
  - 2. Vista Wall Architectural Products
  - 3. Kawneer
  - 4. Oldcastle Building Envelope
- B. Substitutions: Submit under provisions of Section 01 25 00, a minimum of 10 days prior to bid date.
- C. Acceptable Entrance Doors:
  - 1. Standard Duty Doors: Model 35D Medium Stile Door YKK AP with Mid-panel panic device system or equivalent by specified manufacturer.
- D. Acceptable Storefront Framing Systems:
  - 1. Framing System: YES 45 FI (2" x 4-1/2") YKK AP or equivalent by specified manufacturer.

### 2.2 FRAMING MATERIALS AND ACCESSORIES

- A. Aluminum:
  - 1. ASTM B221, alloy 6063-T5 for extrusions; ASTM B209, alloy 5005-H34 for sheets; or other alloys and temper recommended by manufacturer appropriate for specified finish.
- B. Internal Reinforcing:
  - 1. ASTM A36 for carbon steel; or ASTM B308 for structural aluminum.
  - 2. Shapes and sizes to suit installation.
  - 3. Shop coat steel components after fabrication with alkyd type zinc chromate primer complying with FS TT-P-645.
- C. Anchorage Devices:
  - 1. Manufacturer's standard formed or fabricated steel or aluminum assemblies of shapes, plates, bars or tubes.
- D. Fasteners:
  - 1. Aluminum, non-magnetic stainless steel or other materials warranted by manufacturer to be non-

corrosive and compatible with components being fastened.

- 2. Do not use exposed fasteners, except where unavoidable for application of hardware.
- 3. For exposed locations, provide countersunk Phillips head screws with finish matching items fastened.
- 4. For concealed locations, provide manufacturer's standard fasteners.
- 5. Provide nuts or washers of design having means to prevent disengagement; deforming of fastener threads is unacceptable.
- E. Expansion Anchor Devices: Lead-shield or toothed-steel, drilled-in, expansion bolt anchors.
- F. Protective Coatings: Cold-applied asphalt mastic complying with SSPC-Paint 12, compounded for 30 mil (0.77 mm) thickness for each coat; or alkyd type zinc chromate primer complying with FS TT-P-645.
- G. Glazing Gaskets:
  - 1. Compression type design, replaceable, molded or extruded, of neoprene, or ethylene propylene diene monomer (EPDM).
  - 2. Conform to ASTM C509 or C864.
  - 3. Profile and hardness as required to maintain uniform pressure for watertight seal.
  - 4. Provide in manufacturer's standard black color.
- H. Weatherstripping:
  - 1. Wool pile conforming to AAMA 701.2; or extruded EPDM elastomeric conforming to ASTM C509 or C864.
  - 2. Provide EPDM or vinyl-blade gasket weatherstripping in bottom door rail, adjustable for contact with threshold.
- I. Internal Sealants: Types recommended by sealant manufacturer.
- J. "Anti-Walk" Edge Blocking: "W" shaped EPDM blocks for use in keeping glazing material stationary under vibration or seismic loading.
- K. Baffles (at weep holes): Type as recommended by system manufacturer and shown in published installation instructions.
- 2.3 GLASS AND GLAZING ACCESSORIES
  - A. Refer to Section 08 81 00.

#### 2.4 FABRICATION

- A. Coordination of Fabrication:
  - 1. Check actual frame or door openings required in construction work by accurate field measurements before fabrication.
  - 2. Fabricate units to withstand loads which will be applied when system is in place.
- B. General:
  - 1. Conceal fasteners wherever possible.
  - 2. Reinforce work as necessary for performance requirements and for support to structure.
  - 3. Separate dissimilar metals and aluminum in contact with concrete utilizing protective coating or pre-formed separators which will prevent contact and corrosion.
  - 4. Comply with Section 08 81 00 for glazing requirements.
- C. Aluminum Framing:
  - 1. Provide members of size, shape and profile indicated, designed to provide for glazing from interior.

- 2. Fabricate frame assemblies with joints straight and tight fitting.
- 3. Reinforce internally with structural members as necessary to support design loads.
- 4. Maintain accurate relation of planes and angles, with hairline fit of contacting members.
- 5. Seal horizontals and direct moisture accumulation to exterior.
- 6. Provide flashings and other materials used internally or externally that are corrosive resistant, non-staining, non-bleeding and compatible with adjoining materials.
- 7. Provide manufacturer's extrusions and accessories to accommodate expansion and contraction due to temperature changes without being detrimental to appearance or performance.
- 8. Make provisions in framing for minimum edge clearance, nominal edge cover and nominal pocket width for thickness and type of glazing or infill used in accordance with recommendations of manufacturer and FGMA Glazing Manual.
- 9. Provide tight fitting, injection molded, plastic water deflectors at all intermediate horizontals.
- D. Entrance Doors:
  - 1. Fabricate with mechanical joints using internal reinforcing plates and shear blocks attached with fasteners and by welding.
  - 2. Provide extruded aluminum glazing stops of [square] [beveled and mitered (for single glazing only)] design, [permanently anchored on security side and removable on opposite side.]
- E. Hardware:
  - 1. Receive hardware supplied in accordance with Section 08 71 00 and install in accordance with requirements of this Section.
  - 2. Cut, reinforce, drill and tap frames and doors as required to receive hardware.
  - 3. Comply with hardware manufacturer's templates and instructions.
  - 4. Use concealed fasteners wherever possible.
  - 5. Coordinate mid-panel panic device system with hardware at storefront doors to ensure compatibility.
- F. Welding:
  - 1. Comply with recommendations of the American Welding Society.
  - 2. Use recommended electrodes and methods to avoid distortion and discoloration.
  - 3. Grind exposed welds smooth and flush with adjacent surfaces; restore mechanical finish.
- G. Flashings:
  - 1. Form from sheet aluminum with same finish as extruded sections. Apply finish after fabrication. Material thickness as required to suit condition without deflection or "oil-canning".
- 2.5 FINISH
  - A. Manufacturer's standard colors as selected by Architect.

## PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine conditions and proceed with Work in accordance with Section 01 40 00.
- B. Verify dimensions, tolerances and method of attachment with other Work.

#### 3.2 INSTALLATION

- A. Erection Tolerances:
  - 1. Limit variations from plumb and level:
    - a. 1/8 inch (3 mm) in 10 feet (3 M) vertically.
    - b. 1/8 inch (3 mm) in 20 feet (6 M) horizontally.
  - 2. Limit variations from theoretical locations: 1/4 inch (6 mm) for any member at any location.
  - 3. Limit offsets in theoretical end-to-end and edge-to-edge alignment: 1/16 inch (2 mm) from flush surfaces not more than 2 inches (51 mm) apart or out-of-flush by more than 1/4 inch (6 mm).
- B. Install doors and hardware in accordance with manufacturer's printed instructions.
- C. Set units plumb, level and true to line, without warp or rack of frame.
- D. Anchor securely in place, allowing for required movement, including expansion and contraction.
- E. Separate dissimilar materials at contact points, including metal in contact with masonry or concrete surfaces, with bituminous paint or pre-formed separators to prevent contact and corrosion.
- F. Seal perimeter members as shown on manufacturer's installation instructions or as required for unique job conditions. Set other members with internal sealants and baffles as called for in manufacturer's installation instructions. Use sealants as recommended by sealant manufacturer.
- G. Coordinate installation of perimeter sealant and backing materials between assemblies and adjacent construction in accordance with requirements of Section 07 92 00.
- H. Glazing: Refer to requirements of Section 08 81 00. Utilize "anti-walk" edge blocking on all vertical edges of glazing.

#### 3.3 ADJUSTING

A. Test door operating functions. Adjust closing and latching speeds and other hardware in accordance with manufacturer's instructions to ensure smooth operation.

#### 3.4 CLEANING

- A. Clean surfaces in compliance with manufacturer's recommendations; remove excess mastic, mastic smears, foreign materials and other unsightly marks.
- B. Clean metal surfaces exercising care to avoid damage.

#### END OF SECTION

# SECTION 087100 – DOOR HARDWARE

### 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 commercial door hardware for the following:
  - 1. Swinging doors.
  - 2. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
  - 1. Mechanical door hardware.
  - 2. Cylinders specified for doors in other sections.
- C. Related Sections:
  - 1. Division 08 Section "Door Hardware Schedule".
  - 2. Division 08 Section "Hollow Metal Doors and Frames".
  - 3. Division 08 Section "Flush Wood Doors".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
  - 1. ANSI A117.1 Accessible and Usable Buildings and Facilities.
  - 2. ICC/IBC International Building Code.
  - 3. NFPA 70 National Electrical Code.
  - 4. NFPA 80 Fire Doors and Windows.
  - 5. NFPA 101 Life Safety Code.
  - 6. NFPA 105 Installation of Smoke Door Assemblies.
  - 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards:
  - 1. ANSI/BHMA Certified Product Standards A156 Series
  - 2. UL10C Positive Pressure Fire Tests of Door Assemblies

## 1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
  - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
  - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
  - 3. Content: Include the following information:
    - a. Type, style, function, size, label, hand, and finish of each door hardware item.
    - b. Manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    - e. Explanation of abbreviations, symbols, and codes contained in schedule.
    - f. Mounting locations for door hardware.
    - g. Door and frame sizes and materials.
    - h. Warranty information for each product.
  - 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- D. Informational Submittals:
  - 1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

## 1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Installer Qualifications: A minimum 3 years documented experience door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
- E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
  - 1. Function of building, purpose of each area and degree of security required.
  - 2. Plans for existing and future key system expansion.
  - 3. Requirements for key control storage and software.
  - 4. Installation of permanent keys, cylinder cores and software.
  - 5. Address and requirements for delivery of keys.
- G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
  - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.

- 2. Review and finalize construction schedule and verify availability of materials.
- 3. Review the required inspecting, testing, commissioning, and demonstration procedures
- H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

# 1.6 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

### 1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties 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. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
  - 1. Structural failures including excessive deflection, cracking, or breakage.
  - 2. Faulty operation of the hardware.
  - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
  - 1. Seven years for heavy duty cylindrical (bored) locks and latches.
  - 2. Twenty five years for manual surface door closer bodies.

## 1.8 MAINTENANCE SERVICE

A. 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 door hardware.

## PART 2 - PRODUCTS

## 2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
- C. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- D. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

### 2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.
  - 1. Quantity: Provide the following hinge quantity, unless otherwise indicated:
    - a. Two Hinges: For doors with heights up to 60 inches.
    - b. Three Hinges: For doors with heights 61 to 90 inches.
    - c. Four Hinges: For doors with heights 91 to 120 inches.
    - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
  - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
    - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
    - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
  - 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
- a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
- b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
- 4. Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:
  - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
- 5. Acceptable Manufacturers:
  - a. Hager Companies (HA).
  - b. McKinney Products (MK).
- B. Pivots: ANSI/BHMA A156.4, Grade 1, certified. Space intermediate pivots equally not less than 25 inches on center apart or not more than 35 inches on center for doors over 121 inches high. Pivot hinges to have oil impregnated bronze bearing in the top pivot and a radial roller and thrust bearing in the bottom pivot with the bottom pivot designed to carry the full weight of the door. Pivots to be UL listed for windstorm where applicable.
  - 1. Acceptable Manufacturers:
    - a. Architectural Builders Hardware (AH).
    - b. Rixson Door Controls (RF).

#### 2.3 DOOR OPERATING TRIM

- A. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
  - 1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
  - 2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
  - 3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
  - 4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
  - 5. Acceptable Manufacturers:
    - a. Rockwood Manufacturing (RO).
    - b. Trimco (TC).

#### 2.4 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
- C. Cylinders: Original manufacturer cylinders complying with the following:
  - 1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
  - 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
  - 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
  - 4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
  - 5. Keyway: Match Facility Standard.
- D. Keying System: Each type of lock and cylinders to be factory keyed.
  - 1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
  - 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
  - 3. New System: Key locks to a new key system as directed by the Owner.
- E. Key Quantity: Provide the following minimum number of keys:
  - 1. Change Keys per Cylinder: Two (2)
  - 2. Master Keys (per Master Key Level/Group): Five (5).
- F. Key Registration List (Bitting List):
  - 1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
  - 2. Provide transcript list in writing or electronic file as directed by the Owner.
- G. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.
  - 1. Acceptable Manufacturers:
    - a. Lund Equipment (LU).
    - b. MMF Industries (MM).
    - c. Telkee (TK).

#### 2.5 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified.
  - 1. Furnish with solid cast levers, standard 2 3/4" backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.
  - 2. Locks are to be non-handed and fully field reversible.
  - 3. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.2 requirements to 2 million cycles.
  - 4. Acceptable Manufacturers:
    - a. Corbin Russwin Hardware (RU) CL3300 Series.
    - b. Sargent Manufacturing (SA) 10 Line.
    - c. Schlage (SC) ND Series.

#### 2.6 AUXILIARY LOCKS

- A. Narrow Case Deadlocks and Deadlatches: ANSI/BHMA 156.13 Series 1000 Grade 1 certified narrow case deadlocks and deadlatches for swinging or sliding door applications. All functions shall be manufactured in a single sized case formed from 12 gauge minimum, corrosion resistant steel (option for fully stainless steel case and components). Provide minimum 2 7/8" throw laminated stainless steel bolt. Bottom rail deadlocks to have 3/8" diameter bolts.
  - 1. Acceptable Manufacturers:
    - a. Adams Rite Manufacturing (AD) MS1850S / MS1950 Series.

#### 2.7 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
  - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
  - 2. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
  - 3.
- B. Standards: Comply with the following:
  - 1. Strikes for Bored Locks and Latches: BHMA A156.2.
  - 2. Strikes for Auxiliary Deadlocks: BHMA A156.36.
  - 3. Dustproof Strikes: BHMA A156.16.

#### 2.8 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
  - 1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
  - 2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
  - 3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
  - 4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
  - 5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
  - 6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
  - 7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.
- B. Door Closers, Surface Mounted (Commercial Duty): ANSI/BHMA 156.4, Grade 1 certified surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard.
  - 1. Acceptable Manufacturers:
    - a. Corbin Russwin Hardware (RU) DC6000 Series.
    - b. Norton Door Controls (NO) 8500 Series.
    - c. Sargent Manufacturing (SA) 1431 Series.

#### 2.9 ARCHITECTURAL TRIM

- A. Door Protective Trim
  - 1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

- 2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
- 3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
- 4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
  - a. Stainless Steel: 300 grade, 050-inch thick.
- 5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
- 6. Acceptable Manufacturers:
  - a. Hager Companies (HA).
  - b. Rockwood Manufacturing (RO).

#### 2.10 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
  - 1. Acceptable Manufacturers:
    - a. Rockwood Manufacturing (RO).
    - b. Trimco (TC).
- C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
  - 1. Acceptable Manufacturers:
    - a. Rixson Door Controls (RF).
    - b. Rockwood Manufacturing (RO).

c. Sargent Manufacturing (SA).

#### 2.11 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
  - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
  - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Acceptable Manufacturers:
  - 1. National Guard Products (NG).
  - 2. Pemko Manufacturing (PE).
  - 3. Reese Enterprises, Inc. (RE).

#### 2.12 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

### 2.13 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. 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 scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

## 3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

#### 3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
  - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
  - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
  - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
  - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
  - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

#### 3.4 FIELD QUALITY CONTROL

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

#### 3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

#### 3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

#### 3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

### 3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

## Hardware Sets - per drawings dated 6/12/17 - 100% Review

# <u>Set: 1.0</u>

Doors: 100 Description: Exterior Alum

1 Pivot Set	117	626	Rixson
1 Intermediate Pivot	M19	626	Rixson
1 Storeroom Lock	CL3357 PZD	626	Corbin Russwin
1 Electric Strike	1500	630	HES
1 SMART Pac Bridge Rectifier	2005M3		HES
1 Closer w/ Stop Arm	DC6210 A4	689	Corbin Russwin
1 Drop Plate	597F58	689	Corbin Russwin
1 Threshold	2005AT		Pemko
1 Perimeter Seal	By door mfgr		
1 Rain Drip	346C		Pemko
1 Sweep	3452AV		Pemko
1 ElectroLynx Harness	QC-C1500		McKinney
1 Power Supply	AQD3		Securitron
1 Card Reader	By Security Contractor.		

<u>Set: 2.0</u> Doors: 102A Description: Exterior HM

3	Hinge	T4A3386 4-1/2" x 4-1/2" NRP	US32D	McKinney
1	Storeroom Lock	CL3357 PZD	626	Corbin Russwin
1	Electric Strike	1500	630	HES
1	SMART Pac Bridge Rectifier	2005M3		HES
1	Closer w/ Stop Arm	DC6210 A4	689	Corbin Russwin
1	Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	Rockwood
1	Threshold	2005AT		Pemko
1	Perimeter Seal	2891APK		Pemko
1	Rain Drip	346C		Pemko
1	Sweep	3452AV		Pemko
1	ElectroLynx Harness	QC-C1500		McKinney
1	Power Supply	AQD3		Securitron
1	Card Reader	By Security Contractor.		

# <u>Set: 3.0</u>

Doors: 113 Description: Exterior Riser

3	Hinge	T4A3386 4-1/2" x 4-1/2" NRP	US32D	McKinney
1	Storeroom Lock	CL3357 PZD	626	Corbin Russwin
1	Closer w/ Stop Arm	DC6210 A4	689	Corbin Russwin
1	Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	Rockwood
1	Threshold	2005AT		Pemko
1	Perimeter Seal	2891APK		Pemko
1	Rain Drip	346C		Pemko
1	Sweep	3452AV		Pemko
	-			

<u>Set: 4.0</u> Doors: 107 Description: Storage

<ol> <li>Hinge</li> <li>Storeroom Lock</li> <li>Wall Stop</li> <li>Silencer</li> </ol>	TA2714 4 1/2 x 4 1/2 CL3357 PZD 406 608	US26D 626 US32D	McKinney Corbin Russwin Rockwood Rockwood
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<ul><li>3 Hinge</li><li>1 Storeroom Lock</li><li>1 Surface Overhead Stop</li><li>3 Silencer</li></ul>	TA2714 4 1/2 x 4 1/2 CL3357 PZD 9-X36 608	US26D 626 630	McKinney Corbin Russwin Rixson Rockwood
Set: 6.0 Doors: 109 Description: Office			
<ul><li>3 Hinge</li><li>1 Entrance Lock</li><li>1 Wall Stop</li><li>3 Silencer</li></ul>	TA2714 4 1/2 x 4 1/2 CL3351 PZD 406 608	US26D 626 US32D	McKinney Corbin Russwin Rockwood Rockwood
Set: 7.0 Doors: 110 Description: Office - OH Stop			
<ul><li>3 Hinge</li><li>1 Entrance Lock</li><li>1 Concealed Overhead Stop</li><li>3 Silencer</li></ul>	TA2714 4 1/2 x 4 1/2 CL3351 PZD 1-X36 608	US26D 626 630	McKinney Corbin Russwin Rixson Rockwood
Set: 8.0 Doors: 102 Description: Reception			
<ul> <li>3 Hinge</li> <li>1 Storeroom Lock</li> <li>1 Electric Strike</li> <li>1 SMART Pac Bridge Rectifier</li> <li>1 Closer w/ Stop Arm</li> <li>1 Kickplate</li> <li>3 Silencer</li> <li>1 ElectroLynx Harness</li> <li>1 Power Supply</li> <li>1 Card Reader</li> </ul>	TA2714 4 1/2 x 4 1/2 CL3357 PZD 1500 2005M3 DC6210 A4 K1050 8" x 2" LDW 4BE CSK 608 QC-C1500 AQD3 By Security Contractor.	US26D 626 630 689 US32D	McKinney Corbin Russwin HES HES Corbin Russwin Rockwood Rockwood McKinney Securitron

<u>Set: 9.0</u> Doors: 106, 108 Description: Shared Restroom

3	Hinge	TA2714 4 1/2 x 4 1/2	US26D	McKinney
1	Push Plate	70E	US32D	Rockwood
1	Pull Plate	111x70C	US32D	Rockwood
1	Closer - pull side	DC6200	689	Corbin Russwin
1	Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	Rockwood
1	Wall Stop	406	US32D	Rockwood
1	Perimeter Seal	S773D		Pemko

# <u>Set: 10.0</u> Doors: 101

Description: Sgl Restroom

3	Hinge	TA2714 4 1/2 x 4 1/2	US26D	McKinney
1	Privacy Set	CL3320 PZD	626	Corbin Russwin
1	Closer - pull side	DC6200	689	Corbin Russwin
1	Kickplate	K1050 8" x 2" LDW 4BE CSK	US32D	Rockwood
1	Wall Stop	406	US32D	Rockwood
1	Perimeter Seal	S773D		Pemko

# Set: 11.0

Doors: 111 Description: OH

1 Cylinder	To Match Existing	626
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Notes: Balance of hardware by door mfgr. Verify cylinder type and cam required.

END OF SECTION 087100

#### SECTION 08 81 00 — GLASS AND GLAZING

#### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.2 WORK INCLUDED

- A. Glazing for hollow metal doors and frames.
- B. Glazing for aluminum frames.

#### 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Hollow metal doors and frames.
- B. Aluminum entrances and storefronts.
- C. Aluminum window systems.

#### 1.4 SUBMITTALS

- A. Submit manufacturer's literature with material and performance descriptions for each type of glass, sealant and glazing accessories.
- B. Submit detailed shop drawings indicating locations, installation and sealing methods.
- C. Submit 12" x 12" physical samples of each type of tinted or wire glass and panel.
- D. Obtain approved shop drawings from hollow metal supplier, aluminum frame supplier, plastic laminate door supplier.
- E. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.
- 1.5 WARRANTY

- A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.
- B. Warranted defects shall include but not necessarily be limited to water infiltration, air infiltration, glass failure due to improper sizing or installation, sealant failure.

#### 1.6 QUALITY ASSURANCE

- A. Glazing contractor shall have a minimum of 3 years experience in the installation of glazing products for projects of similar size and scope as this project.
- B. Each piece of glass shall bear manufacturer's label indicating type.

#### 1.7 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver glass or panels to the jobsite until openings are ready for glazing.
- B. Deliver glass and panels in manufacturer's original protective packaging. Store in a dry, well ventilated area and take care to prevent condensation on the materials. Keep glass faces separated.

#### 1.8 MINIMUM COMPLIANCE STANDARDS

- A. SAFETY: Contractor shall be responsible for meeting all Federal and applicable code requirements for types and locations of glazing regardless of drawing indications. Comply with the current standards of the Consumer Products Safety Commission and Federal Standard 16 CFR 1201 Federal Architectural Glazing Materials Safety Standard.
- B. INSTALLATION: Comply with recommendations of Flat Glass Marketing Association FGMA Glazing Manual.

#### PART 2 - PRODUCTS

#### 2.1 GENERAL

- A. GLAZING SHEETS: Glazing materials shall conform to the highest qualities as specified in the following standards:
  - 1. Float glass: FS DD-G-451d and ASTM C1036.
  - 2. Float glass, heat strengthened: ASTM C1036 and ASTM C1048.
  - 3. Float glass, tempered: FS DD-G-1403B and ASTM C1036, ASTM C1048, ANSI Z97.1, and Consumer Product Safety Commission 16 CFR 1201.
  - 4. Wired glass: FS DD-G-451, ASTM C1036 and ANSI Z97.1. Misco diamond pattern.
  - 5. Insulating glass: ASTM C1036. Meet industry standards set by the Sealed Insulating Glass Manufacturers Association (SIGMA).
- B. MISCELLANEOUS
  - 1. Glazing sealants: FS TT-S-1543A (silicone rubber); FS TT-S-230 (synthetic rubber); FS TT-S-001657 (butyl rubber).
  - 2. Glazing tape: Architectural Aluminum Manufacturer's Association.

#### 2.2 MANUFACTURERS

- A. GLASS:
  - 1. Guardian
  - 2. PPG Industries
  - 3. Pilkington.

#### B. TEMPERING, LAMINATING AND HEAT STRENGTHENING:

- 1. Oldcastle
- 2. Trulite
- C. WIRE GLASS:
  - 1. Pilkington
  - 2. PPG Industries
- D. GLAZING TAPE:
  - 1. TREMCO tape, shims, setting blocks, edge blocking.
- E. GLAZING SEALANT:
  - 1. TREMCO,
  - 2. General Electric.
- 2.3 MATERIALS: Types as indicated in the drawings.
  - A. TEMPERED GLASS: 1/4" clear and solar tint float glass tempered by the vertical or horizontal process and meeting requirements of FS DD-G-1403B.
  - B. WIRE GLASS: Shall be 1/4" thick. Polish plate glass reinforced with diamond pattern wire mesh No. 24 gauge minimum, with a mesh not larger than 1".
  - C. HOLLOW METAL FRAME AND DOOR GLAZING SYSTEM:
    - 1. Glazing: 1/4" Tempered.
    - 2. Glazing tape: 1/8" x 3/8" x continuous preshimmed butyl tape; Tremco 440.
    - 3. Setting blocks: Neoprene or EPDM in minimum 4" lengths.
    - 4. Edge blocking: Neoprene or EPDM in minimum 4" lengths and sized to allow for 1/8" clear expansion at both vertical edges.
    - 5. Add sealant at exterior glazing.

#### 2.4 INSULATING GLASS

- A. Solar Control Tinted Insulated Units
  - 1. Conformance: ASTM C 1172 and complying with testing requirements in CPSC 16CFR-1201 for Category II materials.
  - 2. Overall Thickness: 1 inch (25 mm)
  - 3. Outboard Lite: Bronze float glass.
    - a. Tinted Float Glass: ASTM C 1036, Type I, Class 2, Quality q3.
    - b. Glass Thickness: 1/4 inch (6 mm).
    - c. Heat Treatment: Fully Tempered, ASTM C 1048, Kind FT
  - 4. Interspace: <sup>1</sup>/<sub>2</sub> inch (12 mm) hermetically sealed air
  - 5. Inboard Lite: Clear float glass.
    - a. Clear Float Glass: ASTM C 1036, Type I, Class 1, Quality q3.
    - b. Glass Thickness: 1/4 inch (6 mm).
    - c. Heat Treatment: Fully Tempered, ASTM C 1048, Kind FT
  - 6. Sealant: Approved by glass manufacturer.

7. Nominal shading coefficient: 0.53

#### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. GENERAL: Install glass without warping, binding or stress. Allow for expansion and contraction of glass due to temperature changes. Do not install sealant with surfaces or ambient temperature below 40 degrees F.
- B. HOLOW METAL FRAMES AND DOORS:
  - 1. Ensure that finish painting of doors and frames is complete.
  - 2. Cut glazing tape to length and install against permanent stop, flush with face of stop.
  - 3. Place setting blocks at 1/4 points.
  - 4. Rest glass on setting blocks and press against stop for full contact and adhesion at perimeter.
  - 5. Place continuous glazing tape on opposite-face perimeter of glass in same manner described above. Install removable stop; avoid displacement of tape; and exert pressure on tape for full continuous contact.
  - 6. Knife trim excess of protruding tape (leave recessed for sealant at exterior glazing).
  - 7. Do not touch glass to metal.
- C. PLASTIC LAMINATE DOORS:
  - 1. Follow procedures specified above for non-rated doors. Metal stops provided by door manufacturer.
  - 2. Follow recommendations of door manufacturer for rated doors. Metal stops provided by door manufacturer.
- D. ALUMINUM FRAMES: Follow door and frame manufacturer's printed instructions for glazing gasketed systems. Provide watertight installation at exterior systems.

#### 3.2 CLEANING AND PROTECTION

- A. During glazing operations, provide sufficient stick-on safety labels or hang streamers on new glazing.
- B. Prior to project closeout, thoroughly clean all glazing inside and out with commercial glass cleaner.
- C. Reglaze any openings where glass is chipped, broken, scratched, pitted or stained.

#### END OF SECTION

#### SECTION 09 21 16 — INTERIOR DRYWALL SYSTEMS

#### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.2 WORK INCLUDED

- A. Provide and install acoustical batt insulation within interior drywall partitions.
- B. Provide and install all interior drywall systems including light gauge metal studs and tracks, gypsum wall board and finishing systems, suspended gypsum board ceilings and soffits, furred gypsum board.
- C. Provide and install troweled firestopping system at drywall ceiling and wall penetrations at rated walls.
- D. Provide and install specified corner guards at each wall corner.

#### 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Painting
- B. Door frames
- C. Carpentry (wood <u>blocking</u>)
- D. Plaster on metal studs
- E. Mechanical, electrical and plumbing penetrations in rated drywall systems.

#### 1.4 SUBMITTALS

- A. Submit manufacturer's product data describing all materials.
- B. Submit gypsum board finish schedule indicating level of finish proposed per each area. Finish levels shall be levels 1 through 4 as specified herein and defined by "Recommended Specification: Levels of Gypsum Board Finish" as jointly published by AWCI, CISA, GA, and PDCA. Submit copy of publication with finish schedule.

- C. Submit manufacturers detail drawings and detailed installation methods for fire rated penetrations and filling of voids with specified firestopping system. Submit only those systems applicable to this project.
- D. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.

#### 1.5 WARRANTY

- A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.
- Warranted defects shall include but not necessarily be limited to cracking, joint tape delamination or B. tearing, dimpling at fastener heads, bowing or warping of wall board, cracking at metal accessories, acoustical sealant failure.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- All materials shall be delivered in manufacturer's original packaging and stored flat in a covered, dry area A. providing protection from damage and exposure to the elements.
- Β. Damaged or deteriorated materials shall be removed from the premises.
- C. During cold weather installation of gypsum panels and joint finishing, temperatures within the building shall be maintained within the range of 50 degrees to 80 degrees F. Adequate ventilation shall be provided to carry off excess moisture.
- D. Steel framing and related accessories shall be stored and handled in accordance with AISI's "Code of Standard Practice"

#### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- Α. Drywall Framing:
  - ClarkDietrich Building Systems 1
- 1. TREMCO 2. Ohio Sealants, Inc.

D. Acoustical Sealant:

- E. Specialty Trims:
  - 1. Fry Reglet Corp.
  - 2. MM Systems Corp.
- B. Gypsum Board and Related Accessories: United States Gypsum Co. 1.
  - 2. National Gypsum Co.
  - Georgia Pacific
  - 3. Temple Inland 4.

  - 5. James Hardie
- C. Acoustical Batts:
  - 1. Owens-Corning
  - 2. Certaineed
  - 3. Manville

- F. Corner Guards:
- 1. WallProtex, (877) 880-8115
- 2.2 FRAMING: Comply with ASTM C645-09 for conditions indicated.
  - 1. Steel Sheet Components: Comply with ASTM C645-09 requirements for metal unless otherwise indicated.

- 2. Protective coating: Comply with ASTM C645-09; roll formed from hot dipped galvanized steel; complying with ASTM A1003/A1003M and ASTM A653/A653M G40 (Z120) or having a coating that provides equivalent corrosion resistance. A40 galvannealed products are not acceptable.
- A. METAL STUDS: 25 gauge galvanized roll formed, screw channel type studs with minimum 5/16 inch flanges and 1-1/4 inch legs. Provide widths of 1-5/8 inch, 2-1/2 inch, 3-5/8 inch, 4 inches and 6 inches as indicated in the drawings. Provide conduit punchouts at 24" o.c.
  - 1. "EQ" (Equivalent Gauge Thickness) Steel Studs and Runners: Members that can show certified third party testing with gypsum board in accordance with ICC ES AC86-2010 (approved February 2010 Effective March 1, 2010) need not meet the minimum thickness limitation or minimum section properties set forth in ASTM C645-09.
  - 2. Non-structural Studs: Cold-formed galvanized steel C-studs, ClarkDietrich Building Systems Pro STUD drywall studs as per ASTM C645-09 for conditions indicated below:
    - a. Flange Size: 1 1/4 inch (32mm)
    - b. Web Depth: As specified on drawings, 1-5/8 inches (41 mm) 2-1/2 inches (64 mm) 3-5/8 inches (92 mm) 4 inches (102 mm) 6 inches (152 mm).
    - Member Description: ProSTUD 25 (25ga equivalent drywall stud) 70ksi Minimum Thickness: 0.0150 inches (0.3810mm) Minimum Design Thickness: 0.0158 inches (0.4013mm)
    - d. Member Description: ProSTUD 22 (22ga equivalent drywall stud) 70ksi Minimum Thickness: 0.0179 inches (0.4547mm) Minimum Design Thickness: 0.0188 inches (0.4775mm)
    - e. Member Description: ProSTUD 20 (20ga equivalent drywall stud) 65ksi Minimum Thickness: 0.0220 inches (0.5588mm) Minimum Design Thickness: 0.0232 inches (0.5893mm)
- B. RUNNER CHANNELS: Provide 25 gauge galvanized channels with minimum 1-1/4 inch flanges with hemmed edges, in widths to accommodate stud sizes.
  - 1. Non structural Track: Cold-Formed galvanized steel runner tracks, ClarkDietrick Building Systems ProTRAK drywall track in conformance with ASTM C645-09 for conditions indicated below:
    - a. Flange Size: 1 1/4 inch (32mm)
    - b. Web Depth: Track web to match stud web size.
    - c. Minimum Material Thickness: Track thickness to match wall stud thickness or as per design.
- C. FURRING CHANNELS: Provide 20 gauge galvanized "hat" channels with face width of 1-1/4 inches, depth of 7/8 inches, and back Width of 2-9/16 inches minimum, hemmed edges.
- D. CEILING SUSPENSION: Provide 16 gauge galvanized channels, 3/4" x 1/2" and 11/2" or 2" x 17/32".
  - 1. Firestop tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

a. Basis of Design Product: Subject to compliance with requirements, provide ClarkDietrich Building Systems; MaxTrak or an equivalent product.

#### 2.3 ACCESSORIES

- A. CORNER BEADS: 26 gauge galvanized beaded angle with 1-1/4" legs.
- B. EDGE TRIM: 26 gauge galvanized steel "J" mould and angle with continuous bead. ClarkDietrich Building Systems 200.A and 200.B.
  - 1. Channel Bridging and Bracing: Steel, 0.0538-inch (1.37mm) minimum base metal thickness, with minimum 1/2 inch (13mm) wide flanges.
    - a. Basis of Design Product: Subject to compliance with requirements, provide ClarkDietrich Building Systems; Spazzer 9200 Bridging and Spacing Bar, or an equivalent product.
    - b. Depth: As indicated on drawings, 7/8 inch by 7/8 inch by 50 inches.
  - 2. Backing Plate: Proprietary fire-resistance treated blocking and bracing in width indicated.
    - a. Basis of Design Product: Subject to compliance with requirements, provide ClarkDietrich Building Systems; Danback Fire-treated wood backing plate or an equivalent product.
- C. WIRE: 9 gauge galvanized hanger wire and 16 gauge galvanized be wire.
- D. SCREWS: Bugel head Type "S" self tapping drywall screws in lengths recommended by wallboard manufacturer. USG "Super-Tite".
- E. CONTROL JOINTS: Roll formed zinc with 1/4" open joint, and perforated flanges. Provide with fireseal backing at rated systems. ClarkDietrich Building Systems No. 093.
- F. JOINT ADHESIVE: Premixed water based compound. USG taping joint compound.
- G. LAMINATING ADHESIVE: Durabond sheetrock setting-type for double-layer application and column fireproofing.
- H. JOINT REINFORCING: Center creased paper tape equal to "Perf-A-Tape".
- I. TROWELED FIRESTOPPING
  - 1. <u>System Type:</u> A combination of glass fiber or mineral wool insulation packing material with troweled-on application of sealing compound.
  - 2. <u>Sealing Compound:</u> Red tinted compound job mixed with water providing protection from heat (to temperatures of 1850 degrees F), smoke, toxic gas, fire and water. "Sta-Smooth FS 90 Fire-Shield Compound Fire and Smoke Stop" as manufactured by National Gypsum Co. or approved equivalent by Domtar Gypsum, Inc.
  - 3. Approvals:
    - a. Rated as noncombustible as defined by NFPA Standard 220 when tested in accordance with ASTM E 136 at Underwriters Laboratories.
    - b. Meet all requirements of ASTM E 814 and UL 1479: Fire tests of through penetration fire stops.
- J. CORNER GUARDS: Textured Vinyl Corner Guards 3" by WallProtex. 4' lengths, taped. Color as selected by Architect.

#### 2.4 WALLBOARD

- A. TYPICAL: 5/8" thick x 48" wide paper-faced gypsum panels, tapered long edges, lengths as required. U.L. listed and conforming to ASTM C-1396/C1396M-09a Standard Specification for Gypsum Board, Type X. USG fire code.
- B. WATER RESISTANT: 5/8" thick x 48" wide U.L. listed, Type X board with chemically treated face paper and water resistant gypsum core. Comply with ASTM C-1396/C1396M-09a Standard Specification for Gypsum Board.
- C. HIGH IMPACT: 5/8" thick x 48" wide, length as required. U.L. listed, "Fiberock Interior Panel Abuse Resistant" by USG or equal.

#### 2.5 TILE BACKER BOARD

A. 5/8" thick cement board formed of aggregated Portland cement slurry with polymer-coated, glass-fiber mesh. "Durock" as manufactured by United States Gypsum Co or approved equivalent.

#### PART 3 - EXECUTION

#### 3.1 PARTITION INSTALLATION

- A. STUD SYSTEM ERECTION: Attach metal runners at floor and to structural elements with suitable fasteners spaced maximum 24" o.c. Position studs vertically, engaging floor track and runner at ceiling or structure. Place studs in direct contact with all door frame jambs, abutting partitions, partition corners and existing construction elements.
- B. Anchor all studs adjacent to door and window frames, partition intersections, and corners to ceiling and floor runner flanges. Securely anchor studs to jamb and head anchor clips of door or side-light frames by screw attachment. Over door and side-light frames, install horizontal runner with a web-flange bend at each end, and secure with one positive attachment per flange.
- C. Install diagonal stud bracing above ceiling at strike side of door jambs and at other locations as indicated in the drawings. Secure to structure.
- D. Follow stud manufacturer's recommendations for all framing construction and fastening.

#### 3.2 WALL PANEL ERECTION

- A. Apply gypsum panels vertically or horizontally. Position all edges over studs for vertical application; all ends over studs for horizontal application. Use maximum practical lengths to eliminate end joints. Fit ends and edges closely together. Stagger joints on opposite side of partition.
- B. For single-layer vertical application of gypsum panels, space screws 12" o.c. in field of panels and 8" o.c. staggered along vertical abutting edges. For horizontal panel application, space screws 12" o.c. in field and along abutting end joints.
- C. For double-layer screw attachment, space screws 16" o.c. for both layers. Apply both layers of gypsum panels vertically with joints in face layer offset from base layer joints. For 5/8" panels, use 1 " screws for base layer and 1-5/8" screws for face layers. For 1/2" panels, use 7/8" screws for base layer and 1-5/16" screws for face layer.

#### 3.3 CHASE WALL ERECTION

- A. Align two parallel rows of floor and ceiling runners spaced as indicated in the drawings. Attach to concrete slabs with powder actuated anchors 24" o.c. and to suspended ceiling tees or structure with suitable fasteners 24" o.c.
- B. Position metal studs vertically in runners, 16" o.c., with flanges in the same direction and with studs on opposite sides of chase directly across from each other. Anchor all studs to floor and ceiling runner flanges with U.S.G. Metal Lock Fastener tool.
- C. Cut gypsum panel bracing to be placed between rows of studs, 12" high by chase wall width. Space braces 48" o.c. vertically and attach to stud webs with screw fasteners. 2-1/2" metal studs may be used in lieu of gypsum panels. Anchor web at each end of metal brace to stud web with two 3/8" pan head screws.

#### 3.4 CEILING FRAMING

- A. GRILLAGE ERECTION: Space 8 gauge hanger wires 48" o.c. along carrying channels and within 6" of ends of carrying-channel runs. Wrap hanger around and through beams or joists. Install 1-1/2" carrying channels at 24" o.c. Position channels for proper ceiling height, level and secure with hanger wire saddlebed along channel. Provide 1" clearance between runners and abutting walls and partitions. Secure furring to carrying channels with clips or saddle-tie to support. Overlap splices at least 8" and securely wire-fie each end with double-strand 16 gauge tie wire.
- B. Erect metal furring channels at right angles to 1-1/2" carrying channels or main support members Space furring (16") o.c. and within 6"of walls. Provide 1" clearance between furring ends and abutting walls and partitions. Secure furring to carrying channels with clips or saddle-tie to supports with double strand 16 gauge be wire. Overlap splices at least 8" and securely wire-tie each end with double-strand 16 gauge fie wire.
- C. At light troffers or any openings that interrupt the carrying or furring channels, install additional cross reinforcing to restore lateral stability of grillage.
- D. At rated ceilings meet all requirements of selected U.L. Design No.
- E. METAL STUD CEILING FRAMING OPTION: Attach runners at ceiling height through gypsum panels to each partition stud with two screws. Insert metal studs in runners and attach each end with one 3/8" pan head screw. Install 1-5/8" stud cross-bracing over stud framing, space 48" o.c. and attach to each framing stud with two 3/8" pan head screws. At hangers, install 12" long stud section for box reinforcing or lap studs 12" and secure each end with two 3/8" pan head screws. At light troffers or any openings that interrupt the ceiling, install additional cross reinforcing to maintain structural integrity of framing.
- F. GYPSUM PANEL ERECTION: Apply gypsum panels of maximum practical length with long dimension at right angles to furring channels. Position end joints over channel web and stagger in adjacent rows. Fit ends and edges closely. Fasten panels to channels with 1 ", Type S screws, spaced 8" o.c. in field of panels and 8" along ends and edges.
- 3.5 EXTERIOR WALLS: Reference Section 05 41 00.

#### 3.6 ACOUSTICAL BATTS

A. Install unfaced full thickness acoustical fiberglass batts between studs at partitions as scheduled on the drawings. Fit batts tight to studs, tight to floor and head tracks and tight to one another. Batts shall run full height of partition unless indicated otherwise in the drawings.

#### 3.7 ACOUSTICAL SEALANT

- A. Install continuous bead of sealant at bottom tracks at drywall partitions.
- B. Install vinyl foam double stick tape and sealant where head track terminates at ceiling.
- C. See drawings for additional locations.

#### 3.8 ACCESSORY APPLICATION

- A. JOINT SYSTEM: Finish all face panel joints and corners with U.S.G. Joint System installed according to manufacturer's directions.
  - 1. Mix joint cement in strict accordance with manufacturers directions.
  - 2. Butter cement into joints filling them evenly and fully.
  - 3. Center tape and press down into cement leaving sufficient cement under tape for proper bond. Cover with thin coat of cement to fill recess between tape and board to bring material flush with surface.
  - 4. Face panels shall be cut fit around all wall outlets and switch boxes, utility lines, etc. All voids and cracks, occurring around all openings in board shall be taped and covered with joint cement.
- B. LAMINATING ADHESIVE: Spread to provide 1/2" adhesive beads 4-1/2" o.c. for full sheet lamination. For strip lamination, apply adhesive in vertical strips of four 1/2" beads, 1-1/2" to 2" o.c. Space strips 24" o.c.
- C. CORNER BEAD: Reinforce all vertical and horizontal exterior corners with corner bead fastened with 9/16" rosin-coated staples 9" o.c. on both flanges along entire length of bead.
- D. METAL TRIM: At exposed edges of board or where board terminates against other materials, apply metal trim over panel edge and fasten with screws.
- E. SCREWS: Power-drive at least 3/8" from edges or ends of panel to provide uniform dimple of 1/32" deep.
- F. CONTROL JOINTS: Cut panel at joint and back with double framing members. Attach control joint to face layer with 9/16" rosin-coated staples spaced 6" o.c. on both flanges along entire length of joint. At rated walls, provide fireseal behind joint. Provide joints at 25' maximum or as otherwise indicated in the drawings.
- G. CORNER GUARDS: Install as per manufacturer's recommendations. Double sided adhesive tape factory applied to corner guard.

#### 3.9 TROWELED FIRESTOPPING:

A. <u>General:</u> Install systems in complete accordance with manufacturers printed instructions and approved submittal for the required fire rating of the particular condition. Install firestopping systems at all penetrations and voids in all rated drywall ceilings and walls.

- B. <u>Through-penetrations.</u> Ensure that pipe, conduit, duct, cables or other penetration element is rigidly supported by drywall framing on both sides of wall or ceiling assembly. Oversize opening in wall board to allow for required opening size and thickness of packing material in accordance with system and rating requirements. Install packing material in accordance with system requirements and compressed to allow for required thickness of sealing material. Trowel red-tint sealing material into void (same thickness as gypsum board) and smooth flush with both faces of drywall. Provide additional layer(s) of gypsum board around penetration where necessary to achieve required minimum thickness of sealing material.
- C. Void-filling: For voids such as intersection of walls and smooth or corrugated deck, pack void with compressed packing material and trowel red-tint sealing material into void (same thickness as gypsum board) and smooth flush with both faces of drywall. Provide additional layer(s) of gypsum board around penetration where necessary to achieve required minimum thickness of sealing material.
- 3.10 WOOD BLOCKING: Coordinate with project carpenter to ensure installation of fire retardant wood blocking between studs for mounting casework, millwork, toilet partitions, drinking fountains and other equipment.
- 3.11 FINISHING SCHEDULE: Follow published "Recommended Specification: Levels of Gypsum Board Finish" as follows:
  - A. LEVEL 1 FINISH: At concealed areas above ceiling.
  - B. LEVEL 2 FINISH: At gypsum backing board to be covered with file or panels thicker than 1/4".
  - C. LEVEL 3 FINISH: At mechanical rooms, storage rooms, custodial and maintenance rooms, electrical and telephone closets.
  - D. LEVEL 4 FINISH: All other drywall areas scheduled for paint, fabric or vinyl wall covering.

END SECTION

#### SECTION 09 30 00 — WALL AND FLOOR TILE

#### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.2 WORK INCLUDED

- A. Provide and install all ceramic wall and floor tile and base as indicated in the drawings and specified herein.
- B. Provide and install all quarry tile flooring and base as indicated in the drawings and specified herein.

#### 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Cast-in-place concrete.
- B. Drywall systems.
- C. Masonry.
- D. Waterproofing and dampproofing.

#### 1.4 SUBMITTALS

- A. Per SUPPLEMENTARY GENERAL CONDITIONS, submit samples, type of tile and color for Architect's approval. Mark with manufacturer's name and space where tile is to be installed.
- B. Submit manufacturer's printed literature describing products.
- C. Submit (2) boxes of tile chips showing full range of available colors.
- D. Submit (2) boxes of grout color samples.
- E. Submit 12" x 12" grouted sample board for each tile/grout combination selected.

F. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.

#### 1.5 WARRANTY

- A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.
- B. Warranted defects shall include but not necessarily be limited to cracking, crazing, staining, joint spalling or cracking, loosening of bond.

#### 1.6 QUALITY ASSURANCE

- A. Tile Contractor shall have a minimum of 3 years experience in tile installation for projects of similar size and scope as this project.
- B. Conform with all applicable requirements of the American Standards Association Specifications (A-108 Series) and the "Tile Handbook" of the Tile Council of America. Tile shall bear the seal of Tile Council of America, Inc., and be equal to or exceed Standard Grade.

#### 1.7 DELIVERY & STORAGE

- A. Deliver all manufactured materials in original, unbroken containers bearing name of manufacturer, brand and grade seal. Keep materials dry, clean and protected against deterioration in any form and at room temperature.
- B. Maintain room temperature between 70 and 80 degrees F. 24 hours prior, during and a minimum of 48 hours after installation.

#### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. CERAMIC TILE:
  - 1. American Olean
  - 2. Dal-Tile
  - 3. United States Ceramic Tile Co.
- B. QUARRY TILE: American Olean, United States Ceramic Tile Co.
- C. GROUT:
  - 1. American Olean
  - 2. Laticrete
  - 3. Tex Rite

#### 2.2 MATERIALS

- A. GENERAL:
  - 1. <u>Floor Tile:</u> Unglazed porcelain ceramic with cushioned edges and sheet backing.
    - a. <u>Water absorption:</u> Classified "Impervious" per A.S.T.M. C-373. Less than 1/2 of 1% absorption.
    - b. <u>Size:</u> Nominal 12" x 12" x 1/4" thick.
    - c. <u>Base:</u> 4" high base. Bottom tile with integral cove (provide bullnose plastic edge strip at top of all ceramic tile base).
    - d. <u>Type:</u> Porcelain Tile in *groups 4* as selected by the Architect from one of the specified manufacturers.
    - e. <u>Color(s)</u>: Bidders shall assume a different color scheme for each room unless colors and patterns are indicated in the drawings.
- B. TOILET/SHOWER ROOMS:
  - 1. <u>Floor Tile:</u> Unglazed porcelain ceramic with cushioned edges and sheet backing.
    - a. <u>Water absorption:</u> Classified "Impervious" per A.S.T.M. C-373. Less than 1/2 of 1% absorption.
    - b. <u>Size:</u> Nominal 1" x 1" x 1/4" thick.
    - c. <u>Base:</u> 4" high base. Bottom tile with integral cove.
    - d. <u>Type:</u> Porcelain Tile in *group 3* as selected by the Architect from one of the specified manufacturers.
    - e. <u>Color(s)</u>: Bidders shall assume a different color scheme for each room unless colors and patterns are indicated in the drawings.
  - 2. <u>Wall Tile:</u> Glazed ceramic with cushion edges.
    - a. <u>Size:</u> Nominal 4" x 4" x 1/4" thick.
    - b. <u>Base:</u> See floor base.
    - c. <u>Type:</u> *Group 1* for field tile and for accent banding as selected by the Architect from one of the specified manufacturers.
    - d. <u>Color(s)</u>: Bidders shall assume a different color scheme for each room unless colors and patterns are indicated in the drawings.
  - 3. <u>Trim:</u> Terminate tile with bullnose edges and rounded outside corners. Provide square inside corners and at ceiling/wall joints.
- C. THINSET BOND COAT: Latex/Portland Cement mortar mix meeting requirements of ANSI A118.4. Provide Portland cement and sand in a 1 to 1 mixture gauged with Laticrete 4237 latex additive. Use on dry cured mortar bed at slab recesses, where thinset on concrete slab, and where thinset on wall substrates.
- D. SEALANT: One part silicone rubber meeting requirements of FS TT-S-001543, as manufactured by Dow Corning or General Electric.
- E. GROUT:
  - 1. <u>Walls:</u> Portland Cement waterproof, dry set grout as manufactured by American Olean. Color(s) as selected by Architect.
  - 2. <u>Floor and base:</u> Interior grout shall be epoxy type as manufactured by American Olean. Color(s) as selected by Architect.
- F. SEALANT: One part silicone rubber meeting requirements of FS TT-S-001543, as manufactured by Dow Corning or General Electric.

#### PART 3 - EXECUTION

#### 3.1 INSPECTION AND PREPARATION

- A. Examine surfaces to receive tile and do not start work until defects that will adversely affect tile work have been corrected.
- B. Inspect all surfaces to see that they are dry, clean, free of oily or waxy film, firm, level and plumb. Report any unsatisfactory conditions to the Architect. Starting installation shall be deemed as acceptance of surfaces.
- C. Do not start until work of other trades, which goes through or in the space behind tile has been completed. Do not proceed with installation until adjoining work is satisfactory protected. Close off spaces in which tile is being set to traffic and other work during installation and for at least 48 hours after completion of tile work.
- D. Do not apply mortar and adhesives to surfaces covered by frost. Maintain minimum temperature-for installation of tile above 50 Deg. F. Prevent rapid evaporation of moisture from mortar bed. Do not set tile on dry bed.
- E. Install specified mortar bed at slab depressions. Slope mortar bed uniformly to drain(s).

#### 3.2 INSTALLATION

- A. GENERAL: Tile shall be installed in accordance with current Tile Council of America's "Handbook for Ceramic Tile Installation", design numbers as indicated below.
- B. Center fields and patterns on applied areas so that no tile is less than half size. For heights stated in feet and inches, maintain full courses to nearest attainable height without cutting tile.
- C. Except where otherwise shown or specified, make joints in wall tile vertical and horizontal and joints in floor tile perpendicular and parallel to walls. Control joint widths of glazed tile by lugs on the sides of tile. Control joints widths between sheets of ceramic mosaic tile by supporting boards with metal spacing strips.
- D. Grind and fit tile carefully at intersections, against trim finish and at built-in fixtures and accessories. Fit tile closely around outlets, pipes, fixtures and fittings so that plates, escutcheons and collars will overlap cuts. Cut and drill tile and trim shapes accurately without damage. Rub all exposed cut edges smooth with abrasive stone.
- E. Coat trim with 1/32 to 1/16" pure coat paste. Set in same mortar mix as is recommended for setting flat tile on walls. Do not use pure coat as mortar to set trim and angles.

#### F. FLOORS:

- 1. <u>Interior thinset on concrete floor slab:</u>
  - a. Tile bonded with minimum 3/32" thick latex-Portland cement bond coat over cleavage membrane adhered to floor slab (modified TCA F113).
  - b. Adhere cleavage membrane to slabin strict accordance with manufacturer's recommendations using specified latex-Portland cement bond coat. Increase typical curing time of bond coat by 50%.
- 2. <u>Interior thin-set on recessed mortar bed (where required at existing kitchens)</u>: Tile bonded with minimum 3/32" thick Latex-Portland Cement bond coat to reinforced mortar bed over loose bond breaker membrane over floor slab (TCA F111).

#### G. WALLS:

- 1. <u>Ceramic Tile at Drywall Toilets:</u> Thinset to water resistant gypsum wallboard.
- 2. <u>Ceramic Tile at Drywall Showers:</u> Thinset to tile backer board.
- 3. <u>Ceramic Tile at Masonry:</u> Bonded to mortar bed at masonry. No. W211.
- 4. <u>12" x 12" Porcelain Up to 3 ft. High Wainscot:</u> Install with mastic over drywall.
- 5. <u>12" x 12" Porcelain Over 3 ft. High Wainscot:</u> Thinset over tile backer board.

#### H. EXPANSION JOINTS:

- 1. At floor tile provide 1/4" sealant expansion joints in accordance with TCA recommendations where tile abuts walls, curbs, columns and other restraining surfaces, where substrate material changes, at floor slab construction joints (cold joints), and each way in pattern approved by the Owner.
- 2. At walls install sealant expansion joints at inside corners, at maximum 30', and at other conditions subject to cracking or movement. Install specified sealant at expansion and control joints, at doorframe perimeters and similar conditions.

#### 3.3 LAYOUT

- A. Layout all work so that no tiles less than half size occur. Align all joints vertically and horizontally.
- B. Cut and drill neatly without marring tile. Rub smooth any necessary cuts with a fine stone and set no cut edge against any fixture, cabinet, or other tile without a joint at least 1/16" wide.
- C. Maximum plane variation shall be 1/8" + or in 10' when a straight edge is laid on the surface in any direction.

#### 3.4 GROUTING AND SEALING:

- A. Follow grout manufacturer's recommendations for grouting procedures and precautions. Damp cure nonepoxy grout in accordance with manufacturer's recommendations.
- B. Grout Haze Removal:
  - 1. Unglazed Tile: For cement grout remove all grout haze following grout manufacturer's recommendations for use of acid and chemical cleaners. Rinse tilework thoroughly with clean water before and after chemical cleaners. Polish surface of tilework with soft cheesecloth.
  - 2. Glazed Tile: For cement grout remove all grout haze with cheesecloth rub.
  - 3. Take special care with epoxy grout to keep tiles clean as work progresses.

#### 3.5 **PROTECTION**

- A. Protect tiled floors from foot and wheel traffic for at least 7 days after installation.
- B. Place plywood panels over traffic floors.
- C. In non-traffic areas, cover floors with heavy paper taped in place.
- D. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Furnish quantity not less than 5 percent for each color, pattern, and type of tile installed.

END OF SECTION

#### SECTION 09 51 00 - ACOUSTICAL TILE CEILINGS

#### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.
- 1.2 WORK INCLUDED
- A. Provide and install all lay-in acoustical ceiling panels and suspended grid system in accordance with the drawings and as specified herein.
- B. Provide and install light fixture protection at all rated ceilings.
- C. Provide and install hold-down clips where required for rated system.
- 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS
- A. Steel joists (spacing)
- B. Mechanical (air devices)
- C. Electrical (lighting fixtures)
- 1.4 DRAWING REFERENCES
- A. See drawings, finish schedule and Section 2.2 for ceiling types and ratings.
- 1.5 SUBMITTALS
- A. Submit manufacturer's product data describing all materials, finishes, ratings and installation requirements.
- B. Submit physical samples for each type of acoustical file proposed.
- C. Submit physical samples for each type of grid proposed.

- D. Submit tile manufacturer's certification for whether hold-down clips are required for the selected tile(s) and rated system(s).
- E. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.
- 1.6 WARRANTY
- A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.
- B. Warranted defects shall include but not necessarily be limited to rusting or deflection of grid, deterioration or deflection of acoustical tiles.
- 1.7 QUALITY ASSURANCE
- A. Suspended acoustical ceiling contractor shall have a minimum of 3 years experience in the installation of specified systems for projects of similar size and scope of this project.
- B. Installation of acoustical tile and panels shall not begin until residual moisture from plaster, drywall, concrete or terrazzo work is dissipated. Before installation, the building shall be enclosed and permanent heating and cooling equipment in operation.
- 1.8 DELIVERY AND STORAGE OF MATERIALS
- A. Do not deliver materials to jobsite until spaces are ready for ceiling installation.
- B. All materials shall be delivered in manufacturer's original packaging and stored in an enclosed shelter providing protection from damage and exposure to the elements.
- C. Damaged, rusted or deteriorated materials shall be removed from the premises.

#### PART 2 – PRODUCTS

- 2.1 MANUFACTURERS
- A. TYPICAL CEILING PANELS:
- 1. Armstrong World Industries, Inc.
- 2. USG Interiors, Inc.
- B. SPECIALTY CEILING PANELS
- 1. Acoustical Resources, Inc.
- 2. Wenger
- 3. U.S.G.
- C. GRID SYSTEMS:
- 1. Armstrong World Industries, Inc.
- 2. USG Interiors, Inc.
- 3. Chicago Metallic Corp.
- 2.2 MATERIALS:

#### A. TYPICAL CEILING PANELS:

- 1. 24" x 24" x 5/8" white **"Cortega Square Lay-in" No. 770**, square-edged as manufactured by Armstrong or equivalent (color, pattern, texture) by specified manufacturer. **Non-rated system.**
- 2. 24" x 24" x 5/8" white **"Cortega Square Lay-In" No. 824** square-edged as manufactured by Armstrong or equivalent (color, pattern, texture) by specified manufacturer. <u>Fire-rated system.</u>
- B. SUSPENSION SYSTEM:
- 1. Components shall be formed from commercial quality cold-rolled steel, electro-galvanized, 2'x2'module.
- 2. The suspension system shall support the ceiling assembly with a maximum deflection of 1/360 of the span per A.S.T.M. C-635-69.
- 3. Main tee with double web design 1-1/2" high and rectangular bulb; 15/16" exposed flange with rolled cap; cross tee holes at 6" o.c.
- 4. Four foot cross tee 1-1/2" high with double web design. Rectangular bulb joining main runners at 2' on center.
- 5. Two foot cross tees perpendicular to 4' cross tees. Two foot cross tees minimum of 1-1/2" high, No. CMC 222-41 or equivalent by specified manufactured.
- 6. Wall molding hemmed edge, electro-galvanized cold rolled steel with equal leg width, finish to match grid.
- 7. Finish: Typical finish, factory white painted steel. At high humidity areas including kitchens, dressing rooms, toilet rooms provide factory white painted aluminum cap.
- 8. Rating: Provide U.L. listed grid for scheduled system rating.

#### PART 3 – EXECUTION

#### 3.1 COORDINATION

- A. Verify that above ceiling work, including fire dampers, ductwork, piping, wiring and insulation is complete and approved prior to beginning ceiling work.
- 3.2 INSTALLATION
- A. Ceiling systems shall be suspended from structural members by 12 gauge annealed wire; spacing as recommended by manufacturer. Provide additional support for light fixtures and grilles at each corner. <u>Provide secondary support framing ("Unistrut") where spacing of structural</u> <u>members exceeds suspension system manufacturer's recommendations</u>.
- B. Acoustical lay-in panels shall be installed in strict accordance with the manufacturer's instructions. Tile shall be

- C. Provide additional hangers at ceiling suspended items including projection screens, speakers, exit lights, air supply and return grilles.
- D. Space main runner hangers a maximum of 6 inches from wall. Do not support systems from wall.
- E. Adjust hangers to ensure level ceiling in plane.

#### 3.3 RATED CEILINGS

- A. Provide specified ceilings in fire rated assembly. Protect light fixture protection in accordance with approved U.L. Design to meet required assembly rating. Provide additional hangers to meet the requirements of the particular U.L. rating.
- B. Ceiling system manufacturers not listed in the required U.L. design number (reference drawings) shall be responsible for determining whether their rated system is acceptable to the particular local code authority.
- C. For ceiling tiles weighing 1 lb. per square foot or more, verify no requirement for hold-down clips at rated systems.

#### 3.4 CLEANING AND REPLACEMENT

- A. At completion, replace file unit and grid systems that are damaged. Clean or replace tile and grid systems that cannot be cleaned.
- B. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Furnish quantity not less than 5 percent for each color, pattern, and type of ceiling tile installed.

END OF SECTION

#### SECTION 09 65 00 - RESILIENT FLOORING AND BASE

#### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.2 WORK INCLUDED

- A. Provide and install all vinyl tile flooring as indicated in the drawings and specified herein.
- B. Provide and install all resilient base as scheduled throughout the project, regardless of floor finish.
- C. Provide and install all resilient transition strips at resilient flooring, steps, stairs and change of flooring materials.
- D. Install tapered resilient transition edge strip at any place where resilient floor is installed on concrete steps/stairs and terminates with risers.
- E. Provide five (5) coats of wax on all new resilient flooring.

#### 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Cast in place concrete.
- B. Millwork.

#### 1.4 SUBMITTALS

- A. Submit manufacturer's product data describing all materials.
- B. Submit physical samples of all resilient materials to the Architect for approval. Color(s) to be selected by the Architect.
- C. Submit manufacturer's recommendations for finishing and maintenance of resilient flooring materials.
- D. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.
- 1.5 WARRANTY

- A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.
- B. Warranted defects shall include but not necessarily be limited to loss of adhesion, excessive surface wear, color change, curling or other deterioration.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver flooring materials to the jobsite until spaces are ready for installation of resilient flooring.
- B. Open material packages and acclimate flooring materials within the installation spaces for a minimum of 3 days prior to installation.

#### 2 PART TWO – PRODUCTS

#### 2.1 MANUFACTURERS

- A. VINYL TILE:
  - 1. Armstrong World Industries
  - 2. Azrock Industries, Inc.
  - 3. Johnsonite
  - 4. Tarkett
- B. RESILIENT BASE:
  - 1. Roppe
  - 2. Burke Flooring Products
  - 3. Mercer Products Co., Inc.

#### 2.2 MATERIALS

- A. VINYL TILE: 12" x 12" x 1/8" Standard Excelon "Imperial Texture" vinyl composition tile, as manufactured by Armstrong World Industries, or equivalent in color and design by specified manufacturer.
- B. RESILIENT BASE: 4" high x 1/8" thick x 4' lengths, rubber cove base as manufactured by Roppe or equivalent by specified manufacturer. Color(s) to be selected by the Architect. Provide manufacturer's pre-molded outside corners.
- C. TRANSITION STRIPS: Vinyl transition strips as manufactured by Roppe or equivalent by specified manufacturer. Color(s) to be selected by the Architect.

#### 3 PART THREE – EXECUTION

#### 3.1 PREPARATION

- A. Inspect the completed floor slab for defects which may adversely affect the finished resilient tile work. Commencing resilient flooring operations indicates acceptance of the sub-floor.
- B. Subfloor depressions shall be brought to level with latex underlayment. Raised areas shall ground and smoothed prior to resilient flooring installation.
- C. Thoroughly clean subfloor of all wax, oil, dusting, dirt or other deleterious material.

#### 3.2 INSTALLATION

#### A. VINYL COMPOSITION TILE

- 1. Tile shall be installed in strict accordance with the manufacturer's recommendations using adhesive approved by tile manufacturer.
- 2. Unless otherwise indicated in the drawings, lay flooring with joints and seams aligned with building walls. Start laying tiles from the center of the room out for equal sized tiles at the perimeters. Avoid tiles of less than ½ size.
- 3. Spread adhesive using notched trowel. Apply only enough adhesive at one time to allow placing of tile prior to initial setting of adhesive.
- 4. Use heavy roller to smooth tile and ensure complete adhesion.
- 5. Install tapered resilient edge strip at any place where resilient floor meets concrete, carpet or other finish flooring material. Typically material changes should be made at the centerlines of doors. Color(s) as selected by the Architect.
- 6. Install tapered resilient transition edge strip at any place where resilient/wood flooring is installed on concrete steps/stairs and terminates with risers. Ensure a tight fit so resilient floor will not crack or be damaged by foot traffic. Color(s) and size as selected by the Architect.
- 7. Install tapered resilient transition edge strip at any place where there is a change of height and/or flooring materials.
- 8. A feature strip shall be used to divide any two areas where it is not possible to maintain alignment from one area to the adjoining area. Coordinate with Architect.
- 9. Scribe flooring to walls, columns, cabinets, floor outlets and other interruptions to ensure tight fitted joints.

#### B. RESILIENT BASE:

- 1. Install base using manufacturer's recommended adhesive applied with notched trowel. Install with contact cement within 6" of a job-formed outside corner.
- 2. Miter inside corners. Use factory-formed outside corners unless job-formed corners are specifically approved by the Architect.
- 3. Butt joints tight and scribe base to door frames, columns and other interruptions.

#### C. TRANSITION STRIP:

- 1. Subfloor must be smooth, sound, dry, clean, and free of dirt, wax, polish, paint, and all other foreign matter which may interfere in a good bond, including curing agents and sealers.
- 2. Carefully follow warnings on container of the Solvent-Based Contact Adhesive. Follow adhesive manufacturer's recommendations for the installation of TRANSITION STRIPS.
3. Roll TRANSITION STRIP with a hand roller.

### 3.3 CLEANING AND ADJUSTING

- A. After installation all resilient flooring shall be cleaned and contractor shall provide five (5) coats of wax on all new resilient flooring.
- B. Replace any damaged tile or tile that shows inconsistent shades of color/pattern. Remove glue stains or other marks.
- C. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Furnish quantity not less than 5 percent for each color, pattern, and type of resilient flooring installed.

# SECTION 09 65 19 - RESILIENT TILE FLOORING. SOLID VINYL FLOOR TILE.

# 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. Resilient Solid Vinyl Tile Flooring

# 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. LEED Submittals:
  - 1. Product Data for Credit EQ 4.1: For adhesives, include printed statement of VOC content and chemical components.
- C. Samples for Initial Selection: For each type of product indicated.
- D. Samples for Verification: For each type of product indicated, in manufacturer's standard-size samples of each resilient product color, texture, and pattern required.
- E. Product Schedule: For resilient products. Use same designations indicated on Drawings.

## 1.4 QUALITY ASSURANCE

- A. Installation Qualification: Contractors for floor covering installation should be experienced in managing commercial flooring projects and provide professional installers, qualified to install the various flooring materials specified. An installer is "qualified" if trained by Tarkett or a certified INSTALL (International Standards & Training Alliance) resilient floor covering installer.
- B. Mockups: Provide resilient products with mockups specified in other Sections.

# 1.5 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by Tarkett, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

# 1.6 **PROJECT CONDITIONS**

- A. Install resilient products after other finishing operations, including painting, have been completed.
- B. Maintain ambient temperatures within range recommended by Tarkett, but not less than 65 deg F (18 deg C) or more than 85 deg F (29 deg C) in spaces to receive resilient products during the following time periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- C. Maintain the ambient relative humidity between 40% and 60% during installation.
- D. Until Substantial Completion, maintain ambient temperatures within range recommended by Tarkett, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

# PART 2 - PRODUCTS

## 2.1 RESILIENT SHEET FLOORING

Manufacturer:		
Tarkett, Inc.	Phone:	(800) 899-8916
30000 Aurora Rd.		(440) 543-8916
Solon, Ohio 44139	Tech:	Ext 9297
Web: www.tarkettna.com	Samples:	Ext 9299
E-mail: info@johnsonite.com	Fax:	(440) 543-8920

Or Approved equal

- A. Resilient Solid Vinyl Tile Flooring
  - 1. Resilient Solid Vinyl Tile Flooring with the following physical characteristics:
    - a. Complies with requirements for ASTM F 1700, Class 1, Type A (Type B for slip resistant tile) Standard Specification for Solid Vinyl Floor Tile.
    - b. Cortina Grande are available as slip resistant tile with an embossed surface
    - c. Wear layer/Overall thickness: 1/8" (3.2 mm)
    - d. Tile size: 16" x 16" (40.6 x 40.6 cm)
    - e. Slip Resistance: ADA Compliant
    - f. ASTM F 970, Standard Test Method for Static Load Limit 800 PSI (modified for higher load)
    - g. ASTM E 648, Standard Test method for Critical Radiant Flux of 0.45 watts/cm<sup>2</sup> or greater, Class I
    - h. Warranty: 10 year Manufacturer's Warranty
    - i. Karim Kolors and Cortina Grande may be installed with SpraySmart System

# 2.2 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation.

c.

1.

- B. Adhesives: As recommended by Johnsonite to meet site conditions
  - Resilient Vinyl and Linoleum Floor Tile
    - a. Tarkett 926 Vinyl Flooring Adhesive (For use with all vinyl planks and tiles)
      - (For use with all viny) planks and thes)
    - b. Tarkett 975 Two-Part Urethane Adhesive
      - (For use with all vinyl planks and tiles)
      - Tarkett 959 Vinyl Tile and Plank Adhesive (Use with I.D. Inspiration and I.D. Freedom only)

## 2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation.

# 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.
- B. 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 resilient products.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

# 3.2 PREPARATION

- A. Prepare substrates according to Tarkett written instructions to ensure proper adhesion of Resilient Flooring.
  - 1. Prepare concrete substrates in accordance with ASTM F 710.
    - a. Concrete floors must be free of dust, solvent, paint, wax, oil, grease, residual adhesive, adhesive removers, film-forming curing compounds, silicate penetrating curing compounds, sealing, hardening or parting compounds, alkaline salts, excessive carbonation or laitence, mold, mildew, and other foreign materials that may affect dissipation rate of moisture from the concrete, discoloration or adhesive bonding.
    - b. Mechanically remove contamination on the substrate that may cause damage to the resilient flooring material. Permanent and non-permanent markers, pens, crayons, paint, etc., must not be used to write on the back of the flooring material or used to mark the substrate as they could bleed through and stain the flooring material.
    - c. Perform moisture testing as recommended by manufacturer. Proceed with installation only after substrates have been tested and meet the minimum requirements from the manufacturer in accordance with ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride or ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
    - d. A pH test for alkalinity must be conducted on the concrete floor prior to installation with results between 7 and 9. If the test results are not within the acceptable range, then installation must not proceed until the problem has been corrected.

- 2. Wood subfloors must have a minimum 18" (45.7 cm) of cross-ventilated space beneath the bottom of the joist.
  - a. The floor must be rigid, free of movement.
  - b. Single wood and tongue and groove subfloors should be covered with <sup>1</sup>/<sub>4</sub>" (6.4 mm) or <sup>1</sup>/<sub>2</sub>" (12.7 mm) APA approved underlayment plywood.
    - Use <sup>1</sup>/<sub>4</sub>" (6.4 mm) thick underlayment panels for boards with a face width of 3" (76 mm) or less.
    - 2) Use <sup>1</sup>/<sub>2</sub>" (12.7 mm) thick underlayment panels for boards with a face width wider than 3" (76 mm).
  - c. Do not install over OSB (Oriented Strand Board), particle board, chipboard, lauan or composite type underlayments.
- B. Fill cracks, holes, depressions and irregularities in the substrate with good quality Portland cement based underlayment leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- C. Floor covering shall not be installed over expansion joints.
- D. Do not install resilient products until they are same temperature as the space where they are to be installed.
  - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

# 3.3 RESILIENT TILE FLOORING INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient tile flooring.
- B. Solid Vinyl Tile Flooring:
  - 1. Install with Tarkett adhesive specified for the site conditions and follow adhesive label for proper use.
  - 2. Follow Tarkett's recommendation for tile orientation.
  - 3. Open enough cartons of floor tiles to cover each area, and mix tile to ensure shade variations do not occur within any one area.
  - 4. Roll the flooring in both directions using a 100 pound three-section roller.

# 3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- B. Perform the following operations immediately after completing resilient product 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 resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
  - 1. No traffic for 24 hours after installation.
  - 2. No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.

- D. Wait 72 hours after installation before performing initial cleaning.
- E. A regular maintenance program must be started after the initial cleaning.

END OF SECTION 09.65.19

## SECTION 09 91 00 – PAINTING AND FINISHING

### PART 1 - GENERAL

### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

### 1.2 WORK INCLUDED

- A. Provide all labor, materials, and equipment required for all painting, staining and finishing as indicated in the drawings, the approved submittals, and as specified herein. Painted or stained systems include but are not necessarily limited to the items listed below:
- B. EXTERIOR SYSTEMS:
  - 1. All visible wood unless noted otherwise.
  - 2. All ferrous metal. All galvanized metal unless noted otherwise. Touch-up on welds or damaged finishes.
  - 3. Exposed conduit, piping, etc., except for roof mounted piping not visible.
  - 4. Exposed roof mounted equipment visible from ground level or from upper floors of the building.
  - 5. All exposed concrete masonry units.
  - 6. All items normally painted in accordance with good construction practice.

#### C. INTERIOR SYSTEMS:

- 1. All visible wood or behind cabinet doors unless noted otherwise.
- 2. All ferrous metal. All galvanized metal unless noted otherwise. Touch-up on welds or damaged finishes. Structural steel, steel joists and deck exposed to view except in mechanical rooms.
- 3. Exposed conduit, piping, outlet boxes, raceways, and panel boxes except galvanized or aluminum piping located in mechanical or electrical rooms.
- 4. All exposed concrete masonry units, gypsum board and plaster unless otherwise noted.
- 5. All factory-primed hardware. Back-priming of all wood trim, millwork or finished carpentry prior to installation.
- 6. All hollow metal doors and frames.
- 7. All items normally painted in accordance with good construction practice.
- 8. All unfinished louvers and grilles.

## 1.3 WORK TYPICALLY EXCLUDED

- A. Shop applied primer on structural steel and miscellaneous metals items.
- B. Aluminum frames, doors, and windows.
- C. Plastic clad casework, millwork, and wall panels.
- D. Factory finished equipment unless noted otherwise (provide job touch-up).
- 1.4 DRAWING REFERENCE: Reference any paint or finish notes in the drawings for any pre-selected colors or other requirements.

# 1.5 SUBMITTALS

- A. Submit manufacturer's product data describing each proposed type of paint, sealer, stain, or coating and it's recommended use. Include viscosity and percent solids information. Where not the specified base manufacturer, list the specified brand name and type and the proposed substitute. The Architect shall be the sole judge as to equivalency of systems.
- B. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.

### 1.6 WARRANTY

- A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of two years after the date of Substantial Completion of the project.
- B. Warranted defects shall include but not necessarily be limited to peeling, crazing, cracking, blistering, mildewing, chalking or dusting, pin holes, color fade or loss of hardness or sheen.

#### 1.7 QUALITY ASSURANCE

- A. Painting contractor shall have a minimum of 5 years experience in the application of the specified systems for projects of similar size and scope as this project.
- B. If requested by the Architect, provide system manufacturer's certification of the proposed painting contractor as approved for application of the product.

#### 1.8 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver painting materials to the jobsite until spaces and surfaces are ready for painting.
- B. Deliver materials in manufacturer's original containers, unopened except for shop mixing of colors. Containers shall bear manufacturer's readable labels indicating brand and type of paint. Any additional containers with labels indicating products not approved shall be removed form the jobsite. Any applied material not previously approved by the Architect is subject to removal and reapplication with the appropriate approved product.
- C. Store materials in environmentally controlled area. Interior products shall be acclimated to a temperature range of 50-80 degrees F. at least 24 hours prior to application.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. TYPICAL PAINTS: Systems are based on the first listed manufacturer. Only equivalent systems provided by specified manufacturers in accordance with attached Product Comparison sheet and as approved by the Architect are approved for use.
  - 1. Sherwin Williams, Inc.
  - 2. Pittsburgh Paints
  - 3. Pratt & Lambert
  - 4. Benjamin Moore Co.
- B. SPECIALTY PAINTS:
  - 1. Epoxies: Sherwin Williams, PPG, Pratt & Lambert.
- C. SUBSTITUTIONS: In accordance with Section 01 25 00 Substitution Procedures.

### 2.2 INTERIOR SYSTEMS

- A. SYSTEM TYPES FOR NEW WALLS (Unless indicated otherwise on Finish Schedule or drawings):
  - 1. Drywall in toilet rooms, storage rooms, and mechanical/electrical/toilet rooms/ classrooms: Semi Gloss Enamel at walls and ceilings.
  - 2. Drywall soffits: Eggshell Enamel.
  - 3. Typical masonry (CMU): Gloss Enamel.
  - 4. Masonry (CMU) in toilet rooms: Gloss Epoxy.
  - 5. Steel railings: Gloss Aliphatic Urethane.
  - 6. Suspended rigging over stage: Dry Fog.
- B. SYSTEM DESCRIPTIONS (Reference item 3.3 for modifications and preparation required for these systems when applied to existing walls already painted):
  - 1. <u>Primer on gypsum board:</u> SW PrepRite High Build Primer B28W601 one coat over light to medium texture (submit texture sample for approval)
  - 2. <u>Eggshell Enamel on Drywall:</u> SW Pro Mar 400 Latex Eg-Shel B20W4400 one coat over specified primer.
  - 3. <u>Semi-Gloss Enamel on Drywall:</u> SW Pro Mar 400 Latex Semi Gloss B31W4400 one coat over specified primer.
  - 4. <u>Epoxy Paint on Drywall:</u> One coat SW PrepRite 200 Latex Primer B28W200 over specified primer.
  - 5. <u>Gloss Enamel on Drywall:</u> Two coats SW Water Based Catalyzed Epoxy B70 Series gloss acrylic over specified primer.
  - 6. <u>Semi-Gloss Enamel on shop-primed metals</u>: SW Water Based Industrial Enamel B53-300 acrylic gloss Enamel two coats.
  - 7. <u>Natural Finish on Wood</u>: SW Sherwood BAC Wiping Stain (one coat) + SW Wood Classics Sanding Sealer B26V3 (one coat) + SW Wood Classics Satin Varnish A66.
  - 8. <u>Clear Finish on Wood</u>: SW Wood Classics Polyurethane Varnish A67 (two coats). Sand lightly between all coats.
  - 9. <u>Block Filler</u>: SW Prep Rite Block Filler B25W25 (for areas not subject to moisture); SW Heavy Duty Block Filler (for areas subject to moisture). Provide 2 coats as specified under "Execution".

- 10. <u>Gloss Enamel on CMU or concrete</u>: Two coats block filler plus two coats SW Water based Industrial Enamel gloss acrylic latex over specified primer.
- 11. <u>Semi-Gloss Enamel on CMU or concrete</u>: Two coats block filler plus two coats SW Water Based Industrial Enamel semi-gloss acrylic latex over specified primer.
- 12. <u>Semi-Gloss Epoxy Paint on concrete</u>: One coat SW Water Based Epoxy semi-gloss over cured concrete plus finish coat of SW Water Based Epoxy semi-gloss. Minimum paint thickness 3.0 dry mils.
- 13. <u>Gloss Epoxy Paint on CMU</u>: Two coats block filler (unless surface-bonded) plus finish coat of gloss. Minimum paint thickness 3.0 dry mils.
- 14. <u>Gloss Epoxy Paint on concrete</u>: One coat SW Water Based Epoxy gloss over cured concrete plus finish coat of SW Water Based Epoxy gloss. Minimum paint thickness 3.0 dry mils.
- 15. <u>Semi-Gloss Enamel on utility piping and galvanized metals</u>: SW Pro-Cryl Universal Metal Primer – one coat + SW DTM Acrylic Semi Gloss – two coats.
- 16. <u>Semi-Gloss Epoxy Paint on CMU</u>: Two coats block filler plus finish coat of SW Water Based Epoxy semi-gloss. Minimum paint thickness 3.0 dry mils.
- 17. <u>Gloss Aliphatic Urethane Enamel on primed steel railings:</u> Over epoxy shop primer apply two coats SW Hydrogloss Single Component Water Based Urethane B65-181 Urethane Gloss Enamel using airless spray equipment.
- 18. <u>Dry Fall Acrylic</u> (exposed deck, structure and rigging): One coat SW Super Save Lite Acrylic Dry Fall Eggshell Primer & Finish. Black color. Overspray dries to non-adhering dust in a ten foot fall.

## 2.3 EXTERIOR SYSTEMS

# A. SYSTEM TYPES:

- 1. Exterior Metals: Gloss Enamel.
- 2. Field welds: Zinc-Rich Coating.
- B. SYSTEM DESCRIPTION:
  - 1. <u>Gloss Enamel on Galvanized Metals:</u> SW Pro-Cryl Universal Metal Primer B66W310 (one coat) + SW Sher-Cryl HPA B66-300 enamel – two coats.
  - 2. <u>Block Filler on CMU:</u> SW Heavy Duty Block Filler B24W46, one coat.
  - 3. <u>Gloss Enamel on Shop-Primed Metals:</u> SW Sher-Cryl HPA B66-300 gloss enamel-two coats.
  - 4. <u>Gloss Enamel on Aluminum:</u> SW Pro-Cryl Universal Metal Primer B66W310 (one coat) + SW Sher-Cryl HPA B66-300 gloss enamel two coats.
  - 5. <u>Field Welds:</u> "ZRC" cold-applied galvanizing.

## PART 3 - EXECUTION

## 3.1 PREPARATION

- A. METALS: Remove grease, oil, and dirt. Touch-up any damaged primer with like material. Remove any welding tags and grind smooth before painting. Fill any open galvanizing ports.
- B. PLASTER, CMU, CONCRETE: Remove dusting and mortar residue. Remove any efflorescence and seal. Ensure that plaster, concrete and mortar joints are dry and fully cured.

## 3.2 APPLICATION

- A. GENERAL: All paint and finishes be brushed or sprayed in even, uniform coats without runs or sags. Allow each coat to dry completely before applying succeeding coats. All surfaces shall be dry and no painting shall be done in damp conditions or when the ambient temperature is below 50 degrees F.
- B. WOOD DOORS: Factory sealed tops, bottoms, and edges of plastic laminate surfaced doors left undisturbed require no additional finishing. Reseal any job cuts. Paint metal glazing stops.
- C. MECHANICAL/ELECTRICAL EQUIPMENT: Painting contractor shall examine the mechanical and electrical drawings to determine quantities and locations of exposed piping, louvers not shown in Architectural drawings, electrical and telephone panels in finished areas, exposed electrical conduit in finished areas.
- D. BLOCK FILLER AT CMU: Apply **first coat** of filler to ensure penetration into voids and work into block texture with bristle brush. Follow with a **minimum of one additional coat**. Provide uniform finish with no pinholes.
- E. DRYWALL: Paint finish, sheen and texture shall be uniform and match the samples submitted to and approved by the Architect.

### 3.3 PREPARATION OF EXISTING PAINTED SURFACES

A. Maintenance painting will frequently not permit or require complete removal of all old coatings prior to repainting. However, all surface contamination such as oil, grease. Loose paint, mill scale dirt, foreign matter, rust, mold, mildew, mortar, efflorescence, and sealers must be removed to assure sound bonding to the tightly adhering old paint. Glossy surfaces of old paint films must be clean and dull before repainting. Thoroughly washing with an abrasive cleanser will clean and dull in one operation, or, wash thoroughly and dull by sanding. Spot prime any bare areas with an appropriate primer. Recognize that any surface preparation short of total removal of the old coating may compromise the service length of the system. Check for compatibility by applying a test patch of the recommended coating system, covering at least 2 to 3 square feet. Allow to dry one week before testing adhesion per ASTM D3359. If the coating system is incompatible, complete removal is required.

## PART 4 – SCHEDULES

## 4.1 COLOR SELECTIONS

- A. SCHEDULE: Unless colors are pre-selected in the Bidding Documents, the Architect shall prepare color schedule for the project using colors selected from the approved paint manufacturer(s). Where colors are pre-selected, the painting contractor shall use the colors selected or submit a schedule of proposed exact color matches by one of the specified paint manufacturers. **Provide 12" x 12" samples of actual paint** for each color whether pre-selected color or proposed color match.
- B. DOCUMENTATION: Upon completion of the Project, painting contractor shall furnish to the Architect a complete schedule of paint brands, types, and colors actually used for each room and area.

## 4.2 EXTRA MATERIALS

B. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Furnish quantity not less than 5 percent for each color (field and accent) of paint used.

## SECTION 09 96 53 - ELASTOMERIC COATING

### PART 1 – GENERAL

- 1.0 Coordination
  - A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
  - B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
  - C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
  - D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.
- 1.1 Description
  - A. Provide internally plasticized, elastomeric high-build waterproof emulsion coating with terpolymer acrylic resins coating for vertical applications for sealing exterior exposed masonry, stone, stucco, tile and concrete walls.
- 1.2 Submittals
  - A. Submit for approval samples, product data.
- 1.3 Quality Assurance
  - A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for five years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

#### PART 2 - PRODUCTS

- 2.1 Materials
  - A. Elastomeric Coating: Concretite Color: White
  - B. Sealant: One-part Urethane sealant, Tuff-Stuff.

#### PART 3 - EXECUTION

- 3.1 Installation
  - A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials with uniform appearance.
  - B. Coordinate with work of other sections.

- B. Surface Preparation:
  - 1. Masonry: Masonry, concrete and stucco surfaces should be clean and free of oil and grease. Remove loose particles, laitance, efflorescence, and other foreign materials by wire brushing, power washing, or other effective means. Surface with heavy chalk face should be power-washed or sand blasted. Repair all cracks, openings, and imperfections with one-part urethane sealant.
  - 2. Concrete Block: Concrete block should be clean and dry. Mortar joints should be free of voids and cracks. Fill all block with a quality exterior block filler.
  - 3. Previously Coated Surfaces: All surface contamination- such as oil, grease, loose paint, mill scale, dirt, foreign matter, rust, mold, mildew, loose mortar and efflorescence- must be removed to assure sound bonding to the tightly adhering old paint.
- C. Application:

Roller Application: Spread Rate: 1-1/2 gallons/100 sq. ft.

## 3.2 CLEANING

- A. As work proceeds and upon completion of areas, remove coating where spilled, splashed or spattered.
- B. During progress of work keep premises free from accumulation of tools, equipment, surplus materials.
- C. Upon completion of work, leave premises neat and clean, to the satisfaction of the Owner.

## SECTION 10 14 00 — GRAPHICS AND SIGNAGE

#### PART 1 - GENERAL

### 1.1 COORDINATION:

- A. The General Conditions of the Contractor for Construction and the Supplementary Conditions to the General Conditions of the Contract for the Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addendum issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the stringent requirements and the greater quantity shall apply.

## 1.2 WORK INCLUDED

- A. Material and installation for the Plastic Room Identification Plaques.
- B. Material and Installation for Exterior/Interior Building Identification Letters.
- C. Material and Installation For Building Dedication Plaque with logos (including but not limited to conversion of architectural drawings into useable vector line art format).

### 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Interior wall materials and finishes.
- B. Exterior wall materials and finishes.
- C. Typical handicapped site signage.

#### 1.4 SUBMITTALS

- A. Submit manufacturer's product data describing materials, and mounting methods for Room Identification Plaques, Exterior/Interior Building Identification Letters, and Building Dedication Plaque.
- B. Submit color samples of actual material for color and finish selection by Architect.
- C. Submit finished sample of room identification plaque(s) with any required symbols other than text.
- D. Submit paper "rubbing" of final layout of Building Dedication Plaque for Architect's approval.
- E. Submit full size paper layout of Exterior Building Identification Letters for each line of text.
- F. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.

## 1.5 WARRANTY

- A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.
- B. Warranted defects shall include but not necessarily be limited to color fading, delamination, failure of anchoring or fastening, cracking, breaking or tarnishing.
- C. Exterior signage or building letters contributing to streaking or staining of building shall be a defect to be corrected by the Contractor, with building materials cleaned or replaced as required.

### 1.6 QUALITY ASSURANCE

A. Fabrication and installation company shall have a minimum of 3 years experience in the installation of similar systems for projects of similar size and scope.

## 1.7 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver materials to the jobsite until surfaces are ready for installation of graphics.
- B. Store materials in covered, dry, temperature and humidity controlled space.

## 2 PART TWO – PRODUCTS

#### 2.1 MANUFACTURERS

- A. ROOM IDENTIFICATION PLAQUES:
  - 1. South Texas Graphic Specialties, Inc.
  - 2. The Southwell Co.
  - 3. Cantrell Industries.

## B. EXTERIOR BUILDING IDENTIFICATION LETTERS:

- 1. A.R.K. Ramos
- 2. Gemini Inc.
- 3. Matthews Bronze Div. Architectural Products
- 4. Metal Arts

### C. BUILDING DEDICATION PLAQUE:

- 1. A.R.K. Ramos
- 2. Matthews Bronze Div. Architectural Products
- 3. Metal Arts
- 4. OMC Industries, Inc.

## 2.2 MATERIALS

- A. ROOM IDENTIFICATION PLAQUES:
  - 1. 6" X 9" X  $\frac{1}{4}$ " thick two tone series:
  - 2. Fabrication: Constructed of Wilson Art face laminate (as selected by the Architect from manufacturer's standard selections) laminated to a solid acrylic core. The raised 1/32" acrylic copy

shall be cut through the laminate face color and chemically welded to the acrylic core to assure permanent attachment, including the symbols. Any lower and secondary copy shall be 5/8" high Helvetica Medium (all caps) incised copy paint filled. Colors as selected by the Architect. Any secondary copy shall be 8-stroke computer engraved. Rounded corner letters will not be acceptable. The edge of the signs shall be finished to match the face laminate color-to-color as selected by the Architect.

- 3. At toilet rooms also provide with 2" high raised gender and wheelchair symbols when handicapped equipped noted on schedule. Symbols shall be chemically welded through the face laminate to the acrylic core. Edges painted a color as selected.
- 4. The raised copy shall be accompanied with grade 2 Braille by means of Visi Touch DuraDot Braille manufacturing system. The clear Glass DuraDot shall have a 0.059 surface diameter and raised 1/32" above the face laminate and shall be unitized to the acrylic core through the face laminate. The edges of the sign shall be finished to match the face laminate color-to color as selected by the Architect. Any secondary copy shall be 8-stroke computer engraved. Rounded corner letters will not be acceptable.
- 5. Installed plaques shall comply with all state, local, and federal requirements for compliance.

### B. EXTERIOR BUILDING IDENTIFICATION LETTERS

- 1. <u>Scope:</u> The project shall include a cast letters as described below, to be provided and installed by contractor. Letterstyle, finish and mounting to be selected by Architect.
- 2. <u>Fabrication of Letters</u>: Fabricate letters to comply with requirements indicated below and as indicated on drawings.
  - A. Cut letters : Form letters by cutting from solid sheet material of thickness specified. Produce characters with smooth flat faces, sharp corners, precisely formed lines and profiles, free from pits, scale, sand holes and other defects. Supply anchoring devices on reverse side of individual letters as required.
- 3. Characteristics:
  - A. Metal: Aluminum
  - B. Size: 6 inches unless noted otherwise on drawings.
  - C. Thickness: 1 1/2 inches.
  - D. Letterstyle: Sans Serif
  - E. Finish: As selected by Architect from manufacturer's finish options (submit samples).
  - F. Mounting: Concealed (refer to drawings for wall type).
  - G. Text:
- 4. <u>Template:</u> Provide full size paper mounting template showing hole placement and location of mounting holes.
- 5. <u>Finishes:</u> Colors and surface textures for exposed letters as selected by the architect from the manufacturer's standard and <u>premium</u> selections.

## C. BUILDING IDENTIFICATION PLAQUE:

- 1. 18" wide X 24" high cast bronze alloy plaque. Borders and raised text shall have satin finish. Background shall receive a dark oxidized leatherette finish. Faces and edges to be chemically cleaned and sprayed with two coats of clear acrylic lacquer.
- 2. Provide threaded stainless steel or brass studs on back for concealed mounting with epoxy. Letter style "Helvetica Medium" per A.R. Ramos or equivalent by specified manufacturer.

3. Layout, logos and letter sizes to be provided by the Architect. General contractor shall perform all conversions of architectural drawings & logos into useable vector line art format or any other type of format as required in order to produce the building plaque layout as provided by the Architect.

## 3 PART THREE- EXECUTION

### 3.1 INSPECTION AND PREPARATION

- A. Ensure that wall surfaces are completed and accepted by the Architect prior to installing wall-mounted items or painted wall graphics.
- B. Obtain approved location schedule for Room Identification Plaques prior to delivery of plaques to the jobsite.

#### 3.2 INSTALLATION

- A. ROOM IDENTIFICATION PLAQUES:
  - 1. Apply top and bottom strips of 1/8" thick double stick vinyl foam tape and backs of each plaque. Apply liberal amount of clear silicone rubber adhesive to a minimum of 50% coverage of back of plaque.
  - 2. Plaques shall be mounted to the strike side of the door on the wall within 5' of the floor and 6" max. from the jamb; when location is on a glass side light or window, mount with a solid color back-up plate to cover reverse side of the glass. Attachment shall be with foam tape and silicone.
- B. BUILDING DIRECTIONALS SIGNS:
  - 1. Apply top and bottom strips 1/8" thick double stick vinyl foam tape on backs of each sign. Apply liberal amount of clear silicone rubber adhesive to a minimum of 50% coverage of back of sign.
  - 2. Signs shall be mounted to the strike side of the door on the wall within 5' of the floor and 6" max. from the jamb; when location is a glass sidelight or window, mount with a solid color back-up plate to cover reverse side of the glass. Attachment shall be with foam tape and silicone.

#### C. EXTERIOR/INTERIOR BUILDING IDENTIFICATION LETTERS.

1. Pre-drill holes into masonry and insert threaded stud on back of letters into epoxy adhesive filled holes. Provide stainless steel spaces to set letters off wall ½" minimum 2 studs per letter. Refer to drawings for wall finish type.

## D. BUILDING IDENTIFICATION PLAQUE:

- 1. <u>Masonry Wall:</u> Pre-drill holes into masonry walls and insert threaded studs on back of letters into epoxy adhesive filled holes. Mount plaque tight against wall.
- 2. <u>Drywall:</u> Mount plaque using a minimum of 4 moly type expansion screws and silicone adhesive. Mount plaque tight against wall.

# SECTION 10 14 53 — TRAFFIC STRIPING AND PARKING SIGNAGE

### PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

- A. The General Conditions of the Contractor for Construction and the Supplementary Conditions to the General Conditions of the Contract for the Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addendum issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the stringent requirements and the greater quantity shall apply.

## 1.2 WORK INCLUDED

- A. Provide traffic line, parking stripe and symbol painting on concrete/asphalt paving as indicated in the drawings.
  1.
- B. Provide and install pipe-mounted parking signs at handicapped parking spaces meeting requirements of ADA.

#### 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Reinforced concrete paving.

### 1.4 SUBMITTALS

- A. PAINT: Submit manufacturer's product literature indicating Federal specification numbers and manufacturer's recommended use and application techniques.
- B. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.
- C. Provide full size template for handicapped stall symbol.

## 1.5 WARRANTY

- A. Provide written warranty against defects in material and workmanship for a period of one year after date of Substantial Completion.
- B. Warranted defects for paint striping shall include but not necessarily be limited to fading, bleed-thru, spalling, excessive wear or delamination.

## PART 2 - PRODUCTS

## 2.1 MATERIALS

- A. PAINT: "Traffic-Line" alkyd base marking paint meeting Federal Specifications TTP-85 and TTP-115 Type 1 as manufactured by Devoe or equivalent.
  - 1. Width: Typically 4 inches unless indicated otherwise in the drawings.
  - 2. Colors:
    - a. White: Traffic lines, directional symbols, symbols for the handicapped.
    - b. Yellow: Striping for parking stalls.
- B. HANDICAPPED PARKING SIGNS:
  - 1. Provide sign size, colors and copy meeting state, local and federal requirements for handicapped parking signage.
  - 2. Sign blank shall be 1/8" aluminum sheet with Dupont "Emron" glass paint background, graphics and copy.
  - 3. Graphics and copy shall be photo silk screened.

### PART 3 - EXECUTION

## 3.1 PREPARATION

- A. Ensure that paving operations are complete and surfaces thoroughly dry, clean, and free of oil or grease stains or other contaminants.
- B. Clean with high pressure wash or brush if necessary for proper adhesion.

# 3.2 PAINT

- A. Spray apply two coats of marking paint in patterns indicated on the drawings after weathering of asphalt or concrete paving for a minimum of 30 days. Edges shall be sharply defined.
- B. Provide minimum dry thickness of 2.5 mils. Provide additional coats if required for complete hiding.
- 3.3 HANDICAPPED PARKING SIGNS: Set 2" galvanized pipe sign support in minimum 6" diameter x 24" deep concrete footing.

## SECTION 10 21 13 - TOILET COMPARTMENTS

## PART 1 - GENERAL

### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

## 1.2 WORK INCLUDED

- A. Provide and install **solid phenolic toilet partition system and urinal screens** as indicated in the drawings, the approved shop drawings and as specified herein.
- B. Provide and install all toilet room and shower accessories as indicated in the drawings and as specified herein.

### 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Wood blocking between studs.
- B. Wall and floor finishes.
- C. Electrical power provided.

### 1.4 SUBMITTALS

#### A. SOLID PHENOLIC PARTITION SYSTEMS:

- 1. Submit shop drawings for solid phenolic partition system indicating plan and elevation dimensions and mounting details. Submit hardware samples and full chain of melamine samples for partition doors.
- 2. Shop drawings indicating handicapped stall layouts not meeting State and Federal requirements will be returned and rejected without review.
- B. ACCESSORIES:
  - 1. Submit manufacturer's product data describing size, type, finish and installation requirements for each item.
  - 2. Indicate mounting heights for each item. Meet State and Federal requirements for the handicapped.
- C. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.
- 1.5 WARRANTY

- A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.
- B. Warranted defects shall include but not necessarily be limited to delamination of facing or edging, swelling of core, change in alignment of parts, failure of anchorage or fasteners.
- C. Provide manufacturer's extended written warranty for systems and accessories where available.
- 1.6 QUALITY ASSURANCE
  - A. Partition system installation company shall have a minimum of 5 years experience in the installation of similar system for projects of similar size and scope.
  - B. Partition system installation company shall be authorized by the system manufacturer for this installation.

#### 1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver partition system materials to the job site in manufacturer's original packaging.
- B. Store materials in covered, dry, temperature and humidity controlled space.

#### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

### A. SOLID PHENOLIC PARTITION SYSTEMS:

- 1. Bobrick Washroom Equipment
- 2. American Specialties, Inc.
- 3. Ampco
- 4. General Partitions
- B. ACCESSORY MANUFACTURERS:
  - 1. Bobrick Washroom Equipment
  - 2. Bradley Wash Fountain Co.

# C. PAPER TOWEL DISPENSERS:

1. Bobrick Washroom Equipment

### D. ELECTRIC HAND DRYERS:

- 1. Bobrick Washroom Equipment
- 2. World Dryer Corporation
- 3. Saniflow Corp. (305) 424-2433

#### 2.2 TOILET ROOM ACCESSORIES:

- 1. <u>Grab bars:</u> Furnish and install grab bars at each handicapped toilet stall. Bars shall be Bobrick No. B-6806 series, 1-1/2" outside diameter, satin finish stainless steel, configuration as indicated on the drawings, 1-1/2" clear to wall. Where bars are mounted over back of toilet, General Contractor shall hold flush valve low.
- 2. <u>Mirrors:</u> Mirrors shall be <sup>1</sup>/<sub>4</sub>" plate glass, mirror quality, with copper backs. Provide polished stainless steel or brass chrome plated frames in sizes indicated on the drawings.

- a. Tilted mirrors shall be Bobrick No. B-293 or equivalent by specified manufacturer.
- b. Flat mirrors shall be Bobrick No. B-290 or equivalent by specified manufacturer.
- 3. Mop Holder: Bobrick B223X24 stainless steel. Furnished and installed by Contractor.
- 4. <u>Soap dispensers:</u> Bobrick Contura Series Surface Mounted Soap Dispenser Model B-4112. <u>Fur-nished and installed by Contractor.</u>
- 5. <u>Tissue dispensers:</u> ClassicSeries Surface-Mounted Toilet Tissue Dispenser for Two Rolls Model B-265 of Bobrick Washroom Equipment, Inc. <u>Furnished and installed by Contractor.</u>
- 6. <u>Paper Towel Dispensers:</u> Recessed Paper Towel Dispenser and Waster Receptacle shall be Model B-369 of Bobrick Washroom Equipment, Inc. <u>Furnished and installed by Contractor.</u>
- 7. <u>Shower Seats:</u> Right hand folding handicap shower seat Model B-517 of Bobrick Washroom Equipment, Inc. Left hand folding handicap shower seat Model B-518 of Bobrick Washroom Equipment, Inc.
- 8. <u>Clothes hooks:</u> Surface mounted clothes hooks Model B-981 of Bobrick Washroom Equipment, Inc.
- 9. <u>Soap Dish:</u> Surface mounted soap dish Model B-680 of Bobrick Washroom Equipment, Inc.
- 10. <u>Towel Pin:</u> Surface mounted towel pin Model B-677 of Bobrick Washroom Equipment, Inc.
- 11. Shower Rod: Model B-207 of Bobrick Washroom Equipment, Inc.
- 12. <u>Shower Curtain & Hooks</u>: Model B-204-1 and Model B-204-2 of Bobrick Washroom Equipment, Inc.

## 2.3 SOLID PHENOLIC PARTITION SYSTEMS:

### A. STILES, PANELS, DOORS, SCREENS, BENCHES

- 1. Solid phenolic material constructed of solidly fused plastic laminate with matte-finish melamine surfaces, colored face sheets, and black phenolic-resin core that are integrally bonded. Edges shall be black. Brown edges shall not be acceptable. Color and pattern as selected by architect from manufacturer's standard colors.
- 2. Solid phenolic material shall meet National Fire Protection Association and International Build ing Code Interior Wall and Ceiling Finish Class A, Uniform Building Code Class I, ASTM E-84 Fire Resistance Standards; flame spread 20, smoke density 95.
- 3. Finish Thickness
  - a. Stiles and doors shall be 3/4" (19mm).
  - b. Panels and benches shall be 1/2" (13mm).

## B. HARDWARE

- 1. All hardware to be 18-8, type-304 stainless steel with satin-finish.
- 2. All hardware shall be concealed inside compartments with the exception of outswing doors.
- 3. Hardware of chrome-plated "Zamak" is unacceptable.

## C. LATCH

- 1. Sliding door latch shall be 16-gauge (1.6mm).
- 2. Sliding door latch shall require less than 5-lb force to operate. Twisting latch operation will not be acceptable.
- 3. Latch track shall be attached to door by flathead machine screws into factory installed threaded brass inserts.
- 4. Latch handle shall have rubber bumper to act as door stop.
- 5. Latch shall allow door to be lifted over 16-gauge (1.6mm) keeper for emergency access.
- 6. Metal-to-metal connection shall withstand a direct pull of over 1,500 lb. per screw.

### D. HINGES

- 1. Cam shall be adjustable in the field to permit door to be fully closed or partially open when compartment is unoccupied.
- 2. Hinges shall be attached to door and stile by theft-resistant, one-way stainless steel machine screws into factory-installed metal inserts. Fasteners secured directly into the core are not acceptable.
- 3. Metal-to-metal connection shall withstand a direct pull of over 1,500 lb. per screw.
- E. Clothes Hook shall be constructed of stainless steel and shall project no more than 1-1/8" (29mm) from face of door. Clothes hook shall be secured by theft-resistant, one-way stainless steel screws.
- F. Mounting Brackets shall be constructed of stainless steel and shall be mounted inside compartment. Mounting brackets exposed on the exterior of the compartment will not be acceptable. Wall mounted urinal screen brackets shall be 11-gauge (3mm) double thickness.
- G. Leveling Device shall be 3/16" (5mm) hot rolled steel bar; chromate-treated and zinc-plated; through bolted to base of solid phenolic stile.
- H. Stile Shoe shall be one-piece, 4" (102mm) high, type-304, 22-gauge (0.8mm) stainless steel with satinfinish. Top shall have 90° return to stile. Patented one-piece shoe capable of adapting to 3/4" or 1" stile thickness and capable of being fastened (by clip) to stiles starting at wall line.
- I. Headrail (Overhead-Braced) shall be satin finish, extruded anodized aluminum (.065" / 1. 65mm thick) with anti-grip profile. <u>Type:</u> Floor mounted, overhead braced continuously over entire system.

## 2.4 ELECTRIC HAND DRYERS:

- 1. <u>Hand Dryers:</u>
  - a. Provide and install No. B-750 115V Recessed Aircraft Automatic Hand Dryer, as manufactured by Bobrick or equivalent by specified manufacturer. Fixed outlet.
  - b. Provide units wired for 115 volt AC, 20 amps, unless electrical drawings provide other power.

#### PART 3 - EXECUTION

# 3.1 INSPECTION

- A. Ensure that Contractor has properly installed solid wood blocking between studs at all mounting points.
- B. Ensure that Contractor has provided coordinated electrical power at each electric dryer location.

## 3.2 INSTALLATION

- A. Install accessories and partition systems in accordance with the project drawings, approved shop drawings and as specified herein. Use tamper proof stainless steel fasteners for all items.
- B. ACCESSORIES:
  - 1. Install through finished stud walls into solid wood blocking with stainless steel one-way screws. No plastic anchors.
  - 2. Attach to masonry walls using stainless steel machine screws in lead shield anchors.
- C. PARTITION SYSTEMS AND URINAL SCREENS:
  - 1. Mount channels using stainless steel one-way screws through finished stud walls into solid wood blocking.
  - 2. Mount channels to masonry walls using stainless steel machine screws in lead shield anchors.
  - 3. Job measure for proper fit and to ensure that the maximum space between edge of any pilaster or panel and its adjacent surface is one inch.
  - 4. Install pilaster, doors and panels plumb and square. Adjust doors for gravity closing.
- D. FRAMED MIRRORS:
  - 1. Mirrors shall be installed with theft-proof anchors at height shown on drawings. Furnish tilted mirrors where shown.
  - 2. Install mirrors at other locations in addition to toilet rooms as indicated in the drawings.
  - 3. Unframed mirrors are provided and installed under another section of these specifications.

## SECTION 10 28 13 - TOILET & BATH ACCESSORIES

### PART 1 GENERAL

#### 1.00 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.01 SECTION INCLUDES

A. Vertical or Horizontal Baby Changing Stations and Child Protection Seat for use in commercial men's and women's toilet and bath facilities.

#### 1.02 QUALITY ASSURANCE

A. Regulatory, Requirements: Conform to ASTM F2285 (formerly ASTM PS125) Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use, ANSI A117.1 Accessible and Usable Buildings and Facilities, ANSI Z535.4 Product Safety Signs and Labels, German TUV Technical Inspection Association, or local code if more stringent installation requirements are applicable for barrier-free accessibility. FDA approved high-density polyethylene (HDPE) materials conform to ASTM G21 Antifungal, and ASTM G22 Antibacterial Standards.

#### 1.03 WARRANTY

A. Submit manufacturer's 5-year limited warranty on materials and workmanship and 5year replacement warranty against vandalism agreeing to repair or replace unit that fails to perform as intended from date of substantial completion.

#### PART 2 PRODUCTS

# 2.01 MANUFACTURERS

A. Acceptable Manufacturers: Koala Kare Products, a Division of Bobrick, Englewood, CO, 877-284-3906

### 2.02 ACCEPTABLE PRODUCTS

- A. Baby Changing Stations
  - 1. Horizontal Design with molded Braille instructions (Model KB100-00)
  - 2. Vertical Design with molded Braille instructions (Model KB101-00)
  - 3. Stainless Steel Recessed Mounted Horizontal Design (Model KB110-SSRE)
  - 4. Stainless Steel Surface Mounted Horizontal Design (Model KB110-SSWM)
- B. Sanitary Liner Refills. Liners are for use with all Koala Baby Changing Station designs (Model KB150-99).
- C. Child Protection Seat: Koala Child Protection Seat (Model KB102-00)

### 2.03 MATERIALS

- A. Materials/finishes: 18 gauge, type 304 satin stainless steel exterior finish with grey polyethylene interior Models KB110-SSRE, KB110-SSWM.
- B. Hinges: reinforced, full-length steel-on-steel.
- C. Mounting supports: multiple, 11-gauge steel.
- D. Operation: hidden pneumatic gas spring mechanism for safe open/close motions.

### 2.04 ACCESSORIES

- A. Integral, built-in Liner Dispenser for use with 3-ply chemical-free biodegradable 13" x 19" sanitary liners.
- B. Replaceable snap-lock protective holding straps.
- C. Molded graphic instructions and safety messages in 6 languages and Braille. Identifying door plaque.
- D. Optional antimicrobial polyethylene.
- E. Optional lock supplied with 2 keys (not available for stainless steel exterior finish models).

### PART 3 EXECUTION

# 3.01 PREPARATION

A. Provide templates and rough-in measurements as required.

#### 3.02 INSTALLATION

- A. Install in accordance with manufacturer's hardware and instructions.
- B. Locate products to eliminate interference with door swings or use of fixtures in compliance with ADA regulations

### SECTION 10 44 00 - FIRE EXTINGUISHERS AND CABINETS

### PART 1 GENERAL

### 1.0 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.01 SECTION INCLUDES

- A. Fire extinguishers.
- B. Fire extinguisher cabinets.
- C. Accessories.

#### 1.02 RELATED SECTIONS

- A. Section 04 22 00 Concrete Masonry Units; CMU walls to receive bracket mounted fire extinguisher.
- B. Section 06 10 00 Rough Carpentry: Wood blocking and framing to receive semi-recessed fire extinguisher cabinets.
- C. Section 09 21 16 Gypsum Drywall Assemblies: Finished openings in walls for semi-recessed fire extinguisher cabinets.

#### 1.03 REFERENCES

- A. NFPA 10 Standard for Portable Fire Extinguishers; National Fire Protection Association; 2002.
- B. UL (FPED) Fire Protection Equipment Directory; Underwriters Laboratories Inc.; current edition.

## 1.04 PERFORMANCE REQUIREMENTS

- A. Conform to NFPA 10.
- B. Provide extinguishers classified and labeled by Underwriters Laboratories Inc. for the purpose specified and indicated.

## 1.05 SUBMITTALS

- A. See Section 01 33 00 Submittals, procedures and requirements for shop drawings, product data and submittal requirements.
- B. Shop Drawings: Indicate cabinet physical dimensions.
- C. Product Data: Provide extinguisher operational features.
- D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

#### 1.06 ENVIRONMENTAL REQUIREMENTS

A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Fire Extinguishers, Cabinets and Accessories:
  - 1. JL Industries, Inc; Product 1037B20 with Extinguisher: <u>www.jlindustires.com</u>.
  - 2. Larsen's Manufacturing Co: <u>www.larsensmfg.com</u>.
  - 3. Potter-Roemer: <u>www.potterroemer.com</u>.
  - 4. Substitutions: See Section 01 25 00 Product Requirements.

### 2.02 FIRE EXTINGUISHERS

- A. Basis of Design: JL Industries, "Cosmic 10E".
- B. Type: Multipurpose dry chemical.
- C. Rating: Sized for project requirements.
- D. Mounting: Refer to floor plans for locations, annotated FEC for cabinets and FE extinguishers alone.
- E. Dry Chemical Type: Stainless steel tank, with pressure gage.
  - 1. Class A:B:C.
  - 2. Size 10.
  - 3. Finish: Baked enamel, Red color.
- G. ALL fire extinguishers shall be inspected and certified by the local authority having jurisdiction that they are charged and ready for use and shall be "tagged" identifying such.

### 2.03 FIRE EXTINGUISHER CABINETS

- A. Basis of Design:
  - 1. JL Industries, "Cosmopolitan 1035B20 ADAC with Saf-T-Loc, TAS compliant.
  - 2. Designations: Refer to the floor plans, FEC for Extinguishers in cabinets and FE for surface mounted extinguishers secured to walls.

- B. Surface Mounted (Non-Cabinet, FE Type) Bracket and Extinguisher (non-cabinet): Manufacturer's standard stainless steel strap with enamel finished bracket with locking band retainer.
  - 1. Bracket shall match the extinguisher type.
- C. Metal for Cabinets: Formed stainless steel sheet; 0.036 inch thick base metal; #4 finish stainless steel.
- D. Cabinet Configuration: Recessed type.
  - 1. Sized to accommodate accessories.
  - 2. Exterior nominal dimensions of 13 7/8 inch wide x 27 3/8 inch high x 6 inch deep.
  - 3. Trim: Returned to wall surface, with 3 inch projection, 1 1/2 inch wide face.
  - 4. Form cabinet enclosure with right angle inside corners and seams. Form perimeters trim and door stiles.
- E. Door: 0.036 inch thick, reinforced for flatness and rigidity; lock with full glass access. Hinge doors for 180 degree opening with two butt hinge. Provide nylon catch.
- F. Door Glazing: Glass, clear, 1/8 inch thick float. Set in resilient channel gasket glazing.
- G. Cabinet Mounting Hardware: Appropriate to cabinet. Pre-drill for anchors.
- H. Weld, fill, and grind components smooth.
- I. Finish of Cabinet Interior: Enamel, color to select from manufacturer's full color line.

#### 2.04 ACCESSORIES

- A. Extinguisher Brackets: Formed steel, chrome-plated.
- B. Cabinet Signage: FIRE EXTINGUISHER, vertical up face of cabinet to one side.

## PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify rough openings for cabinet are correctly sized and located.

## 3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install cabinets plumb and level in wall openings, 30 inches from finished floor to inside bottom of cabinet.
- C. Secure rigidly in place.
- D. Place extinguishers in cabinets.

# SECTION 10 51 13 – METAL LOCKERS

## PART 1- GENERAL

### 1.0 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

### 1.1 SCOPE:

A. Furnish and install new steel lockers, accessories and finish metal trim as shown or indicated on approved drawings. Concrete or masonry bases, wood furring, blocking or trim as may be required by drawings are included in other sections of this specification.

#### 1.2 SUBMITTALS:

- A. Shop Drawings: Submit drawings showing locker types, sizes and quantities, including all necessary details relating to anchoring, trim installation and relationship to adjacent surfaces.
- B. Numbering: The locker numbering sequence shall be provided by the approving authority and noted on approved drawings returned to the locker contractor.
- C. Color Charts: Provide color charts showing manufacturer's available colors. If required by normal office procedures or in the event of non-standard color selection, request samples of paint on metal.
- D. Lock Combination Listings and Master Keys: Use only when combination locks are specified. Delivered directly to the owner's representative.

## 1.3 QUALITY ASSURANCE:

- A. UNIFORMITY: Provide each type of metal locker as produced by a single manufacturer, including necessary accessories, fittings and fasteners.
- B. JOB CONDITIONS: Do not deliver metal lockers until building is enclosed and ready for locker installation. Protect from damage during delivery, handling, storage and installation.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER:

- A. Republic Storage Systems, LLC. 1038 Belden Ave NE Canton, OH 44705-1459 800.477.1255
- B. Products by other manufacturers may be approved provided they meet the detailed specifications written in Section 01 25 00 Substitutions.

## 2.2 LOCKERS:

 A. Configuration: *Double Tier - Standard Lockers* Size: 12"W X 12"D X 72"H Color: To be Selected by Architect.

## 2.3 FABRICATION:

- A. MATERIAL: All major steel parts shall be made of mild cold rolled steel, free from imperfections and capable of taking a high grade enamel or powder coat finish.
- B. FINISH: Surfaces of the steel shall be thoroughly cleaned, phosphatized and prepared for baked enamel or powder coat finish in accordance with paint manufacturer's instructions.
- C. CONSTRUCTION: Lockers shall be built on the unit principle each locker shall have an individual door and frame, an individual top, bottom, back and shelves with common intermediate uprights separating units.
- D. DOOR FRAMES: Door frames shall be 16 gauge formed into 1" wide face channel shapes with a continuous vertical door strike, integral with the frame on both sides of the door opening. Double, triple or four tier locker cross frame members shall be 16 gauge channel shaped securely welded to vertical framing members to ensure a square and rigid assembly. Intermediate cross frame members are not required on box lockers.
- E. DOORS: Shall be 16 gauge or 18 gauge steel for short or narrow doors as required by manufacturer's design, formed with a full channel shape on the lock side to fully conceal the lock bar, channel formation on the hinge side and right angle formation across the top and bottom. Single tier doors 60" and 72" in height and 18" and wider shall have a diagonal reinforcing angle welded to inner surface. Doors for Standard Box Lockers 3, 4, 5 and 6 openings high are 16 or 18 gauge steel and shall be formed with right angle flanges on all four sides. Locker doors shall be ventilated by louvers on the face of each door, top and bottom.
- F. PRE- LOCKING DEVICE: All "tiered" lockers shall be equipped with a positive automatic prelocking device, whereby the locker may be locked while door is open and then closed without unlocking and without damaging locking mechanism.
- G. LATCHING: Latching shall be a one-piece, pre-lubricated spring steel latch, completely contained within the lock bar under tension to provide rattle-free operation. The lock bar shall be of precoated, double-channel steel construction. The lock bar shall be securely contained in the door channel by self-lubricating polyethylene guides that isolate the lock bar from metal-to-metal contact with the door. There shall be three latching points for lockers over 42" in height and two

latching points for all tiered lockers 42" and under in height. The lock bar travel is limited by contacting resilient high-quality elastomeric cushioning devices concealed inside the lock bar. Frame hooks to accept latching shall be of heavy gauge steel, set close in and welded to the door frame. Continuous vertical door strike shall protect frame hooks from door slam damage. A soft rubber silencer shall be securely installed on each frame hook to absorb the impact caused by closing of the door. Box locker doors shall be equipped with a padlock hasp and a stainless steel strike plate with an integral handle pull. Box locker doors may also be equipped with built-in locks.

- H. HANDLES: A non-protruding 14 gauge lifting trigger and slide plate shall transfer the lifting force for actuating the lock bar when opening the door. The exposed portion of the lifting trigger shall be encased in a molded ABS thermoplastic cover that provides isolation from metal-to-metal contact and be contained in a formed 20 gauge stainless steel recessed pocket. This stainless steel pocket shall contain a recessed area for the various lock types available and a mounting area for the number plate.
- I. HINGES: Hinges shall be 2" high, 5-knuckle, full loop, tight pin style, securely welded to frame and double riveted to the inside of the door flange. Locker doors 42" high and less shall have two hinges. Doors over 42" high shall have three hinges.
- J. BODY: The body of the locker consists of 24 gauge upright sheets, backs, tops, bottoms and shelves. Tops, bottoms and shelves are flanged on all four sides; backs are flanged on two sides. Uprights shall be offset at the front and flanged at the rear to provide a double lapped rear corner. All bolts and nuts shall be zinc plated.
- K. INTERIOR EQUIPMENT: Single tier lockers over 42" high shall have one hat/book shelf. Other tiered lockers do not require shelves. All single, double and triple tier lockers shall have one double prong rear hook (single prong in 9" width) and two single prong wall hooks in each compartment. All hooks shall be made of steel, formed with ball points, zinc-plated and attached with two bolts or rivets. Locker openings under 20" high are not equipped with hooks.
- L. NUMBER PLATES: Each locker shall have a polished aluminum number plate with black numerals not less than 1/2" high. Plates shall be attached with rivets to the lower surface within the recessed handle pocket.
- M. COLOR: Doors and exposed body parts shall be finished in colors selected from Republic's collection of twenty-five baked enamel colors. Non-exposed body parts shall be finished in #83 Decorator Tan (baked enamel).
- N. ASSEMBLY: Assembly of all locker components shall be accomplished by the use of zinc plated, low round head, slotless, fin neck machine screws with hex nuts, producing a strong mechanical connection.

## PART 3- EXECUTION

A. INSTALLATION: Lockers must be installed in accordance with manufacturer's approved drawings and assembly instructions. Installation shall be level and plumb with flush surfaces and rigid attachment to anchoring surfaces. Space fasteners at 36" O.C. or less as recommended by manufacturer. Use fasteners appropriate to load and anchoring substratum. Use reinforcing plates wherever fasteners could distort metal. Various trim accessories where shown, such as

sloping tops, fillers, bases, recess trim, etc., shall be installed using concealed fasteners. Flush, hairline joints are provided at all abutting trim parts and at adjoining surfaces.

B. ADJUSTMENT: Upon completion of installation, inspect lockers and adjust as necessary for proper door and locking mechanism operation. Touch up scratches and abrasions to match original finish.

## SECTION 10 51 53 — HARDWOOD LOCKER BENCHES

### PART 1 - GENERAL

#### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

### 1.2 DESCRIPTION

- A. Hardwood bench work includes the following, where indicated:
  - 1. Hardwood Locker Room Benches.
  - 2. ADA Compliant Hardwood Benches.
- B. Furnish all labor and materials necessary for the completion of work in this section as shown on the contract drawings and specified herein.
- C. Work in this section shall include, but is not limited to:
  - 1. Locker room benches and steel, or aluminum pedestals.
  - 2. Hardware for locker room benches and pedestals.
  - 3. Manufacturer's guarantee.
- D. Related work specified elsewhere shall include accessories and anchorage/blocking for attachment of locker room benches.

### 1.3 PRODUCT

- A. Submit six (6) sets of shop drawings and details for architect's approval.
- B. Colors shall be selected from the manufacturer's full range of colors: REPUBLIC STANDARD COLORS; or approved equal.
- C. Color samples and hardware samples shall be submitted for approval by the architect upon request.

### PART 2 - PRODUCTS

### 2.1 MANUFACTURER

A. Locker room benches and pedestals to be supplied by REPUBLIC STORAGE SYSTEM Co., or approved equal.

### 2.2 MATERIALS

- A. Locker room bench tops shall be 9-1/2" wide x 1-1/4" full finish thickness laminated maple. Benches and pedestals shall have an overall height of 17-1/2". All Bench tops are to be maple laminated. Locker room bench tops shall be fabricated from polymer resins compounded under high pressure, forming a single component section which is waterproof, nonabsorbent and has a self-lubricating surface that resists marks from pens, pencils, markers and other writing instruments. All plastic components shall be covered with a protective plastic masking.
- B. ADA Compliant Bench: ADA compliant bench tops are to be 48" wide and 24" deep max, laminated maple, 1-1/4" full finished thickness. All corners are to be rounded and sanded. Top and edges have two coats of a clear finish with one coat on the bottom. Four pedestals required. Benches shall have an overall height of 17-1/2".

### 2.3 CONSTRUCTION

A. Standard locker room bench tops shall be 1-1/2" thick with all edges rounded to a 1/4" radius. Standard bench top size is 9-1/2" wide by customer specified length not to exceed 96" for a single piece. ADA compliant bench tops are to be 48" wide and 24" deep max.

### 2.4 HARDWARE

- A. Standard pedestals shall be 16-1/4" high, and secured to bench tops with stainless steel, torx screws and secured to the floor using lead expansion shields and stainless steel, phillips head screws. Pedestal consist of sturdy 1-1/4" outside diameter tubing with 10 gauge steel flanges.
- B. Moveable Pedestal shall be a freestanding trapezoidal-shaped 16" high, with a 1/4" x 3" aluminum bar stock and feature a black anodized finish. Non-skid pads shall be provided for each pedestal.
- C. Pedestal spacing not to exceed 4' on center.

## PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Examine areas to receive locker room benches for anchorage/blocking that may affect installation of benches. Report any discrepancies to the architect.
- B. Take complete and accurate measurements of locations to receive locker room benches.
- C. Start of work constitutes acceptance of job.

# 3.2 INSTALLATION

- A. Install locker room benches in a rigid, straight, plumb and level manner, with plastic laid out as shown on shop drawings and manufacturer's installation instructions.
- B. No evidence of cutting, drilling and/or patching shall be visible on the finished work.
- C. Finished surfaces shall be cleaned after installation and be left free of all imperfections.

## 3.3 WARRANTY

- A. Provide written warranty against defects in materials and workmanship for the Work under this section for a period of one year after the date of Substantial Completion of the Project.
- B. Warranted defects shall include but not necessarily be limited to deterioration of finish, corrosion, faulty latch or lock operation, loosening of anchorage, failure of rivets or other fastenings.
# 10 81 13 SPECIFICATIONS – BIRD NET 2000<sup>TM</sup>

## PART I – GENERAL

## 1.1 SYSTEM DESCRIPTION

A. Design Requirements: Select appropriate size net and fastening system as determined by site conditions and mounting surface.

## 1.2 SUMMARY

A. Provide labor, materials and supervision to install bird control netting to the building structure. The bird netting shall stop sparrow, starlings and pigeons from roosting on the building structure.

## 1.3 QUALITY ASSURANCE

- A. Obtain all technical information on products and installation from the manufacturer.
- B. Utilize labor or Bird-B-Gone Authorized Installers who are knowledgeable in Bird-B-Gone product installations.
- C. Installer shall visit the site to gather all information of existing site conditions.
- D. Single Source Responsibility: Netting and all parts / accessories of the bird netting shall be from one manufacturer.

## 1.4 SUBMITTALS

- A. Product Data: Submit all descriptive information from the manufacturer including catalogs, installation instructions and other descriptive material.
- B. Provide Warranty: Material and installation.
- C. Provide Samples: Each type of bird netting used, including proposed fastening methods and hardware.
- D. Provide statement by official indicating that they are a certified installation company.

## 1.5 PRODUCT HANDLING

A. Protect Bird-B-Gone products from damage before, during and after the installation.

## 1.6 PROJECT CONDITIONS

- A. Coordination: Furnish all anchor devices required to fasten system to and around existing building structure. Coordinate installation with existing conditions and within on-site tolerances.
- B. Visit site and field measure prior to fabrication and delivery of materials.

# 1.7 WARRANTY

- A. ¾" bird netting shall carry a minimum 10-year guarantee against U.V.
   breakdown for black netting, 3-year guarantee for white and stone netting.
- B. Installation shall be guaranteed for 2 years.
- C. Installation shall be performed by a Certified Bird-B-Gone Authorized Installer.1. Proof of Certification required.

## PART2 - PRODUCTS

# 2.1 ACCEPTABLE MANUFACTURER

## Manufacturer:

Bird-B-Gone, Inc. Bird Net 2000<sup>™</sup> 15375 Barranca Pkwy #D Irvine, CA 92618 Tel: 800-392-6915 or 949-472-3122 Fax: 949-472-3116 P.O.C.: Chris Fields

## 2.2 PRODUCT DESCRIPTION

- A. Model Designation:
  - 1. ¾" Heavy Duty 12/6 Bird Net 2000™
  - 2. 1-1/8" Heavy Duty 12/6 Bird Net 2000™
  - 3. 2" Heavy Duty 12/6 Bird Net 2000<sup>™</sup>
- B. Color: Black, Stone or White

## 2.3 MATERIAL

- A. Material: U.V. stabilized knotted polyethylene net. Flame resistant (270°F melting point). Rot-proof, non-conductive and stable in sub zero temperatures.
- B. Construction: 12/6 Bird Net 2000<sup>™</sup>, comprised of 6 monofilaments, each 12/1000" thick with U.V. stabilizers added. Monofilaments are twisted together to produce a strong twine with 160-200 twists per meter.
- C. Break Strength: ISO 1806 / 9001 protocol mesh tested in excess of 40 lbs. Proof of Test Certification Available.
- D. Sizes: As required.
- E. Hardware: All metal hardware or products are galvanized or stainless steel.

# 2.4 MOUNTING SYSTEMS

- A. Solid Steel: For corner attachments use Bird-B-Gone eye bolts with lock nuts and Bird-B-Gone multipurpose cable brackets with powder actuated fire-in-pins for intermediate attachments.
- B. Steel I-Beams: For corner attachments, use eye bolts with lock nuts. For intermediate attachments, use the appropriate size Bird-B-Gone girder clips.
- C. Sheet Metal: Use Bird-B-Gone multipurpose cable brackets with self-tapping screws for both corner and intermediate attachments.
- D. Brick, Concrete and Stone: For corner attachments, use Bird-B-Gone expanding corner net bolts. For intermediate attachments, use one of the following Bird-B-Gone attachments: open or closed net loop, net spike, split pin with anchor rivet or multipurpose cable bracket.

## PART 3 – EXECUTION

## 3.1 EXAMINATION

- A. Examine the installation area and note any detrimental or hazardous work conditions. Notify contracting officer or inspector of the detrimental work conditions.
- B. Do not proceed with installation until conditions are corrected.

# 3.2 SURFACE PREPARATION

- A. Surface should be thoroughly cleaned and free of bird droppings, nesting materials, rust peeling paint or other debris.
- B. Remove or repair articles that may damage Bird Net 2000<sup>™</sup> after installation, including overhanging foliage, brush and loose parts on the structure.

## 3.3 INSTALLATION

- A. Install Bird Net 2000<sup>™</sup> as recommended by the manufacturer. Bird Net 2000<sup>™</sup> shall fit the area to be protected perfectly so pest birds cannot enter the protected area, and so the netting blends with the architecture.
- B. Bird Net 2000<sup>™</sup> correct mesh sizes shall be specified to ensure exclusion of the correct pest bird.
- C. Bird Net 2000<sup>™</sup> shall be installed tightly and securely to ensure a long lasting installation that is visually hard to see.

## 3.4 INSPECTION

A. Visually inspect Bird Net 2000<sup>™</sup> for any signs of poor installation, including loose screws, fasteners or un-removed debris.

B. Immediately correct and repair as necessary.

END OF SPECIFICATION

### SECTION 12 21 13 - HORIZONTAL LOUVER BLINDS

#### PART 1 – GENERAL

### 1.00 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

#### 1.01 DESCRIPTION

A. Material and installation of 2" Horizontal Louver Blinds With Aluminum Slats at each window location.

### 1.02 SUBMITTALS

- A. Manufacturer's complete CSI 3- part specification sheet.
- B. Submit working hand sample or mock up blind as required.
- C. Submit two 6" samples of aluminum slat indicating color and dimensions.
- D. Approval of submittals by Architect shall not relieve contractor from installing blinds with adequate clearance to permit smooth operation of the blinds and demonstrating blinds to be in smooth, uniform working order. Contractor must field verify all dimensions.

### 1.03 DELIVERY, STORAGE AND HANDLING

- A. Product to be delivered in manufacturer's original packaging.
- B. Products to be handled and stored to prevent damage to materials, finishes and operating mechanisms. Store in a clean, dry area, laid flat to prevent sagging and twisting of packaging.

#### 1.04 EXTRA STOCK

A. Describe extra attic stock as required: One (1) additional horizontal louver blind.

#### PART 2 – PRODUCTS

#### 2.01 ACCEPTABLE MANUFACTURERS

- A. Springs Window Fashions LLC or approved architect equivalent.
- B. Substitutions Request: Submit for approval under provisions of section 01 25 00.
- 2.02 HORIZONTAL BLINDS

- A. Product: Bali® 2" Aluminum School Blinds
- B. Color Name: As Selected by Architect; Color Number: As Selected by Architect.
- C. SureClose® Headrail shall be 1 5/8" high x 2 1/4" wide x .022" thick U-shaped steel with 1/8" light blocking lip on the bottom centerline. The steel finishing process includes phosphate treatment for corrosion resistance, a chrome-free sealer, a low HAP urethane primer and a topcoat with low HAP polyester baked enamel.
- D. Cord tilter shall be a snap-in component incorporating a worm and pulley of low-friction thermoplastic and a nylon gear. Standard tilt cords shall measure 2.2 mm in diameter. Select One: Cord tilter
- E. Cord lock shall be metal of a snap-in design incorporating a floating, shaft-type locking pin and shall incorporate a crash proof safety feature that will lock blind automatically upon release of cord. Options: Ring pull provides a single plated steel ring in lieu of tassels with a nominal 4" cord length.
- F. Lift cord shall be made of braided polyester measuring 2.2mm in diameter.
- G. Vinyl ladder tape shall be 1 1/2" wide reinforced vinyl. Standard ladder spacing shall be 42mm. Architect to Select from One Vinyl Tape Color:
  - 005 White
    670 Creamy Beige
    904 Lamplight
    983 Gray Haze
    062 Char Brown
- H. Slats shall be 5000 series cold-rolled aluminum containing the maximum allowable recycled content to produce a high strength and corrosion resistant flexible product. Slats shall be nominally 2" wide x .008" thick and treated with Advanced Finishing Technology (AFT), providing a smooth, hard, less porous surface. AFT delivers anti-static performance to repel dust and anti-microbial qualities to resist fungal and bacterial growth. Slats shall be treated with a chrome-free sealer and a topcoat of low HAP polyester baked enamel.
- I. Bottomrail shall be "C" shaped 9/16" high x 2" wide x .040 thick anodized aluminum. It is fully enclosed with a dust cover slat and finished with a polyester baked enamel to match headrail.

## 2.03 FABRICATION

A. Blinds shall be fabricated according to specifications and accurate to tolerance established by SWF engineering standards

## PART 3 – EXECUTION

- 3.01 INSPECTION
  - A. Installer shall be responsible for inspection of jobsite, approval of mounting surfaces, verification of field measurements and installation conditions. Installation shall commence when satisfactory conditions are met.
  - B. Do not dimension the drawings. Any questions concerning dimensions should be directed to the Architect for clarification.

## 3.02 INSTALLATION

- A. Install blinds in accordance with manufacturer's instructions including recommended support brackets and fasteners.
- B. Install blinds with adequate clearance to permit smooth operation of the blinds. Demonstrate blinds to be in smooth, uniform working order.

## 3.03 MAINTENANCE AND CLEANING

A. Maintain and clean blinds in accordance with manufacturer's instructions.

### END OF SECTION

## SECTION 12 93 43 BENCHES

#### PART 1 GENERAL

- 1.1 SECTION INCLUDES A. Benches.
- 1.2 REFERENCES
  - REFERENCES
    - A. ASTM Testing Standards:
      - 1. ASTM B 117 Standard Practice for Operating Salt Spray (Fog) Apparatus.
      - 2. ASTM D 522 Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
      - 3. ASTM D 523 Standard Test Method for Specular Gloss.
      - 4. ASTM D 2247 Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
      - 5. ASTM D 2794 Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
      - 6. ASTM D 3359 Standard Test Methods for Measuring Adhesion by Tape Test.
      - 7. ASTM D 3363 Standard Test Method for Film Hardness by Pencil Test.
      - 8. ASTM G 155 Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.
- B. ISO Testing Standards:
  - 1. ISO 1520 Paints and Varnishes Cupping Test.
    - 2. ISO 2815 Paints and Varnishes Buchholz Indentation Test.
    - C. ANSI/BIFMA Testing Standards:

1. ANSI/BIFMA X5.4-2005 – Standard Test for Lounge Seating.

## 1.3 SUBMITTALS

A. **Product Data: Submit manufacturer's product data, storage and handling requirements and** 

recommendations, installation methods and available colors, styles, patterns and textures.

B. Shop Drawings: Submit manufacturer's shop drawings, including plans and elevations, indicating overall dimensions.

- C. Samples: Submit manufacturer's samples of materials, finishes, and colors.
- D. Warranty: Manufacturer's standard warranty.
- **1.4** QUALITY ASSURANCE
- A. Manufacturer's Qualifications: Manufacturer regularly engaged in manufacture of site furnishings since 1969.

B. Product Support: Products are supported with complete engineering drawings and design patents.

C. Base Worth: An installed base of products worworth in excess of one hundred million dollars.

- ISO Testing Standards:
  - 1. ISO 1520 Paints and Varnishes Cupping Test.
    - 2. ISO 2815 Paints and Varnishes Buchholz Indentation Test.

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  - 2. ISO 2815 Paints and Varnishes Buchholz Indentation Test.
  - C. ANSI/BIFMA Testing Standards:

1. ANSI/BIFMA X5.4-2005 – Standard Test for Lounge Seating.

### 1.3 SUBMITTALS

A. **Product** Data: Submit manufacturer's product data, storage and handling requirements and recommendations, installation methods and available colors, styles, patterns and textures.

- B. Shop Drawings: Submit manufacturer's shop drawings, including plans and elevations,
- indicating overall dimensions.
- C. Samples: Submit manufacturer's samples of materials, finishes, and colors.
- D. Warranty: Manufacturer's standard warranty.

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B. Product Support: Products are supported with complete engineering drawings and design patents.

C. Base Worth: An installed base of products worworth in excess of one hundred million dollars.

ISO 2815 – Paints and Varnishes – Buchholz Indentation Test.

C. ANSI/BIFMA Testing Standards:

1. ANSI/BIFMA X5.4-2005 – Standard Test for Lounge Seating.

### 1.3 SUBMITTALS

A. **Product Data: Submit manufacturer's product data, storage and handling requirements and** 

recommendations, installation methods and available colors, styles, patterns and textures.

B. Shop Drawings: Submit manufacturer's shop drawings, including plans and elevations,

- indicating overall dimensions.
- C. Samples: Submit manufacturer's samples of materials, finishes, and colors.
- D. Warranty: Manufacturer's standard warranty.

## **1.4** QUALITY ASSURANCE

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B. Product Support: Products are supported with complete engineering drawings and design patents.

C. Base Worth: An installed base of products worworth in excess of one hundred million dollars.

ANSI/BIFMA Testing Standards:

1. ANSI/BIFMA X5.4-2005 – Standard Test for Lounge Seating.

## **1.3** SUBMITTALS

**A. Pr**oduct Data: Submit manufacturer's product data, storage and handling requirements and

recommendations, installation methods and available colors, styles, patterns and textures.

B. Shop Drawings: Submit manufacturer's shop drawings, including plans and elevations, indicating overall dimensions.

- C. Samples: Submit manufacturer's samples of materials, finishes, and colors.
- D. Warranty: Manufacturer's standard warranty.
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- ANSI/BIFMA Testing Standards:
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A. **Product Data: Submit manufacturer's product data, storage and handling requirements and** 

recommendations, installation methods and available colors, styles, patterns and textures.

B. Shop Drawings: Submit manufacturer's shop drawings, including plans and elevations, indicating overall dimensions.

- C. Samples: Submit manufacturer's samples of materials, finishes, and colors.
- D. Warranty: Manufacturer's standard warranty.

## **1.4** QUALITY ASSURANCE

**A.** Manufacturer's Qualifications: Manufacturer regularly engaged in manufacture of site furnishings since 1969.

B. Product Support: Products are supported with complete engineering drawings and design patents.

C. Base Worth: An installed base of products worworth in excess of one hundred million dollars.

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- D. Assets: Excess of twenty million dollars in assets.
- E. Production: Orders are filled within a 40-day schedule.
- F. Facility Operator: Welders and machine operators are certified.

## 1.5 DELIVERY, STORAGE, ANDNDLING

A. **D**elivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage: Store materials in clean, dry area in accordance with manufacturer's instructions. Keep materials in manufacturer's original, unopened containers and packaging until installation.

C. Handling: Protect materials and finish during handling and installation to prevent damage.

## 1.6 WARRANTY

A. Warranty Information:

Products will be free from defects in material and/or workmanship for a period of three years from the date of invoice.

The warranty does not apply to damage resulting from accident, alteration, misuse, tampering, negligence, or abuse.

Landscape Forms, Inc. shall, a, at its option, repair, replace, or refund the purchase price of any items found defective upon inspection by an authorized Landscape Forms service representative.

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- C. dscape Forms, Inc. shall, a, at its option, repair, replace, or refund the purchase price of any items found defective upon inspection by an authorized Landscape Forms service representative.
- D. Purchasers should be aware that normal use of these high quality products can result in superficial damage affecting the finish. Scratches, nicks, and dents are to be considered normal wear and tear, and are not the responsibility of the manufacturer.

## PART 2 PRODUCTS

- 2.1 MANUFACTURER
  - Landscape Forms, Inc., 7800 E. Michigan Ave, Kalamazoo, Michigan 49048.
     Phone: (800) 521-2546. Fax (269) 381-3455. Website www.landscapeforms.com
     E-mail: specify@landscapeforms.com

#### 2.2 BENCHES

- A. "Plainwell" Benches
  - 1. Style: Backed:
  - 2. Size: Length: 97-1/4 inches
  - 3. Mounting: Surface Mount
  - 4. Option: No center arm

### 2.3 MATERIALS

- A. Seat and back panels:
  - 1. Wood: Solid stock wood boards with eased edges. Boards are 1-1/4" x 2" with 2-7/8" diameter half round face boards that conceal steel channels. Each board is fastened with at least four black Magni-coated steel screws. Individual boards can be replaced with ordinary tools.
    - a. Exterior Use:

2)

- 1) Jarrah: Solid stock, select Australian hardwood.
  - Ipe: Solid stock, select th American hardwood.
    - B. Frame: End supports with integral armrests are sand cast aluminum.

Seat straps, back straps, and center straps are sand-cast aluminum. Leg section is 1-1/2" x 2" oval shape. End supports are connected by two A36 steel channels 1s 1-1/2" x 9/16" x 3/16" fastened with black Magni-coated steel cap screws.

Frame: End supports with integral armrests are sand cast aluminum. Seat straps, back straps, and center straps are sand-cast aluminum. Leg section is 1-1/2" x 2" oval shape. End supports are connected by two A36 steel channels 1s 1-1/2" x 9/16" x 3/16" fastened with black Magni-coated steel cap screws.

## 2.4 ACCESSORIES

A. Anchor Bolts: Corrosion resistant recommended, not provided by the manufacturer.

## 2.5 RECYCLED CONTENT

- A. Wood Benches:
  - -Recycled Material Content: Minimum 20 percent.
    -Post-Consumer Material Content: Minimum 12 percent.
    -Pre-Consumer Material Content: Minimum 8 percent.
    -Recyclable: 100 percent.
- 2.6 FABRICATION

A. Assembly: Shop assembled benches.

## 2.7 FINISHES

A. Finish on Wood:

- 1. Wood for Exterior Use: Unfinished.
- B. Finish on Metal: Landscape Forms, Inc. "Pangard II".
  - 1. Primer: Rust inhibitor
  - 2. Topcoat: Thermosetting TGIC polyester powder coat. UV, chip, and flake resistant.
  - 3. Test Results: "Pangard II".
    - a. Gloss Consistency, Gardner 60 Degrees, ASTM D 523: Plus or minus 5 percent from standard.
    - b. UV Resistance, Color and Gloss, ASTM G 155, Cycle 7: Delta E less than 2 at 2.0 mils and less than 20 percent loss.
    - c. Cross-Hatch Adhesion, ASTM D 3359, Method B: 100 percent pass.
    - d. Flexibility Test, Mandrel, ASTM D 522: 3 mm at 2 mils.
    - e. Erichsen Cupping, ISO 1520: 8 mm.
    - f. Impression Hardness, Buchholz, ISO 2815: 95.
    - g. Impact Test, ASTM D 2794: 60 inch-pounds at 2.5 mils.
    - h. Pencil Hardness, ASTM D 3363: 2H minimum.
    - i. Corrosion Resistance, 1,500-Hour Test, ASTM B 117: Max. undercutting 1 mm.
    - j. Humidity Resistance, 1,500-Hour Test, ASTM D 2247: Max. blisters 1 mm.
  - 4. Architect to select from standard palette of color.

## PART 3 EXECUTION

- 3.1 EXAMINATION
  - A. Site Examinations: Examine areas to receive benches.
    - 1. Verify that substrates are stable and capable of supporting the weight of items covered under this section.
    - 2. Verify that substrates have been adequately prepared to securely anchor those items that will be surface mounted.
    - 3. Notify Architect of conditions that would adversely affect installation or subsequent use.
    - 4. Do not begin installation until unacceptable conditions are corrected.

## 3.2 INSTALLATION

- A. Install benches in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Install benches level.

## 3.3 ADJUSTING

- A. Finish Damage: Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- B. Component Damage: Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

## 3.4 CLEANING

- A. Clean benches promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that could damage finish.

### 3.5 **PROTECTION**

A. Protect installed benches to ensure that, except for normal weathering, benches will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

### SECTION 13 34 19 — PRE-ENGINEERED METAL BUILDINGS

#### PART 1 - GENERAL

#### 1.00 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

### 1.01 SCOPE:

- A. Provide all pre-engineered metal buildings, complete, as shown on the Drawings, specified herein, or needed for a complete and proper installation and not specifically called for under other Sections of these specifications.
- B. The requirements of Division 0 "Bidding and Contract Requirements" and Division 1 "General Requirements" of this Project Manual apply to all work required for this section.

#### PART 2 - PRE-ENGINEERED METAL BUILDING SYSTEM:

## 2.01 GENERAL:

- A. The intent of these specifications and drawings is to establish a quality and performance level for structural design, material, durability, and workmanship.
- B. All bidders must conform strictly to these specifications in their bid.
- C. The building shall be the design of a manufacturer who is regularly engaged in the fabrication of preengineered structures. All materials shall be new, unused, free from defects and of American manufacture.
- D. The following standards and criteria (of most recent issue) shall be used where applicable in the structural design of the building covered by this specification:
  - 1. "MANUAL OF STEEL CONSTRUCTION" American Institute of Steel Construction
  - 2. "COLD FORMED STEEL DESIGN MANUAL" American Iron and Steel Institute
  - 3. "ALUMINUM CONSTRUCTION MANUAL" The Aluminum Association
  - 4. "CODE FOR WELDING IN BUILDING CONSTRUCTION" American Welding Society
  - 5.
  - 6. The following criteria shall also be applicable in other phases of design: latest edition of the INTERNATIONAL BUILDING CODE.

E. Listing by:

#### Underwriters' Laboratories Inc.

Factory Mutual System or other recognized testing laboratories

### 2.02 DESIGN LOADS:

- A. GENERAL:
  - 1. The basic design loads shall include live and wind, in addition to dead load. All other design loads, whether they be of static or dynamic nature, shall be considered as auxiliary loads.
- B. VERTICAL LIVE LOAD:
  - 1. Roof covering shall be designed for either 50 psf uniformly distributed or a 200-pound concentrated (point) load (over a 1' x 1' area) located at center of maximum roof (panel) span. The most severe conditions shall govern.
  - 2. Purlins shall be designed for 20 psf uniformly distributed over the roof area which they support.
  - 3. Primary framing (frames) shall be designed for 20 psf uniformly distributed over the roof area which it supports.
  - 4. All the above loads to be in addition to the applicable dead loads and shall be applied to the horizontal projection of the roof.

### C. WIND LOADS:

- 1. The wind load on the structure shall be proportioned and applied as horizontal and uplift forces according to and as recommended by the latest edition of the INTERNATIONAL BUILDING CODE.
- 2. The roof construction shall carry a U.L. Construction (Uplift) Listing of not less than Class 90.
- 3. Wind load may be proportioned as allowed by the latest edition of the INTERNATIONAL BUILDING CODE. However, such proportioning shall not compromise the UL-Class 90 listing.

#### D. AUXILIARY (ADDITIONAL COLLATERAL) LOADS:

- 1. Other superimposed dynamic and/or static loads shall be considered as part of the design requirements and combined with normal design (live and/or wind) loads as prescribed hereafter:
- E. DYNAMIC LOADS: VARIOUS HVAC EQUIPMENT (REFER TO DRAWINGS FOR LOCATIONS).
- F. STATIC LOADS:THE ROOF FRAMING AT 1:12 PITCH SHALL BE DESIGNED FOR AN AUXILIAR LOAD OF 5 PSI.
- G. COMBINATION OF LOADS:
  - 1. The combining of normal loads and auxiliary loads for design purposes shall be as prescribed and recommended by the latest edition of the INTERNATIONAL BUILDING CODE.
- H. CERTIFICATION:

- 1. After the awarding of the Contract, complete structural analysis shall be submitted by the Metal Building Manufacturer to the Architect. Structural design must be sealed by a Texas Registered Professional Structural Engineer.
- 2.03 DESCRIPTION:
  - A. The pre-engineered metal buildings covered in this specification are to be rigid frame structure of steel (frames) rafter beams.
  - B. The roof slope shall be not less than 1"; 12" as indicated on the drawings.
  - C. Column spacing shall be as indicated on the drawings.
  - D. Nominal eave height shall be as indicated on the drawings.
- 2.04 ROOF COVERING AND SUPPORTS:
  - A. ROOF PANELS "Standing Seam Metal Roof" Panel: At 1:12 ROOFS:
    - 1. The exposed metal roof covering shall be 22-gauge (minimum) "Standing Seam Metal Roof" Panel as manufactured by Berridge Manufacturing Co. or equal. Roof panels shall be of "Standing Seam Metal Roof" panel design and secured to the purlins with a concealed structural fastening system (mechanically seamed panel). The concealed system shall provide minimal through penetration of the exposed roofing surface and allow the roof covering to move independently of any differential thermal movement by the structural framing system. Except at the concealed fastener, there shall be no thermal contact of the roof panels with the supporting purlin. Roof panels with lap-type side (longitudinal) joints and exposed structural fasteners shall not be considered acceptable.
    - 2. Roof panels shall be fastened to the purlins or secondary support members with a concealed clip or backing device of steel having a protective metallic coating. Through penetration of the roofing surface by exposed fasteners shall occur only at terminal locations of the roof panels. Such fasteners shall be stainless steel or aluminum screws, bolts, or rivets, with weather-seals washers. Carbon steel shank-fasteners with vinyl or stainless steel-capped heads shall be acceptable also.
    - 3. Deflection of the roof panel shall not exceed L/180 of its span when supporting the applicable vertical live loads previously described.
    - 4. Roof Panels to be:
      - a. "Standing Seam Metal Roof" Panels with overall panel width to be 38-1/4", with 36" net coverage.
      - b. AllianceLok 16 Panel, from Alliance Steel, Inc. <u>www.allianceokc.com</u> Ph. (800) 624-1579, (405) 745-7500 Ext. 520. Fax (405) 261-0503
      - c. Platinum Series 16 or 18 Panel, from Rigid Global Buildings. <u>www.RigidBuilding.com</u> Ph (713) 550-5884, (888) 467-4443, Fax (281) 443-9064
  - B. WARRANTY:
    - 1. Durability of the roof panels due to rupture, structural failure, perforation, or noticeable discoloration or fading shall be warranted for a period of twenty (20) years by the Roofing Manufacturer and the General Contractor.

## C. PURLINS (ROOF COVER SUPPORT MEMBERS):

- 1. The configuration, thickness and spacing of the purlins shall be the Building Manufacturer's standard. The allowance design capacity of cold-formed purlin members shall be calculated in accordance with the provisions of the AISI Specification for the Design of Cold-Formed Steel Structural Members.
- 2. The deflection of the purlin or secondary member shall not exceed L/180 of its span when supporting the applicable vertical live loads previously prescribed and any collateral loads required.
- 3. The standing seam roof does not provide a diaphragm or purlin bracing function. Brace purlins as required to conform with A.I.S.C. and A.I.S.I. specifications.

#### D. ROOF JACKS AND CURBS:

- 1. At roof penetrations for plumbing vents, install roof jacks (rubber) DEKTITE type where standing seam roofing is installed.
- 7.
- 2. At roof penetrations for mechanical equipment skylights requires curbs; provide custom fabricated roof curbs as manufactured by CUSTOM CURB, INC., LCM INC.

## 2.05 RAKE, TRIM, GUTTERS, ROOF DOWNSPOUTS, TRIMS AND SOFFIT LINERS:

- A. The closures, flashings, fascias, gutters, and trim shall be the Building Manufacturer's standard, compatible with the material furnished as roof panels.
- B. Buildings shall have continuous gutters with downspouts where shown on the drawings.
- C. Gutters, downspouts, rake trim, ridge panels, and trim associated with standing seam roof panels shall be a color to be selected by Architect from manufacturer's KYNAR 500 custom and to be part of base bid colors.
- D. WARRANTY:
  - 1. The exterior color finish for the metal panels shall be warranted by the Material Manufacturer and General Contractor for twenty (20) years against blistering, peeling, cracking, flaking, checking, and chipping. Excessive color change and chalking shall be warranted for twenty (20) years. Color change shall not exceed 5 N.B.S. units (per ASTM D-2244.64T) and chalking shall not be less than a rating of 8 per ASTM D-659.
- E. GIRTS:
  - 1. The girt's configuration and thickness shall be the Building Manufacturer's standard provided all design criteria, including deflection and girt spacing is met.
  - 8.
  - 2. Based on a simple span, the deflection of the girts (supporting the wall covering) shall be proportioned with due regard to that produced by the previously prescribed design (wind) load.

### 2.06 STRUCTURAL STEEL PRIMER:

- A. All uncoated structural steel shall be given one (1) coat of rust inhibitive (primer) paint which meets or exceeds Federal Specifications TT-P-664, or certification shall be submitted that it conforms to a recognized authoritative specification, such as from a Federal or Military authority or the Structural Steel Painting Council.
- B. Exposed pre-engineered metal building must be painted with at least one (1) coat of primer and two (2) coats of finish paint.

## 2.07 INSULATION AND INTERIOR FINISH:

- A. ROOF
  - 1. Johns Manville R-19 unfaced between rafters, ISO-Board Rigid R-20 Between Plywood Sheathing.
  - 2. The upper layer of insulation system shall be applied under the metal roofing panels. The insulation, R-19 batt, should be over the roof support member. The vapor membrane shall always be placed nearest the interior of the building, whether it be exposed or non-exposed. All joints shall be lapped, taped, or folded and stapled in accordance with the Building Manufacturer's standard. The vapor membrane shall have a perm rating of not more than 0.02. The second layer insulation shall be polypropolene scrim-foil; R-19 suspended between the purlins. At exposed locations insulation shall be changed to *Black* plastic faced.
  - 3. All exposed roof insulation shall be supported by *Black* plastic mesh.
  - 4. With blanket-type insulation, a thermal spacer (break) shall separate the roof support member from the roof panel, except at each concealed structural fastener. The spacer shall be of material having a density of not less than 2 pcf and, if of a combustible material, shall be classified (ASTM E-84) as having a flame spread rating no greater than 25.
  - 5. Roof insulation shall be flexible, non-combustible fiberglass blankets with a vapor resistant membrane. The vapor resistant membrane shall be laminated to the insulation as a composite unit. The insulation and vapor membrane shall carry an Underwriters' Laboratories Inc. (U.L. Label) fire hazard classification indicating a flame spread rating of 25 or less and a smoke developed rating of 450 or less, as a tested assembly.

### PART 3 - EXECUTION

#### 3.01 ERECTION:

- A. Erection of metal building, accessories, and insulation shall be performed by one of the following:
   1. Authorized systems contractors or builders of the manufacturer.
  - 2. Building manufacturer's crews.
  - 3. Other erectors authorized by the manufacturer as trained and qualified to erect that manufacturer's product. In this case, the manufacturer shall inspect the work and certify its correctness.

#### END OF SECTION

## SECTION 13 34 23 - PRE-FABRICATED MODULAR BUILDINGS

## PART 1 - GENERAL

The Administration Building is intended to be constructed for a 50-year overall life span on the building components, particularly the building structure and envelope. Construction is type VB. The Administration Building shall contain a public reception area with a restroom; an open office containing workstations; men's and women's staff restrooms and break room. Core supports spaces such as janitor / storage closets, outdoor storages and LAN rooms shall be provided for the building. Due to the sensitivity of the site and site security the new Administration Buildings shall be constructed as "Permanent Modular Construction." The modules shall be shop fabricated to the greatest extent possible, shipped to the site and assembled.

## 1.1 SUMMARY

- A. This Section includes off-site fabricated Administration Building modules for single story structures.
- B. The term Modular Manufacturer refers to the manufacturer of Off-Site Fabricated modules.
- C. The term On-Site Contractor refers to the General Contractor.
- D. Foundation work will be by General Contractor.
- E. Exterior glass and glazing will be by General Contractor.
- F. Porcelain tile will be by Modular Manufacturer.
- G. Connection of electrical distribution system within the fabricated modules is the responsibility of the Modular Manufacturer. Connection of module to the main electrical service entrance shall be by the On-Site Contractor.
- H. Domestic water supply and distribution system within the fabricated modules is the responsibility of the Modular Manufacturer. Connection of module to the site utility water service shall be by the On-Site Contractor.
- I. Drain waste and vent piping within the fabricated modules is the responsibility of the Modular Manufacturer. Connection of module to the site sewer service shall be by the On-Site Contractor.
- J. Fire suppression piping, heads, distribution, and riser within the fabricated modules is the responsibility of the Modular Manufacturer. Connection of module to the fire supply water shall be by the On-Site Contractor.

## 1.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide modules capable of withstanding the effects of gravity loads and lateral loads in accordance with the International Building Code (2012 IBC). Additionally, the modules must be designed for the following loading conditions RFP section 4.2:

Superimposed Dead Loads

Floor finishes:	10 psf
MEP systems:	10 psf
Ceiling and miscellaneous:	8 psf
Roof assemblies:	10 psf
	- · F

Live Loads

Offices:	50 psf
Corridors:	100 psf
Partitions:	15 psf
Roof:	20 psf

## 1.3 SUBMITTALS

- A. Product Data: For each product used to fabricate modules. See Appendix A.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
  - 1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Samples for Verification: For each type of exposed module finish required.

## D. Product test reports.

- 1. Plumbing line air test.
- 2. Electrical testing High Pot test and power up.
- E. Maintenance Data: For each product used to fabricate modules.

## 1.4 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel" and AWS D1.3, "Structural Welding Code--Sheet Steel."
- B. Building Code: The Administration Building shall be designed and constructed in compliance with applicable codes which include the latest editions of the family of codes issued by the International Code Council (ICC) including International Building Code (IBC), Electrical Code (NPFA 70), International Fire Code (IFC), NFPA 10, Standard for Portable Fire Extinguishers, NFPA 13R, Standard for the Installation of Sprinkler Systems, NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, NFPA 101, The Life Safety Code, 2004 ABA Design Standards, 2004 Architectural Barriers Act Accessibility Standard (ABAAS)

C. Pre-installation Conference: Conduct conference at Project site.

## 1.5 COORDINATION

A. Coordinate installation of anchorages for the Off-Site Fabricated Modules. 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. Provide Material Handling Equipment as required for proper unloading and placing of the Modules in compliance with the setting drawings. Coordinate module installation with the on site contractor

## 1.6 DELIVERY AND HANDLING

- A. Delivery: Modular Manufacturer shall deliver each off-site fabricated module to the project site in time for scheduled installation. The Modular Manufacturer shall arrange and pay for all transportation requirements of all States, Municipalities and Department of Transportation Authorities along the planned route of delivery including but not limited to the following:
  - 1. Wide load permits,
  - 2. Required Escorts,
  - 3. Weight limit regulations,
  - 4. Traffic control regulations as required by local authorities to avoid rush-hour traffic, etc.
- B. Handling at the Project Site: The modular manufacturer shall arrange for lifting and handling equipment required to unload and place the Off-Site Fabricated Modules in accordance with the approved shop drawings and setting plans.

## 1.7 WARRANTY

- A. Warranty Period:
  - 1. Module: One year from the date of Substantial Completion.
  - 2. Roof: Twenty-year finish warranty from the date of Substantial Completion.

## PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURER: Palomar Modular Buildings, <u>www.palomarmodular.com</u> (469) 727-0727

## 2.2 FLOOR CONSTRUCTION

- A. Modular Frame: Steel C channel C12x20.7 perimeter beam. ASTM A36
- B. Floor Joists: M8x6.5 Steel ASTM A36 @24" O.C.
- C. Blocking: PT #2 SYP.
- D. Decking: Advantech 1-1/8". Bathrooms (tile): <sup>3</sup>/<sub>4</sub>" Advantech, <sup>1</sup>/<sub>2</sub>" Hardi Panel.

- E. Waterproofing Membrane: "Hydrocide Liquid Membrane, HLM 5000" Cold Applied Seamless Elastomeric, Modified Urethane for use between concrete seal slab and concrete slab-on-grade as manufactured by Sonneborn or approved equivalent by Toch Bros. or Tremco or Henry Company.
- F. Insulation (First Floor): Quadfoam 2.0 2" closed cell spray foam, Johns Manville R-19 fiberglass unfaced batt insulation.
- G. Belly Board: Shepweave II Woven reinforced poly.

## 2.3 WALL CONSTRUCTION

- A. Framing (Exterior Walls): 18 and 16GA cold rolled steel 6" metal stud ASTM A 653/A 653/M @16" O.C.
- B. Framing (Interior Walls): 20GA cold rolled steel 4" stud ASTM A 653/A 653/M 16" O.C., to bottom of roof deck.
- C. Interior Columns: 3"x3"x3/16" Steel Columns ASTM A36.
- D. Exterior Sheathing: Structural panel 7/16" OSB, 1" ISO rigid insulation, 5/8" Densglass Gold or equal,
- E. Weather Resistant Barrier (Exterior Walls): 1-layer Barricade R-Wrap Housewrap.
- F. Interior Walls:
  - 1. Bathroom Walls: 5/8" moisture resistant gypsum board, ½" Hardi Panel.
  - 2. Other Walls: 5/8" type X gypsum.
  - 3. Walls behind mop sink: FRP.
  - 4. Walls in fan coil closets: FRP.
  - 5. Storage Room Walls: FRP.
- G. Insulation (Interior Walls): Johns Manville R-11 fiberglass insulation.
- H. IT Closet: Pyro-Guard 5/8" fire resistant plywood all walls.
- I. Insulation (Exterior Walls): Quadfoam 2.0 Closed cell foam full wall cavity, 1" poly ISO rigid insulation.
- J. Exterior Wall Finish:
  - 1. All window trim shall be provided under specification 08 41 13.
  - 2. All louvers shall be provided and installed by General Contractor.

## 2.4 CEILING CONSTRUCTION

- A. Ceiling Height: Refer to finish schedule.
- B. Gypsum Board Ceilings: National type X gypsum board.
- C. Acoustical ceiling Tile provided by manufacturer. Manufacturer shall install tiles at sprinkler head locations in plant, balance to be manufacturer installed on site after above ceiling work is

completed. Ceiling tiles damaged by General contractor's sub-contractors shall be provided and replaced by General Contractor.

## 2.5 ROOF CONSTRUCTION

- A. Roof Framing: C12X20.7 MATE BEAM, CEILING JOIST, 8" x 16 GA cold rolled steel ceiling joist.
- B. Roof Sheathing: 5/8" PS1 Exp., 7/16" CDX Plywood.
- C. Insulation: Johns Manville R-19 unfaced between rafters, ISO-Board Rigid R-20 Between Plywood Sheathing.
- D. Roof Covering: MBCI Lockseam 22 GA Standing Seam, Solar White, Prefinished, light color metal roof panel. Signature 200 Series prefinished Artisan Series, 24 GA, 12" wide metal soffit and fascia panels, Polar White, 20-year finish warranty.
- E. Gutters and downspouts supplied and installed by General Contractor.
- F. Roof Ventilation: None.

## 2.6 DOORS

- A. Floor Access Hatch: Acudor floor door 24"x24".
- B. Interior Door Frames: Curries CM series hollow metal welded frame 18 GA.
- C. Interior Doors: VT Industries 5-ply, SCL. Interior wood doors shall be 3'-0" x 7'-0" x 1-3/4", unless otherwise specified and shall include a WDMA I.S.-97 SCLC-5, 5-ply structural composite lumber core with a premium grade WDMA I.S.1A-04, flush solid core, naturally stained look, matched and factory finished per AWI quality standards section 1500, specified with a conversion varnish alkyd urea catalyzed polyurethane.
- D. Exterior Door Frames: CM series hollow metal welded frame 16 GA.
- E. Exterior Door: Baron 18 GA Insulated hollow metal door 3'-0" x 7'-0" x 1-3/4"
- F. Exterior Overhead Coiling Door: 4'0" x 7'4", manually operated, factory finished. Overhead Door Company model 625, standard finish, insulated, heavy duty.
- G. Door Hardware:
  - 1. Interior Lockset 1: Falcon T Series Lever sets, Falcon T Series Privacy Lock Womens RR. Satin Chrome US26D Finish.
  - 2. Exterior Lockset 2:
  - 3. Hinges: BAHCO BB0179 (ANSI A8112).
  - 4. Strikes: Falcon
  - 5. Closers: PDQ American Eagle 3100 series, Men's and Women's Bathrooms and Entries.
  - 6. Door stops: Assa Abloy Rockwood 441CU Dome Stop Combo Unit.
  - 7. Door Threshold: National Guard Products 425E.
  - 8. Panic Bars: None.

9. Electric Door Strike: Empty box, conduit.

## 2.7 WINDOWS

1. Transaction window: C.R. Lawrence 30"x36" transaction window with CRL 12"x10" standard deal tray, CRL Vertical Sliding Ticket Window 702A. Wilsonart P-lam countertop, Color: Terra Roca 4837.

## 2.8 CABINETS AND COUNTERTOP

- A. Base Cabinets: Kitchen Kompact, Finish: Glenwood.
- B. Wall-Hung Cabinets: Kitchen Kompact, Finish: Glenwood.
- C. Countertop: High pressure laminate. Wilsonart P-lam, Color: Terra Roca 4837.

## 2.9 INTERIOR FINISHES

- A. Drywall General: National Gypsum 5/8" Type X.
- B. Drywall Moisture Resistant: National XP Moisture Resistant.
- C. Wall Finishes:
  - 1. Paint: Glidden ProMaster acrylic latex finish eggshell low VOC.
  - 2. Level 3 wall finish with orange peel texture.
  - 3. Tile: Daltile TBD

## D. Floor Coverings:

- 1. Resilient Solid Vinyl Tile: Tarkett, Inc. Cortina Grande ASTM F 1700, Class 1. Type A.
- 2. Carpet Tile: Philadelphia Commercial Immerse 24'x24', GSA approved product.
- 3. Glazed Porcelain Tile: Daltile TBD Gray.
- 4. Carpet tile adhesive: Mohawk EnPress low odor and VOC, CRI Green Label Plus Certified.
- 5. Adhesives: As recommended by Johnsonite to meet site conditions \
- E. Base Material: Roppe 700 series 4" rubber wall base. Adhesive: Taylor 2040 wall base adhesive.
- F. Acoustical Ceiling Tile (ACT-1): Armstrong Ultima Tegular, 2'x2' Fine Texture, square lay in. Moisture Resistant in Janitors Closet.
- G. Acoustical Ceiling Grid: Armstrong Prelude XL 15/16" exposed tee system.
- Room NameFloorBaseWallsCeiling<br/>FinishCeiling<br/>HeightNotesOpen OfficeSVTRubberTT&PACT9'-0''
- H. Interior Finish Schedule:

Break room	SVT	Rubber	TT&P	ACT	9'-0"	
IT Room	SVT	Rubber	Fire	None		
			<b>Resistant Ply</b>			
Janitor Closet	SVT	Rubber	FRP	MR ACT	9'-0"	
Mech. Closets	SVT	Rubber	FRP	None		
Storage Room	SVT	Rubber	FRP	None		
Men's RR	Tile	Tile	Tile, TT&P	Gyp	9'-0"	
				TT&P		
Women's RR	Tile	Tile	Tile, TT&P	Gyp	9'-0"	
				TT&P		
Unisex RR	Tile	Tile	Tile, TT&P	Gyp	9'-0"	
				TT&P		
Office	SVT	Rubber	TT&P	ACT	9'-0"	
Reception	Tile	Tile	TT&P	ACT	9'-0"	

Interior Finish Schedule Notes: See color boards for each site for product and color.

## 2.10 SPECIALTIES

- A. Toilet/Bath Accessories:
  - 1. Grab bars: Mainline S.S. 1-1/2" ADA compliant.
  - 2. Paper towel dispenser/waste receptacle: American Specialties model 204623
  - 3. Mirror: American Specialties 18"x36" SS.
  - 4. Soap Dispenser: American Specialties model 0347.
  - 5. Urinal Partition: Accurate Partitions Corp. Color: Sand 836.
  - 6. Note: Provide wood blocking inside walls for bathroom accessories as indicated on the plans.
- B. Bench: Penco 20"x42" accessible wood bench with painted metal pedestals, Color: Light Putty 723.
- C. Lockers: AMP 1003 Metal Lockers 12"x12", Color Sandstone 710.

# 2.11 EQUIPMENT

## A. Appliance Schedule

Appliance	Manufacturer	Model #	Color	Comments

Note: Appliances specified above shall be supplied and installed by Modular Manufacturer.

## 2.12 FIRE SUPPRESSION by Manufacturer

- A. Sprinkler System:
  - 1. Sprinkler Heads: Reliable model F1FR56 upright.
  - 2. Sprinkler Heads: Reliable model F1FR56 recessed standard pendant/F1/F2.
  - 3. Valves: Ames Colt Series C200, C200N check valve.
  - 4. Water flow Detector: System Sensor WFD Series.
  - 5. Trim/Drain Valve: Globe Valves.
  - 6. Test Valve: AGF model 3011.
  - 7. Three-way Brass Valve: FPPI.
  - 8. Sprinkler Gauge: FPPI.
  - 9. Piping: Allied Tube and Conduit, Dyna-Flow high strength light wall.
  - 10. Fittings/Couplings: Anvil International Gruvlok lightweight flexible couplings and fittings.
  - 11. Cast Iron Fittings: Anvil Star.
  - 12. Fire Extinguisher: Potter Roemer 5 LB. Type 2A:10B:C Wall Mount.

## 2.13 PLUMBING

- 1. Water Supply System: Type L Copper
- 2. Drain, Waste and Vent System: PVC all locations.
- 3. Gas Supply System: N/A
- 4. Plumbing Fixtures:
  - 1. Break room Sink: Elkay LRAD1918-55-3, Faucet: Elkay LK1000CR,
  - Lavatory: Men's: Duravit D04911200241 ADA trough sink, Women's: Duravit D04548000001 ADA trough sink, Faucet: Sloan SF- 2350 BDM battery sensor, 0.5 GPM, BDM temperature mixing valve.
  - Lavatory Restroom 103: Kohler K-2032-0, 4" centers. Faucet: Sloan SF-2350 BDM Battery Sensor 0.5 GPM. Supply: Mcguire 2165 Series. Trim: Mcguire 8902 Series. Strainer and Tailpiece: Mcguire 155-A Series. ADA Protective Covers: Truebro 120 Series. Wall Carrier: Concealed Arm Type.
  - 4. Water Closet: Kohler Kingston K-4325-0, Sloan Royal 111-1.28 valve, Wall Carrier Zurn adjustable, Seat Church 295CT. PMB Standard Seat
  - 5. Water Closet Laredo Columbia Webb Only: Kohler K-3609T. PMB Standard Seat.
  - 1. Urinal: Kohler Bardon K4904-ET, Sloan Royal 186-05 valve, Wall Carrier Zurn Z1222.
  - 2. Mop Sink: Fiat Products MSB 2424. Faucet: Fiat 830 AA valve. Fiat stainless steel wall guards, mop hanger and hose rack.
  - 3. Water Heater: AO Smith Durapower DEL tank type 40 gallon 120/208V with overflow pan and Expansion Tank, Quick Stand #60-SWHP-W Platform.
  - 4. Floor Drain: Zurn ZN-415-P-B6
  - 5. Thermostatic mixing valve: Leonard 170 series.
  - 6. Trap primer: PPP P1-500.
  - 7. Refrigerator Box: Mainline

- 2.14 MECHANICAL HEATING, VENTILATING AND AIR-CONDITIONING
- 4. Heating/Cooling: Condenser: 3 ton Daikin DSZ13 Heat Pump. Air Handler: Goodman ARUF series.
- 5. Condenser Housekeeping Pad: ABS
- 6. PTAC: Amana DigiSmart series 12,000 BTU, 120 volt 60Hz, 1 Ph.
- 7. HVAC Duct: M & M Manufacturing Insulated galvanized metal duct with flex drops. Comply with SMACNA HVAC Duct Construction Standards Metal and Flexible 2005 Edition.
- 8. HVAC Duct Insulation: John Manville 35RC
- 9. Duct Hangars and Supports: M & M Duct Accessories. Comply with SMACNA 2005.
- 10. Grilles, Registers, Louvers: Selkirk AirMate series, Damper Equipped.
- 11. Thermostats: 7 days Programmable electronic.
- 12. Exhaust fans: Broan Model QTRE 080, Broan L-250.
- 13. Crawl Space Ventilation: Fantech FR Series with Humidistat.
- 14. HVAC Control Damper: Greenheck VCDR50 Round Damper with Actuator.
- 15. Outside Air Intake Louver: AirMate Prefinished aluminum.
- 16. System Start-up: Modular Manufacturer is responsible for start-up and comfort test and balance of modular mechanical systems.
- 2.15 ELECTRICAL
- 4. Electric Service:
  - 1. Electric Panel Board: Square D NQOD load center, flush interior mount, 120/208 volts, 250 amps, 3 phase.
  - 2. Branch Circuits: Squared D QO standard and GFCI breakers.
- 5. Electrical Devices:
  - 1. Receptacles: Hubbell CR5362I, 20 amps, 125V, Hubbell L5-30R Receptacle.
  - 2. GFI Receptacles: Hubbell GFRST 151, 20 amps, 125v. commercial grade.
  - 3. Switches: Hubbell spec grade CS120W, 20 amps, 120-277 VAC, commercial grade.
  - 4. HVAC Disconnect: Square D, 208/120v.
  - 5. Water Heater Disconnect: Square D, 208/120v.
  - 6. Conduit: Allied EMT, Southwire BX and MC cable.

- 6. Lighting:
  - 1. Finelite HPR-A-2x4-SCO-2T5, Sylvania FP28/835/ECO.
  - 2. Finelite HPR-A-2x4-SCO-1T5, Sylvania FP28/835/ECO.
  - 3. Finelite S16-WCB-1T5HO-WSO, FP28/835/ECO.
  - 4. LITECONTROL 21-1-4-T5, Sylvania FP28/835/ECO.
  - 5. HE Willams 17-4-228-A, FP28/835/ECO.
  - 6. Exit/Emergency Light: Cooper APX Series, Compass CU2 Series.
  - 7. Exterior Lighting: RAB WP2F26/PC w/ photo cell shipped loose.
- 7. Fire Alarm: See specification 28 31 11.
- 8. Mass Notification N/A
- 9. Voice and Data: See specification 27 13 00.
- 10. CATV: N/A

## 3 EXECUTION

- 4. Install Fabricated Unit Modules in accordance with approved shop drawings and setting drawings.
- 5. Set Modules plumb and aligned. Level true to plane with full bearing on first level embed plates.
- 6. Fasteners shall be installed in accordance with structural requirements and approved shop drawings.
- 7. On-Site Contractor to connect off-site fabricated sanitary waste, condensate lines and manifolds to sanitary sewer system.
- 8. On-Site Contractor to connect off-site fabricated domestic water lines and manifolds to domestic water distribution system.
- 9. On-Site Contractor to connect electrical power service to power distribution system.
- 10. Adjust doors, operable windows, and hardware to operate smoothly, easily, properly, and without binding. Confirm that locks engage accurately and securely without forcing or binding.
- 11. Lubricate hardware and other moving parts.
- 12. After completing installation, inspect exposed finishes and repair damaged finishes.

END OF SECTION 133423

### SECTION 28 51 00 - INFORMATION MANAGEMENT & PRESENTATION

#### PERFORMANCE SPECIFICATIONS

1. IT Requirements:

FMCSA inspection facilities shall be co-locating with CBP on CBP sites. Unless an agreement can be reached to share or connect to any part of the CBP infrastructure, it is assumed all IT WAN/LAN infrastructure will be independent of CBP's. This infrastructure includes but is not limited to the Connectivity to Voice/Data Carrier services, buildout of the LAN Room and the installation, termination, labeling and testing of all telecommunications cabling both interior and exterior (for Wireless Access Points). This "headend" room must also support FMCSA physical security functions including but not limited to IP cameras, video recording and access control.-Refer to Section 2.7.

#### References:

ANSI/TIA/EIA-568-C.0 - Generic Telecommunications Cabling for

Customer Premises

ANSI/TIA/EIA-568-C.1 – Commercial Building Telecommunications Cabling Standard ANSI/TIA/EIA-568-C.2 – Balanced Twisted-Pair Telecommunications Cabling and Components Standards

ANSI/TIA/EIA-568-C.3 – Optical Fiber Cabling Components Standard

ANSI/TIA/EIA-568-C.4 – Broadband Coaxial Cabling and Components Standard

ANSI/TIA/EIA-569-B, Commercial Building Standard for Telecommunications Pathways and Spaces

ANSI/TIA/EIA-606-A, Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.

ANSI-J-STD-607-A, Commercial Building Grounding and Bonding Requirements for Telecommunications.

ANSI/NFPA 70 The National Electrical Code (NEC), based upon year approved by local codes or AHJ.

ANSI/TIA/EIA-758 – Customer Owned Outside Plant Telecommunications Cabling Standard

BICSI Customer Owned Outside Plant Design Manual

Building Industry Consulting Services International (BICSI)

Telecommunications Distribution Methods Manual (TDMM), current edition.

Occupational Safety and Health Administration (OSHA) laws, regulations and standards (CFR 29, Part 1910)

National Electrical Manufacturers Association (NEMA)

National Electrical Safety Code (NESC)

Underwriters' Laboratories, Inc. (UL 497)

American Society for Testing Materials (ASTM)

Local, county, state and federal regulations and codes in effect as of date of "notice to proceed."

#### LAN Rooms

Layout – The LAN room floor plan included in Volume 2 depicts the required layout, provisioning and systems requirements. The LAN room size for FMCSA SB field offices is 7-6" x 12' (90 SF) and is uniform for all four office building options. Each LAN Room shall have <sup>3</sup>/<sub>4</sub>" x 4' x 8' AC grade fire retardant treated plywood (with two coats of fire retardant paint to match wall color) installed vertically covering each wall at 12" AFF.

The room walls are to deck and shall have no ceiling with lighting providing 50 footcandles at 3' AFF at front and rear of racks. Two EIA/TIA 19" telecommunications racks with 6" vertical cable managers installed on each side shall be installed extending from the rear wall as shown on the expanded LAN Room plans in Volume 2. Racks shall be installed with a rack base insulator kit for grounding isolation under the rack base, CPI Part # 10605-19 or equal.

Each telecommunications rack and the cable runway shall be connected to the Telecommunications Main Grounding Busbar (TMGB), installed on busbar insulator assembly, located above the cable runway at 8' AFF. Attachment from the racks and runway to the busbar shall be using a minimum # 6 AWG green insulated stranded copper conductor terminated with 2 bolt compression lugs. The TMGB shall be provided and installed in the LAN Room and shall connect to the main building electrical service via appropriately sized grounding conductor.

The TMGB, shall comply with the following: ASTM-B187-C11000 copper busbar (minimum <sup>1</sup>/<sub>4</sub> inch thick, pre-drilled with standard NEMA bolt hole sizing and spacing) suitable for use with No. 6 AWG copper two-hole compression-type compression lugs and sized for the immediate requirements and allowing for growth. The busbar shall be electrotin plated for reduced contact resistance.

Where entry conduits for carrier services enter the LAN Room from the below the building, the conduits shall be installed in the corner of the room adjacent to the front of the racks. The conduits shall extend up 6" to protect against water infiltration from the exterior.

High Pair Count Outside Plant (OSP) Copper cable (25 or 50 pair), 2 Pair Cat 6 shielded feeder cables (Qty. 2) or Outside Plant Single-Mode Optical Fiber (or both copper and fiber) shall be provisioned to each administration building LAN Room where they become the demarcation point for carrier services. Optical Fiber Service (Single Mode) shall terminate in the fiber interconnect at the top position of Rack 1. Any fiber that is required to serve Cisco Aironet (or equal) Outdoor Access Points for deployment in the canopy areas shall originate in this interconnect as well.

The Contractor shall determine the media required to extend from the CBP demarc or an independent (incumbent or competitive) carrier service to the FMCSA administration building. This may be by copper or fiber media. The Contractor shall furnish and install two (2) 2" Schedule 40 PVC conduits from the origination of the carrier service to the administration building with installed length-labeled and detectable muletapes in each for pulling the required connectivity cable. The second conduit shall be a spare for future use. If it is determined that the pathway is subject to potential damage, this conduit duct bank shall be installed with 6" concrete cover.

Copper OSP Building Entrance Protection shall be Lucent (or equal) 188ECA1-100G style lightning arrestor terminals, fully populated with primary protection modules. Primary protection modules shall be solid state, unless otherwise noted for special applications.

Power, duct work and power distribution, not related to the room functions shall not pass through or be located within the space.

Two, four inch sleeves, with bushings each side, shall be installed at the corridor wall above the ceiling line to support a cable path for: 1) all UTP cabling and 2) all access control, coax, line voltage security cable systems, which are to remain separate from the IP supporting UTP cabling.

Ventilation – The LAN room air supply shall be provided by the building HVAC system. A backup/supplementary HVAC source shall be provided by the installation of an

appropriately sized mini-split HVAC system. When the building HVAC system is off or when it is providing heat (winter months) the Mini-Split system shall support the room via Thermostat controls. LAN room temperatures can be monitored and notification initiated if such is required in the future, but this is not a current requirement.

Power – There shall be two 125v /20 amp circuits provided in the LAN room for power adjacent to the racks. One circuit for the IT rack and one circuit for the Security rack. Each circuit shall terminate on the wall behind the racks (see Power and Com Plans) with a standard NEMA rated 5-20R device outlet(s). An additional 20-amp circuit with standard NEMA 5-20 receptacles shall be installed on each of the remaining walls in the LAN Room. To maintain the systems uptime through power interruptions and brown outs, UPS units are installed at the base of each cabinet. Due to the weight of the batteries, and the size of the cabinets, UPS units are normally located at the lowest area on the racks. An APC 2200 VA RM3U (or equal) UPS is deployed at the base of each rack. Each UPS serves as a power distribution unit (PDU) having six 5-15R outlets on the rear face of the unit. Dual cord switches and other technology equipment with dual power supplies shall, for power diversity, plug a cord into each of the UPS units. Thus if a circuit breaker or battery in the UPS fails or requires maintenance, the auto-sensing computer equipment shall shift to the remaining power resource. Legacy or single power supply (single cord equipment) may be provisioned for redundancy and reliability by installing a rack mount transfer switch (APC AP7750A or equal) with two cords, one each plugged into each UPS. Security and Access Control Equipment that is rack mounted shall utilize the UPS units. Wall mounted relays and control systems shall require local independent battery back up at the equipment.

Cabling – Station Distribution Cabling shall consist of Non-Plenum rated CAT 6 UTP media (Beldon Media Twist or equal performance). Cable runs originating in the Demarc/ LAN Room terminate to Cat 6 modular patch panels in Rack 1 (as shown on enlarged floor plan; ref. Volume 2 Sheet A16-02.02).

Rack 1 shall host any optical fiber deployed for the FMCSA site terminating in a fiber interconnect at the top of the rack. A minimum 2 rack unit (RU) horizontal cable manager shall be installed below the fiber interconnect followed by a 24 port, 110-style, 8-pin, RJ-45 (Telco) patch panel which shall support one pair POTS lines and 2-pair T1 circuits via termination of a single pair of a 25 pair cable to the center pair (or two center pairs for T1) of each jack position on the rear of the patch panel. A pre-terminated 25 pair cable extends the copper demarc RJ-21x, 66-block via an amphenol connector to the 24 port Telco patchpanel. The Telco demarc extension patch panel is followed by a 2 RU horizontal cable manager, Reference Volume 2, Elevation 2a/A16-02.02.

Next a 48 port, Cat 6 modular patch panel for Large and Medium (I and II) Administration Buildings and a 24 port modular patch panel for the Basic Building type is to be installed. A horizontal cable manager shall be installed below the patch panel. Every patch panel shall have a horizontal cable manager above and below for structured patch cable routing. All cabling distribution for voice and data originates from this 48port Cat 6 patchpanel. Cables terminate to modular jacks that are the same color and are labeled identically to the jacks at the work area outlets in cubicles and offices, IP/PoE cameras and wireless access points. Two Cat 6 cables shall be terminated at each faceplate as signified on the communications plans with a triangle symbol. Two cables (for large and medium buildings) shall be terminated and labeled and coiled in the ceiling (with 10-foot slack loop) at midpoints toward the ends of the building for use with wireless access points. IP/PoE Camera locations at the administration building shall have a Cat 6 cable and termination as well. Cable is supported via approved hangers at four to five foot intervals when distributed throughout the building via the above ceiling space based on the layout on the power and communications plans. Cabling shall be routed along the corridor and follow a 90-degree path to workstations and distribution locations for an organized structured layout. Cabling in the LAN Room is combed and bundled on the ladder tray across the room to Rack 1 for Voice and Data and to Rack 2 for Security. All cabling shall be properly labeled to identify the outlet number the cable connects to. The cable purpose shall be denoted by the color of jack termination.

- 8. Yellow Connector /Jack- Phones
- 9. Blue Connector /Jack Computers
- 10. Gray Connector /Jack Cameras/Security
- 11. White Connector /Jack Wireless Access Points

All UTP voice/data cable shall be Blue in color. Three and Six foot Cat 6 Patch cables, with equivalent performance to the distribution cable, shall be provided by the Contractor. A patchcord of the same color as the termination connector shall be provided for each port in the LAN Room.

Cat 6 Patchcords for the station cabling shall be 10-foot and 15-foot length and shall be white in color. Two patchcords are to be provided for each faceplate.

The Structured Cabling System for this project including subsystem components; cable, termination hardware, supporting hardware and miscellaneous items required to install a fully operational telecommunications system shall support voice, data and video. This effort shall include all labor, materials supervision, tooling and miscellaneous mounting hardware and consumables necessary to install a complete system. The cable/component manufacturers' extended component warranty shall provide for functionality of all cable/components from the day of acceptance. The link performance defined by the manufacturer for both copper and optical fiber systems shall be warranted including all necessary labor and materials in accordance with the manufacturers 20-year warranty program. The Contractor's Communication Contractor shall be a Certified and Approved Value Added Reseller (VAR) for the cabling and components of the structured cabling system proposed prior to bidding the project. There is no provision for the Contractor's contractors to bid the project and then seek to train personnel and achieve VAR status. Contractor must present documentation of completing work on five equivalent or more complex projects in the past three years and submit five projects completed utilizing the proposed manufacturers system and submit proof of warranty certification for each of these projects.

The Contractor bidding this project shall have a BICSI® certified RCDD on staff to review drawings and submittals and provide quality assurance inspections and assure warranty compliance and certification. The Contractor's Communications Contractor shall perform no portion of the work requiring submittal and review of record drawings, shop drawings, product data, or samples until the respective submittal has been approved by Owner (GSA)/Owner Representative. Such work shall be in accordance with approved submittals.

The Contractor's Communications Contractor's BICSI Registered Communications Distribution Designer (RCDD) supervisor shall review, approve and stamp all documents prior to submitting.

Warranty: Contractor shall deliver manufacturer's signed Extended Product and System Assurance Warranty of installed cabling system to include all components that comprise the complete cabling system. Receipt of the warranty shall be within two weeks of the time of final punch list review. Failure of any component to pass system component tests shall be promptly ameliorated. The Contractor's Communications Contractor shall coordinate with manufacturer for warranty paperwork and procedures prior to the start of the project. This warranty shall be issued to the owner prior to final acceptance of the project.

Cable Testing Plan: The Contractor's Communications Contractor shall provide a test plan for media testing prior to beginning cable testing. The following minimal items shall be submitted for review:

- All testing methods/Product data for test equipment
- Certifications and qualifications of all persons conducting the testing
- Calibration certificates indicating that equipment calibration meets National Institute of Standards and Technology (NIST) standards and has been calibrated at least once in the previous calendar year
- Copper Cabling shall comply with link performance requirements of the latest revision of ANSI/TIA 568-C.2.
- Fiber Optic Cabling shall comply with the cable performance requirements of the latest version of TIA 568-C.3, and the fiber optic connectors shall comply with the performance requirements found in Annex A of the Same Standard.

Cable Testing Reports: The Contractor's Communications Contractor shall submit cable test reports as follows:

- The tests shall clearly demonstrate that the media and its components fully comply with the requirements specified herein.
- Electronic and hardcopy versions of test reports shall be submitted together and clearly identified with cable identification. A native application version of the test results shall be submitted and shall include a copy of the tester application software to assure output is viable and useful for integration with owners CMDB or other databases.
- Any cable damaged or exceeding recommended installation parameters shall be replaced by the contractor prior to final acceptance at no cost to the GSA.

Record Drawings: Furnish "as built" CAD drawings of completed work accurately depicting the status of the system including termination locations, cable routing, cable numbers and labels.

For the purpose of identifying HVAC loads and general information, the planned IT equipment to be deployed at each FMCSA Southern Border facility (by the owner) is shown below:

Server Manufacturer: HP Model number: Proliant ML 370 Wattage/power rating: not listed, but router is plugged in a regular 110/120 volt outlet

Switch Manufacturer: Cisco Systems Model number: Catalyst 3500 Series XL Wattage/power rating: 100-127 V/200-240 V, 1.0A/0.5A
Router Manufacturer: Cisco Systems Model number: 1841 Wattage/power rating: 120-240 VAC 1A

UPS (power supply) Two units (1 per Rack servicing IT and Security) Manufacturer: APC Model number: SMT2200RM3U (or equal) Wattage/power rating: 110/120 V, 12 AMPS

Telephone System Manufacturer: Cisco 2921 UC Bundle w/pvdm3-32 fl-cme-srst-25 Cisco WS-C3750X-24P-L or Cisco WS-C3750X-48P-L Wattage/power rating: 120 VAC, 1.9 A

Slave Unit for Internet/T1 Line Manufacturer: Campus RS ADC Model number: not listed Wattage/power rating: 120 VAC/220 VAC, .02 A

The locations for cabling drops and VoIP instruments and personal computers shall be documented via the telecommunications data/power plans. This shall assure a fully functional voice/data system is constructed, installed and tested at each site.



**Floor Plan** 

9/26/2018



**Rack Elevation** 

### 2. Security Requirements:

This SOW is provided for the protection of Department of Transportation (DOT) owned, leased or occupied Federal facilities. The SOW ensures an effective and efficient Facilities Protection Program for the U.S. Department of Transportation; particularly, Federal Motor Carrier Safety Administration (FMCSA) employees and facilities. This SOW includes all laws within USDOT, Executive Orders, Presidential Directives and applicable Government-wide regulation and directives pertaining to the protection of Federal facilities.

It's important that all parties involved in the design, construction, and maintenance of FMCSA occupied space(s) are aware of and comply with this general Statement of Work and the requirements FMCSA has set forth for the protection of the designated facility. The information contained in this SOW originates in guidance stemming from multiple Federal Directives, Orders and manuals addressing the protection of Federal facilities, particularly Executive Order I2977 (E.O. 12977) and Homeland Security Presidential Directive 7 (HSPD-7).

This SOW shall provide all parties involved a general consensus of the responsibility FMCSA has as it pertains to implementing and maintaining a successful risk management process with respect to the physical security of all FMCSA Facilities. As USDOT owns and operates facilities that vary in function and purpose; each of these physical assets is important to the overall mission of the Department. Each DOT component's infrastructure carries its own risk; thus each organization must examine its own areas of operations and set forth guidance recommended by HSPD-7.

Attached are the general requirements set forth for all required security equipment and protection. Following the risk management process outlined in the references, FMCSA shall be able to mitigate risk at each of its field operating facilities.

The U.S. Department of Transportation; Federal Motor Carrier Safety Administration (FMCSA) is requesting a quote for the purchase, installation, and commissioning of an access control and CCTV closed circuit television (CCTV) system for its Southern Border port of Entry Inspection Facility at Hidalgo.

The contractor shall install a system that shall operate independently at the site. The system specified herein shall include up to 1000 event memory logger accessible via control keypads, real time clock, calendar, test timer, battery charging/voltage supervision circuitry, ground fault detection circuitry lightening/EMI protection circuits, and the associated optional modules and components for a fully operational system. The system shall be installed and programmed to allow the security devices to perform their respective functions without demerit, malfunctions, or false alarms.

The Government requires installation services that shall offer a superior level of workmanship through a team of responsive, highly skilled professionals. The contractor shall be an authorized dealer of the system and installers shall be trained and certified to perform the initial installation, as well as to service and repair the system after the system has been accepted by the client.

The quality of the performance of the contractor shall directly impact the FMCSA and the ability to meet our business goals.

The contractor shall provide all management, supervision, manpower, labor services, parts, supplies, tools, test equipment, lifts, ladders, packaging and shipment of items

necessary to perform overall installation of the security equipment for this project. The contractor shall plan, schedule, coordinate and ensure effective performance of all work being provided.

The following requirements are applicable however they may not be inclusive of all necessary requirements. The contractor must submit a technical proposal which includes its technical approach for performing the services, management plan which includes descriptions of how they intend to maintain quality services throughout the period of performance as well meet the schedules identified for each problem and its solution, key personnel, and a description of the company's qualifications and experience in performing similar services.

Furnish and install 3 HSPD-12 Compliance Card Readers (PIV/Key Pad). The Contractor shall install PIV Class Readers on all entrances to the facility. The mounting height shall be ADA compliant. The system shall consist of appropriate magnetic contacts (recessed or surface mounted) on all perimeter doors and an electric strike. The location of the card readers shall be:

- Front Entrance Door
- Access from vestibule to operational area
- Access side door entrance. (Employee entrance only)

The operational area is the work space for employees. Employees shall also have an access code to the card reader.

Install electronic locking hardware on doors 1, 2, and 3. This allows the doors to lock from within once the door closes.

Furnish and install cameras - CCTV cameras as depicted in camera coverage schematics for the exterior of the administration building and the Inspection Canopy. In addition, a camera(s) shall be installed at each end of the canopy with viewing toward the interior. All cameras should be 510 LOR, low LUX, auto iris, color, day/night digital camera.

Install the necessary security panel in the LAN Room. The security panel should have a battery back-up sufficient to provide four-six hours of service. (Specified below)

Connect the CCTV cameras to a new Digital Video Recorder (specified below).

Install Camera Power Supplies, required to support all cameras with battery-backup capable of a four, six-hour minimum run-time.

Install DVR capable of storing a minimum of one (1) month of video for all cameras at 3.75/IPS 4CIF.

Furnish and install new Uninterruptable Power Supply with a minimum run-time of one hour on battery.

**Equipment Requirements:** 

Note: REQUIREMENTS SHOULD MATCH OR EQUAL THE PRODUCT DESCRIPTION/POSITIONING AS SPECIFIED.

The Contractor shall furnish and install items below along with all accessory items needed to provide a complete system.

(3) Three <u>Key Pad Readers</u> for the building. The contractor shall furnish and install PIV Class Readers on all entrances to the facility. The mounting height shall be ADA compliant. The system shall consist of appropriate magnetic contacts (recessed or surface mounted) on all controlled doors and an electric strike.

(1) One <u>Bosch D4412C623W Security Package</u> to include but not limited to; door contacts, window contacts (where required), wiring etc. The preferred alarm system is Bosch D4412C623W Control/Command Package. The IDS shall be programmed to function in an arm/disarm mode – that is, a properly programmed keypad zoned to a particular alarm point shall arm or disarm the system through the use of an authorized numeric code.

All wires shall be homerun to the alarm control panel. There shall be no splices, T-Taps, etc. except at the panel. At the head-end location, all devices, wires, etc. must be concealed. All cabinets shall have tamper switches installed and all devices inside enclosures shall have their tamper switches activated if they are so equipped with cover tamper switches.

The keypads installed shall annunciate locally along with a display in plain English, a text description of the location where the alarm is being generated (Door 1, 2 or 3). Keypads shall be installed on the alarm panel, at each perimeter door as noted in construction drawings.

(3) Three Electric Strikes Folger-Adam, #310-2 or equal.

One (1) <u>Bosch DVR</u> model DHR-753-16A800, 600 Series Hybrid Recorder, 16 Ch., Int. DVD-RW, 8TB, 1GB Ethernet Port.. DOT FMCSA recommended Bosch Video Recorder 600 or approved equal to record at a frame capture rate of 7.5. Video is stored by one DVR capable of storing video for 30 days. The DVR must retain recorded video for 30 days and then the material is over written. The DVR is a stand-alone system

Two (2) 19" Bosch Color <u>LCD Monitor</u>, 1280 X 1024 Resolution, VGA, DVI, Audio, 120/230VAC, 50/60 HZ

One (1) APC Smart-UPS XL 2200VA RM 3U 120V

Bosch VDC-485V03-20S Camera FlexiDome-XT+, Color NTSC, 540TVL, 12VDC/24VAC 60HZ, W/3-9.5MM F1.0 Varifocal, White, SMB...Surveillance Cameras shall be installed at each door entry of DOT FMCSA and at locations as depicted on camera plan at the Administration Building and the Inspection Canopy. The Contractor's Contractor shall install appropriate cameras with the proper lenses and compatible with the CCTV equipment. The camera shall be enclosed in Bosch Flexidome-XT and securely fastened to the ceiling and or structure as required. These cameras shall be 510 LOR, low lux, auto iris color, day/night digital cameras and report to a network addressable, eight channel digital video recorder (DVR). The Contractor's Contractor shall specify the camera lenses based on the need.

One (1) Altronix ALTV2416ULX3 Power Supply, 16 Channel, 120VAC Input, 24-28VAC Output, 7A Total Output.

Positioning of Equipment -

Location of Camera on building and canopy shall be as follows. All buildings shall have a total number of cameras as depicted on camera coverage schematic plans. The cameras shall be placed at corners of building and oriented such that all elevations are covered. Where canopies exist; in addition to camera locations depicted on schematics, the lanes of the canopy shall have a camera(s) installed underneath canopies directed inward and at locations on exterior as depicted on schematic plans.

All security system control panel/components must be located in the LAN room.

Installation Services:

Wiring that is exposed should be in conduit. Junction boxes are required above the 3 doors with flex conduit to the device (electric strike) locations.

All materials and workmanship provided by the contractor shall be performed in the best practice of the trade utilizing the latest state-of the art methods and shall meet all Underwriters' Laboratories (UL) standards for safety including the UL 681, Installation and Classification of Mercantile and Bank Burglar-Alarm systems, and UL 611, Central Station Burglar-Alarm Systems, National Fire Protection Association (NFPA) requirements, National Electrical Code (NEC), and applicable state and local codes.

All detection devices, the control panel, and all spare enclosures MUST have internal tamper switches and they must be connected, programmed and functional.

Detection devices that are sealed and have wire leads, the end of line resistor shall be spliced in-line with the leads. End of line resistors shall not be mounted in the alarm control panel.

The contractor shall homerun a wire for each device, keypad, receiver, etc. to the alarm control panel/enclosure. There shall be no splices, t-taps, etc.

For all wiring inside the agency's protected space, the contractor shall conceal all wire outside the panel enclosures by placing the wire in the walls; in the ceilings, in the doorframes or in EMT to ensure tamper resistance. Every attempt shall be made to fish wires in walls before using EMT.

For all wiring outside the protected space, the contractor shall use EMT. Unprotected space shall be defined as any and all wire runs outside of the agency space. Wires shall not to be exposed or visible.

The contractor shall securely fasten all security system wiring above drop ceiling systems to the ceiling / roof supports or other structures that would provide adequate support, so as to prevent damage that may occur from existing or future wire runs or work performed above the ceiling tile. No wiring should be run directly on top of the ceiling tiles. There shall be no exposed conduit on the outside of the building.

There shall be no mechanical pulling of wires - no exception. The use of mechanical pulling devices has been found to damage the low voltage cable and wiring.

The contractor may install stranded, non-plenum, UL Listed Wire and Cable. Use only stranded wire of appropriate size and solid copper core RG69U coax with a copper shield. Install an extra pair of wires to each location to allow for future expansion.

The Contractor shall ensure all devices are mounted in accordance with manufacturer's printed recommendations, any applicable UL standards, and all BOCA, NEC, NEMA, NFPA, NBFAA listings, codes, etc. must be followed, in addition to all state, local, or Authority Having Jurisdiction (AHJ) requirements. If a conflict occurs, the most stringent requirement shall prevail. The applicable codes are Underwriters Lab, (UL); and any other industry recognized governing body.

#### Codes:

The Contractor shall provide the services described in the contract according to applicable building codes and regulations.

#### Additional Terms:

Site Inspection: The locations where there shall be installations; should be carefully examined and it shall be the responsibility of the Contractor prior to bidding this job, to seek clarification to any unclear items of the specifications and inform themselves of existing site conditions. Failure to do so shall in no way relieve the Contractor from work that may be required to carry out the terms of the contract, in accordance with the true intent and meaning of the specifications at no cost to the Government.

### **Existing Conditions:**

The Contractor shall verify all conditions and locations in the field and accept these conditions unless the Contractor reports any discrepancies to FMCSA prior to submitting a bid.

#### Coordination:

The Contractor is responsible for all parts of the work under this contract, including all work, which the Contractor may sub-contract. If various items of work are grouped, then the Contractor may allocate this work to Subcontractors and suppliers at his discretion. It shall be his responsibility, however, to settle definitely that portion of the work which each shall do. DOT ASSUMES NO RESPONSIBILITY WHAT SO EVER FOR ANY JURISDICTIONAL CLAIM BY ANY TRADE INVOLVED. The

Contractor shall insure complete cooperation by all parties, which he may bring together to accomplish the work described.

#### Supervision:

The Contractor shall give his personal attention to the work at all times and shall either be present in person or have a duly authorized representative on site continuously during working hours throughout the progress of the work.

#### Labor and Tools:

Any work scheduled should be properly done with skilled labor and shall not be attempted with common labor. The Contractor shall have on the job at all time, ample equipment and personnel to carry out the work properly, including such tools as may be necessary to meet emergency requirements. The installation crew shall need to have been trained and familiar with all equipment provided for this installation.

#### As-Builts:

Upon completion of installation, the Contractor shall prepare "as-built" drawings of the system. These as-built drawings shall be in an easily reproducible format indicating the exact device locations, panel terminations, cable routes and wire numbers as tagged and color-coded on the cable tag. Additionally, final point-to-point wiring diagrams of each type of device shall be included in the as-builts, as shall a wiring legend that clearly defines wire color-coding and tagging. The as-built drawings shall be of an easily readable size and font, and shall remain with the system owner. A reduced-legend shall also be left inside the control panel to depict the wire color-coding and tagging for future reference. As-builts shall be submitted to the owner for approval prior to the system acceptance walk-through.

#### **Unusual Conditions:**

Any conditions, which appear illegal, incorrect, contrary to good installation practices, or otherwise unsatisfactory, shall be brought to GSA/FMCSA attention immediately.

The Contractor shall determine if the delivery dates of any materials specified shall cause a delay to the intended completion date. Should any delays be anticipated, the Contractor shall inform GSA/FMCSA and work with FMCSA to find other material sources to complete the project.

The Contractor's security contractor shall coordinate with the general contractor before starting any work. This is important in ensuring electrical wiring is coordinated.

#### Guarantee:

The Contractor shall guarantee all work executed under this contract, both as to material and workmanship, for a period of twelve (12) months after the date of the certificate of substantial completion, unless otherwise specifically provided for in the contract. The Contractor shall replace any material found defective at the time of installation (including faulty workmanship) with new material. Any such replacing shall be done promptly and at no additional cost to the GSA/FMCSA and at the least inconvenience to the agency.

Test and Acceptance:

The alarm system may have two (2), Government furnished, dedicated analog standard POTS telephone line connected to it. If installed, the alarm system shall have two (2) Ditek MRJ31XSCP-RUV surge protectors, installed ahead of and in addition to standard RJ31X jacks.

### Training:

After the System has been fully tested and accepted by the DOT FMCSA, the contractor shall provide training on the system to DOT FMCSA employees on site.

The training for the system shall be sufficient to enable all attendees to have a good general understanding of the components, arming and disarming the system, the operations manual, and how to reset the system. This training shall be video recorded for ongoing use.

A complete set of operating manuals and all device associated software shall be provided to the GSA/DOT FMCSA office for the operation and maintenance of the system.

## ACCEPTABLE EQUIPMENT:

For security equipment, UL Listed products shall be used and designed for the purpose and installed in a way that UL would issue a UL certification, if requested. The Door Contacts must be recessed, except where it is not possible due to concrete filled doorframes and such. In all cases, no wiring for all devices shall be exposed for any reason (even on surface door contacts) use surface contacts that have an armored shield surrounding the wire.

# 1. APPROVED MANUFACTURERS:

- a. Hirsh
- b. Johnson Controls / Software House
- c. Gallagher Security

## WARRANTY SERVICE AND MAINTENANCE:

System maintenance and repair of system or workmanship defects during the warranty period shall be provided by the Contractor free of charge (parts and labor).

Periodic testing of the system shall be carried out on a quarterly basis to ensure the integrity of the control panel and the telephone lines.

The Contractor shall correct any system defect within six (6) hours of receipt of call from the owner.

## SITE ASSESSMENT:

The Contractor shall contact the site point of contact to make arrangements to conduct a site assessment. The contact should be no less than one (1) week in advance. The purpose of the site assessment is to determine the labor and materials required for each site, and to ensure the availability of telephone line and power requirements in accordance with this statement of work.

If the site assessment reveals a need for installation of telephone line and/or power, the Contractor shall coordinate with the DOT FMCSA point of contact to arrange installation.

# SECTION 31 10 00 — SITE CLEARING, GRADING AND FILLING

### PART 1 - GENERAL

### 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

## 1.2 WORK INCLUDED

- A. Clearing, filling and grading of the affected areas of the site.
- B. Top Soil removal and reuse.
- C. Disposal of debris and surplus materials.
- D. Protection of trees and vegetation to remain, coordinate with the Architect.

### 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS:

- A. Excation and backfilling for underground site utilities.
- B. Paving and sidewalks.
- C. Site drainage systems.

### 1.4 QUALITY ASSURANCE

- A. Testing Laboratory Services: Installed materials shall meet specified requirements as determined by the Owner's Testing Laboratory.
- B. Proposed sitework contractor shall be able to provide documentation that he has a minimum of three years of satisfactory experience in the performance of similar operations.

### PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Existing top soil to be stockpiled and reused.
- B. Existing and off-site earth fill as required.
- C. TOPSOIL:
  - 1. Rich sandy loam, low in silt, free of trash, rocks, debris and other foreign materials.
  - 2. Topsoil stripped at the site and stockpiled may be used if material meets the above requirements and quantities are sufficient to meet all topsoil needs of the site. Otherwise topsoil meeting specified requirements and approved by the testing laboratory shall be provided from an approved off site source.
- D. FERTILIZER AND GRASSING: Provide grass to replace any disturbed areas during regarding.

## PART 3 - EXECUTION

## 3.1 PROTECTION OF EXISTING TREES AND VEGETATION

- A. GENERAL: In addition to any temporary construction fencing provided under Section 01 50 00 Temporary Facilities, provide temporary chain link fencing around existing shrubs, grasses, ground cover and tress indicated to remain. Locate fencing around drip lines of individual trees or groups of trees.
- B. REPLACEMENT: Replace damaged existing trees and vegetation indicated to remain with materials of like kind, size and maturity as approved by the architect. Follow supplier's recommended procedures of planting.

# 3.2 TOPSOIL REMOVAL AND EXCAVATION

- A. Strip topsoil to a depth of 4" to 6" under all new site paving, sidewalks, within new building lines and at all site areas which will receive earth fill for grading adjustments.
- B. Temporarily store removed topsoil at an on-site location designated by the Architect. Stored topsoil shall be kept free of trash and construction debris.
- C. Remove additional existing soil as required to achieve any finish paving grades which may be at or near natural grade elevation.

## 3.3 EXCAVATING, GRADING AND FILLING

- A. GRADE ELEVATIONS: Establish finish grades as indicated on the drawings. Set and maintain grade stakes.
- B. ROUGH GRADING:
  - 1. Provide clean earth fill meeting specified requirements from off-site should additional earth fill be required.
  - 2. Provide temporary and permanent drainage swales, pumps, gutters and trenches necessary to dry existing soil and carry off water during construction. As indicated on drawings shape the site around structures to drain away from the building(s) at all times. Do not allow water to stand around trees scheduled to remain.

- 3. All site fill at unpaved and typical sidewalks areas shall be thoroughly compacted in lifts as specified below. Each layer and subgrade shall be wetted or dried as required to achieve optimum moisture content and then compacted to minimum ninety (90%) percent Proctor density per ASTM D1557. The subgrade shall be thoroughly and completely scarified before wetting and rolling.
- C. COMPACTION: Compaction may be obtained by any of the following methods:
  - 1. By sheepsfoot rollers having a unit weight on the contact feet of not less than 300 pounds per square inch with the soil being compacted in layers not exceeding 8" in depth (loose measurement).
  - 2. By pneumatic tired rollers having a minimum compression of 325 pounds per inch of width of tire tread, with the soil being compacted in layers not exceeding 8" in depth (loose measurement).
  - 3. For those portions of fill which cannot be reached with the sheepsfoot roller, such as corners and areas adjacent to columns, beams, etc., mechanical tampers shall be employed to obtain specified compaction.
- D. EXISTING UTILITIES:
  - 1. Arrange with utility companies for removal or relocation of any existing utilities.
  - 2. Remove abandoned utilities up to the property line and provide permanent watertight cap.
  - 3. If unknown or uncharted utilities are encountered during excavation, promptly notify the Architect before proceeding. Damage to existing utilities by continuing work without notifying the Architect shall be repaired by the Contractor at no additional cost to the Owner.

## E. FINISH GRADING;

- 1. After rough grading and proof rolling operations are complete, install 2" of topsoil over unpaved open area (within the limits of grading) and fine grade to finish contours and make ready to receive grass planting (whether or not grass planting is required under this contract).
- 2. Open areas shall be raked smooth and left free of clumps, trash, debris and vegetation. Finish grading shall be uniform in planarity, meeting elevations and slopes as indicated on the drawings, and as required to ensure proper drainage.

# 3.4 DISPOSAL:

- 1. Adhere to Federal, State, County and local regulations regarding disposal of removed trees, shrubs, vegetation, soil, and rubble. It is the sole responsibility of the Contractor to determine the regulations regarding on-site burning of removed trees and vegetation.
- 2. Upon completion of fine grading operations, any excess soil shall be removed from the site, stockpiled at the site, or relocated to any property controlled by the Owner within five miles of the site. The above options shall be as determined by the Owner at no additional cost to the Owner.

# END OF SECTION

## SECTION 31 31 16 - TERMITE CONTROL

### PART 1 - GENERAL

### 1.1 COORDINATION

- A. The General Conditions of the Contractor for Construction and the Supplementary Conditions to the General Conditions of the Contract for the Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addendum issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the stringent requirements and the greater quantity shall apply.

### 1.2 SECTION REQUIREMENTS

- A. Submittals: Product Data and product certificates signed by manufacturer certifying that products used comply with U.S. EPA regulations for termiticides. Include application instructions and EPA-Registered Label.
- B. Engage a licensed professional pest control operator to apply termite control solution.

### PART 2 - PRODUCTS

### 2.1 TERMITICIDES

A. Provide an EPA-registered termiticide (5 year) complying with requirements of authorities having jurisdiction, in a soluable or emulsible, concentrated formulation that dilutes with water or foaming agent. Use only soil treatment solutions that are not harmful to plants. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to the product's EPA-Registered Label.

### PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Prepare surfaces and apply treatment at rates and concentrations recommended in manufacturer's written instructions.
- B. Apply termite control to the following:
  - 1. At foundations. (Piers, mid-span supports)
  - 2. Under sub-floors and flooring materials.

- 3. Under basement floor slabs.
- 4. At hollow masonry.
- 5. At expansion and control joints and slab penetrations.
- 6. At crawlspaces; treat soil under and adjacent to foundation supports. Treat adjacent areas including around entrance platform, porches, and equipment bases. Apply overall treatment.
- C. Post warning signs in areas of application.
- D. Reapply soil termiticide treatment solution to areas disturbed by subsequent excavation or other construction activities following application.

END OF SECTION

## SECTION 32 11 00 — FLEXIBLE BASE

### PART 1 - GENERAL

### 1.00 COORDINATION

- A. The General Conditions of the Contractor for Construction and the Supplementary Conditions to the General Conditions of the Contract for the Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addendum issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the stringent requirements and the greater quantity shall apply.

### 1.01 GENERAL DESCRIPTION OF WORK:

- 1. This work shall consist of furnishing and placing a foundation course for surface courses or for other base courses.
- 2. Flexible base shall be composed of either caliche (argillaceous limestone, calcareous or calcareous clay particles, with or without stone, conglomerate, gravel, sand or other granular materials), crushed stone, gravel, iron, or topsoil, shell, or crushed slag.
- 3. Flexible base shall be constructed as specified herein in one or more courses in conformance with details, lines and grades shown on the plans, and as established by the ENGINEER.

### PART 2 - PRODUCTS

### 2.01 MATERIALS

- 1. Materials for flexible base shall be crushed or uncrushed as necessary to comply with the requirements hereinafter specified.
- 2. Materials shall consist of durable course aggregate particles mixed with approved binding materials.

### 2.02 LIME STABILIZATION:

1. The material for flexible base shall be lime stabilized.

### 2.03 TYPES:

- 1. Type A Crushed or broken aggregate (excluding gravel aggregate).
- 2. Type B Gravel Aggregate
- 3. Type C Iron Ore Topsoil
- 4. Type D Shell Aggregate with Sand Admixture
- 5. Type E Shell Aggregate with Sand and Caliche Ad mixture
- 6. Type F Caliche
- 7. Type G Crushed Slag
- 8. Unless otherwise noted on the plans, the CONTRACTOR may use any on type of these types provided the material used meet the requirements set forth in the specification test limits herein.

## 2.04 GRADES:

- 1. Unless otherwise shown on the plans or directed by the ENGINEER, the final course of base material shall consist of Grades 1, 2, 3, or 4 as specified in Table 02601-1.
- 2. Base courses or subbase materials, unless otherwise noted on the plans or directed by the ENGINEER, may consist of Grades 1, 2, 3, or 4 as specified in Table 02601-1.
- 3. All grades shall, when tested in accordance with standard laboratory test procedures, meet the physical requirements set forth in Table 0260 1 1.
- 4. Testing of flexible base materials shall be in accordance with the following test procedures:

TEST	TESTING PROCEDURE
Preparation for soil constants and sieve analysis	ТЕХ-101-Е
Liquid Limit	TEX-104-E
Plastic Limit	ТЕХ-105-Е
Plasticity Limit	TEX-106-E
Sieve Analysis	ТЕХ-110-Е
Wet Ball Mill	TEX-116-E
Triaxial Test	TEX-117-E (Part I or II)

- 5. Unless otherwise specified on the plans, samples for testing the material for Soil constants, Graduation and Wet Ball Mill shall be taken prior to the compaction operations.
- 6. Unless otherwise specified on the plans, samples for triaxial tests shall be taken from the stockpile or from production, as directed by the ENGINEER, where stockpiling is required and from production where stockpiling is not required.

PHYSICAL REQUIREMENTS FOR FLEXIBLE BASE MATERIALS					
GRADES					
TYPES	Grade 1:	Grade 2:	Grade 3:	Grade 4:	
	(Triaxial class 1 Min. compressive Strength, psi: 45 at 0 psi lateral pressure and 175 at 15 psi lateral pressure	(Triaxial class 1 to 2.3)Min. compress- ive strength, psi: 35 at 0 psi lateral press- ure and 175 at 15 lateral pressure	(Unspecified Triaxial Class)		
TYPE A Crushed or Broken Aggregate (excluding gravel aggregate)	Retained on %   Sq. Sieve 1-3/40   1-3/40 7/8"0   7/8"30-50 No. 445-65   No. 445-65 No. 4070-85   Max LL35 Max PI10   Wet Ball Mill	Retained on %   Sq. Sieve 1-3/4"0-10   No. 4	Retained on % Sq. Sieve 1-3/4"0-10 No. 4060-85 Max LL45 Max PI15 Wet Ball Mill Max. Amt55 Max increase in passing	As Shown On Plans	

	Max Amt40 in Passing No. 4020	passing No. 4020	No. 4020	
TYPE B Gravel Aggregate		Retained on %   Sq. Sieve 12-2/4"0-10   No. 4	Retained on %   Sq. Sieve 1-3/4"0-5   No. 4	As Shown On Plans
TYPE C Iron Ore Topsoil		Retained on %   Sq. Sieve 2-1/2"0   No. 4050-85 Max LL35   Max PI12 Max PI	Retained on %   Sq. Sieve 2-3/4"0   No. 4045-85 Max LL35   Max PI12 Max PI	As Shown On Plans
TYPE D Sand-Shell		Retained on % Sq. Sieve 1-3/4"0-10 No. 445-65 No. 4050-70 Max LL35 Max PI12	Retained on %   Sq. Sieve 1-3/4"0   No. 4045-65 Max LL35   Max PI12	As Shown On Plans
TYPE E Shell with Sand and Caliche		Retained on %   Sq. Sieve 1-3/4"0   No. 4045-65 Max LL35   Max PI10	Retained on %   Sq. Sieve 1-3/4"0   No. 4045-65 Max LL35   Max PI12	As Shown On Plans
TYPE F Caliche		Retained on %   Sq. Sieve 1-3/4"0   No. 445-75 No. 4050-85   Max LL40 Max PI12	Retained on %   Sq. Sieve 1-3/4"0   No. 4050-85 Max LL40   Max PI12 %	As Shown On Plans
TYPE G Crushed Blast Furn- ance Slag				As Shown On Plans

7. The limits establishing reasonable close conformity with the specified gradation and plasticity index are defined by the following:

- 1) The ENGINEER may accept the material, providing not more than 2 of 10 consecutive gradation tests performed are outside the specified limits on any individual or combination of sieves by no more than 5% and where no two consecutive tests are outside the specified limits.
- 2) The ENGINEER may accept the material providing not more than 2 of 10 consecutive plasticity index samples tested are outside the specified limit by no more than two points and where no two consecutive tests are outside the specified limit.

## 2.05 STOCKPILING:

- 1. When specified on the plans, the material shall be stockpiled prior to delivery on the road. The stockpile shall be not less than the height indicated and shall be made up of layers of material not to exceed the depth shown on the plans.
- 2. After a sufficient stockpile has been constructed as specified on the plans, the CONTRACTOR may proceed with loading from the stock pile for delivery to the road.
- 3. In loading form the stockpile for delivery to the road, the material shall be loaded by making successive vertical cuts through the entire depth of the stockpile.
- 4. If the CONTRACTOR elects to produce the Type a material from more than one material or more than one source, each material shall be crushed separately and placed in separate stockpiles so that at least 75 percent of the material in the course aggregate stockpiles will be retained on the No. 4 sieve and at least 70 percent of the material in the fine aggregate stockpile will pass the No. 4 sieve.
- 5. The materials shall be combined in a central mixing plant in the proportions determined by the ENGINEER to produce a uniform mixture which meets all of the requirements of the specification. In the event that combinations of the materials produced fail to meet all of the specification requirements, the CONTRACTOR will be required to secure other materials which will meet specifications requirements.
- 6. The cental mixing plant shall be either the batch or continuous flow type, and shall be equipped with feeding and metering devices which will add the materials into the mixer in the specified quantities.
- 7. Mixing shall continue until a uniform mixture is obtained.

# PART 3 - EXECUTION

## 3.01 PREPARATION OF SUBGRADE

- 1. Type roadbed shall be excavated and shaped in conformity with the typical sections shown on the plans and to the lines and grades as established by the ENGINEER.
- 2. All unstable or otherwise objectionable material shall be removed from the subgrade and replaced with approved material.
- 3. All holes, ruts and depressions shall be filled with approved material and, if required, the subgrade shall be thoroughly wetted with water and reshaped and rolled to the extent directed in order to place the subgrade in an acceptable condition to receive the base material.
- 4. The surface of the subgrade shall be finished to line and grade as established and in conformity with the typical section shown on the plans, and any deviation in excess of 2 inch in cross section and in a length of 16-feet measured longitudinally shall be corrected by loosening, adding or removing material, reshaping and recompacting by sprinkling and rolling.
- 5. Sufficient subgrade shall be prepared in advance to insure satisfactory prosecution of the work.
- 6. Material excavated in the preparation of the subgrade shall be utilized in the construction of adjacent shoulders and slopes or other-wise disposed on as directed, and any additional material required for the completion of the shoulders and slopes shall be secured from sources indicated on plans or as directed by the ENGINEER.

- 3.02 PLACEMENT OF FIRST COURSE-TYPE A, TYPE B, TYPE C, TYPE F, AND TYPE G MATERIAL:
  - 1. Immediately before placing the base material, the subgrade shall be checked as to conformity with grade and section.
  - 2. The material shall be delivered in approved vehicles of a uniform capacity, and it shall be the charge of the CONTRACTOR that the required amount of specified material shall be delivered in each 100-foot station.
  - 3. Material deposited upon the subgrade shall be spread and shaped the same day.
  - 4. In the event inclement weather or other unforeseen circumstances render impractical the spreading of the material during the first 24-hour period, the material shall be scarified and spread as directed ENGINEER.
  - 5. The material shall be sprinkled, if directed, and shall than be bladed, dragged and shaped to conform to typical sections as shown on plans.
  - 6. All areas and Anests@ of segregated coarse or fine material shall be corrected to removed and replaced with well graded material, as directed by the ENGINEER.
  - 7. If additional binder is considered desirable or necessary after the material is spread and shaped, it shall be furnished and supplies in the amount directed by the ENGINEER. Such binder material shall be carefully and evenly incorporated with the material in place by scarifying, harrowing, brooming or by other approved methods.
  - 8. The course shall be compacted by method of compaction hereinafter specified as the AOrdinary Compaction@ method or the ADensity Control@ method of compaction as indicated on the plans, or as directed by the ENGINEER.
    - 1. When the AOrdinary Compaction@ method is to be used, the following provisions shall apply:
      - 1) The course shall be sprinkled as required and rolled as directed until a uniform compaction is secured. Throughout this entire operation, the shape of the course shall be maintained by blading and the surface upon completion shall be smooth and in conformity with the typical sections shown on the plans and to established lines and grades.
      - 2) In that area on which pavement is to be placed, any deviation in excess of 1/4 inch in cross section in a length of 16-feet measured longitudinally shall be corrected by loosening, adding or removing material, reshaping, and recompacting by sprinkling and rolling.
      - 3) All irregularities, depressions or weal spots which develop shall be corrected immediately by scarifying the areas affected, adding suitable material as required, reshaping and recompacting by sprinkling and rolling.
    - 2. When the ADensity Control@ method of compaction is to be used, the following provisions shall apply:
      - 1) The course shall be sprinkled as required and compacted to the extent necessary to provide not less than the percent density as hereinafter specified under ADensity@.
      - 2) In addition to the requirement specified for density, the full depth of the flexible base shown on the plans shall be compacted to the extent necessary to remain firm and stable under construction equipment.
      - 3) After each section of flexible base is completed, tests as necessary will be made by the ENGINEER. If the material fails to meet the density requirements, it shall be reworked as necessary to meet this requirements.
      - 4) Throughout this entire operation, the shape of the course shall be maintained blading, and the surface upon completion shall be smooth and in conformity with the typical sections shown on the plans and to established lined and grades.

- 5) In that area on which pavement is to be placed, any deviation in excess of 1/4 inch in cross section in a length of 16 feet measured longitudinally shall be corrected by loosening, adding or removing material, reshaping and recompacting by sprinkling and rolling.
- 6) All irregularities, depressions or weak spots which develop shall be corrected immediately by scarifying the areas affected, adding suitable material as required, reshaping and recompacting by sprinkling and rolling.
- 9. Should the base course, due to any reason or cause, lose the required stability, density or finish before the surfacing is complete, it shall be recompacted and refinished at the sole expense of the CONTRACTOR.
- 10. Where Type C material is used, the material shall be scarified, thoroughly wetted, mixed, manipulated, and bladed so as to secure a uniformly wetted material, and pulled in over the subgrade in courses and set under the action of blading and rolling. The work of mixing, blading, rolling, shaping and subsequent maintenance shall be performed by the continuous use of sufficient number of satisfactory rollers and power maintainers with adequate scarifier attachments.

# 3.03 PLACEMENT OF FIRST COURSE – TYPE D MATERIAL:

- 1. Immediately before placing the base material, the subgrade shall be checked as to conformity with grade and section, and corrections made if necessary.
- 2. All materials shall be delivered in approved vehicles of a uniform capacity.
- 3. The required amount of shell shall be uniformly spread across the section and allowed to dry sufficiently to insure proper slaking and mixing of the binder material. Immediately upon completion of the drying period, as determined by the ENGINEER, the specified amount of sand admixture as produce a combined material meeting the requirements hereinbefore specified, shall be spread uniformly across the shell.
- 4. The material shall then be sprinkled as required and thoroughly mixed by blading and harrowing, or other approved methods.
- 5. Failure to proceed with the placing of sand admixtures or mixing and placing operations will be grounds for the suspension of placing of shell.
- 6. Under no condition will the CONTRACTOR be allowed to place an excessive amount of shell without proceeding with the mixing and placing operations.
- 7. The course shall be compacted by the method of compaction hereinafter specified as the AOrdinary Compaction@ method of the ADensity Control@ method of compaction as indicated on the plans, or as directed by the ENGINEER.
  - 1. When the plans indicate that the AOrdinary Compaction@ method is to be used, the following provisions shall apply:
    - 1) After mixing, all material shall be windrowed, and then spread over the section in layers.
    - 2) The layer shall not exceed 2 inches in loose depth.
    - 3) If necessary to prevent segregation, the material shall be wetted in the window prior to spreading.
    - 4) After each lift is spread, it shall be sprinkled and rolled to secure maximum compaction as directed by the ENGINEER. Succeeding layers shall then be placed similarly until the course is completed.
    - 5) All areas and nest of segregated coarse or fine material shall be corrected or removed and replaced with well graded material, as directed by the ENGINEER.
    - 6) The course shall then be sprinkled as required and rolled as directed until a uniform compaction is secured.
    - 7) Throughout this entire operation, the shape of the course shall be maintained by blading,; and the surface, upon completion, shall be smooth and in conformity with the typical sections shown on the plans, and to the established lines and grades.
    - 8) In that area on which pavement is to be place, any deviation in excess of 1/4 inch in cross section in a length of 16-feet measured longitudinally shall be corrected by

loosening, adding or removing material, reshaping and recompacting by sprinkling and rolling.

- 9) All irregularities, depressions or weak spots which develop shall be corrected immediately by scarifying the areas affected, adding suitable material as required, reshaping and recompacting by sprinkling and rolling.
- 2. When the plans indicate that the ADensity Control@ method of compaction is to be used, the compaction method shall be the same as prescribed for Type A, Type B, Type C, Type F and Type G materials.
- 8. When indicated on the plans or permitted by the ENGINEER, Type D material may be mixed in a central mixing plant and delivered to the road as a combined mixture. When this method is used, the combined mixture shall meet the requirements for Type D material as hereinbefore specified and the placing and compaction requirement shall be the same as prescribed for Type A, Type B, Type C, Type F and Type G material.

# 3.04 PLACEMENT OF FIRST COURSE-TYPE E MATERIAL

- 1. The construction methods for placing the first course of Type E material shall be the same as prescribed for Type D material except that after the shell and sand have been placed, the prescribed amount of caliche shall then be spread across the sand and shell.
- 2. The composite mixture shall than be sprinkled as required and thoroughly mixed by blading and harrowing or other approved methods.
- 3. Compaction of the first course of Type E material shall be the same as prescribed above for Type D material.
- 4. Failure to proceed with placing the sand and caliche admixture or mixing and placing operations will be grounds for the suspension of placing the shell.
- 5. Under no conditions will the CONTRACTOR be allowed to place an excessive amount of shell without proceeding with the mixing and placing operations.

# 3.05 PLACEMENT OF SUCCEEDING COURSES – ALL MATERIAL TYPES:

- 1. Construction methods shall be the same as prescribed for the first course.
- 2. Prior to placing the surfacing on the completed base, the base shall be Adry cured@ to the extent directed by the ENGINEER.

# 3.06 DENSITY CONTROL:

- 1. When the ADensity Control@ method of compaction is indicated on the plans, each course of flexible base shall be compacted to the percent density shown on the plans.
- 2. The testing will be as outlined in Test Method Tex- I 14-E.
- 3. It is the intent of this specification to provide in that part of the base included in the top 8 inches immediately below the finished surface of the roadway not less than 100 percent of the density as determined by the compaction ratio method.
- 4. Field density determination shall be made in accordance with Test Method Tex115-E.
- 3.07 TOLERANCES:
  - 1. Flexible base will be measured by the square yard of surface area of completed and accepted work based on the width of flexible base as shown on the plans.
    - 1. The ENGINEER may accept the work providing not more than 25 percent of the density tests performed each day are outside the specified density by no more than three pounds per cubic foot and where no two consecutive tests on continuous work are outside the specified limits.

# PART 4 - MEASUREMENT AND PAYMENT

# 4.01 MEASUREMENT:

- 1. Flexible base will be measure by the square yard of surface area of completed and accepted work based on the width of flexible base as shown on the plans.
  - 1. The flexible base shall be measured for depth by the units of 2000 square yards, with one measurement taken at location selected by the ENGINEER.
  - 2. In that unit where flexible base is deficient by more than 2 inch in thickness, the deficiency shall be corrected by scarifying, adding material as required, reshaping and recompacting by sprinkling and rolling.
  - 3. No additional payment over the contract unit price will be made for any flexible base of a thickness exceeding that required by plans.
- 2. The CONTRACTOR shall schedule his operations in such a manner as to facilitate the measurement of the pay item.
- 3. The ENGINEER may accept the work provided no more than 2 out of 10 depth tests performed are deficient by not more 2 inch and where no two consecutive tests on continuous work are outside the specified depth.

## 4.02 PAYMENT:

- 1. The accepted quantities of flexible base of the type, grade, and compaction method specified will be paid at the contract unit bid price per square yard, complete in place.
- 2. Where ordinary Compaction is used, all sprinkling, rolling, and manipulation required will not be paid for directly, but will be incidental to other bid items.
- 3. The unit prices bid shall each be full compensation for shaping and fine grading the roadbed; for securing and furnishing all materials, including all royalty and freight involved, for furnishing scales and labor involved in weighing the material when required; for loosening, blasting, excavating, screening, crushing and temporary stockpiling when required; for loading all materials for all hauling and delivering on the road; for spreading, mixing, blading, dragging, shaping and finishing and for all manipulation, labor, tools, and incidentals necessary to complete the work.

### END OF SECTION

## SECTION 32 12 00 — PRIME COAT

### PART 1 - GENERAL

### 1.01 COORDINATION

- A. The General Conditions of the Contractor for Construction and the Supplementary Conditions to the General Conditions of the Contract for the Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addendum issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the stringent requirements and the greater quantity shall apply.

### 1.02 GENERAL DESCRIPTION

1. Prime coat shall consist of application of asphaltic materials on completed base course and/or other approved area, which shall be applied in accordance with these specifications, as shown on the plans, and as directed by the ENGINEER.

### 1.03 QUALITY ASSURANCE

- 1. Test and Certification of Bituminous Materials.
  - 1. Bituminous material is to be tested in accordance with the requirements of AASHTO M-82 and sampled in conformance with AASHTO T-40.
  - 2. Supply, at the time of delivery of each shipment of asphalt, two certified copies of test reports, from supplying vendor, to the ENGINEER.
  - 3. Test reports shall indicate name of vendor, type and grade of asphalt delivered, date and point of delivery, quantity delivered, delivery ticket number, purchase order number, and result of specified tests.
  - 4. The test report, signed by an authorized representative of the vendor, shall certify that the product delivered conforms to the specifications for type and grade indicated.
  - 5. Certified test reports and the testing required in the preparation of such report shall be at no cost to the City.
  - 6. Final acceptance of bituminous materials shall be dependent on the determination by the ENGINEER that the material meets prescribed standards.

# PART 2 - PRODUCTS

# 2.01 MEDIUM CURING CUTBACK ASPHALT

1. Medium-curing liquid asphalt, designated by the letters MC, shall consist of an uncracked petroleum bast stock, produced by the processing of asphaltic or semi asphaltic base crude petroleum, blended with a kerosene-type solvent. The base stock for all MC materials shall be straight run asphalt produced within the penetration range of 100 to 300, and the end point of the kerosene type solvent shall not exceed 525 degrees F. Medium curing liquid cutback asphalt shall be free from water and show no separation.

- 2. Medium curing cutback asphalt shall consist of materials specified above and conforming to the requirements set forth in Table 26 10- 1.
- 3. Unless otherwise noted on the plans or directed by the ENGINEER, cutback asphalt Grade MC-30 shall be used.
- 2.02 BLOTTER MATERIAL:
  - 1. Supply blotter material consisting of native and/or sweeping from base course.
  - 2. Native sand shall be local material obtained from approved sources as approved by the ENGINEER.

# PART 3 - EXECUTION

## 3.01 CONSTRUCTION METHODS

- 1. Unless otherwise specified on the plans or, required by the ENGINEER, only asphaltic material shall be used. Where required, a combination of asphaltic and blotter material shall be used.
- 2. Application of Asphaltic Materials Only.
  - 1. Apply prime coat to prepared surface when ambient air temperature is above 40 degrees F. and raising and shall not be applied when the ambient air temperature is below 50 degrees F. and falling.
  - 2. Apply prime coat to surfaces that have been cleaned by sweeping or other approved methods and where base is thoroughly dry and satisfactory for receiving prime coat.
  - 3. Apply prime coat to cleaned base, at a rate of 0.2 to 0.5 gallons per square yard of surface area, using an approved type of self-propelled pressure distributor so constructed and operated to distribute the material evenly and smoothly.
  - 4. Provide necessary facilities for the determination of temperature of asphaltic material in all heating equipment and distributors; and for determination of rate at which it is applied; and for securing uniformity at the junction of two distributor loads.
  - 5. Keep in clean and good working condition all storage tanks, piping, reports, booster tanks and distributors used in the storage and handling of asphaltic materials.
  - 6. Operate all associated equipment in a manner such that there is no contamination of asphaltic material with foreign material.
  - 7. Calibrate distributor and furnish ENGINEER with an accurate and satisfactory record of such calibrations.

<b>TABLE 2610-1</b>							
	AASHTO	ASTM					
Specification	Test	Test	MC	MC	MC	MC	MC
Designation	Method	Method	30	70	250	800	3000
Flash Point							
(Open Cleve)							
oF, Min.	T 48	D 92	100	100	150	150	150
Viscosity			30	70	250	800	3000
140oF,			to	to	to	to	to
Kinematic, CS	T 201	D2170	60	140	500	1600	6000
Furol Viscosity	Т 72	D 88					
at 77 F. (Secs.)			75-150				
at 122 F. (Secs.)				60-120			300
at 140 F. (Secs.)					125-250		to
at 180 F. (Secs.)						100-200	600
Distillation	Т 78	D 402					
Distillate (% of							

Total Distilate)							
to 680 F.							
to 437 F.			0-25	0-20	0-10	-0-	-0-
to 500 F.			40-70	25-60	20-55	10-35	0-15
to 600 F.			75-93	75-90	70-85	65-80	50-75
Residue from							
Distillation to							
680 F Volume %							
by Difference							
Min.			50	55	67	75	80
Test on Residue			120	120	120	120	120
From Distillation			to	to	to	to	to
Penetration at	T 49	D 5	250	250	250	250	250
77 F.							
*Ductility 77 F							
cm., Min.	T 51	D 113	100	100	100	100	100
Solubility in							
CC14, % Min.	T 44	NONE	99.5	99.5	99.5	99.5	99.5
Water, % Min.	Т 55	D 95	0.2	0.2	0.2	0.2	0.2
Reaction to							
Spot Test	T 102**	-0-		-0-	-0-	-0-	-0-

\* If penetration of residue is more than 200 and its ductility at  $77^{\circ}$  F is less than 100, the material will be acceptable if the ductility at  $60^{\circ}$  F is greater than 100.

\*\* Using 85% Standard Nephtha and 15% Xylene

NOTE: Viscosity tests may be made by either Kinematic or Furol test methods.

- 8. Recalibrates distributor, in a manner satisfactory to the ENGINEER, after the beginning of work, should the yield on the asphaltic material applied appear to be in error.
- 9. No traffic, hauling or placing of subsequent courses shall be permitted over fleshy applied prime coat until authorized by the ENGINEER.
- 10. Apply asphaltic material at a temperature within 15° F of temperature of application selected by the ENGINEER based on temperature viscosity relationship noted in Table 2610-1.
- 11. Maintain surface until work is Blotter Material.
- 3. Application of Asphaltic and Blotter Material.
  - 1. Haul blotter material in vehicles of uniform capacity and placedon shoulders at spacings designated by the ENGINEER.
  - 2. After application of asphaltic material as specified above, cover surface with blotter material as directed by the ENGINEER.
  - 3. After application of blotter material, drag surface with approved drag broom, evenly and smoothly distributing the blotter material. Brooming or dragging operation shall continue, as directed by the ENGINEER, until the course has properly cured under traffic.

### PART 4 - MEASUREMENT AND PAYMENT

- 4.01 PRIME COAT
  - 1. Asphaltic material for prime coat will be measured for payment at point of delivery on the project in gallons at applied temperature.

- 2. When not listed as a separate contract pay item, prime coat shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.
- 3. Compensation, whether by contract pay item or incidental work will be for furnishing all material, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

# 4.02 BLOTTER MATERIALS

1. Blotter mater will be considered to asphaltic material for prime coat with no direct payment or payment therefore.

# END OF SECTION

## SECTION 32 12 16 — HOT MIX ASPHALT CONCRETE PAVEMENT

### PART 1 - GENERAL

### 1.01 COORDINATION

- A. The General Conditions of the Contractor for Construction and the Supplementary Conditions to the General Conditions of the Contract for the Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addendum issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the stringent requirements and the greater quantity shall apply.

#### 1.02 DESCRIPTION

- 1. Hot mix asphalt concrete (HMAC) pavement shall consist of a binder course, a leveling up course, a surface course or a combination of the courses as shown on the plans, or as directed by the ENGINEER.
- 2. HMAC pavement shall be composed of a compacted mixture of mineral aggregated and asphaltic material, constructed on previously completed and approved subgrade, subbase course, base course, or existing pavement.
- 3. HMAC pavement shall be in accordance with the specifications herein and in conformity with the lines, grades, quantities, and typical sections in the contract and/or as directed by the ENGINEER.

#### 1.03 QUALITY CONTROL

1. HMAC pavement and its constituent part shall conform to the ASTM, AASHTO and/or Texas SDHPT test methods noted below.

## PART 2 - PRODUCTS

### 2.01 ASPHALTIC MATERIALS

- 1. Asphalt cement binders shall be uncracked petroleum asphalt and shall be carefully refined, be steam, vacuum, or solvent, from asphaltic or semiasphaltic base crude petroleum at a temperature not to exceed 700 degrees F. Asphalt cements shall be free from thermal decomposition products and shall not be blended with any materials which have been subject to cracking or produced from a crude petroleum source other than that of the original sources. Asphalt cement shall be homogeneous, free from water, and shall not foam when heated to 347 degrees F.
- 2. Paving asphalt shall be classified by penetration or viscosity and shall conform to the requirements set fort in one of the following tables as designated by the ENGINEER. The CONTRACTOR may supply asphalt meeting the requirements of one of the following tables provided that he obtains prior approval of the ENGINEER and with the provision that once approval has been obtained, that the CONTRACTOR will remain with that grade throughout the project.

	TABLE 02612-1							
	AASHTO	ASTM	40	60	85	120	150	200
Specification	Test	Test	to	to	to	to	to	to
Designation	Method	Method	50	70	100	150	200	250
Flash Point								
(Open Cup)								
Min.	T 48	D 92		450	450	450	425	350
Penetration of			40	60	85	120	150	200
Orig. Sample at 77			to	to	to	to	to	
F	T 49	D 5	50	70	100	150	200	250
Thin-Film Oven								
Loss, Hours at 325								
F, % Max	T 179	D 1754	0.75	0.75	0.75	0.75	1.00	1.00
Test of Residue								
from Thin-Film								
Oven Test: % of								
Orig. Pen., Min.	T 49	D 5	52	50	50	50	50	50
Ductility at 77 F,								
cm. after Loss at								
325 F, Min.	T 51	D 113	50	50	100	100	100	100
Solubility in								
CC14, % Min.	T 44*	NONE	99.5	99.5	99.5	99.5	99.5	99.5
Reaction to Spot								
Test	T 102**	NONE	-0-	-0-	-0-	-0-	-0-	-0-

\*Procedure No. 1 with CC1 4 substituted for CS2.

\*\*Using 85% Standard Nephtha and 15% Xylene.

TAI	BLE 0261	2-2				
TYPE-GRADE	OA-30		OA-17	5*	OA-400	
	Min. Ma	X.	Min. M	[ax.	Min. Ma	X.
Penetration at 32 F, 200g., 60 sec.	15		В	В	В	В
Penetration at 77 F, 100g., 5 sec.	25	35	150	200	В	В
Penetration at 115 F, 50g., 5 sec.	В	65	В	В	В	В
Ductility at 77 F, 5 Original OA	2	В	70	В	В	В
Flash Point C.O.C., F.	450	В	425	В	425	В
Softening Point, R & B.,F.	185	В	95	130	В	В
Thin Film Oven Test, 1/8 in Film 50 g.,						
5hrs., 325 F, % Loss by wt	В	0.4	В	1.4	В	2.0
Penetration of Residue, at 77 F, 100g., 5	В	В	40	В	В	В
sec. % of Original Pen						
Ductility of Residue at 77 F, 5 cm/min.,	В	В	В	100	В	В
cms						
Solubility in Trichloroethylene, %	99.0	В	99.0	В	99.0	В
Spot Test on Original OA	Ne	g.	Ne	eg.	Ne	g.
Float Test at 122 F, sec	В	В	В	В	120	150
Test on 85 to 115 Pen. Residue* Residue	В	В	В	В	75	В
by Wt., %						
Ductility, 77 F, 5 cm/min:	В	В	В	В	100	В
Original Res., cms						
Subjected to Thin Film Test, cms	В	В	В	В	100	В

*Determined by Vacuum Distillation	(by evaporation if unable to reduce by vacuum).
**For use with Latex Additive only.	

				TA	BLE 026	512-3						
PROPERTIES	AC-1.	5	AC-3		AC-5		AC-10		AC-20		AC-20	00
	MIN.N	AAX.	MIN.N	MAX.	MIN.N	AAX.	MIN.N	IAX.	MIN.N	AX.	MIN.N	MAX.
Viscosity, 140 F												
stokes	150	50	300	100	500	100	1000	200	2000	400	4000	800
Vistrosity, 275 F												
stokes	0.7	В	1.1	В	1.4	С	1.9	В	2.5	В	3.5	В
Penetration 77 F												
100 g, 5 sec.	250	В	210	В	135	В	85	В	55	В	35	В
Flash Point,												
C.O.C., F.	425	В	425	В	425	В	450	В	450	В	450	В
Solubility in												
trichloroethylene,												
percent	99.0	В	99.0	В	99.0	В	99.0	В	99.0	В	99.0	В
Test on residues												
from thin film												
oven test:												
Viscosity, 140 F												
stokes	В	450	В	900	1500	В	3000	В	6000	В	B 1	2000
Ductility, 77 F, 5												
cms per min, cms	100	В	100	В	100	В	70	В	50	В	30	В
Spot Test Negative on all grades												

3. A minimum of two percent, by weight, latex additive (solids basis) shall be added to the OA- 175 Asphalt or to AC-5 Asphalt when specified in the contract. The latex additive shall be governed by the following specifications.

The latex is to be an anionic emulsion of butadiene-styrene low-temperature copolymer in water, stabilized with fatty-acid soap so as to have good storage stability, and possessing the following properties:

Monomer ratio, B/S	70/30
Minimum solids content	76%
Solids content per gal. @ 67%	. 5.31bs
Coagulum on 80-mesh screen	. 0.01% max.
Type Anti-oxidant	. Staining
Mooney viscosity of Polymer (M/L4@212F)	100min.
pH of Latex	. 9.4-10.5
Surface tention	. 28-42 dynes/cm2

The finished latex-asphalt blend shall met the following requirements:

1. Asphalt content shall be within the limits noted below:

HMAC Type	Percent of Mixture by Weight	Percent of Mixture by Volume
AA@	3.5-7.0	8.0-16.0
AB@	3.5-7.0	8.0-16.0
AC@	3.5-7.0	8.0-16.0
AD@	4.0-8.0	9.0-19.0
AF@	3.5-6.5	8.0-16.0

- 2. At the time of delivery of each shipment of asphalt, the vendor supplying the material shall deliver to the purchaser certified copies of the test report which shall indicate the name of the vendor, type and grade of asphalt delivered, date and point of delivery, quantity delivered, delivery ticket number, and results of the above specified tests. The test report shall be certified and signed by an authorized representative of the vendor that the product delivered conforms to the specifications for the type and grade indicated.
- 3. Until the certified test reports and samples of the material have been checked by the ENGINEER to determine their conformity with the prescribed requirement, the material to which such report relates and any work in which it may have been incorporated as in integral component will be only tentatively accepted by the Owner. Final acceptance will be dependent upon the determination of the ENGINEER that the material involved fulfills the requirements prescribed therefore. The certified test reports and the testing required in connection with the reports will be at the expense to the Owner.
- 4. Unless otherwise specified in these specifications or in the Supplementary Specifications, the various grades of paving asphalt shall be applied at a temperature range between 225 to 350E F, the exact temperature to be determined by the ENGINEER.
- 5. Paving asphalt shall be heated in such a manner that stream or hot oils will not be introduced directly into the paving asphalt during heating. The CONTRACTOR shall furnish and keep on the site, at all times, an accurate thermometer suitable for determining the temperature of the paving asphalt.
- 6. HMAC asphalt shall be the grade having the highest penetration, within specified limits, to produce a mix having a maximum stability of the compacted mixtures.
- 7. Only one (1) grade of asphalt shall be required unless otherwise shown on the plans or as required by the ENGINEER.

# 2.02 AGGREGATES

1. HMAC aggregate will be tested in accordance with the following test.

Mechanic Testing
Passing No. 200 Sieve
Liquid Limit
Los Angeles Abrasion
Soundness (Magnesium Sulfate)
Resistance to Degradation
Sieve Analysis
Sand Equivalence Value
Method of Calculating Plasticity Index of Solids
(I & II) Determination of Deleterious Materials and Decantation
Test
Quality Tests for Mineral Aggregates

- 2. Aggregates shall have an abrasion of not more than 40 for all course except the non-skid surface course, which shall have an abrasion of not more than 35.
- 3. When property proportioned, HMAC aggregate shall produce a gradation, which will conform to the limitations for classification for HMAC type shown below, or as directed by the ENGINEER.
- 4. Course aggregate to be crushed limestone rock or crushed gravel with hydrated lime or limestone filler. (Crushed gravel shall be per Highway Department Specifications.)

- 5. Binder aggregate to be composed of 15% crushed limestone screening or as directed by the ENGINEER.
  - 1. Type AA@ Course Graded Base Course

<u> </u>	
	Percent Aggregate by
	Weight or Volume
Passing 2" sieve	100
Passing 1-3/4" sieve	95 to 100
Passing 1-3/4"sieve, retained on 7/8" sieve	16 to 42
Passing 7/8" sieve, retained on 3/8" sieve	16 to 42
Passing 3/8" sieve, retained on No. 4 sieve	5 to 21
Total retained on No. 10 sieve	68 to 84
Passing No. 10 sieve, retained on No. 40 sieve	5 to 21
Passing No. 40 sieve, retained on No. 80 sieve	3 to 16
Passing No. 80 sieve, retained on No. 200 sieve	2 to 16
Passing No. 200 sieve	1 to 8

2. Type AB@ - Fine Graded or Leveling-Up Course

Percent Aggregate by Weight or Volume

Passing 1" sieve	100
Passing 7/8" sieve	95 to 100
Passing 1-3/4" sieve, retained on 7/8" sieve	16 to 42
Passing 7/8" sieve, retained on 3/8" sieve	16 to 42
Passing 3/8" sieve, retained on No. 4 sieve	10 to 26
Passing No. 40 sieve, retained on No. 10 sieve	5 to 21
Total retained on No. 10 sieve	68 to 84
Passing No. 10 sieve, retained on No. 40 sieve	. 5 to 21
Passing No. 40 sieve, retained on No. 80 sieve	. 3 to 16
Passing No. 80 sieve, retained on No. 200 sieve	. 2 to 16
Passing No. 200 sieve	. 1 to 8

3. Type AC@ - Course Graded Surface Course

Percent Aggregate by Weight or Volume

Passing 7/8" sieve	100
Passing5/8" sieve	95 to 100
Passing 5/8" sieve, retained on 3/8" sieve	16 to 42
Passing 3/8" sieve, retained on No. 4 sieve	11 to 37
Passing No. 4 sieve, retained on No. 10 sieve	11 to 32
Total retained on No. 10 sieve	54 to 74
Passing No. 10 sieve, retained on No. 40 sieve	6 to 32
Passing No. 40 sieve, retained on No. 80 sieve	4 to 27
Passing No. 80 sieve, retained on No. 200 sieve	3 to 27
Passing No. 200 sieve	1 to 8

4. Type AD@ - Fine Graded Surface Course

Percent Aggregate by Weight or Volume

Passing 2" sieve	100	
Passing3/8" sieve	85 to	100
Passing 3/8" sieve, retained on No. 4 sieve	21 to	53

Passing No. 4 sieve, retained on No. 10 sieve	11 to	32
Total retained on No. 10 sieve	54 to	74
Passing No. 10 sieve, retained on No. 40 sieve	6 to 3	52
Passing No. 40 sieve, retained on No. 80 sieve	4 to 2	27
Passing No. 80 sieve, retained on No. 200 sieve	3 to 2	27
Passing No. 200 sieve	1 to 8	;

## 5. Type AF@ - Fine Graded Surface Course

Percent Aggregate by Weight or Volume

## 2.03 PRIME COAT

- 1. Prime coat, when specified on the plans, or as directed by the ENGINEER, shall be in accordance with Section 02610 <u>Prime Coat</u>, and as specified herein.
- 2. Prime coat shall be applied to surfaced of based at least 12 hours prior to placing the HMAC unless otherwise directed by the ENGINEER.
- 3. Asphalt prime shall be applied uniformly at the rate of 0. 10 to 0.30 gallon per square yard or as directed by the ENGINEER. It shall be applied only when permitted by the ENGINEER and when the air temperature is not less than 40 F.
- 4. In order to prevent lapping at the junction of two applications, the distributor shall be promptly shut off. A hand spray shall be used to touch up all spots unavoidably missed by the distributor.
- 5. Immediately prior to application of the asphalt prime, an inspection will be made by the ENGINEER to verify that the base course has been constructed as specified. Also, all loose and foreign material shall be removed by light sweeping. Material so removed shall not be mixed with cover aggregate.
- 6. The surface to be primed shall be in a smooth and well-compacted condition, true to grade and cross section, and free from ruts and inequalities.
- 7. The pressure distributor used for applying prime coat material shall be equipped with pneumatic tires and shall be so designed and operated as to distribute the prime material in a uniform spray without atomization, in the amount and between the limits of temperature specified. It shall be equipped with a speed tachometer registering feet per minute and so located as to be visible to the truck driver to enable him to maintain the constant speed required for application at the specified rate.
- 8. The pressure distributor shall be equipped with a tachometer registering the pump seed, pressure gauge, and a volume gauge. The rates of application shall not vary from the rates specified by the ENGINEER by more than 10%. Suitable means for accuracy indicating at all times the temperature of the prime material shall be provided. The thermometer well shall be so placed as not to be in contact with a heating tube.
- 9. The distributor shall be so designed that the normal width of application shall be not less than 6 feet, with provisions for the application of lesser width when necessary. If provided with heating attachments, the distributor shall be so equipped and operated that the prime material shall be circulated or agitated through the entire heating process.
- 10. The asphalt prime coat should preferably be entirely absorbed by the base course and, therefore, require no sand cover. If, however, it has not been completely absorbed prior to the start of placing

the asphalt concrete mixture and in the meantime it is necessary to permit traffic thereon, just sufficient sand shall be spread over the surface to blot up the excess liquid asphalt and prevent picking it up under traffic. Also, sand shall be used in areas where traffic may pass over the prime coat. Prior to placing the asphalt concrete, loose or excess sand shall be swept from the base. If a sand cover is specified in the Supplementary Specifications or noted on the plans to cover asphalt prime, it shall be applied within 4 hours after the application of said prime coat, unless otherwise ordered by the ENGINEER.

- 11. Liquid asphalt shall be prevented from spraying upon adjacent pavements, structures, guard rails, guide posts, culvert markers, trees, and shrubbery that are not to be removed; adjacent property and improvements; and other facilities or that portion of the traveled way being used by traffic.
- 12. The CONTRACTOR shall protect the prime coat against all damage and markings, both form other traffic. Barricades shall be placed where necessary to protect the prime coat. If, after prime coat has been applied satisfaction on the ENGINEER and has been accepted by him, it is distributed by negligence on the part of the CONTRACTOR, it shall be restored at his expense to its condition at the time of acceptance. No material shall be placed until the prime coat is in a condition satisfactory to the ENGINEER.

# 2.04 TACK COAT:

- 1. It the asphalt concrete pavement is being constructed directly upon an existing hard-surfaced pavement, a tack coat shall be evenly and uniformly applied to such existing pavement preceding the placing of the asphalt concrete. The surface shall be free of water, all foreign material, or dust when the tack coat is applied. No greater area shall be treated in any one day than will be covered by the asphalt concrete during the same day. Traffic will not be permitted over tack coating.
- 2. Tack coat for HMAC shall consist of either rapid curing cut-back asphalt RC-2 diluted by addition of (not to exceed 15 percent by volume) an approved grade of gasoline and/or kerosene; emulsified asphalt, EA- 11 M diluted with 50 percent water, or a cut-back asphalt made by combining 50 to 70 percent of the asphaltic materials specified for the paving mixture with 30 to 50 percent gasoline and/or kerosene by volume.
- 3. Tack coat shall conform to the requirements of Section 02620 Tack Coat or as specified herein.
- 4. Application rate shall be 0. 10 to 0. 15 gallons per square yard as directed by the ENGINEER.
- 5. A similar tack coat shall be applied to the surface of any course if, in the opinion of the ENGINEER, the surface is such that a satisfactory bond cannot be obtained between it and the succeeding course.
- 6. When required, the contact surfaces of all cold pavement joints, curbs, gutters, manholes, and the like shall be painted with a tack coat immediately before the joining asphalt concrete is placed. Asphalt tack coat shall be applied in controlled amounts as shown on the plans or determined by the ENGINEER. Surfaces where tack coat is required shall be cleaned to the satisfaction of the ENGINEER before the tack coat is applied.

### 2.05 MINERAL FILLER:

- 1. Mineral filler, other than hydrated lime, shall consist of a thoroughly dry stone dust, portland cement or other mineral dust approved by the ENGINEER.
- 2. The mineral filler shall be free from foreign or other deleterious matter.
- 3. When tested by the method outlined in SDHPT Test Method Tex-200 F (Part 102 3), mineral filler shall meet the following gradations by weight:

Passing No. 30 Sieve	95-100%
Passing No. 80 Sieve	75%
Passing No. 200 Sieve	55%

2.06 Anti- striping compound, as required in the job mix formula, shall be furnished in the amounts calculated therein.

# 2.07 JOB MIX FORMULA:

- 1. A job mix formula based on representative samples, including filler if required, shall be determined by the ENGINEER, or submitted by the CONTRACTOR for approval of the ENGINEER.
- 2. The resultant job mix formula for shall be within the master range for the specified type of HMAC.
- 3. The job mix formula for each mixture shall established a single percentage of aggregate passing each required sieve size, and a single percentage of bituminous material to be added to the aggregate and shall provide for 3 to 5% air avoids in the resultant design mix. During the mix design process the ENGINEER will consider other factors, in addition to air voids and Marshall stability, such a durability, water resistance and asphalt film thickness when developing the mix design.
- 4. After the job mix formula is established, mixtures for the project shall conform thereto within the following tolerance, which may fall outside of the specified master range.

Percent by Weight or Volume as Applicable

Passing 1-3/4" sieve, retained on 7/8" sieve	Plus or minus 5
Passing 7/8" sieve, retained on 3/8" sieve	Plus or minus 5
Passing 5/8" sieve, retained on 3/8	Plus or minus 5
Passing 3/8" sieve, retained on No. 4 sieve	Plus or minus 5
Passing No. 4 sieve, retained on No. 10 sieve	Plus or minus 5
Total retained on No. 10 sieve	Plus or minus 5
Passing No. 10 sieve, retained on No. 40 sieve	Plus or minus 3
Passing No. 40 sieve, retained on No. 80 sieve	Plus or minus 3
Passing No. 80 sieve, retained on No. 200 sieve	Plus or minus 3
Passing No. 200 sieve	Plus or minus 3
Asphaltic Material	Plus or minus 0.05 by wt or 1.2 by vol.
Mixing Temperature	Plus or minus 20 F

5. Asphaltic mixture shall be tested in accordance with SDHPT Test Method Tex200-4 (Part I or Part 111) and shall have the following laboratory values:

	Surface Course	Base Course
Density - Minimum	95%	95%
- Maximum	99%	99%
- Optimum	97%	97%
Stability – (Hveenm)		
Minimum	30%	30%
Maximum	45%	45%
Stability (Marshall – 75		
Blow Briquette)	1500 lbs.	1500 lbs.
Voids	3 - 7%	4 - 7%
Voids Filled With Asphalt	75-85%	65-80%
Sand Equivalent	40	40

### 2.08 EQUIPMENT:

1. All equipment for the handling of all material, mixing, and placing of HMAC shall be in accordance with the provisions of Texas SDHPT Item 340.

### 2.09 STOCKPILING, STORAGE, PROPORTIONING AND MIXING:

1. Stockpiling, storage, proportioning and mixing operations shall be in accordance with the Provisions of Texas SDHPT Item 340.

## PART 3 - EXECUTION

## 3.01 WEATHER AND TEMPERATURE LIMITATIONS:

- 1. Asphaltic mixture, when placed with a spreading and finishing machine, or the tack coat shall not be placed when the air temperature is 50 F and falling, but may be placed when the air temperature is 40 F and rising.
- 2. Asphaltic mixture, when placed with a motor grader, shall not be placed when the air temperature is 60 F and falling, but may be placed when the air temperature is 50 F and rising.
- 3. Mat thickness of I> inches or less shall not be placed when the temperature on which the mat is to be laid is below 50 F.
- 4. No tack or asphaltic mixture shall be placed when the humidity, general weather conditions and temperature and moisture condition of the base, in the opinion of the ENGINEER, are unsuitable.
- 5. If, after being discharged from the mixer and prior to placing, the temperature of the asphaltic mixture is 50 F or more below the temperature established by the ENGINEER, all or any part of the load may be rejected and payment will not be made for the rejected material.

## 3.02 EQUIPMENT:

- 1. Hauling Equipment:
  - 1. Trucks used for hauling asphaltic mixtures shall have tight, clean, smooth metal beds, which have been thinly coated with a minimal amount of paraffin oil, lime, slurry, tine solution or other approved material to prevent mixture adhesion to the bed.
  - 2. The dispatching of hauling equipment shall be arranged so that all material delivered may be placed and all rolling completed during daylight hours, unless otherwise directed by the ENGINEER.
  - 3. All trucks shall be equipped with a cover of canvas, or other suitable material to protect the mixture from weather or on hauls where the temperature of the mixture will fall below specified level. Use of covers will be as directed by the ENGINEER.
- 2. Rollers:
  - 1. Pneumatic Tile Roller. This roller shall consist of not less than seven pneumatic tire wheels, running on axles in such a manner that the rear group of tires shall cover the entire gap between adjacent tires of the forward group; mounted in a rigid frame; and provided with a loading platform or body suitable for ballast loading. The front axle shall be attached to the frame in such manner that the roller may be turned within a minimum circle. The tire shall afford surface contact pressures up to 90 pounds per square inch or more. The roller shall be so constructed as to operate in both a forward and a reverse direction with suitable provisions for moistening the surface of the tires while suitable provisions for moistening the surface of the tires while approved by the ENGINEER.
  - 2. Two Axle Tandem Roller. This roller shall be acceptable power-driver, steel-wheel, tandem roller weighing not less than eight tons. It must operate in forward and reverse directions; contain provision for moistening the surface of the wheels while in motion; and shall be approved by the ENGINEER.
  - 3. Three Wheel Roller. This roller shall be an acceptable power-driven, all steel three-wheel roller weighing not less than 10 tons. It must operate in forward and reverse directions; contain provisions for moistening the surface of the wheel while in motion; and shall be approved by the ENGINEER.

- 4. Vibratory Steel Wheel Roller. If approved for use by the OWNER, this roller shall have a minimum weight of six tons. The compactor shall be equipped with amplitude and frequency controls and shall be specifically designed to compact the material on which it is used. If shall be operated in accordance with a manufacturers recommendations.
- 3. Straight Edges:
  - 1. The CONTRACTOR shall provide an acceptable 16-foot straight-edges for surface testing. Satisfactory templates shall be provided as required by the ENGINEER.
- 4. Spreading and Finishing Machine:
  - 1. Bituminous pavers shall be self-contained, power-propelled units, provided with an activated screed or a strike-off assembly, heated if necessary, and capable of spreading and finishing courses of bituminous plant mix material in lane widths applicable to the specified typical section and thickness shown on the plans.
  - 2. The paver shall be equipped with a receiving hopper having sufficient capacity for a uniform spreading operation. The hopper shall be equipped with a distribution system to place the mixture uniformly in front of the screed. Design will be such that no part of the truck weight will be supported by the paver.
  - 3. The screed of strike-off assembly shall effectively produce a finished surface of the required evenness and texture without tearing, shoving or gouging the mixture. When laying mixtures, the paver shall be capable of being operated at forward speeds consistent with satisfactory laying of the mixture. The screed shall be adjustable for both height and crown and shall be equipped with a controlled heating device.
  - 4. The bituminous paver shall be equipped with an automatic leveling device controlled from an external guide. The initial pass for each course shall be made using a paver equipped with a 40-foot minimum external reference, except that this requirements will not apply when asphalt concrete is placed adjacent to portland cement concrete pavement. Subsequent passes may utilize the matching device of one-foot minimum length riding on the adjacent lay.

# 3.03 CONSTRUCTION METHODS:

- 1. Spreading and Finishing:
  - 1. The asphalt concrete mixture shall be laid on the approved surface, spread and struck off the grade and elevation established. It shall be spread and compacted in layers as shown on the plans or as directed by the ENGINEER. Bituminous pavers shall be used to distribute the mixture either over the entire width or over such partial width as may be practicable.
  - 2. The ENGINEER will determine a minimum placement temperature within a range from 220 F to 300 F which will produce the required density. The established placement temperature, which is measured immediately behind the laydown machine, shall not vary more than 20 F.
  - 3. A conventional paver or suitable equipment approved by the ENGINEER may be used to place asphalt concrete material on shoulders depressed from the traveled lanes in order to establish a uniform typical section. Approval of the equipments used will be based upon the result obtained.
  - 4. The asphalt concrete may be dumped from the hauling vehicles directly into the paving machine or it may be dumped upon the surface being paved and subsequently loaded into the paving machine; however, no asphaltic concrete shall be dumped from the hauling vehicles at a distance greater than 250 feet in front of the paving machine. When asphaltic concrete is dumped first upon the surface being paved, the loading equipment shall be self-supporting and shall not exert any vertical load on the paving machine. Substantially all of the asphaltic concrete dumped all be picked up and loaded into the paving machine.
  - 5. To achieve, as far as practicable, a continuous operation, the speed of the paving machine shall be coordinated with the production of the plant. Sufficient hauling equipment shall be available to insure continuous operation.
  - 6. The control system shall control the elevation of the screed at each end by controlling the elevation of one end directly and the other end indirectly either through controlling the transverse slope or alternately when directed, by controlling the elevation of each end
independently, including any screed attachment used for widening, etc. Failure of the control system to function properly shall be cause for the suspension of the asphaltic concrete operations.

- 7. When dumping directly into the paving machine from trucks, care shall be taken to avoid jarring the machine or moving it out of alignment.
- 8. All course of asphaltic concrete shall be placed and finished by means of self-propelled paving machines except under certain conditions or at certain locations where the ENGINEER deems the use of self-propelled paving machines impracticable.
- 9. Self-propelled paving machines shall spread the asphaltic concrete without segregation or tearing within the specified tolerances, true to the line, grade, and crown indicated on the plans. Pavers shall be equipped with hoppers and augers which will place the asphaltic concrete evenly in from of adjustable screeds without segregation. Screeds shall include any strike-off device without tearing, shoving or gouging the asphaltic concrete and which produces a finished surface of an even and uniform texture for the full width being paved. Screeds shall be adjustable as to height and crown and shall be equipped with a controlled heating device for use when required.
- 10. On areas where irregularities or unavoidable obstacles make use of mechanical spreading and finishing equipment impracticable, the mixture shall be spread, raked, fluted and compacted with had tools. For such areas the mixture shall be dumped, spread and screed to give the required compacted thickness.
- 2. Compaction
  - 1. Rolling with the 3-wheel and tandem roller shall start longitudinally at the sides and proceed toward the center of the surface course, overlapping on successive trips by at least half the width of the rear wheels.
  - 2. Alternate trips of the roller shall be slightly different in length.
  - 3. Rolling with a pneumatic tired roller shall be as directed by the ENGINEER.
  - 4. Rolling shall continue with no further compression can be obtained and all roller marks are eliminated.
  - 5. The motion of the roller shall be slow enough at all times to avoid displacement of asphaltic materials. If displacement occurs, it shall be corrected immediately by use of rakes and fresh asphaltic mixtures, where required.
  - 6. The roller shall not be allowed to stand on the surface coarse when it has not been fully compacted and allowed to cool.
  - 7. To prevent adhesion of the surface course to the roller, the wheels shall be kept thoroughly moistened with water; however, excess water shall not be allowed.
  - 8. All precautions shall be taken to prevent dripping of gasoline, oil, grease, or other foreign substances on the surface or base courses during rolling operations or while rollers are standing.
  - 9. With the approval of the ENGINEER, a vibratory steel wheeled roller by be substituted for the 3-wheel roller and tandem roller.
  - 10. Along forms, curbs, headers, walls and other places are accessible to the rollers, the mixture shall be thoroughly compacted with not hand tampers, smoothing irons, or with mechanical tampers. On depressed areas, a trench roller may be used or cleated compression strips may be used under the roller to transmit compression to the depressed area.
  - 11. Any mixture that becomes loose, broken, mixed with dirt, segregated, or is in any way defective shall be removed and replaced with fresh hot bituminous mixture, which shall be compacted to conform with the surrounding area. Any area showing excess or deficiency of bituminous material shall be corrected immediately as directed by the ENGINEER.
- 3. In-Place Density
  - 1. In-place density shall be required for all mixtures except thin irregular depth leveling courses.
  - 2. Each course, after final compaction, shall have a density of not less than 95 percent of the density developed in the laboratory lest method outlined in Texas SDHPT Bulletin C- 14.
  - 3. Density shall be determined with a portable nuclear test device in conformity with ASTM D-2950, 76.

- 4. Calibration of the portable nuclear device will be established by the ENGINEER from cut pavement samples tested in accordance with AASHTO T- 166 (weight, volume method). The density readings of the cut pavement samples determined in accordance with AASHTO T- 166 (weight, volume method), and the density readings of the pavement samples determined by the portable nuclear test device in conformity with ASTM D 2950 will be correlated by the ENGINEER.
- 5. Other methods of determining in-place density may be used as deemed necessary by the ENGINEER.
- 6. It is intended that acceptance density testing will be done while the bituminous mixture is hot enough to permit further compaction if necessary. If the density of an acceptance section does not meet the specified requirements, the CONTRACTOR shall continue the compaction effort until the optimum density is obtained, but rolling for any compaction effort will not be allowed when the temperature of the mix is below 175 F unless authorized in writing by the ENGINEER. Rerolling the paved surface after it has initially cooled will not be allowed.
- 7. If in-place density test of the mixture produce a value lower than specified and in the opinion of the ENGINEER is not due to a change in the quality of the material, production may proceed with subsequent changes in the mix and/or construction procedures until in-place density equals or exceeds the specified density.
- 8. In-place density tests will be provided by the ENGINEER unless otherwise specified.
- 4. Joints
  - 1. Placing of asphalt concrete shall be as continuous as possible. Rollers shall not pass over the unprotected end of a freshly laid mixture unless authorized by the ENGINEER.
  - 2. When plant mix bituminous pavement is placed over plant mix bituminous treated base or when plant mix seal coat is placed over plat mix bituminous pavement, longitudinal joints shall be staggered at least 6 inches with relation to the longitudinal joints of the underlying course.
  - 3. Transverse joints shall have a two-foot or 12:1 minimum taper. Longitudinal joints shall have a one-foot or 6:1 minimum taper. All traverse tapers shall be cut and squared off prior to commencing new work. Tapered longitudinal joints from previous operations shall be cleaned and tack coated if directed by the ENGINEER. All joints shall be completely bonded. The surface of each course at all joints shall be smooth and shall not show any deviations in excess of 3/16 of an inch when tested with a 10-foot straightedge in any direction.
  - 4. When paving under traffic the CONTRACTOR shall plan his daily surfacing operations on a schedule which will result in not more than one (1) day=s operation of exposed longitudinal joints. The longitudinal joints shall not have a height greater than two (2) inches and shall not be left exposed longer than 24 hours.
- 5. Surface Tolerance:
  - 1. Upon completion, the pavement shall be true to grade and cross section. Expect at intersections or any changes of grade, when a 16 foot straight edge is laid on the finished surface parallel to the centerline of the roadway, the surface shall not vary from the edge of the straight edge more that I/ I 6-inch per foot. Areas that are not within this tolerance shall not be brought to grade immediately following the initial rolling. After the completion of final rolling, the smoothness of the course shall be checked, and the irregularities that exceed the specified tolerances or that retain water on the surface shall be corrected by removing the defective work and replacing with new material as directed by the ENGINEER at the expense of the CONTRACTOR.
- 6. Manholes and Valve Covers
- 1. Manhole frames and valve covers shall be adjusted prior to placing the surface course.
- 7. Compacted Thickness of HMAC and Base Courses
  - 1. Surface Courses. The completed thickness or depth of the asphaltic concrete surface shall be shown on the plans. Where the plans require a depth or thickness of the surface course

greater than two inches compacted depth, same shall be placed in multiple coursed of equal depth, each of which shall be exceed two inches compacted depth. If, in the opinion of the ENGINEER, an additional tack coat is considered necessary between any multiple courses, it shall be applied at a rate as directed.

- 2. Base Courses. The compacted thickness or depth of each base course shall not be shown on the plans. Where the plans require a depth or thickness of the course greater than 4 inches, same shall be accomplished by constructing multiple lifts of approximately equal depth, each of which shall not exceed these maximum compacted depths. If, in the opinion of the ENGINEER, an additional tack coat is considered necessary between any of the multiple lifts, it shall be applied as herein before specified at the rate as directed.
- 8. Pavement Thickness Tests
  - 1. Pavement Thickness Test. Upon completion of the work and before final acceptance and final payment shall be made, pavement thickness test shall be made by the ENGINEER or his authorized representative unless otherwise specified in the special provisions or in the plans. The number and location of tests shall be at the discretion of the OWNER. The cost of the initial pavement thickness test shall be at the expense of the ENGINEER. In the event a deficiency in the thickness of pavement is revealed during normal testing operations, subsequent tests necessary to isolate the deficiency shall be at the same rate charged be commercial laboratories.
- 9. Price Adjustment of Roadway Density
  - 1. The payment of the unit price will be adjusted for roadway density as outlined in the following table. The adjustment will be applied on a lot-by-lot basis for each lift. The adjustment will be based on the average of five density tests. The price adjustment will be applied to the entire asphalt concrete mix which includes the HMAC aggregate, the asphalt cement and anti-stripping compound, if used.

Average Density	Percent of Contract
% of Lab Density	Price to be Paid
Above 95.9	100%
94.0 to 94.99	96%
93.0 to 93.99	91%
92.0 to 92.99	85%
Less than 92.00	*

\*This lot shall be removed and replaced to meet specification requirements as ordered by the ENGINEER. In lieu thereof, the CONTRACTOR and the ENGINEER may agree in writing that for practical purposes, the lost shall not be removed and will be paid for at 50% of the contract price.

## PART 4 - MEASUREMENT AND PAYMENT

### 4.01 INCIDENTAL WORK

1. Prime coat, anti-stripping compound, where used and tack coat shall not be measured for direct payment, but shall be considered as subsidiary work pertaining to the placing of asphaltic mixtures of the contract price.

#### 4.02 MEASUREMENT

1. Hot-mix asphalt concrete material shall be measured by the ton of 2,000 pounds or by the square yard of the type used in the completed and accepted work.

- 2. Weight shall be determined by a certified scale approved by the OWNER and recorded serially numbered weight tickets, identifying the vehicle and presented to the ENGINEER's representative on the job.
- 4.03 PAYMENT
  - 1. Work performed and materials furnished, as prescribed by this item, measured as provided herein, shall be paid at the unit bid price per ton or square yard for the type or types of hot mix asphalt concrete pavement shown on the proposal.
  - 2. Unit bid price shall be payment in full for quarrying; furnishing all materials; for all heating; mixing; hauling; cleaning existing base course or pavement; placing asphaltic mixtures; rolling and finishing; and for all labor, tools, equipment and incidentals necessary to complete the work, including the work and materials involved in the application of price coat and tack coat.

END OF SECTION

## SECTION 32 13 13 – CONCRETE PAVING, CURBS AND SIDEWALK

## PART 1 - GENERAL

# 1.1 COORDINATION

- A. The General Conditions of the Contract for Construction and the Supplementary Conditions to the General Conditions of the Contract for Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addenda issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the more stringent requirements and the greater quantity shall apply.

## 1.2 WORK INCLUDED

- A. All site concrete work, including sidewalks, paving, equipment slabs, ramps, and other miscellaneous concrete.
- B. All form work.
- C. Reinforcing steel.
- D. Installation of sleeves provided by plumbing, heating, and electrical contractors for work under site concrete. Sleeves for irrigation system.

## 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Testing Laboratory services.
- B. Excavation and fill.
- C. Soil stabilization.
- 1.4 DRAWING REFERENCES: See drawings for reinforcing sizes and placement.
- 1.5 SUBMITTALS

- A. DESIGN MIX: Submit six (6) copies directly to the Owners Testing Laboratory the proposed concrete mix for concrete paving and sidewalks. Include cement brand and type, aggregate identification, admixtures, proportions and anticipated strengths.
- B. PLASTIC CHAIR SUPPORT: Submit manufacturer's literature indicating dimensions, configuration, and performance data. Submit sample for approval by the Architect.
- C. JOINT FORMS: Submit manufacturer's literature indicating dimensions, configuration, reinforcing and accessories related to load transfer units.
- D. ADMIXTURES: Submit manufacturer's literature indicating composition and mix proportions.
- E. CURING COMPOUND: Submit manufacturer's literature indicating composition and recommended application procedures.
- F. JOINT SEALANT: Submit manufacturer's literature indicating sealant type(s), performance, recommended application procedures, and recommending open or closed cell backer material for the application.
- G. DELIVERY TICKETS: Furnish copies of delivery tickets for each load of concrete delivered to the site. Provide items of information as follows:
  - 1. Ambient temperature.
  - 2. Any modifications and dispositions of the load.
  - 3. Driver's identification.
  - 4. Identification of placement location at jobsite.
  - 5. Ingredients by weight.
  - 6. Number of cubic yards.
  - 7. Time emptied.
  - 8. Time loaded.
- H. TEST REPORTS: Arrange for the Owner's Testing Laboratory to submit reports to the Owner, Architect and Contractor indicating compressive strength, aggregate type and slump for samples taken at the site.

## 1.6 SAMPLES

- A. Plastic chair support.
- B. Minimum 36" x 36" finish samples at the job site for Architects approval. Provide sample for each type of finish (smooth, light broom, medium broom, etc.) and each type of joint.

# 1.7 WARRANTY

A. Provide written warranty against defects in materials and workmanship for the work under this section for a period of one year after the date of Substantial Completion of the project.

## 1.8 QUALITY ASSURANCE

- A. Cast-in-place concrete shall be installed by technicians specially trained in the proper handling, placing and protection of concrete and reinforcing steel. If required by the Architect, installer shall submit for approval a list of similar installations successfully completed.
- B. Cast-in-place concrete shall be mixed and installed in strict accordance with applicable written recommendations and requirements of the Texas State Department of Highways and Public Transportation (TSDHPT) and the American Concrete Association (ACI) including but not necessarily limited to the following where documents conflict, the most stringent of the requirements as determined by the Architect shall apply:
  - 1. TSDHPT, item 360.
  - 2. ACI 302.
  - 3. Building Code Requirements for Reinforced Concrete, ACI 318.
  - 4. Recommended Practice for Hot Weather Concreting, ACI 305.
  - 5. Recommended Practice for Cold Weather Concreting, ACI 306

## PART 2 - PRODUCTS

# 2.1 MATERIALS

- A. GENERAL: All materials used in the Work shall be stored or handled in a manner which will prevent deteriorations; any materials that have been damaged shall be immediately and completely removed from the Work. All manufactured materials, such as cement, shall be delivered and stored in their original packages, plainly marked with the brand and manufacturer's name. Broken packages or packages that show marks or other evidence of damage shall be wholly rejected.
- B. CEMENT: Portland cement shall conform to standard specifications of ASTM,C-150, Type l, latest edition. The brand shall be one approved by the Architect, and this one brand shall be used throughout the project.
- C. AGGREGATES: Aggregates for concrete of normal weight shall be clean, hard, strong, uncoated, free of loam, fine sand, clay dust, organic or other deleterious matter and shall conform to ASTM C-33.

D.

E. FINE AGGREGATE									
SCHEDULE 1 - Sie a.	ve Size Passing						P	ercent	Passing
SCHEDULE 2 - 4									95-1
SCHEDULE 3 - 16									50-8
SCHEDULE 4 - 50									10-3
100			0-5	1/2"		-		25-60	
	a)	3/8"		10-30			-	20-55	
	b)	#4		0-5			0-10	]0-10	

- B. Clay 3% Maximum Clay 1 % Maximum
- C. WATER: Water shall be clean and potable, free from injurious amounts of oil, acid, Alkali, organic matter or other deleterious substances.
- D. REINFORCING STEEL: All reinforcing steel shall be high bond, new billet stock, and shall conform with ASTM A-615, except that mesh shall conform with ASTM A-1 85. All materials must be free from seams, flaws, scale or an excessive amount of rust. The supplier shall furnish Architect with a certificate certifying the reinforcing steel is domestic, or supply laboratory tests acceptable to the Architect, that foreign steel meets these tests. Laboratory tests shall be made on each size of steel. Samples for testing shall be taken from jobsite. The samples shall be replaced with bar of like size and length, plus 40 diameter.
- E. ANCHORS: Install all necessary anchors, wire loops or other miscellaneous fasteners to be installed in concrete for anchoring masonry or other work.
- F. WOOD JOINT FORMS:
  - 1. Sidewalk Joints: Expansion joints at concrete walks shall be 1X Redwood.
  - 2. Paving Joints: 3/4" thick redwood form with minimum 1" deep removable top strip, 3/4" x 1 0" steel reinforcing bars at 24" o.c. with bond-breaker sleeve on one side, and 3/16" thick steel rebar support plates each side. Provide custom size as required for full depth of paving as manufactured by Shepler Equipment Co., or equivalent by Commercial Lumber Supply, Marine Lumber Co., or Southern States Lumber.
- G. TRANSIT MIX CONCRETE: Contractor shall provide concrete meeting the specifications with regard to compressive strength, method of handling, and controlled by testing lab at batch plant. Concrete shall meet ASTM C-94; Certificate from supplier shall be furnished to Architect.

- H. CURING COMPOUND: Shall be Southform 4-way (cures, seals, dustproofs, and hardens), or equivalent product by Gifford-Hill, Nox-Chem, Sonneborn, or W.R. Grace.
- I. ADMIXTURES:
  - 1. General: All admixtures shall be added at the plant during mixing and must be prior approved by the Testing Laboratory. Admixtures shall comply with requirements of ASTM C-260 and C-494. Admixtures containing calcium chloride are not acceptable. **Do not use admixtures in footings or seal slabs.**
  - 2. Water Reducing Agents: All design mixes must test with the required slumps prior to the addition of a water reducing agent. Each specified maximum slump may be increased by a maximum of 2" at the plant by the addition of a maximum of 3 ounces of water reducing agent per 94 pound bag of cement. Meet requirements of ASTM C494, Type F.
    - a. "PSI Super" as manufactured by Cormix Construction Chemicals.
    - b. "WRDA-1 9" as manufactured by W.R. Grace.
    - c. "Sikament" as manufactured by Sika Chemical Corp.
  - 3. Set-Controlling Agents: Under 40 degrees F., add accelerating agent Over 80 degrees F., add retarding agent.
    - a. Cormix Construction Chemicals.
    - b. Master Builders
    - c. Protex Industries
    - d. Sika Chemical Corp.
  - 4. Air Entrainment: All structural concrete shall contain an air entraining agent compatible with other approved admixtures. Agent added at the plant shall produce 4-5% air entrainment not required at drilled footings.
- J. REINFORCING BAR SUPPORTS: Heavy-duty type four-legged plastic chair supports with sand plate. Series "G" or "B" (as determined by job conditions) as manufactured by W.H.C. Products, Inc. or approved equivalent by Aztec Concrete Accessories. Provide sand plate for slab on grade. Space at a maximum of 45" centers each way. Provide closer spacing where required to prevent excessive sag, or to support the weight of concrete pump hose.
- K. METAL REINFORCEMENT:
  - 1. Bars
    - a. General: Detailing conform to ACI detailing manual.
    - b. Grade 60: Comply with ASTM A 615.
    - c. Grade 40 (#3 bars): Comply with ASTM A 615.
  - 2. Mesh
    - a. Comply with ASTM A 185.
    - b. Mesh shall be type which is fabricated and delivered in flat sheets.
    - c. Use mesh only where specifically indicated in the drawings for sidewalks or equipment pads.
- L. PAVING JOINT SEALANT: Polyurethane base, multi-component, chemical curing, self-leveling Type 1, conforming to requirements of FS TT-S-00227E, Class A (provide equivalent nonsagging Type 2 at vertical joints in curbs), as manufactured by Tremco or equivalent by Sonneborn, Sheplers, or Pecora. Use with flat strip, non-absorbent polyethylene joint backeropen or closed cell type as recommended by the sealant manufacturer.

## 2.2 MIX DESIGNS

A. The concrete mix shall be designed by the concrete supplier and approved by the Owner's Testing Laboratory. Contractor shall furnish to the laboratory samples of the aggregate he proposes to use in the concrete work. Concrete mixes shall achieve twenty eight (28) day compressive strengths indicated below, and shall be so proportioned as to obtain a workable mix in accordance with the following limits:

Minimum Cement

	1 0				
C.	at 28 days			Content 94#	SacksWa
D.	Minimum P.S.I.	Cubic Yard	<u>Gallons</u>		
E.	Paving 3,500	5.5	7.0		
F.	SLUMPS: Slumps grea excessive shrinkage. S addition of any approve	ter than specified can adv lumps specified below are d water reducing agent.	ersely affect concrete perform based upon concrete design	nance due to mix prior to	

Maximum Total

1. 5"+/-1": Sidewalks

**Compressive Strength** 

- 2. 3"+/-1": Paving,curbs
- G. The use of fly ash in the concrete mix is not acceptable.

## H. MIXING

B.

- 1. Comply with ASTM C 94.
- 2. Mix concrete to a uniform distribution of materials. Mix at least two minutes after materials are in mixer. Discharge concrete completely before mixer is recharged.
- 3. Mix each batch not less than 70 or more than 100 revolutions of the drum at mixing speed. Additional mixing is to be done at agitating speed.
- I. ADJUSTMENTS TO MIX DESIGN: Submit for approval by the Owner's Testing Laboratory any proposed adjustments to the approved mix design due to job conditions, weather or testing results. Necessary adjustments to the mix design shall be at the Contractor's expense.

## PART 3 - EXECUTION

## 3.1 PREPARATION

- A. Any portions of the subgrade or fill that are below optimum moisture content shall be wetted at least one (1) week prior to placing concrete in order to achieve a proper uniform distribution of moisture.
- B. All preliminary work shall be carefully checked, all trash and debris removed, and the approval of the Architect obtained before any concrete is placed. The Architect shall be notified twenty-four (24) hours before any concrete is scheduled to be placed.
- C. SUBGRADE APPROVAL- The bearing grade of slab-on-grade concrete shall require approval of the Owner's testing laboratory immediately prior to the placement of concrete regardless of any previous test results. Bearing grade which is overly dry, saturated, exhibits standing water, contaminants, irregularities or other properties which may tend to be deleterious to the

performance of the cast-in-place concrete will not be approved by the Owner's testing laboratory as suitable for concrete placement.

- D. Coordinate and provide for plumbing, electrical, carpentry, masonry, miscellaneous metals and other installation requirements, which must be completed prior to concrete work or which may require special forming or block-outs.
- E. CLEANING: Clean all forms of debris and thoroughly wet wood forms before placing concrete.
- F. Inspect subgrade to determine that uniform thickness of concrete paving and walks will result in proper drainage and no standing water. Notify Architect prior to beginning work of any no slope areas or potential standing water conditions.
- G. HOT WEATHER CONDITIONS: Where ambient temperature exceeds 95 degrees F. with a wind velocity exceeding 5 MPH or temperature exceeds 90 degrees F. with a wind velocity exceeding 15 MPH, follow recommendations in ACI publication "SLABS ON GRADE" to protect against rapid drying.
- H. Do not place concrete when air temperature is 40 degrees F. or below or when the air temperature is expected to go below 30 degrees F. in the following 48 hours after placing of concrete unless the concrete is protected from such temperature.
- I. Install all anchors, fasteners, junction boxes, curb dowels collection boxes or other construction to be installed within concrete paving.

# 3.2 INSTALLATION

- A. TRANSIT: Concrete shall be agitated continuously with slow revolutions of the drum white in transit. No concrete shall be deposited after being in the mixer more than 90 minutes. Testing laboratory shall check each delivery ticket and notify Contractor immediately of any concrete arriving more than 90 minutes after plant loading.
- B. HANDLING: Concrete shall be deposited in the forms as rapidly as practicable by methods which will prevent loss or separation. It shall be deposited as nearly as practicable in its final position to avoid rehandling. Provide runways, or other means for wheeled equipment to carry concrete to points of deposit.
- C. PLACING REINFORCEMENT:
  - 1. A thin film of rust will not be considered objectional, but no loose or scaly rust, dirt, mud or cement will be allowed. Steel must be cleaned with wire brushes or replaced if pitted from rust.
  - 2. Accurately position, secure against displacement with #18 gauge wire ties or suitable clips, support by heavy duty plastic chairs with sand plates. Do not use "brick batts" or rubble for support.
  - 3. Follow recommendations of Concrete Reinforcing Steel Institute as to type of steel, splicing, location and placement.
- D. PLACING CONCRETE:
  - 1. Deposit and consolidate concrete in a continuous operation, within the limits of joint forms, until the placing of a panel or section is completed.

- 2. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement, other embedded items, and into corners.
- 3. Maintain reinforcing steel in the proper position continuously during concrete placement operations.
- 4. Bring slab surfaces to the correct plane with a straight edge or vibrating screed and strike off. Use bull floats or derbies to smooth the surface, leaving it free of humps or hollows. Do not sprinkle water on the plastic surface. Do not disturb the slab surfaces prior to beginning finishing operations.
- 5. Concrete surface shall be true to plane within 1/4" against a 10' straight edge.

# 3.3 JOINTS

- A. LOAD TRANSFER UNITS:
  - 1. Install wood joint form in accordance with manufacturer's printed directions prior to concrete pour. All plastic sleeves at reinforcing bars shall be placed running in same direction.
  - 2. Install manufacturers stakes at 48" o.c. maximum where concrete is to be placed on both sides of form simultaneously. Install at 36" o.c. maximum at cold joints.
  - 3. Longitudinal joint forms shall be continuous through transverse joint forms.
  - 4. Pre-wet form boards prior to placement to ensure against dry wood forms removing water at edges of concrete.
  - 5. Leave removable top strip in place and protect until sealant operations begin.
- B. WOOD FORMS:
  - 1. Install similar to load transfer units. Use at radiused areas and sidewalks.
  - 2. Kerf where required for radius.
  - 3. Leave removable top strip in place at paving and protect until sealant operations begin. Top strip and sealant not required at sidewalks.
- C. KEYED JOINTS:
  - 1. Align metal joint forms and install manufacturer's splice clip at ends to keep joints in alignment during concrete placement.
  - 2. Set all stakes securely to keep joint form from moving during concrete placement.
  - 3. Do not remove forms until concrete has obtained sufficient strength. When removing forms, apply no vertical uplift which may damage or weaken concrete key.

## 3.4 CURBS

- A. Provide machine laid (extruded) reinforced concrete curbs unless monolithic or formed curbs are indicated in the drawings.
- B. Apply epoxy to cured concrete paving and continuously lay curb over installed dowels.

# 3.5 FINISHING

A. GENERAL: Concrete finishes shall match approved jobsite samples approved by the Architect. Spreading of dry cement for finishing is not acceptable. Begin finishing operations as soon as water sheen has disappeared from surface.

- B. PAVING FINISHES: Slabs shall be true to plane within 1/4" in a length of 10' machine finish and provide light to medium broom finish (across the direction of traffic) at all paving as approved by the Architect.
- C. SIDEWALKS: Provide light broom finish perpendicular to walk. Provide Architect with sample panel of proposed finish for approval prior to beginning work.
- D. STEPS AND RAMPS: Shall be constructed as detailed. Exterior steps, landings, and ramps shall be medium broom finished.
- E. PAVING JOINTS: Provide tooled eased edges along both sides of redwood joint form to ensure neat appearance, sealant adhesion, and to facilitate removal of top strip. Use 1/8" radius jointing tool.
- F. OPEN TOOLED JOINT: Provide scored lines on concrete sidewalks 5'-0" o.c. unless spaced otherwise on the drawings. Joint size shall be 1/4" wide x 1/4 depth of concrete.
- G. All concrete paving and walks shall be uniform in color and consistent in finish. Remove and replace any areas dimpled by rain or discolored (concrete mix).

# 3.6 CURING

- A. Apply complete covering of curing compound as soon as concrete is finished and in accordance with manufacturer's instructions. Curing compound shall be applied as it comes from the can, at the rate of 200 to 300 square feet per gallon.
- B. To avoid sealant adhesion problems ensure that curing compound does not seep into paving joints that receive sealant.

# 3.7 CAP SEALANT

- A. Remove redwood top strip from joint forms. Take care to avoid damaging concrete edges. Clean sealant cavity and inspect for proper depth as recommended by sealant manufacturer.
- B. Ensure that sealant cavity is clean, dry, and free of dust, dirt, and small stones. Ensure that edges are not contaminated with curing compound, oil or other agents, which might cause adhesion failure. Prime side walls in accordance with sealant manufacturer's recommendations.
- C. Install flat ethafoam strip in bottom of sealant cavity to provide bond-breaker at bottom of sealant and to ensure against sealant loss past the joint form. Install strip in thickness required to provide sealant cavity size as recommended by sealant manufacturer. Use no sand or other loose material in joint cavity.
- D. Mix sealant thoroughly in accordance with manufacturer's recommendations and pour to within 1/8" of top of paving. Where sealant must be repoured due to run off or improper level, remove completely all traces of sealant on side walls before next application.
- E. At concrete curbs rake joint filler to minimum 1" depth and install sealant manufacturer's vertical joint grade sealant.

## 3.8 CLEANING AND PROTECTION

- A. Paving is to be kept free of any foreign substances (wax, oil, paint, etc.) or surface irregularities, which may affect the final appearance of the completed installation.
- B. Unless otherwise approved by the Architect, no vehicular traffic will be allowed on any concrete slab, paving or drive until after the 7 day concrete tests have been made by the laboratory indicating that the concrete has attained 3,000 psi compressive strength.
- C. Contractor shall coordinate with Architect and Owner to determine a suitable on-site "washout" area for concrete trucks. Contractor shall be responsible for clean up of the designated area.
- D. Contractor shall keep clean all adjacent public streets and rights of way. Wash down daily or more often as needed to maintain a safe condition at entrances/exits to site.

## 3.9 TESTING LABORATORY CONTROL

- A. Contractor shall contact Owner's Testing Laboratory at least 24 hours prior to time of anticipated concrete placement.
- B. Contractor shall require the manufacturers of the cement and metal reinforcement to be used in the work to furnish mill certificates showing that such materials meet ASTM standards as specified.
- C. Contractor shall follow all requirements of ASTM C 31 concerning the proper handling and protection of concrete test cylinders. Contractor shall provide locked storage facilities for test cylinders with all heat, insulation and protection as required by ASTM C 31.

PART 4 - END OF SECTION

### SECTION 33 05 00 — SITE DRAINAGE

#### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The General Conditions of the Contractor for Construction and the Supplementary Conditions to the General Conditions of the Contract for the Construction shall be considered as part of this section of the specifications.
- B. Each Bidder shall be responsible for determining during the bidding period the extent that any addendum issued during the bidding period may affect this section of the specifications.
- C. Reference Instructions to Bidders for requirements regarding substitutions of materials and products.
- D. Where conflicts occur between the drawings and specifications, between different drawings, between different portions of this section of the specifications, or between different sections of the specifications, the stringent requirements and the greater quantity shall apply.

## 1.2 WORK INCLUDED

- A. Provide and install storm sewer piping, collection boxes, grates, manholes, culverts, inlets and headwalls as indicated in the Architectural drawings and specified herein.
- B. Related trenching, pipe bedding, backfill, and compaction as indicated in the Civil and MEP documents drawings and specified herein.
- C. Trench safety in accordance with OSHA requirements and as specified under Trench Safety Section.

#### 1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Piping indicated on pluming drawings.
- B. Site clearing, grading and filling.

#### 1.4 SUBMITTALS

- A. PRODUCT DATA: Submit manufacturer's literature for piping precast drainage structures and grates illustrating performance, fabrication procedures, materials and sizes.
- B. Reference Section 01 33 00 SUBMITTALS for additional submittal requirements.

#### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. CONCRETE SEWER PIPING: Extra strength tongue and groove pipe conforming to ASTM C-76, Class III for reinforced pipe.
- B. JOINT SEALS:
  - 1. <u>Under 42" diameter:</u> Provide Talcote Asphalt Primer No. 041 and Talcote Cold Plastic No. 052 joint compound.
  - 2. <u>42" diameter and larger:</u> Bell and rubber gasketed joints.
- C. CONCRETE: Minimum compressive strength of 3,000 psi. Conform to requirements of Cast in Place Concrete Section 3.
- D. POLYVINYL CHLORIDE (PVC) SDR 26 PIPING: Provide PVC piping where indicated on the drawings. Jointing shall be solvent weld or bell and gasket meeting requirements of A.S.T.M. 3212. Piping shall meet requirements of A.S.T.M. D-3034.
- E. INLETS:
  - 1. Precast concrete, cast in place concrete or brick collection boxes as indicated in the drawings. Brooks Products, or equivalent. Form both inner and outer walls for cast-in-place items.
  - 2. <u>Brick:</u> ASTM C-32 sewer brick, Grade SS, 2-1/4" x 3-3/4" x 8".
  - 3. <u>Gratings, Covers and Frames:</u> Cast iron, McKinley, Neenah or approved equal. Heavy duty in paving. Medium duty in walks. Light duty in grass or planting areas.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. INLETS:
  - 1. All storm sewer inlets shall be constructed to the line and grade and at location shown on the drawings. Inlets shall be constructed in strict accordance with details as indicated in the drawings.
  - 2. When the box section of the inlet has been completed, the floor of the inlet shall be shaped by filling with one-two mortar to conform to the section shown on the detail drawings.
  - 3. Cast iron inlet frames and grates shall be accurately adjusted to line, grade and slope and grouted in place with mortar consisting of one part Portland Cement to two parts sand.
- B. PIPING:
  - 1. <u>Inspection:</u> Review drawings and job conditions and verify all inverts before trenching to avoid conflict with other below grade utilities either planned or existing. Immediately notify Architect of any apparent conflicts before beginning work.
  - 2. <u>Trenching:</u> Provide trenching in strict compliance with current OSHA regulations and in accordance with **Trench Safety Section**. Do not trench ahead of pipe laying unless trench is protected.
  - 3. Begin excavation work at the lower end of flow line and proceed to higher flow line. Avoid overexcavating; return over-excavated bed to grade and thoroughly compact. Remove large rocks, foreign or organic material; return bed to grade and thoroughly compact.
  - 4. Lay all pipe on required bedding to a true line slope as indicated in the drawings. Hand excavate at joints to ensure that full length of pipe lays on a solid bed. Install tongue end of pipes facing direction of drainage flow.
  - 5. Bedding and backfilling of pipe:
    - a. Bed and backfill all piping in accordance with the details indicated on the drawings. Where local or other applicable codes require more stringent specifications, those codes shall govern.

- b. All piping located in County Flood Control District right of way shall be bedded and backfilled with cement stabilized sand in accordance with Flood control District requirements.
- c. Cement stabilized sand shall be a homogeneous mixture of 1-1/2 sacks Portland Cement per cu. yd. of mixed material. Provide greater cement content where required by City or County Requirements.

END OF SECTION