

October 11, 2019

ADDENDUM ACKNOWLEDGEMENT FORM

To Whom It May Concern:

Concerning the **PSJA ISD BALDEMAR G. CANO CENTRAL KITCHEN COMPLEX CANOPY ADDITION BID # 19-20-028**, to be opened at 4:00 p.m., Thursday, October 17, 2019. Please consider the following:

Addendum Number:	Description of REVISED Addendum:
1	CLARIFICATION: REVISED RANKING CRITERIA TABLE FORM CLARIFICATION: REVISED BID FORM CLARIFICATION: REVISED TABLE OF CONTENTS CLARIFICATION: SPECIFICATIONS SECTIONS 04 05 11 CLARIFICATION: SHEET S6A PRE-BID SIGN-IN SHEET

For any questions pertaining to these changes, please contact Emily Garza, Director of Purchasing at (956) 354-2000.

Sincerely,



Emily Garza
Director of Purchasing

With the acceptance of this form, I acknowledge that I have received the above ***"ADDENDUM ACKNOWLEDGEMENT FORM"*** for the **PSJA ISD BALDEMAR G. CANO CENTRAL KITCHEN COMPLEX CANOPY ADDITION BID # 19-20-028**, to be opened at 4:00 p.m., Thursday, October 17, 2019. Please include a signed copy of this ***"ADDENDUM ACKNOWLEDGMENT FORM"*** with your bid/proposal.

Company Name:	_____	Authorized Signature:	_____
Address:	_____ _____	Authorized Signature (Print):	_____
City / State / Zip:	_____	Email:	_____
Telephone Number:	_____	Fax Number:	_____

START COLLEGE NOW! COMPLETE EARLY! GO FAR!

ADDENDUM NUMBER: #1**Date: October 10, 2019**

Project Name: PSJA ISD Baldemar G. Cano
Central Kitchen Complex
Canopy Addition BID #19-20-028

HEI Project No.: 19-123

Date: October 10, 2019
Bid Date: October 17, 2019
Engineer: Hinojosa Engineering, Inc.
108 W. 18th St.
Mission, TX 78572

**NOTICE TO ALL BIDDERS**

This Addendum forms a part of the Contract Document and modifies the original Drawings issued for bid, to the extent noted herein.

Careful note of this Addendum shall be taken by all parties of interest so that proper allowance is made in all computations, estimates and contracts and so that all trades affected are fully advised in the performance of work that will be required by them. Acknowledge receipt of this addendum by inserting its number and date of issue in the place provided for same in the proposal.

Items revised on the Drawings are designated by a cloud line and triangle surrounding the corresponding revision number.

This Addendum supersedes all previous Drawings, Specifications and instructions pertaining to these items. It is imperative that this addendum be inserted INTO set of specifications.

- 1.1 **Clarification:** New Ranking Criteria is to replace Ranking Criteria in contract documents.
- 1.2 **Clarification:** New Construction Criteria Tables is to replace Construction Criteria Tables in contract documents.
- 1.3 **Clarification:** Revised Bid Form – Section 00300 page is to replace page in contract documents. Bid Form was revised to include Add Alternate No. 01 (CMU Screen Wall).
- 1.4 **Clarification:** Revised Table of Contents – Document 00003 page is to replace page in contract documents. Table of Content was revised to include **DIVISION 4 - MASONRY**.
- 1.5 **Clarification:** Specifications Sections 04 05 11 – Masonry Mortaring and Grouting, 04 20 00 Unit Masonry & 04 27 31 Reinforced Unit Masonry is to be added to the contract documents.
- 1.6 **Clarification:** Sheet S6A – Add Alternate No. 01 Masonry Screen Wall is to be added to the contract documents.

END OF ADDENDUM

NEW RANKING CRITERIA

Evaluation Factors and Criteria

Offeror's are required to provide all requested information set forth below. Failure to provide requested information or omissions of requested information may result in Pharr-San Juan-Alamo Independent School District determining that the offeror's bid is non-responsive and can result in disqualification of bid.

Offeror's are required to use enclosed forms to provide response for evaluation. Failure to do so will cause your bid to be Non-Responsive / Non-Conforming.

Offeror's will be evaluated on criteria 1 through 7 with a maximum of 100 total points. The evaluation committee comprised of District staff will evaluate the bids. The district shall document the basis of its selection and shall make the evaluations public not later than the seventh day after the date the contract is awarded. The committee will present its recommendation to the Board. The Board of Trustees retains the right to award or reject all bids in their entirety.

The District retains the right to apply all criteria as appropriate and allowed in Education Code 44.031 section (b). The District specifically requests offeror's to answer or provide information according to the following selection criteria. Questions left unanswered will result in zero (0) points awarded.

Criterion 1: Offeror's proposed price (*Section 44.031 (b) (1) and (7)*). ***(65 points awarded for this area)***

Please note: If Completed Bid/District Forms are not received, bid will be considered non-responsive

Criterion 2: Offeror's Time to complete the project (*Section 44.031 (b) (4), (7), and (8)*); *no extra points will be given if project finished prior to requested date. (1 point awarded for this area).*

The contractor must submit a construction schedule for completion of the project together with the bid.

Criterion 3: Offeror's must also submit an estimated subcontractor list by 12:00pm (noon) on the following day after the bid opening. ***(3 points awarded for this area).***

NEW RANKING CRITERIA

Criterion 4: Offeror's experience with commercial projects of similar size, scope, and/or complexity, preferably public entity projects (Section 44.031 (b) (8)). *Must list a minimum of seven (7) projects (14 points awarded for this area – Complete Forms Provided)*

List projects, completed or ongoing of **similar size, scope, and/or complexity** to this project where ***your company*** was the general/prime contractor of record. Please list projects in chronological order, beginning with the most recent, using the following format and example. For all ongoing projects that are listed, please list separately the current capacity/projects of your business.

Project Name	Project Size in Sq Ft	Location	Owner Representative that dealt with Construction	Architect	Contract Amount	Unique Features/complexity	Completion Date and Days to Completion
ABC Project for X School	85,000	City, ST	Mr. Smith Address Phone #	Architect Address Phone #	\$1,000,000	List details	December 31, 2009 (500 Days)

Criterion 5: Offeror's experience with PSJA ISD on projects of similar size, scope, and/or complexity, preferably public entity projects (Section 44.031 (b) (8)). **(2 points awarded for this area – Complete Forms Provided)**

List projects, completed or ongoing of **similar size, scope, and/or complexity** to this project where ***your company*** was the general/prime contractor of record. Please list projects in chronological order, beginning with the most recent, using the following format and example.

Criterion 6a, 6b and 6c: Reputation and Quality of the vendor (Contractor/Owner), Architect/Engineer, Sub-Contractors and of the vendors goods or services (Section 44.031 (b) (2), (3), and (8)) **(10 points – Complete Forms Provided)**

Criteria 6a: Reputation and Quality of the contractor from the Owner and of the vendors' goods or services {Section 44.031 (b) (8)}. Provide three (3) letters of reference from Owners listed below. Letters must be from owner's representative responsible for management of construction project.

Owner Name	Project Name	Date Completed	Total Value of Project
ABC	ABC School	January 1, 2009	\$5,000,000

Criteria 6b: Reputation and Quality of the contractor from the Architect/Engineer and of the vendors' goods or services {Section 44.031 (b) (8)}. Provide two (2) letters of reference from Architect/Engineer listed below.

Architect/Engineer Name	Project Name	Date Completed	Total Value of Project
ABC	ABC School	January 1, 2009	\$5,000,000

NEW RANKING CRITERIA

*Criteria 6c: Reputation and Quality of the contractor from a Sub-Contractor and of the vendors' goods or services {Section 44.031 (b) (8)}. **Provide two (2) letters of reference from a sub-contractor and/or supplier.***

Sub-Contractor/ Supplier Name	Project Name	Trade	Date Completed	Total Value of Project
	ABC School		January 1, 2009	\$5,000,000

Criterion 7: Offeror's must be Certified by Texas Building and Procurement Commission as a Historically Underutilized Business (HUB): ***(2 points awarded for this area)***

Criterion 8: If estimated value of construction is greater than \$2,000,000 (subject to any other project recommended by the Board) a presentation to the School Board Members will be made ***(up to 3 points awarded for this area)***

Maximum Total Points to be awarded 100:

PHARR-SAN JUAN-ALAMO I.S.D.
(CRITERIA # 4, # 5, AND # 6 - REQUESTED INFORMATION) NEW RANKING SHEETS 2019-2020

Owner Information:

Owner Name	Owner Physical Address	Year Business was established

Criteria # 4: Offeror's experience with commercial projects of similar size, scope, and/or complexity, preferably public entity projects {Section 44.031 (b) (8)} Please list a minimum of seven (7) projects below. *Projects will be ranked based on 75% of the lowest base bid for this project.*

Project Name	Project Size in Sq. Ft.	Location	Owner/Rep. (and contact #)	Architect	Contract Amount	Unique Features/Complexity	Completion Date and Days to Completion

****PLEASE USE THESE FORMS SOLELY FOR PROVIDING INFORMATION. NO OTHER FORMS WILL BE ACCEPTED.****

PHARR-SAN JUAN-ALAMO I.S.D.

(CRITERIA # 4, # 5, AND # 6 - REQUESTED INFORMATION) NEW RANKING SHEETS 2019-2020

Criteria # 5: Offeror's experience with PSJA ISD on projects of similar size, scope, and/or complexity, preferably public entity projects {Section 44.031 (b) (8)}

Project Name	Project Size in Sq. Ft.	Location	Owner/Rep. (and contact #)	Architect	Contract Amount	Unique Features/Complexity	Completion Date and Days to Completion

Criteria # 6a: Reputation and Quality of the contractor from the Contractor/Owner and of the vendors' goods or services {Section 44.031 (b) (8)}.
Provide three (3) letters of reference from Contractors/Owners listed below. Letters must be from owner's representative responsible for management of construction project.

Project Name	Project Size in Sq. Ft.	Location	Owner/Rep. (and contact #)	Architect	Contract Amount	Unique Features/Complexity	Completion Date and Days to Completion

****PLEASE USE THESE FORMS SOLELY FOR PROVIDING INFORMATION. NO OTHER FORMS WILL BE ACCEPTED.****

PHARR-SAN JUAN-ALAMO I.S.D.
(CRITERIA # 4, # 5, AND # 6 - REQUESTED INFORMATION) NEW RANKING SHEETS 2019-2020

Criteria # 6b: Reputation and Quality of the contractor from the Architect/Engineer and of the vendors' goods or services {Section 44.031 (b) (8)}.
Provide two (2) letters of reference from Architect/Engineer listed below.

Project Name	Project Size in Sq. Ft.	Location	Owner/Rep. (and contact #)	Architect	Contract Amount	Unique Features/ Complexity	Completion Date and Days to Completion

Criteria # 6c: Reputation and Quality of the contractor from a Sub-Contractor and of the vendors' goods or services {Section 44.031 (b) (8)}. Provide two (2) letters of reference from a sub-contractor and/or supplier.

Project Name	Project Size in Sq. Ft.	Location	Owner/Rep. (and contact #)	Architect	Contract Amount	Unique Features/ Complexity	Completion Date and Days to Completion

****PLEASE USE THESE FORMS SOLELY FOR PROVIDING INFORMATION. NO OTHER FORMS WILL BE ACCEPTED.****

BID FORM-SECTION 00300

PROJECT IDENTIFICATION: PSJA ISD Baldemar G. Cano Central Kitchen Complex Canopy Addition Bid # 19-20-028

Name and Address of OWNER:

PSJA Independent School District
601 E. Kelly Ave.
Pharr, TX. 78577

1) BASE PROPOSAL AMOUNT: \$ _____

AMOUNT OF PROPOSAL (In Words):

_____ **DOLLARS AND** _____ **CENTS**

Note: BASE PROPOSAL AMOUNT TO INCLUDE ALLOWANCES AS INDICATED IN THE SPECIFICATIONS.

2) ADD ALTERNATE No. 01 (CMU SCREEN WALL) AMOUNT: _____

AMOUNT OF PROPOSAL (In Words):

_____ **DOLLARS AND** _____ **CENTS**

In the event of the award of a Contract to the undersigned, the undersigned will furnish a performance and payment bond for the full amount of the Contract, to secure proper compliance with the terms and provisions of the Contract, to insure and guarantee payment of all lawful claims for labor performed. The proposed work to be done shall be accepted when fully completed and finished in accordance with the Specifications to the satisfaction of the Owner.

Statutory Bond for performance of the Contract and for payments of materials will be required in an amount equal to 100% of the accepted bid, if the bid exceeds \$25,000.00.

Number of consecutive calendar days to complete the project is 90 consecutive calendar days.

Bidder hereby agrees to commence work under this contract within 10 days after NOTICE TO PROCEED is issued and complete the work within 90 consecutive calendar days.

Bidder has examined copies of all Bidding Documents and of the following Addenda (receipt of all which is hereby acknowledged):

Date

Addenda Number

The undersigned certifies that the prices contained in this Bid have been carefully checked and are submitted as correct and final.

DATE: _____

Respectfully submitted:

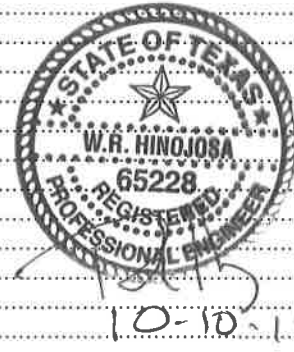
BY: _____ (Signature)

(Type or Print Name)

Document 00003

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SECTION 04 05 11 - MASONRY MORTARING AND GROUTING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Mortar for masonry.
- B. Grout for masonry.

1.2 RELATED REQUIREMENTS

- A. Section 04 20 00 – Unit Masonry: Installation of mortar and grout
- B. Section 04 27 31 – Reinforced Unit Masonry: Installation of mortar and grout.

1.3 REFERENCE STANDARDS

- A. ASTM C 91 – Standard Specification for Masonry Cement; 2005.
- B. ASTM C 94/C 94M – Standard Specification for Ready-Mixed Concrete; 2007.
- C. ASTM C 144 – Standard Specification for Aggregate for Masonry Mortar; 2004.
- D. ASTM C 270 – Standard Specification for Mortar for Unit Masonry; 2007a.
- E. ASTM C 404 – Standard Specification for Aggregates for Masonry Grout; 2007.
- F. ASTM C 476 – Standard Specification for Grout for Masonry; 2008.
- G. ASTM C 780 – Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2008a.
- H. ASTM C 979 – Standard Specification for Pigments for Integrally Colored Concrete; 2005.
- I. ASTM C 1019 – Standard Test Method for Sampling and Testing Grout; 2008.
- J. ASTM C 1072 – Standard Test Method for Measurement of Masonry Flexural Bond Strength; 2006.
- K. ASTM C 1314 – Standard Test Method for Compressive Strength of Masonry Prisms; 2007.
- L. ASTM E 518 – Standard Test Methods for Flexural Bond Strength of Masonry; 2003.
- M. IMIABC (HW) – Recommended Practices and Guide Specifications for Hot Weather Masonry Construction; International Masonry Industry All-Weather Council; current edition.

1.4 SUBMITTALS

- A. Mortar & Grout Mix Design.

1.5 QUALITY ASSURANCE

- A. Where standards or requirements of this Section are in conflict with those noted on the Contract Drawings, or the Building Code, the more stringent requirements shall govern. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected. Failure to do so will not relieve the Contractor from performing the Work correctly at no additional expense to the Owner.
- B. Testing Laboratory Services:
 - 1. Test results shall meet or exceed established standards. A technician from the Owner's Testing Laboratory must be present during all operations.

1.6 FIELD CONDITIONS

- A. Cold Weather Requirements: Comply with recommendations of IMIABC (CW).
- B. Hot Weather Requirements: Comply with IMIABC (HW).

PART 2 PRODUCTS

2.1 MATERIALS

- A. Masonry Cement: ASTM C 91, types as scheduled in this section.
 - 1. Colored mortar: Premixed cement as selected by architects.
- B. Mortar Aggregate: ASTM C 144.
- C. Grout Aggregate: ASTM C 404.
- D. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C 979.
 - 1. Color(s): As selected by architect from manufacturer's full range
- E. Water: Clean and potable

2.2 MORTAR MIXES

- A. Mortar for Unit Masonry: ASTM C 270, Property Specification.
 - 1. Exterior, loadbearing masonry: Type S.
 - 2. Exterior, non-loadbearing masonry: Type S.
 - 3. Interior, loadbearing masonry: Type S.
 - 4. Interior, non-loadbearing masonry: Type N.
 - 5. Glass unit masonry: Type S.
- B. Colored Mortar: Proportion selected pigments and other ingredients as selected by the architects, without exceeding manufacturer's recommended pigment-to-cement ratio.

2.3 MORTAR MIXING

- A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C 270 and in quantities needed for immediate use.
- B. Maintain sand uniformly damp immediately before the mixing process.
- C. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.
- D. Do not use anti-freeze compounds to lower the freezing point of mortar.
- E. If water is lost by evaporation, re-temper only within two hours of mixing.
- F. Use mortar within two hours after mixing at temperatures of 90 degrees F, or two-and-one-half hours at temperatures under 40 degrees F.

2.4 GROUT MIXES

- A. Bond Beams and Lintels: 3,000 psi strength at 28 days; 8-10 inches slump; provide pre-mixed type in accordance with ASTM C 94/C 94M.
 - 1. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
 - 2. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

2.5 GROUT MIXING

- A. Mix grout in accordance with ASTM C 94/C 94M.
- B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C 476 for fine and coarse grout.

2.6 PRECONSTRUCTION TESTING

- A. Testing will be conducted by an independent test agency.

- B. Mortar Mixes: Test mortars prebatched by weight in accordance with ASTM C 780 recommendations for preconstruction testing.
 - 1. Test results will be used to establish optimum mortar proportions and establish quality control values for construction testing.
- C. Grout Mixes: Test grout batches in accordance with ASTM C 1019 procedures
 - 1. Test results will be used to establish optimum grout proportions and establish quality control values for construction testing.

PART 3 EXECUTION

3.1 PREPARATION

- A. Plug clean-out holes for grouted masonry with brick masonry units. Brace masonry to resist wet grout pressure.

3.2 INSTALLATION

- A. Install mortar and grout to requirements of section(s) in which masonry is specified.
- B. Work grout into masonry cores and cavities to eliminate voids.
- C. Do not install grout in lifts greater than 48 inches without consolidating grout by rodding.
- D. Do not displace reinforcement while placing grout.
- E. Remove excess mortar from grout spaces.

3.3 GROUTING

- A. Perform grouting by means of high-lift technique, except in locations that mandate use of low-lift grouting technique.
- B. Low-Lift Grouting:
 - 1. Limit height of pours to 12 inches
 - 2. Limit height of masonry to 16 inches above each pour.
 - 3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
 - 4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.
- C. High-Lift Grouting:
 - 1. Verify that horizontal and vertical reinforcement is in proper position and adequately secured before beginning pours.
 - 2. Hollow Masonry: Limit lifts to maximum 8 feet and pours to maximum height of 8 feet.
 - 3. Place grout for spanning elements in single, continuous pour.

3.4 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field tests.
- B. Test and evaluate mortar in accordance with ASTM C 780 procedures.
 - 1. Test with same frequency as specified for masonry units.
- C. Test and evaluate grout in accordance with ASTM C 1019 procedures.
 - 1. Test with same frequency as specified for masonry units.
- D. Prism Test: Test masonry and mortar panels for compressive strength in accordance with ASTM C 1314, and for flexural bond strength in accordance with ASTM C 1072 or ASTM E 518; perform tests and evaluate results as specified in individual masonry sections.

END OF SECTION 04 05 11

SECTION 04 20 00 - UNIT MASONRY

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Concrete building brick.
3. Decorative concrete masonry units.
4. Pre-faced concrete masonry units.
5. Concrete face brick.
6. Clay face brick.
7. Building (common) brick.
8. Hollow brick.
9. Glazed brick.
10. Structural clay facing tile.
11. Firebox brick.
12. Clay flue lining units.
13. Stone trim units.
14. Mortar and grout.
15. Steel reinforcing bars.
16. Masonry-joint reinforcement.
17. Ties and anchors.
18. Embedded flashing.
19. Miscellaneous masonry accessories.
20. Masonry-cell fill.

B. Products Installed but not Furnished under This Section:

1. Cast-stone trim in unit masonry.
2. Steel lintels in unit masonry.
3. Steel shelf angles for supporting unit masonry.
4. Cavity wall insulation.

C. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for installing dovetail slots for masonry anchors.
2. Section 042300 "Glass Unit Masonry" for glass block.
3. Section 044200 "Exterior Stone Cladding" for stone trim secured with stone anchors.
4. Section 051200 "Structural Steel Framing" for installing anchor sections of adjustable masonry anchors for connecting to structural steel frame.
5. Section 071900 "Water Repellents" for water repellents applied to unit masonry assemblies.
6. Section 072100 "Thermal Insulation" for cavity wall insulation.
7. Section 076200 "Sheet Metal Flashing and Trim" for exposed sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.

8. Section 089516 "Wall Vents" for wall vents (brick vents).
9. Section 096313 "Brick Flooring" for interior brick flooring.
10. Section 096313.35 "Chemical-Resistant Brick Flooring" for chemical-resistant, interior brick flooring.
11. Section 097519 "Stone Trim" for stone window stools.
12. Section 321400 "Unit Paving" for exterior unit masonry paving.
13. Section 323223 "Segmental Retaining Walls" for dry-laid, concrete unit retaining walls.

1.3 ALLOWANCES

- A. Face brick is part of the Face Brick Allowance.

1.4 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For the following:
 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
 2. Stone Trim Units: Show sizes, profiles, and locations of each stone trim unit required.
 3. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.
 4. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
- C. Samples for Initial Selection:
 1. Decorative CMUs, in the form of small-scale units.
 2. Pre-faced CMUs.
 3. Concrete face brick, in the form of small-scale units.
 4. Clay face and Hollow brick, in the form of straps of five or more bricks.
 5. Glazed brick.
 6. Glazed structural clay tile.
 7. Stone trim.
 8. Colored mortar.
 9. Weep holes/cavity vents.
- D. Samples for Verification: For each type and color of the following:
 1. Exposed and Decorative CMUs.
 2. Pre-faced CMUs.
 3. Concrete face brick.

4. Clay face and Hollow brick, in the form of straps of five or more bricks.
5. Special brick shapes.
6. Glazed brick.
7. Glazed structural clay tile.
8. Unglazed structural clay tile.
9. Stone trim.
10. Pigmented and colored-aggregate mortar. Make Samples using same sand and mortar ingredients to be used on Project.
11. Weep holes and cavity vents.
12. Accessories embedded in masonry.

1.7 INFORMATIONAL SUBMITTALS

- A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.
 1. Submittal is for information only. Receipt of list does not constitute approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.
- B. Qualification Data: For testing agency.
- C. Material Certificates: For each type and size of the following:
 1. Masonry units.
 - a. Include data on material properties and material test reports substantiating compliance with requirements.
 - b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
 - c. For exposed brick, include test report for efflorescence according to ASTM C67.
 - d. For surface-coated brick, include test report for durability of surface appearance after 50 cycles of freezing and thawing according to ASTM C67.
 - e. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
 2. Integral water repellent used in CMUs.
 3. Cementitious materials. Include name of manufacturer, brand name, and type.
 4. Mortar admixtures.
 5. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
 6. Grout mixes. Include description of type and proportions of ingredients.
 7. Reinforcing bars.
 8. Joint reinforcement.
 9. Anchors, ties, and metal accessories.
- D. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C109/C109M for compressive strength, ASTM C1506 for water retention, and ASTM C91/C91M for air content.

2. Include test reports, according to ASTM C1019, for grout mixes required to comply with compressive strength requirement.
- E. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.
- F. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.8 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C1093 for testing indicated.
- B. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.
 1. Build sample panels for each type of exposed unit masonry construction typical exterior wall typical interior wall typical exterior and interior walls in sizes approximately 48 inches (1200 mm) long by 48 inches (1200 mm) high by full thickness.
 2. Build sample panels facing south.
 3. Where masonry is to match existing, build panels adjacent and parallel to existing surface.
 4. Clean exposed faces of panels with masonry cleaner indicated.
 5. Protect approved sample panels from the elements with weather-resistant membrane.
 6. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.
 - a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless Architect specifically approves such deviations in writing.
- C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 1. Build mockup of typical wall area as shown on Drawings.
 2. Build mockups for typical exterior and interior walls approximately 48 inches (1200 mm) long by 48 inches (1200 mm) high by full thickness, including face and backup wythes and accessories.
 - a. Include a sealant-filled joint at least 16 inches (400 mm) long in each mockup.
 - b. Include lower corner of window opening, framed with stone trim, at upper corner of exterior wall mockup. Make opening approximately 24 inches wide by 16 inches high.
 - c. Include through-wall flashing installed for a 24-inch (600-mm) length in corner of exterior wall mockup approximately 16 inches (400 mm) down from top of mockup, with a 12-inch (300-mm) length of flashing left exposed to view (omit masonry above half of flashing).

- d. Include metal, wood studs, sheathing, water-resistive barrier, sheathing joint-and-penetration treatment, air barrier, veneer anchors, flashing, cavity drainage material, and weep holes in exterior masonry-veneer wall mockup.
 - e. Include glazed structural clay tile, pre-faced CMUs, clay face brick on one face of interior unit masonry wall mockup.
 3. Where masonry is to match existing, erect mockups adjacent and parallel to existing surface.
 4. Clean exposed faces of mockups with masonry cleaner as indicated.
 5. Protect accepted mockups from the elements with weather-resistant membrane.
 6. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
 - a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
 - b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 7. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.10 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 1. Extend cover a minimum of 24 inches (600 mm) down both sides of walls, and hold cover securely in place.
 2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe, and hold cover in place.

- B. Do not apply uniform floor or roof loads for at least 48 hours and concentrated loads for at least seven days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 PERFORMANCE REQUIREMENTS

- A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.
 - 1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602/ACI 530.1/ASCE 6.
 - 2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C1314.

2.3 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Masonry Units are not allowed to contain chips, cracks, or other defects.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.
 - 1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.4 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
 - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
 - 2. Provide bullnose units for outside corners unless otherwise indicated.
- B. Integral Water Repellent: Provide units made with integral water repellent for exposed units and where indicated.
 - 1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E514/E514M as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.
- C. Insulated CMUs: Where indicated, units shall contain rigid, specially shaped, molded-polystyrene insulation units complying with ASTM C578, Type I, designed for installing in cores of masonry units.
- D. CMUs: ASTM C90.
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi (19.3 MPa).
 - 2. Density Classification: Medium weight unless otherwise indicated.
 - 3. Size (Width): Manufactured to dimensions 3/8 inch (10 mm) less than nominal dimensions.
 - 4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.
 - 5. Faces to Receive Plaster: Where units are indicated to receive a direct application of plaster, provide textured-face units made with gap-graded aggregates.
- E. Concrete Building Brick: ASTM C55.
 - 1. Unit Compressive Strength: As selected by Architect.
 - 2. Density Classification: As selected by Architect.
 - 3. Size (Actual Dimensions): As selected by Architect.
- F. Decorative CMUs: ASTM C90.

1. Unit Compressive Strength: As selected by Architect.
 2. Density Classification: As selected by Architect.
 3. Size (Width): As selected by Architect.
 4. Pattern and Texture: As selected by Architect.
 5. Colors: As selected by Architect from manufacturer's full range.
 6. Special Aggregate: Provide units made with aggregate matching aggregate in Architect's sample.
- G. Pre-faced CMUs: Lightweight hollow or solid concrete units complying with ASTM C90, with manufacturer's standard smooth resinous facing complying with ASTM C744.
1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi (19.3 MPa).
 2. Size: Manufactured to dimensions specified in "CMUs" Paragraph but with pre-faced surfaces having 1/16-inch- (1.5-mm-) wide returns of facing to create 1/4-inch (6.5-mm-) wide mortar joints with modular coursing.
 3. Colors and Patterns: As selected by Architect from manufacturer's full range.
- H. Concrete Face Brick: ASTM C1634.
1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 3750 psi (25.86 MPa).
 2. Density Classification: Medium weight.
 3. Size (Actual Dimensions): As selected by Architect.
 4. Texture: As selected by Architect.
 5. Colors: As selected by Architect from manufacturer's full range.
 6. Special Aggregate: Provide units made with aggregate matching aggregate in Architect's sample.

2.5 CONCRETE AND MASONRY LINTELS

- A. General: Provide one of the following:
- B. Concrete Lintels: ASTM C1623, matching CMUs in color, texture, and density classification; and with reinforcing bars indicated. Provide lintels with net-area compressive strength not less than that of CMUs.
- C. Concrete Lintels: Precast or formed-in-place concrete lintels complying with requirements in Section 033000 "Cast-in-Place Concrete," and with reinforcing bars indicated.
- D. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.6 BRICK

- A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
 - 1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
 - 2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
 - 3. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
 - 4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
- B. Clay Face Brick: As selected by Architect.
- C. Building (Common) Brick: As selected by Architect.
- D. Hollow Brick: As Selected by Architect.
- E. Glazed Brick: As selected by Architecta)].

2.7 FIREPLACE AND CHIMNEY LINING UNITS

- A. Not in this project.

2.8 STONE TRIM UNITS

- A. As selected by Architect.

2.9 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
 - 1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C114.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C91/C91M.
- E. Mortar Cement: ASTM C1329/C1329M.
- F. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C979/C979M. Use only pigments with a record of satisfactory performance in masonry mortar.

- G. Colored Cement Products: Packaged blend made from portland cement and hydrated lime or masonry cement and mortar pigments, all complying with specified requirements, and containing no other ingredients.
 - 1. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
 - 2. Pigments shall not exceed 10 percent of portland cement by weight.
 - 3. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.
- H. Aggregate for Mortar: ASTM C144.
 - 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 - 2. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
 - 3. White-Mortar Aggregates: Natural white sand or crushed white stone.
 - 4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- I. Aggregate for Grout: ASTM C404.
- J. Epoxy Pointing Mortar: ASTM C395, epoxy-resin-based material formulated for use as pointing mortar for glazed or pre-faced masonry units (and approved for such use by manufacturer of units); in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's colors.
- K. Refractory Mortar Mix: Ground fireclay or nonwater-soluble, calcium aluminate, medium-duty refractory mortar that passes ASTM C199 test; or an equivalent product acceptable to authorities having jurisdiction.
- L. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C494/C494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
- M. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.
- N. Water: Potable.

2.10 REINFORCEMENT

- A. Uncoated-Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60 (Grade 420).
- B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch (3.77-mm) steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
- C. Masonry-Joint Reinforcement, General: ASTM A951/A951M.
 - 1. Interior Walls: Hot-dip galvanized carbon steel.
 - 2. Exterior Walls: Hot-dip galvanized carbon Stainless steel.
 - 3. Wire Size for Side Rods: 0.187-inch (4.76-mm) diameter.

4. Wire Size for Cross Rods: 0.187-inch (4.76-mm) diameter.
 5. Wire Size for Veneer Ties: 0.187-inch (4.76-mm) diameter.
 6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches (407 mm) o.c.
 7. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.
- D. Masonry-Joint Reinforcement for Single-Wythe Masonry: Truss type with single pair of side rods.
- E. Masonry-Joint Reinforcement for Multiwythe Masonry:
1. Truss type with one side rod at each face shell of hollow masonry units more than 4 inches (100 mm) wide, plus two side rods at each wythe of masonry 4 inches (100 mm) wide or less.
 2. Tab type, either ladder or truss design, with one side rod at each face shell of backing wythe and with rectangular tabs sized to extend at least halfway through facing wythe, but with at least 5/8-inch (16-mm) cover on outside face.
 3. Adjustable (two-piece) type, truss design, with one side rod at each face shell of backing wythe and with separate adjustable ties with pintle-and-eye connections having a maximum horizontal play of 1/16 inch (1.5 mm) and maximum vertical adjustment of 1-1/4 inches (32 mm). Size ties to extend at least halfway through facing wythe but with at least 5/8-inch (16-mm) cover on outside face. Ties have hooks or clips to engage a continuous horizontal wire in the facing wythe.

2.11 TIES AND ANCHORS

- A. General: Ties and anchors shall extend at least 1-1/2 inches (38 mm) into veneer but with at least a 5/8-inch (16-mm) cover on outside face.
- B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
1. Mill-Galvanized, Carbon-Steel Wire: ASTM A82/A82M, with ASTM A641/A641M, Class 1 coating.
 2. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A82/A82M, with ASTM A153/A153M, Class B-2 coating.
 3. Galvanized-Steel Sheet: ASTM A653/A653M, Commercial Steel, G60 (Z180) zinc coating.
 4. Steel Sheet, Galvanized after Fabrication: ASTM A1008/A1008M, Commercial Steel, with ASTM A153/A153M, Class B coating.
 5. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches (100 mm) wide.
1. Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches (50 mm) long may be used for masonry constructed from solid units.
 2. Where wythes do not align or are of different materials, use adjustable ties with pintle-and-eye connections having a maximum adjustment of 1-1/4 inches (32 mm).
 3. Wire: Fabricate from 3/16-inch- (4.76-mm-) diameter, hot-dip galvanized steel wire. Mill-galvanized wire ties may be used in interior walls unless otherwise indicated.
- D. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- (6.35-mm-) diameter, hot-dip galvanized steel wire. Mill-galvanized wire may be used at interior walls unless otherwise indicated.
 2. Tie Section: Triangular-shaped wire tie made from 0.187-inch- (4.76-mm-) diameter, hot-dip galvanized steel wire. Mill-galvanized wire may be used at interior walls unless otherwise indicated.
- E. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
1. Connector Section: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section; formed from [0.060-inch- (1.52-mm-) thick steel sheet, galvanized after fabrication] [0.105-inch- (2.66-mm-) thick steel sheet, galvanized after fabrication] [0.062-inch- (1.59-mm-) thick].
 - a. [0.064-inch- (1.63-mm-)] [0.108-inch- (2.74-mm-)] thick, galvanized-steel sheet may be used at interior walls unless otherwise indicated.
 2. Tie Section: Triangular-shaped wire tie made from 0.187-inch- (4.76-mm-) diameter, hot-dip galvanized steel wire. Mill-galvanized wire may be used at interior walls unless otherwise indicated.
- F. Partition Top Anchors: 0.105-inch- (2.66-mm-) thick metal plate with a 3/8-inch- (9.5-mm-) diameter metal rod 6 inches (152 mm) long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.
- G. Rigid Anchors: Fabricate from steel bars 1-1/2 inches (38 mm) wide by 1/4 inch (6.35 mm) thick by 24 inches (610 mm) long, with ends turned up 2 inches (51 mm) or with cross pins unless otherwise indicated bent to configuration indicated.
1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A153/A153M.
- H. Adjustable Masonry-Veneer Anchors:
1. General: Provide anchors that allow vertical adjustment but resist a 100-lbf (445-N) load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch (1.5 mm).
 2. Fabricate sheet metal anchor sections and other sheet metal parts from 0.105-inch- (2.66-mm-) thick steel sheet, galvanized after fabrication.
 3. Fabricate wire ties from 0.25-inch- (6.35-mm-) diameter, hot-dip galvanized-steel wire unless otherwise indicated.
- 2.12 EMBEDDED FLASHING MATERIALS
- A. Metal Flashing: As selected by Architect.
 - B. Flexible Flashing: As selected by Architect.
 - C. Application: As selected by Architect.
 - D. Single-Wythe CMU Flashing System: As selected by Architect.
 - E. Solder and Sealants for Sheet Metal Flashings: As selected by Architect.

- F. Adhesives, Primers, and Seam Tapes for Flashings: As selected by Architect.
- G. Termination Bars for Flexible Flashing: As selected by Architect.
- H. Termination Bars for Flexible Flashing: As selected by Architect.
- I. Termination Bars for Flexible Flashing: As selected by Architect.

2.13 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane or PVC.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D2000, Designation M2AA-805 or PVC, complying with ASTM D2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).
- D. Weep/Cavity Vent Products: Use one of the following unless otherwise indicated:
 - 1. Wicking Material: Absorbent rope, made from UV-resistant synthetic fiber, 1/4 to 3/8 inch (6 to 10 mm) in diameter, in length required to produce 2-inch (50-mm) exposure on exterior and 18 inches (450 mm) in cavity. Use only for weeps.
 - 2. Round Plastic Weep/Vent Tubing: Medium-density polyethylene, 3/8-inch (9-mm) OD by 4 inches (100 mm) long.
 - 3. Rectangular Plastic Weep/Vent Tubing: Clear butyrate, 3/8 by 1-1/2 by 3-1/2 inches (9 by 38 by 89 mm) long.
 - 4. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe, in color selected from manufacturer's standard.
 - 5. Mesh Weep/Vent: Free-draining mesh; made from polyethylene strands, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe; in color selected from manufacturer's standard.
 - 6. Aluminum Weep Hole/Vent: Units made from sheet aluminum, designed to fit into a head joint and consisting of a vertical channel, with louvers stamped in web and with a top flap to keep mortar out of the head joint; factory primed and painted before installation to comply with Section 099113 "Exterior Painting" in color selected by Architect.
 - 7. Vent: Units made from flexible PVC, designed to fit into a head joint and consisting of a louvered vertical leg, flexible wings to seal against ends of masonry units, and a top flap to keep mortar out of the head joint; in color selected by Architect.
- E. Cavity Drainage Material: As selected by Architect.

2.14 MASONRY-CELL FILL

- A. Loose-Fill Insulation: Perlite complying with ASTM C549, Type II (surface treated for water repellency and limited moisture absorption) or Type IV (surface treated for water repellency and to limit dust generation).
- B. Lightweight-Aggregate Fill: ASTM C331/C331M.

2.15 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

2.16 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. Use portland cement-lime, masonry cement or mortar cement mortar unless otherwise indicated.
 - 3. For exterior masonry, use portland cement-lime, masonry cement or mortar cement mortar.
 - 4. For reinforced masonry, use portland cement-lime, masonry cement or mortar cement mortar.
 - 5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
 - 1. For masonry below grade or in contact with earth, use Type M.
 - 2. For reinforced masonry, use Type S.
 - 3. For mortar parge coats, use Type S or Type N.
 - 4. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.
 - 5. For interior nonload-bearing partitions, Type O may be used instead of Type N.
- D. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
 - 1. Pigments shall not exceed 10 percent of portland cement by weight.
 - 2. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.
 - 3. Mix to match Architect's sample.

4. Application: Use pigmented mortar for exposed mortar joints with the following units:
 - a. Decorative CMUs.
 - b. Pre-faced CMUs.
 - c. Concrete face brick.
 - d. Clay face brick.
 - e. Hollow brick.
 - f. Glazed brick.
 - g. Glazed structural clay facing tile.
 - h. Stone trim units.
 - i. Cast-stone trim units.
- E. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.
 1. Mix to match Architect's sample.
 2. Application: Use colored-aggregate mortar for exposed mortar joints with the following units:
 - a. Decorative CMUs.
 - b. Pre-faced CMUs.
 - c. Concrete face brick.
 - d. Clay face brick.
 - e. Hollow brick.
 - f. Glazed brick.
 - g. Glazed structural clay facing tile.
 - h. Stone trim units.
 - i. Cast-stone trim units.
- F. Grout for Unit Masonry: Comply with ASTM C476.
 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
 2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi (14 MPa).
 3. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C143/C143M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
 2. Verify that foundations are within tolerances specified.
 3. Verify that reinforcing dowels are properly placed.
 4. Verify that substrates are free of substances that impair mortar bond.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.
- B. Build chases and recesses to accommodate items specified in this and other Sections.
- C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.
- D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.
- G. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested according to ASTM C67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

- A. Dimensions and Locations of Elements:
 - 1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
 - 2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
 - 3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.
- B. Lines and Levels:
 - 1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
 - 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
 - 3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
 - 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
 - 5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.

6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch (1.5 mm) from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches (50 mm). Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- H. Fill cores in hollow CMUs with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- I. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.
2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch (13-mm) clearance between end of anchor rod and end of tube. Space anchors 48 inches (1200 mm) o.c. unless otherwise indicated.
3. Wedge nonload-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
4. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 078443 "Joint Firestopping."

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow brick and CMUs as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.

B. Lay solid masonry units and hollow brick with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Lay structural clay tile as follows:

1. Lay vertical-cell units with full head joints unless otherwise indicated. Provide bed joints with full mortar coverage on face shells and webs.
2. Lay horizontal-cell units with full bed joints unless otherwise indicated. Keep drainage channels, if any, free of mortar. Form head joints with sufficient mortar so excess will be squeezed out as units are placed in position. Butter both sides of units to be placed, or butter one side of unit already in place and one side of unit to be placed.
3. Maintain joint thicknesses indicated except for minor variations required to maintain bond alignment. If not indicated, lay walls with 1/4- to 3/8-inch- (6- to 10-mm-) thick joints.

D. Set firebox brick in full bed of refractory mortar with full head joints. Form joints by buttering both surfaces of adjoining brick and sliding it into place. Make joints just wide enough to accommodate variations in size of brick, approximately 1/8 inch (3 mm). Tool joints smooth on surfaces exposed to fire or smoke.

E. Install clay flue liners to comply with ASTM C1283. Install flue liners ahead of surrounding masonry. Set clay flue liners in full bed of refractory mortar 1/16 to 1/8 inch (1.6 to 3 mm) thick. Strike joints flush on inside of flue to provide smooth surface. Maintain expansion space between flue liner and surrounding masonry except where surrounding masonry is required to provide lateral support for flue liners.

F. Set stone and cast-stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.

1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
 2. Allow cleaned surfaces to dry before setting.
 3. Wet joint surfaces thoroughly before applying mortar.
 4. Rake out mortar joints for pointing with sealant.
- G. Rake out mortar joints at pre-faced CMUs, glazed brick and glazed structural clay tile to a uniform depth of 1/4 inch (6 mm) and point with epoxy mortar to comply with epoxy-mortar manufacturer's written instructions.
- H. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
1. For glazed masonry units, use a nonmetallic jointer 3/4 inch (19 mm) or more in width.
- I. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.
- J. Cut joints flush where indicated to receive waterproofing, cavity wall insulation, air barriers unless otherwise indicated.

3.6 COMPOSITE MASONRY

- A. Bond wythes of composite masonry together as selected by Architect.
- B. Bond wythes of composite masonry together using bonding system indicated on Drawings.
- C. Collar Joints: Solidly fill collar joints by parging face of first wythe that is laid and shoving units of other wythe into place.
- D. Collar Joints in Clay Tile Masonry: After each course is laid, fill the vertical, longitudinal joint between wythes solidly with mortar at exterior walls, except cavity walls, and interior walls and partitions.
- E. Corners: Provide interlocking masonry unit bond in each wythe and course at corners unless otherwise indicated.
1. Provide continuity with masonry-joint reinforcement at corners by using prefabricated L-shaped units as well as masonry bonding.
- F. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:
1. Provide individual metal ties not more than 8 inches (203 mm) o.c.
 2. Provide continuity with masonry-joint reinforcement by using prefabricated T-shaped units.
 3. Provide rigid metal anchors not more than 24 inches (610 mm) o.c. If used with hollow masonry units, embed ends in mortar-filled cores.

3.7 CAVITY WALLS

- A. Bond wythes of cavity walls together using one of the following methods as follows:

1. Individual Metal Ties: Provide ties as shown installed in horizontal joints, but not less than one metal tie for 1.77 sq. ft. (0.16 sq. m) of wall area spaced not to exceed 16 inches (406 mm) o.c. horizontally and 16 inches (406 mm) o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches (305 mm) of openings and space not more than 36 inches (915 mm) apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches (610 mm) o.c. vertically.
 - a. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) ties.
 - b. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) ties to allow for differential movement regardless of whether bed joints align.
 2. Masonry-Joint Reinforcement: Installed in horizontal mortar joints.
 - a. Where bed joints of both wythes align, use tab-type reinforcement.
 - b. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) reinforcement with continuous horizontal wire in facing wythe attached to ties.
 - c. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) reinforcement with continuous horizontal wire in facing wythe attached to ties to allow for differential movement regardless of whether bed joints align.
 3. Header Bonding: Provide masonry unit headers extending not less than 3 inches (76 mm) into each wythe. Space headers not more than 8 inches (203 mm) clear horizontally and 16 inches (406 mm) clear vertically.
 4. Masonry-Veneer Anchors: Comply with requirements for anchoring masonry veneers.
- B. Bond wythes of cavity walls together using bonding system indicated on Drawings.
- C. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.
- D. Parge cavity face of backup wythe in a single coat approximately 3/8 inch (10 mm) thick. Trowel face of parge coat smooth.
- E. Installing Cavity Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches (300 mm) o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.
1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.
- 3.8 ANCHORED MASONRY VENEERS
- A. Anchor masonry veneers to wall framing and concrete and masonry backup with masonry-veneer anchors to comply with the following requirements:
1. Fasten screw-attached anchors through sheathing to wall framing and to concrete and masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.

2. Embed tie sections or connector sections and continuous wire in masonry joints.
3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
4. Space anchors as indicated, but not more than 18 inches (458 mm) o.c. vertically and 24 inches (610 mm) o.c. horizontally, with not less than one anchor for each 2 sq. ft. (0.2 sq. m) of wall area. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 8 inches (203 mm), around perimeter.
5. Space anchors as indicated, but not more than 16 inches (406 mm) o.c. vertically and 25 inches (635 mm) o.c. horizontally, with not less than one anchor for each [2.67 sq. ft. (0.25 sq. m)] of wall area. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 36 inches (914 mm), around perimeter.
6. Space anchors as indicated, but not more than 18 inches (458 mm) o.c. vertically and horizontally. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 24 inches (610 mm), around perimeter.

- B. Provide not less than 2 inches (50 mm) of airspace between back of masonry veneer and face of sheathing or insulation.

1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.

3.9 MASONRY-CELL FILL

- A. Pour loose-fill insulation into cavities to fill void spaces. Maintain inspection ports to show presence of fill at extremities of each pour area. Close the ports after filling has been confirmed. Limit the fall of fill to one story high, but not more than 20 feet (6 m).
- B. Install molded-polystyrene insulation units into masonry unit cells before laying units.

3.10 MASONRY-JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).
1. Space reinforcement not more than 16 inches (406 mm) o.c.
 2. Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.
 3. Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings in addition to continuous reinforcement.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.
- E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.11 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:
 - 1. Provide an open space not less than 1/2 inch (13 mm) wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
 - 2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
 - 3. Space anchors as indicated, but not more than 24 inches (610 mm) o.c. vertically and 36 inches (915 mm) o.c. horizontally.

3.12 CONTROL AND EXPANSION JOINTS

- A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form control joints in concrete masonry as follows:
 - 1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout, and rake out joints in exposed faces for application of sealant.
 - 2. Install preformed control-joint gaskets designed to fit standard sash block.
 - 3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar, or rake out joint for application of sealant.
 - 4. Install temporary foam-plastic filler in head joints, and remove filler when unit masonry is complete for application of sealant.
- C. Form expansion joints in brick as follows: As selected by Architect.
- D. Provide horizontal, pressure-relieving joints by either leaving an airspace or inserting a compressible filler of width required for installing sealant and backer rod specified in Section 079200 "Joint Sealants," but not less than 3/8 inch (10 mm).
 - 1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

3.13 LINTELS

- A. Install steel lintels where indicated.
- B. Provide concrete or masonry lintels where shown and where openings of more than 12 inches (305 mm) for brick-size units and 24 inches (610 mm) for block-size units are shown without structural steel or other supporting lintels.
- C. Provide minimum bearing of 16 inches (200 mm) at each jamb unless otherwise indicated.

3.14 FLASHING, WEEP HOLES, AND CAVITY VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.

- B. Install flashing as follows unless otherwise indicated: As selected by Architect.
- C. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.
- D. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.
- E. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.
- F. Place pea gravel in cavities as soon as practical to a height equal to height of first course above top of flashing, but not less than 2 inches (50 mm), to maintain drainage.
 - 1. Fill cavities full height by placing pea gravel in cavities as masonry is laid, so that at any point, masonry does not extend more than 24 inches (600 mm) above top of pea gravel.
- G. Place cavity drainage material in cavities and airspace behind veneers to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.
- H. Install cavity vents in head joints in exterior wythes at spacing indicated. Use specified weep/cavity vent products or open-head joints to form cavity vents.
 - 1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

3.15 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 - 1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
 - 2. Limit height of vertical grout pours to not more than 48 inches.

3.16 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Inspections: Special inspections according to Level B in TMS 402/ACI 530/ASCE 5.
 - 1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
 - 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
 - 3. Place grout only after inspectors have verified proportions of site-prepared grout.
- C. Testing Prior to Construction: One set of tests.
- D. Testing Frequency: One set of tests for each 5000 sq. ft. (464 sq. m) of wall area or portion thereof.
- E. Clay Masonry Unit Test: For each type of unit provided, according to ASTM C67 for compressive strength.
- F. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C140 for compressive strength.
- G. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C780.
- H. Mortar Test (Property Specification): For each mix provided, according to ASTM C780. Test mortar for mortar air content and compressive strength.
- I. Grout Test (Compressive Strength): For each mix provided, according to ASTM C1019.
- J. Prism Test: For each type of construction provided, according to ASTM C1314 at 28 days.

3.17 PARGING

- A. Parge exterior faces of below-grade masonry walls, where indicated, in two uniform coats to a total thickness of 3/4 inch (19 mm). Dampen wall before applying first coat, and scarify first coat to ensure full bond to subsequent coat.
- B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch per foot (3 mm per 300 mm). Form a wash at top of parging and a cove at bottom.
- C. Damp-cure parging for at least 24 hours and protect parging until cured.

3.18 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
 - 5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
 - 6. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.
 - 7. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
 - 8. Clean stone trim to comply with stone supplier's written instructions.
 - 9. Clean limestone units to comply with recommendations in ILI's "Indiana Limestone Handbook."

3.19 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
 - 1. Crush masonry waste to less than 4 inches (100 mm) in each dimension.
 - 2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 312000 "Earth Moving."
 - 3. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.
- C. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.
- D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04 20 00

SECTION 04 27 31 - REINFORCED UNIT MASONRY

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Concrete Block.
- B. Mortar and Grout.
- C. Reinforcement and Anchorage.
- D. Flashings.
- E. Lintels.
- F. Accessories.

1.2 RELATED REQUIREMENTS

- A. Section 04 05 11 – Masonry Mortaring and Grouting.
- B. Section 05 50 00 – Metal Fabrications: Loose steel lintels.
- C. Section – Rough Carpentry: Nailing strips built into masonry.
- D. Section – Wood Blocking and Curbing: Nailing strips built into masonry.
- E. Section – Joint Sealers and Sealants: Backing rod and sealant at control and expansion joints.
- F. Section 04 20 00 – Unit Masonry: Commercial and Structural Block.

1.3 REFERENCE STANDARDS

- A. ACI 530/ASCE 5/TMS 402 – Building Code Requirements for Masonry Structures; American Concrete Institute International; 2008.
- B. ACI 530.1/ASCE 6/TMS 602 – Specification For Masonry Structures; American Concrete Institute International; 2008.
- C. ASTM A 82/A 82M – Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007.
- D. ASTM A 653/A 653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Glavannealed) by the Hot-Dip Process; 2009.
- E. ASTM C 91 – Standard Specification for Masonry Cement; 2005.
- F. ASTM C 270 – Standard Specification for Mortar for Unit Masonry; 2007a.
- G. ASTM C 476 – Standard Specification for Grout for Masonry; 2008.

1.4 SUBMITTALS

- A. As specified in section 042000- Unit Masonry.

1.5 QUALITY ASSURANCE

- A. Comply with provisions of ACI 530/ASCE 5/TMS 402 and ACI 530.1/ASCE 6/TMS 602, except where exceeded by requirements of the contract documents.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry unit by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.1 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
 - 1. Size: Standards units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
 - 2. Special Shapes: Provide non-standard blocks configured for corners.

2.2 MORTAR AND GROUT MATERIALS

- A. Mortar and Grout: As specified in Section 04 05 11 – Mortaring and Grouting.

2.3 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers of Joint Reinforcement and Anchors:
 - 1. Dur-O-Wal: www.dur-o-wal.com.
 - 2. Hohman & Barnard, Inc.: www.h-b.com.
 - 3. Masonry Reinforcing Corporation of America: www.wirebond.com
 - 4. Substitutions: See Section – Product Requirements.

2.4 FLASHINGS

- A. Metal Flashing Materials: Per Architectural Specs.

2.5 ACCESSORIES

- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.

2.6 LINTELS

2.7 PRECONSTRUCTION TESTING

- A. An Independent Testing Agency will perform Inspection and Testing.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.2 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. Clean reinforcement of loose rust.
- C. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.3 COURSING

- A. Establish lines, levels, and coursing indicated. Protect form displacement.

- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units.

3.4 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Lay hollow masonry units with face shell bedding on head and bed joints.
- C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- D. Remove excess mortar as work progresses.
- E. Perform job site cutting of masonry units with proper tools to provide straight, clean, un-chipped edges. Prevent broken masonry unit corners or edges.

3.5 REINFORCEMENT AND ANCHORAGE

- A. Reinforcement Bars: Secure at locations indicated and to avoid displacement during grouting. Minimum spacing between bars or to masonry surfaces shall be one bar diameter.
- B. Wall Ties: Install wall ties at locations indicated, spaced at not more than 24 inches on center horizontally and 16 inches on center vertically, unless otherwise indicated on drawings.
- C. Reinforced Hollow Unit Masonry: Keep vertical cores to be grouted clear of mortar, including bed area of first course.
 - 1. Bond Beams: At bond beams or other locations for horizontally reinforced masonry, provide special masonry unit or saw to accommodate reinforcement.

3.6 MASONRY FLASHINGS

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
 - 1. Extend flashing full width at such interruptions and at least 4 inches into adjacent masonry or turn up at least 4 inches to form watertight pan at non-masonry construction.
 - 2. Remove or cover protrusions or sharp edges that could puncture flashing.

3.7 GROUTING

- A. Use either high-lift or low-lift grouting techniques, at's option, subject to other limitations of contract documents.
- B. Low-Lift Grouting:
 - 1. Limit height of pours to 12 inches.
 - 2. Limit height of masonry to 16 inches above each pour.
 - 3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
 - 4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.
- C. High-Lift Grouting:
 - 1. Verify that horizontal and vertical reinforcement is in proper position and adequately secure before beginning pours.
 - 2. Place grout for spanning elements in single, continuous pour.

3.8 CONTROL AND EXPANSION JOINTS

- A. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

3.9 TOLERANCES

- A. Maximum Variation from Plumb: ¼ inch per story non-cumulative; ½ inch in two stories or more.
- B. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
- C. Maximum Variation from Cross Sectional Thickness of Walls: ¼ inch,

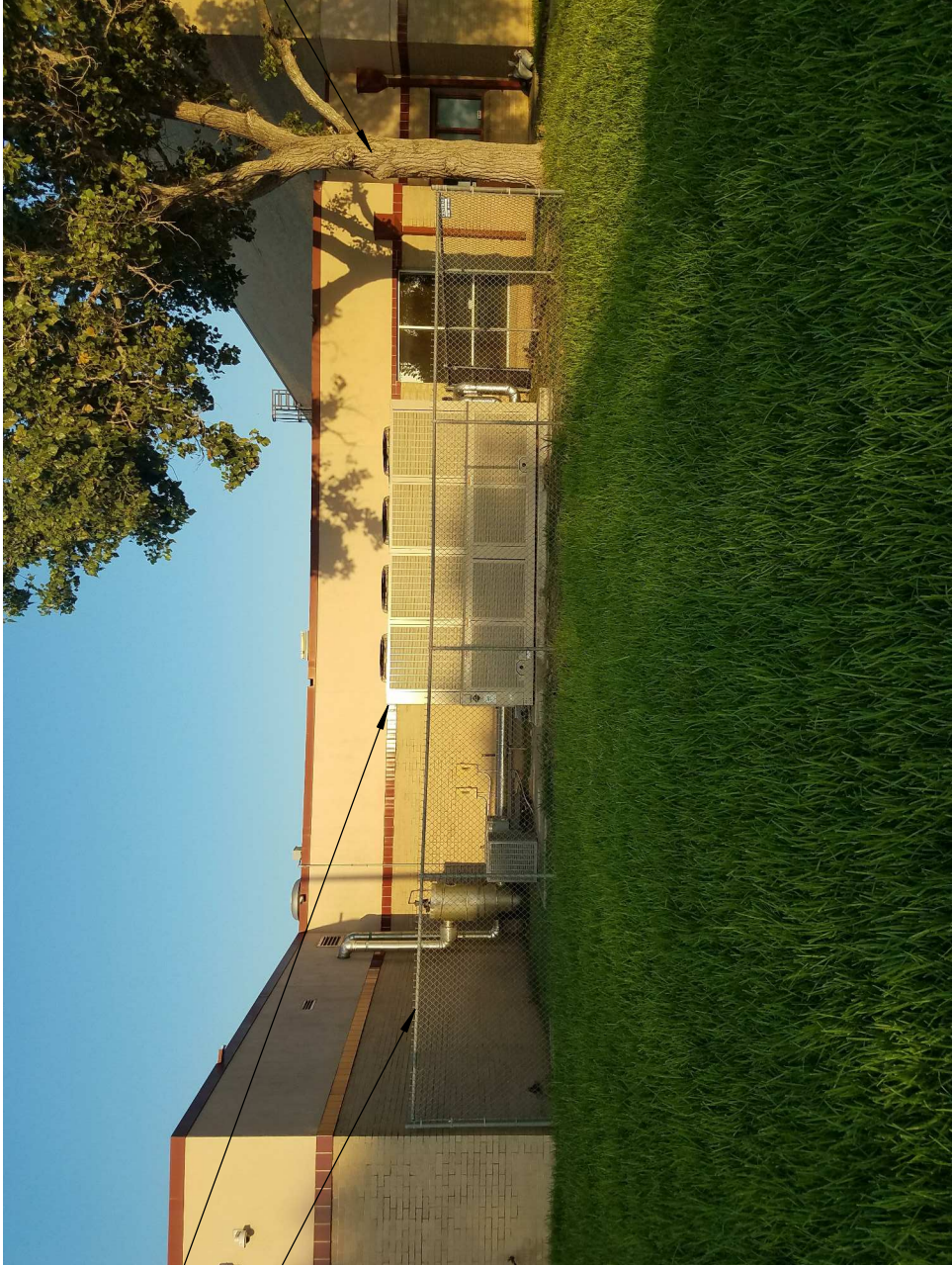
3.10 CLEANING

- A. Remove excess mortar and mortar smears as work progresses.
- B. Use non-metallic tools in cleaning operations.

3.11 PROTECTION

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION 04 27 31

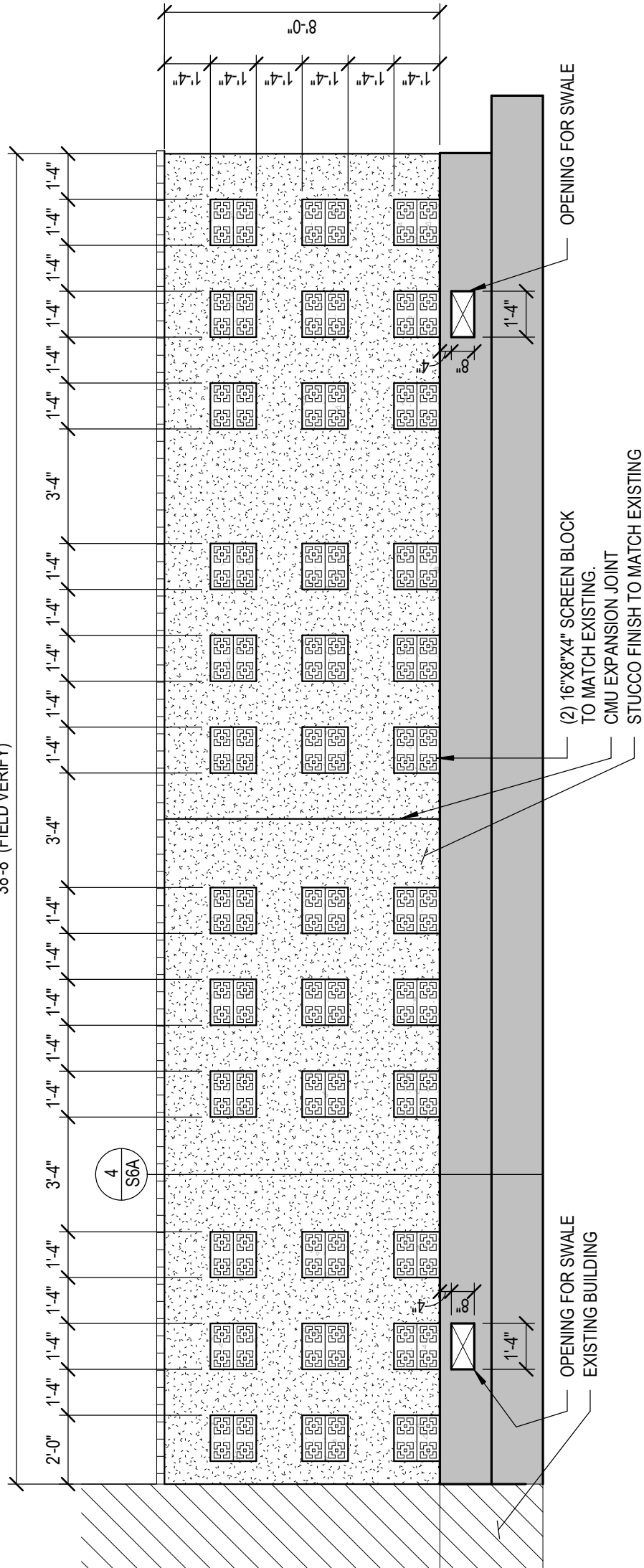


EXISTING MECHANICAL EQUIPMENT AND CONCRETE SLAB TO REMAIN
REMOVE EXISTING CHAINLINK FENCE WITH ENTIRETY RETURN TO OWNER TO SALVAGE

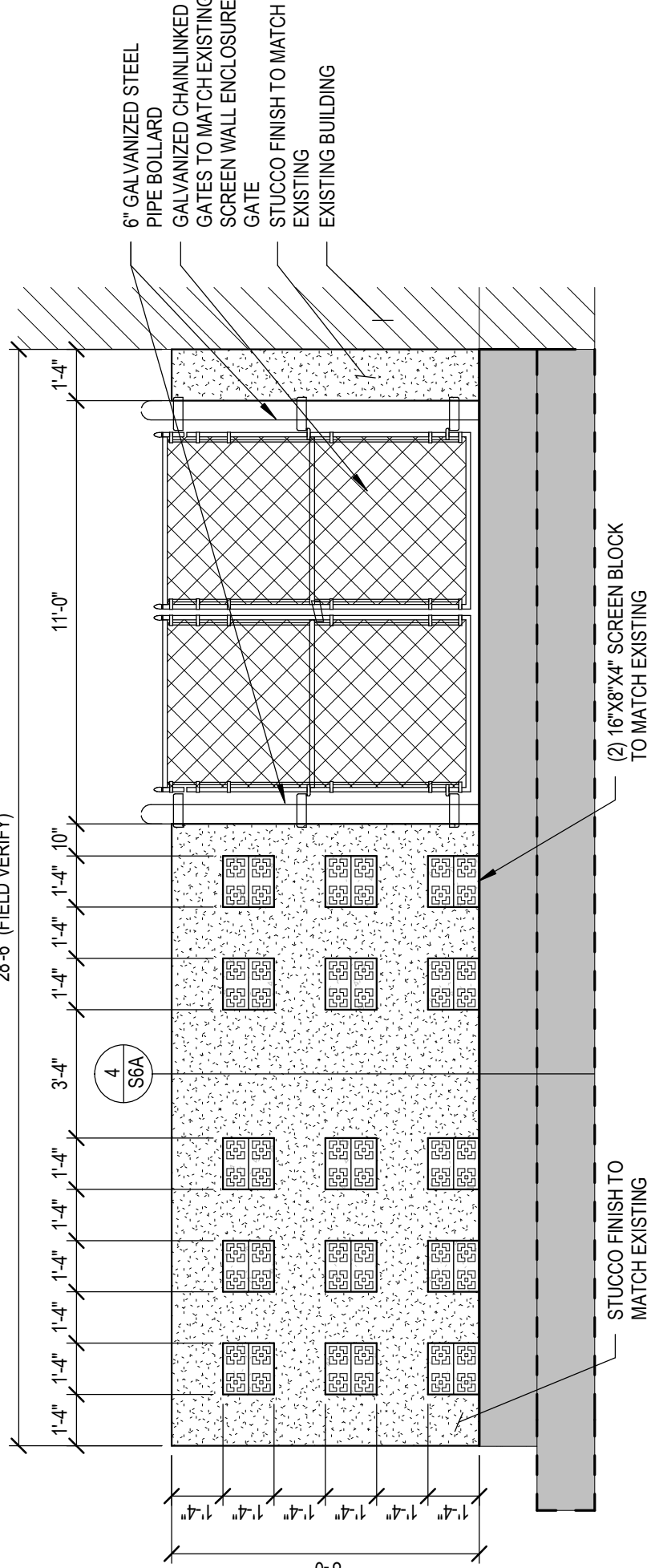


EXISTING MECHANICAL EQUIPMENT AND CONCRETE SLAB TO REMAIN
REMOVE EXISTING CHAINLINK FENCE WITH ENTIRETY RETURN TO OWNER TO SALVAGE
REMOVE EXISTING CHAINLINK GATE WITH ENTIRETY RETURN TO OWNER TO SALVAGE

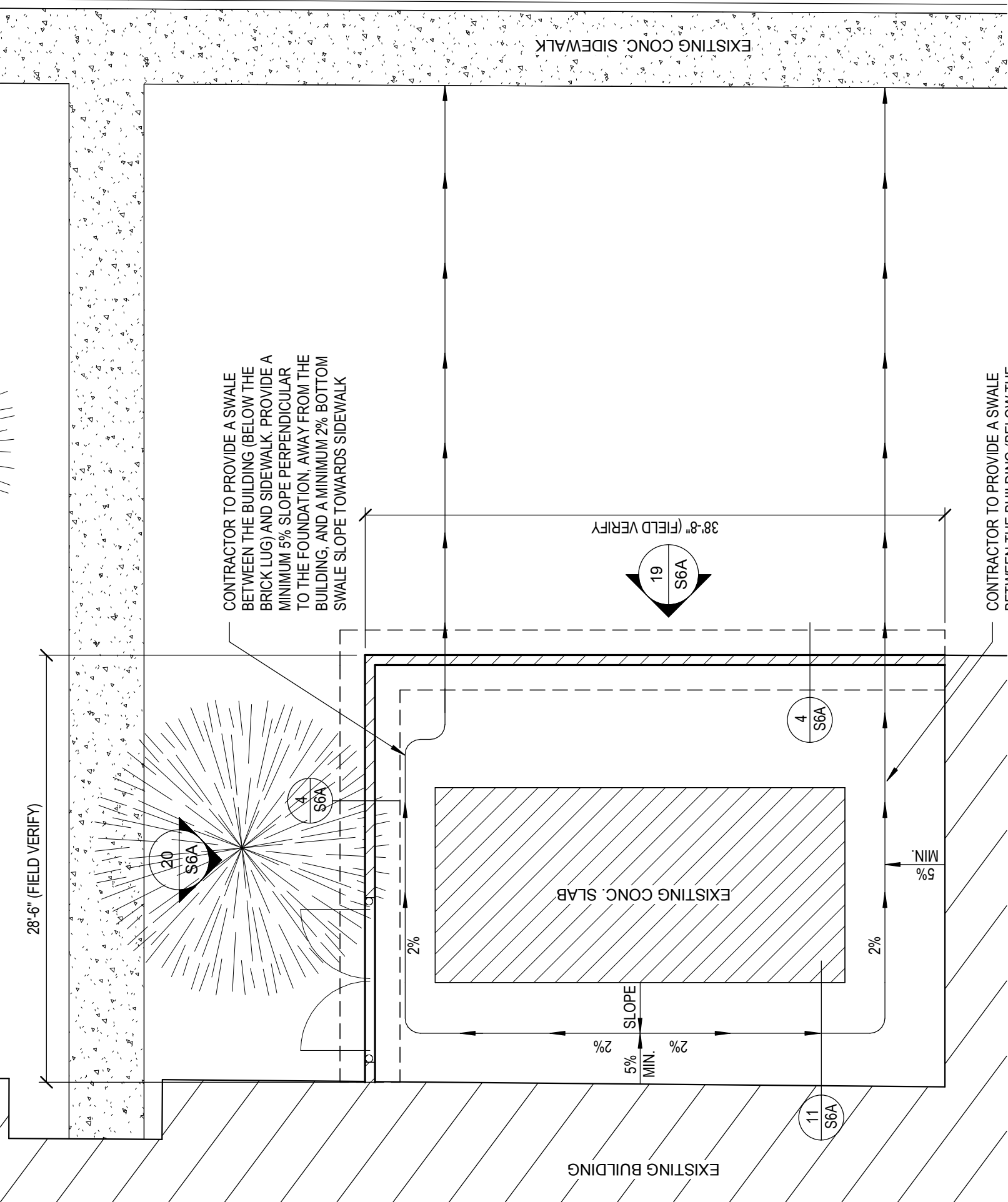
17 SELECTIVE DEMOLITION



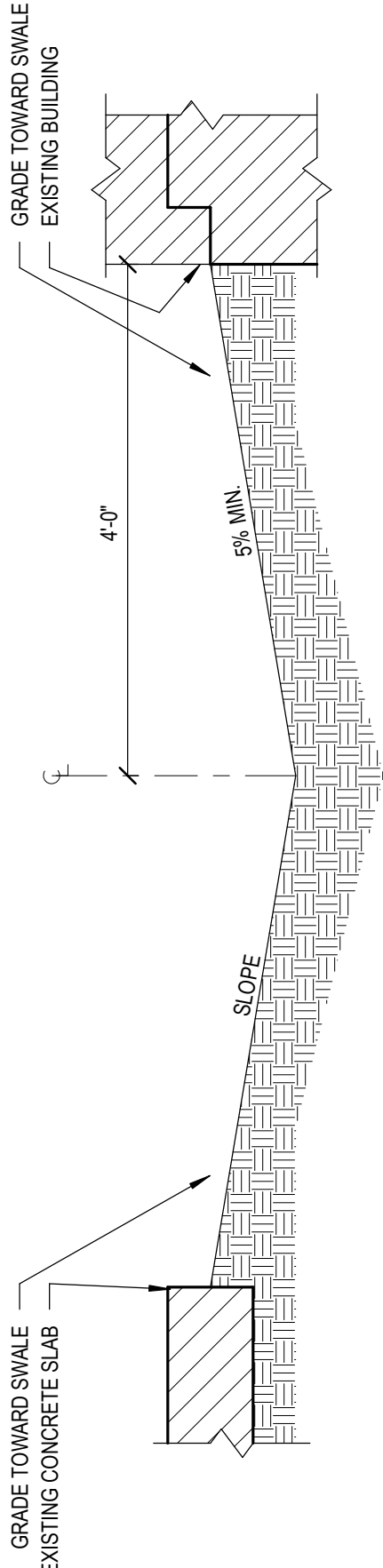
19 NEW MASONRY SCREEN WALL ELEVATION



20 NEW MASONRY SCREEN WALL ELEVATION



10 ADD ALTERNATE NO. : 1
MASONRY SCREEN WALL PLAN
1/8" = 1'-0"



11 TYP. SWALE SECTION

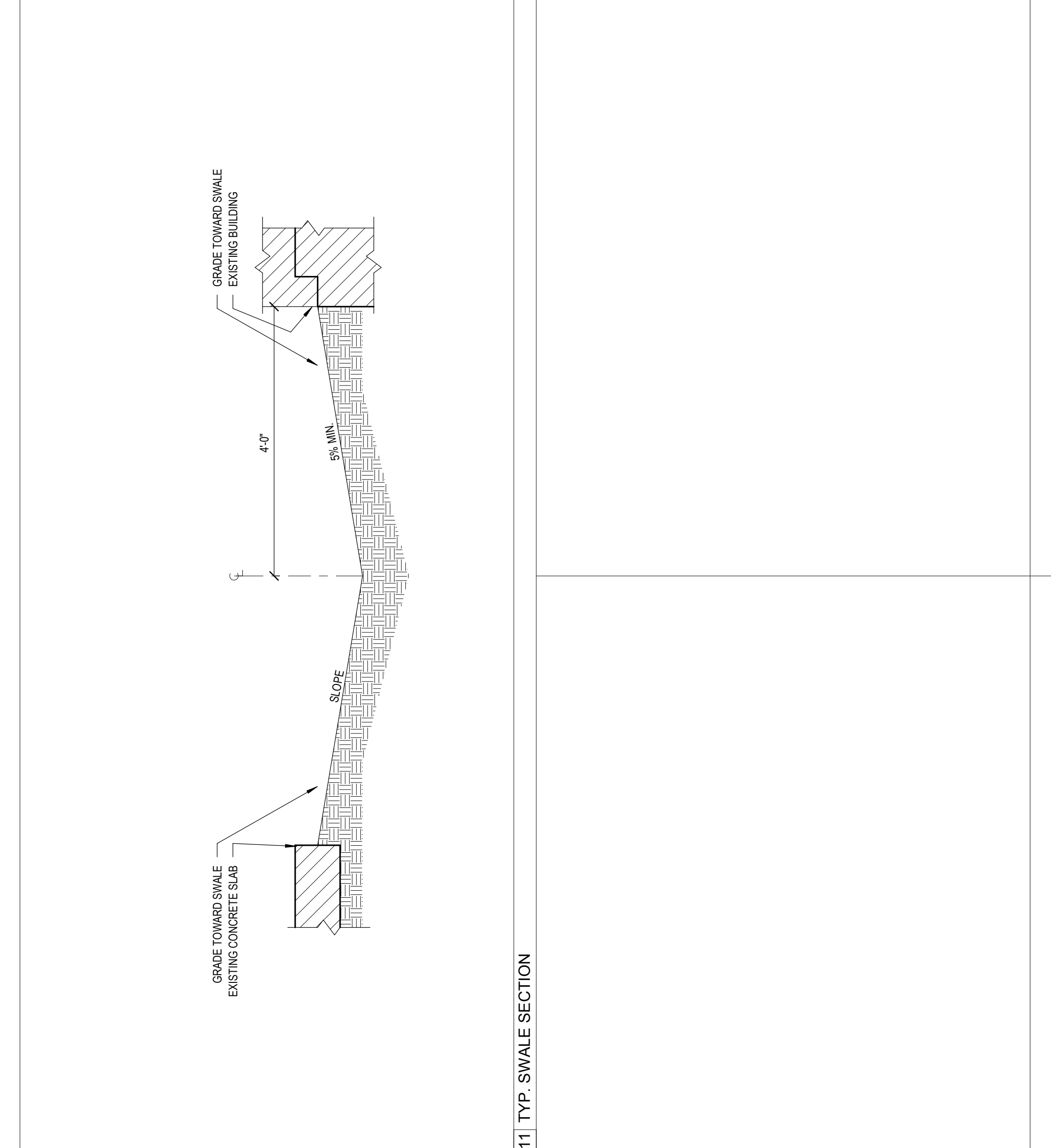
REINFORCED CONCRETE MASONRY UNIT WALLS

- CONCRETE MASONRY UNITS (CMU) SHALL CONFORM TO ASTM C90, ASTM C426 AND AS FOLLOWS:
 - UNIT COMPRESSIVE STRENGTH: 1900 PSI MINIMUM AVERAGE NET AREA COMPRESSIVE STRENGTH
 - * WEIGHT CLASSIFICATION: MEDIUM WEIGHT
 - * CEMENTATION: TYPE III
 - * MORTAR SHALL BE TYPE "S"
- ALL REINFORCING BARS SHALL BE NEW BILLET STEEL AND SHALL CONFORM TO ASTM A615, GRADE 60. REINFORCING BARS #6 AND SMALLER MAY BE GRADE 40. CONCRETE SHALL CONFORM TO ASTM C150 TYPE I, LOW ALKALI, MASONRY CEMENTS UNLESS DETAILED OTHERWISE. TYPICAL VERTICAL REINFORCEMENT SHALL BE #6 AT 48" ON CENTER, AND TWO (2) #6 AT JAMBS OF ALL OPENINGS. THREE (3) #6 AT CORNERS. PROVIDE ADDITIONAL VERTICAL REINFORCEMENT FOR SPECIAL REQUIREMENTS. PROVIDE ADDITIONAL VERTICAL REINFORCEMENT FOR GROUT FILLED CELLS. PROVIDE DOWELS FROM FOUNDATION, SAME SIZE AND SPACING.
- VERTICAL CELLS TO BE FILLED SHALL HAVE VERTICAL ALIGNMENT SUFFICIENT TO MAINTAIN A CLEAR UNOBSTRUCTED CONTINUOUS VERTICAL REINFORCING PATH. REINFORCING BARS SHALL BE PLACED IN THE TOP, BOTTOM, AND AT INTERVALS NOT FARTHER APART THAN 50 BAR DIAMETERS.
- TYPICAL HORIZONTAL REINFORCEMENT SHALL BE TWO (2) #6 CONTINUOUS IN 8"x6" DEEP CONTINUOUS CONCRETE FILLED BOND BEAM BELOW EACH FLOOR SLAB. PROVIDE ADDITIONAL HORIZONTAL REINFORCEMENT FOR SPECIAL REQUIREMENTS. PROVIDE ADDITIONAL HORIZONTAL REINFORCEMENT FOR GROUT FILLED CELLS. PROVIDE DOWELS FROM FOUNDATION, SAME SIZE AND SPACING.
- WALL LENGTHS LESS THAN OR EQUAL TO FOUR (4) TIMES ITS THICKNESS SHALL BE CONSIDERED COLUMN SECTIONS AND SHALL BE REINFORCED WITH #6 VERTICAL REINFORCEMENT. PROVIDE ADDITIONAL VERTICAL REINFORCEMENT FOR SPECIAL REQUIREMENTS. PROVIDE ADDITIONAL VERTICAL REINFORCEMENT FOR GROUT FILLED CELLS. PROVIDE DOWELS FROM FOUNDATION, SAME SIZE AND SPACING.
- PROVIDE HORIZONTAL JOINT REINFORCEMENT EVERY OTHER COURSE WHERE ALL CELLS CONTAINING VERTICAL REINFORCEMENT SHALL BE FILLED SOLIDLY WITH PEA GRAVEL CONCRETE (3/8" MAX. AGGREGATE SIZE) OR GROUT. EACH WITH A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS. GROUT OR CONCRETE SHALL BE A WORKABLE MIX SUITABLE FOR PUMPING WITHOUT SEGREGATION AND SHALL BE PLACED IN THE JOINTS BY PUMPING OR AN APPROVED ALTERNATE METHOD AND SHALL BE PLACED BEFORE INITIAL SET OR HARDENING OCCURS. GROUTING SHALL BE PER NCMAT 3.2. ALLOW CMU WALLS TO SET AT LEAST 24 HOURS AFTER COMPLETION BEFORE BACKFILLING OR GRADING. PROVIDE ADDITIONAL VERTICAL REINFORCEMENT FOR SPECIAL REQUIREMENTS. PROVIDE ADDITIONAL VERTICAL REINFORCEMENT FOR GROUT FILLED CELLS. PROVIDE DOWELS FROM FOUNDATION, SAME SIZE AND SPACING.
- END WALLS AND CROSS WEBS FORMING CELLS TO BE FILLED SHALL BE FULL BEDDED OR GROUT APPROXIMATELY 1/2 INCH ABOVE OR BELOW BED JOINT.
- PROVIDE VERTICAL CONTROL JOINTS AT A MAXIMUM SPACING OF 24' (10' FROM CORNERS). DO NOT CONTINUE THE TYPICAL TRUSS TYPE JOINT REINFORCEMENT THROUGH THE JOINT. CONTROL JOINTS LOCATIONS SHALL BE COORDINATED WITH ARCHITECT BUT NOT EXCEED 1/2 INCH FROM THE JOINT. PROVIDE ADDITIONAL VERTICAL REINFORCEMENT AT THE CONTROL JOINT. ALTHOUGH CHORD REINFORCING STEEL AT FLOORS & ROOFS MUST CONTINUE THROUGH THE CONTROL JOINTS.
- DURING ERECTION, COVER TOP OF WALLS, PROJECTIONS AND SILLS WITH WATERPROOF SHEATHING AT THE END OF EACH DAY'S WORK.
- ALLOW CMU WALL GROUT TO SET AT LEAST 24 HOURS AFTER GROUTING BEFORE CONTINUING BLOCK INSTALLATION ON TOP OF IT.

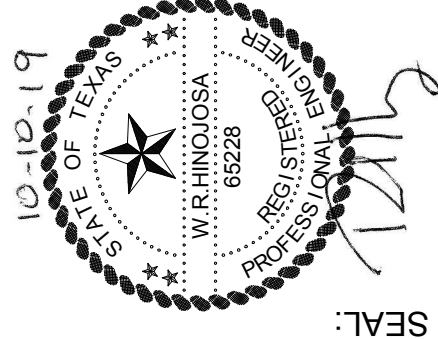
PHARR-SAN JUAN-ALAMO ISD
BALDEMAR G. CANO CENTRAL
KITCHEN COMPLEX CANOPY
ADDITIONS
800 S STEWART RD, SAN JUAN, TX 78589

TITLE:

18 SELECTIVE DEMOLITION



4 MASONRY SCREEN WALL SECTION



SEAL:

HINOJOSA
STRUCTURAL ENGINEERING
CIVIL ENGINEERING
MISSION, TEXAS
108 W. 18TH ST.
FAX: (956) 581-1913
REGISTRATION NUMBER: 6908
EXPIRATION DATE: 09/30/2020



ENGINEER: RH
DESIGNER: AT
SURVEYOR:
DRAWN BY: MR
JOB NO.: 19-123
BOOK NO.:

S6A

20 NEW MASONRY SCREEN WALL ELEVATION

PHARR-SAN JUAN-ALAMO I.S.D.
PSJA ISD BALDEMAR G. CANO CENTRAL KITCHEN COMPLEX CANOPY ADDITION BID # 19-20-028
PRE-BID MEETING DATE: OCTOBER 3, 2019 @ 10:00 A.M.

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Rc Design/Construct	" "	Monica Rodriguez	(956) 789 0704		Monica
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