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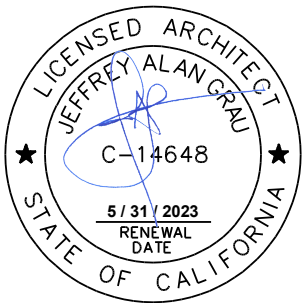
May 05, 2022

Rainforth Grau Architects Project No. 21-1504.05
DSA File and Application No. 34-53 / 02-119975
PTN: 67439-390

ADDENDUM NO. 1

Shade Structure at Sequoia Elementary School
Sacramento, California



Rainforth Grau Architects

1. ALL WORKMANSHIP, MATERIALS, APPLIANCES AND EQUIPMENT which may be included in the following items shall be the same relative quantity as described for similar work set forth in the original or main specifications of which these Addendum items shall be considered a part.

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Business Services
Contracts Office
5735 47th Avenue ● Sacramento, CA 95824
(916) 643-2464
Rose Ramos, Chief Business Officer
Jessica Sulli, Contract Specialist

ADDENDUM NO. 1

Date: May 4, 2022

Issued by: Sacramento City Unified School District

Project: **SCUSD Project No. 454-1**
Shade Structures Group 1A

This Addendum shall supersede the original Information, attachments, and specifications regarding RFQ/P where it adds to, deletes from, clarifies or otherwise modifies them. All other conditions and any previous addenda shall remain unchanged.

ADD 1 - For 02-119973 Shade Structure at Tahoe Elementary School

Drawings

A. Sheet A0.2, Typical Mounting Heights and Details

1. ADD Detail 11, Concrete Sidewalk per sheet AD1.01 included with this addendum
2. ADD Detail 12, Storm Drain Trench per sheet AD1.02 included with this addendum

B. Sheet A0.7, Local Fire Authority Site Plan

1. Detail 1, Local Fire Authority Site Plan: REVISE existing AC paving under Unit SS to a concrete pad per 2/AD1.03

C. Sheet A1.1.0, Site Plan and Code Information

1. Detail 1, Site Plan: REVISE existing AC paving under unit SS to a concrete pad per 2/AD1.03

D. Sheet A1.1.1, Partial Site Plans and Details

Sacramento City
UNIFIED SCHOOL DISTRICT

1. DELETE in its entirety and REPLACE with sheet AD1.03 included with this addendum.

E. Sheet E1.1, Site Plan - Electrical

1. DELETE in its entirety and REPLACE with sheet AD1.04 included with this addendum.

F. Sheet E3.1, Details

1. DELETE in its entirety and REPLACE with sheet AD1.05 included with this addendum.

ADD 1 - For 02-119975 Shade Structure at Sequoia Elementary School

Project Manual

A. Table of Contents

1. DELETE Table of Contents in its entirety and REPLACE with Table of Contents included with this addendum.

B. Section 03 2000, Concrete Reinforcing

1. ADD Section 03 2000, Concrete Reinforcing included with this addendum.

C. Section 04 2200, Concrete Masonry Unit

1. ADD Section 04 2200, Concrete Masonry Unit included with this addendum.

ADD 1 - For 02-119976 Shade Structure at New Joseph Bonnheim Elementary School

Drawings

A. Sheet A0.7, Local Fire Authority Site Plan

1. Detail 1, Local Fire Authority Site Plan: REVISE AC paving at accessible parking stalls and accessible aisles to concrete per AD1.02.

Sacramento City
UNIFIED SCHOOL DISTRICT

B. Sheet C2.1, Grading and Paving Plan

1. DELETE in its entirety and REPLACE with sheet AD1.01 included with this addendum.

C. Sheet A1.1.0, Site Plan and Code Information

1. Detail 1, Site Plan: REVISE AC paving at accessible parking stalls and accessible aisle to concrete per AD1.02

D. Sheet A1.1.1, Partial Site Plans and Details

1. Detail 13, Enlarged Site Plan – Parking: REVISE per sheet AD1.02 included with this addendum

END OF ADDENDUM NO. 1

Vendor to sign as acknowledgment of receipt and return with Bid:

Signature: _____ Date: _____

Company Name (please print) _____

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Technical Specifications

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Reinforcing for concrete.
2. Installation accessories.

1.2 RELATED REQUIREMENTS

A. Section 01 4523, Testing and Inspection Services.

B. Section 04 2200, Concrete Masonry Units

C. Section 32 1600, Site Concrete.

1.3 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. American Concrete Institute (ACI):

1. ACI 117: Tolerances for Concrete Construction and Materials.
2. ACI 301: Specifications for Structural Concrete.
3. ACI 315: Manual of Standard Practice for Detailing Reinforced Concrete Structures.
4. ACI 318: Building Code Requirements for Reinforced Concrete.

D. Concrete Reinforcing Steel Institute (CRSI):

1. Manual of Standard Practice.

E. ASTM International (ASTM):

1. A706/A706M: Standard Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement.
2. A1064/A1064M: Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

F. American Welding Society (AWS):

1. D1.1/D1.1M: Structural Welding Code – Steel.
2. D1.4/D1.4M: Structural Welding Code – Steel Reinforcing Bars.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

B. Coordination:

1. Coordinate reinforcing with the other work affected by these operations, such as forms, electrical work, mechanical work, and structural steel concrete.
2. Coordinate resolution of or procedures whenever pipes, conduits, sleeves, and other construction interferes with placement.

1.5 ACTION SUBMITTALS

A. General: Review does not imply or state that fabricator has correctly interpreted the construction documents.

B. Shop Drawings: Show complete bending and placing details of reinforcement.

1. Details of reinforcement not covered shall be in accordance with ACI 318 and ACI 315.
2. Detailing, fabricating, and spacing of reinforcement shall be equal or superior to ACI 315, unless otherwise indicated.
3. Check Architectural, Structural, Mechanical, and Electrical Drawings for anchor-bolt schedules and locations, anchors, inserts, conduits, sleeves, and other items to be cast in concrete. Reinforcing steel shall not interfere with placement of such embedded items.
4. Do not fabricate or place reinforcing steel until shop drawings have been reviewed and returned to Contractor.
5. Review of shop drawings will not constitute relief of responsibility for errors or for failure in accuracy and complete placing of the work.

C. Product Data:

1. General:
   a. List and complete descriptive data of products proposed for use.
   b. Include manufacturer's specifications, installation instructions, and maintenance instructions.
2. Mechanical Splices: Types of mechanical splices proposed for use. Include the latest ICC-ES Reports (ESR) for threaded or sleeve-type splices to verify compliance with specified requirements.
3. Headed Bars or Terminators: Types of headed bars or terminators proposed for use. Include the latest ESR to verify compliance with the specified requirements.

1.6 INFORMATIONAL SUBMITTALS

A. Statement of qualifications for fabricator, installer, and welders.

B. Welding Procedures and Qualifications: Description of reinforcement weld locations, welding procedures, and welder qualifications when welding is permitted.

C. Certificates: Certified copies of mill test reports for each bundle of reinforcing bars delivered to the site, indicating physical and chemical properties for each heat. In addition, show correlation between a specific heat number and specific sizes from that heat number and location in which those bars will be placed.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

B. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.

C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

D. Conflicting requirements: In the event of conflict between pertinent codes and regulations and the requirements of the referenced standards or these specifications, the provisions of the more stringent shall govern.

E. Shop Quality Assurance:

1. General:
    a. Testing and inspection of shop-fabricated components or assemblies will be the same as specified for field quality assurance in Part 3.
    b. Identify reinforcing and verify reinforcement is of type and grade specified.
2. Testing:
    a. Reinforcing shall be tested in accordance with CBC Section 1910A.2.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver reinforcing bars in bundles with tags showing quantity, grade, size, and suitable identification to allow checking, sorting, and placing.

1. Identification of steel shall be maintained after bundles are broken.
2. Bundles of flat sheets and rolls of welded wire fabric shall be tagged showing quantity, style designation, width, and length.

B. Store reinforcement at site in a manner to prevent excessive rusting or fouling that will interfere with bond.

1.10 FIELD CONDITIONS

A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Allowable Tolerances: Fabrication and placement tolerances shall be in accordance with ACI 117.

2.2 REINFORCING STEEL

A. Reinforcing bars shall conform to ASTM A615/A615M, Grade 60 or ASTM A706/A706M. For reinforcing bars conforming to ASTM A706, which will be welded, furnish a report of the chemical analysis for each heat of the bars.

B. Plain and Deformed Wire: ASTM A1064/A1064M.

2.3 ACCESSORIES AND ADDITIONAL MATERIALS

A. Bar Supports: In accordance with CRSI Manual of Standard Practice; types and sizes as required for the conditions of the installation.

1. For exposed to view concrete surfaces where legs of supports are in contact with forms, provide supports with legs that are hot-dipped galvanized, plastic. or stainless steel, in accordance with CRSI Class 1.
2. Provide precast concrete blocks not less than 4 inches square when supporting reinforcing steel on ground. Precast concrete blocks shall have a compressive strength equal to that of surrounding concrete.

B. Anchor Bolts and Anchor Rods: See the Structural Notes on the Structural Drawings for anchor bolt materials.

1. Nuts: As recommended by ASTM specification for corresponding anchor rod or bolt.
2. Washers: As recommended by ASTM specification for corresponding anchor rod or bolt.

2.4 FABRICATION

A. Refer to the Drawings for bar sizes, number of bars, and placing details.

B. Conform to requirements of Chapter 25 and Section 26.6 of ACI 318 except lap bar splices shall be as indicated on the Drawings.

C. Bending:

1. Minimum bend diameters and hook extensions as shown on the Drawings.
2. Reinforcing bars are to be bent cold unless heating is permitted.
3. Do not bend or kink reinforcing except as shown on the Drawings.

D. Deformed Bar Anchors:

1. Detailing of bends, hooks, and similar items, to comply with requirements for reinforcing bars.
2. Install deformed bar anchors in accordance with the manufacturer's recommendations and the requirements of AWS D1.1.

E. Steel reinforcement shall not be bent or straightened in a manner that will injure material. Bars with kinks or bends not shown on Drawings are not permitted.

1. Heating of bars for bending will not be permitted.
2. Straightening or rebending will not be permitted without approval by the Architect and DSA.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine excavations in accordance with requirements specified in Division 31, Earthwork, prior to placing reinforcement.

B. Wherever embedded items interfere with placement of reinforcement, notify Architect and obtain written approval before placing any concrete.

3.2 INSTALLATION

A. Bar Reinforcement:

1. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations.
2. Do not exceed the tolerances defined in ACI 117 or ACI 318 Section 26.6 or CBC Section 1907.5.
3. Where Drawings do not show the spacing of the reinforcing, provide minimum clear spacing in conformance with ACI 318 Section 25.2 not less than 4/3 times the maximum size aggregate.
4. Dowels shall be tied securely in place before concrete is deposited.
5. Do not install kinked, bent or misplaced reinforcing.
6. When necessary to move reinforcement beyond the specified placing tolerances to avoid interference with other reinforcement or embedded items, submit the resulting arrangement of reinforcement for acceptance.
7. Continue reinforcement across construction joints at least equal to lap development lengths on either side of the joint unless otherwise detailed.

B. Field Bending:

1. Field bending or straightening shall be in accordance with ACI 301 Section 3.3.2.8.
2. Do not re-bend reinforcement that has previously been bent within 6 inches of new bend except as shown on the Drawings or explicitly allowed by the Architect.

C. Splices:

1. General:
   a. Unless otherwise shown on Drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices at adjacent splices whenever possible.
   b. Bar laps shall be wired together.
2. Lap splice lengths as shown on the Drawings.

D. Anchor Bolts and Rods:

1. Supervise setting of anchor bolts required for wood framing and anchor rods required for erection of structural steel to ensure correct installation and location.
2. Anchor bolts and rods must be securely held in place and aligned in a true straight line prior to and during concrete placement.
3. Anchor bolts and rods may not be, pushed into wet concrete.

E. Cover:

1. As a minimum, provide the concrete cover shown on the Drawings.
2. Tolerances on concrete cover shall meet the requirements of ACI 117.

3.3 CLEANING

A. At time of placing concrete, clean reinforcement and other embedded items thoroughly of loose rust, mill scale, oil, grease, and other foreign material that reduces or destroys bond.

B. Rust and mill scale that is “tight” to the bar will be allowed to remain.

C. Rust that is flaky or easily removed, such as by dropping or striking with a hammer, indicates excessive rust. Such bars shall be cleaned of rust, and not be used unless found to comply with ACI 318 Section 26.6.1.2.

D. Where there is a potential of rust staining adjacent finish surfaces, take necessary steps to prevent staining.

3.4 FIELD WELDING

A. Welding of reinforcing bar shall be performed only where indicated on the Drawings and in compliance with AWS D1.4. Welding of reinforcement is to be inspected in accordance with CBC Section 1705A.3.2.

3.5 FIELD QUALITY CONTROL

A. Approval of reinforcing steel, after installation, must be received from the Owner's Project Inspector. Architect, Structural Engineer, and DSA.

1. Notify Inspector, Architect, Structural Engineer, and DSA at least two business days before concrete is to be poured or reinforcing is covered up.
2. Inspection will include the following:
    a. Reinforcing for conformance with ACI 318 Sections 25.2, 25.3, 25.5, 25.6, and 36.6.
    b. Verification that anchor bolts, anchor rods and other embedded items are held firmly in position prior to placing concrete.
    c. Re-bent bars for signs of cracking or fracture.
    d. Installation of deformed bar anchors in accordance with Section 7.1 of AWS D1.1 and corresponding ESR.
    e. Mechanical coupler installation in accordance with corresponding ESR.
3. The following reinforcing steel work will be considered defective and shall be removed and replaced by the Contractor at no additional cost to the Owner:
    a. Bars with kinks or bends not shown on the Drawings.
    b. Bars injured due to bending or straightening.
    c. Bars heated for bending.
    d. Reinforcement not placed in accordance with the drawings and/or specifications.
4. Allow sufficient time to perform any corrective actions prior to concrete pour.

B. Owner's Testing Agency will provide the following:

1. Inspection of welding except that cost of welding inspection required beyond 3 days total of shop and field welding will be backcharged to Contractor.
2. Provide continuous inspection during any field bending of reinforcement.

C. Keep responsible reinforcing person on job to maintain position of reinforcing as concrete is placed.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Reinforced concrete masonry units (CMU).
2. Colored mortar.

1.2 RELATED REQUIREMENTS

A. Section 01 4523, Testing & Inspection Services.

B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

C. Section 03 2000, Concrete Reinforcing.

D. Section 07 9200, Joint Sealants.

E. Section 09 9100, Painting.

1.3 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. American Concrete Institute (ACI):

1. 315R: "Guide to Presenting Reinforcing Steel Design Details."
2. 530/530.1: “Building Code Requirements and Specifications for Masonry Structures and Companion Commentaries.”

D. ASTM International (ASTM):

1. A307: Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
2. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
3. A653/A653M: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
4. C5: Standard Specification for Quicklime for Structural Purposes.
5. C90: Standard Specification for Loadbearing Concrete Masonry Units.
6. C144: Standard Specification for Aggregate for Masonry Mortar.
7. C150/C150M: Standard Specification for Portland Cement.

8. C207: Standard Specification for Hydrated Lime for Masonry Purposes.
9. C270: Standard Specification for Mortar for Unit Masonry.
10. C404: Standard Specification for Aggregates for Masonry Grout.
11. C426: Standard Test Method for Linear Drying Shrinkage of Concrete Masonry Units.
12. C476: Standard Specification for Grout for Masonry.
13. C595/C595M: Standard Specification for Blended Hydraulic Cements.
14. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
15. C989/C989M: Standard Specification for Slag Cement for Use in Concrete and Mortars.
16. C1019: Standard Test Method for Sampling and Testing Grout for Masonry.
17. F1554: Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

E. The Masonry Society (TMS):

1. 402/602: Building Code Requirements and Specification for Masonry Structures.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

B. Pre-installation Meeting: Convene meeting to be attended by Owner's Representative, Contractor, Architect, Structural Engineer, Project Inspector and Special Inspector at least one week prior to scheduled commencement of masonry mockup construction and associated work.

1. Notify attendees not less than 5 business days prior to date established for meeting.
2. Discussion is to include, but not limited to, the following:
    a. Requirements for the mockup, and confirmation of the location and construction of control / expansion joints.
    b. Testing and inspections required.
    c. Means and methods that will be employed.
    d. Cold weather and hot weather procedures, as applicable.
    e. Items to be addressed prior to and during the work.
    f. Protection of adjacent surfaces required.
3. At the Owner's option, a third party expert in CMU construction may be invited.
4. Record discussions of meeting, decisions and agreements reached, and furnish copy of record to each party attending.

1.5 ACTION SUBMITTALS

A. Shop Drawings:

1. To-scale drawings to illustrate detailing, fabrication, bending and placement of unit masonry reinforcing bars.
   a. Comply with ACI 315R showing bar schedules, stirrup spacing, diagrams of bent bars and arrangements of masonry reinforcement.
   b. Indicate location of conduit, plumbing and other items embedded in unit masonry walls in coordination with placement of reinforcement.
2. Bracing drawings and calculations where required by Section 3.3E of TMS 402/602, sealed by a professional engineer licensed in the jurisdiction where the project is being constructed, shall be submitted for record purposes.

B. Product Data: Complete list and descriptive data of products proposed for use. Include manufacturer's specifications, installation instructions, and maintenance instructions.

C. Samples:

1. Initial Submittals:
   a. Manufacturer’s standard available colors for masonry units and grout for Architect's selection.
2. Confirmation Submittals: The following conforming to selections made during review of initial submittals.
   a. Full-size units for each different exposed CMU unit for review of texture and color.
   b. Colored mortar for each selected color.

D. Mix Designs:

1. Mix designs and test results for mortar and grout conforming to requirements specified in TMS 402/602, Article 1.5.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For installers.

B. Mill test reports for all reinforcing steel.

C. Certificates:

1. Material certificates for the following signed by the manufacturer and the Contractor certifying that each material complies with requirements and standards specified.
   a. Each material and grade of reinforcing bars. See Section 03 2000, Concrete Reinforcement.
   b. Each type and size of anchors, inserts, ties and accessories.
2. Plant certificates for concrete masonry units to the Owner’s Testing Agency and Architect stating that all units have been properly cured before shipment and that

they conform to requirements of these Specifications, including but not limited to, requirements for moisture content per ASTM C90.

D. Extreme Weather Procedures: Cold and hot-weather construction procedures evidencing compliance with requirements specified in ACI 530/530.1 and these Specifications.

E. Record of Pre-installation Meeting.

F. Sustainable Design:

1. General:
   a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
   b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
   a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
   b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSE OUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: Firms and persons specified in Section 1.6 of TMS 402/602, to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, telephone numbers, names of Architects and Owners, and other information specified.

B. Use only newly manufactured products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

C. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.

D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

E. Special Inspection: Coordinate with Owner's special inspector of building structural masonry construction in compliance with CBC Section 1705A.4. See additional requirements specified under Article "Field Quality Control" in Part 3.

F. Mockup: Construct a sample panel of masonry wall types, including color and texture, having a minimum dimension of 6 feet by 6 feet, in the specified bond pattern, to be approved by Owner's Representatives, Project Inspector and Architect.

1. The mockup is to be built on a stable foundation as required to support the panel(s) during the duration of the project and is not to be an integral part of the construction and is to remain on site for comparison to the CMU installation, including cleaning, and the application of the water repellent and graffiti-resistant coating.
2. Do not construct the mockup panel(s) prior to approval of submitted samples for texture and color.
3. The assembly is to include, but is not necessarily limited to, the following as applicable to the project:
   a. Color, texture and accent banding.
   b. Reinforcing steel.
   c. Expansion joint, control joint, and sealant.
   d. Mortar joint type, color, tooling and workmanship.
   e. Tolerances of unit sizes, and level and plumb workmanship.
   f. Flashing, including cap flashing.
   g. Weep holes and end dams.
   h. Air and vapor barrier.
4. After mockup is constructed and approved, the same cleaning procedure to be performed on the building is to be performed on the sample panel(s), leaving a portion un-cleaned.
5. Upon approval of the mockup and cleaning, the water repellent and anti-graffiti coating shall be applied and cured as specified, followed by water testing in accordance with the manufacturer's requirements.

1.9 PRECONSTRUCTION TESTING

A. General:

1. Refer to approved DSA Form-103 for testing requirements.
2. Owner will select a qualified independent testing agency to perform preconstruction testing indicated below. Payment for these services will be made by Owner.

B. Compressive Strength:

1. Compliance with the requirements for the specified compressive strength of masonry, f'_m, shall be provided in accordance with CBC Section 2105A.3 as well as the approved construction documents.
2. Verification masonry to be supplied meets the specified compressive strength prior to the start of construction, determined in accordance with TMS 402/602 Article 1.4 A.

C. Linear Shrinkage Tests:

1. Linear shrinkage testing to be performed in accordance with ASTM C426. Test data shall be traceable to the units being supplied for the project, and shall comply with ASTM C90.

2. Linear shrinkage testing may be omitted if the maximum spacing of control joints does not exceed 25 feet.

1.10 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to job in manufacturer's sealed containers, where applicable, and/or original bundles with tags and labels intact. Masonry units to be delivered and stored on pallets.

B. Store materials in protected, dry, clean conditions off of ground and in areas so as to not interfere with the progress of the work.

C. Transport, store and handle in strict accordance with the manufacturer's recommendations.

1.11 FIELD CONDITIONS

A. Comply with TMS 402/602 Article 1.8 C for cold weather construction when ambient temperature will fall below 40 degrees F and TMS 402/602 Article 1.8 D for hot weather construction when ambient temperature will rise above 90 degrees F.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Comply with TMS 402/602 and other requirements specified in this Section applicable to each material indicated.

B. Sustainable Design:

1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MANUFACTURERS

A. Concrete Masonry Units: Basalite Concrete Products, Calstone Company, Angelus Block Company, or equal.

2.3 CONCRETE MASONRY UNITS

A. General: Comply with requirements indicated below applicable to each form of concrete masonry unit required.

1. Concrete masonry units shall comply with ASTM C90, Medium Weight Class, Grade N, Type I.
2. Size: Provide concrete masonry units complying with requirements indicated below for size that are manufactured to specified face dimensions within tolerances

specified in the applicable referenced ASTM specification for concrete masonry units.

a. Nominal Modular Size: 8 x 8 x 16 inches and 12 x 8 x 16 inches;

b. Bond Beam Units: Single or double open end.

1) Provide bond beam units at horizontal reinforcement.

2) The depth of the bond beam channel below the top of the unit shall be a minimum of 1-1/2 inches and the width shall be 3 inches minimum.

3) Provide 3 inches high by 3 inches wide minimum bond beam web openings at high lift construction.

3. Provide special units for 90-degree corners and lintels as detailed.

4. Caps: Match specified units in height as indicated on the Drawings.

a. Height: 1-1/2 inches.

5. End Pieces: Match specified units.

B. Regular Hollow Load Bearing Units:

1. Color: Standard gray**.**
2. Texture: Precision (smooth).
3. Compressive Strength: Provide units with Minimum Design Compressive Strength (f 'm) of 2,000 psi, and minimum unit net area compressive strength of 2,650 psi.

2.4 REINFORCEMENT AND ANCHORAGE

A. General: Provide reinforcing steel complying with requirements of Section 2.4 of TMS 602 and Section 03 2000, Concrete Reinforcement.

B. Steel Reinforcing Bars: Carbon steel complying with ASTM A615/A615M, Grade 60.

C. Bar Positioners for High-Lift Grouting:

1. Single Curtain: "RB Rebar Positioners" by Hohmann & Barnard, or equal.
2. Double Curtain: "RB-Twin Rebar Positioners" by Hohmann & Barnard, Inc., or equal.

D. Anchors and Ties:

1. Masonry Anchor Slots at Masonry or Concrete Walls: Galvanized dovetail anchor slots and masonry anchors, as detailed on the Drawings; Hohmann & Barnard, Inc., or equal; furnished under this Section for installation as specified. Dovetail anchors, as detailed to fit slots.
2. Masonry Anchor System at Wood-Framed or Metal-Stud Framed Structures: 14 gage galvanized anchor clips and 22 gage anchor channel; ""Fleming Masonry Anchor System" by Halfen Anchoring Systems, or equal.
3. Tie Wire: Black annealed, 16 gage.

2.5 MORTAR

A. Materials:

1. Cement: Portland cement, ASTM C150/C150M, Type I or II.
2. Aggregate: Natural sand, complying with ASTM C144; white or light grey color, not less than 3 percent passing No. 100 sieve.
3. Hydrated Lime: ASTM C207, Type S.
4. Color Additive: Mineral oxide pigment; color as selected by the Architect.
5. Water: Clean and fresh from public water system.

B. Mix: Type S in accordance with CBC Section 2103A and ASTM C270.

1. Do not use calcium chloride in mortar.
2. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with TMS 602 Article 2.6A.
3. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.
4. Do no use anti-freeze compounds to lower the freezing point of mortar.
5. Mortar shall be adjusted to satisfaction of mason, but only as much water shall be added as is compatible with convenience in using mortar.
    a. If mortar begins to stiffen from evaporation or absorption of part of mixing water, mortar shall be re-tempered by adding water and re-mixing.
    b. Mortar shall not be used after cement begins its final set, and in no case shall it be used more than two hours after original mixing.
6. When ambient air or masonry temperatures drop below 40 degrees F special provisions of TMS 602, Article 1.8C for cold weather construction shall apply. If temperatures rise above 90 degrees F, special provisions of TMS 602, Article 1.8D for hot weather construction shall apply.
7. Do not add air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, except as specified, without prior written approval of Structural Engineer and DSA.

2.6 GROUT

A. Grout shall consist of a mixture of cementitious materials and aggregate to which water has been added such that the mixture will flow without segregation of the constituents.

B. Materials:

1. Portland cement, ASTM C150/C150M, Type I or II.
2. Coarse Aggregate: ASTM C404, maximum aggregate size 3/8-inch.
3. Additives: Grout-enhancing shrinkage-compensating additive; “Sika Grout Aid” by Sika Corporation, or equal.
4. Water: Clean and fresh from public water system.

C. Mix: Conform to ASTM C476 for coarse grout with no lime. Also, see CBC 2104A.1.3.1.2 for high-lift grouting provision.

1. General:
    a. Thoroughly mix grout ingredients in quantities needed for immediate use.

b. Provide for uniformity of mix.

c. Grout shall not be used more than 90 minutes after initial mixing water has been added to dry ingredients.

d. Proportioning or mixing of grout on site is not permitted.

2. Compressive Strength: ASTM C1019; 2,000 psi minimum at 28 days.
   a. See Structural Drawings for specified grout strength.
   b. No water reducing admixtures will be approved.
3. Slump: 8 to 11 inches, W/C equal to or greater than 0.7.
4. Cementitious Replacement:
   a. Types:
      1) As permitted by ASTM C476, blended hydraulic cements meeting ASTM C595/C595M may be used.
      2) Fly ash or pozzolans may be used as cement replacements for 15 to 40 percent of the total weight of cementitious material. Fly ash shall be class F, meeting ASTM C618 requirements.
      3) Ground granulated blast furnace slab shall meet ASTM C989/C989M requirements.
   b. Grout with cementitious replacements shall provide minimum grout compressive strength specified at 28-day tests.
5. Mix shall contain specified grout aid admixtures added at a rate of 1 pound per 100 pounds of cementitious materials in accordance with manufacturer's recommendations.
   a. Regardless of whether grout is job-mixed or plant-mixed, admixture shall be added in accordance with manufacturer's requirements.
   b. Admixture must be combined with water to form a slurry which is then added to the mix in order to avoid "balling" and to get proper distribution of the admixture within the mix.
6. Do not add other admixtures, air-entraining agents, accelerators, retarders, water-repellent agents, and antifreeze compounds, except as otherwise specified, without prior written approval of Structural Engineer and DSA.
   a. Do not use calcium chloride in grout.
   b. Do not use anti-freeze compounds to lower the freezing point of grout.

2.7 EMBEDDED MATERIALS

A. Sheet Metal Flashing: Galvanized steel complying with ASTM A653/A653M, Z275 (G90) coating designation; structural quality, 0.0239 inch thick (24 gage), complying with additional requirements specified in Section 07 6200, Sheet Metal Flashing and Trim.

B. Headed Anchor bolts: ASTM A307, Grade A.

C. Bent-Bar Anchors: ASTM F1554 Grade 36 galvanized steel with Class 1A threads.

2.8 ADDITIONAL MATERIALS

A. Preformed Control Joints: Rubber or neoprene material; Hohmann & Barnard, or equal.

1. Provide with corner and tee accessories, heat or cement-fused joints.

B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self-expanding.

C. Building Paper: #30 asphalt saturated felt.

D. Nailing Strips: Softwood, preservative treated for moisture resistance, dovetail shape, sized to masonry joints.

E. Weep Holes: Cotton wick.

F. Cleaning Solutions: Non-acidic, not harmful to masonry work or adjacent materials designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry surfaces without discoloring or damaging masonry surfaces and without leaving any chloride residue; expressly approved for intended use by manufacturer of masonry units being cleaned; ProSoCo, Inc. or equal.

G. Bituminous Coating: Cold-applied asphalt mastic complying with SSPC-Paint 12 except containing no asbestos fibers.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work:

1. That foundation surface is level to permit the initial bed joint within a range of 1/4 to 1-1/4 inch.
2. That edge is true to line to permit projection of masonry to less than 1/4 inch.
3. That projecting dowels are free from loose scale, dirt, concrete or other bond-inhibiting substances.

B. Verify items provided by other Sections of work are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

D. Beginning of installation means installer accepts existing conditions.

3.2 PREPARATION AND PROTECTION

A. Direct and coordinate placement of metal anchors supplied to other Sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

C. If rain is anticipated, cover the top of incomplete CMU construction as required to prevent moisture intrusion.

D. Protect face materials against staining.

E. Remove misplaced grout or mortar immediately.

F. Protect sills, ledges, off-sets and similar items from mortar drippings or other damage during construction.

G. Masonry units shall be free of dust and dirt.

3.3 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Lay concrete masonry units in running bond, unless otherwise indicated on project documents. Course one unit and one mortar joint to equal 8 inches.

D. Vertical cells to be filled shall have vertical alignment sufficient to maintain a clear, unobstructed, continuous vertical cell measuring not less than 3 inches by 3 inches.

E. Use open end units where vertical reinforcement occurs. Use bond beam or lintel units where horizontal reinforcement occurs.

F. Lay decorative units to coursing of one unit and one mortar joint to equal 8 inches. Form concave mortar joints.

3.4 PLACING AND BONDING

A. Lay hollow masonry units with face shell bedding on head and bed joints.

B. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.

C. Remove excess mortar as work progresses. Maximum mortar projection is limited to 1/4-inch. Clean out all mortar droppings.

D. Compact joint mortar solidly with tooling skate when mortar is thumbprint hard to form a watertight joint, free of voids, cracks, and pin holes:

1. All Joints, Unless Otherwise Indicated: Concave.
2. Interior Walls to be Painted, Inside Face of Utility Yard Walls: Flush.

E. Interlock intersections and external corners.

F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

H. Cut mortar joints flush where resilient base is scheduled.

I. All masonry shall be built to preserve the unobstructed vertical continuity of the cells to be filled. All head joints shall be solidly filled with mortar for a distance in from the face of the wall or unit not less than the thickness of the longitudinal face shells.

J. Walls and cross webs forming such cells to be filled shall be full bedded in mortar to prevent leakage of grout.

K. Unless otherwise indicated, bond shall be provided by lapping units in successive vertical courses.

L. At the time of laying, all masonry units shall be free of dust and dirt.

M. Remove and repoint all cracked or unbonded mortar joints.

3.5 MASONRY FLASHINGS

A. Lap end joints minimum 6 inches and seal watertight.

B. Use flashing manufacturer's recommended adhesive and sealer.

3.6 PLACEMENT OF REINFORCING

A. Reinforcing and wire ties shall be embedded in the grout.

B. Provide 1 bar diameter minimum clear space between masonry unit and reinforcing.

C. Horizontal reinforcing in bond beams to have a minimum grout cover of 1 inch.

D. Place reinforcing bars at locations indicated on structural drawings and secure in place.

E. Install reinforced masonry unit lintels over openings.

F. Reinforce openings as detailed on structural drawings.

G. Securely fasten reinforcing bars from displacement at intervals not exceeding 192 bar diameters. Maintain position within 1/2-inch of dimensioned position.

H. Lap splices in accordance with Section 03 2000, Concrete Reinforcing, and CBC 2107A.2.1 or 2108A.2.

I. Allow masonry lintels to attain specified strength before removing temporary supports.

3.7 PIPE, CONDUITS AND EMBEDDED ITEMS

A. No pipe shall be embedded in masonry work except rigid electrical conduit of 1-inch diameter or less. Pipe to be embedded in masonry shall be rigid and comply with the requirements for embedment shown on the Structural Drawings.

B. Embedded items shall be securely anchored against moving prior to grouting (i.e. no wet setting).

C. Bolts shall be accurately set with templates and held in place to prevent dislocation during grouting.

D. Reinforcement, embedded items, and bolts shall be solidly embedded in grout.

E. Anchor bolts in face shells shall maintain a minimum of 1/2-inch of grout and face shell.

3.8 GROUT PLACEMENT

A. All cells shall be grouted solid.

B. Place and consolidate grout fill without displacing reinforcing.

C. Grout shall be a workable mix suitable for placing without segregation and shall be thoroughly mixed.

1. Grout shall be placed by pumping or an approved alternate method and shall be placed before initial set or hardening occurs.
2. Grout shall be consolidated by mechanical vibration during placing and reconsolidated after excess moisture has been absorbed, but before workability is lost.
3. The grouting of any section of a wall shall be completed in one day, with no interruptions greater than one hour.

D. Horizontal reinforcement shall be placed in bond beam units with a minimum grout cover of 1 inch above steel for each grout pour.

E. Unobstructed grout spaces no less than 2 inches x 3 inches in width with fine grout to be provided for low lift grouting techniques, and grout spaces no less than 3 inches x 3 inches in width with coarse grout to be provided for high or low-lift grouting techniques.

1. Increase minimum size by the width or diameter of obstructions including reinforcing and conduit.
2. Grout shall be placed so that all spaces do not contain voids.

F. When grouting is stopped for more than one hour, terminate grout 1-1/2 inch minimum below top of upper masonry unit, except at bond beam 1/2-inch below top of upper masonry unit, to form a positive key for subsequent grout placement.

G. Grout shall not be handled with aluminum equipment, unless demonstrated that there will be no deleterious effects.

H. Low-Lift for CMU Grouted Construction: Where low-lift grouting is used, the method shall conform with CBC Section 2104A.1.3.1.2.2 requirements.

I. High-Lift for CMU Grouted Construction: Where high-lift grouting is used, the method shall conform with CBC Section 2104A.1.3.1.2.3 requirements, and be approved by the Architect and DSA. An approved admixture that reduces early water loss and produces an expansive action shall be used in the grout. Contractor shall submit a request to use “High-Lift” in accordance with Section 01 3300.

J. Wall Cap: Form and screed rounded mortar cap at all walls with exposed tops. Cap shall be level and smooth with minimum 1-inch rise at center of wall.

3.9 BUILT-IN WORK

A. As work progresses, build in metal door frames, window frames, anchor bolts, plates and other items furnished by other Sections.

B. Build in items plumb and level.

C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.

D. Do not build in organic materials subject to deterioration.

3.10 TOLERANCES

A. Erect masonry within the tolerances of TMS 60 Article 3.3 F.

3.11 CUTTING AND FITTING

A. Openings in CMU walls shall conform with details on structural drawings.

B. Obtain Architect/Engineer approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.12 POINTING AND CLEANING

A. Final Cleaning: Comply with provisions of Section 01 7700, Closeout Procedures, and the following.

1. Use non-metallic tools in cleaning operations.
2. Remove excess mortar and mortar smears.
3. Clean soiled surfaces with cleaning solution.
4. Do not use acid solution to remove green stain or efflorescence resulting from vanadium salts. Follow recommendations of manufacturer for removal of such stains.
5. When ordinary methods are not adequate, with Architect’s approval, employ sandblasting, chipping or other special methods.

B. Point holes or defective mortar joints upon completion of work; where necessary, cut out and re-point defective joints.

1. Replace defective or damaged work with conforming work.
2. Match adjacent work.

C. Architect will review proposals for the repair or replacement of damaged, defective, or missing work.

D. Progress Cleaning:

1. At end of workday, fiber brush new surfaces to remove mortar splotches, clean with mild detergent or enzymes, and rinse with clean water.

E. Protect finished installation under provisions of Section 01 5000, Temporary Facilities and Controls.

F. Without damaging completed work, provide protective boards at exposed external corners which may be damaged by construction activities.

3.13 FIELD QUALITY CONTROL

A. General:

1. Refer to approved DSA Form-103 for testing requirements.
2. Owner will select a qualified independent testing agency to perform preconstruction testing indicated below. Payment for these services will be made by Owner.
3. Refer to Section 01 4523, Testing & Inspection Services, for additional requirements.

B. Masonry Inspection:

1. Masonry construction shall be inspected and verified in accordance with TMS 402/602 Level 3 quality assurance program as set forth in Tables 3 and 4.
2. Structural masonry work shall be periodically inspected during laying and continuously during grouting by an inspector specially approved for that purpose by DSA.
    a. The inspector shall make test samples and perform such tests as are required and shall check the materials, details of construction, and construction procedures.
    b. The special masonry inspector shall furnish a verified report that, of its own personal knowledge, the work covered by the report has been performed, and materials used and installed in every material respect in compliance with the duly approved Drawings and Specifications.

C. Inspection and testing of post-installed anchors in masonry shall be required in accordance with requirements for concrete in CBC Chapters 17A and 19A.

D. Testing for compressive strength on installed masonry shall be in accordance with CBC 2105A.
1. Mortar and Grout Tests: Comply with CBC Section 2105A.3.

3.14 PAINTING AND COATING

A. Prepare Concrete masonry units indicated to be painted per Section 09 9100, Painting.

B. Prepare concrete masonry units to receive water repellent in accordance with Section 07 1900, Water Repellents, and graffiti-resistant coating per Section 09 9623, Graffiti-Resistant Coatings, where indicated.

1. Masonry units must be clean, dry, and free of efflorescence, dust and mortar.
2. Mortar joints must be free of defects as defined by the coating manufacturer.

END OF SECTION