

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE _____ PAGE _____ OF _____ PAGES

2. AMENDMENT/MODIFICATION NO. _____ 3. EFFECTIVE DATE _____ 4. REQUISITION/PURCHASE REQ. NO. _____ 5. PROJECT NO. *(If applicable)* _____

6. ISSUED BY _____ CODE _____ 7. ADMINISTERED BY *(If other than Item 6)* _____ CODE _____

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)* _____ (X) 9A. AMENDMENT OF SOLICITATION NO. _____
 9B. DATED *(SEE ITEM 11)* _____
 10A. MODIFICATION OF CONTRACT/ORDER NO. _____
 10B. DATED *(SEE ITEM 11)* _____
 CODE _____ FACILITY CODE _____

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended, is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:
 (a) By completing items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment your desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)* _____

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: <i>(Specify authority)</i> THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES <i>(such as changes in paying office, appropriation date, etc.)</i> SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER <i>(Specify type of modification and authority)</i>

E. IMPORTANT: Contractor is not, is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER <i>(Type or print)</i>		16A. NAME AND TITLE OF CONTRACTING OFFICER <i>(Type or print)</i>	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
<i>(Signature of person authorized to sign)</i>		<i>(Signature of Contracting Officer)</i>	

Item 14. Continued.

CHANGE TO SECTION 00100, INSTRUCTIONS, CONDITIONS AND NOTICES TO BIDDERS

1. Section 00100. – Change FAR 52.214-31 to read as shown on the attached page, bearing the notation “ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO. DACA63-02-B-0002.”

CHANGES TO THE SPECIFICATIONS

2. New Section - Add the following accompanying new section, bearing the notation "ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO. DACA63-02-B-0002:"

SECTION 07463 ALUMINUM SIDING

3. Replacement Section - Replace the following section with the accompanying new section of the same number and title, bearing the notation "ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO. DACA63-02-B-0002:"

SECTION 04200 MASONRY

CHANGES TO THE DRAWINGS

4. Write-in Change to Drawings - In order to comply with the A/E/C CAD Standard file naming convention the Structural drawings are re-numbered as shown in the attached Table 1, bearing the notation . "ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO. DACA63-02-B-0002"

5. Replacement Drawings.- Replace the drawings listed below with the attached new drawings of the same number, bearing the notation "AM #0001":

g02.cal G02 VOLUME ONE INDEX SHEET
a103f.cal A103f Floor Plan Zone B
a105f.cal A105f Reflected Ceiling.- Zone A
a106f.cal A106f Reflected Ceiling- Zone B
a405f.cal A405f Enlarged Plans-Int. Elevations I
a406f.cal A406f Enlarged Plans-Int. Elevations II
a407f.cal A407f Cabinet Details
S001f.cal S001f NOTES
S002f.cal S002f NOTES AND MISCELLANEOUS DETAIL
S003f.cal S003f CMU NOTES
S101f.cal S101f FOUNDATION PLAN FIRE STATION GARAGE
S102f.cal S102f FOUNDATION PLAN FIRE STATION ADMINISTRATION
S103f.cal S103f FIRE STATION GARAGE ROOF PLAN
S104f.cal S104f FIRE STATION ADMINISTRATION ROOF PLAN
S105f.cal S105f FIRE STATION CLERESTORY ROOF PLAN
S201f.cal S201f BRACING FIRE STATION
S301f.cal S301f FOUNDATION SECTIONS
S302f.cal S302f FOUNDATION SECTIONS II
S303f.cal S303f FIRE STATION FOUNDATION SECTIONS PLINTHS
S304f.cal S304f FIRE STATION FOUNDATION SECTIONS PLINTHS II
S305f.cal S305f ROOF SECTIONS I
S306f.cal S306f ROOF SECTIONS II FIRE STATION
S307f.cal S307f ROOF SECTIONS III FIRE STATION
S501f.cal S501f MISCELLANEOUS DETAILS
ct06.cal CT06 ENLARGED WEST SITE LAYOUT PLAN
g04.cal G04 VOLUME TWO INDEX SHEET
S101m.cal S101m FOUNDATION PLAN MOTOR POOL GARAGE

S102m.cal S102m FOUNDATION PLAN MOTOR POOL ADMINISTRATION
S103m.cal S103m ROOF PLAN MOTOR POOL GARAGE
S104m.cal S104m ROOF PLAN MOTOR POOL ADMINISTRATION
S105m.cal S105m WIND UPLIFT FIRE STATION & MOTOR POOL
S201m.cal S201m BRACING MOTOR POOL
S301m.cal S301m WALL & FOUNDATION SECTIONS
S302m.cal S302m FOUNDATION SECTIONS
S303m.cal S303m FOUNDATION SECTIONS II
S304m.cal S304m FOUNDATION SECTIONS MOTOR POOL
S305m.cal S305m ROOF SECTIONS
S306m.cal S306m ROOF SECTIONS MOTOR POOL
S307m.cal S307m MAINTENANCE PIT
S101w.cal S101w WASH RACK FOUNDATION PLAN & ROOF FRAMING
S102w.cal S102w WASH RACK ROOF FRAMING
S103w.cal S103w WIND UPLIFT WASH FACILITY

END OF AMENDMENT

52.214-31 FACSIMILE BIDS (DEC 1989)

(a) Definition. "Facsimile bid," as used in this solicitation, means a bid, modification of a bid, or withdrawal of a bid that is transmitted to and received by the Government via electronic equipment that communicates and reproduces both printed and hand-written material.

(b) Bidders may submit facsimile bids as responses to this solicitation. These responses must arrive at the place and by the time, specified in the solicitation.

(c) Facsimile bids that fail to furnish required representations or information or that reject any of the terms, conditions, and provisions of the solicitation may be excluded from consideration.

(d) Facsimile bids must contain the required signatures.

(e) The Government reserves the right to make award solely on the facsimile bid. However, if requested to do so by the Contracting Officer, the apparently successful bidder agrees to promptly submit the complete original signed bid.

(f) Facsimile receiving data and compatibility characteristics are as follows:

AM#0001

(1) Telephone number of receiving facsimile equipment: **(817) 886-6408**.

(2) Compatibility characteristics of receiving facsimile equipment (e.g., make and model number, receiving speed, communications protocol): Digital Facsimile Transceiver; Make: Lanier; Model: 2230; Compatibility: CCITT Group 2 and 3; Communications: Half Duplex.

(g) If the bidder chooses to transmit a facsimile bid, the Government will not be responsible for any failure attributable to the transmission or receipt of the facsimile bid including, but not limited to, the following:

- (1) Receipt of garbled or incomplete bid.
- (2) Availability or condition of the receiving facsimile equipment.
- (3) Incompatibility between the sending and receiving equipment.
- (4) Delay in transmission or receipt of bid.
- (5) Failure of the bidder to properly identify the bid.
- (6) Illegibility of bid.
- (7) Security of bid data.

(End of clause)

SECTION 04200

MASONRY
07/92
Amendment 0001

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ACI INTERNATIONAL (ACI)

ACI SP-66 (1994) ACI Detailing Manual

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 82 (1997a) Steel Wire, Plain, for Concrete Reinforcement

ASTM A 153/A 153M (1998) Zinc Coating (Hot-Dip) on Iron and Steel Hardware

ASTM A 615/A 615M (1996a) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

ASTM C 55 (1997a) Concrete Brick

ASTM C 62 (1997a) Building Brick (Solid Masonry Units Made from Clay or Shale)

ASTM C 67 (1998a) Sampling and Testing Brick and Structural Clay Tile

ASTM C 90 (1998) Loadbearing Concrete Masonry Units

ASTM C 91 (1998) Masonry Cement

ASTM C 126 (1996) Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units

ASTM C 129 (1997) Nonloadbearing Concrete Masonry Units

ASTM C 140 (1998b) Sampling and Testing Concrete Masonry Units

ASTM C 216 (1998) Facing Brick (Solid Masonry Units Made from Clay or Shale)

ASTM C 270 (1997ae1) Mortar for Unit Masonry

ASTM C 476 (1998) Grout for Masonry

ASTM C 494 (1998) Chemical Admixtures for Concrete

ASTM C 578	(1995) Rigid, Cellular Polystyrene Thermal Insulation
ASTM C 641	(1982; R 1991) Staining Materials in Lightweight Concrete Aggregates
ASTM C 780	(1996) Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
ASTM C 1019	(1989a; R 1998) Sampling and Testing Grout
ASTM C 1072	(1998) Measurement of Masonry Flexural Bond Strength
ASTM D 2000	(1998c) Rubber Products in Automotive Applications
ASTM D 2240	(1997e1) Rubber Property - Durometer Hardness
ASTM D 2287	(1996) Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds
ASTM E 119	(1998) Fire Tests of Building Construction and Materials
ASTM E 447	(1992b) Compressive Strength of Masonry Prisms
ASTM E 514-74	(1974) Integral Liquid Polymeric Admixture

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Masonry Work; G

Drawings including plans, elevations, and details of wall reinforcement; details of reinforcing bars at corners and wall intersections; offsets; tops, bottoms, and ends of walls; control and expansion joints; and wall openings. Bar splice locations shall be shown. If the Contractor opts to furnish inch-pound CMU products, drawings showing elevation of walls exposed to view and indicating the location of all cut CMU products shall be submitted for approval. Bent bars shall be identified on a bending diagram and shall be referenced and located on the drawings. Wall dimensions, bar clearances, and wall openings greater than one masonry unit in area shall be shown. No approval will be given to the shop drawings until the Contractor certifies that all openings, including those for mechanical and electrical service, are shown. If, during construction, additional masonry openings

are required, the approved shop drawings shall be resubmitted with the additional openings shown along with the proposed changes. Location of these additional openings shall be clearly highlighted. The minimum scale for wall elevations shall be 1 to 50. Reinforcement bending details shall conform to the requirements of ACI SP-66.

SD-03 Product Data

Clay or Shale Brick; G,
Concrete Brick; G,

Manufacturer's descriptive data.

Cold Weather Installation; G,

Cold weather construction procedures.

SD-04 Samples

Concrete Masonry Units (CMU); G,

Clay or Shale Brick; G,

Color samples of three stretcher units and one unit for each type of special shape. Units shall show the full range of color and texture.

Anchors, Ties, and Bar Positioners; G,

Two of each type used.

Expansion-Joint Materials; G,

One piece of each type used.

Joint Reinforcement; G,

One piece of each type used, including corner and wall intersection pieces, showing at least two cross wires.

Insulation; G,

One piece of board type insulation, not less than 400 mm by 600 mm in size, containing the label indicating the rated permeance and R-values.

Portable Panel; G,

One panel of clay or shale brick, 600 mm by 600 mm, containing approximately 24 brick facings to establish range of color and texture.

SD-06 Test Reports

Efflorescence Test; G,
Field Testing of Mortar; G,
Field Testing of Grout; G,

Masonry Cement; G,
Fire-rated CMU; G,

Test reports from an approved independent laboratory. Test reports on a previously tested material shall be certified as the same as that proposed for use in this project.

Special Inspection; G,

Copies of masonry inspector reports.

SD-07 Certificates

Clay or Shale Brick;
Concrete Brick;
Concrete Masonry Units (CMU);

Control Joint Keys;
Anchors, Ties, and Bar Positioners;
Expansion-Joint Materials;
Joint Reinforcement;
Reinforcing Steel Bars and Rods;
Masonry Cement;
Mortar Coloring;
Insulation;
Precast Concrete Items;
Mortar Admixtures;
Grout Admixtures;

Certificates of compliance stating that the materials meet the specified requirements.

Insulation;

Certificate attesting that the polyurethane or polyisocyanurate insulation furnished for the project contains recovered material, and showing an estimated percent of such recovered material.

1.3 SAMPLE MASONRY PANELS

After material samples are approved and prior to starting masonry work, sample masonry panels shall be constructed for each type and color of masonry required including section of wall with cast stone sill and banding.

At least 48 hours prior to constructing the sample panel or panels, the Contractor shall submit written notification to the Contracting Officer's Representative. Sample panels shall not be built in, or as part of the structure, but shall be located where directed.

1.3.1 Configuration

Panels shall be L-shaped or otherwise configured to represent all of the wall elements. Panels shall be of the size necessary to demonstrate the acceptable level of workmanship for each type of masonry represented on the project. The minimum size of a straight panel or a leg of an L-shaped panel shall be 2.4 m LONG BY 2.4 m HIGH BY 1.6 m WIDE.

1.3.2 Composition

Panels shall show full color range, texture, and bond pattern of the masonry work. Panels shall also be finished with (water repellent) Sealer as specified herein. The Contractor's method for mortar joint tooling; grouting of reinforced vertical cores, collar joints, bond beams, and lintels; positioning, securing, and lapping of reinforcing steel; positioning and lapping of joint reinforcement (including prefabricated corners); and cleaning of masonry work and application of sealer shall be demonstrated during the construction of the panels. Installation or application procedures for anchors, wall ties, , CMU control joints, brick expansion joints, insulation, flashing, brick soldier, row lock courses and weep holes shall be shown in the sample panels. The panels shall contain a masonry bonded corner that includes a bond beam corner. Panels shall show parging and installation of electrical boxes and conduit. Panels that represent reinforced masonry shall contain a 600 mm by 600 mm opening placed at least 600 mm above the panel base and 600 mm away from all free edges, corners, and control joints. Required reinforcing shall be provided around this opening as well as at wall corners and control joints.

1.3.3 Construction Method

Where anchored veneer walls are required, the Contractor shall demonstrate and receive approval for the method of construction; i.e., either bring up the two wythes together or separately, with the insulation and appropriate ties placed within the specified tolerances across the cavity. Temporary provisions shall be demonstrated to preclude mortar or grout droppings in the cavity and to provide a clear open air space of the dimensions shown on the drawings. Where masonry is to be grouted, the Contractor shall demonstrate and receive approval on the method that will be used to bring up the masonry wythes; support the reinforcing bars; and grout cells, bond beams, lintels, and collar joints using the requirements specified herein. If sealer is specified to be applied to the masonry units, sealer shall be applied to the sample panels. Panels shall be built on a properly designed concrete foundation.

1.3.4 Usage

The completed panels shall be used as the standard of workmanship for the type of masonry represented. Masonry work shall not commence until the sample panel for that type of masonry construction has been completed and approved. Panels shall be protected from the weather and construction operations until the masonry work has been completed and approved. After completion of the work, the sample panels, including all foundation concrete, shall become the property of the Contractor and shall be removed from the construction site.

1.4 DELIVERY, HANDLING, AND STORAGE

Materials shall be delivered, handled, stored, and protected in an approved manner to avoid chipping, breakage, and contact with soil or contaminating material, and exposure to the elements.

1.4.1 High Performance Masonry Units

High Performance Concrete masonry units shall be covered or protected from inclement weather and shall conform to the moisture content as specified in ASTM C 90 when delivered to the jobsite. Prefabricated lintels shall be marked on top sides to show either the lintel schedule number or the number and size of top and bottom bars.

1.4.2 Reinforcement, Anchors, and Ties

Steel reinforcing bars, coated anchors, ties, and joint reinforcement shall

be stored above the ground. Steel reinforcing bars and uncoated ties shall be free of loose mill scale and rust.

1.4.3 Cementitious Materials, Sand and Aggregates

Cementitious and other packaged materials shall be delivered in unopened containers, plainly marked and labeled with manufacturers' names and brands. Cementitious material shall be stored in dry, weathertight enclosures or be completely covered. Cement shall be handled in a manner that will prevent the inclusion of foreign materials and damage by water or dampness. Sand and aggregates shall be stored in a manner to prevent contamination or segregation.

1.5 SPECIAL INSPECTION

A qualified masonry inspector approved by the Contracting Officer shall perform inspection of the masonry work. Minimum qualifications for the masonry inspector shall be 5 years of reinforced masonry inspection experience or acceptance by a State, municipality, or other governmental body having a program of examining and certifying inspectors for reinforced masonry construction. The masonry inspector shall be present during preparation of masonry prisms, sampling and placing of masonry units, placement of reinforcement (including placement of dowels in footings and foundation walls), inspection of grout space, immediately prior to closing of cleanouts, and during grouting operations. The masonry inspector shall assure Contractor compliance with the drawings and specifications. The masonry inspector shall keep a complete record of all inspections and shall submit daily written reports to the Quality Control Supervisory Representative reporting the quality of masonry construction.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

The source of materials which will affect the appearance of the finished work shall not be changed after the work has started except with Contracting Officer's approval.

2.2 CLAY OR SHALE BRICK

Color range and texture of clay or shale brick shall be as indicated in Section 09915 - COLOR SCHEDULE and shall conform to the approved sample. Grade SW shall be used for brick in contact with earth or grade and for all exterior work. Brick shall be tested for efflorescence. Clay or shale brick units shall be delivered factory-blended to provide a uniform appearance and color range in the completed wall.

2.2.1 Solid Clay or Shale Brick

Solid clay or shale brick shall conform to ASTM C 216, Type FBS. Brick size shall be modular and the nominal size of the brick used shall be 57 mm thick, 90 mm wide, and 190 mm long. Minimum compressive strength of the brick shall be 17.2 MPa

2.3 HIGH PERFORMANCE CONCRETE MASONRY UNITS (HPCMU)

High performance concrete masonry units shall have a minimum net compressive strength at 28 days of 21.0 MPa as an average of five units with no individual unit less than 18.9 MPa net compressive strength when tested in accordance with ASTM C 90, ASTM C 140, and ASTM E 447. In addition to the manufacturer's recommended curing process, the HPCMU's shall be allowed to air cure in the manufacturers yard and/or job site a minimum of 10 days from the time of removal from the kiln. The

minimum net compressive strength when tested ten days or less from time of removal from kiln shall be at least 18.9 MPa net compressive strength as an average of three units, with no individual unit less than 17.5 MPa net compressive strength prior to placement in wall. Cement shall have a low alkali content and be of one brand. The HPCMU shall be manufactured with a combination of cement, fly ash, and silica fume to give a dense mixture with good texture, high strength, and low absorption. Blending of limestone chips, cinders, unexpanded slag, calcareous and/or siliceous gravel, or cinder bottom ash is prohibited.

The normal dry (received) weights of various sizes of two core HPCMU's shall not exceed the weight shown below when tested in accordance with ASTM C 140. Weights given are for minimum face shell and web thickness allowed by ASTM C 90. If units are manufactured using "optimized webs" or thicker face shells than required by ASTM C 90, an adjustment in maximum block weight will be allowed based on the units' calculated volume.

WEIGHT REQUIREMENTS

Nominal Size (mm)	100x200x400	150x200x400	200x200x400	300x200x400
Normal Weight (kg)	7.3	8.6	11.4	15.9

2.3.1 Kinds and Shapes

Units shall be modular in size and shall include closer, jamb, header, lintel, and bond beam units and special shapes and sizes to complete the work as indicated. In exposed interior masonry surfaces, units having a bullnose shall be used for vertical external corners except at door, window, and louver jambs. Radius of the bullnose shall be 25 mm (1 inch).

Units used in exposed masonry surfaces in any one building shall have a uniform fine to medium texture and a uniform color, and shall be free from chipped edges or other imperfections detracting from the appearance of the finished work.

2.3.1.1 Architectural Units

Units shall have patterned face shell. Face shell pattern shall be split-face and ground face as shown on drawings. Units shall be integrally colored and provided with an integral liquid polymeric (water repellent) admixture ("Dry Block" by W.R. Grace Co.) in accordance with ASTM E 514-74 during manufacture. Color shall be as indicated in Section 09915 - COLOR SCHEDULE. Patterned face shell shall be properly aligned in the completed wall.

2.3.2 Fire-Rated HPCMU

High Performance Concrete masonry units used in fire-rated construction shown on the drawings shall be of minimum equivalent thickness for the fire rating indicated and the corresponding type of aggregates indicated in TABLE I. Units containing more than one of the aggregates listed in TABLE I will be rated on the aggregate requiring the greater minimum equivalent thickness to produce the required fire rating.

TABLE I

FIRE-RATED CONCRETE MASONRY UNITS

See note (a) below

Aggregate Type	Minimum equivalent thickness in mm (inches) for fire rating of:		
	4 hours	3 hours	2 hours
Pumice	120 (4.7)	100 (4.0)	75 (3.0)
Expanded slag	130 (5.0)	110 (4.2)	85 (3.3)
Expanded clay, shale, or slate	145 (5.7)	120 (4.8)	95 (3.7)

(a) Minimum equivalent thickness shall equal net volume as determined in conformance with ASTM C 140 divided by the product of the actual length and height of the face shell of the unit in millimeters . Where walls are to receive plaster or be faced with brick, or otherwise form an assembly; the thickness of plaster or brick or other material in the assembly will be included in determining the equivalent thickness.

2.4 [Enter Appropriate Subpart Title Here]

2.4.1 [Enter Appropriate Subpart Title Here]

2.4.2 [Enter Appropriate Subpart Title Here]

2.4.3 Horizontal Joint Reinforcement

Joint reinforcement shall be factory fabricated from steel wire, and shall conform to ASTM A 82. Wire shall be zinc coated after fabrication by the hot-dip process conforming to ASTM A 153/A 153M, Class B-2. Reinforcement shall consist of two or more parallel longitudinal wires not lighter than 9 gauge weld connected with cross wires not lighter than 14 gauge at not greater than 200 mm on center. Out-to-out dimension of the longitudinal wires shall be 40 mm less than the actual width of the block. Joint reinforcement in flat sections not less than 2.40 m long shall be provided, except that corner reinforcements and other special shapes may be shorter.

2.4.4 Strip Anchor

Perforated steel strip shall be not less than 20 gauge, minimum of 45 mm (1-3/4 inches) wide by 600 mm long and galvanized after fabrication.

2.4.5 Wire-Type Anchor

Steel wire shall be not less than 9 gauge of approved design suitable for use with the panel stiffener provided and galvanized after fabrication.

2.4.6 [Enter Appropriate Subpart Title Here]

2.4.7 Packing (Backer Rods)

Polyethylene foam, neoprene, or filler shall be as recommended by the sealant manufacturer.

2.5 PRECAST CONCRETE ITEMS

Trim, lintels, copings, splashblocks and door sills shall be factory-made units from a plant regularly engaged in producing precast concrete units. Unless otherwise indicated, concrete shall be 28 MPa (4000 psi) minimum conforming to Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE using 13 mm (1/2 inch) to No. 4 nominal-size coarse aggregate, and minimum reinforcement shall be the reinforcement required for handling of the units. Clearance of 20 mm shall be maintained between reinforcement and faces of units. Unless precast-concrete items have been subjected during manufacture to saturated-steam pressure of at least 827 kPa (120 psi) for at least 5 hours, the items, after casting, shall be either damp-cured for 24 hours or steam-cured and shall then be aged under cover for 28 days or longer. Cast-concrete members weighing over 35 kg shall have built-in loops of galvanized wire or other approved provisions for lifting and anchoring. Units shall have beds and joints at right angles to the face, with sharp true arises and shall be cast with drip grooves on the underside where units overhang walls. Exposed-to-view surfaces shall be free of surface voids, spalls, cracks, and chipped or broken edges. Precast units exposed-to-view shall be of uniform appearance and color. Unless otherwise specified, units shall have a smooth dense finish. Prior to use, each item shall be wetted and inspected for crazing. Items showing evidence of dusting, spalling, crazing, or having surfaces treated with a protective coating will be rejected.

2.5.1 Lintels

Precast or cast-in-place lintels, unless otherwise shown, shall be of a thickness equal to the wall and reinforced with two No. 16 bars for the full length. Top of lintels shall be labeled "TOP" or otherwise identified and each lintel shall be clearly marked to show location in the structure.

2.5.2 Sills and Copings

Sills and copings shall be cast with washes. Sills for windows having mullions shall be cast in sections with head joints at mullions and a 6 mm (1/4 inch) allowance for mortar joints. The ends of sills, except a 20 mm (3/4 inch) wide margin at exposed surfaces, shall be roughened for bond. Treads of door sills shall have rounded nosings. Refer to specification section CAST STONE 04735 for specifications on cast stone products.

2.5.3 Splash Blocks

Splash blocks shall be as detailed. Reinforcement shall be the manufacturer's standard.

2.6 MORTAR

Mortar shall be Type S in accordance with the proportion specification of ASTM C 270 except Type S cement-lime mortar proportions shall be 1 part cement, 1/2 part lime and 4-1/2 parts aggregate; when masonry cement ASTM C 91 is used the maximum air content shall be limited to 12 percent and performance equal to cement-lime mortar shall be verified. Verification of masonry cement performance shall be based on ASTM C 780 and ASTM C 1072. Mortar for prefaced concrete masonry units shall contain aggregates with 100 percent passing the 2.36 mm sieve and 95 percent passing the 1.18 mm sieve. Pointing mortar in kitchens shall contain ammonium stearate, or

aluminum tri-stearate, or calcium stearate in an amount equal to 3 percent by weight of cement used. Cement shall have a low alkali content and be of one brand. Aggregates shall be from one source.

2.6.1 Mortar Admixtures

In cold weather, a non-chloride based accelerating admixture may be used subject to approval. Accelerating admixture shall be non-corrosive, shall contain less than 0.2 percent chlorides, and shall conform to ASTM C 494, Type C. All exposed exterior masonry (brick and split-face CMU units) shall be laid using mortar with an integral liquid polymeric (water repellent) admixture in accordance with ASTM E 514-74.

2.6.2 Coloring

Mortar coloring shall be added to the mortar used for exposed masonry surfaces to produce a uniform color as indicated in Section 09915: Color Schedule. Mortar color for split-face units shall be equal to split-face color and mortar color for brick shall be equal to brick color. Mortar coloring shall not exceed 3 percent of the weight of cement for carbon black and ten percent of the weight of cement for all other pigments. Mortar coloring shall be chemically inert, of finely ground limeproof pigment, and furnished in accurately pre-measured and packaged units that can be added to a measured amount of cement.

2.7 GROUT

Grout shall conform to ASTM C 476. Cement used in grout shall have a low alkali content. Grout slump shall be between 200 and 250 mm. Grout shall be used subject to the limitations of Table III. Proportions shall not be changed and materials with different physical or chemical characteristics shall not be used in grout for the work unless additional evidence is furnished that the grout meets the specified requirements.

2.7.1 Grout Admixtures

In cold weather, a non-chloride based accelerating admixture may be used subject to approval. Accelerating admixture shall be non-corrosive, shall contain less than 0.2 percent chlorides, and shall conform to ASTM C 494, Type C.

2.7.2 Grout Barriers

Grout barriers for vertical cores shall consist of fine mesh wire, fiberglass, or expanded metal.

2.8 ANCHORS, TIES, AND BAR POSITIONERS

Anchors and ties shall be fabricated without drips or crimps and shall be zinc-coated in accordance with ASTM A 153/A 153M, Class B-2. Steel wire used for anchors and ties shall be fabricated from steel wire conforming to ASTM A 82. Anchors and ties shall be sized to provide a minimum of 16 mm mortar cover from either face.

2.8.1 Wire Mesh Ties

Wire mesh for tying 100 mm (4 inch) thick concrete masonry unit partitions to other intersecting masonry partitions shall be 13 mm (1/2 inch) mesh of minimum 16 gauge steel wire. Minimum lengths shall be not less than 300 mm.

2.8.2 Wall Ties

Wall ties shall be rectangular-shaped or Z-shaped fabricated of 5 mm diameter zinc-coated steel wire. Rectangular wall ties shall be no less than 100 mm wide. Wall ties may also be of a continuous type conforming to paragraph JOINT REINFORCEMENT. Adjustable type wall ties, if approved for use, shall consist of two essentially U-shaped elements fabricated of 5 mm diameter zinc-coated steel wire. Adjustable ties shall be of the double pintle to eye type and shall allow a maximum of 13 mm eccentricity between each element of the tie. Play between pintle and eye opening shall be not more than 2 mm. The pintle and eye elements shall be formed so that both can be in the same plane.

2.8.3 Dovetail Anchors

Dovetail anchors shall be of the flexible wire type, 5 mm diameter zinc-coated steel wire, triangular shaped, and attached to a 12 gauge or heavier steel dovetail section. These anchors shall be used for anchorage of veneer wythes or composite-wall facings extending over the face of concrete columns, beams, or walls. Cells within vertical planes of these anchors shall be filled solid with grout for full height of walls or partitions, or solid units may be used. Dovetail slots are specified in Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE.

2.8.4 Adjustable Anchors

Adjustable anchors shall be 5 mm diameter steel wire, triangular-shaped. Anchors attached to steel shall be 8 mm diameter steel bars placed to provide 2 mm play between flexible anchors and structural steel members. Spacers shall be welded to rods and columns. Equivalent welded-on steel anchor rods or shapes standard with the flexible-anchor manufacturer may be furnished when approved. Welds shall be cleaned and given one coat of zinc-rich touch up paint.

2.8.5 Bar Positioners

Bar positioners, used to prevent displacement of reinforcing bars during the course of construction, shall be factory fabricated from 9 gauge steel wire or equivalent, and coated with a hot-dip galvanized finish. Not more than one wire shall cross the cell.

2.9 JOINT REINFORCEMENT

Joint reinforcement shall be factory fabricated from steel wire conforming to ASTM A 82, welded construction. Tack welding will not be acceptable in reinforcement used for wall ties. Wire shall have zinc coating conforming to ASTM A 153/A 153M, Class B-2. All wires shall be a minimum of 9 gauge. Reinforcement shall be ladder type design, having one longitudinal wire in the mortar bed of each face shell for hollow units and one wire for solid units. Joint reinforcement shall be placed a minimum of 16 mm cover from either face. The distance between crosswires shall not exceed 400 mm. Joint reinforcement for straight runs shall be furnished in flat sections not less than 3 m long. Joint reinforcement shall be provided with factory formed corners and intersections. If approved for use, joint reinforcement may be furnished with adjustable wall tie features.

2.10 REINFORCING STEEL BARS AND RODS

Reinforcing steel bars and rods shall conform to ASTM A 615/A 615M, Grade 60.

2.11 CONTROL JOINT KEYS

Control joint keys shall be a factory fabricated solid section of natural or synthetic rubber (or combination thereof) conforming to ASTM D 2000or

polyvinyl chloride conforming to ASTM D 2287. The material shall be resistant to oils and solvents. The control joint key shall be provided with a solid shear section not less than 16 mm thick and 10 mm thick flanges, with a tolerance of plus or minus 2 mm. The control joint key shall fit neatly, but without forcing, in masonry unit jamb sash grooves. The control joint key shall be flexible at a temperature of minus 34 degrees C (minus 30 degrees F) after five hours exposure, and shall have a durometer hardness of not less than 70 when tested in accordance with ASTM D 2240.

2.12 EXPANSION-JOINT MATERIALS

Backer rod and sealant shall be adequate to accommodate joint compression equal to 50 percent of the width of the joint. The backer rod shall be compressible rod stock of polyethylene foam, polyurethane foam, butyl rubber foam, or other flexible, nonabsorptive material as recommended by the sealant manufacturer. Sealant shall conform to Section 07900JOINT SEALING.

2.13 INSULATION

2.13.1 Rigid Board-Type Insulation

Rigid board-type insulation shall be extruded polystyrene, polyurethane, or polyisocyanurate. Polystyrene shall conform to ASTM C 578. Polyurethane or polyisocyanurate shall conform to ASTM C 1289, Type I, Class 2, faced with aluminum foil on both sides of the foam. The insulation shall be a standard product and shall be marked with not less than the manufacturer's trademark or name, the specification number, the permeance and R-values.

2.13.1.1 Insulation Thickness and Air Space

The cavity space shall allow for a maximum insulation thickness of 25 mm, and a minimum air space of 20 mm.

2.13.1.2 Aged R-Value

The insulation shall provide a minimum aged R-value of 0.9 for the overall thickness. The aged R-value shall be determined at 24 degrees C (75 degrees F) in accordance with the appropriate referenced specification. The stated R-value of the insulation shall be certified by an independent testing laboratory or certified by an independent Registered Professional Engineer if tests are conducted in the manufacturer's laboratory.

2.13.1.3 Recovered Material

Insulation shall contain the highest practicable percentage of recovered material derived from solid waste (but material reused in the manufacturing process cannot be counted toward the percentage of recovered material). Where two materials have the same price and performance, the one containing the higher recovered material content shall be provided. The polyurethane or polyisocyanurate foam shall have a minimum recovered material content of 9 percent by weight of the core material.

2.13.2 Insulation Adhesive

Insulation adhesive shall be specifically prepared to adhere the insulation to the masonry dampproofing and, where applicable, to the thru-wall flashing. The adhesive shall not deleteriously affect the insulation or dampproofing, and shall have a record of satisfactory and proven performance for the conditions under which to be used.

2.14 FLASHING

Flashing shall be as specified in Section 07600 SHEET METALWORK, GENERAL.

2.15 WEEP HOLE VENTILATORS

Weephole ventilators shall be prefabricated aluminum grill type vents designed to prevent insect entry with maximum air entry. Ventilators shall be sized to match modular construction with a standard 10 mm (3/8 inch mortar joint.

2.16 MORTAR DROPPING COLLECTION DEVICE

Mortar dropping collection device shall be manufactured of high density polyethylene, nylon or recycled polyester designed to catch mortar droppings above the level of the weep holes. The collection device will allow water and air to move through the device to the weep holes.

2.17 Water

Water for mortar mixing shall be clean, potable, and shall not contain substances injurious to the mortar or that would cause staining.

PART 3 EXECUTION

3.1 ENVIRONMENTAL REQUIREMENTS

3.1.1 Hot Weather Installation

The following precautions shall be taken if masonry is erected when the ambient air temperature is more than 32 degrees C in the shade and the relative humidity is less than 50 percent. All masonry materials shall be shaded from direct sunlight; mortar beds shall be spread no more than 1.2 m ahead of masonry; masonry units shall be set within one minute of spreading mortar; and after erection, masonry shall be protected from direct exposure to wind and sun for 48 hours.

3.1.2 Cold Weather Installation

Before erecting masonry when ambient temperature or mean daily air temperature falls below 4 degrees C, a written statement of proposed cold weather construction procedures shall be submitted for approval. The following precautions shall be taken during all cold weather erection.

3.1.2.1 Preparation

Ice or snow formed on the masonry bed shall be thawed by the application of heat. Heat shall be applied carefully until the top surface of the masonry is dry to the touch. Sections of masonry deemed frozen and damaged shall be removed before continuing construction of those sections.

- a. Air Temperature 4 to 0 degrees C. Sand or mixing water shall be heated to produce mortar temperatures between 4 degrees C and 49 degrees C.
- b. Air Temperature 0 to minus 4 degrees C. Sand and mixing water shall be heated to produce mortar temperatures between 4 degrees C and 49 degrees C. Temperature of mortar on boards shall be maintained above freezing.
- c. Air Temperature minus 4 to minus 7 degrees C. Sand and mixing water shall be heated to provide mortar temperatures between 4 degrees C and 49 degrees C. Temperature of mortar on boards

shall be maintained above freezing. Sources of heat shall be used on both sides of walls under construction. Windbreaks shall be employed when wind is in excess of 24 km/hour.

- d. Air Temperature minus 7 degrees C and below. Sand and mixing water shall be heated to provide mortar temperatures between 4 degrees C and 49 degrees C. Enclosure and auxiliary heat shall be provided to maintain air temperature above 0 degrees C. Temperature of units when laid shall not be less than minus 7 degrees C.

3.1.2.2 Completed Masonry and Masonry Not Being Worked On

- a. Mean daily air temperature 4 degrees C to 0 degrees C. Masonry shall be protected from rain or snow for 24 hours by covering with weather-resistive membrane.
- b. Mean daily air temperature 0 degrees C to minus 4 degrees C. Masonry shall be completely covered with weather-resistant membrane for 24 hours.
- c. Mean Daily Air Temperature minus 4 degrees C to minus 7 degrees C. Masonry shall be completely covered with insulating blankets or equally protected for 24 hours.
- d. Mean Daily Temperature minus 7 degrees C and Below. Masonry temperature shall be maintained above 0 degrees C for 24 hours by enclosure and supplementary heat, by electric heating blankets, infrared heat lamps, or other approved methods.

3.1.2.3 [Enter Appropriate Subpart Title Here]

3.2 LAYING MASONRY UNITS

Masonry shall be laid by masonry mechanics. Masonry units shall be laid in running bond pattern unless otherwise indicated. Facing courses shall be level with back-up courses, unless the use of adjustable ties has been approved in which case the tolerances shall be plus or minus 13 mm. Each unit shall be adjusted to its final position while mortar is still soft and plastic. Units that have been disturbed after the mortar has stiffened shall be removed, cleaned, and relaid with fresh mortar. Air spaces, cavities, chases, expansion joints, and spaces to be grouted shall be kept free from mortar and other debris. Units used in exposed masonry surfaces shall be selected from those having the least amount of chipped edges or other imperfections detracting from the appearance of the finished work. Vertical joints shall be kept plumb. Units being laid and surfaces to receive units shall be free of water film and frost. Solid units shall be laid in a nonfurrowed full bed of mortar. Mortar for veneer wythes shall be beveled and sloped toward the center of the wythe from the cavity side. Units shall be shoved into place so that the vertical joints are tight. Vertical joints of brick and the vertical face shells of concrete masonry units, except where indicated at control, expansion, and isolation joints, shall be completely filled with mortar. Mortar will be permitted to protrude up to 13 mm into the space or cells to be grouted. Means shall be provided to prevent mortar from dropping into the space below. In double wythe construction, the inner wythe may be brought up not more than 400 mm ahead of the outer wythe. Collar joints shall be filled with mortar or grout during the laying of the facing wythe, and filling shall not lag the laying of the facing wythe by more than 200 mm.

3.2.1 Surface Preparation

Surfaces upon which masonry is placed shall be cleaned of laitance, dust, dirt, oil, organic matter, or other foreign materials and shall be slightly roughened to provide a surface texture with a depth of at least 3 mm. Sandblasting shall be used, if necessary, to remove laitance from pores and to expose the aggregate.

3.2.2 Forms and Shores

Forms and shores shall be sufficiently rigid to prevent deflections which may result in cracking or other damage to supported masonry and sufficiently tight to prevent leakage of mortar and grout. Supporting forms and shores shall not be removed in less than 10 days.

3.2.3 Concrete Masonry Units

Units in piers, pilasters, columns, starting courses on footings, solid foundation walls, lintels, and beams, and where cells are to be filled with grout shall be full bedded in mortar under both face shells and webs. Other units shall be full bedded under both face shells. Head joints shall be filled solidly with mortar for a distance in from the face of the unit not less than the thickness of the face shell. Foundation walls below grade shall be grouted solid. Jamb units shall be of the shapes and sizes to conform with wall units. Solid units may be incorporated in the masonry work where necessary to fill out at corners, gable slopes, and elsewhere as approved. Double walls shall be stiffened at wall-mounted plumbing fixtures by use of strap anchors, two above each fixture and two below each fixture, located to avoid pipe runs, and extending from center to center of the double wall. Walls and partitions shall be adequately reinforced for support of wall-hung plumbing fixtures when chair carriers are not specified.

3.2.4 Clay or Shale Brick Units

Brick facing shall be laid with the better face exposed. Brick shall be laid in running bond with each course bonded at corners, unless otherwise indicated. Molded brick shall be laid with the frog side down. Brick that is cored, recessed, or has other deformations may be used in sills, treads, soldier courses, except where deformations will be exposed to view.

3.2.4.1 Wetting of Units

Wetting of clay, shale brick, or hollow brick units having an initial rate of absorption of more than 0.155 gm per minute per square cm (1 gm per minute per square inch) of bed surface shall be in conformance with ASTM C 67. The method of wetting shall ensure that each unit is nearly saturated but surface dry when laid.

3.2.4.2 Solid Units

Bed, head, and collar joints shall be completely filled with mortar.

3.2.4.3 Hollow Units

Hollow units shall be laid as specified for concrete masonry units.

3.2.5 Tolerances

Masonry shall be laid plumb, true to line, with courses level. Bond pattern shall be kept plumb throughout. Corners shall be square unless noted otherwise. Except for walls constructed of prefaced concrete masonry units, masonry shall be laid within the following tolerances (plus or minus unless otherwise noted):

3.2.5.1 Surface to Receive Ceramic Tile

Masonry surfaces shall be level and plumb with struck joints and square openings. No variations in the surfaces exceeding 3 mm in 30 meters and no abrupt irregularities exceeding 1.6 mm shall be allowed where ceramic tile installed over masonry by the dry set method.

3.2.5.2 Surfaces to Receive Vinyl Wallcovering

Masonry surfaces shall be level and plumb with struck joints and square openings. No variations in the surfaces exceeding 3 mm in 30 meters and no abrupt irregularities shall be allowed where vinyl coated wallcovering is installed over masonry areas.

TABLE II
 TOLERANCES

Variation from the plumb in the lines
 and surfaces of columns, walls and arises

In adjacent masonry units	3 mm
In 3 m	6 mm
In 6 m	10 mm
In 12 m or more	13 mm

Variations from the plumb for external corners,
 expansion joints, and other conspicuous lines

In 6 m	6 mm
In 12 m or more	13 mm

Variations from the level for exposed lintels,
 sills, parapets, horizontal grooves, and other
 conspicuous lines

In 6 m	6 mm
In 12 m or more	13 mm

Variation from level for bed joints and top
 surfaces of bearing walls

In 3 m	6 mm
In 12 m or more	13 mm

Variations from horizontal lines

In 3 m	6 mm
In 6 m	10 mm
In 12 m or more	13 mm

Variations in cross sectional dimensions of
 columns and in thickness of walls

TOLERANCES

Minus	6 mm
Plus	13 mm

3.2.6 Cutting and Fitting

Full units of the proper size shall be used wherever possible, in lieu of cut units. Cutting and fitting, including that required to accommodate the work of others, shall be done by masonry mechanics using power masonry saws. Concrete masonry units may be wet or dry cut. Wet cut units, before being placed in the work, shall be dried to the same surface-dry appearance as uncut units being laid in the wall. Cut edges shall be clean, true and sharp. Openings in the masonry shall be made carefully so that wall plates, cover plates or escutcheons required by the installation will completely conceal the openings and will have bottoms parallel with the masonry bed joints. Reinforced masonry lintels shall be provided above openings over 300 mm wide for pipes, ducts, cable trays, and other wall penetrations, unless steel sleeves are used.

3.2.7 Jointing

Joints shall be tooled when the mortar is thumbprint hard. Horizontal joints shall be tooled last. Joints shall be brushed to remove all loose and excess mortar. Mortar joints shall be finished as follows:

3.2.7.1 Flush Joints

Joints in concealed masonry surfaces and joints at electrical outlet boxes in wet areas shall be flush cut. Flush cut joints shall be made by cutting off the mortar flush with the face of the wall. Joints in unparged masonry walls below grade shall be pointed tight. Flush joints for architectural units, such as fluted units, shall completely fill both the head and bed joints.

3.2.7.2 Tooled Joints

Joints in exposed exterior and interior brick masonry surfaces shall be tooled slightly concave. Joints in exposed exterior split-face cmu masonry surfaces shall be tooled flush. Joints shall be tooled with a jointer slightly larger than the joint width so that complete contact is made along the edges of the unit. Tooling shall be performed so that the mortar is compressed and the joint surface is sealed. Jointer of sufficient length shall be used to obtain a straight and true mortar joint.

3.2.7.3 Door and Window Frame Joints

On the exposed interior side of exterior frames, joints between frames and abutting masonry walls shall be raked to a depth of 10 mm. On the exterior side of exterior frames, joints between frames and abutting masonry walls shall be raked to a depth of 10 mm.

3.2.8 Joint Widths

Joint widths shall be as follows:

3.2.8.1 Concrete Masonry Units

Concrete masonry units shall have 10 mm (3/8 inch) joints.

3.2.8.2 Brick

Brick joint widths shall be the difference between the actual and nominal dimensions of the brick in either height or length. Brick expansion joint widths shall be as shown.

3.2.9 Embedded Items

Spaces around built-in items shall be filled with mortar. Openings around flush-mount electrical outlet boxes in wet locations shall be pointed with mortar. Anchors, ties, wall plugs, accessories, flashing, pipe sleeves and other items required to be built-in shall be embedded as the masonry work progresses. Anchors, ties and joint reinforcement shall be fully embedded in the mortar. Cells receiving anchor bolts and cells of the first course below bearing plates shall be filled with grout.

3.2.10 Unfinished Work

Unfinished work shall be stepped back for joining with new work. Tothing may be resorted to only when specifically approved. Loose mortar shall be removed and the exposed joints shall be thoroughly cleaned before laying new work.

3.2.11 Masonry Wall Intersections

Each course shall be masonry bonded at corners and elsewhere as shown. Masonry walls shall be anchored or tied together at corners and intersections with bond beam reinforcement and prefabricated corner or tee pieces of joint reinforcement as shown.

3.2.12 Partitions

Partitions shall be continuous from floor to underside of floor or roof deck where shown. Openings in firewalls around joists or other structural members shall be filled as indicated or approved. Where suspended ceilings on both sides of partitions are indicated, the partitions other than those shown to be continuous may be stopped approximately 100 mm above the ceiling level. An isolation joint shall be placed in the intersection between partitions and structural or exterior walls as shown. Interior partitions having 100 mm (nominal thick units shall be tied to intersecting partitions of 100 mm units, 125 mm into partitions of 150 mm units, and 175 into partitions of 200 mm or thicker units. Cells within vertical plane of ties shall be filled solid with grout for full height of partition or solid masonry units may be used. Interior partitions having masonry walls over 100 mm) thick shall be tied together with joint reinforcement. Partitions containing joint reinforcement shall be provided with prefabricated pieces at corners and intersections or partitions.

3.3 ANCHORED VENEER CONSTRUCTION

The inner and outer wythes shall be completely separated by a continuous airspace as shown on the drawings. Both the inner and the outer wythes shall be laid up together except when adjustable joint reinforcement assemblies are approved for use or when dampproofing or board-type insulation is installed against the inner wythe. When both wythes are not brought up together, through-wall flashings shall be protected from damage until they are fully enclosed in the wall. The airspace between the wythes shall be kept clear and free of mortar droppings. A coarse gravel or drainage material shall be placed behind the weep holes in the cavity to a minimum depth of 100 mm of coarse aggregate or 250 mm of drainage material to keep mortar droppings from plugging the weep holes.

3.3.1 Dampproofing and Board-Type Insulation

Masonry units to receive dampproofing and board-type insulation shall be free from chipped edges, protrusions, cracks, and other imperfections which could interfere with installed system. Joint reinforcement, anchors, and ties shall be kept clean of dampproofing, moisture, and other foreign matter when the outer wythe is laid. Dampproofing is specified in Section 07110 BITUMINOUS DAMPPROOFING. Insulation shall be kept dry prior to, during, and after installation. The cavity between the wythes shall not be filled with loose fill insulation.

3.4 WEEP HOLES

Weep holes shall be provided not more than 600 mm on centers in mortar joints of the exterior wythe above wall flashing, over foundations, bond beams, through wall flashings, and any other horizontal interruptions of the cavity. Weep holes shall be formed by placing short lengths of well-greased No. 10, 8 mm (5/16 inch) nominal diameter, braided cotton sash cord in the mortar and withdrawing the cords after the wall has been completed. Weep holes shall be constructed using weep hole ventilators. Other approved methods may be used for providing weep holes. Weep holes shall be set above the base flashing as specified along with the mortar dropping collection device. The base flashing shall extend up the inner wythe a height of six inches above the mortar dropping collection device, or per manufacturers recommendations. Weep holes shall be kept free of mortar and other obstructions.

3.5 COMPOSITE WALLS

Masonry wythes shall be tied together with joint reinforcement or with unit wall ties. Facing shall be anchored to concrete backing with wire dovetail anchors set in slots built in the face of the concrete as specified in Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE. The facing wythe shall be anchored or tied to the backup at a maximum spacing of 400 mm (16 inches) on center vertically and 600 mm (24 inches) on center horizontally. Unit ties shall be spaced not over 600 mm (24 inches) on centers horizontally, in courses not over 400 mm (16 inches) apart vertically, staggered in alternate courses. Ties shall be laid not closer than 16 mm to either masonry face. Ties shall not extend through control joints. Collar joints between masonry facing and masonry backup shall be filled solidly with grout.

3.6 [Enter Appropriate Subpart Title Here]

3.7 MORTAR

Mortar shall be mixed in a mechanically operated mortar mixer for at least 3 minutes, but not more than 5 minutes. Measurement of ingredients for mortar shall be by volume. Ingredients not in containers, such as sand, shall be accurately measured by the use of measuring boxes. Water shall be mixed with the dry ingredients in sufficient amount to provide a workable mixture which will adhere to the vertical surfaces of masonry units. Mortar that has stiffened because of loss of water through evaporation shall be retempered by adding water to restore the proper consistency and workability. Mortar that has reached its initial set or that has not been used within 2-1/2 hours after mixing shall be discarded.

3.8 REINFORCING STEEL

Reinforcement shall be cleaned of loose, flaky rust, scale, grease, mortar, grout, or other coating which might destroy or reduce its bond prior to placing grout. Bars with kinks or bends not shown on the drawings shall not be used. Reinforcement shall be placed prior to grouting. Unless otherwise indicated, vertical wall reinforcement shall extend to within 50 mm of tops of walls.

3.8.1 Positioning Bars

Vertical bars shall be accurately placed within the cells at the positions indicated on the drawings. A minimum clearance of 13 mm shall be maintained between the bars and masonry units. Minimum clearance between parallel bars shall be one diameter of the reinforcement. Vertical reinforcing may be held in place using bar positioners located near the ends of each bar and at intermediate intervals of not more than 192 diameters of the reinforcement. Column and pilaster ties shall be wired in position around the vertical steel. Ties shall be in contact with the vertical reinforcement and shall not be placed in horizontal bed joints.

3.8.2 Splices

Bars shall be lapped a minimum of 48 diameters of the reinforcement. Welded or mechanical connections shall develop at least 125 percent of the specified yield strength of the reinforcement.

3.9 JOINT REINFORCEMENT

Joint reinforcement shall be installed at 400 mm (16 inches) on center or as indicated. Reinforcement shall be lapped not less than 150 mm. Prefabricated sections shall be installed at corners and wall intersections. The longitudinal wires of joint reinforcement shall be placed to provide not less than 16 mm cover to either face of the unit.

3.10 PLACING GROUT

Cells containing reinforcing bars shall be filled with grout. Hollow masonry units in walls or partitions supporting plumbing, heating, or other mechanical fixtures, voids at door and window jambs, and other indicated spaces shall be filled solid with grout. Cells under lintel bearings on each side of openings shall be filled solid with grout for full height of openings. Walls below grade, lintels, and bond beams shall be filled solid with grout. Units other than open end units may require grouting each course to preclude voids in the units. Grout not in place within 1-1/2 hours after water is first added to the batch shall be discarded. Sufficient time shall be allowed between grout lifts to preclude displacement or cracking of face shells of masonry units. If blowouts, flowouts, misalignment, or cracking of face shells should occur during construction, the wall shall be torn down and rebuilt.

3.10.1 Vertical Grout Barriers for Fully Grouted Walls

Grout barriers shall be provided not more than 10 m apart, or as required, to limit the horizontal flow of grout for each pour.

3.10.2 Horizontal Grout Barriers

Grout barriers shall be embedded in mortar below cells of hollow units receiving grout.

3.10.3 Grout Holes and Cleanouts

3.10.3.1 Grout Holes

Grouting holes shall be provided in slabs, spandrel beams, and other in-place overhead construction. Holes shall be located over vertical reinforcing bars or as required to facilitate grout fill in bond beams. Additional openings spaced not more than 400 mm (16 inches) on centers shall be provided where grouting of all hollow unit masonry is indicated. Openings shall not be less than 100 mm in diameter or 75 by 100 mm in horizontal dimensions. Upon completion of grouting operations, grouting

holes shall be plugged and finished to match surrounding surfaces.

3.10.3.2 Cleanouts for Hollow Unit Masonry Construction

Cleanout holes shall be provided at the bottom of every pour in cores containing vertical reinforcement when the height of the grout pour exceeds 1.5 m. Where all cells are to be grouted, cleanout courses shall be constructed using bond beam units in an inverted position to permit cleaning of all cells. Cleanout holes shall be provided at a maximum spacing of 800 mm (32 inches) where all cells are to be filled with grout.

A new series of cleanouts shall be established if grouting operations are stopped for more than 4 hours. Cleanouts shall not be less than 75 by 100 mm openings cut from one face shell. Manufacturer's standard cutout units may be used at the Contractor's option. Cleanout holes shall not be closed until masonry work, reinforcement, and final cleaning of the grout spaces have been completed and inspected. For walls which will be exposed to view, cleanout holes shall be closed in an approved manner to match surrounding masonry.

3.10.4 Grouting Equipment

3.10.4.1 Grout Pumps

Pumping through aluminum tubes will not be permitted. Pumps shall be operated to produce a continuous stream of grout without air pockets, segregation, or contamination. Upon completion of each day's pumping, waste materials and debris shall be removed from the equipment, and disposed of outside the masonry.

3.10.4.2 Vibrators

Internal vibrators shall maintain a speed of not less than 5,000 impulses per minute when submerged in the grout. At least one spare vibrator shall be maintained at the site at all times. Vibrators shall be applied at uniformly spaced points not further apart than the visible effectiveness of the machine. Duration of vibration shall be limited to time necessary to produce satisfactory consolidation without causing segregation.

3.10.5 Grout Placement

Masonry shall be laid to the top of a pour before placing grout. Grout shall not be placed in two-wythe solid unit masonry cavity until mortar joints have set for at least 3 days during hot weather and 5 days during cold damp weather. Grout shall not be placed in hollow unit masonry until mortar joints have set for at least 24 hours. Grout shall be placed using a hand bucket, concrete hopper, or grout pump to completely fill the grout spaces without segregation of the aggregates. Vibrators shall not be inserted into lower pours that are in a semi-solidified state. The height of grout pours and type of grout used shall be limited by the dimensions of grout spaces as indicated in Table III. Low-lift grout methods may be used on pours up to and including 1.5 m in height. High-lift grout methods shall be used on pours exceeding 1.5 m in height.

3.10.5.1 Low-Lift Method

Grout shall be placed at a rate that will not cause displacement of the masonry due to hydrostatic pressure of the grout. Mortar protruding more than 13 mm into the grout space shall be removed before beginning the grouting operation. Grout pours 300 mm or less in height shall be consolidated by mechanical vibration or by puddling. Grout pours over 300 mm in height shall be consolidated by mechanical vibration and reconsolidated by mechanical vibration after initial water loss and settlement has occurred. Vibrators shall not be inserted into lower pours

that are in a semi-solidified state. Low-lift grout shall be used subject to the limitations of Table III.

3.10.5.2 High-Lift Method

Mortar droppings shall be cleaned from the bottom of the grout space and from reinforcing steel. Mortar protruding more than 6 mm into the grout space shall be removed by dislodging the projections with a rod or stick as the work progresses. Reinforcing, bolts, and embedded connections shall be rigidly held in position before grouting is started. CMU units shall not be pre-wetted. Grout, from the mixer to the point of deposit in the grout space shall be placed as rapidly as practical by pumping and placing methods which will prevent segregation of the mix and cause a minimum of grout splatter on reinforcing and masonry surfaces not being immediately encased in the grout lift. The individual lifts of grout shall be limited to 1.2 m in height. The first lift of grout shall be placed to a uniform height within the pour section and vibrated thoroughly to fill all voids. This first vibration shall follow immediately behind the pouring of the grout using an approved mechanical vibrator. After a waiting period sufficient to permit the grout to become plastic, but before it has taken any set, the succeeding lift shall be poured and vibrated 300 to 450 mm into the preceding lift. If the placing of the succeeding lift is going to be delayed beyond the period of workability of the preceding, each lift shall be reconsolidated by reworking with a second vibrator as soon as the grout has taken its settlement shrinkage. The waiting, pouring, and reconsolidation steps shall be repeated until the top of the pour is reached. The top lift shall be reconsolidated after the required waiting period. The high-lift grouting of any section of wall between vertical grout barriers shall be completed to the top of a pour in one working day unless a new series of cleanout holes is established and the resulting horizontal construction joint cleaned. High-lift grout shall be used subject to the limitations in Table III.

TABLE III

POUR HEIGHT AND TYPE OF GROUT FOR VARIOUS GROUT SPACE DIMENSIONS

Maximum Grout Pour Height (m) (4)	Grout Type	Grouting Procedure	Minimum Dimensions of the Total Clear Areas Within Grout Spaces and Cells (mm) (1,2)	
			Multiwythe Masonry (3)	Hollow-unit Masonry
0.3	Fine	Low Lift	20	40 x 50
1.5	Fine	Low Lift	50	50 x 75
2.4	Fine	High Lift	50	50 x 75
3.6	Fine	High Lift	65	65 x 75
7.3	Fine	High Lift	75	75 x 75
0.3	Coarse	Low Lift	40	40 x 75
1.5	Coarse	Low Lift	50	65 x 75
2.4	Coarse	High Lift	50	75 x 75
3.6	Coarse	High Lift	65	75 x 75
7.3	Coarse	High Lift	75	75 x 100

Notes:

- (1) The actual grout space or cell dimension must be larger than the sum of the following items:
 - a) The required minimum dimensions of total clear areas given in the table above;
 - b) The width of any mortar projections within the space;
 - c) The horizontal projections of the diameters of the horizontal

reinforcing bars within a cross section of the grout space or cell.

- (2) The minimum dimensions of the total clear areas shall be made up of one or more open areas, with at least one area being 20 mm or greater in width.
- (3) For grouting spaces between masonry wythes.
- (4) Where only cells of hollow masonry units containing reinforcement are grouted, the maximum height of the pour shall not exceed the distance between horizontal bond beams.

3.11 BOND BEAMS

Bond beams shall be filled with grout and reinforced as indicated on the drawings. Grout barriers shall be installed under bond beam units to retain the grout as required. Reinforcement shall be continuous, including around corners, except through control joints or expansion joints, unless otherwise indicated on the drawings. Where splices are required for continuity, reinforcement shall be lapped 48 bar diameters. A minimum clearance of 13 mm shall be maintained between reinforcement and interior faces of units.

3.12 CONTROL JOINTS

Control joints shall be provided as indicated and shall be constructed by using special control-joint units and/or sash jamb units with control joint key in accordance with the details shown on the drawings. Sash jamb units shall have a 19 by 19 mm groove near the center at end of each unit. The vertical mortar joint at control joint locations shall be continuous, including through all bond beams except the floor levels (second floor, third floor etc.) or the roof level bond beams. This shall be accomplished by utilizing half blocks in alternating courses on each side of the joint. The control joint key shall be interrupted in courses containing continuous bond beam steel. In single wythe exterior masonry walls, the exterior control joints shall be raked to a depth of 20 mm; backer rod and sealant shall be installed in accordance with Section 07900 JOINT SEALING. Exposed interior control joints shall be raked to a depth of 6 mm. Concealed control joints shall be flush cut.

3.13 BRICK EXPANSION JOINTS AND CONCRETE MASONRY VENEER JOINTS

Brick expansion joints and concrete masonry veneer joints shall be provided and constructed as shown on the drawings. Joints shall be kept free of mortar and other debris.

3.14 SHELF ANGLES

Shelf angles shall be adjusted as required to keep the masonry level and at the proper elevation. Shelf angles shall be galvanized. Shelf angles shall be provided in sections not longer than 3 m and installed with a 6 mm gap between sections. Shelf angles shall be mitered and welded at building corners with each angle not shorter than 1.2 m, unless limited by wall configuration.

3.15 LINTELS

3.15.1 Masonry Lintels

Masonry lintels shall be constructed with lintel units filled solid with grout in all courses and reinforced with a minimum of two No. 4 bars in the bottom course unless otherwise indicated on the drawings. Lintel reinforcement shall extend beyond each side of masonry opening as detailed

on the drawings (am#1) or 600 mm, whichever is greater. Reinforcing bars shall be supported in place prior to grouting and shall be located 15 mm above the bottom inside surface of the lintel unit.

3.15.2 Precast Concrete and Steel Lintels

Precast concrete and steel lintels shall be as shown on the drawings. Lintels shall be set in a full bed of mortar with faces plumb and true. Steel and precast lintels shall have a minimum bearing length of 200 mm (8 inches) unless otherwise indicated on the drawings.

3.16 SILLS AND COPINGS

Sills and copings shall be set in a full bed of mortar with faces plumb and true.

3.17 ANCHORAGE TO CONCRETE AND STRUCTURAL STEEL

3.17.1 Anchorage to Concrete

Anchorage of masonry to the face of concrete columns, beams, or walls shall be with dovetail anchors spaced not over 400 mm on centers vertically and 600 mm (24 inches) on center horizontally.

3.17.2 Anchorage to Structural Steel

Masonry shall be anchored to vertical structural steel framing with adjustable steel wire anchors spaced not over 400 mm on centers vertically, and if applicable, not over 600 mm (on centers horizontally.

3.18 INSULATION

Anchored veneer walls shall be insulated, where shown, by installing board-type insulation on the cavity side of the inner wythe. Board type insulation shall be applied directly to the dampproofed masonry or thru-wall flashing with adhesive. Insulation shall be neatly fitted between obstructions without impaling of insulation on ties or anchors. The insulation shall be applied in parallel courses with vertical joints breaking midway over the course below and shall be applied in moderate contact with adjoining units without forcing, and shall be cut to fit neatly against adjoining surfaces.

3.19 SPLASH BLOCKS

Splash blocks shall be located as shown.

3.20 POINTING AND CLEANING

After mortar joints have attained their initial set, but prior to hardening, mortar and grout daubs or splashings shall be completely removed from masonry-unit surfaces that will be exposed, painted, dampproofing, insulated with board-type insulation, or covered with vinyl coated wallcovering. Before completion of the work, defects in joints of masonry to be exposed or painted shall be raked out as necessary, filled with mortar, and tooled to match existing joints. Immediately after grout work is completed, scum and stains which have percolated through the masonry work shall be removed using a high pressure stream of water and a stiff bristled brush. Masonry surfaces shall not be cleaned, other than removing excess surface mortar, until mortar in joints has hardened. Masonry surfaces shall be left clean, free of mortar daubs, dirt, stain, and discoloration, including scum from cleaning operations, and with tight mortar joints throughout. Metal tools and metal brushes shall not be used for cleaning.

3.20.1 Concrete Masonry Unit and

Exposed concrete masonry unit and shall be dry-brushed at the end of each day's work and after any required pointing, using stiff-fiber bristled brushes.

3.20.2 Clay or Shale Brick Surfaces

Exposed clay or shale brick masonry surfaces shall be cleaned as necessary to obtain surfaces free of stain, dirt, mortar and grout daubs, efflorescence, and discoloration or scum from cleaning operations. After cleaning, the sample panel of similar material shall be examined for discoloration or stain as a result of cleaning. If the sample panel is discolored or stained, the method of cleaning shall be changed to assure that the masonry surfaces in the structure will not be adversely affected. The exposed masonry surfaces shall be water-soaked and then cleaned with a solution proportioned 30 milliliters trisodium phosphate and 30 milliliters laundry detergent to 1 liter of water or cleaned with a proprietary masonry cleaning agent specifically recommended for the color and texture by the clay products manufacturer. The solution shall be applied with stiff fiber brushes, followed immediately by thorough rinsing with clean water. Proprietary cleaning agents shall be used in conformance with the cleaning product manufacturer's printed recommendations. Efflorescence shall be removed in conformance with the brick manufacturer's recommendations.

3.21 BEARING PLATES

Bearing plates for beams, joists, joist girders and similar structural members shall be set to the proper line and elevation with damp-pack bedding mortar, except where non-shrink grout is indicated. Bedding mortar and non-shrink grout shall be as specified in Section 03300CAST-IN-PLACE STRUCTURAL CONCRETE.

3.22 PROTECTION

Facing materials shall be protected against staining. Top of walls shall be covered with nonstaining waterproof covering or membrane when work is not in progress. Covering of the top of the unfinished walls shall continue until the wall is waterproofed with a complete roof or parapet system. Covering shall extend a minimum of 600 mm down on each side of the wall and shall be held securely in place. Before starting or resuming, top surface of masonry in place shall be cleaned of loose mortar and foreign material.

3.23 TEST REPORTS

3.23.1 Field Testing of Mortar

At least three specimens of mortar shall be taken each day. A layer of mortar 13 to 16 mm thick shall be spread on the masonry units and allowed to stand for one minute. The specimens shall then be prepared and tested for compressive strength in accordance with ASTM C 780.

3.23.2 Field Testing of Grout

Field sampling and testing of grout shall be in accordance with the applicable provisions of ASTM C 1019. A minimum of three specimens of grout per day shall be sampled and tested. Each specimen shall have a minimum ultimate compressive strength of 13.8 MPa at 28 days.

3.23.3 Efflorescence Test

Brick which will be exposed to weathering shall be tested for efflorescence. Tests shall be scheduled far enough in advance of starting masonry work to permit retesting if necessary. Sampling and testing shall conform to the applicable provisions of ASTM C 67. Units meeting the definition of "effloresced" will be subject to rejection.

3.23.4 Sealer

All exposed masonry (brick and split-face cmu) shall be sealed with "Prime A Pell 200" by Chemprobe after all masonry is installed and cleaned. Coverage Rate shall be determined by Technical Representative of product and the Sample panel constructed on site. Refer to 09900 and 09915 for additional specifications.

3.24 Pointing and Cleaning

Mortar daubs or splashings, before setting or hardening, shall be completely removed from masonry-unit surfaces that will be exposed or painted. Before completion of the work, all defects in joints of masonry to be exposed or painted shall be raked out as necessary, filled with mortar, and tooled to match existing joints. Masonry surfaces shall not be cleaned, other than removing excess surface mortar, until mortar in joints has hardened. Masonry surfaces shall be left clean, free of mortar daubs, dirt, stain, and discoloration, including scum from cleaning operations, and with tight mortar joints throughout. Metal tools and metal brushes shall not be used for cleaning. Concrete masonry unit surfaces shall be dry-brushed at the end of each day's work and after any required pointing.

-- End of Section --

SECTION 07463

ALUMINUM SIDING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum soffit.

1.2 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Framing and Sheathing.
- B. Section 07900 - Joint Sealers.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01330 SUBMITTAL PROCEDURES.
- B. Product Data: Manufacturer's standard printed product data and installation instructions for specified products.
- C. Selection Samples: Submit color chips of manufacturer's full range of colors for Contracting Officer's selection as per 09915 COLOR SCHEDULE.
- D. Verification Samples: Submit three samples, each 12 inches in length, of each specified product in specified color.
- E. Regulatory Agency Compliance: Submit evidence of specified regulatory agency compliance.

1.4 QUALITY ASSURANCE

Shall match or exceed requirements set forth in Section 07430 COMPOSITE, FOAM-INSULATED, METAL WALL PANELS section 1.4 QUALITY ASSURANCE.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to project site in original packaging.
- B. Store products in original packaging, on flat surface under cover, stacked no more than 12 boxes high.

1.6 WARRANTY

- A. Provide manufacturer's lifetime limited warranty.

PART 2 PRODUCTS

2.1 PRODUCTS

Exterior surface profile shall be smooth, flat. Panel length shall extend full length run of soffit from exterior

wall surface to edge of soffit.

Aluminum Soffit Panels:

1. Style: (304.8 mm) wide panels, (9.5 mm) deep, with double (137.2 mm) wide faces forming U-grooves at (152.4 mm) on center.
2. Thickness: Nominal 0.016 inch (0.4 mm); aluminum alloy 3105-H28P:
 - a. Minimum Tensile Strength: (1,827,982 g/sq cm).
 - b. Minimum Yield Strength: (1,546,754 g/sq cm).
3. Interlocking edges and elongated nailing hems.
4. Finish Color: As per section 09915 COLOR SCHEDULE..
5. Supply non-ventilating type soffit material.

2.2 ACCESSORIES

A. Accessories:

1. Starter Strips.
2. Outside Corner Posts.
3. Inside Corner Posts.
4. J-Channels.
5. General Purpose Trim.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrate conditions before beginning installation of siding and soffit products; verify dimensions and acceptability of substrate.
- B. Do not proceed with installation until unacceptable conditions have been corrected.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's printed installation instructions.
- B. Attach panels to substrate interlocked and lapped for weather tight installation, nails concealed; install horizontal components true to level and vertical components true to plumb.
 1. Space siding nails at 16 inches (406.4 mm) on center; center nails in nailing slots without binding to allow for thermal movement.
- C. Paint or otherwise protect dissimilar metals in contact.
- D. Installation of joint sealers is specified in Section 07900.

3.3 ADJUSTING AND CLEANING

- A. Clean dirt from surface of installed products, using mild soap and water.
- B. After completing installation, remove from project site excess materials and debris resulting from installation.

END OF SECTION

ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO. DACA63-02-B-0002

OLD	TITLE	FILE	NEW	TITLE	FILE
S001	NOTES	fmps001n	S001f	NOTES	fmps001f
S002	NOTES AND MISCELLANEOUS DETAIL	fmps002n	S002f	NOTES AND MISCELLANEOUS DETAIL	fmps002f
S503	MISCELLANEOUS DETAILS	fmps503d	S003f	CMU NOTES	fmps003f
S104	FOUNDATION PLAN FIRE STATION GARAGE	fmps104g	S101f	FOUNDATION PLAN FIRE STATION GARAGE	fmps101f
S105	FOUNDATION PLAN FIRE STATION ADMINISTRATION	fmps105a	S102f	FOUNDATION PLAN FIRE STATION ADMINISTRATION	fmps102f
S306	FOUNDATION SECTIONS I	fmps306f	S103f	FIRE STATION GARAGE ROOF PLAN	fmps103f
S307	FIRE STATION FOUNDATION SECTIONS PLINTHS	fmps307f	S104f	FIRE STATION ADMINISTRATION ROOF PLAN	fmps104f
S308	FOUNDATION SECTIONS II	fmps308f	S105f	FIRE STATION CLERESTORY ROOF PLAN	fmps105f
S309	FIRE STATION FOUNDATION SECTIONS PLINTHS II	fmps309f	S201f	BRACING FIRE STATION	fmps201f
S109	FIRE STATION GARAGE ROOF PLAN	fmps109g	S301f	FOUNDATION SECTIONS	fmps301f
S110	FIRE STATION ADMINISTRATION ROOF PLAN	fmps110a	S302f	FOUNDATION SECTIONS II	fmps302f
S328	FIRE STATION CLERESTORY ROOF PLAN	fmps328f	S303f	FIRE STATION FOUNDATION SECTIONS PLINTHS	fmps303f
S311	ROOF SECTIONS I	fmps311r	S304f	FIRE STATION FOUNDATION SECTIONS PLINTHS II	fmps304f
S312	ROOF SECTIONS II FIRE STATION	fmps312a	S305f	ROOF SECTIONS I	fmps305f
S313	ROOF SECTIONS III FIRE STATION	fmps313a	S306f	ROOF SECTIONS II FIRE STATION	fmps306f
S213	BRACING FIRE STATION	fmps213b	S307f	ROOF SECTIONS III FIRE STATION	fmps307f
			S501f	MISCELLANEOUS DETAILS	fmps501f
S114	FOUNDATION PLAN MOTOR POOL GARAGE	fmps114f			
S115	FOUNDATION PLAN MOTOR POOL ADMINISTRATION	fmps115f	S101m	FOUNDATION PLAN MOTOR POOL GARAGE	fmps101m
S316	FOUNDATION SECTIONS I	fmps316f	S102m	FOUNDATION PLAN MOTOR POOL ADMINISTRATION	fmps102m
S317	FOUNDATION SECTIONS II	fmps317f	S103m	ROOF PLAN MOTOR POOL GARAGE	fmps103m
S329	FOUNDATION SECTIONS MOTOR POOL	fmps329m	S104m	ROOF PLAN MOTOR POOL ADMINISTRATION	fmps104m
S518	MAINTENANCE PIT	fmps518p	S105m	WIND UPLIFT FIRE STATION & MOTOR POOL	fmps105m
S119	ROOF PLAN MOTOR POOL GARAGE	fmps119r	S201m	BRACING MOTOR POOL	fmps201m
S120	ROOF PLAN MOTOR POOL ADMINISTRATION	fmps120r	S301m	WALL & FOUNDATION SECTIONS	fmps301m
S321	ROOF SECTIONS	fmps321r	S302m	FOUNDATION SECTIONS	fmps302m
S322	ROOF SECTIONS MOTOR POOL	fmps322r	S303m	FOUNDATION SECTIONS II	fmps303m
S223	BRACING MOTOR POOL	fmps223b	S304m	FOUNDATION SECTIONS MOTOR POOL	fmps304m
S124	WIND UPLIFT FIRE STATION & MOTOR POOL	fmps124w	S305m	ROOF SECTIONS	fmps305m
			S306m	ROOF SECTIONS MOTOR POOL	fmps306m
S125	WASH RACK FOUNDATION PLAN & ROOF FRAMING	fmps125f	S307m	MAINTENANCE PIT	fmps307m
S327	WALL & FOUNDATION SECTIONS	fmps327f			
S130	WASH RACK ROOF FRAMING	fmps130r	S101w	WASH RACK FOUNDATION PLAN & ROOF FRAMING	fmps101w
S131	WIND UPLIFT WASH FACILITY	fmps131w	S102w	WASH RACK ROOF FRAMING	fmps102w
S026	CMU NOTES	fmps026m	S103w	WIND UPLIFT WASH FACILITY	fmps103w