

SECTION 04200 - UNIT MASONRY

PART 1 - GENERAL

RELATED DOCUMENTS:

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

Requirements of this section apply to masonry work specified in Division-4 section "Reinforced Unit Masonry".

DESCRIPTION OF WORK:

Extent of each type of masonry work is indicated on drawings and schedule.

Types of masonry work required include:

Concrete unit masonry (standard lightweight units).

Regular light weight concrete masonry units

Solid and corner units.

Block lintels

Rated 8" and 12" masonry for 3 hr. wall construction meeting U.L. classification C-3.

Clay unit masonry in the form of brick.

Brick modular masonry units for veneered and infill masonry applications including solids, corners and caps and special shapes as indicated on the drawings

Color : (typical field brick)as noted on drawings MATCH EXISTING CHURCH  
MASONRY BRICK SIZE AND COLOR.

SYSTEM PERFORMANCE REQUIREMENTS:

Provide unit masonry that develops the following installed compressive strengths ( $f_m$ ):

For clay unit masonry: As follows:

$f_m = 2500$  psi.

As indicated.

For concrete unit masonry: As follows:

$f_m = 1750$  psi.

As indicated.

### QUALITY ASSURANCE:

Fire Performance Characteristics: Where indicated, provide materials and construction which are identical to those of assemblies whose fire endurance has been determined by testing in compliance with ASTM E 119 by a recognized testing and inspecting organization or by another means, as acceptable to authority having jurisdiction.

Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.

Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

Field Constructed Mock Ups: Prior to installation of masonry work, erect sample wall panels to further verify selection made for color and textural characteristics, under sample submittals of masonry units and mortar, and to represent completed masonry work for qualities of appearance, materials and construction; build mock-ups to comply with the following requirements:

Locate mock-ups on site in locations as directed by Architect .

Build mockups for the following types of masonry in sizes of approximately 4' long by 5' high by full thickness, including face and back-up wythes as well as accessories (including flashing).

**Each type of exposed brick masonry work and pattern shall be modeled.**

Retain mock-ups during construction as standard for judging completed masonry work. When directed, demolish mock-ups and remove from site.

### SUBMITTALS:

Samples for Initial Selection Purposes: Submit samples of the following materials:

Unit masonry samples in small-scale form showing full extent of colors and textures available.

### DELIVERY, STORAGE, AND HANDLING:

Prepackaged mortar cements shall be delivered to job site and stored in unbroken bags or other containers. These materials shall be stored in dry, weather tight sheds or enclosures with elevated floors, which will prevent the inclusion of foreign materials and damage by water or dampness. Masonry sand shall be delivered and stored in a manner to prevent inclusion of foreign matter therein.

Brick shall be delivered and stored on job site on platforms or timbers, clear of the ground. Brick which are chipped, cracked, broken, or marred in other manner shall not be used wher exposed to view.

Deliver masonry materials to project in undamaged condition.

Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.

Store cementitious materials off the ground, under cover and in dry location.

Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

### **PROJECT CONDITIONS:**

Protection of Work: During erection, cover top of walls, projections and sills with heavy waterproof sheeting at end of each day's work. Cover completed construction when work is not in progress.

**Face brick shall be covered to its full extent until all masonry work overhead is complete and a base protecting material shields the base from ground contamination.**

**Extend cover of standard CMU a minimum of 24 inches down both sides and hold cover securely in place.**

**Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.**

Do not apply uniform floor or roof loading for at least 24 hours after building masonry walls or columns.

Do not apply concentrated loads for at least 3 days after building masonry walls or columns.

Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.

**Protect base of walls from rain-splashed mud and mortar splatter.**

**Protect sills, floors, ledges and projections from droppings of mortar.**

### **COLD WEATHER PROTECTION:**

Do not lay masonry units which are wet or frozen.

Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.

Remove masonry damaged by freezing conditions.

Perform the following construction procedures while the work is progressing. Temperature ranges indicated below apply to air temperatures existing at time of installation except for grout. For grout, temperature ranges apply to anticipated minimum night temperatures. In heating mortar and grout materials, maintain mixing temperature selected within 10 degrees F.

No bricklaying shall be performed unless the temperature of the surrounding air is 40 degrees F. and rising. The use of antifreeze or accelerating admixtures is not permitted. Provide temporary protection of completed portions of masonry to ensure a minimum of 48 hours curing time at a minimum of 40 degrees F.

Protect completed masonry and masonry not being worked on in the following manner. Temperature ranges indicated apply to mean daily air temperatures except for grouted masonry. For grouted masonry temperature ranges apply to anticipated minimum night temperatures.

40 degrees F to 32 degrees F:

Protect masonry from rain or snow for at least 24 hours by covering with weather-resistive membrane.

32 degrees F to 25 degrees F:

Completely cover masonry with weather-resistive membrane for at least 24 hours.

Except as otherwise indicated, maintain masonry temperature above 32 degrees F (0 degrees C) for 24 hours using enclosures and supplementary heat, electric heating blankets, infrared lamps or other methods proven to be satisfactory. For grouted masonry maintain heated enclosure to 40 degrees F (4 degrees C) for 48 hours.

Hot-Weather Construction: Comply with referenced unit masonry standard.

## PART 2 - PRODUCTS

### BRICK MADE FROM CLAY OR SHALE:

General: Comply with referenced standards and other requirements indicated below applicable to each form of brick required.

Provide special molded shapes where indicated on drawings or as follows:

None required

For applications requiring brick of form, color, texture, and size on exposed surfaces that cannot be produced by sawing standard brick sizes.

Provide units without cores or frogs and with all exposed surfaces finished for ends of sills, caps, and similar applications that expose brick surfaces that otherwise would be concealed from view.

Face Brick Standard: ASTM C 216 and as follows:

Grade and Unit Compressive Strength: Provide units of grade and minimum average net area compressive strength indicated below:

Grade SW.  
3000 psi.

Type FBS (for general use in exposed masonry requiring wider variations in size and color ranges than Type FBX).

Size: Provide bricks manufactured to the following actual dimensions: Modular Brick: 2-1/4" x 3-5/8" x 7'5/8". **Match the existing Church building masonry.**

Taylor Clay Products, Inc. manufactures a brick called "Williamsburg #60" modular that is a possible match but must be evaluated for the best match with other manufacturer's selections.

Application: Use where brick is exposed, unless otherwise indicated.

Building Common Brick: ASTM C 62 and as follows:

Grade SW.

Application: Use where brick is indicated for concealed locations.

### CONCRETE MASONRY UNITS:

Provide special shapes where required for column covers, lintels, control joints and bonding and other special conditions.

Provide square-edged units for outside corners, except where indicated as bullnose.

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.

Concrete Masonry Units: Manufactured to specified dimensions of 3/8 inch less than nominal widths by nominal heights by nominal lengths indicated on drawings.

Concrete Building Brick: Specified dimensions as follows:

Standard Modular: 3-5/8" inches by 3-5/8 inches high by 15-5/8 inches long.

Type I, moisture-controlled units.

Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated:

Hollow Loadbearing Block: ASTM C 90, type N and as follows:

Unit Compressive Strength: Provide units with minimum average net area compressive strength indicated below:

2200 psi.

Not less than the unit compressive strengths required to produce concrete unit masonry construction of compressive strength indicated.

Weight Classification: Lightweight. Provide units without rust causing pyrite content.

Solid Loadbearing Block: ASTM C 145 and as follows: **(Not Used)**

Unit Compressive Strength: Provide units with minimum average net area compressive strength indicated below:

75 % solid units.  
2200 psi.

Weight Classification: Lightweight. 75% solid.

U.L. Rated Block: Where required for U.L.904 &907 3hr assemblies provide Type C-3 CMU.

8" and 12" CMU required.

Concrete Building Brick: ASTM C 55 and follows:

Unit Compressive Strength: Provide units with minimum average net area compressive strength indicated below:

3500 psi.

#### MORTAR AND GROUT MATERIALS:

Comply with ASTM C 476 for grout for use in construction of reinforced and nonreinforced unit masonry.

Portland Cement: ASTM C 150, Type I. Provide natural color or white cement as required to produce required mortar color. **Match the existing mortar color of the existing Church building. Provide white sand or special color mix if necessary to match existing mortar. (a weathered/bleached out lt. grey mortar is anticipated but modifications may be needed to match the existing mortar which is critical to the success of the addition)**

Sand shall meet the requirements of Standard Specifications for Aggregate for Masonry Mortar (ASTM C-144-81), with the gradation to satisfy paragraph 4, Grading, and with the omission of sub-paragraph 4.4. **Sand color shall be determined in the field as required to produce matching masonry mortar color desired.**

Hydrated Lime: shall meet the requirements of the Standard Specifications for Hydrated Lime for Masonry Purposes (ASTM C-ASTM C 207, **Type S.**

Aggregates for Mortar: ASTM C 144, except for joints less than 1/4" use aggregate graded with 100% passing the No. 16 sieve.

Aggregate for Grout: ASTM C 404.

Colored mortar pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with record of satisfactory performance in masonry mortars.

Water: Clean, and potable.

## PREPACKAGED MORTAR CEMENTS

Prepackaged mortar cements: The mortar cement shall be in accordance with ASTM C91-83, and meet the following minimum requirements.

Type S Mortar Cement: The masonry mortar made from the mortar cement shall have a compressive strength of 1800 psi minimum at 28 days when tested in accordance with ASTM C-270, with maximum air volume of 16%.

The mortar cement shall contain Portland cement, hydrated lime, plasticized admixtures and/or hydraulic hydrated lime. Mortar cements which contain other materials, including ground limestone, ground slag or other cementitious and non-cementitious materials, are not acceptable.

Instructions for mixing the mortar shall be published and accompany all shipments. The instructions shall be volumetric measurements, and shall be developed to show proper proportions of sand to one (1) bag of the prepackaged mortar cement with volume of water to produce a flow of the proper consistency.

Freeze-thaw resistance: The mortar cement shall comply with the following requirements when subjected to 50 cycles of the freeze-thaw test:

Loss of compressive strength	35.0% maximum
Loss of dry weight	1.0% maximum

The test specimen shall be made in accordance with ASTM C-91, Paragraphs 18, 19, and 20, and be tested in accordance with ASTM C-91, Paragraphs 22.1 and 22.2.1, and ASTM C-67, Paragraphs 8.1, 8.3, and 8.4.

## MEASUREMENTS AND MIXING

The method of measuring materials shall be by volume, and shall be such that the specified proportions of the mortar materials can be controlled and accurately maintained. A measuring device to make consistent volume measurements shall be used throughout the project. Measurement of sand by shovel shall not be permitted.

Mortar Mixer shall be paddle-type mechanical mixer. It shall be of such design and size to accommodate the mixing of the ingredients.

The mortar mixer shall be charged in this order: add approximately one-half the water required, one-half the sand, prepackaged mortar cement, the remaining amount of sand, and then sufficient water to bring the mix to desired consistency. Mortar shall be mixed for a minimum of five minutes after all materials have been charged into the mixer with all batches being mixed to the same consistency.

Mortars that have stiffened because of evaporation of water from the mortar may be retempered by adding water as frequently as needed to restore the required consistency. Mortars shall be used and placed in their final position within 2 hours after mixing. When the temperature is over 80 degrees F., the mortar shall be used within 1-1/2 hours after mixing. Mortar not used within the stated time periods shall be discarded.

## REINFORCING STEEL

General: Provide reinforcing steel complying with requirements of referenced unit masonry standard and this article.

Steel Reinforcing Bars: Material and grade as follows:

Billet steel complying with ASTM A 615.

Grade 60

Plain Welded Wire Fabric: ASTM A 185.

## JOINT REINFORCEMENT, TIES AND ANCHORING DEVICES:

Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form of joint reinforcement, tie and anchor for size and other characteristics:

Zinc-Coated (galvanized) Steel Wire: ASTM A 82 for uncoated wire and with ASTM C 641 for zinc coating of class indicated below:

Class 1 (0.40 oz. per sq. ft. of wire surface).

Application: Use for masonry not exposed to exterior or earth. (Also Pool Areas).

Hot-Dip Galvanized Steel Wire: ASTM A 82 for uncoated wire and with ASTM A 153, Class B-3 for zinc coating applied after prefabrication into units.

Application: Use for masonry exposed to exterior and in contact with earth. (Also Pool Areas).

Zinc-Coated (Galvanized) Steel Sheet: Carbon steel with zinc coating complying with ASTM A 525, Coating Designation G90.

Application: For dovetail and anchors slots used in masonry and concrete not exposed to exterior or earth.

Hot-Dip Galvanized Carbon Steel Sheet: ASTM A 366, Class 2 or ASTM A 635; hot dip galvanized after fabrication to comply with ASTM A 153; Class B.

Application: For dovetail slots and anchors used in masonry and concrete exposed to exterior or in contact with earth.

Joint Reinforcement: Provide welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10', with prefabricated corner and tee units, and complying with requirements indicated below:

Width: Fabricate joint reinforcement in units with widths of approximately 2" less than nominal width of walls and partitions as required to provide mortar coverage of not less than 5/8" on joint faces exposed to exterior and 1/2" elsewhere.

Wire Size for Side Rods: 0.1875 inch.

Wire Size for Cross Rods: 0.1875 inch.

For single-wythe masonry provide type as follows with single pair of side rods:

Ladder design with perpendicular cross rods spaced not more than 16" o.c.

For multi-wythe masonry provide type as follows:

For multiwythe masonry, provide types as follows:

Ladder type with perpendicular cross rods spaced not more than 16 inches o.c. and 1 side rod for each face shell of hollow masonry units more than 4 inches in width, plus 1 side rod for each wythe of masonry 4 or less in width.

Uses: Typical interior walls.

Adjustable (2-piece) type with single pair of side rods and cross ties spaced not more than 16 inches o.c. and with separate adjustable veneer ties engaging the cross ties. Cross ties are either U-shaped with eyes or rectangular. Space side rods for embedment within each face shell of backup wythe and size adjustable ties to extend at least halfway through outer wythe but with at least 5/8-inch cover on outside face.

Uses: Typical exterior brick veneer walls.

Hardware cloth: See drawings for indicated locations and applications.

Hot dip mill-galvanized wire, 16 gauge 2 x 2 (1/2") mesh. Tie is 1" less than nominal width of unit or wall.

D/A WMT Wire Mesh Ties; Dur-O-Wall, Inc.  
269 Wire Mesh Ties; Heckman Building Products.

Structural Steel and Masonry Wall Anchors: Tie masonry walls to column flanges parallel to the wall. Anchors are 3/8" diameter mill-galvanized wire. Provide anchor width required for masonry bend to extend 2" into the horizontal joint.

Hot dip mill-galvanized wire, 16 gage 2 x2 (1/2") mesh. Tie is 1" less than nominal width of unit or wall.

No. 216 Wire Type Anchor; Heckmann Building Products  
D/A-F/P and D/A-F/RA; Dur-O-Wall, Inc

Channel Slots and Anchors: Two piece Assemblies which permit vertical or horizontal differential movement between wall and steel framework parallel to, but resist tension and compression forces perpendicular to wall. Consists of wire tie section and extended type metal anchor section.

D/A 902 anchor with ties 912 and 918-921; Dur-O-WALL, Inc.  
131 anchor with ties 134 and 129; Heckman building products.

Weld-on Adjustable Anchor Rods and Straps: Two piece assemblies for tying masonry walls to steel columns and beams.

D/A 709-711 anchor and D/A 701/708 tie; Dur-O-Wall, Inc.  
No. 315 anchor and No.316 tie; Heckman Building Products.

Masonry Veneer Anchors: Two-piece assemblies which permit vertical or horizontal differential movement between wall and framework parallel to, but resist tension and compression forces perpendicular to plane of wall; consisting of wire tie section and metal anchor section for attachment over sheathing to metal studs and complying with the following requirements.

Wire Size: 0.1875 inch.

Wire Tie Shape: Triangular.

Wire Tie Material: Stainless steel.

Wire Tie Length: As required to extend within 1" of masonry veneer face.

**Note provide anchors extending into 3/4" Plywood sheathing and stud back-up.**

Unit Type Masonry Inserts in Concrete:

Dovetail Slots: Furnish dovetail slots, with filler strips, of slot size indicated and entire height of wall, fabricated from 22 gage sheet metal. Cast into concrete walls backing brick veneer at 24" o.c. horizontally to allow veneer anchors to be spaced not more than 24" o.c. horizontally and 16" o.c. vertically.

Dovetail Anchors:

Wire Size: 0.1875" diameter.

Wire Tie Shape: Triangular.

Wire Tie Coating: Hot dipped galvanized.

Wire Tie Length: As required to extend within 1" of masonry veneer face.

Products: Subject to compliance with requirements, provide the following or equal products:

"D/A 100 slot and D/A 720-723 anchor"; Dur-O-Wal, Inc.

"100 slot and 103 anchor"; Heckman Building Products.

Anchor Bolts: Provide steel bolts with hex nuts and flat washers complying with ASTM A 307, Grade A, hot-dip galvanized to comply with ASTM C 153, Class C, in sizes and configurations indicated.

CONCEALED FLASHING MATERIAL: (thru-wall-flashing)

Vinyl Sheet Flashing: Flexible sheet flashing especially formulated from virgin polyvinyl chloride with plasticizers and other modifiers to remain flexible and waterproof in concealed masonry applications, black in color and thickness indicated below.

Thickness: 30 mils with adhesive backing.

Solder and Sealants for Sheet Metal Flashings: As specified in Division-7 section "Flashing and Sheet Metal".

Adhesive for Flashings: Of type recommended by manufacturer of flashing material for use indicated.

MISCELLANEOUS MASONRY ACCESSORIES:

Reinforcing Bars: Deformed steel, ASTM A 615, Grade 60 for bars No. 3 to No. 18. Galvanize at Pool Areas.

Non-Metallic Expansion Joint Strips: Premolded, flexible filler strips complying with ASTM D 1056, Type 2 (Closed cell), Class A (cellular rubber and rubber-like materials with specific resistance to petroleum base oils), Grade 1 (Compression-deflection range of 2-5 psi), compressible up to 35%, of width and thickness indicated, formulated from the following material:

Neoprene.

Preformed Control Joint Gaskets: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

Styrene-Butadiene Rubber Compound: ASTM D 2000, Designation 2AA-805.

Polyvinyl Chloride: ASTM D 2287, General Purpose Grade, Type PVC-65406.

Face Brick Expansion Joint Bridge: D/A 2200 by DUR-O-Wall.

Bond Breaker Strips: Asphalt-saturated organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

Weepholes: Provide weepholes in masonry construction just above thru-wall flashing, 8" above the base of all exterior walls, and at heads of all windows, glass block or vent openings and at points indicated on drawing. **Install weep at 2'-0" along length of wall.**

Wicking Material: Material as indicated below in lengths required to produce a 1/2" exposure on exterior and 18" in cavity between wythes.

Fibrous glass rope.

INSULATION: (IF ANY) (Continuous insulation board sheathing specified in 07200)

Extruded Polystyrene Board Insulation: Rigid cellular polystyrene thermal insulation with closed cells and integral high density skin, formed by the expansion of polystyrene base resin in an extrusion process to comply with ASTM C 578, Type IV; 5-year aged r-value of 5 Btu/(hr x sf x degrees F) at 75 degrees F (24 degrees C); in manufacturer's standard lengths and widths; 2" (two inches) thickness typical unless noted otherwise on drawings.

Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

Products: Subject to compliance with requirements, provide one of the following:

"Styrofoam SM/SB"; Dow Chemical USA.

"Foamular 250"; UC Industries.

"Certifoam", Minnesota Diversified Products, Inc.

Adhesive: Type recommended by insulation board manufacturer for application indicated.

MASONRY CLEANERS:

Job-Mixed Detergent Solution: Solution of trisodium phosphate (1/2 cup dry measure) and laundry detergent (1/2 cup dry measure) dissolved in one gallon of water.

### MORTAR AND GROUT MIXES:

General: Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, anti-freeze compounds or other admixtures, unless otherwise indicated.

**Do not use calcium chloride in mortar or grout.**

Mixing: Combine and thoroughly mix cementitious, water and aggregates in a mechanical batch mixer; comply with referenced ASTM standards for mixing time and water content.

Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specifications, for types of mortar required, unless otherwise indicated.

Limit cementitious materials in mortar to portland cement-lime.

Use Type S mortar for all masonry.

Grout for Unit Masonry: Comply with ASTM C 476 for grout for use in construction of reinforced and nonreinforced unit masonry. Use grout of consistency indicated or if not otherwise indicated, of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout.

Use fine grout in grout spaces less than 2" in horizontal direction, unless otherwise indicated.

Use coarse grout in grout spaces 2" or more in least horizontal dimension, unless otherwise indicated.

## PART 3 - EXECUTION

### INSTALLATION, GENERAL:

Wetting Clay Brick: Wet brick made from clay or shale which have ASTM C 67 initial rates of absorption (suction) of more than 30 grams per 30 sq. in. per minute. Use wetting methods which ensure each clay masonry unit being nearly saturated but surface dry when laid.

Do not wet concrete masonry units.

Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.

Thickness: Build cavity and composite walls, floors and other masonry construction to the full thickness shown. Build single-wythe walls (if any) to the actual thickness of the masonry units, using units of nominal thickness indicated holding dimension to face or unit same as indicated on drawings.

Build chases and recesses as shown or required for the work of other trades. Provide not less than 8" of masonry between chase or recess and jamb of openings, and between adjacent chases and recesses.

Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.

Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible.

Use dry cutting saws to cut concrete masonry units.

#### CONSTRUCTION TOLERANCES:

Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4" in 10', or 3/8" in a story height. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4" in any story. For vertical alignment of head joints do not exceed plus or minus 1/4" in 10', 1/2" maximum.

Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4" in any bay or 20' maximum, not 1/2" in 40' or more. For top surface of bearing walls do not exceed 1/8" between adjacent floor elements in 10' or 1/16" within width of a single unit.

Variation of Linear Building Line: For position shown in plain and related portion of columns, walls and partitions, do not exceed 1/2" in any bay or 20' maximum, nor 3/4" in 40' or more.

Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4" nor plus 1/2".

Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to 1/2". Do not exceed head joint thickness indicated by more than plus or minus 1/8".

#### LAYING MASONRY WALLS:

Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to accurately locate opening, movement-type joints, returns and offsets. Avoid the use of less-than-half-size units at corners, jambs and wherever possible at other locations.

Lay-up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other work.

Pattern Bond: Lay exposed masonry in the bond pattern shown or, if not shown, lay with vertical joint in each course centered on units in courses above and below (lay utility brick at one third lap). Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2". Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4" horizontal face dimensions at corners or jambs.

Stopping and Resuming Work: Rack back 1/2-unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh memory.

Built-in Work: As the work progresses, build-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items.

Fill space between hollow metal frames and masonry solidly with mortar.

Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.

Fill cores in hollow masonry units with grout 3 courses (24") under bearing plates, beams, lintels, posts and similar items, unless otherwise indicated.

#### MORTAR BEDDING AND JOINTING:

Lay solid brick-size masonry units with completely filled bed and head joint; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints.

Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.

Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints.

Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.

Tool exposed joints slightly concave using a jointer larger than joint thickness, unless otherwise indicated.

Typical all exposed brick and standard concrete masonry units.

Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners or jambs to shift adjacent stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

Collar Joints: After each course is laid, fill in vertical longitudinal joint between wythes solidly and with mortar for the following masonry work:

Interior walls and partitions.

Exterior walls, except cavity walls.

Nonloadbearing interior walls or partitions where metal ties or horizontal reinforcing are indicated for structural bonding and nominal thickness of wall or partition is required to meet code requirements for height-to-thickness ratio.

### STRUCTURAL BONDING OF MULTI-WYTHE MASONRY:

Use continuous horizontal joint reinforcement installed in horizontal mortar joints for bond tie between wythes. Install at not more than 16" o.c. vertically.

For horizontally reinforced masonry, provide continuity at corners with prefabricated "L" units, in addition to masonry bonding.

Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, provide same type of bonding specified for structural bonding between wythes and space as follows:

Provide continuity with horizontal joint reinforcement using prefabricated "T" units.

Non-bearing Interior Partitions: Build full height of story to underside of solid floor or roof structure above, unless otherwise shown. (See Wall Rating Legend on plan drawings to determine which walls are intended to run full height.)

Run non-bearing partitions within 1" of structure above and secure against lateral movement with channel section width of wall x 1'-0" length spaced at 4'-0" o.c. unless detailed otherwise on drawings.

Anchor masonry wall tops to structure per structural drawings but in no case less than 4'-0" OC.

### CAVITY WALLS:

Keep cavity clean of mortar droppings and other materials during construction. Strike joints facing cavity flush.

Tie exterior wythe to back-up with continuous horizontal joint reinforcing, installed in mortar joints at not more than 16" o.c. vertically.

Provide weep holes in exterior wythe of cavity wall located immediately above ledges and flashing, spaced 2'-0" o.c., unless otherwise indicated.

### CAVITY WALL AND MASONRY-CELL INSULATION:

On units of plastic insulation, install small pads of adhesive spaced approximately 1'-4" o.c. both ways on inside face. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.

### HORIZONTAL JOINT REINFORCEMENT:

General: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" exterior side of walls, 1/2" elsewhere. Lap reinforcing a minimum of 6".

Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

Reinforce walls with continuous horizontal joint reinforcing unless specifically noted to be omitted.

Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.

Space continuous horizontal reinforcement as follows:

For multi-wythe walls (solid or cavity), space reinforcement 16" o.c. vertically.

For single-wythe walls, space reinforcement at 16" o.c. vertically, unless otherwise indicated.

For parapets, space reinforcement at 8" o.c. vertically, unless otherwise indicated.

Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and immediately below the sill. Extend reinforcement a minimum of 2'-0" beyond jambs of the opening except at control joints.

In addition to wall reinforcement, provide additional reinforcement at openings as required to comply with the above.

#### ANCHORING MASONRY WORK:

General: Provide anchor devices of type indicated.

Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:

Headed Bolts.

Postinstalled Anchors: Anchors as described below, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

Type: Expansion Anchors.

Corrosion Protection: Stainless-steel components with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Alloy Group 1 or 4) for bolts and nuts; ASTM A 167 or ASTM A 276, Type 304 or 316, for anchors.

For Postinstalled Anchors in Grouted Concrete Masonry Units: Capability to sustain, without failure, a load equal to 6 times the loads imposed by masonry.

Installation of Anchor Bolts: Position fixture, drill hole. Insert anchor bolt, tap flush with fixture, and tighten.

Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:

Provide an open space not less than 1" in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.

Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.

Space anchors as indicated, but not more than 24" o.c. vertically and 36" o.c. horizontally.

Anchor single wythe masonry veneer to metal studs with masonry veneer anchors to comply with the following requirements:

Fasten each anchor section through sheathing to metal studs with 2 metal fasteners of type indicated.

Embed tie section in masonry joints. Provide not less than 1" air space between back of masonry veneer wythe and face of sheathing unless detailed otherwise on drawings.

Locate anchor section relative to course in which tie section is embedded to allow maximum vertical differential movement of tie up and down.

#### CONTROL AND EXPANSION JOINTS:

General: Provide vertical and horizontal expansion, control and isolation joints in masonry where shown. Build-in related items as the masonry work progresses.

Build-in non-metallic joint filler where indicated.

Build in vertical pressure relieving joints where indicated; construct joints by inserting non-metallic compressible joint filler of width required to permit installation of sealant and backer rod.

#### LINTELS:

Provide masonry lintels where shown or wherever openings of more than 1'-0" for brick size units and 2'-0" for block size units are shown without structural steel or other supporting lintels. Provide precast or formed-in-place masonry lintels. Cure precast lintels before handling and installation.

For hollow concrete masonry unit walls, use specially formed U-shaped lintel units with reinforcement bars placed as shown filled with coarse grout.

Provide minimum bearing of 8" at each jamb, unless otherwise indicated.

#### FLASHING OF MASONRY WORK:

General: Provide concealed flashing in masonry work at, or above, shelf angles, lintels, ledges and other obstructions to the downward flow of water in the wall so as to divert such water to the exterior. Prepare masonry surfaces smooth and free from projections which could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with mastic before covering with mortar. Extend flashings through exterior face of masonry.

Extend flashing the full length of lintels and shelf angles and minimum of 4" into masonry each end. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4", and through the inner wythe half the width of the inner wythe unit.

Install flashing to comply with manufacturer's installation.

Provide weep holes in the head joints of the first course of masonry immediately above concealed flashings. Space 2'-0" o.c., unless otherwise noted. Trim wicking material used in weep holes flush with outside face of wall after mortar is set.

Install reglets and nailers for flashing and other related work where shown to be built into masonry work.

### INSTALLATION OF REINFORCED UNIT MASONRY:

#### INSTALLATION, GENERAL:

Temporary Formwork: Provide formwork and shores as required for temporary support of reinforced masonry elements. Do not remove forms or shores until reinforced masonry member has hardened sufficiently to carry its own weights.

#### High-Lift Grouting:

Do not use high-lift grouting technique for grouting of brick or CMU unless cavity dimension is 3" and 10 sq.in., respectively.

Provide cleanout holes in first course at all vertical cells which are to be filled with grout.

Use units with one face shell removed and provide temporary supports for units above, or use header units with concrete brick supports, or cut openings in one face shell.

Construct masonry to full height of maximum grout pour specified, prior to placing grout.

Limit grout lifts to a maximum height of 4' and grout pour to a maximum height of 12', unless otherwise indicated.

Place vertical reinforcement before grouting. Place before or after laying masonry units, as required by job conditions. Tie vertical reinforcement to dowels at base of masonry where shown and thread CMU over or around reinforcement. Support vertical reinforcement at intervals not exceeding 96 bar diameters nor 5'.

Where individual bars are placed after laying masonry, place wire loops extending into cells as masonry is laid and loosen before mortar sets. After insertion of reinforcing bar, pull loops and bar to proper position and tie free ends.

Where reinforcement is prefabricated into cage units before placing, fabricate units with vertical reinforcement bars and lateral ties of the size and spacing indicated.

Place horizontal beam reinforcement as the masonry units are laid.

Embed lateral tie reinforcement in mortar joints where indicated. Place as masonry units are laid, at vertical spacing shown.

Where lateral ties are shown in contact with vertical reinforcement bars, embed additional lateral tie reinforcement in mortar joints. Place as shown, or if not shown, provide as required to prevent grout

blowout or rupture of CMU or face brick shells, but provide not less than No. 2 bars or 8 gage wire ties spaced 16" o.c. for members with 20" or less side dimensions, and 8" o.c. for members with side dimensions exceeding 20".

Preparation of Grout Spaces: Prior to grouting, inspect and clean grout spaces. Remove dust, dirt, mortar droppings, loose pieces of masonry and other foreign materials from grout spaces. Clean reinforcing and adjust to proper position. Clean top surface of structural members supporting masonry to ensure bond. After final cleaning and inspection, close cleanout holes and brace closures to resist grout pressures.

Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist displacement of masonry units and breaking of mortar bond. Install shores and bracing, if required, before starting grouting operations.

Place grout by pumping into grout spaces unless alternate methods are acceptable to the Architect.

Limit grout pours to sections which can be completed in one working day with not more than one hour interruption of pouring operation. Place grout in lifts which do not exceed 5'. Allow not less than 30 minutes, nor more than one hour between lifts of a given pour. Rod or vibrate each grout lift during pouring operation.

Place grout in lintels or beams over openings in one continuous pour.

Where bond beam occurs more than one course below top of pour, fill bond beam course to within 1" of vertically reinforced cavities, during construction of masonry.

When more than one pour is required to complete a given section of masonry, extend reinforcement beyond masonry as required for splicing. Pour grout to within 1-1/2" of top course of first pour. After grouting masonry is cured, lay masonry units and place reinforcement for second pour section before grouting. Repeat sequence if more pours are required.

#### REPAIR, POINTING, AND CLEANING:

Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.

Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.

Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:

Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.

Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.

Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film or waterproof masking tape.

Saturate wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

Use bucket and brush hand cleaning method described in BIA "Technical Note No. 20 Revised" to clean brick masonry made from clay or shale, except use masonry cleaner indicated below.

Detergent.

Protection: Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures unit masonry work being without damage and deterioration at time of substantial completion.

Apply masonry weatherproof sealer no sooner than recommended by the waterproofing manufacturer's standard product specifications.

END OF SECTION 04200

SECTION 04300 – LIGHTWEIGHT CAST STONE

PART 1 - GENERAL

WORK INCLUDED:

Provide and install all Stone Coated Cast Profile elements for this project. Drawings may call out “EIFS” coated shaped Cornice and Column profiles.

SUBMITTALS:

Sample of Light Weight Stone Coated Cast Stone Profiles: Submit sample(s) of cast profile work, using materials specified, indicating finish surfaces and color to be expected. Approved samples shall provide standard quality for all precast lightweight concrete work on this project.. Provide profile elements for the building into the sample panel to conform to requirements specified in this section.

SHOP DRAWINGS:

Provide shop and setting drawings, indicating jointing, fabrication details, setting details, and location number, so indicated on the shop drawings.

Fabrication of Lightweight Stone Cast Profiles shall be in accordance with approved shop and setting drawings approved by the Architect or Owner.

HANDLING AND STORAGE: Lightweight Stone Cast Profiles shall be palletized and/or crated and covered to protect the pieces in transit. Upon arrival at the job site, Cast profiles shall be inspected prior to unloading and damaged or inferior stones returned to the manufacturer by the delivering vehicle.

STORAGE: Store Lightweight Cast Stone Profile pieces on platforms to protect from contact with the soil, and covered to protect against the weather. Protect lightweight cast stone profile pieces to prevent chipping, staining, and other damage until ready for installation. Product should be stored on a flat surface.

Manufacturer:

Basis of Specification:  
Lightweight Stone Concepts  
Contact: Greg Ganster 770-722-8079

Other approved Manufacturers:

Georgia Pre-cast Services

PART 2 - MATERIALS

MATERIALS:

Material composition: Lightweight Stone Coat Cast Profiles is a unique blend of natural minerals, special bonding agents, and other proprietary ingredients with Portland cement as a base element for strength over minimum 1#density EPS. Compressive strength minimum – 5500PSI @ 28 days per ASTM C109.

Lightweight Stone Coat Cast Profiles shall be cast over minimum 1# density foam.

Lightweight Stone Coat Cast Profiles shall be lightweight (approximately 3.5 pounds per square foot in a 3/8" thick application), conforming to ASTM C331-81.

Color to be selected by Architect.

Finish to be "Light Sandblast".

### PART 3 - EXECUTION

SETTING – Per manufacturer's recommendation and Architects details. Adhesive attachments per manufacturer's current installation instructions and details and as detailed on the plans.

All Stone Coat Cast Profile pieces shall be set in accordance to the design intent and details set forth on the drawings.

A surface sealer shall be applied post installation if required by the Architect. Pre-treat an inconspicuous area of Stone Coat Cast Profile to test sealer for compatibility and color stability.

Use Prosoco SureKlean Weatherseal Natural Stone treatment as applied per the manufacturer's instructions.

All expansion and piece joints shall be treated with sealant recommended by the manufacturer that matches the Stone Cast Profile color.

All Stone Coat Cast Profile pieces shall be protected from splashing mortar or damage by other trades. Any foreign matter splashed on the stone should be removed immediately.

END OF SECTION 04300