**SECTION 04 20 00**

**UNIT MASONRY**

**BASED ON DFD MASTER UNIT MASONRY SPECIFICATION DATED 06/03/14**

***This section has been written to cover most (but not all) situations that you will encounter. Depending on the requirements of your specific project, you may have to add material, delete items, or modify what is currently written. The Division of Facilities Development expects changes and comments from you.***

***It is recommended that the consultant examine the Minimum Requirements and Guidelines for the Exterior Building Envelope on the DFD web site.***

# PART 1 - GENERAL

## Scope

This section describes the products and execution requirements relating to furnishing and installation of Unit Masonry and related items for this project. Included are the following topics:

[PART 1 - GENERAL 1](#_Toc389572261)

[Scope 1](#_Toc389572262)

[Related Work 2](#_Toc389572263)

[Reference Standards 2](#_Toc389572264)

[Material Furnished But Not Installed Under This Section 2](#_Toc389572265)

[Material Installed But Not Furnished Under This Section 2](#_Toc389572266)

[Related Material Furnished and Installed by Other Sections 2](#_Toc389572267)

[Submittals 2](#_Toc389572268)

[Coordination 3](#_Toc389572269)

[Quality Assurance 3](#_Toc389572270)

[Delivery, Storage and Handling 4](#_Toc389572271)

[Extra Stock 4](#_Toc389572272)

[Project/Site Conditions 4](#_Toc389572273)

[PART 2 - PRODUCTS 4](#_Toc389572274)

[Masonry Units, General 4](#_Toc389572275)

[Face Brick 4](#_Toc389572276)

[Concrete Masonry Units 6](#_Toc389572277)

[Architectural Precast Concrete Units: 6](#_Toc389572278)

[Mortar And Grout Materials 7](#_Toc389572279)

[Continuous Masonry Joint Reinforcement 7](#_Toc389572280)

[Individual Ties and Anchors: 8](#_Toc389572281)

[Shelf Angles And Lintels 8](#_Toc389572282)

[Flashing Materials and Closure Strips 8](#_Toc389572283)

[Inserts In Open Head Joints 8](#_Toc389572284)

[Air And Vapor Barriers 8](#_Toc389572285)

[Rigid Wall Insulation 8](#_Toc389572286)

[Cavity Drainage Material 8](#_Toc389572287)

[Masonry Cleaners 8](#_Toc389572288)

[Mortar Mixes 9](#_Toc389572289)

[PART 3 - EXECUTION 9](#_Toc389572290)

[Examination 9](#_Toc389572291)

[Preparation 9](#_Toc389572292)

[Installation, General 9](#_Toc389572293)

[Tolerances 9](#_Toc389572294)

[Laying Masonry Wythes 10](#_Toc389572295)

[Mortar Bedding and Jointing 11](#_Toc389572296)

[Rain Screen Walls 11](#_Toc389572297)

[Masonry Joint Reinforcement 12](#_Toc389572298)

[Anchoring Masonry Veneers 12](#_Toc389572299)

[Movement Joints 13](#_Toc389572300)

[Shelf Angles and Lintels 13](#_Toc389572301)

[Flashing 13](#_Toc389572302)

[Closure Strips 14](#_Toc389572303)

[Spray Applied Air and Vapor Barrier and Rigid Insulation 14](#_Toc389572304)

[Repairing and Pointing 15](#_Toc389572305)

[Laying, Protection and Cleaning 15](#_Toc389572306)

[Adjustment 15](#_Toc389572307)

[Masonry Waste Disposal 16](#_Toc389572308)

[COORDINATION ITEMS FOR CONCRETE SPECIFICATION 16](#_Toc389572309)

[COORDINATION ITEMS FOR METAL SPECIFICATION 16](#_Toc389572310)

[COORDINATION ITEMS FOR INSULATION SPECIFICATION 16](#_Toc389572311)

[COORDINATION ITEMS FOR AIR AND VAPOR BARRIER SPECIFICATION 16](#_Toc389572312)

[COORDINATION ITEMS FOR ROOFING SPECIFICATION 17](#_Toc389572313)

[COORDINATION ITEMS FOR FLASHING & SHEET METAL SPECIFICATION 17](#_Toc389572314)

[Flashing Materials and Fabrication For Masonry 17](#_Toc389572315)

[COORDINATION ITEMS FOR SEALANT SPECIFICATION 18](#_Toc389572316)

[COORDINATION ITEMS FOR DOOR SPECIFICATION 18](#_Toc389572317)

[COORDINATION ITEMS FOR WINDOW SPECIFICATION 18](#_Toc389572318)

[COORDINATION ITEMS FOR MECHANICAL, PLUMBING AND ELECTRICAL 18](#_Toc389572319)

## Related Work

Applicable provisions of Division 01 govern work under this Section.

Section 01 91 0**x** – Commissioning Process

Section 03 31 13 – Cast-In-Place Concrete

Section 04 05 00 – Common Work Results for Masonry

Section 04 08 00 – Commissioning of Masonry

Section 05 12 00 – Shelf Angles and Steel Lintels

Section 07 27 26 – Fluid-Applied Membrane Air and Vapor Barriers (Renumber & Rename

Section 07 50 00 – Membrane Roofing for specific project)

Section 07 60 00 – Flashing and Sheet Metal

Section 07 92 00 – Joint Sealants

Section 08 11.00 – Metal Doors and Frames

Section 08 51 00 – Metal Windows

## Reference Standards

Abbreviations of standards organizations referenced are as follows:

ACI American Concrete Institute

ASCE American Society of Civil Engineers

ASTM American Society for Testing and Materials

TMS The Masonry Society

## Material Furnished But Not Installed Under This Section

None, except for extra face brick required to be turned over to Owner.

## Material Installed But Not Furnished Under This Section

Steel weight supports and attachments for unit masonry, furnished by Section 05 12 00 contractor.

Flashing and sheet metal for unit masonry, furnished by Section 07 60 00 contractor.

## Related Material Furnished and Installed by Other Sections

Dovetail inserts and reglets into concrete by Section 03 31 13 contractor.

Air and vapor barrier along with rigid insulation by Section 07 27 26 contractor.

## Submittals

Shop Drawings: Submit shop drawings for architectural precast concrete sills and coping, and stainless steel flashing, barriers and receivers for counterflashing.

Product Data: Submit manufacturer’s product data for each type of masonry unit, accessory and other manufactured products.

Samples for Final Approval of Appearance: Face brick and architectural precast concrete units.

Samples for Verification: Horizontal joint reinforcement and masonry anchors and ties.

As-Built Operations and Maintenance Masonry Manual: A binder with the listing of all materials utilized in the masonry work including source, brands, type, and/or manufacturer’s literature as appropriate for potential future maintenance, shall be turned over to the Owner upon Substantial Completion of the masonry work.

## Coordination

Examine all parts of the supporting structure and the conditions under which the masonry work is to be installed, and notify the Contractor in writing of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the installation of masonry work until unsatisfactory conditions have been corrected in a manner acceptable to this Section contractor.

Review installation procedures of other work by Subcontractors whose work must be coordinated with the masonry work.

Advise Section 03 31 13 contractor on placement of inserts which will be used by the mason for supporting and anchoring masonry work.

The Contractor shall coordinate all work.

Consult with all Subcontractors and material suppliers whose involvement will be affected by the work of this Section.

In the event that the exterior facing wythe cannot be laid up within 45 days after the exterior wall insulation is installed, the Contractor causing the delay shall be responsible for providing protection such as a coat of latex paint over the exposed insulation to protect it from ultraviolet deterioration.

## Quality Assurance

Source Limitations for Masonry Units and Mortar Materials: One source from a single manufacturer for each product utilized.

Sample Panel Required:

As soon as possible after the face brick for this project has been check tested and physical properties found proper, a sample panel shall be laid up at the project site, which includes all elements of the masonry construction. An actual wall sample shall be constructed including: face brick, mortar, back-up, continuous ties, air barrier, insulation, through-wall flashing, clean outs, and a non-coincident vertical movement joint in each wythe; all to ensure compliance with design intent and evaluate quality of materials, techniques, and workmanship.

Face brick shall be from the actual firing for this project and shall reasonably match the appearance of the mounted panel which was used for initial approval of brick appearance. (At the Contractor's option, to avoid potential delays, face brick from previous firings may be used for a preliminary sample. No further sample panel will be required if brick from the actual firing for this project are subsequently checked and comply with both the physical property requirements as well as the appearance requirements, and the preliminary sample panel satisfies all other requirements of the Contract Documents.)

Mortar in sample panel shall comply with specification requirements for exterior masonry. Cleaning of sample wall shall comply with specification requirements for exterior masonry. Sample panel shall be at least four feet high and at least five feet long.

Start no brick work until a dry, minimum seven-day old, sample panel of brick work has been viewed and approved for overall appearance by the Owner and A/E. More than one sample panel may thus be required. The approved sample panel shall serve as the standard for wall appearance comparison and shall remain on the job site until all brick work is completed and accepted by Owner and A/E. Remove sample panel and all evidence thereof from site upon acceptance of masonry work, unless directed otherwise by Owner or A/E.

Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless such deviations are specifically approved by the Owner and A/E in writing.

Preinstallation Conference: Conduct conference at Project before commencing masonry work.

## Delivery, Storage and Handling

Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp or contaminated.

Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

## Extra Stock

Furnish and deliver 1/4 of a percent of the amount of each type of brick installed to the Owner’s designated local storage area.

## Project/Site Conditions

Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day’s work. Cover partially completed masonry when construction is not in progress. Extend cover a minimum of 24 inches down both sides and hold cover securely in place. Since the concrete masonry back-up wythe is required to be completed in advance of the face brick wythe, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.

Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed. Immediately remove grout, mortar, and soil that come in contact with such masonry. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface. Protect sills, ledges, and projections from mortar droppings. Protect surfaces of window and door frames, including similar products with painted and integral finishes, from mortar droppings. Use cant strips or similar devices on the scaffold boards against the wall to prevent mortar spattering off of the scaffold braces or directly on the wall below. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

# PART 2 - PRODUCTS

## Masonry Units, General

Provide special shapes or sizes as indicated on the Drawings or where cutting of units would expose the cut in the completed work.

Referenced masonry unit standards allow a certain percentage of units to exceed tolerances and to contain chips, cracks or other imperfections exceeding limits stated in the standard. Do not use units where such imperfections, including tolerances that vary more than the amount stated in the standard, will be exposed in the completed Work.

## Face Brick

Materials: Face brick shall be made from materials, fired, and manufactured in one batch to comply with all applicable requirements of ASTM C216, Grade SW, Type FBS, typically cored; except where superseded by more stringent requirements mentioned herein. ASTM C652 Class H40V brick meeting all other requirements of this specification except for the void area may also be used. Brick which have been significantly surface-coated prior to firing or siliconed, or similarly surface-treated after firing are not permitted.

Physical Properties: All face brick shall have physical properties that conform to the following specific requirements in Table 1:

|  |  |  |  |
| --- | --- | --- | --- |
| **Test** | **Units** | **Average of 5 Bricks** | **Individual** |
|  |  |  |  |
| Compressive Strength | psi | 8,500 min. | 7,500 min. |
| Modulus of Rupture (net area) | psi | 1,200 min. | 800 min. |
| Water Absorption (24 hr. cold) | % | -- | 8 max. |
| Initial Rate of Absorption | grams per min. |  |  |
|  | per 30 sq. in. | 5 min. | 3 min. |
| Initial Rate of Absorption | grams per min. |  |  |
|  | per 30 sq. in. | 20 max. | 25 max |
| Efflorescence |  |  | None |
| Autoclave Expansion (age of 1 month) | % | 0.10 max. | 0.20 max. |
| Must meet one of the following requirements: |  |  |  |
| C/B Ratio | -- | 0.76 max. | 0.78 max. |
| \* Water Absorption (24 hr. cold) |  |  |  |
| Fire Clay | % | -- | 2 max. |
| Shale | % | -- | 5 max. |
| \*\* Frost Resistance Durability Factor | -- | -- | 70 min. |
| \* For mixtures of fire clay and shale, prorate values listed as requirements | | | |
| \*\* DF = 3.2/PV + 2.4 P3 | | | |
| DF = Frost-Resistance Durability Factor | | | |
| PV = Total Intruded Pore Volume (cm**3**/g) | | | |
| P3 = Pore Volume with Diameters Greater than 3µm (%) | | | |

TABLE 1: ADDITIONAL FACE BRICK PHYSICAL PROPERTY REQUIREMENTS

Testing Standards: Sampling and testing of face brick shall be done in accordance with ASTM C67, except as follows. Brick may be heated in a ventilated oven to 900F and, upon retesting, shall still comply with all the specific physical property requirements and with results similar to that obtained prior to heating in the oven. Testing of brick for moisture expansion by autoclaving shall be conducted in accordance with the time, temperature, pressure, and moisture conditions required by ASTM C151. Pore size distribution of brick shall be determined by mercury intrusion porosimetry using applicable procedures of ASTM D4284. Pore volumes shall be measured between pore diameters of 100µm and 0.01µm using a porosimeter. Pressure readings shall be converted to pore diameters with the angle of contact of the mercury assumed at 130 degrees.

The Contractor shall make necessary brick available when requested, for physical tests conducted by a testing laboratory selected and employed by the Owner to check for compliance of brick with the specifications. In the event the test results show the brick to be in noncompliance with the specifications, the Contractor shall reimburse the Owner for the testing costs.

Size: Except where drawings require otherwise, face brick shall be of Utility size and shall have dimensions of 3-5/8" x 3-5/8" x 11-5/8". Size differences between brick shall not exceed three percent in any dimension.

Quantity: Provide face brick required to complete brickwork as indicated on the Drawings and as herein specified. Where face brick are used in a wall with both faces exposed to the weather, the wall shall be built of the same face brick throughout. Provide special brick as indicated on the Drawings or otherwise required for a complete installation, with same size, surface texture and color range on all exposed surfaces to match adjacent brick. The Contractor to note ASTM C216 allows up to five percent broken brick, unless otherwise stipulated.

Furnish and deliver 1/4 of a percent of the amount of each type of brick installed to the Owner’s designated local storage area upon completion of the work.

Storage: All brick shall be stored at the site of manufacture and/or the project site for a minimum time period of 4 weeks after completion of manufacture and before being incorporated into the structure.

Approved Appearance: The following face brick have been offered to the Owner as face brick meeting the physical property requirements specified herein. Any one of the following face brick also have the appearance approved by the Owner for this project.

1.

2. (Minimum number of distributors required for good competition – 3)

3.

Ordering: As soon as possible after award of contract, the Contractor shall place the order for any one of the previously listed face brick, so that the brick can be delivered in sufficient time to avoid construction delays. The Contractor shall be satisfied and be able to show that the proposed brick fully complies with the requirements of the Contract Documents in all respects. The Contractor shall also make the face brick manufacturer, vendor and/or supplier responsible to the Contractor for meeting these specifications. Transportation shall include shrink-wrap weather protection or other protection as required by the Contractor.

Sampling and Testing: Upon completion of firing of all face brick for this Project and notification by the Contractor, the Owner will have made an impartial sampling and check testing of such face brick. No face brick shall leave the site of manufacture for use in this Project until after this sampling and check testing is completed and indicates that the face brick comply with the physical property requirements of the Contract Documents. The Contractor will be notified immediately of the results of the sampling and check testing. Brick approved and needed for use on this Project shall not be sold to others, and only brick from the same run shall be shipped to the project site. In the event the tests indicate noncompliance, the face brick are automatically rejected.

Delivery, Unloading and Storage: Upon delivery of brick to the job site, the Contractor shall immediately have each load sampled and compared with the approved sample, and shall report any deviations immediately. All units used in the work shall conform to requirements specified herein. Any improper brick shall be culled out and immediately removed from the site. Brick shall be resorted or culled as necessary, especially when plant palletized, to avoid spotty or irregular ranges of color or texture in the finished walls. The responsibility for meeting these specifications and the approved sample rests with the Contractor. Brick shall be carefully unloaded and neatly stacked on or near the project site, undamaged, and adequately protected at all times.

## Concrete Masonry Units

Materials and Physical Properties: Concrete block units shall be made from materials and manufactured to comply with all applicable requirements of ASTM C90, Solid Units of Normal Weight, typically cored. No integral water repellent is permitted.

Concrete brick units shall be made from materials and manufactured to comply with all applicable requirements of ASTM C55, Normal Weight, cored or uncored to be used with concrete block units as infill.

Source: All units shall be from one source and of uniform color and texture.

Size: Concrete block units shall be 7-5/8" x 15-5/8" x thickness indicated on Drawings. Concrete brick may be of size as appropriate to facilitate the work.

Special Shapes: Provide where required for lintels, corners, jambs, sash, movement joints, headers, bond beams, and other special conditions specifically indicated including applications which cannot be produced by cutting of standard size units.

Protection: Concrete masonry units shall be protected from the elements for a minimum time of seven days immediately prior to being incorporated into the Work.

## Architectural Precast Concrete Units:

Materials: All materials shall be from the same individual sources for the entire unit of work. Materials containing chlorides shall not be used.

Physical Properties: All architectural precast concrete units shall be wet cast. Dry-tamp products will not be permitted. Concrete quality requirements include 5,000 psi minimum 28-day compressive strength, 4" maximum slump (unless super plasticizer is used), 3 to 6 percent entrained air, and 6 percent maximum absorption. Reinforcing shall be minimum hot-dipped galvanized after fabrication or epoxy coated, with a minimum 1-1/2" cover.

Appearance: Simulate limestone.

Size, Configuration and Installation: Make sills, where required, lug-type and of one-piece when practical. Extend sills into adjacent masonry to align with coursing and minimize cutting of masonry units. Coping and sills shall project beyond face of walls minimum of 1-1/2", with a drip, and minimum 1/2" per foot wash surfaces.

Cracking, Crazing, Spalling or Patching: Not permitted.

Protection: Architectural precast concrete units shall be protected from the elements for a minimum time of seven days immediately prior to being incorporated into the work.

## Mortar And Grout Materials

Portland Cement: Shall conform to ASTM C150, Type I. Only one brand and kind of Portland cement from one source shall be used for the work unless prior written approval is obtained from the A/E. Brands are subject to approval of the A/E based upon the mortar color desired and obtainable by use of the various brands readily available. No white cement or nonstaining cement will be required.

Lime: Shall be pressure-hydrated, non air-entrained and conform to ASTM C207, Type S.

Masonry Sand: Shall be clean, sharp, free from loam, silt, vegetable matter, salts, and other injurious substances, and shall conform to ASTM C144. Sand is further subject to approval of the A/E, based on mortar color desired and obtainable by use of local sands readily available, and shall be from one source.

Aggregate for Grout: ASTM C404.

Water: Shall be potable, fresh, clean, clear, and free of injurious amounts of oil, acid, alkali, salts, organic matter or other detrimental substances, and handled in clean containers.

Plasticizer: Not permitted.

Water Repellent: Not permitted.

Coloring Pigments: Not permitted.

Other Admixtures: Shall not be used at any time and will not be knowingly approved. Use of special air-entraining admixtures, chlorides or nitrates, with or without approval, will be sufficient cause to require removal and replacement of all masonry work containing or treated with same.

The autoclave expansion of the cementitious portion of the mortar materials, when mixed in proportions required under “mortar mixes,” shall not exceed one-half percent when tested according to ASTM C151. The air content of any mortar required under “mortar mixes” shall not exceed six percent when tested according to ASTM C231 and/or ASTM C173 and/or ASTM C457.

Fully or partial premixed mortar materials will be considered for approval when each requirement of the individual materials is complied with and is so stated on the container, or certified, along with proportions and quantities.

## Continuous Masonry Joint Reinforcement

Materials and Coatings: Use prefabricated electrically flush or butt welded wire units, truss type, not less than 10-feet long, with matching corner units, fabricated from cold drawn steel wire complying with ASTM A82. Provide galvanized (zinc coated) units conforming to Class B requirements of ASTM A153 in all exterior walls and in interior corridors or partitions enclosing wet or high moisture areas. For other interior walls, coating of wire units may conform to Class 3 requirements of ASTM A641.

Masonry Rain Screen Wall Construction: Use truss type reinforcing with one side rod for each face shell of concrete masonry units and one rod for brick wythe without moisture drip. All wire shall be 3/16"diameter. Units shall be equivalent to Hohmann & Barnard, Inc. # 130. Continuous wire in brick wythe shall engage brick wythe a minimum of 3/4" and held back from the face of the wall a minimum of 3/4".

Brick Veneer Over Concrete: Use seismic-Notch, masonry-veneer dovetail anchor designed to engage a continuous 3/16" diameter wire embedded in the face brick veneer mortar joint, fitted to engage 12 gauge dovetail anchor. Units shall be equivalent to Hohmann & Barnard, Inc. #303 SV Seismic-Notch Anchor. Include coated continuous wire.

Single Wythe Interior Concrete Masonry Corridors and Partitions: Use one side rod for each face shell of concrete masonry units. All wire shall be 9 gauge. Units shall be equivalent to Hohmann & Barnard, Inc. # 120.

## Individual Ties and Anchors:

Materials and Coatings: Provide galvanized (zinc coated) steel units conforming to Class B requirements of ASTM A153, unless otherwise specified.

Juncture of Underside Concrete Spandrel Beam with Top of Concrete Masonry Back-up: Provide 8" long channel piece fastened to underside of concrete spandrel beam; equivalent to Hohmann & Barnard, Inc. #303 SV with mill galvanized finish.

Juncture of Concrete Masonry Back-up with Concrete Columns: Provide corrugated dovetail tie 1" wide by 12 gauge by 5-1/2" long, fitted to 12 gauge dovetail anchor; equivalent to Hohmann & Barnard, Inc. # 303 corrugated dovetail brick tie with mill galvanized finish.

Attachment of Exterior Face Wythe Brick Passing Over Concrete Columns: None required.

Attachment of Concrete Masonry Partitions to Concrete Masonry Back-up or Other Partitions: Provide prefabricated T-shaped units or wire mesh tie 1/2" squares of 16 gauge; equivalent to Hohmann & Barnard, Inc. MWT Mesh Wall Tie with hot galvanized finish.

Around Openings in the Exterior Wall: Where no other fastening occurs between concrete masonry back-up wythe and face brick wythe within 2 feet of an opening, provide corrugated wall tie 16 gauge thick, 7/8" wide by 7" long; equivalent to Hohmann & Barnard, Inc. CWT Corrugated Wall Tie hot galvanized.

## Shelf Angles And Lintels

Coordinate with Section 05 12 00 contractor for metal materials and fabrication and drawing schedules and details for size and locations.

Concrete masonry lintels may be prefabricated or built-in-place masonry lintels made from bond beam concrete masonry units. Provide reinforcing bars of material specified in the Concrete Reinforcing Section in accordance with drawing schedules and details. Fill lintel with ASTM C 476 Coarse Grout or concrete as specified in the Section 03 31 13. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

## Flashing Materials and Closure Strips

Coordinate with Section 07 60 00 contractor for metal materials and fabrication and drawing schedules and details for size and locations.

## Inserts In Open Head Joints

Not permitted.

## Air And Vapor Barriers

Furnished and installed by Section 07 27 26 contractor.

## Rigid Wall Insulation

Furnished and installed by Section 07 27 26 contractor.

## Cavity Drainage Material

Not permitted.

## Masonry Cleaners

Not permitted.

## Mortar Mixes

Conventional Job Mixed Mortar: Measure materials for mortars by volume, in a manner whereby proportions can be controlled within two percent. Mix materials dry and then water to bring to proper consistency for use. Mix materials in the approved type machine mixer of adequate capacity for 3 to 5 minutes after all materials have been introduced, until materials are evenly distributed throughout the batch and the mixture is uniform in color with a workable consistency.

Silo Metered and Bulk Container Mortar: Shall comply with ASTM C1714. Use materials specified hereinbefore and proportion mixes as specified hereinafter. Add water and mix according to system manufacturer’s recommendations.

Use maximum water consistent with good workability and freedom from smearing the face of masonry work. Use no mortar that has stood more than one hour after initial mixing. Mortar less than one hour old shall be reasonably retempered as necessary to maintain its workability, but used before it is one hour old or otherwise discarded. No anti-freeze ingredient or contaminate of any type will be permitted.

Mortar for Brick and Concrete Block: Shall be ASTM C270, Type N, Cement-Lime Mortar conforming to the proportion specification requirements. (1:1:6).

The proportions listed above are Portland cement, lime, damp loose sand, respectively by volume. The proportions are listed only as samples for the required type mortars and shall be modified as necessary, within tolerances, to suit the particular masonry sand being used.

# PART 3 - EXECUTION

## Examination

Examine Work of other Section Contractors on which or to which unit masonry is to be built, supported or attached, to determine completeness and proper alignment to receive unit masonry. Do not commence masonry work until all related noncompliant work has been corrected.

Before installation of masonry, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

## Preparation

Verify that items provided by other Section Contractors are properly sized and located.

Verify that anchorages embedded in concrete are properly placed.

Establish lines, levels, and coursing. Protect from disturbance.

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

## Installation, General

Build cavity and veneered walls to full thickness indicated on the drawings. Build interior concrete masonry walls to actual width of masonry units using units of widths indicated.

Build chases and recesses to accommodate items specified in this and other Sections.

Leave openings for equipment to be installed before completing masonry. After equipment is installed, complete masonry to match the construction immediately adjacent to opening.

Use full size units without cutting where possible. If cutting is required to provide a continuous pattern or to fit adjacent construction, cut units with motor-driven saws to provide cuts that are straight and true, resulting in clean, sharp unchipped edges of the units. Allow typical cut units to surface dry before laying. Install cut units with cut surfaces and, where possible, cut edges concealed.

Select and arrange units for exposed masonry to produce a uniform blend of colors and textures.

## Tolerances

Dimensions and Locations of Elements: For dimensions in cross section or elevation do not vary by more than minus 1/4 inch or plus 1/2 inch.

For location of elements in plan do not vary from that indicated by more than minus ± 1/2 inch in 20 feet or ± 3/4 inch total.

For location of elements in elevation do not vary from that indicated by more than ± 1/4 inch in a story height or ± 3/4 inch total.

Lines and Levels: For bed joints, do not vary from level by more than ± 1/4 inch in 10 feet, or ± 1/2 inch maximum.

For horizontal lines, do not vary from level by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or ½ inch maximum.

For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum. Total vertical alignment of exposed head joints may have double these tolerances.

For lines and surfaces, do not vary from straight or plane by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.

For faces of adjacent exposed masonry units, do not vary from flush alignment by more than ± 1/8 inch.

If Type FBS Rough brick or Type FBA brick is used, revise tolerance in subparagraph below to allow for variation in brick size.

Joints: For bed joints, do not vary from thickness indicated by more than ± 1/8 inch.

If Type FBS Rough brick or Type FBA brick is used, revise tolerances in five subparagraphs below to allow for variation in brick size. Consider restricting tolerances if Type FBX brick is used.

For head and collar joints, do not vary from thickness indicated by more than minus 1/4 inch or plus 3/8 inch.

If the above tolerances cannot be met due to previous construction, notify the A/E.

## Laying Masonry Wythes

Lay out walls in advance for alignment of head joints with uniform joint thicknesses and for accurate location of openings, movement joints, returns, and offsets. Maintain horizontal joint plane through all wythes of masonry. Fully bond intersections, and external and internal corners. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

Bond Pattern for All Masonry: Lay masonry in 1/2 running bond. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4 inch horizontal face dimensions at corners or jambs.

Adjusting Units: Adjust the final position of each masonry unit while the mortar is still plastic. To replace or reposition a unit after mortar has begun to set, remove the unit, replace the mortar with plastic mortar, and replace the unit.

Tooling: Tool all mortar joints exposed in the finished work, including the bed joint directly above flashing.

Tool exposed joints when “thumb-print” hard with a round jointer, slightly larger than width of joint and of sufficient length to obtain a straight and true mortar joint. Tooling shall be performed so that the mortar is compressed and the joint surface is sealed and in intimate contact with the edge of the masonry unit. This may require some craft persons to complete work after normal working hours. All crafts persons involved in the project shall utilize new hardened steel jointers of the same size when beginning to lay masonry on the project.

Where air and vapor barrier is to be applied to concrete masonry units, strike joint once, brush and leave joint full, flush and free of voids.

Stopping and Resuming Work: Stop off horizontal run of masonry by racking back 1/2 length of unit in each course from those in course below. Do not tooth except where necessary around openings. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar.

Built-in Work: As construction progresses, build in items specified in this and other Sections. Include built-in metal frames, anchor bolts, reglets, and other items to be built into the work supplied by other Section Contractors. Bed anchors of hollow metal frames in mortar joints. Build in items plumb and level. Fill in solidly with masonry around built-in items. Use ASTM C 476 grout or job mortar with high flow to slush full voids between masonry and hollow metal door frames.

Cutting and Fitting: Cut and fit masonry units for chases, pipes, conduit, sleeves, ductwork, door and window openings. Cooperate fully with other Contractors to ensure correct size, shape and location.

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

Fill cores in concrete masonry units directly under lintels with mortar or grout.

Fill cores in concrete masonry units with mortar or grout above and below where portions of anchors are to be installed.

Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, with mortar joint at juncture.

## Mortar Bedding and Jointing

For Face Brick: Lay units with filled bed and head joints. Butter ends with sufficient mortar to fill head joints and set into place. Do not deeply furrow bed joints or slush head joints. Head and bed joints will be considered full when the average joint solidity is 90 percent or greater, with no voids in that half of the joint nearest the exterior face of the masonry.

Retain one or more of first three subparagraphs below or revise to suit Project. Coordinate with firestopping requirements. Retain first subparagraph if live-load deflection of structure above will produce stress in masonry. Indicate on Drawings or insert descriptive requirements in this Section for building walls around steel joists and similar construction if required. Indicate joint-filler thickness on Drawings as well as details of connection required if structure acts as lateral support for partitions.

For Concrete Masonry Units: Lay units with face shells fully bedded in mortar and with head joints of depth equal to bed joints. For starting courses on concrete, lay units fully bedded in mortar, including areas under cells.

Set architectural precast concrete units in full bed of mortar over flashing with full vertical joints.

Bed and head joints in masonry shall be of a nominal 3/8 inch thickness.

## Rain Screen Walls

All exterior walls shall be of a rain screen wall type. Build walls with materials of nominal thicknesses and at locations, as indicated on the Drawings.

All interior wythes shall be constructed first, followed by application of the spray applied air and vapor barrier along with the rigid insulation required, before the face brick are laid.

Shelf angles shall be installed before the air and vapor barrier is applied.

Install flashing at the base of all cavities, at all window and door heads and sills, and under coping. (Only a bond break will be required where face brick bear on brick ledges in concrete.) Set all flashing on a beveled bed of mortar to turn out any water. Installation of flashing shall be completed before the air and vapor barrier is applied.

Stainless steel sheet metal closure strips shall be installed at the location of vertical movement joints in brick masonry (those joints near corners and joints 20 to 25 feet on center) to prevent lateral movement of air in the wall cavity. Installation of closure strips shall be completed before the air and vapor barrier is applied.

The inner and outer masonry wythes of rain screen walls shall be separated by a continuous space that is a nominal 4 inches wide, except for masonry returns indicated at the jambs of openings. Bond the two wythes together with continuous joint wall reinforcing as specified.

The first course of masonry at supports shall receive a beveled bed to plumb the brick over the slightly sloped flashing below.

The concrete masonry inner wythe of the exterior wall shall be anchored to the columns, and laterally supported by a wall-top anchor fastened to the underside of the spandrels. Wires of the continuous ties in the concrete masonry wythe shall be interrupted at junctures with the concrete columns, but the wire in the face brick wythe shall be continuous or spliced where the face brick wythe passes over the face of the concrete column.

Coordinate with the Section 07 27 26 contractor for the timely application of their materials including rigid insulation. Care must be taken to achieve smooth faces on the face of the concrete masonry back-up wythe in the cavity.

Provide open head joints in mortar joints on the exterior facing wythe on 24 inch centers at the base of all cavities, immediately above shelf angles, and wherever flashing is built into exterior masonry walls or other water stops occur. Provide the same venting immediately below shelf angles and one course below the tops of wall panels and the roof edge. Remove bed joint mortar beneath open head joints.

The wall cavity shall be closed off with vertical closure strips at vertical movement joints in the brick wythe to prevent horizontal air movement.

The following special precautions shall be taken to achieve smooth faces on the inside of the cavity space and to ensure that the bottom of the cavity is clean and relatively free of mortar droppings:

Lay a full mortar bed for the exterior wythe. A very shallow furrowing of the mortar bed will be permitted, so long as bed joints are at least 90 percent full and can be so observed when face brick are lifted out of their fresh mortar bed to verify bond with mortar. Back bevel mortar bed away from the cavity to minimize mortar protrusions and mortar dropping into the cavity as masonry facing units are placed and aligned.

Provide sufficient cleanouts in the cavity to permit visual inspection and all necessary cleaning out of mortar droppings at the base and intermediate support of all cavity walls. As a minimum, every third face brick at each masonry weight support shall be left out at the bottom. The wall cavity shall be inspected and cleaned out at least twice-a-day during construction of the wall. The inspection and clean-out openings shall be sealed immediately after the wall cavity is covered above by other construction and the A/E or a delegated representative has subsequently had the opportunity to inspect the cavity. Make final cleaning of bottom of cavity just before brick are placed in clean-out openings. Hold off tooling of mortar joints for inspection hole brick until mortar is “thumb-print’ hard to avoid color mismatch.

## Masonry Joint Reinforcement

Install entire length of longitudinal wire in mortar bed joints with a minimum cover of 3/4 inch on exterior side of walls.

Do not bend typical continuous masonry joint reinforcement in the construction process.

Lap continuous masonry joint reinforcement ends a minimum of 6 inches.

Space continuous masonry joint reinforcement a minimum of 16 inches on center vertically.

Provide reinforcement no more than 8 inches above and below wall openings and extending 12 inches beyond openings. Such reinforcement is in addition to continuous reinforcement when not coincident.

Interrupt joint reinforcement in a wythe wherever a movement joint occurs.

Provide continuity at concrete masonry wall intersections by using prefabricated T-shaped units or wire mesh with cores filled.

Provide continuity at corners by using prefabricated L-shaped units.

## Anchoring Masonry Veneers

Anchors for brick veneer shall be spaced 16" on center vertically and 24" on center vertically into dovetail slots provided by Section 03 31 13 contractor.

Continuous wire in brick wythe shall be sized and placed to engage brick wythe a minimum of 3/4" and held back from the face of the wall a minimum of 3/4".

## Movement Joints

General: Install movement joints in unit masonry as work progresses. Note that the movement joints in the two wythes of the rain screen walls do not typically coincide.

Vertical Movement Joints in Face Brick Wythe: Form movement joints free of mortar the full depth of face brick wythe and of 3/8 inch to 1/2 inch width for installation of backing and sealant by Section 07 92 00 contractor. Stainless steel sheet metal closure strips are also required in all major movement joints in the face brick wythe, to prevent lateral movement of air in the wall cavity. See Drawings for movement joint locations, not to exceed 4 feet from one side of a corner and 25 feet on center. Interrupt masonry joint reinforcing at movement joints. Movement joints shall be made free of all mortar as work progresses and maintained free of mortar.

Horizontal Movement Joints in Face Brick Wythe: Provide horizontal pressure-relieving joints free of mortar the full depth of face brick wythe and of size indicated, but not less than 1/4 inch for installation of backer rod and sealant by Section 07 92 00 contractor. Movement joints shall be made free of all mortar as work progresses and maintained free of mortar. No filler materials permitted.

Vertical Movement Joints in Concrete Masonry Wythes: Form movement joints with bond broken the full depth of concrete masonry wythe and of width indicated, but not less than 3/8 inch for installation of backer rod and sealant by Section 07 92 00 contractor. Use sash units and preformed gaskets, a continuous bond break and grout or mortar, or special shaped units. Movement joints in the back-up concrete masonry wythe typically occur at corners and at the juncture with concrete columns. See Drawings for location of movement joints in interior concrete masonry corridors and partitions, typically above end of lintel at the door jambs furthest away from the nearest vertical movement joint and at a maximum spacing of 25 feet. Interrupt masonry joint reinforcing at movement joints. Mortar and bond breaker shall be raked back from the wall surfaces sufficient to properly install backing and sealant.

## Shelf Angles and Lintels

Install continuous shelf angles where indicated on the Drawings with angles and bolted connection hardware supplied by Section 05 12 00 contractor into inserts in concrete spandrel beams or slab edges installed by Section 03 31 13 contractor. Adjust angles as needed to keep the masonry level and at the proper elevation. Where shims are required at attachment, they shall extend to the heel of the shelf angle to prevent rotation of the angle. Shelf angles shall be mitered for building corners, typically prefabricated with each angle not shorter than 4 feet, unless limited by wall configuration. Leave 1/8" to 1/4" space between ends of angles when installing. In lieu of bolted connections, the Contractor may elect to use welded connections, except joints in shelf angles shall then coincide with vertical movement joints in the face brick and a certified welder shall be used.

Install loose steel lintels where indicated on the Drawings with angles supplied by Section 05 12 00 contractor. Provide minimum bearing of 4inches at each jamb with lintel centered over opening. Provide polyethylene bond breaker at the underside angle/top of masonry bearing surface.

Install concrete masonry lintels over doors, windows, and other substantial openings that occur in the concrete masonry back-up wythe. Lintels may be precast or cast-in-place bond beams.

## Flashing

Install continuous through-wall, two-piece flashing at all shelf angles and lintels, and one-piece flashing below sills and coping. (Only a bond break is required at the concrete foundation brick ledge). Provide end dams at ends of flashing runs, in flashing below sills, and at man-door and window heads, when not coincident with shelf angles. End dams will not be allowed at typical movement joints in brick masonry. Install special flashing with reglet for Section 07 50 00 contractor to connect counterflashing.

The stainless steel flashing required beneath sills and coping shall be placed so that the drip extends out beyond the face of the brick 1-1/4" to 1-1/2" turned down 45° with a drip.

The top edge of the flashing at shelf angles shall be secured in a continuous horizontal reglet in the concrete frame. Reglet shall be continuous at the columns.

The top of the flashing at window and door heads not coincident with a shelf angle shall have a bent lip inserted into the mortar joint at the top of the concrete masonry bond beam lintel over the opening. Install concealed end dams at longitudinal ends of flashing up into head joints of brick masonry.

Joints in flashing shall overlap at ends for each piece a minimum of 4 inches. All field joints and penetrations shall be treated with silicone sealant to prevent capillary suction. Use ultra low modulus silicone sealant. Install prefabricated inside and outside corners without mechanical field adjustment.

Place wall flashing on bed of mortar so that all flashing slopes slightly down and out to ensure that the flashing will not pond water. (Flashing is required to be pre-bent with slightly greater than a 90° angle between horizontal and vertical portions to facilitate the installation.) Any temporary shims used to facilitate the work shall be removed before the mortar has stiffened, and the remaining voids shall be pointed.

Flashing shall be installed prior to the air barrier application.

Flashing shall be sized and installed with or without shims such that the break for the drip portion is near flush (within 1/8") of the face of the new face brick facade. Use impact-resistant, rigid polyvinyl chloride or approved equal shims behind flashing at fastening locations where needed to bring drip portion of flashing out to future face of masonry.

Flashing drips shall be installed with hems where the public may come in contact with the flashing. Other areas shall not be hemmed. This Section contractor shall provide protective covering over sharp edges of drip as needed.

If flashing is disrupted or damaged by scaffold supports, repair flashing as necessary to retain its integrity without visual impairment. Soldering may be required.

Flashing under architectural precast concrete coping shall also have a mortar bed above and below the flashing.

The top portion of the exposed drip shall be covered with a water resistant tape to protect the metal from mortar droppings during construction. For protection of workers, the tape should also extend over any sharp drip edges. Remove tape as part of final cleaning or as scaffolds are taken down.

## Closure Strips

Install continuous “L” shaped closure piece extending continuous in vertical movement joints in rain screen walls (near corners and approximately 20 to 25 feet on center) from top of brick ledge or shelf angle flashing to underside of shelf angle above. Wherever two piece closures become necessary, use stainless steel screws to fasten pieces together. Provide the same device in brick faced veneer walls with concrete backing, using similar installation.

Short leg of “L” shall be 2" minimum and mechanically fastened to concrete masonry back-up wythe with a maximum spacing of 24" on center vertically. Seal closure piece to concrete masonry back-up wythe with butyl self-adhered flashing, minimum 4" wide, to be later covered by air and vapor barrier.

Long leg of “L” shall be located in the center of the vertical movement joint and of a length to penetrate to approximately 1/2" to 3/4" behind the face of brick, depending upon width of joint. Shim if required at fasteners into concrete masonry back-up wythe when installing closure piece.

Set closure strip in bed of sealant on foundation or flashing on shelf angles and extend up to within 1/8"of the shelf angle above, top and bottom sealed with fast-cure polyurethane sealant.

Installation of closure strips shall be such that joint subcaulking will be in continuous contact with the outstanding leg of a closure piece, from top to bottom, when movement joint is sealed.

The new closure pieces shall be installed after the shelf angle flashing, but prior to the air barrier application.

## Spray Applied Air and Vapor Barrier and Rigid Insulation

Work closely with Section 07 27 26 contractor to assure proper conditions, sequence, and timing of work. It is anticipated that there will be multiple down times for this work as different elements of the project are made ready.

Ensure work of this Section is without openings of a nature such that the Section 07 27 26 contractor cannot readily bridge air leakage pathways around window and door openings, piping, and other penetrations in the wall assembly.

Window and door frames shall be installed before the air barrier and insulation are applied and before installation of the face brick and architectural precast concrete elements.

This contractor to install facing within 45 days after insulation is installed or be responsible for providing protection from ultraviolet deterioration, such as a coat of latex paint over the insulation.

## Repairing and Pointing

Remove and replace to A/E’s satisfaction masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units as intended. Install new units to match adjoining units and install in fresh mortar, pointed to eliminate evidence of replacement.

Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent work, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

## Laying, Protection and Cleaning

All masonry shall be in final acceptance condition within 24 hours after laying and shall be maintained in that condition, by meeting or exceeding the degree of cleanliness required, demonstrated on the approved sample panel.

Lay masonry utilizing all necessary care to achieve cleanliness. Remove excess mortar from exposed exterior and interior masonry surfaces as the work progresses and before it tenaciously adheres to the faces of the masonry. Remove mortar protrusions and smears as masonry units are laid and tooled, as scaffolds are raised, and at the start of the next day's work, leaving the surface of the masonry clean and finished. Use calcimine brushes, stiff fiber brushes, other similar masonry units, burlap, rags, carpet remnants, rubber floats, or other approved means. (Cleaning of masonry the morning after laying by the same masons who laid the masonry the previous day, using stiff fiber brushes with or without water and sand, and concentrating on cleaning the field of the masonry units has also been successfully used to achieve an appearance matching or exceeding the cleanliness of the approved sample panel.) **Use of chemical cleaning or harsh physical cleaning will not be permitted**. Included as chemical cleaners and prohibited are most manufactured masonry cleaning solutions or compounds. Equipment or methods and techniques utilized, reduced productivity, as well as weather conditions experienced will not relieve this Section contractor of required compliance.

Protection shall be provided to prevent mortar spattering and maintain masonry in a clean condition so that the masonry is satisfactory for acceptance when masonry work is completed. This may require covering portions of finished masonry which is below new work in progress with polyethylene, canvas, or other approved means. Cover tops of unfinished walls and new work during inclement weather and at the end of each day's work to prevent moisture entry. Extend covering a minimum of 24 inches down both sides of wall, and hold covering securely in place. Hair-pin type devices frequently spaced have been successfully used in the past. When practical, lay masonry from the top floor down.

No final washdown is required unless removal of earthy construction dirt or dust is necessitated by extremely unusual site conditions.

If any masonry is not cleaned as required by these specifications, or if walls have an unsatisfactory appearance upon completion of work, such violations will require additional work by this Section contractor for producing acceptable masonry at no extra cost to the Owner. This is not to be construed as a Contractor's option. Procedures must be submitted by this Section contractor and samples approved by all other parties to the contract prior to proceeding with such work.

Upon completion of masonry work on exterior walls, inform Contractor so that covers on top of walls installed by this Section contractor can be maintained until roofing and roof edge work has been completed.

## Adjustment

Should any Contractor use or attempt to use chemical cleaning utilizing acid or strong alkali based materials, or should any Contractor use or attempt to use harsh physical cleaning such as sand blasting or pressure water jetting; such actions will be construed as nonperformance causing the Owner damages which shall be liquidated by reducing payment to the Contractor in the amount of $2.50 per square foot of masonry involved.

## Masonry Waste Disposal

Except for the extra stock of face brick required to be turned over to the Owner, excess masonry materials are this Section contractor’s property and shall be removed from the Project site upon completion of unit masonry work.

**END OF SECTION**

# COORDINATION ITEMS FOR CONCRETE SPECIFICATION

Twelve gauge dovetail anchors and reglets supplied and cast into concrete by Section 03 31 13 contractor. Reglets shall be continuous at columns.

Cast-in devices for fastening shelf angles cast into concrete furnished by Section 05 12 00 contractor and cast into concrete by Section 03 31 13 contractor.

Coordinate with Section 04 20 00 contractor so that masonry related anchorages to be embedded in concrete are properly located and placed.

# COORDINATION ITEMS FOR METAL SPECIFICATION

Steel weight supports and cast-in attachments for unit masonry, furnished by Section 05 21 00 contractor.

Require vertically slotted holes in shelf angles to allow for adjustment and full depth metal shims where needed at fastenings, so completed installation will prevent rotation and vertical movement of the shelf angle.

# COORDINATION ITEMS FOR INSULATION SPECIFICATION

Supply and installation of all rigid insulation in exterior walls are the responsibility of Section 07 27 26 contractor.

# COORDINATION ITEMS FOR AIR AND VAPOR BARRIER SPECIFICATION

Examine all parts of the masonry and the conditions under which the air and vapor barrier work is to be installed, and notify the Contractor in writing of any conditions detrimental to the proper and timely completion of the work.

Advise that installation of the air and vapor barrier as well as the insulation is an important part of an all-inclusive system to provide adequate rain, air, vapor and thermal control layers.

Need to require air barrier over cast-in-place concrete (thickness of applied material can be reduced) where faced with brick to act as adhesive to help hold insulation in place tight against the concrete.

Require consultation with Section 04 20 00 contractor on timing and frequency of work needed to be done during construction of the exterior walls.

Materials and installation methods to transition between concrete masonry back-up wythe, all built in items, metal flashing and metal closure strips.

Advise that Section 07 27 26 contractor will utilize Section 04 20 00 contractor’s scaffold for all air barrier work needed in exterior walls.

Require a pre-installation conference prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

Walls shall have 16 inch high horizontal strips of specified rigid insulation applied between protruding continuous ties to the freshly installed air and vapor barrier on the cavity face of the inner wythe. Press insulation tightly into the freshly installed air and vapor barrier. All insulation shall tenaciously adhere to the air and vapor barrier material or a compatible, continuous spray adhesive shall be applied before installing the insulation.

Closures utilizing rigid insulation, closed cell compressible fillers, and/or sealant shall also be provided at the perimeter (horizontally and vertically) around all openings in the wall, where not tightly closed with a lintel or masonry.

The wall & roof junctures shall be closed off (sealed) as required to eliminate air leakage on a long term basis.

Use strips of like-kind thinner insulation over flashing at shelf angles.

In the event any areas of insulation become unbonded from the concrete wall, mechanically refasten insulation to concrete. For 2 inch board insulation, use 1/4" x 3" Tapit nylon anchors with 1/4" x 1-1/2" nylon washers inserted into predrilled holes in the concrete, with one anchor for every 2 square feet of insulation.

# COORDINATION ITEMS FOR ROOFING SPECIFICATION

Supply & install counterflashing for masonry walls above low roofs into receiver provided by Section 04 20 00 contractor.

# COORDINATION ITEMS FOR FLASHING & SHEET METAL SPECIFICATION

Advise that all sheet metal installation for masonry work will be handled by Section 04 20 00 contractor.

## Flashing Materials and Fabrication For Masonry

Elements Involved: Provide flashing at shelf angles and lintels, flashing beneath architectural precast concrete sills and copings, and closure strips in vertical movement joints of brick masonry. At low roof areas with walls above, provide 24 or 26 gauge material with reglet for Section 07 50 00 contractor to install counterflashing.

Materials: All flashing and closure strips shall be corrosion-resistant stainless steel, ASTM A167, AISI Type 304 with 2B or 2D finish, 26 or 28 gage thickness unless otherwise specified. Closure strips may be of other finish. No flexible flashing permitted.

Solder: FS QQ-S-571 or ASTM B32. Use 50/50 for all applicable work unless otherwise specified.

Soldering Flux: FS O-F-506, type best suited for specific material.

Quality Assurance: Shop fabricate in accordance with the Sheet Metal and Air Conditioning Contractors National Association (SMACNA).

Fabrication of Wall Flashing at Shelf Angles and Steel Lintels: Provide two-piece flashing to accommodate construction tolerances, with top portion overlapping bottom portion by a minimum of 2".

The top piece at shelf angles shall come out of an angled-down 1" deep continuous reglet cast into the concrete frame and come out to the plane of the shelf angle face and turn vertically down. The top of the flashing shall be fabricated with an open hem “V” shaped to hold the flashing in the reglet. Form wall flashing at shelf angles in 8 or 10 foot lengths.

The top piece at steel lintels shall come out of the first mortar joint in the concrete masonry back-up and turn vertically down on the face of the concrete masonry back-up. The top of the flashing shall be fabricated so as to engage the full depth of the face shell with a 1/8" upturn at the end. Wall flashing at steel lintels shall be one piece in horizontal length, including prefabricated end dams at ends of lintel.

The upturned leg on the lower part of the flashing shall be fastened to the concrete or concrete masonry back-up 24" on center. An alternate to the fastening is a juncture of the two pieces in a lock seam, or the lower piece slipped into a bend in the upper piece, allowing adjustment.

Provide an outward slope of the flashing by breaking the metal at an angle slightly greater than 90° (3 to 5 %) to ensure positive outflow of any water.

The exposed exterior edge of flashings shall uniformly extend out 1-1/4" to 1-1/2" and be turned downward with approximately a 45 degree bend. Notch hem and taper-cut drip for the underlying piece at joints. Provide a 3/8" hem on the drip, but only where flashing is accessible to the public.

Flashing at corners shall be continuous around the corners. One piece, prefabricated in the shop, interior and exterior corner pieces are required. Prefabricated flashing elements shall be soldered in the shop. They shall not be less than 18" in length both ways from the mitered corner with final fastening of the corner. Perform field measurements as required to ensure proper fit. Mechanical field adjustment of prefabricated elements will not be tolerated.

Provide prefabricated in the shop end dams in flashing at junctures with other materials. Taper-cut end dams so that they are not exposed out of the wall.

Flashing Beneath Architectural Precast Concrete Window Sills: See flashing at shelf angles and steel lintels, except flashing shall be one piece with unfastened 2" high back and end dams.

Flashing Under Architectural Precast Concrete Coping: The exposed exterior edge of flashings shall uniformly extend out 1-1/4" to 1-1/2" and be turned downward with approximately a 45 degree bend. Taper-cut drip for the underlying piece at joints. Provide a 3/8" hem where flashing is accessible to the public. Provide a slight, continuous crease at the centerline of the flashing (1/4" to 1/2" rise) to drain any penetrating water out of the wall.

Closure Strips at all Vertical Movement Joints in Brick Masonry: Provide “L” shaped closure piece extending continuously in all vertical movement joints in brick masonry from top of flashing to underside of shelf angle.

Long leg of “L” shall be of a length to penetrate approximately 1/2" to 3/4" behind face of brick in the center of the movement joint. Short leg of “L” shall be a minimum of 2" or may be slightly shorter or longer than long leg of “L”.

# COORDINATION ITEMS FOR SEALANT SPECIFICATION

Advise that all required sealant in contact with exposed masonry will be done by Section 07 92 00 contractor.

Require application of sealant bead beneath the flashing drips.

Do not allow any sealant work to proceed on masonry movement joints in the face brick wythe until after the joints have been cleaned out and approved by the A/E.

Closure strips in face brick vertical movement joints shall extend close enough to the surface to stop lateral movement of air when backing and sealant is installed. Request A/E direction on how to proceed if such construction is not proper.

Should sealant occur above any water stop, the sealant shall be periodically broken to form weep holes.

Sealant in movement joints shall approximately match color of adjacent facing material.

# COORDINATION ITEMS FOR DOOR SPECIFICATION

Door frames will be installed before the air and vapor barrier.

Ensure masonry openings are proper.

# COORDINATION ITEMS FOR WINDOW SPECIFICATION

Window frames will be installed before the air and vapor barrier.

Ensure masonry openings are proper.

# COORDINATION ITEMS FOR MECHANICAL, PLUMBING AND ELECTRICAL

To be determined for each project.

**END OF SECTION**