

INSTRUCTIONS FOR EDITING

SECTION 4100

MORTAR

1. Paragraph 2.01(G): If project is a new school, addition, repair and patching of existing building with no colored mortar, delete reference to mortar with color additive.

SECTION 04100

MORTAR

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section.

1.02 RELATED WORK

- A. Section 04200: Unit Masonry Work.

1.03 REFERENCE STANDARDS

- A. ASTM C150 - Portland Cement.
- B. ASTM C91 - Masonry Cement.
- C. ASTM C5 - Quicklime for Structural Purposes.
- D. ASTM C207 - Hydrated Lime for Masonry Purposes.
- E. ASTM C144 - Aggregate for Masonry Mortar.
- F. ASTM C387 - Packaged, Dry, Combined Materials for Mortar and Concrete.
- G. ASTM C270 – Standard Specification for Mortar for Unit Masonry.
- H. ASTM C780 - Standard Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.

1.04 SUBMITTALS

- A. Provide product data and certifications for all mortar materials including mortar design mix, in order to indicate compliance to referenced standards.

PART 2 - PRODUCTS

2.01 MORTAR MATERIALS

- A. Portland Cement: ASTM C150, Type 1.
- B. Masonry Cement: ASTM C91.

- C. Aggregates: Standard masonry type, ASTM C144, clean, dry and protected against dampness, freezing and foreign matter.
- D. Hydrated Lime: Conforming to requirements of ASTM C207, Type S.
- E. Quicklime: Non-hydraulic type, ASTM C5.
- F. Premix Mortar: Commercially prepared type, ASTM C387:
 - 1. Below grade: Type M.
 - 2. Above grade: Type S.
- G. Premix Mortar with Color Additive: ASTM C387, Type S, color as selected by Architect. For additions to existing buildings, match existing mortar, as approved in writing by Architect.
 - 1. "Flamingo-Brixment", ESSROC Cement Corporation, Nazareth, PA 1-610-837-6725 (www.essroc.com)
 - 2. Lehigh Cement Co., Allentown, PA, 1-800-523-5488.
- H. Water: Clean and free from injurious amounts of oil, alkali, organic matter or other deleterious material.

2.02 MORTAR MIX

- A. Provide minimum 1800 psi mortar.

2.03 MORTAR ADMIXTURES

- A. Accelerators: ASTM C494, Type C; AASHTO M194, Type C. shall not contain calcium chloride; W. R. Meadows "Hydraset-Free" accelerator or comparable.

PART 3 - EXECUTION

3.01 MIXING MORTAR

- A. Thoroughly mix mortar ingredients, in quantities needed for immediate use.
- B. Do not use anti-freeze compounds to lower the freezing point of mortar.
- C. Mortar shall be used within two and one half hours of the initial mix-up at temperatures between 40 degrees F (10 degrees C) and 80 degrees F (26 degrees C) and within two hours of mixing at temperatures over 80 degrees F (26 degrees C). It shall not be used after it has begun to set.

- D. If necessary, retemper mortar within two hours of mixing to replace water lost by evaporation. Do not retemper mortar after two hours of mixing.

END OF SECTION

INSTRUCTIONS FOR EDITING

SECTION 04200

UNIT MASONRY

1. General: Approval of concrete masonry unit manufacturers is based upon compliance with the following:
 - A. Submittal of current test reports for specified average shrinkage, per 1.06 (C) and 2.02 (E).
 - B. Age of masonry units per sub-paragraph 2.02 F (2).
 - C. Single source responsibility per 2.02 (A).

No manufacturer shall be approved for concrete masonry units for the project unless the above criteria are met.
2. Paragraph 1.06 (B) 1 m: Edit and insert project specific cladding material. Submit edits for owner approval.
3. Paragraph 2.01 A: For new schools, delete reference to matching face brick to existing.
 1. Add brick selection if known. Architect must visit site to match new brick with existing with Owner present.
4. 3.06B: Ensure that control joints are shown or noted on Drawings (Indicate control joints for both exterior and interior walls).

SECTION 04200

UNIT MASONRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section.

1.02 RELATED WORK

- A. Section 01020 Allowances
- B. Section 01340: Shop Drawings, Product Data and Samples.
- C. Section 04100: Mortar
- D. Section 05810: Expansion Control (Wall and Surfaces)
- E. Section 07210: Building Insulation (Cavity Wall and Safing Insulation)
- F. Section 07265: Liquid Applied Air Barrier
- G. Section 07600: Flashing and Sheet Metal
- H. Section 07900: Sealants
- I. Section 07910 Through Penetration Protection Systems
- J. Section 08520 Aluminum Window

1.03 REFERENCES

- A. ASTM A82 - Cold-Drawn Steel Wire for Concrete Reinforcement.
- B. ASTM A615M - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- C. ASTM C55 - Concrete Building Brick.
- D. ASTM C216 - Facing Brick.
- E. ASTM C90 - Hollow and Solid Load-Bearing Concrete Masonry Units.
- F. ASTM C129 - Non-Load-Bearing Concrete Masonry, Normal Weight Units.
- G. ASTM C426 - Shrinkage Testing of Concrete Masonry Units.

- H. ASTM C476 - Grout for Reinforced and Non-Reinforced Masonry.
- I. FF QQ-W-416 - Wire, Steel, Carbon, (Round, Bare and Coated).
- J. ASTM C140 - Sampling and Testing Concrete Masonry Units.
- K. ACI-530/ACI 530.1 - Building Code Requirements for Masonry Structures and Specifications for Masonry Structures.
- L. ASTM C331 – Standard Specification for Lightweight Aggregate for Concrete Masonry Units.
- M. ASTM A951 – Standard Specification for Masonry Joint Reinforcement.
- N. ACI 216.1-97/TMS 0216.1-97 – Standard Method for Determining Fire Resistance of Concrete and Masonry Construction Assemblies.

1.04 REQUIREMENTS OF REGULATORY AGENCIES

Fire-resistance rated masonry: Comply with requirements for materials and installation established by governing authorities for the construction and fire-resistance rating indicated.

1.05 SUBMITTALS

- A. Product Data for each type of masonry unit, accessories and other manufactured products specified in this Section.
- B. Shop drawings for masonry reinforcing as indicated on Drawings, detailing fabrication, bending and placement of reinforcing bars.
- C. Grout mix design for grout used in reinforced and non-reinforced masonry.
- D. Samples:
 - 1. Four (4) samples of each type of exposed masonry unit required, indicating the full range of exposed colors and textures.
 - 2. All accessories that shall be embedded in masonry.
- E. Material certificates signed by the manufacturers, attesting to compliance with referenced standards and requirements of this Section.
 - 1. Cement products required for masonry grout.
 - 2. Material and grade for reinforcing bars.
 - 3. Each type and size of joint reinforcement.

4. Each type and size of anchors, ties, and other metal accessories.
5. UL listings (or equivalencies) for masonry utilized in fire resistive assemblies, indicating hourly rating.

1.06 QUALITY ASSURANCE:

- A. Samples: Typical units of each type of masonry shall be submitted to the Architect before beginning sample panel.
- B. Mock-up Panel:
 1. Construct a sample panel 5'-4" X 6' minimum on the job site in a location selected by the Architect, and situated such that both interior and exterior faces are clearly visible. Construct panel of selected units representing full color and texture range of both the facing units and the masonry back-up. Panel shall demonstrate cavity wall construction as indicated on the Drawings and Specifications but not limited to the following:
 - a. solid grouted CMU with reinforcement
 - b. brick
 - c. insulation
 - d. thru wall flashing
 - e. termination bar with flashing
 - f. weeps
 - g. liquid applied air-barrier
 - h. lintel
 - i. sealants
 - j. control joints
 - k. aluminum window frame
 - l. profile footer (simulated with CMU)
 - m. [_____] (Insert other exterior cladding material per project scope of work)
 2. The approved panel shall be a standard of comparison for all masonry work, and shall serve as a standard of quality for the following criteria:
 - a. Reasonable uniformity of color and texture for all facing units.
 - b. Reasonable uniformity of shade and texture for all exposed interior masonry units.
 - c. Reasonable accuracy for color, thickness and tooling of all mortar joints for both facing units and interior exposed masonry units.
 - d. Level of workmanship for installation of thru-wall flashing, air barrier and weep holes.

- e. Level of workmanship for integrity of cavity air space (free of mortar droppings or other obstructions).
 - f. No masonry work shall begin until the Architect, in concurrence with the Owner's Representative, has given approval of the panel in writing.
3. Failure of masonry work to comply with the standards of quality represented by the sample panel may, at the discretion of the Owner's Representative, give cause for the rejection of that work.
 4. The approved sample panel shall remain in place until completion of the project, and shall be demolished and removed from the site upon approval of the Owner's Representative.
- C. Test Reports: As a condition of approval, the masonry units listed here shall require the submittal of the following certified test reports:
1. Hollow load-bearing units:
 - a. ASTM C90-93, for Type 1, moisture controlled units using 8" samples.
 - b. ASTM C-426-83 for average shrinkage not to exceed .030 using a minimum of three (3) 8" samples. The test report shall indicate shrinkage measurements for each duration period of drying. Testing shall be performed for a minimum total time of 19 days, or until equilibrium is obtained, whichever is greater.
 - c. ASTM C140-75 indicating absorption characteristics.
 2. Hollow non-load bearing units:
 - a. ASTM C129-85 for Type 1, moisture controlled units using 6" samples.
 - b. ASTM C426-83 for average shrinkage not to exceed .030 using a minimum of three (3) 6" samples. The test report shall indicate shrinkage measurements for each duration period of drying. Testing shall be performed for a minimum total time of 19 days, or until equilibrium is obtained whichever is greater.
 - c. ASTM C140-75 indicating absorption characteristics.

1.07 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Units shipped from the manufacturer shall comply with the parameters of Type 1 for moisture content. Units shall be delivered covered and protected from the weather in such a manner as to eliminate contact with excessive moisture.
- B. Store units above ground.
- C. Store on level platform, which permits air circulation under stack.
- D. Cover and protect units from weather, moisture and neglect.
- E. Protect anchors, ties, and reinforcement from weather exposure and construction activity.

1.08 COLD WEATHER PROTECTION

- A. Conform to BIA Technical Notes 1, and 1A.
- B. Conform to applicable requirements of ACI 530.1.

1.09 HOT WEATHER PROTECTION

- A. Protect masonry construction from direct exposure to wind and sun when erected in an ambient air temperature of 99 degrees F in shade, with RH less than 50 percent.
- B. Conform to applicable requirements of ACI 530.1.

PART 2 - PRODUCTS**2.01 FACE BRICK**

- A. Face brick shall comply with ASTM C216, Type FBS, Grade SW. (Face brick shall match existing for addition and alteration projects.)
 - 1. Brick: [Add manufacturer name and brick selection]
 - 2. Accent brick shall be: [Add manufacturer name and brick selection]
- B. All face brick used as an interior finish material shall be bullnose at all external corners.

2.02 CONCRETE MASONRY UNITS

- A. Single source responsibility: All masonry units shall be of one manufacturer.

- B. Hollow load-bearing units: ASTM C90-93, Grade N, Type 1 nominal face dimension of 8 x 16 inches.
- C. Building Brick: ASTM C55-85, Grade N, Type 1.
- D. Hollow non-load bearing units: ASTM C129-85, Type 1 and nominal face dimension of 8 x 16 inches.
- E. Solid load bearing units: ASTM C90-93.
- F. Approved Manufacturers:
 - 1. An approved manufacturer is one who has given evidence that the masonry units to be supplied have been tested in accordance with the ASTM specifications listed in this specification (see Quality Assurance). The manufacturer shall have on file with the Owner current certified test reports. Current test reports are defined as those reports performed and dated within twelve (12) months of the bid due date for this project.
 - 2. The manufacturer shall certify, as a condition of approval, that the masonry units supplied for the project shall be a minimum of 30 days old at time of shipment from manufacturer, and shall comply with 1.05 (A) above.
- G. Provide UL listed units as required for fire resistant ratings indicated, or provide units for masonry assemblies complying with ACI 216.1-97/TMS 0216.1-97 for the fire resistant rating required.
- H. Provide Bullnose units as indicated and at all external corners.

2.03 ANCHORS, TIES AND JOINT REINFORCEMENT

- A. Acceptable Manufacturers:
 - 1. Hohmann and Barnard, Hauppauge, NY, 1-631-234-0600 (www.h-b.com) (Basis of Specification except as noted)
 - 2. AA Wire Products, LLC, Chicago, IL, 1-312-586-6700
 - 3. Wirebond, Charlotte, NC, 1-800-849-6722 (www.wirebond.com)
- B. Horizontal Joint Reinforcement
 - 1. General: Factory welded, truss type wire units, pre-fabricated into straight, corner and tee units.
 - 2. Multi-wythe (cavity) wall: Truss type joint reinforcement with factory welded projecting eyes to accommodate thickness of cavity insulation and

- to accept adjustable masonry veneer ties. Hohmann and Barnard "Lox All" adjustable eye-wire, truss type #170.
3. Composite Wall (no cavity): 3-wire truss type joint reinforcement; Hohmann and Barnard "Lox All" #130 "Truss-Tri Mesh".
 4. Single-wythe wall: 2-wire truss type joint reinforcement; Hohmann and Barnard "Lox All" #120 "Truss-Mesh".
 5. Longitudinal wire:
 - a. Style: Single one sided
 - b. Treatment: Deformed
 - c. Wire: ASTM A-82
 - d. Size: 9 gauge
 6. Transverse wires:
 - a. Wire: ASTM A-82
 - b. Size: 9 gauge
 7. Finish: Hot-dip galvanized, ASTM A153, class B-2 for both exterior and interior masonry walls.
- C. Restoration Anchors (for securing existing face brick to existing CMU backup): Hohmann and Barnard Torq-Lox 500, sized to fit masonry joint (facade hole diameter).
- D. Masonry Ties and Anchors
1. Masonry-to-column ties: 3/16" diameter wire, hot dipped galvanized, triangular type; Hohmann and Barnard #VBT "Vee" wall tie (for use with weld-on column ties).
 2. Rigid partition anchors (load bearing walls): 3/16" x 1 1/4" bent bars, hot dipped galvanized, 2" bends; Hohmann and Barnard #344.

2.04 MASONRY REINFORCING STEEL

- A. Steel reinforcing bars: Billet steel complying with ASTM A615, Grade 60, deformed.
- B. Steel reinforcing wire: Complying with ASTM A496, deformed, with ASTM A153, Class B-2 zinc coating.

2.05 FLASHING

A. Through-wall Flashing Membrane (Self-Adhering):

1. SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film, having the following physical properties:
 - a. Thickness: 40 mils (1.0 mm).
 - b. Tear Resistance: 45 lbs. MD to ASTM D1004;
 - c. Tensile Strength (film): 5000 psi ASTM D882
 - d. Puncture Resistance: 134 lbf to ASTM E154;
 - e. Low temperature flexibility: -22°F to CGSB 37-GP-56M;
 - f. Aluminum termination bar, wire-bond model #4200 required for vertical membrane flashing with a vertical rise greater than 12" or higher, seal top with Henry 925 Sealant.
2. Basis of Design Product: Blueskin TWF, Henry Company, Huntington Park , CA.
 - a. Other acceptable products shall be 705 TWF, Carlisle Coatings & Waterproofing, Wylie, TX. (www.carlisleccw.com)
3. Coordinate with and confirm compatibility with air barrier system specified in section 07265.

2.06 CEMENT PARGING

One coat of mortar as specified in Section 04100 with an anti-hydro additive, 1/2" minimum total thickness or as denoted on Drawings.

2.07 WEEP HOLES

- A. Full course and joint polypropylene plastic weep vent in a range of colors for Architect's selection and coordination with the range of brick types in the project. Weep vent installed in accordance with 3.13 of this Section. Basis of design "Cell Vent" or approved equal.

2.08 CLEANING AGENTS

- A. As recommended by brick manufacturer. Protect adjacent surfaces, such as window frames, door frames and wall cladding from exposure to cleaning agents.

2.09 PVC CONTROL JOINT MATERIAL

- A. "Wirebond", extruded polyvinyl chloride, conforming to ASTM D2287, type PVC 654-4; ASTM D2240, Durometer Hardness of 80. Select joint configuration to cover full depth of joint.

- B. See Drawings for locations and details.
- C. Apply sealant at both sides of joint.
- D. Coordinate work with sealants, etc. specified in Section 07900 and Expansion Control specified in Section 05800.

2.10 EXPANSION JOINTS

See Sections 05810 and 07900.

PART 3 - EXECUTION

3.01 QUALITY CONTROL

Should concrete masonry units be encountered on the job that do not comply with the criteria described in 1.06 and 2.02, then this condition shall be grounds for rejection of the company producing the units as an approved manufacturer.

3.02 INSPECTION

- A. Carefully examine Drawings. Check arrangement of courses and jointing with size of masonry openings and work built-in in connection with masonry. If discrepancies occur, notify Architect immediately.
- B. Inspect foundations to assure surfaces to support masonry work are as follows:
 - 1. To proper grades and elevations.
 - 2. Free of dirt and other deleterious materials.
 - 3. Surfaces not properly prepared have been satisfactorily corrected.

3.03 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4 inch in 10 feet, 3/8 inch in a story height not to exceed 20 feet, nor 1/2 inch in 40 feet or more. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4 inch in any story or 20 feet maximum, nor 1/2 inch in 40 feet or more.
- B. Variation from Level: For lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4 inch in any bay or 20 feet maximum, or 3/4 inch in 40 feet or more.

- C. Variation of Linear Building Line: Position indicated in plan and related portion of columns, walls, and partitions, do not exceed 1/2 inch in any bay or 20 feet maximum, nor 3/4 inch in 40 feet or more.
- D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, for dimensions indicated, do not exceed minus 1/4 inch nor plus 1/2 inch.

3.04 INSTALLATION

- A. Do not lay masonry when temperature is below 40 degrees F unless suitable means as approved by Architect and Owner's Representative are provided to heat materials. Protect work from cold and frost and insure that mortar will harden without freezing.
- B. Build walls and other masonry construction to full thickness indicated, except, build single-wythe walls to actual thickness of masonry units, using units of nominal thickness shown.
- C. Build all interior non-bearing masonry walls to full height of story, tight to underside of floor or roof deck. Voids between decking and top of wall shall be filled with fire safing insulation as specified in Section 07210.
- D. Build chases and recesses as indicated and as required. Provide not less than 8 inches of masonry between chase or recess and jamb of openings, and between adjacent chases and recesses. Build in chases, do not cut in.
- E. Cut masonry units with motor-driven saws designed to cut masonry with clean, sharp, unchipped edges. Cut units as required to provide pattern shown and to fit adjoining work neatly. Use full units without cutting wherever possible.
- F. Set units plumb, true to line with level courses accurately spaced within tolerance specified.
- G. Lay units in running bond.
- H. CMU shall be dry when laid.
- I. Adjust unit to final position while mortar is soft and plastic.
- J. Cut and fit masonry units, including that required to accommodate work of other sections, by masonry mechanics with masonry saws.
- K. Remove units disturbed after mortar has stiffened, clean joints and relay unit with fresh mortar.
- L. Grout masonry cells with reinforcing bars solid. Grout lift height and grout pour height shall not exceed 5 feet. Acceptable range for grout slump shall be between 8" and 11". Do not consolidate grout by rodding. Utilize cleanouts at

base of masonry walls if necessary to verify that cells have been completely filled.

3.05 JOINING OF WORK

- A. Where fresh masonry joins partially or totally set masonry, clean exposed surface of set masonry and remove loose mortar and foreign material prior to laying fresh masonry.
- B. If necessary to stop off a horizontal run of masonry, rack back one-half block length in each course. Tothing shall not be permitted.
- C. Fill collar joints full.

3.06 CONTROL AND EXPANSION JOINTS

- A. Keep joint free of mortar, debris, or other foreign matter.
- B. Refer to drawings for maximum control joint spacing.
- C. Wall reinforcement shall be interrupted at control and expansion joints.
- D. Provide and install control joints at a maximum of 30 foot spacing and as shown on drawings. If control joints are not indicated on drawings, contractor to provide and install at a maximum of 30 foot spacing. Architect will choose locations for both interior and exterior masonry control joints to be installed by contractor.

3.07 PROTECTION OF WORK

- A. Provide temporary shoring and bracing for all exterior and interior bearing and exterior bearing walls subsequent to erection and prior to permanent connection to floor or roof systems, or abutting cross walls. Temporarily shore and brace any other walls exposed to lateral forces or other conditions, which would compromise stability prior to completion of building envelope.
- B. Protect face materials against staining.
- C. Remove misplaced grout or mortar immediately. As walls are constructed, use methods to avoid mortar droppings in cavities.
- D. Protect sills, ledges, offsets, and similar items from mortar droppings or other damage during construction.
- E. Cover top of walls, so as to prevent any penetration of water, with nonstaining waterproof coverings when work is not in progress.

- F. Coverings shall overhang at least 2 feet on each side of wall and be securely anchored.

3.08 BUILD-IN WORK

- A. Install bolts, anchors, nailing blocks, inserts, doorframes, vents, flashing, conduits, insulation and other built-in items as masonry work progresses.
- B. Grout solid with mortar spaces around built-in items.
- C. Provide 1/4 inch to 3/8 inch outside joint around exterior doors and other wall openings to receive sealant. Rake and tool smooth to uniform depth of 1/2 inch.

3.09 HORIZONTAL AND VERTICAL FACE JOINTS

- A. Uniform 3/8 inch thick unless otherwise required to obtain coursing indicated.
- B. Shove vertical joints tight.
- C. Tool joints in all exposed masonry surfaces, when thumbprint hard, with round jointer.
- D. Cut mortar joints in surfaces covered with finish material flush.
- E. Remove mortar protrusions extending into cells or cavities to be reinforced and filled.
- F. Fill horizontal joints between top of masonry partitions and underside of concrete slabs or metal deck with compressed mineral wool firesafing insulation (unfaced).

3.10 HOLLOW UNIT MORTAR BEDDING

- A. Lay with full mortar coverage on horizontal and vertical face shells.
- B. Bed webs in courses of piers, columns, and pilasters; in starting course; and where adjacent to cells or cavities to be reinforced or filled with grout.

3.11 SOLID UNIT MORTAR BEDDING

- A. Lay with full horizontal and vertical joints.

3.12 BONDING WITH PREFABRICATED JOINT REINFORCEMENT

- A. Bond facing and backing of adjacent wythes of masonry walls with prefabricated joint reinforcement.
- B. Provide one cross wire serving as tie for not more than each two square feet of wall face area.

- C. Vertical spacing of reinforcement shall not exceed 16 inches.
- D. Embed longitudinal wires in mortar. Lap reinforcement a minimum of 6" at ends. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" Sections.

3.13 WEEP HOLES:

- A. Provide polypropylene plastic weep vent at 24 inches maximum on center horizontally in mortar joints of exterior wythe of walls along bottom of the foundations, through-wall flashings, and other water stops in wall. Place weep vent to span full height of head joint.
- B. Keep weep holes free of mortar and other obstructions.
- C. Coordinate location of weep holes with finish grade to avoid covering weep holes by planting soil, sod, or other landscaping materials.

3.14 LINTELS (Precast concrete lintels only or steel as scheduled)

- A. Provide precast masonry lintels where indicated and wherever openings of more than 1 foot 0 inch are shown without structural steel or other supporting lintels. Cure precast lintels before handling and installation. Exposed surface finish texture to match lightweight masonry units. Masonry lintels shall bear minimum of 8 in. on each side of opening.
- B. Submit data on precast lintels to Architect for review/approval.

3.15 FLASHING OF MASONRY WORK

- A. Provide concealed flashings in masonry work at, or above, all shelf angles, lintels, ledges and other obstructions at the downward flow of water in the wall to divert water to the exterior. Prepare masonry surfaces smooth and free of projections that could puncture flashing. Place through-wall flashing on bed of mortar and cover with mortar. Seal penetrations in flashing with sealant before covering with mortar.
- B. Extend flashings the full length of lintels and shelf angles and minimum of 4 inches into masonry each end. Turn up flashing a minimum of 2 inches each end. Extend flashing from a line 1/4 inch in from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4 inches. Terminations which are 12" or higher shall be secured with a termination bar and sealant.
 - 1. Coordinate with Section 07265.
 - 2. Install in accordance with manufacturer's instructions.
 - 3. Align and position the leading edge of through-wall flashing membrane with the fully adhere membrane over surface.

4. Roll firmly into place. Ensure minimum 2 inch overlap at all end and side laps.
 5. Promptly roll all laps and membrane to effect the seal.
 6. Ensure all air barrier work is complete prior to applying through-wall flashing.
 7. Ensure through-wall flashing membrane extends fully to the exterior face of the exterior masonry veneer. Trim of excess as directed by the Architect.
 8. Apply through-wall flashing membrane along the base of masonry veneer walls, over windows, doors and all other wall openings. Flashing shall form continuous flashing and extend up a minimum of 8 inches up the back-up wall.
- C. Provide weep holes in the head joints of the same course of masonry bedded in the flashing mortar. Comply with requirements of 3.13 of this Section.

3.16 POINTING AND CLEANING

- A. Cut out defective joints and holes in exposed masonry and repoint with mortar.
- B. Dry brush masonry surface after mortar has set at end of each day's work and after final pointing.
- C. Clean exposed masonry with stiff brush and clear water.
- D. Apply cleaning agent to sample area of 20 square feet in location acceptable to the Architect if cleaning by water does not produce satisfactory results.
 1. Do not proceed with cleaning until sample area is acceptable to Architect.
 2. Follow manufacturer's recommendations.
 3. Thoroughly wet surface of masonry on which no green efflorescence appears before using cleaning agent.
 4. Scrub with acceptable cleaning agent.
 5. Immediately rinse with clear water.
 6. Work small sections at a time.
 7. Work from top to bottom.
 8. Protect sash, metal lintels, and other materials that may corrode when masonry is cleaned with acid solution.
 9. Remove efflorescence in accordance with brick manufacturer's recommendations.

- E. Leave work area and surrounding surfaces clean and free of mortar spots, droppings and broken masonry.

3.17 CLEAN UP

- A. Remove all excess materials from the work area and dispose of legally.

END OF SECTION

**INSTRUCTIONS FOR EDITING
AND COORDINATION
SECTION 04270**

CAST STONE MASONRY

1. Page 04270-3, paragraph 2.04 (A): Edit mortar types for project requirements.
2. Page 04270-4, paragraph 3.01(B): Edit sub paragraphs for project requirements.

SECTION 04270
CAST STONE MASONRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section includes the following:

- 1. Cast stone trim window sills.

1.03 RELATED WORK

- A. Section 04200 Unit Masonry

1.04 SUBMITTALS

- A. Product Data: Include dimensions of individual components.
- B. Shop Drawings: Show fabrication and installation details for cast stone units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces.
- C. Samples: For each color and texture of cast stone required.
- D. Colored Mortar Samples: For each mortar color required.
- E. Qualification Data: For manufacturer.
- F. Material Test Reports.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer of cast stone units similar to those indicated for this Project, with sufficient production capacity to manufacture required units.
 - 1. Manufacturer is a producing member of the Cast Stone Institute.

PART 2- PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers:
1. Continental Cast Stone East; Russell, Inc.
 2. Corinthian Cast Stone, Inc.
 3. Arban Associates, Inc.
 4. Architectural Cast Stone, Inc.
 5. Advance Architectural Stone
 6. Cast Stone Systems, Inc.
 7. Stafford Stone Works, LLC
 8. Hoyle Stone Products
 9. Sun Precast Co., Inc.
 10. Pre-bid approved manufacturer.

2.02 CAST STONE UNITS

- A. Provide cast stone units complying with ASTM C 1364 using the vibrant dry tamp or wet-cast method.
1. Provide units that are resistant to freezing and thawing.
 2. Slope exposed horizontal surfaces 1:12, unless otherwise indicated.
 3. Provide raised fillets at backs of sills and at ends indicated to be built into jambs.
 4. Provide drips on projecting elements, unless otherwise indicated.
- B. Cure units by one of the following methods:
1. Cure units with steam in enclosed curing room at temperature of 105 deg F (41 deg C) or above and 95 to 100 percent relative humidity for 6 hours.
 2. Cure units with dense fog and water spray in enclosed warm curing room at 95 to 100 percent relative humidity for 24 hours.
 3. Cure units to comply with one of the following:
 - a. Not less than 5 days at mean daily temperature of 70 deg F (21 deg C) or above.
 - b. Not less less than 6 days at mean daily temperature of 60 deg F (16 deg C) or above.

- c. Not less than 7 days at mean daily temperature of 50 deg F (10 deg C) or above.
 - d. Not less than 8 days at mean daily temperature of 45 deg F (7 deg C) or above.
- C. Acid etch units after curing to remove cement film from surfaces to be exposed to view.
- D. Colors and Textures: Match Architect's samples.

2.03 ACCESSORIES

- A. Anchors and Dowels: Type 304 stainless steel.
- B. Proprietary Acidic Cleaner: Manufacturer's standard-strength, general-purpose cleaner complying with requirements in Division 04 Section "Unit Masonry" and approved for intended use by cast stone manufacturer and approved by cleaner manufacturer for use on cast stone and adjacent masonry materials.

2.04 MORTAR

- A. Comply with requirements in Division 04 Section "Unit Masonry" for mortar materials and mixes.
- 1. For setting mortar, use Type S.
 - 2. For pointing mortar, use Type N.
 - 3. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required.

2.05 SOURCE QUALITY CONTROL

- A. Employ an independent testing agency to sample and test cast stone units according to ASTM C 1364.

PART 3- EXECUTION

3.01 SETTING CAST STONE IN MORTAR

- A. Install cast stone units to comply with requirements in Division 04 Section "Unit Masonry."
- B. Set units in full bed of mortar with full head joints, unless otherwise indicated.
- 1. Fill dowel holes and anchor slots with mortar.
 - 2. Fill collar joints solid as units are set.

3. Build concealed flashing into mortar joints as units are set.
 4. Keep head joints in window sills with exposed horizontal surfaces open to receive sealant.
- C. Point mortar joints by placing and compacting mortar in layers not greater than 3/8 inch (10 mm). Compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
 - D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless noted otherwise.
 - E. Provide expansion, control, and pressure-relieving joints of widths and at locations indicated. Keep joints free of mortar and other rigid materials.
 - F. Prepare joints indicated to receive sealant and apply sealant of type and at locations indicated to comply with applicable requirements in Division 07 Section "Sealants."

3.02 INSTALLATION TOLERANCES

- A. Variation from Plumb: : Do not exceed 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum
- B. Variation from Level: : Do not exceed 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum
- C. Variation in Joint Width: : Do not vary joint thickness more than 1/8 inch in 36 inches (3 mm in 900 mm) or one-fourth of nominal joint width, whichever is less
- D. Variation in Plane between Adjacent Surfaces (Lipping): Do not vary from flush alignment with adjacent units or adjacent surfaces indicated to be flush with units by more than 1/16 inch (1.5 mm), except due to warpage of units.

3.03 ADJUSTING AND CLEANING

- A. Remove and replace stained and otherwise damaged units and units not matching approved Samples. Cast stone may be repaired if methods and results are approved by Architect.
 1. Replace units in a manner that shows no evidence of replacement.
- B. In-Progress Cleaning: Clean cast stone as work progresses.
 1. Remove mortar fins and smears before tooling joints.
 2. Remove excess sealant immediately, including spills, smears and spatter.

Final Cleaning: After mortar is thoroughly set and cured, clean exposed cast stone to comply with requirements in Division 04 Section "Unit Masonry Assemblies.

END OF SECTION