

SECTION 04 0511
MORTAR AND MASONRY GROUT

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 WORK INCLUDED

Mortar and grout for masonry construction.

1.03 RELATED WORK

- A. Section 01 45 00 – Testing and Laboratory Services.
- B. Section 04 22 00 – Concrete Masonry Units.

1.04 REFERENCES

- A. ACI 530 – Building Code Requirements for Masonry Structures.
- B. ACI 530.1 – Specifications for Masonry Structures.
- C. ASTM C5 – Specification for Quicklime for Structural Purposes.
- D. ASTM C144 – Aggregate for Masonry Mortar.
- E. ASTM C150 – Portland Cement.
- F. ASTM C207 – Hydrated Lime for Masonry Purposes.
- G. ASTM C270 – Mortar for Unit Masonry.
- H. ASTM C404 – Aggregate for Masonry Grout.
- I. ASTM C476 – Grout for Reinforced and Non-Reinforced Masonry.
- J. ASTM C780 – Test Method for Evaluation of Mortars.
- K. ASTM C952 – Testing of Mortar Bond Strength.
- L. ASTM C1072 – Method for Measurement of Masonry Flexural Bond Strength.
- M. ASTM C1142 – Ready Mixed Mortar for Masonry.

1.05 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Design Mix and Admixtures.
- C. Samples of mortar illustrating mortar color and range of color.

1.06 QUALITY ASSURANCE

Perform work in accordance with ACI 530 and ACI 530.1.

1.07 TESTING

- A. As specified in Section 01 45 00.
- B. Per ASTM C780 for Mortar.
- C. Per ASTM C143 for Grout.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products under provisions of Section 01 60 00.
- B. Maintain packaged materials clean, dry and protected against dampness, freezing and foreign matter.

1.09 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather:

Maintain materials and surrounding air temperature to minimum 40 degree F prior to, during and 48 hours after completion of masonry work.

B. Hot Weather:

Maintain materials and surrounding air temperature to 90 degrees F prior to, during and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 MATERIALS

A. Portland Cement: ASTM C150, normal-Type I.

B. Mortar Aggregate: ASTM C144, standard masonry type, clean, dry, protected against dampness, freezing, and foreign matter.

C. Grout Course Aggregate: ASTM C404.

D. Hydrated Lime: ASTM C207, Type S.

E. Water: Clean and potable.

F. Water Repellent Additive: "Mortar Tite" integral admixture for water repellent mortar by Addiment, Inc.

G. Mortar Color: An approved brand, pure, non-fading, mineral pigment color as submitted by the Contractor and selected by Architect. A different color may be used with each type and color of masonry.

H. Substitutions under provisions of Section 01 60 00.

2.02 MORTAR MIXES

A. Allowable mortar mix ranges for proportions of mortar for masonry by volume per ASTM C270 types.

1. Mortar for exterior masonry veneer walls:

-1 part Portland cement

-½ part hydrated lime (1 part)

-Sand not less than 2-1/4 and not more than 3 times the sum of the separate volumes of cementitious materials

-Incorporate "Mortar Tite" per label instructions.

2. Mortar for structural walls (Type S):

-1 part Portland cement

-½ part hydrated lime

-Sand not less than 2 ¼ and not more than 3 times the sum of the separate volumes of cementitious materials.

-Incorporate "Mortar Tite" per label instructions for exterior walls.

B. Provide cement-lime mortar; masonry cement is not acceptable.

C. Color as selected by Architect.

2.03 GROUT MIXES

A. Shall be in accordance with ASTM C476.

B. 2500 PSI Strength.

C. Testing: In accordance with ASTM C1019.

2.04 MORTAR MIXING

- A. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use between 3 minutes and 5 minutes with the maximum amount of water to produce a workable consistency in a mechanical batch mixer.
- B. If water is lost by evaporation, re-temper within 2 hours of mixing. Do not re-temper mortar after 2 hours of mixing.
- C. GROUT MIXING:
Comply with ASTM C476 for grout of consistency at time of placement that will completely fill all spaces intended to receive grout.

2.05 MORTAR STRENGTH

Mortar shall have a minimum 28 day compressive strength of 1800 PSI. This is Type S.

2.06 PRECONSTRUCTION TESTING

- A. Mortar Mixes: Test mortars prebatched by weight in accordance with ASTM C780 recommendations for preconstruction testing. Test results will be used to establish optimum mortar proportions and establish quality control values for construction testing.
- B. Grout Mixes: Test grout batches in accordance with ASTM C1019 procedures. Test results will be used to establish optimum grout proportions and establish quality control values for construction testing.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install mortar and grout in accordance with ASTM C270.
- B. Work grout into masonry cores and cavities to eliminate voids.
- C. Do not install grout in lifts greater than 16 inches without consolidating grout by rodding.
- D. Do not displace reinforcement while placing grout.
- E. Remove excess mortar from grout spaces.

3.02 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01 45 00.
- B. Test and evaluate mortar in accordance with ASTM C780.
- C. Test and evaluate grout in accordance with ASTM C1019.

END OF SECTION

SECTION 04 2000
UNIT MASONRY

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 WORK INCLUDED

- A. Concrete masonry units.
- B. Lintels.
- C. Reinforcement, anchors, and accessories.

1.03 RELATED WORK

- A. Section 04 05 00 – Mortar and Grout.
- B. Section 06 10 00 – Rough Carpentry.
- C. Section 07 90 00 – Joint Sealant.

1.04 REFERENCES

- A. ACI 530 – Building Code Requirements for Masonry Structures.
- B. ACI 530.1 – Specifications for Masonry Structures.
- C. ASTM A82 – Cold Drawn Steel Wire for Concrete Reinforcement.
- D. ASTM A123 – Zinc Coatings on Iron and Steel Products.
- E. ASTM A951 – Standard specification for masonry joint reinforcement.
- F. ASTM C55 – Concrete brick.
- G. ASTM C90 – Load-bearing concrete masonry units.
- H. ASTM C126 – Glazed concrete masonry units.
- I. ASTM C129 – Non-load-bearing concrete masonry units.
- J. ASTM C744 – Prefaced concrete units.
- K. ASTM C780 – Method for Construction Evaluation of Mortars.
- L. ASTM E514 – Test Method for Water Permeance of Concrete Masonry.

1.05 SUBMITTALS

- A. Submit in accordance with Section 01 33 00.
- B. Submit manufacturer's product data for each type of concrete unit masonry, concrete unit masonry accessories, and other manufactured products, including certifications that each type complies with specified requirements.
- C. Submit 1 sample of all accessories and anchors.

1.06 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 530 and ACI 530.1.
- B. Maintain one copy of documents on site.

1.07 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified with minimum 3 years experience.
- B. Installer: Minimum 5 years documented experience.

1.08 MOCKUPS

A. Concrete Masonry Unit Mockup:

1. Provide mockups as directed by the Architect.
2. As soon as the samples have been approved, deliver enough units to the job site to construct:
 - a. 4'-0" long x 4'-0" high sample wall panel. Note that Interior walls shall be constructed for exposed to view on both sides. Provide sample of each condition including Split Face units when used for specific projects, interior walls and each exterior wall system. Include back up wall (studs or CMU), sheathing, flashings, damproofing, mortar net and weeps, caps, sills, insulation, etc.
3. Construct the panel using the mortar, reinforcing, tooling and cleaning as specified.
4. The approved sample panel shall be the standard of workmanship.
5. Panel shall not be removed until masonry work as required by this section has been accepted or as directed by the Architect.
6. Use sample panel to test cleaning methods.

1.09 ENVIRONMENTAL CONDITIONS

A. Hot Weather Installation:

Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

B. Cold Weather Installation:

1. No frozen work shall be built upon.
2. Before erecting masonry during temperatures below 40 degrees F, a written statement shall be submitted and approval received of the methods proposed to heat the masonry materials and protect the masonry from freezing as required below.
3. Masonry units shall be kept completely covered and free from frost, ice, and snow at all times. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.

1.10 DELIVERY, STORAGE AND HANDLING OF MATERIALS

Deliver, store and handle materials to prevent inclusion of foreign materials and damage by water or weather. Store packaged materials in their original packages. Damaged or deteriorated materials shall be removed from the premises.

1.11 PRE-INSTALLATION CONFERENCE

Convene one week prior to commencing work of this section, under provisions of Section 01 20 00.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Acceptable concrete masonry unit manufacturers:

1. Normal Concrete Masonry Units (Smooth Face and Split Face) CMU
 - a. Product specified is manufactured by Texas Building Products Corporation and is listed as a standard of quality.
 - b. Products of Featherlight Building Products Corporation, conforming to specification requirements are acceptable.
2. Substitutions: Under provisions of Section 01 60 00

B. Normal Concrete Masonry Units:

1. Provide units complying with characteristics indicated below for Grade, Type, face size, exposed face and, under each form of block included, for weight classification:
 - a. All concrete masonry units: ASTM C90 Grade N, hollow units made from Portland Cement and lightweight aggregate.
 - b. Sizes: Manufacturer's standard units with nominal face dimensions of 16 inches long x 8 inches high x (4", 8", and 12") thickness as indicated or as required.
 - c. Type I, ASTM C90, moisture-controlled units. Limit moisture absorption during delivery and until time of installation to the maximum percentage specified for Type I units for average relative humidity as reported by the U.S. Weather Bureau Station nearest the project site.
 - d. Exposed Faces: Manufacturer's standard color and texture. Double face units shall have the same texture on both sides except split face units. All masonry exposed to view from the exterior shall have integral color and waterproofing, unless specifically indicated.
 - e. Special Shapes: Provide where required for lintels, corners, jambs, sash, control joint, headers, bonding, starter blocks, sill blocks, and other special conditions. Bull nose corner units shall be used at all exposed corners and jambs, inside the building.

2.02 REINFORCEMENT, ANCHORS AND ACCESSORIES

A. Acceptable Manufacturers:

1. Products specified are manufactured by Hohmann & Bernard, Inc., and are listed as a standard of quality.
2. Products of Dur-O-Wall, AA Wire Products, and Heckman Building Products, conforming to specification requirements, are acceptable.
3. Substitutions: Under provisions of Section 01 60 00.

B. Horizontal Joint Reinforcement:

1. Wire not lighter than 9-gauge conforming to ASTM A82; hot-dipped, galvanized finish ASTM A641, Class 1.
2. Joint Reinforcement: Consists of a ladder type masonry reinforcing; overall width approximately 2 inches less than finished wall width; Dur-O-Wal Ladur.
3. Adjustable Joint Reinforcement Cavity Walls:
 - a. CMU Backup truss-type masonry reinforcing with box ties flush-welded every 16 inches o.c. that extend into the outer wythe; overall width approximately 2 inches less than finished wall width; Lox-All Truss-Box-Mesh.
 - b. Screws: Self-drilling, self-taping, Type 410 Stainless Steel.
 - c. Reinforcing Steel: Type specified in Section 03 20 00; sizes as indicated on drawings.
 - d. Anchors: Dovetail Anchors: Corrugated bar type, minimum 16-gauge and hot-dipped galvanized. Dovetail anchor slots furnished and installed in Section 03 10 00.
 - e. Wall Stabilizer: Slip-set stabilizer, hot-dipped, galvanized, Type "H" and "U".

C. Reinforcing Steel: ASTM A615 Grade 60, deformed billet-steel bars, unfinished.

D. ACCESSORIES

1. Control Joints: Preformed rubber material; RS Series conforming to ASTM 2000 2AA-805, size as required.
2. Bond Breaker: ASTM D226, #15 felt.
3. Compressible Filler: Premolded, flexible cellular neoprene rubber filler strips complying with ASTM D 1056, Grade RE41E1, capable of compression up to 35% of width and thickness indicated.

4. Mortar Net: High-density polyethylene (HOPE), 90% open mesh, dovetail shape. Size as required for cavity opening.
5. BlockNet by Mortar Net for all exterior single wythe masonry walls. Installed per mfr recommendations
6. Weep Holes: Weeps shall be formed with weep tabs as part of the Total Flash system. Where weep tabs are not used provide tube type 3/8" OD x 3 1/2" long
7. Flashing: As per Section 07 62 00.
8. Other accessories as may be required for work of this section.

2.03 PRECONSTRUCTION TESTING

- A. Testing will be conducted by an independent test agency, in accordance with provisions of Section 01 45 00.
- B. Compressive Strength: Prepare and test masonry prisms in accordance with ASTM C1314 for all load-bearing walls.
 1. Prepare two sets of prisms using units and mortar identified for load-bearing walls. Test one set at 7 days and the other set at 28 days.
 2. Concrete masonry prisms: Height-to-thickness ratio of not less than 1.33 and not more than 5.0; apply correction factor per ACI 530/530.1/ERTA for ratio other than 2.0.
- C. Flexural Bond Strength: For load-bearing walls, test masonry prisms in accordance with ASTM E518 with tooled joints downward.

PART 3 EXECUTION

3.01 LAYING AND SETTING CONCRETE UNIT MASONRY

- A. Concrete masonry units shall be laid up ahead of masonry veneer, then dampproofed as specified in Section 07 19 00
- B. Lay concrete unit masonry with full-face shell mortar beds. Fill vertical head joints (end joints between units) solidly with mortar from face of unit to a distance behind face equal to not less than the thickness of longitudinal face shells. Solidly bed cross webs with mortar of starting courses, cells filled with grout and cells with reinforcement.
- C. Maintain vertical continuity of core or cell cavities, which are to be reinforced and grouted, to provide minimum clear dimension indicated and to provide minimum clearance and grout coverage for vertical reinforcement bars. Keep cavities free of mortar. Solidly bed webs in mortar where adjacent to reinforced cores or cells.
- D. All work shall be plumb and true and built accurately to the dimensions shown. All units shall be set in running bond except where indicated stacked bond. Units shall be cut accordingly to fit around pipes, ducts, openings, and all voids slushed full with mortar.
- E. Units shall be set tightly against inside of frames where they occur and all voids slushed full with mortar. Frame anchors shall be built-in as the work progresses and the cells of all masonry units adjacent to the bucks or frames shall be filled solidly with mortar. Such filling shall extend to full height of frames and to a point not less than 16 inches on each side of jamb. Slush hollow metal frame jambs in masonry work with well-compacted mortar as the work progresses.
- F. Wall horizontal joint reinforcement at intersections, corners, and splices shall be lapped 12 inches. Similar reinforcement shall be placed over all door openings in block walls and extended a minimum of 4 feet beyond the jamb on each side of the opening. The above reinforcement is in addition to the regular reinforcement in every other block joint.
- G. Vertical joints in concrete masonry units work shall be spaced so as to line up plumb and true, and all joints shall be as uniform as the units will allow.
- H. Bond partitions to other partitions, but in locations where partitions join exterior walls, form cold butt

joints and tie with corrugated ties spaced 16 inches o.c. vertically. Sealant for cold butt joints shall be in accordance with Section 07 90 00.

- I. Anchor all masonry to concrete by means of reinforcing dowels spaced not to exceed 16 inches o.c. vertically or as required by structural documents.
- J. Where cutting of any concrete masonry unit is necessary and the joints are exposed, the cuts shall be made with a power driven saw with wet diamond blade.
- K. Mortar joints shall be nominal 3/8 inch thick varying slightly as necessary to work bond and shall be cut off flush where back is not exposed and elsewhere where indicated on the drawings. All other joints shall be tooled with sled jointing tool to provide neat concave joint after they have become thumbprint hard.
- L. All walls and partitions shall be laid with extreme care to prevent irregularities, mortar splotches, and hold clean straight mortar joint.
- M. All concrete masonry units shall have all mortar and other foreign materials completely removed from the pores and faces of the block and left clean. Pointing of units shall be done when joints are tooled.
- N. Top of all CMU walls shall have continuous bond beams. On span greater than 10ft. without perpendicular intersecting walls or diagonal bracing to structure indicated on drawings, provide horizontal diagonal bracing on top of walls at 6ft. from the corner using 4 x 4 x 1/4 steel angle. All walls shall be secured to structure above or nearest adjacent structural wall in concealed manner where possible.
- O. Reinforcing Bars:
 - 1. Reinforcing bars shall be installed at locations as indicated on the drawings.
 - 2. Clean reinforcement of loose rust, mill scale, earth, and other materials which will reduce bond to mortar or grout. Do not use reinforcement bars with kinks or bends not shown on drawings, or bars with reduced cross-section due to excessive rusting or other causes.
 - 3. Place vertical reinforcement prior to laying of concrete unit masonry. Extend above elevation of maximum pour height as required for splicing. Support in position at vertical intervals not exceeding 192 bar diameters nor 10 feet.
 - 4. Position reinforcement accurately at the spacing indicated. Support and secure vertical bars against displacement. Provide at least 1/2 inch clear between vertical bars and concrete unit masonry shell.
 - 5. Splice reinforcement bars where shown; do not splice at other points unless approval is obtained. Provide lapped splices, unless otherwise indicated. In splicing vertical bars or attaching to dowels, lap ends, place in contact, and wire tie.
- P. Grouting:
 - 1. Provide fine grout in accordance with ASTM C476 for filling spaces less than 4 inches in one or both horizontal directions.
 - 2. Provide coarse grout in accordance with ASTM C476 for filling 4 inch spaces and larger in both horizontal directions.
 - 3. Grout for cells of concrete unit masonry shall be 2500 psi grout in accordance with Section 04 05 00.
 - 4. Pour grout using chute or container with spout. Rod or vibrate grout during placing. Place grout continuously; do not interrupt pouring of grout for more than one hour. Terminate grout pours 1-1/2 inch below top course of pour. Maximum pour height allowed shall be 5 feet.
- Q. Control Joints:
 - 1. Vertical: Locate where indicated on the drawings or max 15' (field verify exact location with architect) and full height along both sides of all openings including doors and windows. Lay

units to form a vertical joint free of mortar and same width as normal head joint. Do not continue horizontal joint reinforcing through control and expansion joints.

2. Sealant: Shall be in accordance with Section 07 92 00.

R. At the top of sloping walls, cut rake at continuous angle to avoid stepping the block

3.02 FLASHINGS

Build in, as the work progresses, all dampproofing and flashings which enter the masonry, using the material and following the instructions of the appropriate section of the specifications.

3.03 REINFORCED MASONRY BOND BEAMS AND LINTELS

- A. Provide concrete masonry unit lintels and tie beams in the locations indicated and over openings more than 15 inches wide where no lintels are indicated. This includes openings for ducts and similar items.
- B. All exposed lintels, including precast units, shall have joint to match the pattern of the adjacent masonry.
- C. Form lintels and bond beams of concrete masonry trough units; reinforced as indicated and fill with 2500 psi grout. Care shall be exercised in casting lintels and bond beams to insure complete filling of cells and true alignment with uniform mortar joints on exposed faces.

3.04 OPENINGS AND HOLES

- A. Provide all openings and holes in masonry work. Provide all chases and recesses in masonry work of all types as indicated on the drawings and as required for pipes, ducts, and other work of Mechanical and Electrical Contractors. Such work shall be accurately located by the Contractor requiring the work, but masonry work shall not be constructed without giving other Contractors due notice and opportunity to lay out or install such items as may be required for their work.
- B. Where required for installation of work of other Contractors, leave openings as indicated on the drawing or as required to receive a later installation.
- C. After work of other Contractors is in place, openings shall be neatly filled with masonry of the same type as in the adjoining surfaces.

3.05 SETTING AND BUILDING-IN

- A. Build-in materials occurring in any type of masonry construction which are furnished by other Contractors. All build-in work shall be accurately placed, secured, held in position, and located by the Contractor requiring the work.
- B. Set and build-in items of miscellaneous iron such as loose lintels and anchors required to complete all parts not connected to steel.
- C. Set all anchor bolts required for the attachment of work to masonry.
- D. Build-in recesses, flashings, slots, anchors, reinforcing, sleeves and other work required by the drawings.

3.06 PROTECTION

At the end of each days work, cover the tops of walls with canvas or other suitable material weighted down to exclude weather.

3.07 REPAIR, POINTING AND CLEANING

- A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes and completely fill with mortar. Point-up joints at openings and adjacent work to provide a neat, uniform appearance, properly prepared for application of sealant where it occurs.

- C. Clean concrete unit masonry to comply with masonry manufacturer's directions and applicable NCMA "Tek" bulletins.

3.08 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 45 29.
- B. Prism Tests: Test masonry and mortar panels for compressive strength in accordance with ASTM C1314 and for flexural bond strength in accordance with ASTM C1072 or ASTM E518; perform tests for load bearing wall construction and evaluate results. Constructed two sets of prisms for every 5000 sq. ft. of wall surface.

END OF SECTION

SECTION 04 4301
STONE MASONRY VENEER

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sawn stone veneer at exterior walls.
- B. Metal anchors and accessories.
- C. Setting mortar and pointing mortar.

1.02 REFERENCE STANDARDS

- A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- C. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
- D. ASTM C568/C568M - Standard Specification for Limestone Dimension Stone.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on stone units, _____, mortar, and reinforcement.
- C. Samples: Submit two stone samples illustrating minimum and maximum stone sizes, _____, color range, texture, and markings.
- D. Samples: Submit mortar color samples.

1.05 QUALITY ASSURANCE

- A. Stone Fabricator Qualifications: Company specializing in fabricating cut stone with minimum ten years of experience.
- B. Installer Qualifications: Company specializing in performing work of the type required by this section, with minimum five years of documented experience.

1.06 MOCK-UP

- A. Construct stone wall mock-up, 6 feet long by 4 feet wide; include stone anchor accessories, corner condition, and typical control joint in mock-up.
- B. Locate where directed.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect stone from discoloration during storage on site.

1.08 FIELD CONDITIONS

- A. Cold Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Stone Quarriers:
 - 1. Salado Quarry; 6-8-12 sawn top and bottom with chop ends, random lengths, contact: Shawn Webb, Salado, 254-793-3355.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Stone Masonry Reinforcement and Accessories
 - 1. Hohmann & Barnard, Inc; _____: www.h-b.com/sle.

2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 STONE

- A. Limestone: Indiana Oolitic Limestone; complying with ASTM C568/C568M Classification I - Low Density.

2.03 MORTAR

- A. Setting Mortar: ASTM C270, Type S, using the Proportion Method as specified in Section 04 0511.
- B. Pointing Mortar: Type N as specified in Section 04 0511, and using the Property Method in ASTM C270.
 1. Color: Mineral oxide pigment; color as selected. Provide _____ manufactured by _____.

2.04 ACCESSORIES

- A. Wall Ties: Formed steel wire, at least ____ inch diameter, hot dip galvanized per ASTM A123/A123M, eye and pintle type, with provision for vertical adjustment after attachment.
- B. Flashings: _____ type as specified in Section 07 6200.
- C. Weep/Cavity Vents: Molded PVC grille, insect resistant.
- D. Cleaning Solution: Type that will not harm stone, joint materials, or adjacent surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that support work and site conditions are ready to receive work of this section.
- B. Verify that items built-in under other sections are properly located and sized.

3.02 PREPARATION

- A. Establish lines, levels, and coursing. Protect from disturbance.
- B. Clean stone prior to erection. Do not use wire brushes or implements that mark or damage exposed surfaces.
- C. Clean sawn surfaces of rust stains and iron particles.

3.03 INSTALLATION

- A. Install flashings of longest practical length and seal watertight to back-up. Lap end joints minimum 6 inches and seal watertight.
- B. Size stone units to fit opening dimensions and perimeter conditions.
- C. Arrange stone pattern to provide color uniformity and minimize visual variations, and provide a uniform blend of stone unit sizes. Verify desired pattern with Architect.
- D. Arrange stone coursing in ashlar bond with consistent joint width.
- E. Set stone in full mortar setting bed to fully support stone over bearing surface. Use setting buttons or shims to maintain correct joint width.
- F. Install weep/cavity vents in vertical stone joints at 24 inches on center horizontally; immediately above horizontal flashings, above shelf angles and supports, and at top of each cavity space; do not permit mortar accumulation in cavity space.

3.04 REINFORCEMENT AND ANCHORAGE

- A. In addition, place wall ties at maximum 3 inches on center each way around perimeter of openings, within 12 inches of openings.

3.05 JOINTS

- A. Leave the following joints open for sealant:
 1. Head joints in top courses, including copings, parapets, cornices, sills, and steps.

2. Joints in projecting units.
 3. Joints between rigidly anchored units, including soffits, panels, and column covers.
 4. Joints below lugged sills and stair treads.
 5. Joints below ledge and relieving angles.
 6. Joints labeled "expansion joint".
- B. Rake out mortar joints 5/8 to 3/4 inch and brush joints clean to accommodate pointing mortar. Fill joints with pointing mortar.
 - C. Pack mortar into joints and work into voids. Neatly tool surface to concave joint.
 - D. At joints to be sealed, clean mortar out of joint before it sets. Brush joints clean.

3.06 CLEANING

- A. Remove excess mortar as work progresses, and upon completion of work.
- B. Clean soiled surfaces with cleaning solution.
- C. Use non-metallic tools in cleaning operations.

3.07 PROTECTION

- A. During temporary storage on site, at the end of working day, and during rainy weather, cover stone work exposed to weather with non-staining waterproof coverings, securely anchored.

END OF SECTION