

COLDSRING AND NEW WORLD STONWORKS® HAVE TEAMED UP TO DELIVER NATURAL STONE THAT IS SELECTED, WATERJET-CUT, SHAPED AND INSTALLED ACCORDING TO YOUR DRAWINGS AND SPECIFICATIONS. PRE-CUT NUMBERED STONE ARRIVE ON PALETES, STACKED IN ORDER. CHOOSE CONVENTIONAL MORTAR OR QUICK-SETTING EPOXY WITH POINTING MORTAR FOR INSTALLATION TIMES THAT ARE UP TO 75% FASTER, WITH NO WASTE.

SECTION NUMBERS AND TITLES IN THIS SPECIFICATION UTILIZE MASTERFORMAT 2004. THIS SPECIFICATION GUIDE IS WRITTEN ACCORDING TO THE CONSTRUCTION SPECIFICATIONS INSTITUTE (CSI) THREE-PART SECTION FORMAT (1998) AND PAGEFORMAT (1992), AS CONTAINED IN THE CSI PROJECT RESOURCE MANUAL.

THIS SECTION MUST BE CAREFULLY REVIEWED AND EDITED BY THE ARCHITECT/ENGINEER TO MEET THE REQUIREMENTS OF THE PROJECT AND TO COORDINATE WITH OTHER SPECIFICATION SECTIONS AND THE DRAWINGS.

CONSULT COLDSRING FOR ASSISTANCE IN EDITING THIS SPECIFICATION GUIDE FOR SPECIFIC APPLICATIONS.

NOTE ITEMS THROUGHOUT THE SPECIFICATION WHERE THE SPECIFICATION STATES "SHOWN ON DRAWINGS". THE DRAWINGS NEED TO SHOW THESE ITEMS OR MODIFY THE TEXT.

NOTE ITEMS THROUGHOUT THE SPECIFICATION WHERE THE TEXT IS ENCLOSED IN SQUARE BRACKETS: **[TEXT]**. EDIT THE TEXT WHERE THIS OCCURS BY MAKING SELECTIONS AND DELETING TEXT NOT DESIRED.

THESE SPECIFICATIONS WERE CURRENT AT THE TIME OF PUBLICATION BUT ARE SUBJECT TO CHANGE. PLEASE CONFIRM THE ACCURACY OF THESE SPECIFICATIONS WITH THE MANUFACTURER PRIOR TO APPLICATION.

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SECTION 04 43 10

STONE MASONRY SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. This Section specifies pre-cut, shaped and numbered stonework and setting materials for exterior applications.

B. Related Sections:

[Note to Specifier: Delete sections below not applicable to the project.]

1. Section 03 30 00 – Cast-in-Place Concrete for concrete backup wall.

2. Section 04 42 00 – Unit Masonry for concrete masonry unit backup wall.
3. Section 05 54 00 – Cold Formed Metal Framing for stud backup wall.
4. Section 06 61 00 – Rough Carpentry for wood backup wall.
5. Section 07 90 00 – Joint Sealants for sealant at perimeter of stone masonry.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's data sheets on each stone type and each manufactured product to be used.
- B. Shop Drawings: Submit fabrication and installation details for stone including dimensions and profiles of stone units.
 1. Include building elevations showing stone masonry locations.
 2. Include overall and key dimensions, and profiles of stone units.
 3. Show locations and details of joints.
- C. Verification Samples: Submit sample boards containing units sized to represent the full range of stone shapes, colors, and finish characteristics specified. Samples shall exhibit the full range of color and size expected.
 1. Sample boards shall include mortar in specified color when applicable.

1.3 QUALITY ASSURANCE

- A. Fabricator Qualifications: Engage experienced fabricator that has completed stone fabrication similar in material, design, and extent to that indicated for the project.
- B. Installer Qualifications: Engage experienced installer that has completed stone installation similar in material, design, and extent to that indicated for the project.

[Note to Specifier: Delete mockup if not required.]

- C. Visual Mock-Up: If requested by Architect, provide a mock-up for evaluation of appearance on site (not on the building). Mock-up shall be approximately 6 feet wide by 3 feet high with a minimum 18 inch corner return if applicable. Include specified materials and joint width. Retain mock-up until completion of the project, and then remove.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver stone to Project site, with each stone numbered and stacked on pallets according to their numbered order of assembly, and accompanied by a laminated assembly plan.
- B. Store materials as recommended by manufacturer, including the following.
 1. Stack stone on timber or platforms at least 4 inches above the ground.
 2. Prevent staining or discoloration during storage.
 3. Stockpile aggregate to prevent contamination from foreign materials.
 4. Store masonry accessories, including metal items, to prevent corrosion and contamination.

1.5 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
 1. Cold-Weather Requirements: ACI 530.1/ASCE 6/TMS 602.
 2. Hot-Weather Requirements: ACI 530.1/ASCE 6/TMS 602:

1.6 SEQUENCING AND SCHEDULING

- A. Conference: Convene a pre-installation conference to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

PART 2 PRODUCTS

2.1 MATERIALS AND STYLES

- A. Stone Masonry System: Stone as supplied by ColdSpring and fabricated by New World Stoneworks. No substitutions.

- B. Granite:

- 1. Stone Variety: [Carnelian®] [Mesabi Black®] [Mountain Green®] [Rockville White®] [Sierra White®] [_____].

[Note to Specifier: Delete finishes not required.]

- 2. Finish: [Split] [Split and Dressed] [Thermal] [Split, Tumbled] [Split and Dressed, Tumbled] [Thermal, Tumbled] [Custom].
- 3. Nominal Thickness: Not less than 3 inches.
- 4. Tolerance: Plus or Minus 1/2 inch (12 mm) to 3/4 inch (19 mm) from target dimension.

- C. Limestone:

- 1. Stone Variety: Kasota Valley® Limestone.

[Note to Specifier: Delete finishes not required.]

- 2. Finish: [Split] [Split and Dressed] [Split, Tumbled] [Split and Dressed, Tumbled] [Custom].
- 3. Nominal Thickness: Not less than 3 inches.
- 4. Tolerance: Plus or Minus 1/2 inch (12 mm) to 3/4 inch (19 mm) from target dimension.

- D. Layout Style:

[Note to Specifier: Delete items not required from list below; modify if required.]

- 1. Fieldstone: Uncoursed rubble with rounded corners.
- 2. Mosaic Stone: Uncoursed rubble with sharp corners
- 3. Cliffstone: Narrow chiseled rectangles, more substantial than standard ledgerstone.
- 4. Hillstone: Rugged collection of distinctive stone varieties.
- 5. Olde English Stone: Broken range ashlar.
- 6. Custom: Tailored to your design.

- E. Setting Bed:

[Note to Specifier: Delete items not required from list below; modify if required.]

- 1. Type: Portland cement mortar setting bed and joints, 1/2 inch joint width, minimum.
- 2. Type: Portland cement mortar setting bed and pigmented pointing mortar, 1/2 inch joint width, minimum
- 3. Type: Epoxy mortar setting bed and pigmented pointing mortar, 1/2 inch joint width, minimum
- 4. Type: Dry stack, 3/8 inch joint width, maximum.

2.2 ASSEMBLY MATERIALS

- A. Mortar Materials:

[Note to Specifier: Delete two of the following three paragraphs.]

1. Portland Cement: ASTM C 150, Type I or Type II, except Type III may be used for cold-weather construction.
 - a. Provide natural color or white cement as required to produce mortar color indicated.
 - b. Hydrated lime, ASTM C207.
2. Portland Cement-Lime Mix: ASTM C 150, Type I or Type III and lime.
 - a. Low-Alkali Cement: ASTM C 114.
3. Colored Portland Cement-Lime Mix: ASTM C 150, Type I or Type II, lime, and mortar pigments.

[Note to Specifier: Delete paragraph below if not applicable.]

4. Mortar Pigments: Natural and synthetic iron oxides. Use only pigments with a record of satisfactory performance in mortar and containing no carbon black.
 5. Aggregate: ASTM C 144.
 6. Water: Potable.
- B. Wire Veneer Anchors: Wire ties formed from W1.7 or 0.148-inch- (0.38-mm-) wire.
1. Wire Veneer Anchor Materials: Hot-dip galvanized steel.
 2. Wire Veneer Anchor Materials: Stainless-steel.
- C. Two-Part Veneer Anchors: Wire tie section and a metal anchor section.
1. Structural Performance Characteristics: Capable of withstanding a 100-lbf (445-N) load in both tension and compression without deforming or developing play in excess of 0.05 inch (1.3 mm).
- D. Coated, Steel Drill Screws for Steel Studs: ASTM C 954 with hex washer head and neoprene washer, No. 10 (4.8 mm diameter), with organic polymer coating.
- E. Stainless-Steel Drill Screws for Steel Studs: 300 Series stainless-steel, complying with ASTM C 954 with hex washer head and neoprene washer, No. 10 (4.8 mm diameter).
- F. Coated Steel Tapping Screws for Concrete Masonry: Self-tapping screws with threads for masonry, with hex washer head and neoprene washer, 3/16 inch (4.8 mm) diameter by 1-1/2 inch (38 mm) length, and with organic polymer coating.
- G. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and Division 07 Section "Sheet Metal Flashing and Trim", and as follows:
1. Stainless Steel: ASTM A 240/A 240M, Type 304, 0.016 inch (0.4 mm) thick.
 2. Metal Drip Edges: Extend at least 3 inches (75 mm) into wall and 1/2 inch (13 mm) out from wall, with outer edge bent down 30 degrees and hemmed.
 3. Metal Flashing Terminations: Fabricate from stainless steel.
- H. Flexible Flashing: For concealed flashing use one of the following:
1. Rubberized-Asphalt Flashing: Composite flashing consisting of rubberized-asphalt compound, bonded to high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.040 inch (1.0 mm).
 2. EPDM Flashing: Sheet flashing product made from ethylene-propylene-diene terpolymer, complying with ASTM D 4637, 0.040 inch thick (1.0 mm).
- I. Solder and Sealants for Sheet Metal Flashings: As specified in Division 07 Section "Sheet Metal Flashing and Trim".
- J. Adhesives, Primers, and Seam Tapes for Flexible Flashings: Flashing manufacturer's recommended products.

- K. Compressible Filler: ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated.
- L. Weep Hole/Vent Products: Round plastic tubing, medium-density polyethylene, 3/8 inch (10 mm) o.d. by thickness of stone masonry.
- M. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
 - 1. Strips, full-depth of cavity and 10 inches (250 mm) wide, with dovetail shaped notches 7 inches (175 mm) deep that prevent mesh from being clogged with mortar droppings.

2.3 MORTAR MIXES

- A. Preblended, Dry Mortar Mix:
 - 1. Provide preblended mix.
 - 2. Measure quantities by weight to ensure accurate proportions.
 - 3. Thoroughly blend ingredients before delivering to Project site.
- B. Mortar for Stone Masonry: Comply with ASTM C 270, Proportion Specification.
 - 1. Mortar for Setting Stone: Type S.
 - 2. Mortar for Setting Stone: Type N.
 - 3. Mortar for Pointing Stone: Type N.
 - 4. Mortar for Pointing Stone: Type O.
- C. Pigmented Mortar: Provide pigments to produce color required.
 - 1. Do not exceed 10 percent of portland cement by weight, or 5 percent of masonry cement or mortar cement by weight.
 - 2. Mix to match Architect's sample.

2.4 STONE FABRICATION

- A. General: Fabricate stone to comply with applicable stone association or, by recommendations of stone source.
- B. Shaping and Finishing: Utilizing water-jet technology, after which, each unit is hand-dressed to produce the specified finish, and numbered to correspond to the final layout in the building wall and palletized for shipment to the Project site.
- C. Fabricate stone to produce pieces and details indicated on Drawings. Dress joints (bed and vertical) straight and at right angle to face.
- D. Provide precut corner units.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Prepare substrates using the methods recommended by the manufacturer for achieving best result for the substrates under project conditions.

[Note to Specifier: Delete paragraphs below not required.]

1. For concrete or masonry backup, verify that dovetail slots, inserts, reinforcement, veneer anchors, flashing, and other items installed in substrates and required for or extending into stone masonry are correctly installed.
 2. For steel or wood-framed backup, examine wall framing, sheathing, and weather-resistant sheathing paper to verify that stud locations are suitable for spacing of veneer anchors. Accurately mark stud centerlines on face of weather-resistant sheathing paper before beginning stone installation over steel or wood stud-framed walls
 3. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Do not proceed with installation until substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.
- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

3.2 INSTALLATION

- A. Setting of Stone Masonry:
1. Stone is factory cut to precise sizes to eliminate field cutting and trimming. Where unexpected or unforeseen obstructions occur that require field modifications of stone sizes or shapes, consult fabricator for instructions before proceeding.
 2. Set stone to comply with requirements indicated on the laminated assembly plan provided with each pallet of material. Install supports, fasteners, and other attachments indicated or necessary to secure stone masonry in place. Set stone accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances.
 3. Maintain uniform joint widths as indicated on the Drawings.
 4. Provide joints for sealant, of widths and at locations indicated. Keep sealant joints free of mortar and other foreign materials; refer to Division 07 Section "Joint Sealants" for materials and installation requirements.
 5. Install expansion strips in sealant joints at locations indicated on Drawings.
 6. Install embedded flashing and weep holes as follows:

[Note to Specifier: ~~Delete paragraphs below not required.~~]

- a. Backup Construction: Concrete backup.
 - 1) Extend flashing through stone masonry, turn up and insert into reglet.
 - 2) Minimum Turn Up: 4 inches (100 mm).
 - 3) Minimum Turn Up: 6 inches (150 mm).
 - 4) Minimum Turn Up: 8 inches (200 mm).
 - 5) Minimum Turn Up: 12 inches (300 mm).
- b. Backup Construction: Multi-wythe masonry walls, including cavity walls.
 - 1) Extend flashing through stone masonry, turn up and extend into or through inner wythe.
 - 2) Minimum Turn Up: 4 inches (100 mm).
 - 3) Minimum Turn Up: 6 inches (150 mm).
 - 4) Minimum Turn Up: 8 inches (200 mm).
 - 5) Minimum Turn Up: 12 inches (300 mm).
- c. Backup Construction: Stud-framed walls.
 - 1) Extend flashing through stone masonry, turn up the face of sheathing and extend behind weather-resistant sheathing paper.
 - 2) Minimum Turn Up: 8 inches (200 mm).
 - 3) Minimum Turn Up: 12 inches (300 mm).

- 4) Minimum Turn Up: 16 inches (400 mm).
 - d. At lintels and shelf angles, extend flashing full length of angles but not less than 6 inches (150 mm) into masonry at each end.
 - e. At sills, extend flashing not less than 4 inches (100 mm) at ends.
 - f. At ends of head and sill flashing turn up not less than 2 inches (50 mm) to form end dams.
 - g. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches (38 mm) or as recommended by flashing manufacturer, and seal lap with elastomeric sealant.
 - h. Install metal drip edges with ribbed sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant.
 - i. Extend sheet metal flashing 1/2 inch (13 mm) beyond face of masonry at exterior and turn flashing down to form a drip.
7. Flexible Flashing with Metal Drip Edge:
- a. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall and adhere flexible flashing to top of metal drip edge.
8. Place weep holes and vents in joints where moisture may accumulate, including at base of cavity walls, above shelf angles, and at flashing.
- a. Space weep holes 24 inches (600 mm) maximum o.c.
 - b. Space weep holes formed from plastic tubing or wicking material 16 inches (400 mm) o.c.
 - c. Trim wicking material used in weep holes flush with outside face of wall after mortar has set.
 - d. Place cavity drainage material in cavities.
- B. Construction Tolerances:
1. For expansion joints, control joints, and other conspicuous lines, do not exceed 1/4 inch in 20 feet (6 mm in 6 m) or 1/2 inch in 40 feet (12 mm in 12 m).
 2. Variation from Plumb:
 - a. Vertical lines and surfaces of walls not to exceed:
 - 1) 1/4 inch in 10 feet (6 mm in 3 m).
 - 2) 3/8 inch in 20 feet (10 mm in 6 m).
 - 3) 1/2 inch in 40 feet (12 mm in 12 m) or more.
 - b. Expansion joints, and other conspicuous lines not to exceed:
 - 1) 1/8 inch in 10 feet (3 mm in 3 m).
 - 2) 1/4 inch in 20 feet (6 mm in 6 m) or more.
 3. Variation from Level:
 - a. Bed joints and lintels, sills, water tables, parapets, horizontal bands, horizontal grooves, and other conspicuous lines, not to exceed:
 - 1) 1/4 inch in 20 feet (6 mm in 6 m).
 - 2) 1/2 inch in 40 feet (12 mm in 12 m) or more.
 4. Variation of Linear Building Line:
 - a. Positions indicated in plan on Drawings not to exceed:
 - 1) 1/2 inch in 20 feet (12 mm in 6 m).
 - 2) 3/4 inch in 40 feet (19 mm in 12 m) or more.
 5. Variation in Mortar-Joint Thickness: Do not vary from joint size range approved in mock-ups.
- C. Anchored Masonry Installation:
1. Anchor stone masonry to backup with veneer anchors.
 2. Embed veneer anchors in mortar joints of stone masonry.

[Note to Specifier: [Revise paragraph below to local code requirements as applicable.](#)]

3. Space anchors not more than 16 inches (400 mm) o.c. vertically and 24 inches (600 mm) o.c. horizontally. Install additional anchors within 12 inches (300 mm) of openings, joints, and perimeter of wall.
4. Anchor stone trim with stone trim anchors. Provide compressible filler in ends of dowel holes and bottoms of kerfs. Fill remainder of anchor holes, kerfs with mortar.
5. Set stone in full bed of mortar with full head joints. Build anchors into mortar joints as stone is set.
6. Provide 1 inch (25 mm) cavity between stone masonry and backup construction. Keep cavity free of mortar droppings, debris; minimize mortar protrusions into cavity.
7. Rake out joints for pointing with mortar to uniform depths.

[Note to Specifier: Delete paragraph if not required.]

- D. Pointing: Concave joint profile.
 1. Remove dust and mortar particles from stone joints. Where setting mortar was removed to depths greater than surrounding areas, apply pointing mortar.
 2. Place and compact pointing mortar in layers not more than 3/8 inch (10 mm) deep.
 3. Tool joints when pointing mortar is thumbprint hard.
- E. Adjusting:
 1. Remove and replace damaged stone masonry. Repair stone masonry using methods approved by Architect.
 2. Remove and replace defective joints.
 3. Remove and replace stone masonry not matching approved samples and mockups.
 4. Remove and replace stone masonry not complying with other requirements indicated.
 5. Replace stone masonry to match approved samples and mockups, comply with other requirements, and show no evidence of replacement.

3.3 CLEANING AND PROTECTION

- A. Clean surfaces that are dirty or stained. Scrub with fiber brushes, then drench with clear water. Use cleaning compounds recommended by manufacturer.
- B. Cleaning: Verify appropriate products for cleaning masonry with manufacturer and supplier of cleaning products
 1. In-Progress Cleaning: Clean stone masonry as work progresses. Remove mortar fins and smears before tooling joints.
 2. Final Cleaning: Clean stone masonry as recommended by fabricator.
- C. Repair or replace damaged stonework before Substantial Completion.

END OF SECTION