SP-157002
(New)

SPECIAL PROVISIONS
FOR
EXTERIOR STONE CLADDING

Dubuque County
TAP-U-2100(683)--8I-31

Effective Date
November 17, 2015

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

1 GENERAL

1.1 RELATED DOCUMENTS

A. Plans.

1.2 SUMMARY

A. Provide stone masonry work as shown and specified. The work includes:

1. Dimension stone panels set with individual anchors.
2. Dimension stone panels mechanically anchored on cast in place concrete.
3. Dimension stone trim units, including bands copings.
4. Mortar and grout.
5. Ties and anchors.
6. Embedded flashing.
7. Miscellaneous masonry accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication and installation details for dimension stone cladding assembly, including dimensions and profiles of stone units.

1. Show locations and details of joints both within dimension stone cladding assembly and between dimension stone cladding assembly and other construction.
2. Show direction of veining, grain, or other directional pattern.

C. Samples for Initial Selection: For joint materials involving color selection.

D. Samples for Verification: For each variety, color, and finish of the following:

1. Stone. Not less than 12 inches square.
2. Pigmented mortar. Make samples using same sand and mortar ingredients to be used on project.
3. Weep holes.
4. Accessories embedded in masonry.

E. Colored Pointing Mortar Samples for Verification: For each color required. Make Samples using same sand and mortar ingredients to be used on Project.

F. Delegated-Design Submittal: For dimension stone cladding assembly.

1.4 INFORMATIONAL SUBMITTALS

A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

1. Submittal is for information only. Neither receipt of list nor approval of mockup constitutes approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Engineer and approved in writing.

B. Qualification Data: For testing agency.

C. Material Certificates: For each type and size of the following:

1. Cementitious materials. Include brand, type, and name of manufacturer.
2. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
3. Grout mixes. Include description of type and proportions of ingredients.
4. Anchors, ties, and metal accessories.

D. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

E. Cold-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.5 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockups of typical exterior wall area not less than 72 inches long by 48 inches high.

a. Include typical components, attachments to building structure, and methods of installation.
b. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

B. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.

C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Mark stone units, on surface that will be concealed after installation, with designations used on Shop Drawings to identify individual stone units. Orient markings on vertical panels so that they are right side up when units are installed.

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

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

D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.

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

1.7 FIELD CONDITIONS

A. Protect dimension stone cladding during erection by doing the following:

1. Cover tops of dimension stone cladding installation with nonstaining, waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress. Extend cover a minimum of 24 inches down both sides and hold securely in place.
2. Prevent staining of stone from mortar, grout, sealants, and other sources. Immediately remove such materials without damaging stone.
3. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surface.
4. Protect sills, ledges, and projections from mortar and sealant droppings.

B. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Remove and replace dimension stone cladding damaged by frost or freezing conditions. Comply with cold-weather construction and protection requirements for masonry contained in ACI 530.1/ASCE 6/TMS 602.

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

1.8 COORDINATION

A. Coordinate installation of inserts that are to be embedded in concrete or masonry, flashing reglets, and similar items to be used by dimension stone cladding Installer for anchoring, supporting, and flashing of dimension stone cladding assembly. Furnish setting drawings, templates, and directions for installing such items and deliver to Project site in time for installation.

B. Time delivery and installation of dimension stone cladding to avoid extended on-site storage and to coordinate with work adjacent to dimension stone cladding.

2 PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Stone: Obtain each variety of stone from single quarry with resources to provide materials of consistent quality in appearance and physical properties.

1. For stone types that include same list of varieties and sources, provide same variety from same source for each.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of uniform quality for each cementitious component from single manufacturer and each aggregate from single source or producer.

2.2 PERFORMANCE REQUIREMENTS

A. Corrosion and Staining Control: Prevent galvanic and other forms of corrosion as well as staining by isolating metals and other materials from direct contact with incompatible materials. Materials shall not stain exposed surfaces of stone and joint materials.

2.3 LIMESTONE

A. Limestone locations and types indicated on the drawings as:

1. STONE TYPE A (VENEER STONE)
    a. Regional limestone material to be sourced from Dubuque County. Grade and Color Select, Tan.
    b. Layout to be stacked ashlar with accents as indicated on drawings
        1) Coursing to be per drawings
        2) Coursing accents to be placed at random by installer.
    c. Stone Fabrication
        1) Split face
        2) Dress edge and bed
        3) Stone thickness to be 90% 3 inches. 10% 5 inches
    d. Joints: Mortar
2. STONE TYPE B (VENEER STONE)
    a. Mo-Keta Limestone Grade and Color: Select Buff.
    b. Layout to be as indicated on drawings
    c. Stone Fabrication
        1) Smooth Fleuri Finish

2) Dress edge and bed
3) Stone thickness to be 3 inches

d. Joints: Mortar

3. STONE TYPE C (ACCENT STONE)
   a. Mo-Keta Limestone Grade and Color: Select Buff.
   b. Layout to be as indicated on drawings
   c. Stone Fabrication
      1) Smooth on exposed faces
      2) Bed cut
      3) Dress edge and bed
      4) Stone thickness to be as indicated on plans.
   d. Joints: Mortar

2.4 ANCHORS AND FASTENERS

A. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plan of wall.

1. Anchor Section for connection to concrete: Standard plate 14 gage.
2. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.25 inch diameter, stainless-steel wire.
3. Reference Product: Dur-O-Wall Inc. D/A 801 veneer anchors.

B. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Anchor Section for Welding to Steel Frame: Crimped 1/4 inch diameter, stainless-steel wire.
2. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.25 inch diameter, stainless-steel wire.
3. Reference Product: Dur-O Wall Inc. D/A 709 column anchors.

C. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch (0.85 mm) thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.5 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of Portland cement and hydrated lime containing no other ingredients.

D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Use only pigments with a record of satisfactory performance in masonry mortar.

1. Color to be selected by Engineer.

E. Aggregate for Mortar: ASTM C 144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4 inch thick, use aggregate graded with 100% passing the No. 16 sieve.
3. White-Mortar Aggregates: Natural white sand or crushed white stone.
4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

F. Aggregate for Grout: ASTM C 404.

G. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

H. Water: Potable.

2.6 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:

1. Stainless Steel: ASTM A 240/A 240M, Type 304, 0.016 thick.
2. Metal Drip Edge: Fabricate from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed. Set drip edge on flexible flashing in sealant bead.

B. Flexible Flashing: Use one of the following unless otherwise indicated:

1. Elastomeric Thermoplastic Flashing: Composite flashing product consisting of a polyester-reinforced ethylene interpolymer alloy.
   a. Self-Adhesive Sheet with Drip Edge: Elastomeric thermoplastic flashing, 0.025 inch thick, with a 0.015 inch thick coating of rubberized-asphalt adhesive. Where flashing extends to face of masonry, rubberized-asphalt coating is held back approximately 1 1/2 inches from edge.
      1) Color: Black.
   b. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.

C. Solder and Sealants for Sheet Metal Flashings:

1. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
2. Elastomeric Sealant: ASTM C 920, chemically curing urethane sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

2.7 STONE ACCESSORIES

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

B. Weep Products: Use following unless otherwise indicated:

1. Wicking Material: Absorbent rope, made from cotton 1/4 to 3/8 inch in diameter, in length required to produce 2-inch exposure on exterior and 18 inches in cavity. Use only for weeps.

C. 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 high, with dovetail shaped notches 7 inches deep that prevent clogging with mortar droppings.

2.8 STONE FABRICATION

A. Cut stone from one block or contiguous, matched blocks in which natural markings occur.

B. Clean backs of stone to remove rust stains, iron particles, and stone dust.

C. Inspect finished stone units at fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units.

1. Grade and mark stone for overall uniform appearance when assembled in place. Natural variations in appearance are acceptable if installed stone units match range of colors and other appearance characteristics represented in approved samples and mockups.

2.9 MORTAR MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

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

B. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.

1. Mix to match Architect's sample.
2. Application: Use colored aggregate mortar for exposed mortar joints with the following units:
   a. Stone units.

C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide Type N unless another type is indicated.

D. Grout for Unit Masonry: Comply with ASTM C 476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
2. Provide grout with a slump of 8 to 11 as measured according to ASTM C 143/C.
3. Provide grout with a minimum compressive strength of 2000 psi.

2.10 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

2.11 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform source quality-control testing.

1. Retesting of materials that fail to meet specified requirements shall be done at Contractor's expense.
2. Furnish test specimens randomly selected from same blocks as actual materials proposed for incorporation into the Work.
3. Flexural Strength Tests: ASTM C 880/C 880M, performed on specimens of same thickness, orientation of cut, and finish as installed stone. One set of test specimens is required to be tested for every 5000 square feet, but not fewer than two sets for each stone variety.

3 EXECUTION

3.1 EXAMINATION

A. Examine surfaces indicated to receive stone veneer assemblies, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

1. Examine substrate to verify that dovetail slots, inserts, reinforcement, veneer anchors, flashing, and other items installed in unit masonry or concrete and required for or extending into stone veneer assemblies are correctly installed.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

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

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Advise installers of other work about specific requirements for placement of reinforcement, veneer anchors, flashing, and similar items to be built into stone veneer assemblies.

B. Clean dirty or stained stone surfaces by removing soil, stains, and foreign materials before setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives.

3.3 SETTING OF STONE VENEER, GENERAL

A. Perform necessary field cutting as stone is set. Use power saws to cut stone. Cut lines straight and true, with edges eased slightly to prevent snipping.

B. Sort stone before it is placed in wall to remove stone that does not comply with requirements relating to aesthetic effects, physical properties, or fabrication, or that is otherwise unsuitable for intended use.

C. Set stone to comply with requirements indicated on Drawings. Set stone accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances. Randomly place 5 inch deep stone units so that no two units are adjacent to one another.

D. Set stone in full bed of mortar with full head joints, unless otherwise indicated.

E. Maintain uniform joint widths except for variations due to different stone sizes and where minor variations are required to maintain bond alignment, if any. Lay walls with 3/8 inch joints.

F. Provide expansion, control, and pressure-relieving joints of widths and at locations indicated.

1. Keep expansion and pressure-relieving joints free of mortar and other rigid materials.
    a. Sealing expansion, control, and pressure-relieving joints shall be installed as follows:Comply with joint-sealant manufacturer's written installation instructions for producst and applications indicated, unless more stringent requirements apply.
    b. Sealant installation standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
    c. Install sealant backings of kind indicated to support sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability
    d. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
    e. Install sealants using proven techniques that comply with the following and at the same time backings are installed.
        1) Place sealants so they directly contact and fully wet joint substrates.
        2) Completely fill recesses in each joint configuration.
        3) Produce uniform, cross-sectional shapes and depth relative to joint widths that allow optimum sealant movement capability.
    f. Tooling of non-sag sealants: Immediately after sealant application an dbefore skinning of curing begins, tool sealants according to requirements speccified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
        1) Remove excess sealant from surfaces adjacent to joints.
        2) Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
        3) Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
            a) Use masking tape to protect surfaces adjacent to recessed tooled joints.
2. Install embedded flashing and weep holes indicated.

G. Set dimension stone cladding with mortar and mechanical anchors unless otherwise indicated.

H. Set stone in full bed of mortar with head joints filled unless otherwise indicated.

1. Use setting buttons of adequate size, in sufficient quantity, and of thickness required to maintain uniform joint width and to prevent mortar from extruding. Hold buttons back from face of stone a distance at least equal to width of joint, but not less than depth of pointing materials.
2. Do not set heavy units or projecting courses until mortar in courses below has hardened enough to resist being squeezed out of joint.
3. Support and brace projecting stones until wall above is in place and mortar has set.
4. Provide compressible filler in ends of dowel holes and bottoms of kerfs to prevent end bearing of dowels and anchor tabs on stone. Fill remainder of anchor holes and kerfs with mortar.

I. Embed ends of sills in mortar; leave remainder of joint open until final pointing.

J. Rake out joints for pointing with mortar to depths of not less than 1/2 inch. Rake joints to uniform depths with square bottoms and clean sides.

K. Prepare stone-joint surfaces for pointing with mortar by removing dust and mortar particles. Where setting mortar was removed to depths greater than surrounding areas, apply first layer of pointing mortar in layers not more than 3/8 inch until a uniform depth is formed.

L. Point stone joints by placing pointing mortar in layers not more than 3/8 inch. Compact each layer thoroughly and allow to become thumbprint hard before applying next layer.

M. Tool joints with a round jointer having a diameter 1/8 inch larger than width of joint, when pointing mortar is thumbprint hard.

N. Rake out mortar from sealant-pointed joints to depths required for sealant and sealant backing but not less than 1/2 inch. Rake joints to uniform depths with square bottoms and clean sides.

O. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown.

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

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

R. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

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

1. Mix units from several pallets or cubes as they are placed.

3.4 ADJUSTING AND CLEANING

A. Remove and replace stone veneer assemblies of the following description:

1. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Architect.
2. Defective joints.
3. Stone veneer assemblies not matching approved samples and mockups.
4. Stone veneer assemblies not complying with other requirements indicated.

B. Replace in a manner that results in stone veneer assemblies' matching approved samples and mockups, complying with other requirements, and showing no evidence of replacement.

C. In-Progress Cleaning: Clean stone veneer assemblies as work progresses. Remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean stone veneer assemblies as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on mockup; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before cleaning stone veneer assemblies.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
4. Wet wall surfaces with water before applying cleaner; remove cleaner promptly by rinsing thoroughly with clear water.
5. Clean stone veneer assemblies by bucket and brush hand-cleaning method described in BIA Technical Note No. 20 Revised II, using job-mixed detergent solution.
6. Clean stone veneer assemblies according to manufacturer's written instructions.

3.5 EXCESS MATERIALS AND WASTE

A. Excess Masonry Waste: Remove excess clean masonry waste, and other waste, and legally dispose of off Contracting Authority’s property.

4 MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Cost for work under this Special Provision shall be paid for in accordance with a lump sum price bid for Exterior Stone Cladding.

4.2 BASIS OF PAYMENT

A. Prices bid shall include all labor, materials, and equipment, necessary to complete the work for the individual items as specified herein and as shown on the plans.