



**SPECIAL PROVISIONS  
FOR  
LIMESTONE VENEER**

**Polk County  
EDP-PA26(002)--7Y-77**

**Effective Date  
October 15, 2024**

**THE STANDARD SPECIFICATIONS, SERIES 2023, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.**

**231032.01 DESCRIPTION.**

**A. Description.**

This special provision includes:

1. All labor materials, equipment and supervision required to furnish and install Limestone Veneer and limestone slab platforms.
2. This section includes the requirements for limestone veneer, mortar, anchors, weep/vents, flashing, and cleaning.

**B. References.**

1. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
2. American Concrete Institute International (ACI).
  - a. ACI 530/530.1 (2011) Building Code Requirements and Specification for Masonry Structures and Related Commentaries
3. American National Standards Institute (ANSI)
  - a. ANSI A118.3 Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy Adhesive
4. Astm International (ASTM)
  - a. ASTM A240/A240M (2011a) Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
  - b. ASTM A276 (2010) Standard Specification for Stainless Steel Bars and Shapes
  - c. ASTM A666 (2010) Standard Specification for Annealed or Cold-Worked Austenitic

Stainless Steel Sheet, Strip, Plate and Flat Bar

- d. ASTM B370 (2011) Standard Specification for Copper Sheet and Strip for Building Construction
  - e. ASTM C114 (2011a) Standard Test Methods for Chemical Analysis of Hydraulic Cement
  - f. ASTM C119 (2011) Standard Terminology Relating to Dimension Stone
  - g. ASTM C503/C503M (2010) Standard Specification for Marble Dimension Stone
  - h. ASTM C568/C568M (2010) Standard Specification for Limestone Dimension Stone
  - i. ASTM C144 (2011) Standard Specification for Aggregate for Masonry Mortar
  - j. ASTM C150/C150M (2011) Standard Specification for Portland Cement
  - k. ASTM C207 (2006; R 2011) Standard Specification for Hydrated Lime for Masonry Purposes
  - l. ASTM C270 (2010) Standard Specification for Mortar for Unit Masonry
  - m. ASTM C494/C494M (2011) Standard Specification for Chemical Admixtures for Concrete
  - n. ASTM C1193 (2011a) Standard Guide for Use of Joint Sealants
  - o. ASTM F 593 (2002; R 2008) Stainless Steel Bolts, Hex Cap Screws, and Studs
  - p. ASTM F 594 (2009e1) Standard Specification for Stainless Steel Nuts
5. Brick Industry Association (BIA)
- a. BIA Tech Note 20 (1990; R 2000) Cleaning Brick Masonry
6. Indiana Limestone Institute Of America (ILI)
- a. ILI Hnbk Indiana Limestone Handbook

**C. Submittals.**

The following shall be submitted.

**1. Product Data:**

- a. For stone varieties proposed for use on Project, include test data indicating compliance with physical properties specified or required by reference ASTM standards.
  - b. Mortar Materials
  - c. Stone Trim Anchors
  - d. Mockups: List of materials used in constructing mockups. List generic product names together with manufacturers, manufacturers' product names, sources of supply, and other information as required to identify materials used. Include mix proportions for mortar and source of aggregates.
2. Shop Drawings: Indicate layout, pertinent dimensions, anchorages, reinforcement, head, jamb and sill opening details, control and expansion jointing methods and cutting and setting. Provide shop drawing approval to stone supplier within lead time required prior to date first shipment of stone is needed at site.
3. **Samples.**
- a. **Pigmented Mortar.**
    - 1) Samples for Initial Selection. For colored mortar and other items involving color selection.
    - 2) For each color of mortar required, label samples to indicate types and amounts of pigments used.
  - b. Stone: Samples for verification for each stone type indicated. Include at least five 12 inch by 12 inch samples in each set for each type of stone, exhibiting extremes of the full range of color and other visual characteristics expected in completed Work. Samples will establish the standard by which stone provided will be judged.
4. Certification of Installer: Qualification Data.

5. **Manufacturer's Instructions:** Submit stone fabricator's installation instructions and field erection or setting drawings. Indicate on setting drawings, panel identifying marks and locations.
6. **Closeout Submittals.**
  - a. Preinstallation Conference
  - b. Meeting Minutes

**D. Quality Assurance.**

1. **Installer Qualifications:** A qualified installer who employs experienced stonemasons and stone fitters with a minimum of 5 years of experience and has successfully completed a minimum of five projects of similar size and scope.
2. **Source Limitations for Stone:** Obtain each variety of stone, regardless of finish, from one quarry, whether specified in this Article or in another Article, with resources to provide materials of consistent quality in appearance and physical properties.
3. **Source Limitation 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.
4. **Mockups:**
  - a. Build mockups to demonstrate aesthetic effects and set quality standards for materials and execution.
  - b. Build mockup of typical wall area as shown on the plans.
  - c. Contractor shall be prepared to construct up to five mockups, if necessary, at the direction of the Engineer.
  - d. Build mockups for each type of stone masonry and typical exterior walls in sizes approximately 8 feet, 0 inches (h) by 8 feet, 0 inches (w) by full thickness, including face and backup wythes and accessories.
    - 1) Include stone coping at top of mockup.
    - 2) Include a sealant-filled joint at least 16 inches long in mockup.
    - 3) Include metal veneer anchors, flashing, and weep holes in exterior masonry-veneer wall mockup.
  - e. Protect accepted mockups from the elements with weather-resistant membrane.
  - f. Approval of mockups is for color, texture, and blending of stone; relationship of mortar and sealant colors to stone colors; tooling of joints; and aesthetic qualities of workmanship.
    - 1) Approval of mockups is also for other material and construction qualities Engineer specifically approves in writing.
    - 2) Approval of mockups does not constitute approval of deviations from the contract documents contained in mockups unless Engineer specifically approves such deviations in writing.
  - g. Approved mockups may not become a part of completed work.
5. **Pre-installation Conference:** Conduct conference at Project site.

**E. Delivery, Storage, and Handling.**

Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp. Store aggregates where grading and other required characteristics can be maintained, and contamination avoided. Deliver pre-blended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store pre-blended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

**F. Project Conditions.**

1. Protection of Stone Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed stone masonry when construction is not in progress. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
2. Stain Protection: Immediately remove mortar and soil to prevent them from staining the face of stone masonry.
  - a. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on the ground and over the wall surface.
  - b. Protect sills, ledges, and projections from mortar droppings.
  - c. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
  - d. Turn scaffold boards near the wall on edge at end of each day to prevent rain from splashing mortar and dirt on completed stone masonry.
3. **Cold-Weather Requirements:**
  - a. Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace stone masonry damaged by frost or freezing conditions. Comply with cold-weather construction requirements contained in ACI 530/530.1.
  - b. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40°F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.
4. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530/530.1.

**G. Coordination.**

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

**231032.02 MATERIALS.**

**A. Basis Of Design.**

1. Products furnished and installed under this section shall conform to the specifications and characteristics listed herein. Manufacturer, if listed, have been used as a Basis of Design; however, products of other manufacturers are acceptable provided they conform to these specifications.
2. Stone masonry furnished and installed under this section shall closely match the color, texture, and size of existing masonry presently installed on the Riverwalk in Long Look Gardens at Des Moines, Iowa City Hall; or two projects North of Court Avenue on the west side of the Des Moines River.

**B. Limestone Supplier.**

**1. Limestone Veneer.**

- a. Comply with ASTM C119 limestone, single source supplied, natural, deep ledge quarried, free of efflorescence, also meeting ASTM C503/C503M Class II.
- b. Medium Density Limestone ASTM C568/C568M Class II.
- c. Basis of Design is as follows:
  - 1) Kasota Stone, Inc 820 North Willow Street, Mankato MN 56001, 507.508.0684.
  - 2) Vetter Stone Company, Kasota, MN 507.345.4568.

- 3) Coldspring, Kasota Valley, Coldspring, MN 800.328.5040.
- 4) Colors: Full range blend of Cream, Golden Buff and Grey.
- 5) Color Mix: 30% Cream, 60% Golden Buff and 10% Grey Fleuri. Eight inch stone pieces shall not comprise more than 10% of the stone mix and shall be evenly distributed among the color ranges.
- 6) Cut Type: Veine Cut.
- 7) Surface Finish: Honed.
- 8) Stone Sizes: See plans.

## 2. Limestone Slab Platforms.

- a. Comply with ASTM C119 limestone, single source supplied, natural, deep ledge quarried, free of efflorescence, also meeting ASTM C503/C503M Class II.
- b. Medium Density Limestone ASTM C568/C568M Class II.
- c. Basis of Design is as follows:
  - 1) Kasota Stone, Inc 820 North Willow Street, Mankato MN 56001, 507.508.0684.
  - 2) Vetter Stone Company, Kasota, MN 507.345.4568.
  - 3) Coldspring, Kasota Valley, Coldspring, MN 800.328.5040.
  - 4) Or approved equal.
- d. Colors: Buff.
- e. Surface Finish: See plans.
- f. Stone Sizes: See plans.

## C. Stone Fabrication.

1. Cut stone from one block or from contiguous blocks in which natural markings consistent with approved range samples and mock-ups. Cut stone accurately to shape and dimensions with jointing as shown on approved shop drawings. Cut exposed faces true with joints and beds dressed straight and square within fabrication tolerances specified herein. Grade and mark stone for overall uniform appearance when assembled in place. Natural full range variations in appearance are acceptable if installed stone units match approved range samples and mock-up for color and other characteristics. Cut Stone Fabrication Tolerances:
  - a. Maximum variation from thickness +/- 1/8 inch for non-finished ends, +/- 1/16 inch for finished ends and corner pieces.
  - b. Maximum Variation from face sizes +/- 1/16 inch
  - c. Maximum Variation from flat +/- 1/16 inch
  - d. Maximum Variation from square +/- 1/16 inch
2. Form external corners to square joint profile. Provide for cramp anchorage top and bottom bed joints of corner pieces.
3. Slope exposed top surfaces of stone and horizontal sill surfaces for natural wash.
4. Provide chases, reveals, reglets, openings and similar features as required to accommodate contiguous work.
5. Joints of stone shall be square and true and at approximately 90 degrees to the face. Joints shall be 1/4 inch wide unless noted otherwise.
6. All arrises shall be slightly blunted to remove sharp edge and to reduce chipping of finished edge.
7. Carefully inspect stone at quarry or fabrication plant for compliance with requirements for appearance, material and fabrication. Replace defective units before shipment. Clean sawed backs of stone to remove rust stains and iron particles.

## D. Mortar Materials.

1. Portland Cement: ASTM C150/C150M, 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. Low-Alkali Cement: Not more than 0.60% total alkali when tested according to ASTM C114.
2. Hydrated Lime: ASTM C207, Type S.
3. **Mortar Pigments.**
  - a. Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in stone masonry mortar.
  - b. Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:
    - 1) Davis Colors; True Tone Mortar Colors.
    - 2) Lanxess Corporation; Bayferrox Iron Oxide Pigments.
    - 3) Solomon Colors; SGS Mortar Colors.
4. Aggregate: ASTM C144 and for pointing mortar, use aggregate graded with 100% passing No. 16 sieve.
5. **Latex Additive.**
  - a. Manufacturer's standard water emulsion, serving as replacement for part or all of gaging water, of type specifically recommended by latex-additive manufacturer for use with field-mixed Portland cement mortar bed, and not containing a retarder. Latex additive shall meet ANSI A118.3.
  - b. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - 1) Boiardi Products Corporation.
    - 2) Bonsal.
    - 3) Bostik Findley Inc.
    - 4) C-Cure.
    - 5) Custom Building Products.
    - 6) DAP Inc.
    - 7) Laticrete International, Inc.
    - 8) MAPEI Corp.
6. **Cold-Weather Admixture.**
  - a. Nonchloride, noncorrosive, accelerating admixture complying with ASTM C494/C494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
  - b. Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:
    - 1) Euclid Chemical Company (The); Accelguard 80.
    - 2) Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Morset.
    - 3) Sonneborn, Div. of Degussa Building Systems; Trimix-NCA.
7. Water: Potable.

**E. Stone Trim Anchors**

1. Units fabricated with tabs or dowels designed to engage kerfs or holes in stone trim units and holes for fasteners or post installed anchor bolts for fastening to substrates or framing as indicated.
2. Subject to compliance with requirements, provide products by one of the following available

manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. Halfen Anchoring Systems; Meadow Burke.
- b. Heckmann Building Products Inc.
- c. Hohmann & Barnard, Inc.

**3. Materials:**

- a. Fabricate anchors from stainless steel, ASTM A240/A240M, Type 304.
  - b. Fabricate dowels from stainless steel, ASTM A276, Type 304.
4. Fasteners for Stone Trim Anchors: Annealed stainless-steel bolts, nuts, and washers; ASTM F 593 for bolts and ASTM F 594 for nuts, Alloy Group 1 (A1).
  5. Post Installed Anchor Bolts for Fastening Stone Trim Anchors: Chemical anchors or torque-controlled expansion anchors made from stainless-steel components complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 for bolts and nuts; ASTM A666 or ASTM A276, Type 304 for anchors.

**F. Miscellaneous Masonry.**

For weep hole/vent products, use the following unless otherwise indicated:

1. Rectangular Plastic Tubing: clear butyrate, 1/4 inch by 1 1/2 inches by thickness of stone masonry.
2. Stone Slab Platform Weeps: 1/2 inch diameter PVC pipe with 3/8 inch diameter cotton rope threaded through pipe.

**G. Masonry Cleaners.**

1. Manufacturer's standard-strength cleaner designed for removing mortar and grout stains, efflorescence, and other new construction stains from stone masonry surfaces without discoloring or damaging masonry surfaces; expressly approved for intended use by cleaner manufacturer and stone producer.
2. Manufacturers shall be subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - Diedrich Technologies, Inc.
  - Dominion Restoration Products.
  - EaCo Chem, Inc.
  - Hydrochemical Techniques, Inc.
  - Prosoco, Inc.

**H. Mortar Mixes.**

**1. General.**

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

- a. Do not use calcium chloride.
- b. Limit cementitious materials in mortar to Portland cement, mortar cement, and lime.
- c. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- d. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding water. Then mix again, adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this

dampened condition for one to two hours. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within 30 minutes of final mixing; do not retemper or use partially hardened material.

2. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in the form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
3. Mortar for Stone Masonry: Comply with ASTM C270, Property Specification.
  - a. Mortar for Setting Stone: Type N.
  - b. Mortar for Pointing Stone: Type N.
  - c. Mortar for stone masonry below grade or in contact with earth, use Type M.
4. Latex-Modified Portland Cement Setting Mortar: Proportion and mix Portland cement, aggregate, and latex additive to comply with latex-additive manufacturer's written instructions.
5. Pigmented Mortar: Use colored cement product and proportion pigments with other ingredients to produce color required. Pigments shall not exceed 10% of Portland cement by weight.

**I. Metal Flashing.**

Metal flashing under the stone cap where shown on drawings shall meet ASTM B370 for copper sheet. Weight shall be 10 ounces per square foot.

**J. Joint Sealant.**

1. Single component, non-sag joint sealant per ASTM C920 Type S, Grade NS, Class 35, Use T and M.
2. Color: From Manufacturer's product range to match color of stone.
3. Products.
  - a. BASF Master Seal NP1
  - b. Tremco Dymonic 100
  - c. Sika Corporation, Sikaflex 1A

**231032.03 CONSTRUCTION.**

**A. Examination.**

Examine surfaces indicated to receive stone masonry, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Examine substrate to verify that veneer anchors, flashing, and other items installed in substrates and required for or extending into stone masonry are correctly installed. Proceed with installation only after unsatisfactory conditions have been corrected.

**B. Preparation.**

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.

**C. Setting of Stone Masonry, General.**

1. Perform necessary field cutting and trimming as stone is set. Use power saws to cut stone that is fabricated with saw-cut surfaces. Cut lines straight and true, with edges eased slightly to prevent snipping.



2. 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.
3. Arrange stones in range ashlar pattern with course heights as indicated, random lengths, and uniform joint widths, with offset between vertical joints as indicated.
4. Arrange stones with color and size variations uniformly dispersed for an evenly blended appearance.
5. Set stone to comply with requirements indicated on the plans. 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.
6. 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 joints not less than 1/4 inch at narrowest points or more than 5/16 inch at widest points.
7. Provide sealant joints of widths and at locations indicated. Keep sealant joints free of mortar and other rigid materials. Coat limestone with cementitious damp proofing as follows:
  - a. Stone Extending below Grade: Beds, joints, back surfaces, and face surfaces below grade.
  - b. Allow cementitious damp proofing formulations to cure before setting damp proofed stone. Do not damage or remove damp proofing in the course of handling and setting stone.
8. Place weep holes and vents in joints where moisture may accumulate, including at base of cavity walls, above shelf angles, and at flashing. Use rectangular plastic tubing to form weep holes. Space weep holes 24 inches on center.

#### **D. Construction Tolerances.**

1. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/4 inch in 10 feet, For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4 inch in 20 feet.
2. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed 1/4 inch in 20 feet.
3. Measure variation from level, plumb, and position shown in plan as variation of the average plane of the face of each stone from level, plumb, or dimensioned plane.
4. Variation in Mortar-Joint Thickness: Do not vary from joint size range indicated.
5. Variation in Plane between Adjacent Stones: Do not exceed one-half of tolerance specified for thickness of stone.

#### **E. Installation of Anchored Stone Masonry.**

1. Anchor stone masonry to concrete with screw-attached cramp or toe bar veneer anchors unless indicated or necessary to secure stone in place. Install anchors by fastening to concrete substrate and inserting tabs and dowels into kerfs and holes in stone units. 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. Set stone accurately in locations in locations indicated with edges and faces aligned according to

established relationships and indicated tolerances.

2. Space anchors not more than 16 inches on center vertically and 24 inches on center horizontally. Install additional anchors within 12 inches of openings, sealant joints, and perimeter at intervals not exceeding 12 inches.
3. Set stone in full bed of mortar with full head joints unless otherwise indicated. Build anchors into mortar joints as stone is set.
4. Place setting buttons and set stone in full mortar setting bed to support stone.
5. Shore up units until setting bed will maintain panel in position without movement for 7 days after setting.
6. Provide 1 inch cavity between stone masonry and backup construction unless otherwise indicated. Keep cavity free of mortar droppings and debris where indicated on drawings.
  - a. Place mortar spots in cavity at veneer anchors to maintain spacing.
  - b. Slope beds toward cavity to minimize mortar protrusions into
  - c. cavity.
  - d. Do not attempt to trowel or remove mortar fins protruding into cavity.
7. Rake out joints for pointing with mortar to depth of not less than 3/4 inch before setting mortar has hardened. Rake joints to uniform depths with square bottoms and clean sides.
8. Do not shift or tap stone units after mortar has achieved initial set.
9. Where adjustment is required, remove mortar and replace.
10. Provide sealant joints of widths and at locations indicated. Install sealant and backing rod or bond breaker at joints. Perform installation in accordance with ASTM C1193 and the following:
  - a. Keep joints free of mortar and other rigid materials.
  - b. Tool joints concave

#### **F. Stone Slab Platforms.**

1. Cast PVC pipe with Rope weeps in concrete support structure at locations indicated at 16 inches on-center and under all head joints in stone slabs. Thread cotton rope through PCV pipe so it extends 1 inch beyond bottom of weep. Lay top end of rope across the surface of the concrete substructure to the front of each stone slab prior to placing mortar bed.
2. Drill holes to receive stainless steel anchor pins in concrete support structure and in bottom sides of stones. Insert pins into holes prior to placing stones.
3. Apply mortar bed to concrete sub-structure, bottom and back sides of stones and tamp stones into place, verify stones are plumb side to side and have 1/4 inch per foot wash from back to front. Maintain uniform joint widths when setting stones.
4. Remove excess mortar from joints.

#### **G. Pointing.**

1. 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 pointing mortar in layers not more than 3/8 inch deep until a uniform depth is formed.

2. Point stone joints by placing and compacting pointing mortar in layers not more than 3/8 inch deep. Compact each layer thoroughly and allow to become thumbprint hard before applying next layer.
3. Tool joints, when pointing mortar is thumbprint hard, with a smooth jointing tool to produce the concave joint profile.
4. For head joints to receive sealant, rake back joints to a depth of 1/2 inch.

**H. Joint Sealant.**

Apply joint sealant to head joints and below cap stones, completely filling recesses in each joint configuration. Produce uniform cross-sectional shapes and depths relative to the joint widths that allow optimum sealant movement capability. Immediately after sealant application and before skinning or curing begins, tool sealants to form a smooth, uniform bead. Eliminate air pockets to ensure contact and adhesion with the sides of the joint.

**I. Adjusting and Cleaning.**

1. Remove and replace stone masonry of the following description:
  - a. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Contracting Authority.
  - b. Defective joints.
  - c. Stone masonry not matching approved samples and mockups.
  - d. Stone masonry not complying with other requirements indicated.
2. Replace in a manner that result in stone masonry matching approved samples and mockups, complying with other requirements, and showing no evidence of replacement.
3. In-Progress Cleaning: Clean stone masonry as work progresses. Remove mortar fins and smears before tooling joints.
4. Final Cleaning: After mortar is thoroughly set and cured, clean stone masonry as follows:
  - a. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  - b. Test cleaning methods on mockup; leave one-half of panel uncleaned for comparison purposes. Obtain Engineer's approval of sample cleaning before cleaning stone masonry.
  - c. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
  - d. Wet wall surfaces with water before applying cleaner; remove cleaner promptly by rinsing thoroughly with clear water.
  - e. Clean stone masonry by bucket and brush hand-cleaning method described in BIA Tech Note 20, Revised II, using job-mixed detergent solution.
  - f. Clean stone masonry with proprietary acidic cleaner applied according to manufacturer's written instructions.
  - g. Clean limestone masonry to comply with recommendations in ILI Hnbk.

**J. Excess Materials and Waste.**

1. Excess Stone: Stack excess stone where directed by Engineer for the City of Des Moines' use.
2. Disposal as Fill Material
  - a. Dispose of clean masonry waste; including mortar and excess or soil-contaminated sand, by crushing and mixing with fill material as fill is placed.
  - b. Crush masonry waste to less than 4 inches in greatest dimension.

- c. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste.
  - d. Do not dispose of masonry waste as fill within 18 inches of finished grade.
- 3. Excess Masonry Waste: Remove excess clean masonry wastes that cannot be used as fill, as described above, and other waste, and legally dispose of off City of Des Moines property.

**231032.04 METHOD OF MEASUREMENT.**

**A. Limestone Veneer**

Measurement for Limestone Veneer shall be made on a square foot basis as measured by the Engineer.

**B. Limestone Slab Platforms**

Measurement for Limestone Slab Platforms shall be made on a per ton basis as measured by the Engineer.

**231032.05 BASIS OF PAYMENT.**

**A. Limestone Veneer.**

Contractor shall be paid the contract unit price for Limestone Veneer for each square foot measured. Payment shall be considered full compensation for installation of Limestone Veneer, including all limestone veneer, limestone caps, mortar, anchors, weeps/vents, sealants, flashing, cleaning, and disposal. Mock-ups shall be incidental to this bid item.

**B. Limestone Slab Platforms.**

Contractor shall be paid the contract unit price for Limestone Slab Platforms for each ton installed. Payment shall be considered full compensation for installation of Stone Slab Platforms, including all stone, mortar, weeps, shims, anchors, sealants, cleaning, and disposal.