



## **To Architects and Designers:**

The following document has been created as a generic and alterable specification document that can be used for creating specifications for a particular project. The document is based on guidelines established by the Construction Specifications Institute. It is designed to be used for specification systems with appropriate edits in the portions indicated in colored and/or shaded sections.

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3north LLC

**SECTION 04852  
ADHERED STONE VENEER**

**SECTION 04 42 00  
EXTERIOR ADHERED STONE CLADDING**

**3North Natural Stone Products**

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**PART 1 GENERAL**

**1.01 RELATED DOCUMENTS**

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

**1.02 SUMMARY**

- A. This Section includes the following:
- [1. Natural stone veneer adhered with latex modified portland cement mortar over concrete walls.]
  - [2. Natural stone veneer adhered with latex modified portland cement mortar over concrete masonry unit walls.]
  - [3. Natural stone veneer adhered with latex modified portland cement mortar over Portland cement brown coat over [plywood] [exterior gypsum] [cement backer unit (CBU) ] sheathing on structural [wood stud] [structural metal stud] framing.]

**1.03 SYSTEM DESCRIPTION**

- A. Performance Requirements: Fabricate, design and install adhered stone cladding system to withstand normal loads from wind, gravity, movement of building structure, and thermally induced movement, and to resist deterioration under conditions of normal use including exposure to weather, without failure. Comply with [UBC] IBC Chapter 14 and the following:
1. Design: Adhered stone cladding, including its backing, shall be designed to have a bond to the supporting element sufficient to withstand a shearing stress of 50 psi.
  2. Seismic Loads: Adhered stone cladding shall be designed to withstand the effects of seismic motions as determined according to local building code requirements for seismic zone where the project is located or ASCE 7 - Minimum Design Loads for Buildings and Other Structures, Section 9, "Earthquake Loads," whichever is greater.
  3. Thermal Movement: Adhered stone cladding shall be designed and installed to provide for thermal expansion and contraction within the system components caused by a maximum 120 degree ambient, 180 degree surface temperature cycling temperature without causing detrimental effects to system or components

including displacement of stone, opening of joints, failure of connections or joint sealant, or overstressing of components.

4. Shrinkage and Creep: Allow for 1/8 inch in 10 feet progressive vertical shortening of the building frame.

#### 1.04 SUBMITTALS

- A. Shop Drawings:
  1. Indicate layout, pertinent dimensions, head, jamb and sill opening details, and jointing methods.
  2. Provide product data on stone units.
- B. Samples: Submit samples to the Architect for review prior to [\[constructing job-site mock-ups,\]](#) delivering materials to the site or commencing the work in this Section.
  1. Stone Samples:
    - a. Provide samples of stone in sufficient quantity to successfully show the full range of size, shape, texture and color variations expected in the finished Work for the type of stone specified.
    - a. Provide [ 1 ] samples of stone showing the full range of size, shape, texture and color variations expected in the finished Work for the type of stone specified.
    - b. Units provided to the Project shall match these samples.
  2. Mortar Color Samples: Submit mortar channels for color selection. Submit written colored mortar proportions for each color of mortar to be supplied for review by the Architect.
- C. Stone Material Test Reports: Provide test results from a qualified independent testing agency for each variety (color) of stone proposed for use on the Project. Include detailed test results indicating full range of tested performance and average performance characteristics for test procedures specified.
- D. Procedures: Submit requirements for hot and cold weather protection.
- E. Stone Maintenance: Submit stone supplier's literature or instructions for preventive care and maintenance measures pertinent to the specific stone type and finishes for normal maintenance and special cleaning procedures.

#### 1.05 QUALITY ASSURANCE

- A. Applicator Qualifications: Company with minimum 3 years experience in the installation of manufactured stone veneers of the type specified.
- B. Regulatory Requirements:
  1. Materials and workmanship shall meet requirements of the building codes which are applicable to the jurisdiction in which Project is located.
  2. Weather Resistive Barrier: Provide weather resistive barriers that are manufactured in accordance with UBC Standard 14-1 or unperforated asphalt saturated organic felt complying with ASTM D226, Type I, or ICC approved alternative acceptable to authorities having jurisdiction as a weather resistive barrier.
- C. Subcontractor's Qualifications: The firm executing the work under this Section shall have a minimum of five (5) years experience in work of similar scope and nature to that

specified.

- D. Pre-Installation Meeting: Prior to commencing the work of this Section, schedule and attend a meeting at the job site to discuss conformance with Project requirements.
- E. Stone shall be sound, durable and free of visible defects which will impair the strength, durability or appearance; or concentrations of material that will cause objectionable staining or weakening under normal environments of use.
- F. Stone Testing: Provide stone which has been tested in accordance with the following:
  - 1. Testing shall be performed on stone specimens of same minimum thickness, face dimensions, cut and finish as stone proposed for use on the Project:
  - 2. Flexural Strength: ASTM C880-98, tested in wet and dry condition and with orientation of load parallel and perpendicular to rift for both wet and dry conditions.
  - 3. Absorption and Bulk Specific Gravity: ASTM C97-02.
  - 4. Abrasion Resistance: ASTM C241-90 (1997).
  - 5. Coefficient of Thermal Expansion: ASTM C531-00 (2005).
  - 6. Slip Resistance: CAN/CGSB-75.1-M88.
  - 7. Resistance to Accelerated Freeze/Thaw: ASTM C67-03a.
  - 8. Shear Bond Strength: ASTM C482-02.
- G. Mock-Ups:
  - 1. Prior to start of work, construct a sample panel from the approved materials, containing each different kind or color of stone including typical joint tooling, approximately 4 feet high x 6 feet long (1200mm high x 1800mm long) (or as required to illustrate wall design) under the direction of the Architect.
  - 2. Sample shall provide a standard of workmanship, bond, thickness and tooling of joints, and representative range of color and texture of the adhered stone cladding expected in the final work.
  - 3. Request Architect's review only after sample wall mortar is dry.
  - 4. Construct successive sample panels until the standard is approved.
  - 5. When accepted, sample wall shall be the standard of comparison for the remainder of the adhered stone cladding work.
  - 6. Upon completion of the Project, remove the sample wall from the site and dispose of in a legal manner.

#### 1.06 DELIVERY, STORAGE AND HANDLING

- A. Transport and handle stone units in such a manner as to prevent chipping and breakage.
- B. Deliver materials in manufacturer's unopened containers and packaging, fully identified with manufacturer's name, materials name, types, sizes, color(s) and other pertinent information.
- C. Store materials in dry, protected areas and keep free of stain, construction traffic and other damage.
- D. Replace damaged material at no cost to Owner.

#### 1.07 PROJECT/SITE CONDITIONS

- A. Hot Weather Requirements:
  - 1. Do not lay stone when the ambient air temperature exceeds 100 degrees F. (38 degrees C.), or when the ambient air temperature exceeds 90 degrees F. (32 degrees C.) and the wind velocity is greater than 8 mph (13km/h), unless hot

weather protection is implemented using procedures as submitted and approved by the Architect.

2. Do not spread mortar beds more than 4 feet (1200mm) ahead of placing stone.
3. Place stone within one minute of spreading mortar.

B. Cold Weather Requirements:

1. Fully protect stone against freezing by a weather-tight covering which shall also prevent accumulation of ice.
2. Do not lay stone when the temperature of the surrounding atmosphere is below 40 degrees F. (4 degrees C.) or is likely to fall below 40 degrees F. (4 degrees C.) in the 24 hour period after laying, unless adequate protection is provided.

1.08 SCHEDULING AND SEQUENCING

- A. Coordination: Coordinate with other work relating to stone installation for placing required blocking, backing, furring, conduits and other items.

**PART 2 PRODUCTS**

2.01 MANUFACTURER

- A. Furnish stone as manufactured by the following manufacturer:

1. 3North Stone Products, P.O. Box 1154, Chino Valley, Arizona 86323 (928) 713-1884 F (928) 636-2780, [www.3northstone.com](http://www.3northstone.com), email: [info@3northstone.com](mailto:info@3northstone.com).

2.02 STONE MATERIALS

- B. Natural Sandstone Cladding Units: Provide the following:

[1. Stone Type: 3north Natural Stone Products].

a. Pattern

b. Size:

- 1) Field Units: 1/2 inch to 1-1/2 inch thickness and face dimension sizes ranging in 2 inches x 6 inches up to 8 inches x 16 inches.
- 2) Corner Units: 1/2 inch to 1-1/2 inch thickness x 6 inches high with 2 inch short side return and varying lengths on long side to 16 inches maximum.

sizes ranging in 1 inch to 4-1/2 inches high and up to 24 inches in length.

- 2) Corner Units: 1/2 inch to 1-1/2 inch thickness with short and long side returns of various lengths and heights.

## 2.03 INSTALLATION MATERIALS AND ACCESSORIES

- A. Weather-Resistive Barrier: Provide one of the following:
1. Asphalt-saturated organic felt complying with ASTM D226, Type I (No. 15 asphalt felt), unperforated.

-OR-

1. Polyolefin Sheet Weather-Resistive Barrier: Weather resistive barrier composed of either cross-laminated polyolefin films, woven polyolefin strands, or spunbonded polyolefin fibers, coated or uncoated, with or without perforations to transmit water vapor but not liquid water complying with UBC Standard 14-1 or ICC approved alternative:
  - a. Thickness: 3 mils minimum.
  - b. Water Vapor Transmission: 10 perms minimum as tested per ASTM E96, Procedure A.
  - c. Flame Spread: Maximum of 25 per ASTM E84.
  - d. Minimum Allowable Exposure: 3 months.

Metal lath must be installed over waterproofing or weather resistive barrier to provide bond between stone and the substrate.  
Metal lath is also required over masonry surfaces which have been painted, sealed, or are dirty and cannot be properly cleaned to achieve proper adhesion.  
Metal lath over a weather resistive barrier should also be considered where moisture penetration is a primary concern.

- B. Metal Lath and Accessories:

Use the following for most installations requiring metal lath

1. Metal Lath: 3.4 lb./sq.yd. expanded metal diamond mesh, self-furring type; galvanized finish.

-OR-

Consult the manufacturer for locations and conditions where the following metal lath may be used.

1. Galvanized Woven Wire Fabric Lath: 1.1 lb/sq. yd. 0.049 inch (No. 18 B.W. gauge), 1-1/2 inch hexagonal woven wire fabric.
2. Tie wire shall be double annealed and galvanized conforming to Type I FS QQ-W-461, of gages specified.
3. Anchorages: Nails, staples, or other approved metal supports, of type and size to suit application, galvanized to rigidly secure lath and associated metal accessories in place.

Scratch coat is always applied prior to application of stone units. Scratch coat is installed directly, and completely encapsulate, the metal lath or untreated masonry surface where the stone is being installed.

- C. Scratch Coat Materials:

1. Water: Clean and free of deleterious matter.
2. Portland Cement: Conform to ASTM C150, Type I or II.
3. Hydrated Lime: Conform to ASTM C207, Type S.
4. Aggregate shall be clean, well graded sand or screenings from crushed stone or slag, and shall conform to ASTM C33 for fine aggregate except that it shall be graded within the following limitations:
  - a. Passing No. 4 sieve: 100 percent

- b. Passing No. 8 sieve: 90 percent
- c. Passing No. 16 sieve: 60 percent-90 percent
- d. Passing No. 30 sieve: 35 percent-70 percent
- e. Passing No. 50 sieve: 10 percent-30 percent
- f. Passing No. 100 sieve: 5 percent

Latex additive improves the adhesion, flexibility and weather resistance of the mortar.

- D. Setting Mortar: Latex-modified portland cement mortar for exterior use and complying with ANSI A118.4. Provide either prepackaged dry-mortar mix or mixture of dry-mortar mix and latex additive as standard with manufacturer.
  - 1. Color: [As selected by Architect from manufacturer's full range of available colors

Coordinate the Section name and Number listed below with Project Specifications.

- E. Sheet Metal Flashings: In accordance with Section 07600 and as indicated on Drawings.

Coordinate the Section name and Number listed below with Project Specifications.

- F. Perimeter Sealant: In accordance with Section 07900.

## 2.04 MIXING SCRATCH COAT AND MORTAR MATERIALS

- A. Scratch Coat: Accurately measure ingredients. Proportion successive batches exactly alike. Mix aggregate, cement and other dry materials until the mass is uniform in color and homogeneous before adding water. Determine the quantity of water necessary for the desired consistency by trial, and thereafter measure in proper proportions. Retempering will not be allowed.
  - 1. Mortar for coats shall consist of one volume of Portland cement to not less than three or more than five volumes of damp, loose aggregate.
  - 2. Hydrated lime, hydrated lime putty, or slaked lime putty may be added as a plasticizing agent, but the amount used shall not exceed 10 percent by weight nor more than 25 percent by volume of the cement used.
  - 3. Mix materials dry, to uniform color and consistency, before adding water.
- B. Setting Mortar: Comply with mortar manufacturer's instructions for mixing latex modified portland cement mortar.
  - 1. Latex Additive: Accurately measure and mix latex additive as recommended by the mortar or latex additive manufacturer.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verification of Conditions: Examine subsurfaces to receive Work and report detrimental conditions in writing to Architect. Commencement of Work will be construed as acceptance of subsurfaces.
- B. Coordination: Coordinate with other work, which affects, connects with, or will be concealed by this Work.

### 3.02 PREPARATION

- A. Protection: Protect sills, ledges, offsets and other projections from dropping of brown coat materials and mortar.

- B. Establish lines, levels, and coursing. Protect from disturbance.
- C. Clean stone prior to installation. Do not use wire brushes or implements which will mark or damage exposed surfaces.
- D. Remove paint, coatings, curing compounds, dirt, grease, oils, soaps, wax and substances from masonry surfaces where stone units will be adhered directly to the masonry substrate.

### 3.03 INSTALLATION OF WEATHER-RESISTIVE BARRIER AND METAL LATH

Weather resistive barrier is required when stone is installed over rigid sheathing on wood or metal studs at exterior locations. Barrier may be omitted when installed at interior locations. Weather resistive barrier should also be considered over concrete masonry substrates where moisture penetration is a primary concern. When used over masonry, installation of metal lath is also required to achieve proper adhesion.

- A. Asphalt felt type weather resistive barrier:
  - 1. Starting at bottom of wall or lowest level, apply asphalt-saturated organic felt horizontally in shingle fashion with the upper layer lapped over the lower layer not less than 2 inches. Lap vertical end laps 6 inches minimum.



2. Fasten at 12 to 18 inches on center spacing at each vertical stud using the following fasteners:
  - a. Fasten to sheathed wood frame construction with staples, large head nails, or plastic washer nails.
  - b. Fasten to metal frame construction with steel drill screws with washers.
3. Wrap weather-resistive barrier a minimum of 16 inches around all inside and outside corners.
4. Completely lap flashing legs.
5. Completed installation shall be free of holes or breaks.

-OR-

- A. Polyolefin Sheet Weather-Resistive Barrier:
1. Apply material horizontally starting at outside corner with bottom aligned with foundation or bottom termination and plumb. Leave 6 to 12 inches of material at corner for overlap. Align stud marks on rolls with framing members of exterior wall.
  2. Use material as required to span floor to floor height and lap upper layer over lower layer 6 inches minimum. Lap vertical joints 6 inches minimum.
  3. Secure sheet to foundation with continuous bead of joint sealer.
  4. Wrap sheet 6 inches minimum around all corners lapped over adjacent sheet and taped.
  5. Extend sheet directly over window and door openings, cut and wrap material into opening, or trim material at openings and seal with tape as recommended by manufacturer.
  6. Fasten at 12 to 18 inches on center spacing at each vertical stud using the following fasteners:
    - a. Fasten to sheathed wood frame construction with staples, large head nails, or plastic washer nails.
    - b. Fasten to metal frame construction with steel drill screws with washers.
    - c. Attach to masonry surfaces with adhesive.
  7. Lap upstanding flashing with 4 inch minimum overlap and secure with adhesive.
  8. Tape all seams, window and door penetrations, corners, and torn or damaged areas as recommended by sheet manufacturer.
  9. Completed installation shall be free of holes or breaks.

**Metal lath must be installed over weather resistive barrier to provide bond between stone and the substrate.**  
**Metal lath is also required over masonry surfaces, which have been painted, sealed, or are dirty and cannot be properly cleaned to achieve proper adhesion.**  
**Metal lath over a weather resistive barrier should also be considered where moisture penetration is a primary concern.**

- B. Lathing:
1. Install lath with the long dimensions of the sheet across supports and secure to substrate at intervals not exceeding 6 inches o.c. vertically and 16 inches o.c. horizontally, with corrosion resistant fasteners that penetrate a minimum of 1 inch into the structural substrate.
  2. Install with "cups" of expanded metal lath facing upward and with minimum 2-inch overlaps.
  3. Make end laps of lath only over supports and stagger endlaps in adjacent courses.
  4. Wrap metal lath a minimum of 16 inches around all inside and outside corners.

### 3.04 APPLICATION OF SCRATCH COAT

- A. Apply scratch coat with sufficient pressure so that it is forced through the metal lath and against the backing to form full keys and to embed lath completely. Apply to an approximate thickness of 1/4 inch (6mm) from the face of the backing. Scratch to provide bond for mortar setting of stone.

-OR-

- A. Dampen surface of concrete or masonry substrate to prevent rapid drying of the scratch coat. Apply scratch coat directly to and fully encapsulate clean masonry or concrete surface. Apply to an approximate thickness of 1/4 inch (6mm) from the face of the substrate. Scratch to provide bond for mortar setting of stone.
- B. Temperature shall be 45 degrees F. (7 degrees C.) and rising during application and for 48 hours thereafter.
- C. Allow scratch coat to dry overnight before applying stone veneer.

### 3.05 APPLICATION OF STONE VENEER

- A. Stone Layout: Lay stone out on a suitable surface adjacent to where the stone is to be installed and arrange stones by size and color to achieve the desired appearance of the stone prior to setting.
- B. Install stone in accordance with stone supplier's instructions, erection drawings and as follows:

**The following is especially important in hot dry conditions**

1. Dampen surface of scratch coat and stone veneer units to prevent rapid drying of the setting mortar.
2. Apply skim coat of setting mortar of approximate 3/8 inch to 1/2 inch thickness using a mason's or plasterer's trowel over dampened scratch coat to a workable area of not more than 10 square feet, or less as required to keep skim coat workable.
3. Apply stone prior to skim coat drying.
4. Start installation of stone from the bottom up, or as otherwise recommended by the manufacturer.
5. Apply inside and outside corner units first, alternating short and long legs of corner units to produce a natural look.
6. Apply mortar directly to the entire back surface of each stone unit in approximately 3/4 to 1 inch thickness and press stone units firmly into position in soft mortar bed, joggle each piece slightly to bond firmly, causing mortar to extrude around all edges of units. Apply pressure to the stone to ensure a good bond and complete coverage between the mortar bed and back surface of the stone without voids, resulting in a mortar thickness of approximately 1/2 to 3/4 inch total.
7. Total mortar bed depth (including scratch coat) should be approximately 1/2 to 1-1/4 inches thickness.
8. Place units with consistent joint spacing of nominal [3/8 inch] [ \_\_\_\_\_ ] width.
9. Utilize wire ties where required to secure units in position until mortar has set.
10. Remove excess mortar from edges of installed stone prior to installation of adjacent unit as necessary to achieve joint width.
11. Grout Joints: Fill all joints completely with mortar using a masonry grout bag,

forcing mortar into all joints to ensure there are no voids. Allow mortar to dry until it is firm or "thumb print" dry before tooling.

1. Tool all joints using a wood or metal pointing tool to produce a dense, slightly concave tooled surface which is well bonded to stone at edges.
2. Tool all joints smooth with surface of stone, allowing mortar to spread slightly onto face of stone.
3. Finish the grout joints with a stiff broom or brush.

-OR-

11. Dry Stack Appearance Stone: Place units with uniform joints and remove excess mortar by raking joints to uniform depth to achieve a "dry stack" appearance.
  12. Do not attempt to remove wet mortar from face of stone. Allow mortar to dry and remove with a stiff broom or brush.
  13. Colored Mortar: Consistency of appearance shall be maintained throughout the project.
- C. Accessory Units: Install [wall caps] [hearth stones] [water table sills] at locations indicated on Drawings in full bed of mortar following manufacturer's instructions and details on Drawings.
- D. Do not lay chipped, cracked, or otherwise defective units in the wall where damaged portion of the unit will be exposed to view.
- E. Openings: Provide openings in stone walls where required or indicated. Steel lintels shall be provided unless otherwise noted.
- F. Cutting of Stone: Plan work to minimize jobsite cutting. When required, exposed units shall be cut with a power driven Carborundum or diamond disc blade saw to provide uniform edges. When using "wet" cutting methods, clean water shall be used on exposed units.
1. Lay units with cut edge so that cut edge is concealed in finished work.
- G. Where fresh stone joins stone that is partially or totally set, the exposed surface of the set stone shall be cleaned and lightly wetted so as to obtain the best possible bond with the new Work. Loose stone and mortar shall be removed.
- H. Provide sealant joints at joints between adhered stone cladding and adjacent materials. Coordinate sealant application as specified in Section 07900 as detailed and as required to maintain waterproof integrity.

### 3.06 CLEANING AND PROTECTION

- A. Stone Cleaning: Clean mortar droppings from face of stone veneer units after the mortar has dried using stiff broom or brush in accordance with manufacturer's recommendations.
- B. Furnish temporary protection for exposed stone corners subject to injury.
- C. In hot and dry weather, protect adhered stone cladding against too rapid drying.
- D. Protect finished work against freezing for a period of not less than 48 hours by means of enclosures, artificial heat, or such other protective methods as may be required.

END OF SECTION