PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes anchored stone paneling for the following interior applications:
1. Interior stone wall paneling.
2. Stone sill, base and trim.

B. Related Requirements:
1. Division 3 Section "Cast-in-Place Concrete" for installing concrete inserts for anchoring stone paneling.
2. Division 4 Section "Unit Masonry" for installing masonry inserts for anchoring stone paneling.
3. Division 7 Section "Joint Sealants" for sealing expansion joints in stone paneling.

1.3 QUALITY ASSURANCE

A. The work of this section shall be performed by a company which specializes in the type of stone paneling work required for this Project, with a minimum of 5 years of documented successful experience and shall be performed by skilled workmen thoroughly experienced in the necessary crafts.
1. Work shall be performed in compliance with Owner's insurance underwriters' requirements and UL approvals and testing for materials, assemblies and procedures.

B. Manufacturer shall specialize in manufacturing the type of stone paneling specified in this section, with a minimum of 5 years of documented successful experience, and have the facilities capable of meeting all requirements of Contract Documents as a single-source responsibility and warranty.

C. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate stone paneling similar to that required for this Project, and whose products have a record of successful in-service performance.

D. Installer Qualifications: Fabricator of stone paneling.

E. Installer Qualifications: A firm or individual experienced in installing stone paneling similar in material, design, and extent to that indicated for this Project, whose work has a record of successful in-service performance.

F. Full-sized dry Mock-up:
1. Layout out the wall panels for the following spaces on a smooth and level horizontal surface to represent each stone’s final location in the constructed Work.
   a. Ground Level Building Lobbies.
   b. Ground Level Elevator Lobbies.
2. Locate mock-up in Contractor’s off-site facility as approved by the Project Manager.
3. Provide Project Manager and Architect with at least 15 working days advance notice that the mock-up is ready for review by the Architect and Project Manager.
4. Relocate stones as determined by the Project Manger and Architect to create an overall blend and consistency acceptable to the Architect.
5. Remove and replace stone which is not within the approved range.
6. After acceptance by the Architect and Project Manager, mark each stone panel to record the approved location. Install panels according to the approved mock-up.

G. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for fabrication and installation.
1. Build mockup of typical wall area, not less than 72 inches long by 96 inches high.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

H. Manufacturer’s identification tags or marks are not acceptable on surfaces which will remain exposed to view after installation.
1. Evidence of “patching” after removal of tags or marks is not acceptable.

1.4 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design stone paneling system.

B. General: Design stone anchors and anchoring systems according to ASTM C1242.

B. General: Design, fabricate and install interior stone facing and back-up system to withstand wind loads, gravity loads, and movement of building structure, as well as to resist deterioration under conditions of normal use without failure.
   1. Except where specifically shown otherwise on drawings, provide all support steel and connection elements and assemblies for support of interior stone facing.
   2. Support member shapes shown on the drawings are not necessarily the exact shapes required or best suited for the particular condition.
      a. Method of installing and anchoring of stone and back-up system work shown on drawings is diagrammatic only.
      b. Alternative methods of detailing proposed by Contractor will be considered.
      c. It shall be Contractor's responsibility to design and guarantee stone and anchorage requirements.
      d. Details shown are not intended to depict required connections.
   3. All points of support for the stonework shall be properly braced in the three orthogonal directions (vertical, transverse, and longitudinal) to resist all loads from any direction including both wind pressure and suction.
   4. Anchorage and supports shall be designed to accommodate variation (up/down, in/out) from theoretical location of supporting structure and adjacent construction.
      a. Design installation to meet performance requirements specified and allow for expansion, contraction and differential deflection of supporting floors.
   5. For all interior stone facing 10'-0" above finish floor, provide dead load support at 10'-0" on center vertically.
   6. Capacity of stone anchors shall not be based on the use of epoxy or grout.
      a. Dead load support of panels shall not depend on pull-out.

1.5 SUBMITTALS

A. Submit the following according to Conditions of the Construction Contract and Division 1 Specification Sections.

B. Preliminary Design Proposal: Submit a "preliminary design proposal" with Bid, including drawings as necessary for the basic concept of the interior stone facing installation system.

C. Product Data:
   1. For each variety of stone include data on physical properties required by referenced ASTM standards.
   2. Stone installation materials and other manufactured products.

D. LEED Submittals:
   1. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regional materials, certificates indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.
   2. Product Data for Credit IEQ 4.1: For sealants, documentation including printed statement of VOC content.

E. Shop Drawings: Show fabrication and installation details for stone paneling system, including dimensions and profiles of stone units. Include plans, elevations, sections, details, and attachments to other work.
   1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
      a. Submit drawings indicating engineering and details of system; relationships to other wall components and systems adjacent to, or penetrating, interior stone facing; and method of joinery to latter components and systems that achieve compliance with indicated performance requirements.
   2. Show locations and details of joints both within stone paneling system and between stone paneling system and other finish materials.
   3. Show locations and details of anchors, including locations of supporting construction.
   4. Show direction of veining, grain, or other directional pattern.
   5. Include large-scale shaded drawings of decorative surfaces.

F. Samples:
1. Prior to the Architect's visit to the fabricator's plant for formal stone review, submit three samples of each stone type, 12 inch x 12 inch, showing full range of color and texture including typical inclusions in finished work from the proposed material source.
   a. Architect's review and acceptance of samples is for color, texture and pattern only of the material source proposed.
   b. Formal review and acceptance of the material for actual use on the Project shall occur at the fabricator's plant.
   c. Compliance with other requirements is Contractor's responsibility.
   d. Sample review and acceptance shall precede mock-up installation.
2. In addition to above, provide adjacent 12 inch x 12 inch sample panels showing sealant and grout materials for Architect's review.

G. Delegated-Design Submittal: For stone paneling assembly.

H. Hazardous Materials Notification: In the event no product or material is available that does not contain asbestos, PCB or other hazardous materials as determined by the Owner, a "Material Safety Data Sheet" (MSDS) equivalent to OSHA Form 20 shall be submitted for that proposed product or material prior to installation.

I. Asbestos and PCB Certification: After completion of installation, but prior to Substantial Completion, Contractor shall certify in writing that products and materials installed, and processes used, do not contain asbestos or polychlorinated biphenyls (PCB), using format in Article 3 of General Conditions.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, fabricator and professional engineer.

B. Material Test Reports:
1. Stone Test Reports: For each stone variety proposed for use on Project, by a qualified testing agency, indicating compliance with required physical properties, other than abrasion resistance, according to referenced ASTM standards. Base reports on testing done within previous three years.
2. Sealant Compatibility and Adhesion Test Report: From sealant manufacturer indicating that sealants will not stain or damage stone. Include interpretation of test results and recommendations for primers and substrate preparation needed for adhesion.

C. Statement of Suitability: Submit statements signed by representative of respective manufacturers that proprietary products, such as mortars, admixtures, sealants and anchorage devices are proper for intended use and that no materials soluble in water after set shall be used.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For stone paneling to include in maintenance manuals. Include product data for stone-care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Comply with General Conditions and Division 1 Section "Product Requirements".

B. Deliver materials to Project Site in undamaged condition.

C. Store and handle stone and related materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, or other causes.

D. Store and handle stone and related materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, and other causes.
1. Lift stone with wide-belt slings; do not use wire rope or ropes that might cause staining. Move stone, if required, using dollies with cushioned wood supports.
2. Store stone on wood A-frames or pallets with nonstaining, waterproof covers. Arrange to distribute weight evenly and to prevent damage to stone. Ventilate under covers to prevent condensation.

E. 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.

F. Deliver sealants to Project site in original unopened containers labeled with manufacturer's name, product name and designation, color, expiration period, pot life, curing time, and mixing instructions for multicomponent materials.

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

H. Do not exceed building design loads during delivery and storage of stone and setting materials.
1. No portions of the building or Project site are designated as storage locations for the stone.

1.9 FIELD CONDITIONS

A. Maintain air and material temperatures to comply with requirements of installation material manufacturers, but not less than 50 deg F (10 deg C) during installation and for seven days after completion.

B. Field Measurements: Verify dimensions of construction to receive stone paneling by field measurements before fabrication and indicate measurements on Shop Drawings.

1.10 COORDINATION

A. Coordinate installation of inserts that are to be embedded in concrete or masonry and similar items to be used by stone paneling Installer for anchoring and supporting stone paneling. 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 stone paneling to avoid extended on-site storage and to coordinate with work adjacent to stone paneling.

1.11 WARRANTY

A. Comply with General Conditions and Division 1 Section “Product Requirements”.

1.12 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
1. Interior Stone Facing Units: Furnish quantity of full-size units for each shape and thickness equal to 2% of amount installed.

1.13 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.14 PRECONSTRUCTION TESTING

A. Preconstruction Sealant Adhesion and Compatibility Testing: Submit to joint-sealant manufacturers, for compatibility and adhesion testing according to sealant manufacturer's standard testing methods and Section 07 92 00 "Joint Sealants," Samples of materials that will contact or affect joint sealants.

PART 2 PRODUCTS

2.1 UNAUTHORIZED MATERIALS

A. Materials and products required for work of this section shall not contain asbestos, polychlorinated biphenyls (PCB) or other hazardous materials identified by the Owner.

2.2 ACCEPTABLE MANUFACTURERS

A. Products of the manufacturers specified in this section establish the minimum functional, aesthetic and quality standards required for work of this section.

B. Source Limitations for Stone: Obtain each variety of stone, regardless of finish, from a single quarry, whether specified in this Section or in another Section of the Specifications, 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.
   2. Make quarried blocks available for examination by Architect.
   3. The acceptable color range and grain variation for each stone type and finish will be developed through a visit to each of the stone fabricator's plants.
      a. Set up a number of large uncut finished slabs (minimum of 11) of each type sufficient to demonstrate the extreme range, extent of veining, inclusions, knots, swirls, etc. that can be expected for the production run material in a vertical position in the fabricator's yard for viewing by the Architect and Owner.
      b. The Architect will select the stones which are acceptable and conform to the requirements of the specifications rejecting any other stones falling outside of the requirements.
      c. Each approved stone panel will be cut in half, with one half being shipped to the Project site with the initial shipment of stone and the other half remaining at the fabricator's plant for quality control purposes.
   4. Establish procedures for blending range in installed stone.
      a. Control variation from piece to piece to eliminate patchwork or "checkerboard" appearance.
      b. Provide for evenly blended appearance of finish work.

C. Varieties and Sources: Subject to compliance with requirements, provide stone of varieties and from sources complying with Division 4 Section "Exterior Stone Cladding".

D. Substitutions: Comply with General Conditions using form in Division 1 Section "Substitution Request Form".

2.3 STONE TYPES

A. STONE TYPE **ST–2**:
   1. Type: Marble.
   2. Name: Calacatta White.
   3. Finish: High honed.
   4. Thicknesses: 2 cm. minimum.
   5. Location: Lobby interior walls.

B. STONE TYPE **ST–1** and **ST-3**: See Section 09 63 40 "Stone Flooring".

C. STONE TYPE **ST-4**: See Section 12 36 40 "Stone Counter Tops".

2.4 MARBLE

A. Material Standard: Comply with ASTM C503.

B. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.

2.5 SETTING MATERIALS

A. Epoxy Filler: As recommended by stone fabricator for use at outside corners conditions.

B. Adhesives, General: Use only adhesives formulated for stone and ceramic tile and recommended by their manufacturer for the application indicated.

C. Water-Cleanable Epoxy Adhesive: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Laticrete International, Inc.
      b. MAPEI Corp.

2.6 SEALANTS

A. Joint Sealants: Manufacturer's standard sealants of characteristics indicated below that comply with applicable requirements in Section 079200 "Joint Sealants" and will not stain the stone they are applied to.

B. Sealant for Filling Kerfs: Same sealant used for joints in dimension stone.

2.7 STONE ANCHORS AND ATTACHMENTS

A. Fabricate anchors from stainless steel, ASTM A240/A 240M or ASTM A666, Type 304.
   1. Fasteners for Stainless-Steel Anchors: Annealed stainless-steel bolts, nuts, and washers; ASTM F593 (ASTM F738M) for bolts and ASTM F594 (ASTM F836M) for nuts, Alloy Group 1 (A1).

B. Fabricate dowels from stainless steel, ASTM A276, Type 304.

C. Wire Tiebacks: 0.120-inch- (3.0-mm-) diameter, stainless-steel wire.

2.8 STONE ACCESSORIES

A. Temporary Setting Shims: Rigid plastic shims, nonstaining to stone, sized to suit joint thickness.

B. Epoxy Adhesive: As recommended by Stone Fabricator.

C. Cleaner: Stone cleaner specifically formulated for stone types, finishes, and applications indicated, as recommended by stone producer. Do not use cleaning compounds containing acids, caustics, harsh fillers, or abrasives.
   1. Cleaner: Miracle Sealants Co. “Miraclean #1.”

D. Stone Sealer: Colorless, stain-resistant sealer that does not affect color or physical properties of stone surfaces, as recommended by stone producer for application indicated.

2.9 STONE FABRICATION, GENERAL

A. Select stone for intended use to prevent fabricated units from containing cracks, seams, and starts that could impair structural integrity or function.
   1. Repairs that are characteristic of the varieties specified are acceptable provided they do not impair structural integrity or function and are not aesthetically unpleasing, as judged by Architect.

B. Fabricate stone paneling in sizes and shapes required to comply with requirements indicated, including details on drawings and shop drawings.
   1. For marble, comply with recommendations in MIA's "Dimension Stone - Design Manual VII."

C. Cut stone to produce pieces of thickness, size, and shape indicated and to comply with fabrication and construction tolerances recommended by applicable stone association.
   1. Where items are installed with adhesive or where stone edges are visible in the finished work, make items uniform in thickness and of identical thickness for each type of item; gage back of stone if necessary.
   2. Clean sawed backs of stones to remove rust stains and iron particles.
   3. Dress joints straight and at right angle to face unless otherwise indicated.
   4. Cut and drill sinkages and holes in stone for anchors, supports, and lifting devices as indicated or needed to set stone securely in place; shape beds to fit supports.
   5. Provide openings, reveals, and similar features as needed to accommodate adjacent work.

D. Finish exposed faces and edges of stone to comply with requirements indicated for finish of each stone type required and to match approved Samples and mockups.

E. Carefully 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.

2.10 STONE WALL PANELING

A. Arrange panels in shop or other suitable space in proposed orientation and sequence for examination by Architect. Mark units with temporary sequence numbers to indicate position in proposed layout.
   1. Lay out one elevation at a time if approved by Architect.
   2. Notify Architect seven days in advance of date and time when layout will be available for viewing.
   3. Provide lighting of similar type and level as that of final installation for viewing layout unless otherwise approved by Architect.
   4. Rearrange panels as directed by Architect until layout is approved.

5. Do not trim nonmodular-size units to less than modular size until after Architect's approval of layout, unless otherwise approved by Architect.
6. Mark backs of units and Shop Drawings with sequence numbers based on approved layout. Mark backs of units to indicate orientation of units in completed Work.

B. Nominal Thickness: 3/4 inch (20 mm) unless otherwise indicated.

C. Control depth of stone to maintain minimum clearances of 3/4 inch (20 mm) between backs of panels and structural members, fireproofing if any, backup walls, and other work behind stone. Do not back check stone less than 1 inch (25 mm) thick.

* D. Cut stone to produce joints of size and in locations listed in drawings.

E. Pattern Arrangement: Fabricate and arrange panels with veining and other natural markings to comply with the following requirements:
1. Arrange panels with veining horizontal per samples and mock-ups approved by the Architect.

2.11 STONE SILLS, BASE AND TRIM

A. Sills:
1. Nominal Thickness: 1-1/4 inch, unless otherwise indicated.
2. Edge Detail: Straight, slightly eased at corners.
3. Joints: 1/8 inch wide grouted joints.

B. Base:
1. Nominal Thickness: 3/4 inch, unless otherwise indicated.
2. Top-Edge Detail: As indicated.
3. Joints: 1/8 inch wide, sealant-filled joints.

C. Flat Trim:
1. Nominal Thickness: 3/4 inch unless otherwise indicated.
2. Edge Detail: As indicated.
3. Joints: 1/8 inch wide, sealant-filled joints.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive stone paneling and conditions under which stone paneling will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of stone paneling.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the interior stone paneling.

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

3.2 SETTING STONE, GENERAL

A. Before setting stone, clean surfaces that are dirty or stained by removing soil, stains, and foreign materials. 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.

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

C. Contiguous Work: Provide reveals and openings as required to accommodate contiguous work.

D. Set stone to comply with requirements indicated. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure stone in place. Shim and adjust anchors, supports, and accessories to set stone accurately in locations indicated, with edges and faces aligned according to established relationships and indicated tolerances so they are not visible through open joints.

E. Erect stone units level, plumb, and true with uniform joint widths. Use temporary shims to maintain joint width.

F. Provide expansion, control, and pressure-relieving joints of widths and at locations indicated.
1. Sealing of expansion and other joints is specified in Section 079200 "Joint Sealants."
2. Keep expansion joints free of plaster, mortar, grout, and other rigid materials.

G. Fill space between back of stone units and backup wall solidly with mortar up to 12" above finished floor surface.

3.3 CONSTRUCTION TOLERANCES

A. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/8 inch in 96 inches (3 mm in 2400 mm), 1/4 inch (6 mm) maximum.

B. Variation from Level: For lintels, sills, chair rails, horizontal bands, horizontal grooves, and other conspicuous lines, do not exceed 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), 3/8 inch (10 mm) maximum.

C. Variation of Linear Building Line: For position shown in plan and related portion of walls and partitions, do not exceed 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), 3/8 inch (10 mm) maximum.

D. Variation in Cross-Sectional Dimensions: For thickness of walls from dimensions indicated, do not exceed plus or minus 1/8 inch (3 mm).

E. Variation in Joint Width: Do not vary from average joint width more than plus or minus 1/16 inch (1.5 mm) or one-fourth of nominal joint width, whichever is less.

F. Variation in Plane between Adjacent Stone Units (Lipping): Do not exceed 1/32-inch (0.8-mm) difference between planes of adjacent units.

3.4 INSTALLATION OF STONE PANELING

A. Set units on direct-mount anchoring system with anchors securely attached to stone and to backup surfaces. Comply with anchoring recommendations in ASTM C1242.
1. 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 sealant for filling kerfs.
2. Set stone supported on clips or continuous angles on resilient setting shims. Use material of thickness required to maintain uniform joint widths and to prevent point loading of stone on anchors. Hold shims back from face of stone a distance at least equal to width of joint.

C. Minimum Anchors: Provide a minimum of four anchors per panel up to 12 sq. ft. (1.1 sq. m) in face area, plus a minimum of two additional anchors for each additional 8 sq. ft. (0.7 sq. m).

3.5 JOINT-SEALANT INSTALLATION

A. Prepare joints and apply sealants of type and at locations indicated to comply with applicable requirements in Section 07 92 00 "Joint Sealants." Remove temporary shims before applying sealants.

3.6 ADJUSTING AND CLEANING

A. In-Progress Cleaning: Clean stone paneling as work progresses. Remove adhesive, grout, mortar, and sealant smears immediately.

B. Remove and replace stone paneling 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 stone paneling.
3. Defective joints, including misaligned joints.
4. Stone paneling and joints not matching approved Samples and mockups.
5. Stone paneling not complying with other requirements indicated.

C. Replace in a manner that results in stone paneling that matches approved Samples and mockups, complies with other requirements, and shows no evidence of replacement.

D. Clean stone paneling no fewer than six days after completion of grouting and pointing, using clean water and soft rags or stiff-bristle fiber brushes. Do not use wire brushes, acid-type cleaning agents, cleaning compounds with caustic or harsh fillers, or other materials or methods that could damage stone.

E. Sealer Application: Apply stone sealer to comply with stone producer's and sealer manufacturer's written instructions and recommendations.

3.7 PROTECTION

A. Protect stone surfaces, edges, and corners from construction damage. Use securely fastened untreated wood, plywood, or heavy cardboard to prevent damage.

B. Before inspection for Substantial Completion, remove protective coverings and clean surfaces.

END OF SECTION