

## STONE FLOORING

### PART ONE: GENERAL

#### 1.1 Description

1.1.1 Work in this Section, as shown or specified, shall be provided by the Interior Contractor and shall be in accordance with the requirements of the Contract Documents.

1.1.2 Work of this Section includes all labor, materials, equipment, and services necessary to complete the Stone Flooring as shown on the drawings and specified herein, including, but not limited to, the following:

- a. Moisture protection above substrate, where required.
- b. Furnishing, cutting, fabricating, delivery and setting of all Stone Flooring.
- c. Substructure as required.
- d. All fastening devices and accessories necessary for complete installation.
- e. Protection of stone during transit, storage and installation. Cleaning of stone prior to acceptance.

1.1.3 Related work in other section:

- a. Interior Stone Section 04401.
- b. Wood Flooring Section 09550.
- c. Millwork Section 06410.
- d. Finish Carpentry Section 06200
- e. Carpet Section 09680

#### 1.2 Submittals

1.2.1 All submittals shall be made according to Section 01300

and as specified herein.

1.2.2 Submit the following to the Consultant for approval prior to construction and fabrication.

- a. Shop Drawings, indicating fabrication and installation methods, to include plans at not less than  $1/2" = 1'-0"$  (or 1:20) scale and details at not less than  $3" = 1'-0"$  (1:5) scale. Indicate required field dimensions, materials, finishes, substructure, all fastening devices and accessory items. Include coordination details for related and adjoining work.
- b. Submit samples of all materials to be encompassed in the work in size and quantity, as required by the Consultant. These will include, but not be limited to, samples of:
  1. For each type of Stone and for each pattern condition: Three sets indicating full range of materials, color, texture and pattern. Each set shall be  $18" \times 18"$  ( $450 \times 450$  mm), or larger if necessary to show full range. Inherent variations characteristic of the stone and the quarry from which the stone is to be obtained shall be brought to the attention of the Consultant at the time the samples are submitted for approval and shall be subject to approval of the Consultant.
  2. Fastening, Devices, Anchors, Shims and Setting Pad: Each type.
  3. Grout: Each color.
  4. Metal inset strips: each type, each finish.
- c. Maintenance Data: Submit manufacturers recommendations for cleaning of stone, including recommended products, cleaning machinery and procedures for maintenance.

### **1.3 Documentation**

1.3.1 The drawings and specifications are an outline of the criteria and performance requirements of the work. The requirements shown by the details are intended to establish basic dimensions and

profiles of members. Within these parameters, the Interior Contractor is responsible for the design and engineering of the floor and support system, including whatever modifications or additions may be required to meet the specified requirements and maintain the visual design concept.

1.3.2 It is recognized that the design details do not cover every condition. It is intended that any conditions not detailed shall be developed through the Interior Contractor's Shop Drawings in compliance with performance criteria, as indicated for detailed areas and stipulated in these specifications.

#### **1.4 Quality Assurance**

1.4.1 All Stone Flooring and trim shall be installed using experienced, skilled workmen who are regularly engaged in the engineering, fabrication, manufacture, finishing, installation and sealing of similar work to the highest standard of workmanship. The finished appearance of the floor shall be free from any defects due to faulty workmanship.

1.4.2 The Interior Contractor, by commencing the work of this Section, assumes overall responsibility, as a part of his warranty of the work, to assure that all assemblies, components and parts shown or required within the work of this Section, comply with the Contract Documents.

1.4.3 Consultants's inspection of the stone does not relieve Interior Contractor from responsibility to provide all Stonework in accordance with the approved samples and Shop Drawings.

##### **1.4.4 Examination Criteria:**

All examinations, selections and approvals shall be for the purpose of achieving a final appearance of stone with the greatest possible uniformity, and will be based upon the following criteria.

- a. Color within approved, pre-selected color range and finishes.

- b. Sequence matching of adjacent stone units, as approved by the Consultant.
  - c. Only one source of each type of stone shall be used throughout the work. Stone shall match the type, pattern, color, texture and finish of samples available for inspection in the office of the Consultant.
  - d. Conformance to approved Shop Drawings and details within specified dimensions and tolerances.
  - e. Other criteria as specified in Part 2, Products, herein.
- 1.4.5 The Interior Contractor shall be responsible for taking accurate job site measurements for all dimensions related to the Work.
- 1.4.6 The Interior Contractor shall examine all conditions pertaining to the installation of Stone Flooring and shall provide all coordination as required to achieve the proper and timely completion of the installation.
- 1.4.7 The Interior Contractor will not change brands of materials during the course of the work unless approved by Consultant.

## **1.5 Fabrication Tolerances**

### **1.5.1 Fabrication:**

- a. Stone dimension tolerance shall be  $\forall 1/16"$  (2 mm) in both directions with 90 degree angle, unless specified otherwise for all corners, unless noted otherwise.
- b. Except as noted, all joints shall be  $1/16"$  (2 mm) wide.
- c. Joint dimension tolerance shall be  $\forall 0$ .
- d. Stone face dimension tolerance shall be  $\forall 1/32"$  (1 mm) in all directions.
- e. Stone thickness tolerance shall be  $\forall 1/16"$  (2 mm).

1.5.2 Variation from Plumb or from Level: For lines and surfaces of walls and arrises, do not exceed  $1/8"$  (3 mm) in 10 ft. max (3M).

1.5.3 Offset of Joints: Do not exceed plus or minus  $1/32"$  (1 mm).

1.5.4 Maximum variation in height between adjacent units:  $1/32"$  (1 mm).

1.5.5 Out-of-square variation: Maximum  $1/16"$  (2 mm) in diagonal measurement, while not exceeding specified unit face size variation.

1.5.6 Maximum variation in specified thicknesses for setting bed:  $\forall 1/16"$  (2 mm).

## **1.6 Performance Requirements**

1.6.1 Methods and fabrication and assembly (except as specified herein) shall be at the discretion of the Interior Contractor provided that the visible architectural effect is not changed, the work of other Contractors is not affected, and the strength and function qualities, as demonstrated by engineering calculations are not reduced.

1.6.2 Remedial measures, which may be necessary on the building, shall maintain standards of quality and durability and are subject to approval by the Owner.

1.6.3 Anchors:

- a. Adequate number and size of anchors shall be provided to satisfy the load requirements and design criteria. In any case, anchors shall not be less in size and number than shown on approved drawings.

1.6.4 Variations in Structure:

- a. The work shall be designed to accommodate variation in location of surrounding and supporting work, as defined as allowable variations in the work, as specified in other sections of the project Specification.

**1.9 Job Conditions**

1.9.1 Interior Contractor must review installation procedure and coordination with other work with General Contractor and other Subcontractors whose work will be affected by stonework.

**1.10 Protection**

1.10.1 Protect stone surfaces and adjacent surfaces from damage. Prevent adjacent materials or materials used for installing work of this Section from staining or damaging the exposed surfaces of stone units or the exposed surfaces of the adjoining construction.

## **1.11 Guarantee**

- 1.11.1 Unless stated otherwise in these Specifications, guarantee shall state that all work is in accord with drawings and Specifications, as amended by any changes thereto authorized by the Consultant, free from defects in materials and workmanship for a period of five (5) years from the date of acceptance of the work by the Owner. Interior Contractor shall agree to repair or replace defective materials and workmanship during the guarantee period at no additional cost to the Owner.
- 1.11.2 Defective materials and workmanship are hereby defined to include evidence of abnormal deterioration, aging, structural failure of components resulting from exposure to normal load and forces, failure of operating parts to function normally, sealant failure, deterioration or discoloration of finishes in excess of normal aging and failure to fulfill other specified performance.
- 1.11.3 Interior Contractor and respective Subcontractors shall be responsible for damage to the building and furnishings occasioned by defective materials, workmanship or damage as part of repairs to the stone.

## **PART TWO: PRODUCTS**

### **2.1 Products**

- 2.1.1 Stone flooring shall be in the colors, types, sizes, finishes and thickness and by the Manufacturers as shown by the drawings and specified herein, or an approved equal (see Section 0100).
- 2.1.2 Substructure of Stone Flooring if required, shall be constructed of materials and methods as recommended by Stone Floor Manufacturer.
- 2.1.3 Trim, base and accessories shall be provided as required for complete installation as specified herein, on drawings, and as recommended by Manufacturer.
- 2.1.4 If stone finish is not indicated on drawings or

specifications, notify Consultant. Before proceeding with any pricing and before proceeding with the work, verify intended surface texture of stone, its finish and surface sealer or topcoat with Consultant.

#### 2.1.5 Criteria for Stone:

- a. Visual: Final appearance of stone shall have the greatest possible uniformity, and will be based upon the following criteria.
  - 1. All stone shall be of sound stock and uniform texture, and shall be free from holes, seams, shakes, clay pockets, spalls, stains, starts and other defects which would impair the strength, durability and appearance of the work, as determined by the Consultant.
  - 2. Stone provided at time of installation shall be of same quarry, color, veining and other characteristics as that of samples approved by Consultant.
  - 3. All stone shall be selected for background color, veining, marking and matching, shall run in even shades and shall be set accordingly.

#### 2.1.6 Physical and Mechanical:

- a. All engineering calculations and design shall be based on the mechanical and physical properties of the selected stone.

## **2.2 Accessory Materials for Stonework**

2.2.1 Mortar materials shall be as recommended by the Manufacturer for each stone type, size and application. Mortar color shall be as selected by Consultant.

- a. For colored pointing mortar, furnish matching stone ground down to meet grading requirements for sand.



### 2.2.2 Stone support:

#### a. Manufacturer and General:

Where required, stone support systems, anchors and accessories shall be manufactured by a company specializing in the design and fabrication of stone. Provide all fastening devices, support angles, relieving angles, anchors, coping anchors, dowels, cramps, bolts, nuts, shims, expansion sheilds, flashing, etc., necessary to properly secure stone to the structure as required.

## 2.3 Fabrication and Installation

2.3.1 Stone shall be accurately cut to sizes, shapes, profiles, textures, and dimensions. There shall be no diviation from jointing.

2.3.2 Exposed surfaces and edges of stone units shall be free from cracks, broken corners, chipped arrises, scratches or other defects affecting appearance. Patching not permitted. Stone with chipped edges or faces shall not be used.

2.3.3 Cut stone units full and true on faces, reveals, beds, joints and tops to the full dimensions required by drawings. All edges shall be straight and true with sharp and true arrises. All edges ahll be straight and true with sharp and true arrises. All stone shall fit together accurately.

2.3.4 Make faces of stone units in same plane flush at joints. All finished surfaces shall be true in line and face.

2.3.5 Sawn surfaces and edges shall be cleaned of all rust stains and iron particles.

2.3.6 Install stone flooring only when temperature and humidity levels are according to Manufacturers recommendations.

## 2.4 Cutting, Drilling and Fitting

2.4.1 Provide holes and sinkages required for anchors, dowels

and other devices required to support and/or suspend stone, and to accommodate other items which connect to or penetrate the stone.

2.4.2 Include all cutting, drilling and fitting of stonework required to accommodate the work of other trades.

In cutting and fitting carefully cut and grind edges to a neat tight fit. Do cutting in such a manner so as not to impair strength or appearance of stone. Use physical templates for all cutting and drilling; obtain required templates from proper trades.

### **THREE: EXECUTION**

#### **3.1 Inspection**

3.1.1 Advise General Contractor of requirements relating to his placement of any inserts which are to be used for anchoring and supporting Stone Flooring.

#### **3.2 Installation**

3.2.1 Erection Tolerances:

- a. The work shall be designed to accommodate all permitted tolerances as listed in paragraph 1.5 and anticipated dead and live load movement, creep, sway and torsion of the structure without any harmful effects.

3.2.2 Patching or hiding defects in stone will not be permitted.

3.2.3 Clean stone before setting as recommended by Stone Manufacturer. Follow all Manufacturer directions during installation.

3.2.4 Connections:

- a. Anti-galvanized Action: Isolate dissimilar metal surfaces to prevent galvanic action.
- b. Metal-to-metal contact: Separate metal surfaces in such a manner that metal does not move on metal. Materials used for this purpose shall be low friction components, sealants or gaskets.

#### **3.3 Setting Stone**

#### 3.3.1 Mixing mortar:

- a. Mix mortar for setting Stone on anchor plates and for spotting back of stone. Mix approved non-shrinking cement for filling of anchor holes in accordance with manufacturer's direction.
- b. Mix mortar in small batches to make a stiff plastic mass; mix until thoroughly homogenous; retempering with water is prohibited.

3.3.2 Set Stone in accordance with drawings and final shop drawings for stonework. Provide anchors, supports, fasteners, and other attachments shown, or necessary to secure stonework in place. Shim and adjust accessories as required for proper setting of stone. Completely fill holes, slots and other sinkages for anchors, dowels, fasteners and supports with non-shrink grout during setting of stones.

3.3.3 Maintain an even joint between units 1/16" (2 mm) maximum, unless noted otherwise on drawings.

3.3.4 Grout joints full and flush with face of Stone. Where metal inset strips are indicated, butt Stone flush and tight against strips, with no gaps exceeding 1/32" (1 mm).

3.3.5 Cleaning: After final cleaning of stone, repoint any open joints with grout.

3.3.6 The construction and preparation of any subfloors shall be in strict accordance with the Manufacturer's recommendations. The installation procedure of the Stone Floors to be laid thereon shall conform in all respects to the laying instructions of the Manufacturer. Extend Stone Floor into toe spaces, door reveals, and into closets and similar openings.

3.3.7 Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on the finished floor as marked in the subfloor. Use non-permanent marking devices.

3.3.8 Unless otherwise specified lay flooring from center marks established with principal walls, discounting minor offsets, so that pattern of Stone Floor is centered in room. Lay Stone Floor pattern square to room axis, unless otherwise shown.

3.3.9 All trim and bases shall be provided as required for complete installation as shown in drawings and specified herein and shall be installed according to Manufacturer's recommendations.

#### **3.4 Repair and Cleaning (After Installation)**

3.4.1 Remove and replace stone units which are broken, chipped, stained or otherwise damaged. Where directed, remove and replace units which do not match adjoining stonework. Patching or hiding defects in stonework will not be permitted. Provide new matching units, install as specified and reseal joints to eliminate evidence of replacement. Reseal defective and unsatisfactory joints to provide a neat, uniform appearance.

3.4.2 Clean stone flooring after completion of work according to manufacturers instructions. Provide penetrating topcoat sealer. Verify with Consultant requirements and application.

#### **3.5 Protection**

3.5.1 After installation and cleaning, protect stonework from damage during subsequent construction activities.

3.5.2 At completion of construction work, remove all temporary protection from the work of this Section.

3.5.3 Examine all work and repair all damage. Clean soiled or stained surfaces. In the event damage is irreparable or soiled or stained surface cannot be cleaned, notify Consultant for direction on correction procedure.

**END OF SECTION**