

SECTION 042400
EXTERIOR STONE CLADDING

1. GENERAL

- 1.01 GENERAL CONDITIONS The General Conditions, Supplementary General Conditions and all Sections of Division 1 shall apply to each and every contract and contractor, person or persons supplying material, labor or entering into the work directly or indirectly.
- 1.02 CODES: All work shall conform with the requirements of the local building codes. This Contractor shall verify compliance and where non compliance is noted it shall be reported immediately to the Architect. No work shall commence without this certification and no work should proceed unless it is in strict compliance with all applicable code requirements. See Division 1, Article 2.2.
- 1.03 STANDARDS: All materials and work shall conform with the recommendations of the National Building Granite Quarry Association. All granite shall be obtained from quarries having adequate capacity and facility to meet the specified requirements. Cutting and finishing shall be done by a firm equipped to process the material promptly on order and in accordance with specifications.
- 1.04 SUBMITTALS
- A. One ozalid transparency and two prints of erection and shop fabrication drawings.
 - B. Shop drawings shall show all bedding, bonding, jointing and anchoring details and the dimension and setting number of each piece of granite. No final sizing or finishing shall be done until shop drawings for that part of the work has been approved.
 - 1. Show location of inserts (for stone anchors and supports) which are to be built into concrete or unit masonry.
 - 2. Show large scale details of decorative surfaces and inscriptions.
- 1.05 SAMPLES: Submit to the Architect, one sample for approval of color, texture and surface finish. Sample shall be at least 12" x 12" in size and representative of the proposed finished product.
- 1.06 QUALITY ASSURANCE:
- A. Upon receipt at the site, the granite shall be stacked on timber or platforms at least 4" above the ground and extreme care shall be taken to prevent staining during storage. If storage is to be for a prolonged period, polyethylene shall be placed between any wood and finished surfaces and shall be used also as an overall protective coating. Lewis holes shall be plugged during freezing weather to prevent the accumulation of water. Salt shall not be used for melting of ice formed in Lewis holes or on pieces or for any purpose involving its contact with the granite.
 - B. If any unit is damaged during handling or erection, it shall be inspected by the Architect to determine whether the unit can be repaired or rejected.
 - C. Reference Standards: Comply with National Building Granite Quarries Association, Inc. (NBGQA).
 - 1. Granite: National Building Granite Quarries Association, Inc. (NBGQA).
 - D. Fabricator: Sub-subcontract fabrication of stone to a firm which has successfully fabricated stone similar to the quality specified for a period of not less than 5 years and is equipped to provide the quantity shown.
- 1.07 SCOPE: The Section includes all labor, materials, equipment and related services necessary for the fabrication, delivery and installation of the work shown on the drawings and/or specified herein, including but not limited to the following:

- A. Fabrication, delivery and erection of all granite veneer panels, cornices, bases, etc. as shown on the drawings.
- B. Mortars and sealants.
- C. Anchors, cramps, dowels and other anchoring devices.
- D. Incidental cutting and drilling.
- E. Pointing of joints.
- F. Cleaning and protecting the finished work.

1.08 RELATED WORK IN OTHER SECTIONS:

- A. Masonry 042000

1.09 INSTALL ONLY Install following items, to be furnished under other Sections:

- A. Anchors, inserts and other items furnished by other trades required to be built in with stone masonry.

1.10 FURNISH ONLY: Furnish and deliver, to jobsite unless otherwise indicated, the following items for installation under the Designated Sections or as otherwise noted.

- A. Anchors, inserts, other accessory items for securing stone masonry to other construction and required to be built in with the other construction: DIVISION 3 and SECTION 042000 - UNIT MASONRY.
- B. Metal anchors, other accessories required to be welded or otherwise secured to structural steel framing: DIVISION 5.

1.11 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Comply with requirements of SECTION 042000.
- B. Protect stone during storage and construction against moisture, soiling, staining and physical damage.
- C. Handle stone to prevent chipping, breakage, soiling or other damage. Do not use pinch or wrecking bars without protecting edges of stone with wood or other rigid materials. Lift with wide belt type slings wherever possible; do not use wire rope or ropes containing tar or other substances which might cause staining. If required, use wood rollers and provide cushion at end of wood slides.
- D. Store stone on wood skids or pallets, covered with non-staining, waterproof membrane. Place and stack skids and stones to distribute weight evenly and to prevent breakage or cracking of stones. Protect stored stone from weather with waterproof, non-staining covers or enclosures, but allow air to circulate around stones.
- E. Protect mortar materials and stonework accessories from weather, moisture and contamination with earth and other foreign materials.

1.12 JOB CONDITIONS:

- A. Comply with requirements of SECTION 042000.

- B. Weather Protection, General: During all seasons protect partially completed stonework against weather when work is not in progress. Cover top of walls with strong waterproof, non-staining membrane extending at least 2 ft. down both sides of walls and anchor securely in place.
- C. Cold Weather Protection: Refer to SECTION 04200.

2. MATERIAL

2.01 GRANITE

- A. All granite shall be of standard grade, free of cracks, seams or starts which may impair its structural integrity or function. Inherent variation characteristic of the quarry from which it is obtained is acceptable.
- B. Granite must conform to ASTM C97, C170 and C99.
- C. Granite shall be of type, finish, and thickness to match existing.

2.02 MORTAR AND GROUT MATERIALS:

- A. Mortar for setting and pointing shall be: 1 part portland cement, 1 part plastic lime hydrate, and 3 parts clean, non-staining sand.
- B. Calcium chloride or accelerator is not permitted.
- C. Cement: Provide white cement as follows:
 - 1. Portland Cement: ASTM C 150, except comply also with non-staining staining requirements of ASTM C 91 for not more than 0.13% soluble alkali. Furnish Type I, except Type III may be used for setting stonework in cold weather subject to approval by Architect.
 - 2. Masonry cement: Not acceptable.
- D. Hydrated Lime: ASTM C 207, Type S.
- E. Sand: ASTM C 144, except graded with 100% passing the No. 16 sieve for 1/4" and narrower joints.
 - 1. For white pointing mortar, provide natural white sand or ground stone meeting specified requirements.
 - 2. For colored pointing mortar, provide marble, granite or other sound stone, meeting specified grading requirements for sand, as required to match Architect's sample.
- F. Coloring Pigments: Limeproof, non-fading, mineral pigments as approved by Architect.

2.03 MIXES:

- A. Mortar: Non-staining, cement/lime mortar, complying with ASTM C 270, Proportion Specification, using specified materials.
 - 1. Use Type N unless otherwise indicated.

DELETE ABOVE OR BELOW. GENERALLY RETAIN ABOVE FOR SETTING LIMESTONE, BELOW FOR SETTING OTHER KINDS OF STONE.

- 1. Use Type S unless otherwise indicated.

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- 2. Use specified mortar for grouting.
- 2. Use specified mortar for parging.

B. Grout: For parging provide proportions as specified under Part 3.

2.04 ANCHORS, CRAMPS & DOWELS:

- A. All anchors, cramps, dowels and other anchoring devices shall be type 304 stainless steel by Hohmann & Barnard Inc. or suitable non-ferrous metal of the types and sizes shown on approved shop drawings.
- B. Schedule of Anchoring devices by Hohmann & Barnard, Inc.

#	Name	Gauge
370	channel slots	12 gauge
St.2	storch anchors	12 gauge
366	strap anchors	12 gauge 1" wide length as required
365	strap anchors	12 gauge 1" wide length as required
402R	cramp anchor	14" 0 length as required
406	dowel	1/2" 0 length as required

2.05 FABRICATION:

- A. General: Fabricate as shown and as detailed on final shop drawings and in compliance with recommendations of applicable stone association. Provide holes and sinkages cut or drilled for anchors, fasteners, supports and lifting devices, as shown and as necessary to secure stonework in place. Cut and back check as required for proper fit and clearance. Shape beds to fit supports.
- B. Contiguous Work: Provide chases, reveals, reglets, openings and similar spaces and features as required for contiguous work. Coordinate with drawings and final shop drawings showing contiguous work.
- C. Workmanship: Cut accurately to shape and dimensions shown on final shop drawings, maintaining fabrication tolerances of applicable stone associations.
 - 1. Dress joints (bed and vertical) straight and at 90 degree angle to face, unless otherwise indicated.
 - 2. Provide quirk-mitered corners, unless otherwise shown. Provide for cramp anchorage in top and bottom bed joints of corner units, unless otherwise shown.
- D. Joint Widths: Cut to provide joint widths as indicated or, if not indicated, cut to allow for uniform 3/8" wide joints.
- E. Thickness: Provide stone of thickness indicated. Saw cut back surfaces which will be concealed in finished work.
 - 1. Allow not less than 1" clearance between back face of units and structure framing (or fireproofing, if any).
- F. Reglets:
 - 1. Flashing Reglets: Cut flashing reglets, 5/8" wide x 3/4" deep, unless otherwise indicated.
 - 2. Gasket Reglets: Cut gasket reglets in edges of panels where gasketed joints are shown. Coordinate with profile of gaskets to be used in the work.

- G. Moldings: Fabricate molded work to profiles indicated, with arrises sharp and true and matched at joints between units.
- H. Carvings: Carve and cut decorative surfaces and inscriptions in accordance with final shop drawings.
- I. Saddles and Thresholds: Cut to profiles and dimensions shown.

3. EXECUTION

3.01 INSPECTION

- A. The installation of the granite shall be an indication of this contractor's acceptance of all subsurfaces and he will automatically assume the responsibility of any unacceptable finished work caused by subsurface conditions.
- B. Condition of surfaces: Inspect foundations and back-up block wall to assure surface to support granite panel as follows.
 - 1. To proper grades and elevations.
 - 2. Dry and free of all dirt and other deleterious material.
 - 3. All surfaces not properly prepared have been satisfactorily corrected.
- C. Granite panels shall be verified to determine any flaws or imperfections upon receipt at the site.

3.02 PREPARATION

- A. Pieces shall be dry and clean of all dirt.
- B. Anchors, cramps, dowels and other anchoring devices: remove all dirt, ice, loose rest and scale prior to installation.
- C. Mortar shall be mixed in small batches using clean non-alkaline water until it is homogenous, stiff and plastic. After mixing the mortar shall not sit form more than two hours before being used.

3.03 ALLOWABLE TOLERANCES:

- A. Maximum variation in the diversion of any piece shall be 1/4 of the specified bed and joint width.
- B. Flatness Tolerances shall be determined from a 4 foot long straight edge in any direction. The maximum variation from true plane shall not exceed a/4 of specified joint width.
- C. Variation from true plane to face surface shall not exceed 3/16" for thermal finish of moldings, washes and drips shall be constant in profile throughout their length in strict conformity with the details shown on approved shop drawings.

3.04 INSTALLATION

- A. General: Do not install cracked, broken or chipped granite exceeding ASTM allowances.
 - 1. Granite pieces shall be bedded and jointed as shown on the approved shop drawings.
 - 2. 3/8" for beds and joints of thermal finish granite. All mortar joints between stones should be thoroughly filled. The front 1/2" should be filled with pointing mortar after the setting bed has set. Tool a concave mortar joint.

3. Place an adequate number of lead pads or plastic buttons in the horizontal joint under heavy stones in order to sustain weight until mortar has set.
4. Prevent physical contact between back face of stone and concrete slabs and steel beams. Maximum variation of backs of granite shall be:
 - 1/4" on pieces up to modular 2" thick
 - 3/8" on pieces up to modular 2" to 3" thick
 - 1/2" on pieces up to modular 3" thick or moreSawn back shall be cleared of all rust stains and free of iron particles.
5. Dowel pins should not be embedded solidly when installed through a relieving angle at an expansion joint. Compressible materials should be installed at the base of the dowel pin holes to allow for thermal expansion of the granite.
6. Cavity wall should be kept clear of mortar droppings during construction.
7. Holes and sinkages for anchors, cramps and dowels shall be provided in accordance with approved shop drawings. Holes for other purposes shall be provided only when specifically shown on contract drawings. Fill all holes to prevent water traps.

B. Protection of the Work

1. Protect all cornices, ledges and offsets from mortar drippings or other damage during construction with wood covers and galvanized nails in mortar joints for support.
2. Remove misplaced mortar or grout immediately.
3. Do not permit wash from concrete floors or scaffolding to run down onto or behind walls.
4. Provide protection at all the corners and jambs from damage throughout the duration of construction.

C. Weather

1. Granite shall not be assembled when stone temperatures and surrounding air temperatures are below 50°F or above 95°F. Assembly of units below 50°F is permitted when the temperature of the stone units and the adhesive is raised by artificial heating to a temperature of 50°F. After the units have been joined, artificial heat should continue to be applied to the stone adjacent to the joint area to give the adhesive the curing temperature above 50°F. The contractor shall protect the granite from harm during the cold weather. No calcium chloride or accelerators may be permitted in mortar mix. If stone is set in cold weather construction follow recommendations of International Masonry Industry All Weather Council.
2. Adequately cover all work at the end of the work period during showers or storms and when so covered keep at least 50°F for at least 72 hours.
3. With wind velocities over 15 mph provide wind breaks.
4. Do not install granite pieces having a film of frost on its surface and do not build on any frozen work. Such work shall be required to be removed and rebuilt.

D. Setting

1. Each piece shall be carefully bedded in a full bed of mortar and tapped home with a rawhide mallet to a full and solid bearing.

2. Particular care shall be exercised to equalize bed and joint openings and eliminate the need for redressing of exposed surfaces. Exposed surfaces shall be kept free of mortar at all times.
 3. Except at expansion joints shown on the approved shop drawings, all joints and beds shall be completely filled, then raked out to a depth of not less than 3/4", and every precaution shall be taken to prevent direct bearing contact between pieces.
 4. Granite facing shall in no case be built up more than two courses above the backing and no piece having a greater bed width than the one below it shall be set until the lower course is backed up. Sills and other pieces subject to uneven pressure shall be bedded at their ends only.
 5. Cavity Wall Construction: Where open space between back of stone units and back up or framing is shown, keep cavity open; do not fill with mortar or grout.
 1. Back parge stone wall units with non-staining cement mortar not more than 1/2" thick. Add specified moisture retardant additive to mortar mix in amount equal to not more than 3% of cement weight.
 6. Grouted Construction: Where space between back of stone wall units and back up or framing is shown to be grouted, fill open space solidly with non-staining grout. Pour grout in lifts and rod to eliminate voids, allowing each pour to set enough to carry weight of next pour. Exercise care to prevent displacement of stone units during grouting operation.
 7. Projecting Courses: Do not set until mortar in courses below has hardened sufficiently to prevent extrusion. Support projecting stone units until wall above is set.
 8. Joints: Butter vertical joints for full width before setting and set units in full bed of mortar, unless otherwise indicated.
 1. Rake out joints 3/4" deep before mortar sets to allow for mortar pointing. Clean face of stone after raking. After mortar is set, wet raked joints thoroughly and force pointing mortar into joints. Tool to profile shown or, if not shown, tool slightly concave. Provide pointing mortar using specified materials to match Architect's sample.
 2. Rake out joints before mortar is set to allow for sealant pointing as shown. Refer to SECTION 07900 for backer rod and sealant.
 3. Where joints are shown to be set on shims without mortar, provide quantity of shims required to maintain uniform joint width and alignment of stone units. Sealing joints is specified under SECTION 07900.
- E. Anchorage: All granite shall be anchored and/or doweled as shown on approved shop drawings and the anchors, dowels, etc. being inserted with non-expanding filler in holes provided in granite.
- F. Pointing and Cleaning
1. Except where otherwise specified all joints and beds previously raked, shall be brushed clean and pointed with mortar to a flat cut joint. When thumb print hard, the joints shall be tooled with a round joiner having a diameter of 1/8" larger than the width of the joint.
 2. All open beds and joints, such as under sills, shall be pointed for a depth of at least one inch.
 3. At special locations where directed the joints and beds shall be pointed and finished as the setting progresses.

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4. After being pointed, the granite work shall be carefully cleaned starting at the top, removing all dirt, excess mortar stains and other defacements.
5. Stainless steel wire brushes or wool may be used but the use of other wire brushes or of acid or other solutions which cause discoloration is expressly prohibited.

END OF SECTION