SECTION 04 42 00
EXTERIOR CUT STONE

1.01 REFERENCE STANDARDS

A. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

B. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.

C. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.

D. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.

PART 1.00 - GENERAL

2.01 ----------

A. GENERAL REQUIREMENTS

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

B. Work Included

The Work of this Section includes all labor, materials, equipment and services necessary to complete the stone work as shown on the drawings and as specified herein, including but is not necessarily limited to the following:

1. Cut stone work at base wall panels.
2. Stone sills at curtain wall.
3. Anchorages
4. Accessories
5. Mortar / Sealant
6. Cleaning

1.03 RELATED SECTIONS

Concrete – Section 03 30 00

1. Structural Steel – Section 05 20 00
2. Light Gauge Metal framing – Section 05 40 00
3. Joint Sealer - Section 07 90 00
4. Aluminum curtain wall – Section 08 90 00

1.03 REFERENCES

A. National Building Granite Quarries Association, Inc. (NBGQA).

B. Federal Specifications (FS).

American Society for Testing and Materials (ASTM).

D. NYC BUILDING CODE – SEISMIC / WIND PRESSURE REQUIREMENTS

1.04 SUBMITTALS

A. Shop Drawings

1. Shop Drawings shall be submitted at scale not less than 1/2" = 1'-0".
2. Shop Drawings shall show sizes, dimensions of stone, jointing, bonding, anchoring and other necessary details; relation of contiguous work, including other masonry; also the supporting of stone by lintels, shelf angles, and other means.

Samples:

a. Submit stone samples for approval in sets of four of each kind of stone.
b. Size of samples shall be 12" x 12".
c. Samples shall have same finish as required for the completed work.

d. Indicate extreme variation in color and texture of materials proposed to be used; materials incorporated in the finished work must be within the ranges or will be rejected.
e. Any material falling below the general character, as shown by the approved samples, will be rejected and must be replaced with approved material.
f. Accessories: One of each item and type specified.

3. Mock Up:
   a. Prepare for approval an in –situ mock up of size and at location as directed by NYCHA. The work may become part of the final work after approval by NYCHA.
   b. Product Data:
      1) Suppliers' catalog sheets and specifications for stone units; and catalog sheets, specifications and installation instructions for accessories.
   c. Certificates:
      1) Statements that stone suppler and installer have the specified qualifications.
      2) Statements that each kind and type of stone provided for this project meets the specified requirements.

1.05 QUALITY ASSURANCE

A. Qualifications

1. Stone Supplier: Firm with 10 years of experience specializing in cutting the required kind and type of stone.
2. Installer: Firm with 5 years of experience specializing in installing cut stone.

B. Source Quality Control

a. Stone of a given color range and grain shall come from a single quarry.

C. Defects

a. Do not use stone units with chipped arrises, cracks, voids, stains, or other defects which will be visible in the finished Work.
b. Do not patch or hide defects. Remove defective stone units from the site.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Cut stone shall be carefully packed for transportation and all precautions shall be taken against damage to the stone in transit.

a. Where necessary to ensure against damage, the stone shall be crated. All stone shall be delivered in the proper sequence required for expediting the work of setting.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Construction Requirements

a. Salt or other chemicals for lowering the freezing temperature of the mortar shall not be used.
b. Stone units, mortar, and grout shall be preconditioned and masonry protected for the following cold weather conditions:
   1. Air temperature 40oF to 32oF:
      a. Heat mixing water or sand to minimum of 70oF and to maximum of 160oF.
c. Air temperature 32oF to 25oF:
   1) Heat mixing water and sand to minimum of 70oF and to maximum of 160oF.
   2) Provide heat source to maintain a minimum air temperature 32°F on each side of masonry wall construction.
   3. Air temperature 25oF to 20oF:
   1) Heat mixing water and sand to minimum of 70oF and to maximum of 160oF.
   2) Provide heat source to maintain a minimum air temperature of 32° on each side of masonry wall construction.
   3) Provide wind breaks for wind in excess of 15 miles per hour.
d. Air temperature 20oF and Below:
   1) Heat mixing water and sand to a minimum of 70oF and to maximum of 160oF.

2) Provide enclosures and heat source to maintain a minimum air temperature of 32oF on each side of masonry wall construction.
3) Keep temperature of masonry units a minimum of 30oF when laid.

e. Protection Requirements
1) Mean Daily Air Temperature of 40°F to 32°F:
(a) Protect masonry from rain or snow for 24 hours.
2) Mean Daily Air Temperature of 32°F and Below:
(a) An air temperature of at least 32°F shall be maintained on each side of masonry for a period of at least 48 hours if Type S mortar is used and at least 72 hours if Type N mortar is used.

1.08 FIELD CONDITIONS

a. Take necessary field measurements of existing structures and construction in progress. Report any discrepancies with plans or obstacles to completing the work to the Architect.

PART 2 - PRODUCTS

11.01 2.01 GENERAL

a. All stone shall be well seasoned and free from quarry sap or any material producing stains after weathering. Stone shall contain no seams or defects which would impair its strength. All exposed surfaces shall be free from spots, spalls, chips, stains, discolorations or other defects which would affect the appearance of the Work.
1) Stone shall be obtained from quarries or shops capable of furnishing quantity, sizes and character of the stone required. Cutting must be done by firms properly equipped to produce the finished material without causing delay in the progress of the Work. The Contractor will be held responsible for any delay in the completion of the Work due to his failure to supply satisfactory stone in ample quantities and proper sequence.

2.02 GRANITE

1. Type: Granite Building Stone Standard ASTM C615. ‘Cold Spring Black’ as supplied by Cold Spring Granite. Color to match NYCHA’s sample.
a. Grade
1) Standard; free of cracks, seams, and starts which may impair structural integrity or function, non-absorbent.
b. Finish :
1) Thermal jet honed Diamond 10.

2.03 BASE COURSES

A. Extend at least 2" below grade of sidewalks or other paving and not less than 4" below grade where earth adjoins the building.

2.04 WEEP HOLES

a. Rigid plastic tubing having outer diameter of 1/4" shall be field cut and used as weep holes for exterior stonework.

2.05 MORTAR

a. ASTM C270.
b. Portland Cement
1) Type I, ASTM C150
c. Sand
1) ASTM C144.
d. Hydrated Lime Fed. Spec. SSL-351, ASTM C207, Type "S".
e. Water
1) Clean, potable, free of injurious materials.
f. Mix (Granite)
1) Setting Mortar: (Type "S") 1 part cement, 1/2 part lime, 4-1/2 parts dry sand.
2) Pointing Mortar: (Type "S") 1 part cement, 1/2 part lime, 4-1/2 parts dry sand.

g. Measure mortar ingredients by volume or equivalent weight. In measuring by volume, use a container to measure ingredients. Do not measure by shovel.
    1) Mix ingredients in a clean mechanical mixer, with the minimum amount of water to produce a workable consistency.
h. Mortar Coloring
    1) If mortar coloring is indicated on Drawings, use Natural and synthetic Iron Oxides and Chromium Oxides, compounded for use in mortar mixes. SGS mortar Colors, Solomon Grind-Chem Services, Inc. or "True Tone Mortar Colors", Davis Colors (Rockwood Industries).

2.06 ANCHORS AND DOWELS

a. Provide all anchors, dowels and accessories shown on the Drawings and as required for securing stone, as manufactured by Hohmann Barnard; stainless steel ASTM A666/A666M, Type 304.
b. Anchors shall be provided for all that extend less than 8" into wall, and for all stones, that project more than 1-1/4" beyond the wall face immediately below.
c. Anchors shall have ends turned 1" into cut stone and 2" into the masonry. Lengths specified are exclusive of bent ends. When anchors are required, provide 2 anchors for each stone 18" or more in length, and one anchor for smaller stones.
d. Anchors for bonding stone to masonry shall be 1/4" x 1-1/4" flat stainless steel (Type 302/304) bars extending beyond stone at least 4" into masonry.
e. Cramps
    1) Type 302/304 stainless steel bars, 1/8" x 1", unless indicated otherwise on the Drawings.
f. Dowels
    1) Type 302/304 stainless steel rods, 3/8" minimum diameter, unless indicated otherwise on the Drawings.
g. Anchor Bolts, Washers, and Nuts
    1) Type 304 stainless steel.
h. Wire Ties
    1) 10 gage stainless steel wire.
i. Setting buttons/Pads
    1) Lead.
j. Stone Cleaner
    1) Non-staining cleaning solution which will not harm stone and mortar.

2.07 FABRICATION

a. Cut stone to the required dimensions and profiles, with surfaces finished to true planes.
    1) Cut or drill to form chases, openings, reveals, reglets, and similar spaces and features shown and as required for contiguous Work.
    2) Cut or drill hole and sinkages for anchors, supports, fasteners, and necessary lifting devices. If possible, do not locate holes sinkages within 2" of exposed surfaces.
    3) Unless otherwise shown, cut stone for a uniform joint width of 1/4".
b. Tolerances:
    1) Stone shall be cut within the indicated tolerances for the specified finish. Backs of stone units shall be sawn to true planes parallel to face plane.
    2) Granite: Fabrication tolerances in the "Specifications For Building Granite" by the National Building Granite Quarries Association, Inc.

PART 3 - EXECUTION

18.01 3.01 EXAMINATION

a. Examine surfaces to receive cut stone for defects that will adversely affect the execution and quality of the Work. Do not proceed until unsatisfactory conditions are corrected.
    1) Verify that required built-in anchorage items are install in designed locations.
    2) Verify that required bituminous dampproofing has been applied (if indicated on the Drawings or if specified).

3.02 PREPARATION

a. Just prior to setting stone, clean surfaces that support the Work of this Section.
b. Clean stone before setting by scrubbing with fiber brushes, followed by a thorough drenching with clear water. Use only mild cleaning solutions that contain no harsh or caustic abrasive or fillers.
   C. If stone is not wet at time of setting, drench or sponge stone with clean water, except do not wet expansion joint or control joint surfaces that require sealant.

3.03 INSTALLATION

A. Install stone plumb and true to line in level courses, unless otherwise shown. Set stone in full mortar setting bed and completely fill joints, accessory sinkages, and lifting holes with mortar, except keep expansion joints, control joints, and other required cavities free of mortar.

a. Faces of stone units shall be same plane, flush at joints. All finished surfaces shall be true in line and face.
b. Set stone with 1/4" wide joints and beds, unless otherwise shown. If necessary, temporarily use wet wooden wedges for proper spacing.
    1) Tolerance: Maximum variation of + 1/4 of specified width.
c. After mortar has set "thumb-print" hard, rake out exposed joints 3/4" deep. Brush face of joints clean. Remove wooden wedges when setting bed will maintain stone in position without movement.
d. Weep Holes
    1) Provide at the following locations:
    2) 1" above grade on all vertical joints.
    3) In every horizontal joint where an angle is located.
    4) Care shall be taken in placing weep holes in joints so that stone underneath will not be stained as a result of the weep holes.
e. Anchorage:
    1) Anchor stone to masonry backing as indicated on the Project Drawings and the Shop Drawings and in accordance with Stone Institute or Association recommendations.
f. POINTING
g. Except where joints are to be pointed with sealant, wet the raked joints and point full with pointing mortar. Cut joints flush and neatly tool surface or joints slightly concave. Finish joints that abut other masonry to match the joint finish of the adjacent masonry.

3.05 PROTECTION

a. Protect face materials against staining. Remove misplaced mortar immediately.
b. Protect newly laid masonry from exposure to precipitation, excessive drying, freezing, soiling, backfill, and other harmful elements.
    1) Do not use frozen materials or lay masonry on frozen materials; remove frozen materials from wall. Refer to Part 1 of this Section, "Environmental Requirements" for temperature restrictions.
c. Cover top of walls with not-staining, waterproof, temporary covering when work is not in progress. Protective covering shall overhang each side of wall a minimum of 2' and be securely anchored.

3.06 CLEANING

a. Clean the stone after completion of setting , pointing, and other Work liable to soil the stone.

1) Carefully remove excess mortar and other encrusted matter.
2) Scrub soiled surfaces of stone with mild detergent or stone cleaner and water. Use non-metallic tools.
   (a) Do not use any acid bearing cleaner on limestone.
3) Remove any remaining stains by rubbing with a carborundum stone and restore the specified surface finish. Do not use carborundum or any other abrasive materials where it would damage or mar the surface in any way.
4) Flush stone with clean water to remove any remaining residue of cleaning agent and dirt.

END OF SECTION 04 42 00