2. Where built-in items are to be embedded in cored of hollow masonry units, place a layer of metal plates, beams, lintels, posts and similar items, unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow concrete masonry as follows:

1. With full mortar coverage on horizontal and vertical face shells.

B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

C. Cut joints flush for masonry walls to be concealed or to be covered by other materials, unless otherwise indicated.

3.6 STRUCTURAL BONDING OF MULTI WYTHE MASONRY

A. Use continuous horizontal joint reinforcement installed in horizontal mortar joints for bind ties between wythes.

B. Corners: Provide interlocking masonry unit bond in each course at corners, unless otherwise shown.

1. Provide continuity with horizontal joint reinforcement at corners using prefabricated "L" units, in addition to masonry bonding.

3.7 ANCHORING MASONRY TO STRUCTURAL MEMBERS

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:

1. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but no more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

3.8 LINTELS

A. Install lintels where indicated, whether steel or precast.

B. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

3.9 FLASHING/WEEP HOLES

A. Install flashings as follows:

B. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges and other obstructions to the downward flow of water in the wall and where indicated.

C. Prepare masonry surfaces so that they are smooth and free from imperfections that could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with adhesive/sealant/tape as recommended by flashing before covering with mortar.

D. Install flashing as follows:

1. At lintels and shelves, extend flashing a minimum of 4 inches into masonry at each end. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4 inches, and into the inner wythe.
2. At heads and sills, extend flashing as specified above unless otherwise indicated but turn up ends not less than 2 inches to form a pan.
3. Install flashing in masonry veneer walls as specified above but carry flashing up face of back up at wall at least 8 inches.
4. Interlock end joints of ribbed sheet metal flashings by overlapping ribs not less than 1-1/2 inches or as recommended by flashing manufacturer and seal lap with elastomeric sealant complying with requirements of Division 7 Section "Joint Sealers" for application indicated.
5. Turn down sheet metal flashings at exterior face of masonry to form drip.

E. Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashing and as follows:
1. Form weepholes with product specified in Part 2 of this Section.
2. Space weep holes 32 inched o.c.

F. Install reglets and nailers for flashing and other related construction where shown to built into masonry.

3.10 INSTALLATION OF REINFORCED UNIT MASONRY

A. General: Install reinforced unit masonry to comply with requirements of referenced unit masonry standard.

B. Temporary Formwork: Construct Formwork and shores to support reinforced masonry elements during construction.

1. Construct Formwork to conform shape, line and dimensions shown. Make sufficiently tight to prevent leakage of mortar and grout. Brace, tie and support forms to maintain position and shape during construction and curing of reinforced masonry.

C. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.

D. High Lift Grouting: Provide cleanouts at base of wall at bottom of all cores containing dowels or vertical reinforcement and at a maximum of 32 inches on center. The cleanout opening shall be a minimum of 3" horizontally.

E. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

3.11 REPAIRING, POINTING AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained or otherwise damaged or if units do not match adjoining unit. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes and completely fill with mortar. Point-up all joints including corners, openings and adjacent construction to provide a neat uniform appearance, prepared for application of sealants.

C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave ½ panel not cleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning masonry.
3. Protect adjacent precast and non-masonry surfaces from contact with cleaner by covering them with liquid strippable asking agent, polyethylene film or waterproof masking tape.
4. Wet wall Surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
5. Clean brick by means of bucket and brush hand-cleaning method described in BIA "Technical Note No. 20 Revised" using the following masonry cleaner:

    a. Proprietary acidic cleaner; apply in compliance with directions of acidic cleaner manufacturer.

D. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer that ensures unit masonry is without damage and deterioration at time of Substantial Completion.

3.12 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Retain first paragraph below if clean masonry waste can be used as fill in footing trenches, etc. This diverts some material from waste stream, conserving landfill space and energy required to haul waste away.

C. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
1. Crush masonry waste to less than 4 inches (100 mm) in each dimension.

2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 312000 "Earth Moving."
3. Generally retain subparagraph below. If required, increase limit if acid-soil plants are used for foundation plantings.
4. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.

D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

3.13 WASTE MANAGEMENT

A. Coordinate with Section 01 74 23.

1. Separate and recycle cut-offs and waste materials and material packaging in accordance with Waste Management Plan and to the maximum extent economically feasible and place in designated areas for recycling.
2. Set aside and protect materials suitable for reuse and/or remanufacturing.
3. Separate and fold up metal banding; flatten and place along with other metal scrap for recycling in designated area.

END OF SECTION 04 20 00

SECTION 04 41 20- STONE VENEER

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Stone cladding, siding and veneer of interior and exterior walls as indicated.
B. Stone signs.
C. Stone columns.
D. Stone accent trim and shapes.

1.2 RELATED SECTIONS

.A. Section 04 22 00 - Unit Masonry Assemblies (Concrete Unit Masonry): Masonry supporting walls.

B. Section 05 50 00 - Metal Fabrications: Galvanized shelf angles, structural supports, anchors and other built-in components for building into natural thin veneer stone.

C. Section 07 90 00 - Joint Sealers (Joint Protection): Sealant and joint filler for perimeter and control joints.

D. Section 09 24 00 - Portland Cement Plaster (Portland Cement Plastering): Metal lath and scratch coat back-up over supporting walls.

1.3 REFERENCES

3A. ASTM C91 - Standard Specification for Masonry Cement.

B. ASTM C144 – Standard Specification for Aggregate Masonry Mortar.

C. ASTM C150 - Standard Specification for Portland Cement.

D. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes.

E. ASTM C270 - 08a Standard Specification for Mortar for Unit Masonry.

F. ASTM C847 - Standard Specification for Metal Lath.

G. ASTM C979 - 05 Standard Specification for Pigments for Integrally Colored Concrete.

H. ASTM D226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.

I. ACI-530.1-95/ ASCE 6-95/TMS 602-95 -The Specification for Masonry Structures.

J. ANSI A118.4 Latex Portland Cement Mortar

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct Conference at Project site

1.5 ACTION SUBMITTALS

A. Submit under provisions of Section 01 33 00 Submittal Procedures.

B. Shop Drawing: Show fabrication and installation details for dimension stone cladding assembly, including dimensions and profiles of stone units.

1. Show location and details of joints both within dimension stone cladding assembly and between dimension stone cladding assembly and other construction.
2. Included details of mortar joints, sealant joints, and mortar joints pointed with sealant.
3. Show location of backup structure
4. Show direction of veining, grain, or other directional pattern
5. Include large-scale shaded elevations and details of decorative surfaces and inscriptions.

C. Product Data:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

D. Selection Samples: Submit mortar color samples.

E. Verification Samples: Submit 2 manufacturer's full-size samples of natural veneer stone for each pattern specified as well as color, and finish.

1. Sample shall exhibiting extremes of the full range of color and other visual characteristics expected and will establish the standard by which stone will be judged.

F. Sealant Samples for Verification: For each type and color of joint sealant required.

G. Delegated-Design Submittal: For dimension stone cladding assembly.

1.6 INFORMATION SUBMITTALS

A. Qualification Data: For Installer, and fabricator.

B. Material Test Reports:

1. Stone Test Report: 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 five years.
2. For metal components, by a qualified testing agency, indicating chemical and physical properties of metal.
3. Sealant Compatibility and Adhesion Test Report: From sealant manufacturer complying with requirements in Division 07 Section "Joint Sealants" and 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. Preconstruction test reports.

D. Source quality-control reports

E. Cold-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with cold-weather requirements.

1.8 QUALITY ASSURANCE

A. Stone Producer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

B. Stone Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience.

1.9 PRECONSTRUCTION TESTING

A. Preconstruction Stone Testing: Engage a qualified independent testing agency to perform preconstruction testing.

1. Retesting of materials that fail to meet specified requirements shall be done at Contractor's expense.
2. Furnish test specimens that are representative of materials proposed for incorporation into the Work.
3. Physical Property Tests: For each stone variety proposed for use on Project, tested for compliance with physical property requirements, other than abrasion resistance, according to referenced ASTM standards.
4. Flexural Strength Tests: For each combination of stone variety, thickness, orientation of cut, and finish, proposed for use on Project, tested according to ASTM C 880/C 880M, in both wet and dry conditions.

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

C. Preconstruction Field Testing of Sealants: Before installing joint sealants, field test their adhesion to joint substrates according to Division 07 Section "Joint Sealants."

1.10 DELIVERY, STORAGE, AND HANDLING

A. Store stone on pallets or wooden crates. Pallet shall be shrink-wrapped.

B. 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 skids or pallets with nonstaining, waterproof covers. Arrange to distribute weight evenly and to prevent damage to stone. Ventilate under covers to prevent condensation.

C. 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.

D. 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.

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

F. Store aggregates in locations where grading and other required characteristics can be maintained and where contamination can be avoided.

1.11 PROJECT CONDITIONS

A. Protect dimension stone cladding during erection by doing the following:

1. Cover tops of dimension stone cladding installation with nonstaining, waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress. Extend cover a minimum of 24 inches (600 mm) down both sides and hold securely in place.
2. Prevent staining of stone from mortar, grout, sealants, and other sources. Immediately remove such materials without damaging stone.
3. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surface.
4. Protect sills, ledges, and projections from mortar and sealant droppings.

B. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Remove and replace dimension stone cladding damaged by frost or freezing conditions. Comply with cold-weather construction and protection requirements for masonry contained in ACI 530.1/ASCE 6/TMS 602.

C. Hot-Weather Requirements: Comply with hot-weather construction and protection requirements for masonry contained in ACI 530.1/ASCE 6/TMS 602.

D. Environmental Limitations for Sealants: Do not install sealants when ambient and substrate temperatures are outside limits permitted by sealant manufacturer or below 40 deg F (5 deg C) or when joint substrates are wet.

E. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install natural stone veneer under environmental conditions outside manufacturer's limits.

F. Hot and Cold Weather Requirements: ACI 530.1/ASCE 6/TMS 602.

G. Air Temperature: 40 degrees F or above during installation.

H. Mortar Mixing Water: Heat mortar mixing water when air temperature falls below 50 degrees F.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of design: Portsmouth Granite Square & Rectangular as manufactured by "Stone Yard New England Stone Veneer" In Littleton, Ma., or an approved equal Manufacturer:

1. Centurion Stone
2. Eldorado Stone
3. Natural Stone Veneers

2.2 ACCESSORIES

A. Concrete Bonding Agent: Water-based polyvinyl acetate type or concrete adhesive emulsion formulated for use as an admixture.

B. Joint Sealants and Joint Fillers: As specified in Section 07 90 00.

2.3 ADHERED MASONRY VENEER INSTALLATION MATERIALS AND ACCESSORIES

A. Latex-Portland Cement Mortar for leveling beds and scratch/plaster coats: LATICRETE MVIS Premium Mortar or approved equal Bed to meet the following physical requirements:

1. Compressive Strength (ANSI A118.4 Modified): >4000 psi (27.6 MPa)
2. Water Absorption (ANSI A118.6): ≤ 5%
3. Service Rating (TCA/ASTM C627): Extra Heavy
4. Smoke & Flame Contribution (ASTM E84 Modified): 0
5. Total VOC Content: < 0.05 mg/m^3

B. Latex Portland Cement Mortar: MVIS Hi Bond Veneer Mortar ** to be weather, frost, shock resistant, non-flammable and meet the following physical requirements:

1. Compressive strength (ANSI A118.4): >2500 psi (17.2 MPa)
2. Bond strength (ANSI A118.4): >450 psi (3.1 MPa)
3. Smoke & Flame Contribution (ASTM E84 Modified): 0
4. Total VOC Content: < 0.05 mg/m^3

C. Latex Portland Cement Pointing Mortar / Grout: MVIS Pointing Mortar ** to be weather, frost and shock resistant, as well as meet the following physical requirements:

1. Compressive Strength (ASTM C91): 3500 psi (24.1 MPa)
2. Smoke & Flame Contribution (ASTM E84 Modified): 0
3. Total VOC Content: < 0.00 mg/m^3

D. Spot Bonding Epoxy Adhesive: LATAPOXY 310 Stone Adhesive (Standard or Rapid Grade) for installing adhered masonry veneer, brick and stone over vertical and overhead surfaces shall be high strength, high temperature resistant, non-sag and shall meet the following physical requirements:

1. Thermal Shock Resistance (ANSI A118.3): >1000 psi (6.9 MPa)
2. Water Absorption (ANSI A118.3): 0.1 %
3. Compressive Strength (ANSI A118.3): >8300 psi (57.2 MPa)
4. Shear Bond Strength (ANSI A118.3 Modified): >730 psi (5 MPa)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not begin installation until backing structure is plumb, bearing surfaces are level and substrates are clean and properly prepared.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION OF ADHERED MASONRY THIN VENEER - MORTARED OR DRY STACK JOINTS

A. General: Install in accordance with current versions of American National Standards Institute, Inc. (ANSI) "A108 American National Standard Specifications for Installation of Ceramic Tile" and TCNA "Handbook for Ceramic Tile Installation." Cut and fit adhered masonry veneer neatly around corners, fittings, and obstructions. Perimeter pieces to be minimum half unit of stone. Maintain masonry courses to uniform dimensions. Form vertical and horizontal joints of uniform thickness. Install divider strips at junction of flooring and dissimilar materials.

B. Pre-float Method: Over clean, dimensionally stable and sound concrete or masonry substrates, apply thick-bed mortar as scratch/leveling coat in compliance with current revision of A108.1A (1.0, 1.4 & 5.1). Float surface of scratch/leveling coat plumb, true and allow mortar to set until firm. For installation of adhered masonry veneer follow Direct Adhere Method (§ 3.3 D).

C. Direct Adhere Method to Install Masonry Veneer: Install latex portland cement mortar in compliance with current revisions of ANSI A108.02 (3.11), A108.1B and ANSI A108.5. Use the appropriate trowel notch size to ensure proper bedding of the adhered masonry veneer, selected so that 100% coverage of the back surface of the Thin Adhered Veneer is achieved. Work the latex portland cement mortar into good contact with the substrate and comb with notched side of trowel. Spread only as much latex portland cement mortar as can be covered while the mortar surface is still wet and tacky. When installing large format (>8" x 8"/200mm x 200mm) units, spread latex portland cement mortar onto the back of (i.e. 'back-butter') each piece/unit in addition to troweling latex portland cement mortar over the substrate. Beat each piece/unit into the latex portland cement mortar with a beating block or rubber mallet to insure 100% full bedding and flatness. Allow installation to set until firm. Clean excess latex portland cement mortar from adhered masonry veneer face and joints between pieces.

1. Pattern Bond:

a.. Layout work in advance and distribute color range of stone uniformly over total work area.
b. Lay stone with face exposed.
c. Take care to avoid concentration of any one color to any one wall surface.
d. Maintain uniform joints, as stone allows.
e. Do not use stacked vertical joints.

D. Pointing/Grouting Joints

1. Polymer Fortified Pointing Mortar - for joint widths ≥1/16"(1.5mm) and ≤1" (25mm]); Allow Thin Adhered veneer to cure a minimum of 24 hours @ 70° F (21°C). Verify joints are free of dirt, debris, wedges or spacers. Sponge or wipe dust/dirt off veneer face and remove any water standing in joints. Surface temperature must be between 40-90° F (4-32°C). Pour approximately 4 quarts (3.8 L) of clean, potable water into a clean mixing container. Add a 50 lb. (22.7 kg) bag of LATICRETE Pointing Mortar to the container while mixing. Mix by hand or with a slow speed mixer to a smooth, stiff consistency. Install latex fortified cement grout/pointing mortar in compliance with current revisions of ANSI A108.1A (7.0), ANSI A108.02 (4.5) and ANSI A108.10. Dampen dry surfaces with clean water.
2. Place LATICRETE MVIS Pointing Mortar into a high quality masonry mortar pointing bag. Carefully bag the pointing mortar into the joints. Once the mortar has become stiff in the joint, ("thumb-print dry") typically 15-20 minutes after pointing @ 70° F (21°C), using a striking or joint tool, strike the mortar joints to the desired finish/contour. Remove excess mortar using a masonry brush or sponge. Do not over wash the mortar joint.
3. Higher temperatures may require faster time to initial cleaning; wider joints or lower temperatures may require a longer time to initial cleaning. Allow joints to become firm. Inspect joint for pinholes/voids and repair them with freshly mixed grout/pointing mortar. Within 24 hours, check for remaining haze and remove it with warm soapy water and a nylon scrubbing pad, using a circular motion, to lightly scrub surfaces and dissolve haze/film. Do not use acid cleaners on latex portland cement grout/pointing mortar less than 10 days old.

E. Adjusting: Correction of defective work for a period of one (1) year following substantial completion, return to job and correct all defective work. Defective work includes, without limitation, adhered masonry veneer units stones broken in normal abuse due to deficiencies in setting bed, loose grout/pointing mortar, and all other defects which may develop as a result of poor workmanship.

1. Control and Expansion Joints:
   3.G.A.1. Keep joints open and free of debris.
   3.G.A.2. Coordinate control joints as specified in Section 07 90 00 for sealant performance.

2..Sealant Recesses:
   3.G.B.1. Provide open joints 3/4 inch deep and 1/4 inch wide, where masonry meets doors, windows, and other exterior openings.
   3.G.B.2. Coordinate sealant joints as specified in Section 07 90 00 for sealant performance.

3. Cutting and Fitting:
   3.G.C.1. Cut and fit thin veneer stone for chases, pipes, conduit, sleeves, grounds, and other penetrations and adjacent materials.
   3.G.C.2. Coordinate with other work to provide correct size, shape, and location.

4. During progress of the work, cover top of unfinished stone masonry work for protection from weather.

3.4 CLEANING

A. Keep face of stone free of mortar as work progresses.

B. If residual mortar is on face of stone, allow to dry partially and brush mortar off surface and sponge off residue.

C. When work is completed and mortar has set for 2 to 3 days, clean surface from top to bottom using mild masonry detergent acceptable to natural stone manufacturer.

D. Do not use harsh cleaning materials or methods that could damage stone.

E. Do not use metal brushes or acids for cleaning.

3.5 PROTECTION

A. Protect installed natural stone veneer to ensure that, except for normal weathering, stone will be without damage or deterioration at time of Substantial Completion.

B. Touch-up, repair, or replace damaged stone before Substantial Completion.

3.6 WASTE MANAGEMENT

A. Coordinate with Section 01 74 23.

B. Separate and recycle cut-offs and waste materials and material packaging in accordance with Waste Management Plan and to the maximum extent economically feasible and place in designated areas for recycling.

C. Set aside and protect materials suitable for reuse and/or remanufacturing.

D. Separate and fold up metal banding; flatten and place along with other metal scrap for recycling in designated area.

END OF SECTION 04 41 20

SECTION 04 72 00 – CAST STONE MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. The Work of this Section consists of the provision of all plant, labor, materials, equipment, testing and services necessary to complete the work of cast stone masonry as shown on the schedules, keynotes, drawings, as specified herein, and as may be required by conditions and authorities having jurisdiction, including, but not limited to, the following:

1. Architectural Cast stone units.
2. Architectural Cast stone trim including the following:
   a. Pier and Tier Caps.
   b. Coping (Wall Caps).
3. Installing contractor shall unload, store, furnish all anchors, set, patch, clean and seal the Cast Stone as required.

B. Related Sections:
1. Division 03: “Cast in Place Concrete”
2. Division 04: "Unit Masonry" and “Stone Veneer”

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1. For cast stone units, include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Show fabrication and installation details for cast stone units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces.

1. Include building elevations showing layout of units and locations of joints and anchors.

2. Manufacturer responsible for design and engineering of all supports, anchors and ties. Provide shop drawings stamped by professional engineer.

C. Samples for Initial Selection: For colored mortar.

D. Samples for Verification:

1. For each color and texture of cast stone required, 10 inches (250 mm) square in size.
2. For colored mortar. Make Samples using same sand and mortar ingredients to be used on Project. Label Samples to indicated types and amounts of pigments used.

E. Full-Size Samples: For each color, texture and shape of cast stone unit required.

1. Make available for Architect's review at Project site.
2. Make Samples from materials to be used for units used on Project.
3. Approved Samples may be installed in the Work.

F. Test Results:

1. Submit manufacture's test results from cast stone units previously made by manufacture using materials from same sources proposed for use in project.

G. Manufacture's project References: Submit list of projects similar in scope, including project name and location, name of architect, and type and quantity of cast stone installed.

H. Warranty: Submit manufacture's standard warranty.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and testing agency.

1. Include copies of material test reports for completed projects, indicating compliance of cast stone with ASTM C 1364.

B. Material Test Reports: For each mix required to produce cast stone, based on testing according to ASTM C 1364, including test for resistance to freezing and thawing.

1. Provide test reports based on testing within previous two years.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer of cast stone units similar to those indicated for this Project that has sufficient production capacity to manufacture required units, and is a plant certified by the Cast Stone Institute.

B. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

C. Source Limitations for Cast Stone: Obtain cast stone units through single source from single manufacturer.

D. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution. The approved mock-up shall become the standard for appearance and workmanship for the project.

F. Warranty: provide (ten) 10-year limited product warranty on Cast Stone as required for Cast Stone Institute members.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Coordinate delivery of cast stone with unit masonry work to avoid delaying the Work and to minimize the need for on-site storage.

B. Pack, handle, and ship cast stone units in suitable packs or pallets.

1. Lift with wide-belt slings; do not use wire rope or ropes that might cause staining. Move cast stone units, if required, using dollies with wood supports.
2. Store cast stone units on wood skids or pallets with nonstaining, waterproof covers, securely tied. Arrange to distribute weight evenly and to prevent damage to units. Ventilate under covers to prevent condensation.
3. Provide itemized shipping list.
4. Do not double stacks pallets.
5. Protect cast stone units, including corners and edges, during storage, handling and installation to prevent chipping, cracking, staining or other damage.
6. Do not use pry bar or other equipment in a manner that could damage units.

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

D. Store mortar aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

1.7 PROJECT CONDITIONS

A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Comply with cold-weather construction requirements in ACI 530.1/ASCE 6/TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until cast stone has dried, but no fewer than seven days after completing cleaning.

B. Hot-Weather Requirements: Comply with hot-weather construction requirements in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.1 CAST STONE MATERIALS

A. General: Comply with ASTM C 1364 and the following:

B. Portland Cement: ASTM C 150, Type I or Type III, containing not more than 0.60 percent total alkali when tested according to ASTM C 114. Provide natural color or white cement as required to produce cast stone color indicated.

C. Coarse Aggregates: Granite, quartz, or limestone complying with ASTM C 33; gradation and colors as needed to produce required cast stone textures and colors.

D. Fine Aggregates: Natural sand or crushed stone complying with ASTM C 33, gradation and colors as needed to produce required cast stone textures and colors.

E. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

F. Admixtures: Use only admixtures specified or approved in writing by Architect.

1. Do not use admixtures that contain more than 0.1 percent water-soluble chloride ions by mass of cementitious materials. Do not use admixtures containing calcium chloride.
2. Use only admixtures that are certified by manufacturer to be compatible with cement and other admixtures used.
3. Air-Entraining Admixture: ASTM C 260. Add to mixes for units exposed to the exterior at manufacturer's prescribed rate to result in an air content of 4 to 6 percent, except do not add to zero-slump concrete mixes.
4. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
5. Water-Reducing, Retarding Admixture: ASTM C 494/C 494M, Type D.
6. Water-Reducing, Accelerating Admixture: ASTM C 494/C 494M, Type E.

2.2 CAST STONE UNITS

A. Basis-of-Design for color and texture, manufacturer: "Modern Pre-Cast", Color to be determined by Architect and selected from manufactures standard color range, other manufactures are subject to compliance with requirements. Other manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Continental Cast Stone East.
2. Corinthian Cast Stone, Inc.
3. Sun Precast Company.

B. Provide cast stone units complying with ASTM C 1364 using either the vibrant dry tamp or wet-cast method.

1. Provide units that are resistant to freezing and thawing as determined by laboratory testing according to ASTM C 666/C 666M, Procedure A, as modified by ASTM C 1364.

C. Fabricate units with sharp arris and accurately reproduced details, with indicated texture on all exposed surfaces unless otherwise indicated.

1. Slope exposed horizontal surfaces 1:12 to drain unless otherwise indicated.
2. Provide raised fillets at backs of sills and at ends indicated to be built into jambs.
3. Provide drips on projecting elements unless otherwise indicated.
4. provide corner return pieces at all inside and outside corners unless noted otherwise.

D. Fabrication Tolerances:

1. Variation in Cross Section: Do not vary from indicated dimensions by more than 1/8 inch (3 mm).
2. Variation in Length: Do not vary from indicated dimensions by more than 1/360 of the length of unit or 1/8 inch (3 mm), whichever is greater, but in no case by more than 1/4 inch (6 mm).
3. Warp, Bow, and Twist: Not to exceed 1/360 of the length of unit or 1/8 inch (3 mm), whichever is greater.

4. Location of Grooves, False Joints, Holes, Anchorages, and Similar Features: Do not vary from indicated position by more than 1/8 inch (3 mm) on formed surfaces of units and 3/8 inch (10 mm) on unformed surfaces.

E. Cure units as follows:

1. Cure units in enclosed moist curing room at 95 to 100 percent relative humidity and temperature of 100 deg F (38 deg C) for 12 hours or 70 deg F (21 deg C) for 16 hours.
2. Keep units damp and continue curing to comply with one of the following:

a. No fewer than five days at mean daily temperature of 70 deg F (21 deg C) or above.
b. No fewer than six days at mean daily temperature of 60 deg F (16 deg C) or above.
c. No fewer than seven days at mean daily temperature of 50 deg F (10 deg C) or above.
d. No fewer than eight days at mean daily temperature of 45 deg F (7 deg C) or above.

F. Acid etch units after curing to remove cement film from surfaces to be exposed to view.

G. Color and Texture: Provide units with fine-grained "smooth" texture. Final color selection and approval by Architect.

H. Provide all units with manufacturer's integral water repellant.

2.3 MORTAR MATERIALS

A. Provide mortar materials that comply with Section 04 20 00 "Unit Masonry."

B. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

C. Hydrated Lime: ASTM C 207, Type S.

D. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

E. Masonry Cement: ASTM C 91.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Capital Materials Corporation.
b. Essroc, Italcementi Group.
c. Lafarge North America Inc.
d. Lehigh Cement Company

F. Mortar Cement: ASTM C 1329.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Lafarge North America Inc.

G. Colored Cement Product: Packaged blend made from masonry cement or mortar cement and mortar pigments, all complying with specified requirements and containing no other ingredients.

1. Colored Masonry Cement:

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) Capital Materials Corporation; Flamingo Color Masonry Cement.
2) Essroc, Italcementi Group; Brixment-in-Color.
3) Lafarge North America Inc.; U.S. Cement Custom Color Masonry Cement.
4) Lehigh Cement Company; Lehigh Custom Color Masonry Cement.

2. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
3. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.

H. Aggregate for Mortar: ASTM C 144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
3. White-Mortar Aggregates: Natural white sand or crushed white stone.
4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

I. Water: Potable.

2.4 ACCESSORIES

A. Anchors: Type and size indicated, fabricated from Type 316 stainless steel complying with ASTM A 240/A 240M, ASTM A 276 and hot-dip galvanized to comply with ASTM A 123/A 123M. (As indicated on drawings). Manufacturer responsible for design and engineering of all anchors and ties.

B. Dowels: 1/2-inch- (12-mm-) diameter, round bars, fabricated from Type 316 stainless steel complying with ASTM A 240/A 240M, ASTM A 276 and hot-dip galvanized to comply with ASTM A 123/A 123M. (As indicated on drawings).

C. Provide lifting inserts installed by manufacturer.

D. Embedded Anchors and Other Inserts: Fabricated from type 316 stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or and hot-dip galvanized to comply with ASTM A 123/A 123M. (As indicated on drawings).

E. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cast stone manufacturer and expressly approved by cleaner manufacturer for use on cast stone and adjacent masonry materials.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Diedrich Technologies, Inc.
    b. EaCo Chem, Inc.
    c. ProSoCo, Inc.

2.5 MORTAR MIXES

A. Do not use admixtures including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Use masonry cement or mortar cement mortar unless otherwise indicated.

B. Comply with ASTM C 270, Proportion Specification.

1. For setting mortar, use Type N.
2. For pointing mortar, use Type N.

C. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.

1. Pigments shall not exceed 10 percent of portland cement by weight.
2. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.
3. Mix to match Architect's sample.
4. Application: Use pigmented mortar for exposed mortar joints.

2.6 SOURCE QUALITY CONTROL

A. Engage a qualified independent testing agency to sample and test cast stone units according to ASTM C 1364.

1. Include one test for resistance to freezing and thawing.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

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

3.2 SETTING CAST STONE IN MORTAR

A. Install cast stone units to comply with requirements in Section 04 20 00 "Unit Masonry."

B. Set cast stone as indicated on Drawings. Set units accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances.

1. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place.
2. Coordinate installation of cast stone with installation of flashing specified in other Sections.

C. Wet joint surfaces thoroughly before applying mortar or setting in mortar.

D. Set units in full bed of mortar with full head joints unless otherwise indicated.

1. Set units with joints 1/4 to 3/8 inch (6 to 10 mm) wide unless otherwise indicated.
2. Build anchors and ties into mortar joints as units are set.
3. Fill dowel holes and anchor slots with mortar.
4. Fill collar joints solid as units are set.
5. Build concealed flashing into mortar joints as units are set.
6. Keep head joints in coping and other units with exposed horizontal surfaces open to receive sealant.
7. Keep joints at shelf angles open to receive sealant.

E. Rake out joints for pointing with mortar to depths of not less than 3/4 inch (19 mm). Rake joints to uniform depths with square bottoms and clean sides. Scrub faces of units to remove excess mortar as joints are raked.

F. Point mortar joints by placing and compacting mortar in layers not greater than 3/8 inch (10 mm). Compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.

G. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

H. Provide sealant joints at copings and other horizontal surfaces, at expansion, control, and pressure-relieving joints, and at locations indicated.

1. Keep joints free of mortar and other rigid materials.
2. Build in compressible foam-plastic joint fillers where indicated.
3. Form joint of width indicated, but not less than 3/8 inch (10 mm).
4. Prime cast stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant unless otherwise indicated.
5. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants."

3.3 SETTING ANCHORED CAST STONE WITH SEALANT-FILLED JOINTS

A. Set cast stone as indicated on Drawings. Set units accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances.

1. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place.
2. Shim and adjust anchors, supports, and accessories to set cast stone in locations indicated with uniform joints.

B. Keep cavities open where unfilled space is indicated between back of cast stone units and backup wall; do not fill cavities with mortar or grout.

C. Fill anchor holes with sealant.

1. Where dowel holes occur at pressure-relieving joints, provide compressible material at ends of dowels.

D. Set cast stone supported on clip or continuous angles on resilient setting shims. Use material of thickness required to maintain uniform joint widths. Hold shims back from face of cast stone a distance at least equal to width of joint.

E. Keep joints free of mortar and other rigid materials. Remove temporary shims and spacers from joints after anchors and supports are secured in place and cast stone units are anchored. Do not begin sealant installation until temporary shims and spacers are removed.

1. Form open joint of width indicated, but not less than 3/8 inch (10 mm).

F. Prime cast stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant unless otherwise indicated.

G. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants."

3.4 INSTALLATION TOLERANCES

A. Variation from Plumb: Do not exceed 1/8 inch in 10 feet (3 mm in 3 m).

B. Variation from Level: Do not exceed 1/8 inch in 10 feet (3 mm in 3 m).

C. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches (3 mm in 900 mm) or one-fourth of nominal joint width, whichever is less.

D. Variation in Plane between Adjacent Surfaces (Lipping): Do not vary from flush alignment with adjacent units or adjacent surfaces indicated to be flush with units by more than 1/16 inch (1.5 mm), except where variation is due to warpage of units within tolerances specified.

3.5 ADJUSTING AND CLEANING

A. Remove and replace stained and otherwise damaged units and units not matching approved Samples. Cast stone may be repaired if methods and results are approved by Architect.

B. Replace units in a manner that results in cast stone matching approved Samples, complying with other requirements, and showing no evidence of replacement.

C. In-Progress Cleaning: Clean cast stone as work progresses.

1. Remove mortar fins and smears before tooling joints.
2. Remove excess sealant immediately, including spills, smears, and spatter.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed cast stone as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample; leave one sample uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of cast stone.
3. Protect adjacent surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet surfaces with water before applying cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
5. Clean cast stone by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
6. Clean cast stone with proprietary acidic cleaner applied according to manufacturer's written instructions.

END OF SECTION 04 72 00

SECTION 10 14 00 - SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes identifying devices.

1.2 SUBMITTALS

A. See Division 1 – General Requirements for submittal procedures.

B. Product Data: Manufacturer's printed literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions.

C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts and colors.
1. When room numbers to appear on signs differ from those on the drawings, include drawing room number on schedule.
2. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
3. Submit for approval by Owner through Architect prior to fabrication.

D. Samples: Submit three samples of each type of sign, of size similar to that required for project, illustrating sign style, font and method of attachment.
1. Selection Samples: Where colors are not specified, submit three sets of color selection charts or chips.
2. Verification Samples: Submit samples showing colors selected

E Manufacturer's Installation Instructions: Submit installation template and attachment devices.

1.3 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor and building.

C. Store adhesive attachment tape at ambient room temperatures.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Do not install signs when ambient temperature is lower than recommended by manufacturer.

B. Maintain this minimum temperature during and after installation of signs.

PART 2 - PRODUCTS

2.1 EXTERIOR SIGNAGE

A. Refer to drawings for dimension, text style, and material

2.2 INTERIOR SIGNS

A. Manufacturers:
1. Ark Ramos
2. Mohawk Sign Systems, Inc.
3. Seton Identification Products.
4. Substitutions: See Division 1 - General Requirements for submittal procedures.

2.3 SIGNAGE APPLICATIONS

A. Accessibility Compliance: All signs are required to comply with ADAAG and ANSI/CC A 117.1 and applicable building codes,

B. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, excluding corridors, lobbies and similar open areas.

C. Maximum Occupancy Signage: Provide a sign for every assembly space (gymnasium, pool, fitness center, boys' & girls' locker rooms, wrestling practice room) for posted maximum occupancy for the space. Review maximum occupancies with Architect.

D. Electrically Powered Gymnasium Dividers Curtain Signage: Signage as required by SED for operation/controls/safety warnings for the electrically controlled gym dividers. (NOT USED)

E. Electrically Powered Gymnasium Bleachers Signage: Signage as required by SED for operation/controls/safety warnings for the electrically powered/controlled gym bleachers. (NOT USED)

2.4 GRAPHIC PROCESS

A. Tactile characters shall be raised the required 1/32" inches from sign face. Glue-on letters or etched backgrounds are not acceptable.

B. All text shall be accompanied by Grade 2 braille. Braille shall be separated ½" from the corresponding raised characters or symbols. Grade 2 braille translation to be provided by signage manufacturer.

C. All letters, numbers and/or symbols shall contrast with their background, either light characters on a dark background or dark characters on a light background. Characters and background shall have a non-glare finish.

D. Plaque material shall be Special Purpose SP125 decorative thermosetting high pressure laminate. Material to be 1/8" thick laminate with a melamine resin surface and a phenolic resin core which provides resistance to abrasion, stains, alcohol, solvents, boiling water, and

heat. The material shall be NEMA rated and have flammability and smoke values that meet the standards for flammability of interior materials.

E. Background color as selected by architect from manufacturer's actual color samples.

2.5 STAIR & ELEVATOR FLOOR LEVEL SIGNS, STAIR AND ELEVATOR FLOOR IDENTIFYING SIGNS (NOT USED)

A. Provide stair and elevator floor number signs, stair and elevator floor identifying signs, door signs for exit Stairs.

2.6 AREA OF REFUGE SIGNAGE (NOT USED)

A. Signage indicating special accessibility provisions shall be provided: Each door providing access to an area of refuge from the adjacent floor shall be identified by a sign stating: AREA OF REFUGE.

B. Signage shall comply with the ICC A117.1 requirements for visual characters and include the International Symbol of Accessibility. Where exit sign illumination is required by Section 1011.2, the signs shall be illuminated. Additionally, tactile signage complying with ICC A117.1 shall be located at each door to an Area of Refuge.

C. The Internally Illuminated LED shall be 10.5" H x 14" W x 3"D. Sign must have Red or Blue LED lights that provide constant uniform illumination. Sign must be UL listed to meet UL 924, NEC, OSHA, NFPA, and Life Safety Code Illumination requirements. Sign must also be provided with Directional left & right arrows.

D. Directional Signage: Direction signage indicating the location of the other means of egress and which are accessible means of egress shall be provided at the following:
1. At exits serving a required accessible space but not providing an approved accessible means of egress
2. At Elevator Landings
3. Within Areas of Refuge

E. Instructions: In areas of refuge and exterior areas for assisted rescue, instructions on the use of the area under emergency conditions shall be posted. The instructions shall include all of the following:
1. Persons able to use the exit stairway do so as soon as possible, unless they are assisting others.
2. Information on planned availability of assistance in the use of stairs or supervised operation of elevators and how to summon such assistance.
3. Directions for use of the two-way communications system where provided.

2.7 ADA GUIDELINES FOR SIGNAGE

A. Room Identification Signs: Signs which designate permanent rooms or spaces shall comply with the following guidelines:
1. Raised Copy - Letters and numerals shall be raised 1/32" upper case, sans serif or simple serif typestyle.
2. Character Height - Raised characters shall be at least 5/8" high, but no higher than 2".
3. Symbols - Symbols shall be accompanied by the equivalent verbal description placed directly below the symbol. The border dimension of the symbol shall be 6" minimum in height.
4. Braille Tags - Grade 2 Braille shall be on all signs, as required.

5. Colors - The characters and backgrounds of all signs shall be of matte or other non-glare finish. Characters and symbols shall contrast with light characters on a dark background or dark characters on a light background. Colors to be as selected by the Architect from the manufacturer's standard colors.
6. Mounting - Signs shall be installed on the wall adjacent to the latch side of the door. If there is no space on the latch side of the door, including double leaf doors, signs shall be placed on the
nearest adjacent wall. Mounting height shall be 60" above the finished floor to the centerline of the
sign. Mounting location for such signage shall be so that a person may approach within three inches of signage without encountering protruding objects or standing within the swing of a door.

B. Directional and Information Signs: Signs which provide direction to, or information about functional spaces of the building shall comply with the same guidelines as those set for Room Identification Signs with the following additions and exceptions.
1. Character Proportion - Letters and numerals on sign shall have a width to height ratio between 3:5 and 1:1 and a stroke width to height ratio between 1:5 and 1:10.
2. Character Height - Characters and numbers on signs shall be sized according to the viewing distance from which they are to be read. The minimum height is measured using an upper case X. Lower case characters are permitted. Any signs that are suspended or projected overhead shall have characters at least three inches high and shall maintain a minimum clearance of 80 inches from finished floor.
3. Raised Copy - Directional and Informational signsare NOT required to use raised copy or braille tags.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting Work.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install neatly, with horizontal edges level.

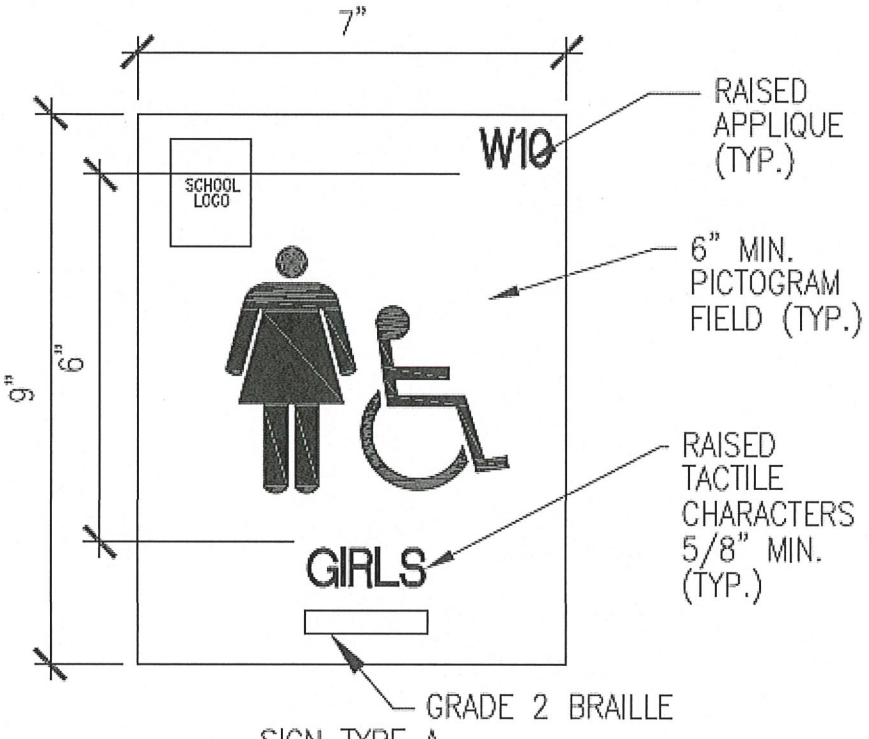
C. Sign Locations:
1. Room and Door Signs: Locate on wall at latch side of door with centerline of sign at 60 inches above finished floor.
2. If no location is indicated, obtain Owner/s instructions.
3. Maximum Occupancy Signs: Locate per SED requirements (NOT USED)
4. Electrically controlled gym dividers and bleachers signage – Locate per SED and manufacturers requirements. (NOT USED)

D. Protect from damage until Substantial Completion; repair or replace damaged items.

3.3 WASTE MANAGEMENT

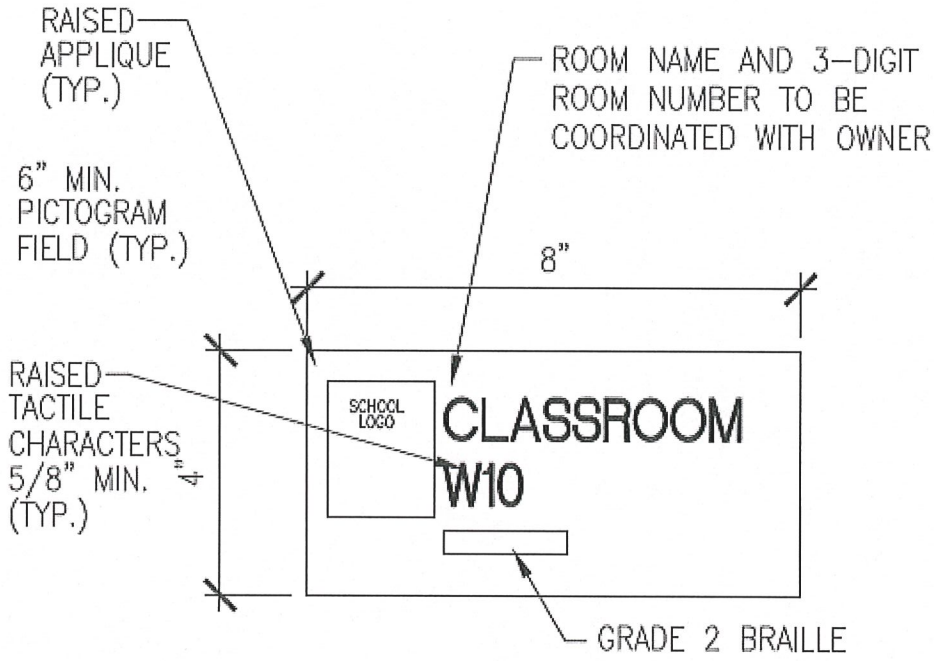
A. Coordinate with Section 01 74 23.

1. Separate and recycle cut-offs and waste materials and material packaging in accordance with Waste Management Plan and to the maximum extent economically feasible and place in designated areas for recycling.
2. Set aside and protect materials suitable for reuse and/or remanufacturing.
3. Separate and fold up metal banding; flatten and place along with other metal scrap for recycling in designated area.



SIGN TYPE A
(SINGLE SEX PICTOGRAM AS REQ'D)

TOILET ROOMS
NTS



SIGN TYPE B

CLASSROOM / OFFICE
NTS

END OF SECTION 10 14 00