

STANDARD SPECIFICATION
JANUARY 2010

DIVISION 4

SECTION 4A MASONRY

4A.01 GENERAL: Comply with all of the Contract Documents.

4A.02 SCOPE OF WORK: Refer to "Division Scope of Work"

4A.03 WORK NOT INCLUDED

A. The following items are excluded from the work of this Section:

1. Furnishing lintels, anchor bolts etc., by Section 5A.

4A.04 MATERIALS

A. Where applicable, materials shall be delivered to the site in original unopened containers with manufacturer's name and brand shown. Cement, lime, brick, block, shall be stored on planking at least four inches (4") off the ground and shall be suitably covered for protection against inclement weather.

B.

1. Sand - for stucco, mortar and grout shall be fine natural granular material of hard, strong, durable mineral particles free of injurious amounts of saline, alkaline, organic or other deleterious substances. Sand shall be graded from fine to coarse in accordance with ASTM Designation C-144 except not less than 5% shall pass the No.100 mesh sieve.
2. Water - for use in stucco, mortar and grout shall be taken from domestic water supply, clean and free from injurious amounts of alkaline, saline, or deleterious substances.
3. Hydrated Lime - ASTM Designation C-207, Type S.
4. Lime Putty - shall be of high calcium lime and shall be aged to insure complete slaking before using shall weigh not more than 83 lbs. per cubic feet.
5. Chimney and Parapet Coping and Window Sills - shall be pre-cast concrete 5,000 p.s.i. reinforced with two 3/8" steel rod.
6. Reinforcement Steel - shall be as specified in Section 3A-Concrete.
7. New Brick - shall match existing in size, color and texture and shall conform to ASTM Designation C-62, Grade SW. Clean used brick will be allowed if meeting the above require- ments.

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8. Concrete Masonry Units Hollow masonry units shall conform to the following:
 - (1) Hollow load bearing units - ASTM C-90, Normal weight, Type 1.
 - (2) Hollow non-load bearing units - ASTM C-129, Type I.
 - (3) Solid load bearing units - ASTM C-145, Normal weight, Type 1.(maximum 25% voids). Ultimate compressive strength 2500 psi.
9. Masonry Cement - shall be standard American brand in conformance with ASTM C-91, Type II.
10. Portland Cement - shall be standard American Brand in conformance with ASTM Designation C-150 Type I. Cement for pointing shall be waterproof type.
11. Metal Lath - self furring type, galvanized diamond mesh (3.4 pounds per square yard) .
12. Joint reinforcing for interior block partitions, shall be of proper width for wall or partition thickness and formed in truss design with deformed side rods and cross rods butt welded in same plane. Side rods and cross rods shall be of No.9 gauge wire. Joint reinforcing shall be 2" less than thickness of wall and lapped a minimum of 6" at joints, manufactured by one of the following or approved equal by HPD
 - a. Dur-O-Wall Products, Company.
 - b. A.A. Wire Products Company.
 - c. Hohmann & Barnard Inc.
13. Grout under steel members shall be 1-3 mix non-shrink.
14. Clay flue lining: ASTM C 315.
15. Marble stair treads shall be the same thickness as existing but not less than 1 1/8" thick. Treads shall be Grade A first quality, free from cracks, chips, stains or other defects, uniform in tone and coloring as selected by the Architect/Engineer. New treads shall match profile of existing.
16. Sandstone/Brownstone Stucco Mixes:

DO NOT USE GRAY CEMENT.

USE ONLY LATEX ADMIXTURE that labeled nonreemulsifiable, such as ACRYL-60.

 - a. Slurry coat:

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Mix (1 part White Poland cement, 2 parts Type S lime and 6 parts sand) with (water and admixture) in 3:1 ratio.

b. Scratch coats:

Mix (1 part White Poland cement, 1 parts Type S lime and 6 parts sand) with (water and admixture) in 5:1 ratio.

c. Finish coat:

Mix (1 part White Poland cement, 1 parts Type S lime and 2 to 3 parts 00 sand) with (water and admixture) in 5:1 ratio.

The finish coat shall be the accurate reproduction with the same amount of dry pigment and the same mixing ratio as the test sample.

17. Mortar and Grout Mixes

a. General: Do not add any admixtures unless otherwise indicated. Provide mortar color for exposed masonry as approved by Architect/Engineer.

b. Mixing: Combine and thoroughly mix cement, water and aggregates in a mechanical batch mixer; comply with referenced ASTM standards for mixing time and water content.

c. Mortar for Unit Masonry: Comply with ASTM 270, Proportion Specification, for types of mortar required. Provide pigmented mortar to match approved samples, where required. Provide fire-clay mortar for clay flue linings.

- Use Type M mortar for masonry in contact with earth.

- Use Type S mortar for reinforced masonry and where indicated.

- Use Type N mortar for all other applications.

d. Grout for Unit Masonry: Comply with ASTM C 476. Use grout of consistency which will completely fill grout spaces.

- Use fine grout in grout spaces less than 2" wide.

- Use coarse grout in grout spaces 2" or wider.

e. Measurement and Mixing: Measure cement and aggregate material in a dry condition by volume or weight. Do not measure by shovel. Mix

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materials in a clean mechanical batch mixer.

- Mixing Pointing Mortar: Thoroughly mix dry materials before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix which will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 1 to 2 hours. Add remaining water in small portions until mortar of desired consistency is reached. Use mortar within 30 minutes of final mixing; do not re-temper or use partially gardened material.
 - f. Colored Mortar: Match existing color by use of selected ingredients. Do not adjust proportions without Architect's/Engineer's approval.
 - g. Admixtures: Do not use admixtures, unless otherwise approved.
18. Terra Cotta:
- a. Provide terra cotta as manufactured by Gladding, McBean & Co., of color and texture as approved by the Architect/Engineer. Product shall meet or exceed Part II Table I of Standard Specifications for Ceramic Veneer in the "Public Works Specifications - Ceramic Veneer" of the Architectural Terra Scott Institute, A.I.A. File No. 9.

4A.05 WORKMANSHIP AND INSTALLATION

A. General Provisions for Masonry Work:

1. Lay masonry work plumb, true to line and with courses level. Keep bond plumb and uniform. Space courses accurately.
2. Slush all built in items, such as door frames, fill with mortar.
3. Do not lay masonry in freezing weather unless materials are heated or work is protected from cold by suitable means that Architect/Engineer approves. Anti-freezing ingredients shall not be mixed with the mortar and in no case shall brick work be laid at a temperature of 40 degrees F. and falling.
4. All materials for mortars shall be measured by volume, sand cement mixed dry, lime putty added and then water added to bring to the proper consistency for use. No mortars that have stood more than 1 hour shall be used.
5. Clean out mortar boxes at end of each day's work. Keep trowels and pointing tools clean.
6. All exposed joints shall be tooled with a round jointer. Make complete contact with edges of joints, compressing and sealing the surface of the joint.

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7. Cooperate with work of other related sections as required or directed by Architect/Engineer. Provide full cooperation with other sections in setting built-in items. Use special care in setting units so that built-in members are true, plumb, level.
8. All pointing, patching shall be done with waterproof cement.
9. Provide chases, openings as required for proper installation of work under other sections. New beam pockets shall be provided if required to accommodate new wood joists. Pockets shall be finished to provide stable and even support.
10. Install door frames in masonry openings, steel which bears on masonry, miscellaneous metal specialties occurring in masonry; sleeves, anchors, supports, nailing strips, braces, jambs and items provided under other sections.
11. Exercise special care in setting blocks for door frames. See that frames are plumb square. Set blocks against inside of bucks and fill voids with mortar.
12. This section shall be responsible for damage to work and items required to be built into masonry and shall be responsible for damage to work of other sections caused by work of this section.
13. When resuming work, clean off top surface of masonry work in place in dry weather, wet with clean water.
14. Set first course of block partitions with cells vertical; fill cells with setting mortar to one half height of block.
15. Provide required openings in walls and partitions for switch receptacle boxes. Cut channels in masonry for passage of pipes, sleeves, conduits etc. Cut blocks to fit around pipes, openings, inserts etc., slushing all voids fully.
16. All concrete block walls and partitions shall be reinforced every 2nd course with steel truss masonry reinforcing, installed in accordance with the manufacturer's recommendations and as approved. Corners and intersections of reinforcing shall be prefabricated sections.
17. Block work shall be laid in full beds of mortar, and all joints shall be thoroughly and solidly filled. Joints at intersections of wall shall be neatly made, well bonded or anchored. Joints on concealed surfaces, within pipe spaces, ducts, shafts etc., shall be struck flush.

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18. Intersecting load bearing walls: Tied together in masonry bond at corners and where they abut for load bearing and fire walls, or with rigid steel anchors, embedded in horizontal joints at vertical intervals not exceeding 32" o.c. hook ends embedded in cores, joints filled solid with mortar.
19. Intersection non-load bearing walls: Bonded to corners and where they abut, with wire mesh or two-looped wire ties spaced at vertical intervals not exceeding 16" o.c. for walls 6" or less and with rigid steel anchors embedded in horizontal joints at vertical spacing not exceeding 32" o.c. for walls greater than 6".

B. Mortar Mixing

1. Mortars shall be machine-mixed in approved type mixer in which water quantity can be accurately uniformly controlled; however for work requiring only small mortar or grout batches or when otherwise approved, mortar may be hand mixed.

4A.06 BRICK WORK REPAIR

- A. Structurally defective masonry shall be restored as required to perform its function. Exposed masonry repair shall match existing finish. Cracks in exterior exposed masonry units that do not impair structural integrity but are large enough to be a source of water entry, or affect the appearance of the structure, shall be repaired by installing new units, matching the existing, or cutting out, back packing and caulking the crack with polysulfide sealant. All exposed defective finishes shall be restored to match adjoining areas.
- B. Where new openings are cut, or openings altered, trim off jambs and heads to form true and plumb surfaces.
- C. Openings to be closed up shall be filled with masonry and properly bonded. Materials and finishes to match existing.
- D. Damage caused by removals, or due to installation of lintels, fire escape supports, anchors, sleeves, mechanical penetrations etc., shall be patched to match adjoining finishes.

4A.07 REPOINTING

- A. All loose, cracked, washed out, defective and missing mortar joints in masonry and stone shall be cut out to form true, uniform recesses not less than 3/4" deep. Soak recesses with water and keep damp until mortar is applied. Completely fill recess with mortar, compress for a dense joint and strip or tool as required to match existing finish. Mortar shall be colored as required to match remaining work and to be approved by Architect/Engineer.

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- B. When 100% repointing is required, mortar joints, which are not defective, shall be cut out and repointed as described above.

4A.08 CEMENT STUCCO WATERPROOFING

- A. Remove all loose and defective materials and existing loose mastic from walls to be finished with stucco.
- B. Remove all loose and eroded brick and material from joints. Replaced all missing areas of brick work and provide a solid and even base for application of cement stucco.
- C. Cut out loose or defective brickwork to allow a minimum thickness of 3/4 inch for patching material. Surfaces of stonework shall be rough for proper, secure, bonding. Fill in all crack at window location with cement mortar prior installation of metal lath (where damp-proofing exists).
- D. Use wire brush to remove dirt and loose particles at all areas where stuccowork is to be installed. Apply metal lath over area where damp proofing exists secured with galvanized spiral masonry nails spaced 12 inches on center horizontally and vertically.
- E. Scratch coat of cement stucco shall be firmly trowelled on, hard and tight (1/4" to 1/2" thick), pressed into all voids and cracks before it is set and leveled off, plumb, level and true to line.
- F. Second finish coat of cement stucco shall be float finish, 1/4 inch thickness minimum, applied to an even, sand textured surface.
- G. All mortar droppings and excess materials on connected or adjoining work shall be removed before it has attained final set.
- H. No stuccowork shall be performed unless temperature is above 40°F., and rising.
- I. If it is forecasted that temperature is to drop below freezing at end of day, tarpaulin shall be draped around newly finished work.
- J. Any work that appears frozen in the opinion of the Inspector shall be removed and replaced at the contractor's expense.

4A.09 SANDSTONE/BROWNSTONE REPAIR

A. COMPOSITE PATCHING

1. TEST SAMPLE AND TEST PATCH:

- Study commercial sands to find the color, grain size and shape to match the existing sandstone.

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- Blend different sands and dry pigments with crushed stone and/or natural aggregate as necessary, keep note of the ingredients and amounts in each sample.
- Add water and an acrylic latex admixture to make a paste sample to fill a 3-inch pie tin.
- Cure the sample at least 48 hours and treat each sample with different surface finishes.
- Compare samples to actual existing stone and make new samples as necessary. Submit sample to Architect/Engineer for approval.
- A 2' x 2' test patch of the sandstone finish shall be applied to the building for HPD's approval.

NOTE: NO REPAIR WORK SHALL BE PERFORMED PRIOR TO HPD'S APPROVAL OF TEST PATCH.

2. PATCHING:

- Chisel surface to firm base to provide mechanical key. Drill 1/2 inch dia. Holes 1/2 inch deep, at varied angles, spaced 3 inches apart in staggered rows. Wash and remove all dust and stone fragments.
 - Apply a thin slurry coat.
 - Apply several scratch coats
- Press scratch coat into the slurry while still moist, and wet each scratch coat before applying the next one. Allow 2-4 hours for each scratch coat to cure.

NOTE: NO SCRATCH COAT SHOULD EXCEED 3/8 INCH IN THICKNESS.

- Apply finish coat. The finish coat shall be the accurate reproduction of the test sample.

3. SURFACE FINISHES: To match the texture and surface treatment of existing sandstone.

- Rubbing stones by course and fine grade (grits # 60,80,100,120). Use dry sand with water to hone the surface of well-cured repairs, and/or

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- Stipple with a damp sponge or dry trowel with a wooden float when the repair is cured to the point of leather hardness.
- Tool marks and patterns can be made by scoring the repaired areas.

B. ORNAMENTAL DETAILS:

1. The contractor shall visit site and be responsible for recording all existing conditions within scope of work.
2. The contractor shall make every effort to preserve all existing decorative carved surfaces, moldings, cornices, lintels, etc. on the building.

C. FEES AND PERMITS:

1. If required by DOB or other agencies, the contractor shall pay all fees, obtain licenses, permits and file with the related agencies. Approvals are required according to all State and City Laws and Regulations pertaining to the work and/or the equipment required to perform same.

4A.10 COPING

- A. Pre-cast concrete coping shall be properly cured after casting before delivery to site. All pre-cast concrete shall be set in full bed of mortar with joints not over 3/16" wide with two (2) 1/2" diameter brass dowels per unit for anchoring in place. All pre-cuts concrete shall be delivered to the site properly protected and in good condition. Submit samples to Architect/Engineer, for approval. Coping shall match existing.

4A.11 SCAFFOLDING AND PROTECTION

- A. Furnish and erect adequate scaffolding for this work. Scaffolding shall conform to requirements of public agencies having jurisdiction thereof.
- B. Provisions shall be made to protect all property from damage and the public against hazard or injury. All property damaged as a result of this work shall be restored or repaired by this Section without additional charge.

4A.12 SAMPLES AND CERTIFICATIONS

- A. Submit manufacturer's certifications of the composition or specifications of all products used by this section.

4A.13 GUARANTEES

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- A. Guarantee all items of work furnished and installed under this Section for (1) one year, in addition to manufacturer's standard warranties. All guarantees to be from the date, when **Final Certificate of Occupancy** is issued from Department of Buildings.

END OF SECTION