SECTION 04100 - MORTAR

PART l - SCOPE

A. This Section includes all labor, materials, equipment, and related items required for the work of mortar as shown on the Drawings and specified herein. The work includes but is not necessarily limited to the following:

(l) Furnishing of all mortars required for the work of unit masonry.

B. This Section does not include the following related items:

(l) Concrete or grout required for the filling of hollow masonry units, grouting door frames, etc.
(2) Unit masonry work.

PART 2 - PRODUCT HANDLING

A. All materials shall be delivered, stored, and handled in a manner to prevent damage by breakage, water, or moisture, or the inclusion of foreign particles. Packaged materials shall be delivered in unbroken packages with the manufacturer's name, brand, and applicable data plainly marked thereon. No materials shall be dumped or stored on the ground. Bulk materials shall be stored on a clean surface or platform as required and shall be protected from deterioration and foreign matter.

B. All tools and equipment shall be delivered, protected, and handled in a manner to prevent any damage which may make them defective for the purpose for which they are intended.

PART 3 - MATERIALS

A. General. One manufacturer's brand and/or source of supply shall be utilized for each material specified hereinafter in order to maintain uniformity of mortars prepared under work of this section.

B. Portland cement shall conform to ASTM Cl50, Type I or III.

C. Masonry cement shall conform to ASTM C9l.

D. Hydrated lime shall conform to ASTM C207.

E. Aggregate shall be natural river sand conforming to ASTM Cl44, shall be clean, sharp, well graded, and free from injurious amounts of dust, lumps, shale, alkalies, surface coating, and organic matter.

F. Water shall be clean and free from deleterious quantities of acid, alkali, oils, salts, and organic matter.

G. Admixtures. The use of admixtures in mortar shall not be permitted unless approved in writing by the Architect. If an admixture is approved, it shall be used throughout whatever segment of the work for which it is proposed.

H. Antifreeze Compounds. Antifreeze liquids, salts, and other substances shall not be used in order to lower the freezing point of mortar.

PART 4 - MIXES

A. Mortar shall be freshly prepared and uniformly mixed in proportions by volume conforming to ASTM C270, Type N, 750 p.s.i. or Type S, 1,800 p.s.i. at 28 days as specified.

B. Mortar for use in all applications shall be mixed as follows. Proportions of mortar by volume shall conform to the following table, with the aggregate measured in a damp, loose, condition.

Mortar Type	Portland Cement	Masonry Cement	Hydrated Lime or Lime Putty	Aggregate
N	None	1 (Type II)	None	(Not less than 2¼ nor more than 3 times the sum of the cements and lime used)
N	1	None	Over ½ to 1¼	
S	½	1 (Type II)	None	

C. The weights per cubic foot of materials in mortar are considered to be as follows:

Material	Weight/Cubic Foot
Portland Cement	94 lbs.
Masonry Cement	Weight printed on bag
Hydrated Lime	40 lbs
Sand, damp and loose	80 lbs.

D. Mortar shall be colored to match the Buff colored CMU.

PART 5 - MIXING

A. Measurement by volume shall be manufacturer's packages or other containers of known capacity or by approved batching device so that specified proportions shall be consistently maintained. Material that has partially set shall not be re-tempered or used; frozen, caked, or lumpy material shall not be used. Mix mortar with proper amount of water, for a minimum of 5 minutes to desired consistency, and uniform color is obtained in electric batch mixer.

B. Mortar Flow. Mortar of the materials and proportions used in the construction shall have a flow after section for one (l) minute of not less than 70 percent of that immediately before suction. The flow shall be determined by the method of the Water Retention Test of the Standard Specifications for Masonry Cement, ASTM C9l.

C. Mortar Consistency. The mortar shall be of as wet a consistency as can be conveniently handled, and it shall be re-tempered frequently if necessary. Mortar which has greatly stiffened or in which the cement material has started to set shall not be used.

End of Section

SECTION 04200 - UNIT MASONRY

PART l - GENERAL

A. This Section includes all labor, materials, equipment, and related items required for the work of unit masonry as shown on the Drawings and as specified.

PART 2 - SUBMITTALS

A. None

PART 3 - PRODUCT HANDLING

A. Store all masonry units on screeds and under cover to properly protect from the elements until ready for use. Dirty, cracked, chipped, or otherwise damaged masonry units shall not be used.

PART 4 - ENVIRONMENTAL CONDITIONS

A. Masonry shall not be laid in freezing weather unless suitable means are used to heat the materials and protect the work from cold and frost, and to insure that the mortar will properly harden without freezing.

PART 5 - PROTECTION

A. The Contractor shall protect exposed masonry materials of every kind against staining, and the tops of all walls shall be kept covered with non-staining waterproof covering at the end of each work day and at any time the work thereon is not in progress. When starting or resuming work at a new level, the top surface of the work in place shall be cleaned of all loose mortar and foreign materials and in drying weather thoroughly wetted with clean water. Then resume laying.

PART 6 - MATERIALS

A. Masonry Units:

1. Concrete block for general use throughout the project shall be hollow, load-bearing concrete masonry units complying with ASTM C90, Grade N-1, shall have nominal 8" x 16 face, or as shown, shall have a compressive strength of not less than 800 p.s.i. for individual units and an average of 1,000 for five units.

    a. All aggregates for concrete masonry units shall conform to ASTM C33l, and shall be expanded shale produced by the rotary kiln process.

    b. All units shall be made with Portland cement complying with ASTM Cl50, and weighing not more than 100 lbs. per cubic foot.

c. All units shall be square, true, and have sharp arriser. They shall be of consistent texture, and shall be dimensionally stable with regard to height, width, and lengths. All units shall be free of organic impurities that will cause rusting, staining, or pop-outs, and shall contain no combustible matter.

d. Steam Curing. All concrete blocks shall be steamed in an atmosphere of 100° F. for a period of 4 to 6 hours. Steam curing shall commence after masonry units have been allowed to "set" for a period of 1½ to 2 hours. After steam curing, allow kiln temperature to drop slowly before removing blocks from kiln. Blocks shall be stored for a period of 30 days and protected from the weather during this period before delivery to site.

1. Fire rated concrete block for use in interior shafts shall conform to general specifications for other concrete block set forth above, and shall conform to Underwriter's Laboratories D-2 classification for two-fire rating.

a. Manufacturer of concrete block units shall provide U.L. standard certificate certifying that materials furnished meet classification specified to the Architect for approval prior to delivery of units to the site.,

B. Masonry Wall Reinforcement:

1. Provide all prefabricated internal or external corners required by installation.

C. Anchors and ties shall be of corrosion resistant metal equal in strength, size and numbers to conform with requirements of American standard A4l.l titled American Standard Building Code Requirements for Masonry.

1. Truss type reinforcement for horizontal reinforcing at concrete masonry partitions. Reinforcement shall be Dur-O-Wall Truss No. 9 gauge cross rod or approved equal. All components of anchor to have a hot dipped galvanized finish. Place joint reinforcement directly on masonry and place mortar over wire to form bed joint.

PART 7 - LAYING CONCRETE BLOCK

A. Lay all concrete block in exterior and interior wall construction where indicated, using Type N mortar furnished under work of Section 04100, except that Type S mortar shall be used in laying concrete block below grade.

B. All bed and head joints shall be completely filled with mortar. Bed joints shall be filled by spreading a thick bed of mortar. Fill head joints with a heavy buttering of mortar on one side (each flange) of block, press the block down into the bed joint, and push the block into place so that the mortar squeezes out from the top and sides of the head joint. Mortar should correspondingly cover the end flange of the block before placing the next block. Attempting to fill joints by slushing or dashing will not be permitted. Partial filling of joints with mortar cut from the extruded bed joint will not be permitted. Where closures are required, fill with mortar so that the intersection of the closure will extrude mortar, both laterally and

vertically. Extend walls and partitions to heights indicated, building in around joist bearings, etc. as shown or required. Cut units as required to properly course in plan and vertical section as shown on the Drawings or as directed by the Architect. All cuts shall be accurately made with masonry saw.

C. Joints and Bond. All concrete masonry units shall be laid in running bond. Joints in concrete block work shall be 3/8" wide for both head and bed joints. Joints in masonry scheduled to receive separate finish or where concealed in the work shall be cut flush. Rake joints 3/8" deep at control joints, where masonry abuts concrete surfaces, etc., and otherwise where shown on the Drawings, for caulking by others under work of Section 07900.

D. Reinforcement. Concrete masonry walls and partitions shall be reinforced continuously in every other course, (l6" o.c. vertically) using masonry wall reinforcement of types as hereinbefore specified. Reinforcement shall be seated in the mortar bed by lifting cross ties as work progresses. Lay internal and external corners and intersections as required for the completed job.

E. Chases for pipes, conduits, etc. shall be plumb and smooth on the inside, with offsets formed where required, kept free of obstructions and cleaned out on completion. There shall be at least 8" of masonry between chases and the jambs of openings.

F. Build units accurately to metal door frames, building in anchors furnished with frames. Slush solid with mortar at jambs and head.

G. Coordinate work with other trades, building in all items shown to be installed in concrete block work such as lintels, anchors, sleeves, etc. Prepare openings as shown or required for proper installation of mechanical, electrical, and other items.

H. Cleaning. Extreme care shall be exercised during laying to protect units from mortar droppings, etc. Upon completion of work, all exposed concrete block shall be properly cleaned with a stiff bristle brush to remove all excess mortar, dirt and stains. Do not use acid.

I. Workmanship. The contractor is cautioned that the Architect will demand first class workmanship. All concrete masonry work shall be performed by experienced masons. Any chipped, cracked or otherwise damaged or defective work will be rejected.

End of Section