SECTION 3200

MASONRY

1.00 GENERAL

1.01 Scope. Work to be completed under this section shall include all labor, equipment, plant, and materials necessary to furnish and install all masonry units, together with all miscellaneous and appurtenant items required for installation and/or furnished by other trades, as shown on the Plans and as specified herein.

1.02 Related Work in this Manual.

Section 3100 - Cast-In-Place Concrete

1.03 Related Work Specified Elsewhere.

Section 05100 - Structural Metal Framing
Section 05500 - Metal Fabrications
Section 10100 - Toilet Accessories
Section 15050 - Plumbing
Section 16000 - Electrical

1.04 Reference Standards.

ASTM C476 - Standard Specification for Mortar and Grout for Reinforced Masonry

ASTM C404 - Standard Specification for Aggregates for Masonry Grout

ASTM C144 - Standard Specification for Aggregates for Masonry Mortar

ASTM C55 - Standard Specification for Concrete Building Brick

International Masonry Industry, All-weather Council, "Recommended Practices and Guide Specification for Cold Weather Masonry Construction".

1.05 Submittals. Descriptive literature and catalogue cuts on masonry units, reinforcing steel and insulation.

1.06 Protection of Work. Contractor responsible for protection of all work prior to acceptance. Exposed insulation or cells shall be covered to prevent moisture or dirt intrusion.

1.07 Storage of Materials. Materials shall be stored in a dry place and in a manner to prevent damage or intrusion of foreign matter. During freezing weather, all masonry units shall be protected with tarpaulin or other suitable material. Concrete masonry units shall be stored under covers that will permit circulation of air and prevent excessive moisture absorption. Cement, lime and air-settling mortars shall be stored in watertight sheds with elevated floors. Reinforcement shall be protected from the elements; immediately before placing, reinforcement shall be free from loose rust, ice or other foreign coatings that will destroy or reduce the bond. Concrete masonry units shall be protected against wetting prior to use. Deliver packaged material in original manufacturer's containers. Materials showing evidence of water or other damage are subject to rejection.

2.00 MATERIALS

2.01 Concrete Masonry Units (CMU's). Units shall conform to ASTM C90 specifications. All units shall be Type I. Units below grade or exposed to weather shall be Grade N. Other units may be Grade S. Crushing strength, f'm = 1350 psi.

Units shall be in modular sizes with standard 8" width or 4" width as required. Corner units shall have square external corners. Jamb units at windows, bond beam units and other special units shall match the approved samples for the type of construction and locations designated. Units shall not contain iron spots or other substances that will strain plaster or paint.

2.02 Joint Reinforcement. Steel reinforcement for use in horizontal bed joints of concrete masonry units and other locations as hereinafter specified shall be prefabricated truss design type formed of zinc-coated cold drawn steel wire conforming to ASTM A82 and A116 of Class 3 coating. Side wire shall be formed of 9 gauge rod; cross rods shall be of 9 gauge, smooth or deformed wire, butt welded to side wires in the same plan at contact points. Special formed pieces shall be provided at corners and wall intersections. Reinforcing shall be of proper widths for the wall thicknesses shown. Reinforcing shall be Standard Type Fur-O-Wall, Rewal or approved equal. Unless otherwise noted on the plans , reinforcement in masonry walls shall be installed in the first and second bed joints above lintels, below sill at openings and below bond beams around the entire top of the perimeter walls of the building. Elsewhere, reinforcing shall be installed in bed joints at 16" vertical intervals. Side rods shall be lapped horizontally a minimum of 6". Joint reinforcement embedded in horizontal mortar joints shall have not less than 5/8" mortar coverage from the exposed face.

2.03 Reinforcing Steel. See Section 3100, Part 2.07.

2.04 Mortar and Grout. Shall conform to the property requirements of ASTM C476. Proportion mix to meet strength and other requirements.

2.05 Portland Cement. See Section 3100, Part 2.01.

2.06 Loose Fill Insulation. Zonolite, Permalite or approved equal water repellent masonry fill insulation.

2.07 Masonry Cement. Cement shall conform to ASTM Specification C91. Cement shall be gray.

2.08 Lime. Hydrated lime shall be Type S conforming to ASTM Specification C207. Quicklime shall conform to ASTM Specification C5; it shall be slaked in accordance with the manufacturer's directions.

2.09 Lime Putty. Putty shall be a stiff mixture of lime and water. Keep putty moist until used. Putty made from quicklime shall be slaked and allowed to soak at lest 24 hours before using. Putty made from Type S hydrated lime may be used immediately after mixing.

2.10 Sand. Sand shall conform to ASTM Specification C144 except that sand for mortar in 1/4 inch wide joints shall pass a No. 16 sieve.

2.11 Mixing Water. Water shall be clean and potable.

2.12 Coarse Aggregate for Masonry Grout. Aggregate shall conform to ASTM Specification C404.

3.00 METHODS AND PROCEDURES

3.01 Mixing Mortar. Mix all ementitious materials and sand in a mechanical batch mixer for a minimum of 5 minutes. Adjust the consistency of the mortar to the satisfaction of the mason, but add only as much water as is compatible with convenience in using the mortar. If the mortar begins to stiffen from evaporation or from absorption of a part of the mixing water, re-temper the mortar immediately by adding water and remix the mortar. All mortar shall be used within 2 1/2 hours of the initial mixing. It shall not be used after is has begun to set.

3.02 Other Trades. Other trades shall be consulted and provisions made such that the installation of their work is permitted in a manner to avoid butting and patching. Install, by way of example, anchor bolts, bearing plates, pipe and conduit openings and sleeves, HVAC openings and other knockouts required by other trades. Provide minimum 7-day notice to Owner, Engineer and other trades prior to requiring materials or detailing information. Build in work specified under other sections, as necessary and as the work progresses in accordance with requirements or other trades. Masonry contractor not responsible for installation of materials running within walls such as concealed conduit and piping.

3.03 Laying Masonry Units. All units shall be set plumb and true to line. All units shall be laid with level horizontal joints. Units shall be lain in "running bond" unless otherwise shown.

All interior masonry partitions unless otherwise shown shall terminate 1/2 inch from structural ceilings and a ½-inch thick by 8-inch wide expansion joint material installed thereon.

Where electric conduit, outlet and switch boxes occur, units shall be ground and cut before building-inservice. Work shall be coordinated with electrical subcontractor. Cutting of all units exposed in finished work shall be done with an approved type of power saw. Work must also be coordinated with plumbing subcontractor where plumbing occurs in masonry partitions.

Masonry units shall be reinforced horizontally with continuous joint reinforcement placed not to exceed 16" on center vertically in exterior walls and in non-load bearing partitions.

Bond each course at corners in a masonry bond and at intersections with metal ties, anchors or joint reinforcement spaced as above.

Partitions of all units that abut exterior walls, columns and other partitions shall be bonded in or be anchored thereto once every 16 inches in height. Where anchors are used they shall be 1/8 x 1¼-inch zinc coated steel anchors with ends turned up 2 inches and extending 4 inches into wall and not less than 8 inches onto partitions; or anchors may be of type to fit the slats in concrete.

Interior joints of all masonry construction shall be "flush". Exterior joints of all masonry construction shall be "concave".

3.04 Special Requirements. Masonry shall not be laid when the temperature of the outside air is below 40°F., unless suitable means as approved by the Engineer are provided to heat materials, protect work from cold and frost and ensure that mortar will harden without freezing. (No anti-freeze ingredient shall be used in the mortar).

The facing material shall be protected against staining and tops of walls kept covered with non-staining waterproof coverings when work is not in progress. When work is resumed, top surface of work shall be cleaned of all loose mortar and in drying weather thoroughly wet except for concrete masonry units.

Where fresh masonry joins masonry that is partially set or totally set, clean the exposed surface of the set masonry and wet it lightly so as to obtain the best possible bond with the new work. Remove all loose brick and mortar. If it is necessary to "stop off" a horizontal runt of masonry, this shall be permitted only with the Engineer's approval. (Toothing will not be permitted).

All reinforced hollow unit masonry shall be built to preserve the unobstructed vertical continuity of the cells to be filled. Walls and webs forming such cells to be filled shall be full bedded in mortar to prevent leakage of grout. All head (or end) joints shall be solidly filled with mortar for a distance of the longitudinal face shells. Bond shall be provided by lapping units in successive vertical courses or by equivalent mechanical anchorage.

Vertical cells to be filled shall have vertical alignment sufficient to maintain a clear, unobstructed continuous vertical cell measuring not less than 2 inches by 3 inches.

All cells containing reinforcement shall be filled solidly with grout. Grout shall be poured in lifts of 8 feet maximum height. All grout shall be consolidated at time of pouring by puddling or vibrating and then reconsolidated by again puddling later, before plasticity is lost.

When total grout pour exceeds 8 feet in height, the grout shall be placed in 4 foot lifts and special inspection during grout shall be required. Minimum cell dimension shall be 3 inches.

When the grouting is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the pour of grout 1½ inches below the top of the uppermost unit.

Steel in lintels shall be set in beds of mortar. Spaces around jambs and heads of metal door bucks and frames shall be filled solidly with mortar.

Bond beams or concrete caps along the top of the walls shall be provided with the necessary and required bearing plates, anchor bolts, expansion joint filler, etc. and welds and connections of the pre-cast concrete components to the walls shall be made by the contractor under this section.

3.05 Insulation. Loose fill insulation shall be poured directly from the bag. block joints at columns or other vertical members shall be mortared in to prevent leakage. All block throughout the entire job is to be filled except interior partitions.

4.00 FIELD QUALITY CONTROL

4.01 General. All mortar smears and mortar chucks shall be cleaned from all exposed surfaces or surfaces to receive paint. Point all joints as directed by Engineer removing joint material sufficient to allow uniform joint after repair. Receive approval of finished wall.

End of Section