

SECTION 04220**UNIT MASONRY****PART 1 - GENERAL****1.01 SCOPE OF WORK:**

- A. Furnish all labor, materials, tools, supervision, scaffolding, equipment, transportation and services necessary for and incidental to the completion of all types of masonry construction as shown on the Drawings or herein specified.
- B. See Drawings for type, quantity and location of masonry work required and do all necessary work for a complete job.
- C. Build in all items furnished by other trades and coordinate the work as required. This shall include the installation of anchor bolts, louvers, door frames, loose lintels, outlet boxes, etc., where same are built into the masonry unless otherwise noted. Be responsible for the installation of these items being plumb and true.

1.02 RELATED WORK

- A. Section 04060 - Mortar.
- B. Section 04082 - Joint reinforcement.

1.03 REGULATIONS, REFERENCES AND STANDARDS

All masonry work shall conform to the following:

- A. South Florida Building Code (Latest edition)
- B. Standard Specification for the Design and Construction of Loadbearing Concrete Masonry, NCMA TR-75B by National Concrete Masonry Association.
- C. Building Code Requirements for Masonry Structures, ACI 530-88/ASCE 5-88.
- D. The most stringent requirement shall govern where there are discrepancies between the regulation, references, standards and these project specifications.

1.04 PRODUCT HANDLING

- A. Pack, deliver, store and handle all materials as to prevent the inclusion of foreign materials and damage by water or breakage. Packaged materials shall be in original packages until ready for use.
- B. Masonry units shall be stored on a plank platform above ground and protected against excessive moisture absorption.

1.05 SHOP DRAWINGS AND SAMPLES

The Contractor shall submit shop drawings and samples to the Engineer of Record for approval.

1.06 PRECAUTIONS

- A. Brace masonry walls against wind and/or earth pressures until such time that the masonry has attained sufficient strength to resist these forces and the permanent supports (floors, roofs, etc.) are installed and ready to support these walls.
- B. Protect masonry materials against staining and top of walls covered with non-staining waterproof covering when work is not in progress. When work is resumed, top surface shall be cleaned of all loose mortar and, in drying weather, thoroughly wetted.
- C. Do not lay block masonry when the temperature of the outside air is below 40°F.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Concrete masonry units: ASTM C90.
- B. Units to be of Grade N-1, Type 1, normal weight. Moisture content at time of delivery not to exceed 35% of total absorption and to be in equilibrium with the average relative humidity at the time of laying the wall. Moisture content tested in accordance with ASTM C426.
- C. Units shall be nominal 8 x 8 x 16 inches. Web thickness minimum 1 inch. Face of shell thickness 1-1/16 inch, minimum.
- D. Each type of masonry unit shall be:
 - 1. The product of one manufacturer, units of modular dimension and include all special shapes and sizes to complete the work as shown.
 - 2. Be free of iron or other substances that will stain plaster or paint.
 - 3. Have exposed surfaces of generally uniform texture and light color.
 - 4. Be well cured, at least 28 days, dry and completely protected from dampness prior to laying.
- E. Portland cement shall be of one type and color, conforming to ASTM C150 type 1, one brand throughout this project.
- F. Masonry cement shall conform to ASTM C91, one brand throughout this project. Cement shall be non-staining.
- G. Hydrated lime shall conform to ASTM C207, Type S, with 8% maximum unhydrated oxides.

- H. Lime putty shall be quicklime, conforming to ASTM C5. Putty shall be slaked and allowed to soak at least 72 hours before using, or aged in accordance with manufacturer's printed recommendations.
- I. Sand shall be clean natural bank sand conforming to ASTM C144. All sand shall be the same color and come from the same source.
- J. Water shall be fresh and free of alkalies, acids, oils, organic matter or other deleterious substances.
- K. Metal wall plugs shall be inserted in masonry joints where wood is to be attached to masonry by nailing.
- L. Masonry cleaner shall be Sure Klean No. 600 detergent as manufactured by the Process Solvent Company, Inc.

2.02 INSPECTION

- A. All units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or impair the strength or permanence of the construction.
- B. Units that are intended to serve as a base for plaster or stucco shall have a sufficiently rough surface to afford a good bond. Where units are to be used in exposed wall construction, the face or faces that are to be exposed shall be free of chips, cracks or other imperfections.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. All masonry construction shall be as per National Concrete Masonry Association requirements and specifications for heights and thicknesses shown or specified and for materials indicated.
- B. All masons shall be skilled mechanics. Consult other trades in advance and make preparations for installation of their work to avoid cutting and patching. Build in work specified under other sections of specifications as work progresses. Grout around all boxes, plates, pipes, escutcheons, etc., in masonry walls.
- C. Acceptance of concrete surfaces: prior to laying of any units, contractor shall inspect concrete surfaces for level and coursing. Notify Engineer of Record of any serious defects or conditions that will interfere with, or prevent, a satisfactory installation. Do not proceed with laying of units until such defects or conditions have been corrected. Starting of work shall imply acceptance of surfaces to receive masonry units.
- D. Build in all lintels, bearing plates, and other loose structural members, as well as all masonry anchors, anchor bolts, inserts, hangers, sleeves, door frames, plugs for grounds and all other miscellaneous items. Fill solid with mortar around jambs and heads of metal door frames and carefully point all joints between the metal frame and adjacent masonry or other construction.

- E. Form all chases as shown or required for conduits and piping. All cutting and patching shall be done by the mason.
- F. Lay walls to line, plumb and straight. Courses equal and level to given height dimensions using coursing pole, with each course breaking joints with the course next below. Lay out first course dry in all locations before commencing to lay up in order to insure equal joints and proper bond patterns. Lay up all walls without stepping or toothing in order to preserve bond. Cutting of masonry with masonry saw only.
- G. Non-bearing partitions shall terminate approximately $\frac{1}{2}$ " below structure unless otherwise detailed. This joint shall be filled and caulked.
- H. Concrete masonry:
 - 1. Lay concrete masonry units plumb, level and true to line in running bond pattern and properly jointed with other connecting work. Units with open cells exposed in wall will not be permitted.
 - 2. Lay units with full mortar coverage on horizontal and vertical face shells, except that webs shall also be bedded in all courses of piers, columns and pilasters and in the starting course on footings and solid foundation walls, and where adjacent to cells or cavities to be reinforced and/or filled with grout or concrete. Horizontal and vertical face joints shall be $\frac{3}{8}$ inch thick unless otherwise noted.
 - 3. Provide and install all necessary anchors; embed joint reinforcements, control joints and expansion joints as herein specified or required.
 - 4. Bond each course at corners and intersections.
 - 5. Damaged walls shall be solidly repaired with cement mortar where not exposed. Exposed damaged masonry must be replaced.
 - 6. Use four inch regular, two cell blocks where required. End or corner blocks may be used only at corners, door frames or window frames, not within field nor where concrete columns are to be poured. No broken or chipped block permitted.
 - 7. All joints, both vertical and horizontal, to be fully mortared and tooled flush.
- I. Reinforced wall:
 - 1. Masonry walls to be reinforced vertically and/or horizontally to a greater extent than called for herein shall be as per all details shown on the drawings. Reinforcing shall be continuously bonded to mortar.
 - 2. Where masonry walls less than 24 inches in width exist reinforce subject wall with minimum 2#5 vertical and fill with concrete.
- J. Anchorage of structural systems and wall systems shall be in accordance with the following requirements:

1. All structural elements depending upon one another for continuity or support shall be securely anchored to resist all forces which might tend to separate the structural elements.
 2. Masonry walls and partitions shall be securely anchored or bonded at points where they meet or intersect by one of the following methods:
 - a) Interior non-loadbearing walls shall be anchored at their intersection at vertical intervals of not more than two feet on centers, with metal ties extending at least 4" into the masonry, or with other ties which proved an equivalent method of anchorage.
 - b) Walls carried up separately where the courses of meeting or intersecting walls are carried up separately, corner intersections shall be made by regularly tothing or blocking with 8" maximum offsets and the joint provided with rigid steel anchors. Maximum vertical spacing of such anchors shall be 16 inches, other metal ties, joint reinforcement or anchors, if used, shall be spaced to provide equivalent anchorage at the intersection to that required by this section. Other intersections shall be similarly bonded except that the masonry bond may be omitted.
 - c) Walls adjoining or intersecting structural framing, all exterior walls, curtain walls, panel walls, or other walls interior or exterior dependent upon the structural frame for lateral support shall be anchored to the structural members with flexible metal anchors or by galvanized dovetail masonry anchors to cast in place dovetail anchor slot in adjacent columns, beams and slabs on all sides of the masonry panel, or otherwise keyed to the structural members. Maximum vertical spacing 16-inches, maximum horizontal spacing 32-inches.
- K. All mechanical, plumbing or electrical work included in other sections shall not be enclosed or covered up until all required inspections have been completed and work approved and accepted.
- L. All cutting and fitting of masonry, including that required to accommodate the work of the other sections shall be done by masonry mechanics with masonry saws. Work shall be coordinated with other trades to insure proper placement of bolts, anchors, nailing blocks, inserts, window and door frames, vents, conduits, pipes, flashings, etc.
- M. Door frames: all hollow metal door frames shall be filled solid with mortar as walls are laid. Install metal anchors provided with frames. Where frames are to be bolted to concrete, grout frames solid prior to bolting.
- N. Where indicated on drawings, fill block cells solid with specified concrete. Fill cells as block progresses so concrete lift does not exceed 48 inches. Rod well so cells are completely filled.
- O. Contractor shall furnish certificates, test reports, and other acceptable evidence that the masonry materials comply with specification requirements.
- 3.02 Joint reinforcement
- A. All concrete masonry walls shall be reinforced with the proper size horizontal wall reinforcement.

- B. Horizontal reinforcement shall be placed in the first and second bed joints above and below openings and in every second joint (16" on center) elsewhere. Reinforcement to extend two feet beyond the opening and all splices shall be lapped a minimum of 6".
- C. Horizontal reinforcement shall not pass through vertical control joints unless noted or detailed otherwise on the drawings.

3.03 TOLERANCES

- A. Variation from plumb:
 - 1. Lines and surfaces of walls: 3/8" in any story or 3/8" in 10 feet not cumulative.
 - 2. External corners, expansion joints, 1/4" in any story or 1/4" in 10 feet.
- B. Variations from level:
 - 1. Lintels, sills, parapets, horizontal grooves, 1/4" in 20 feet.
 - 2. Bearing surfaces of slabs: 1/8" in 10 feet.
- C. Variation of building lines from established position in plan and related portion of walls and partitions, 1/2" in 200 feet.
- D. Variation in cross sectional dimension of wall shall be plus or minus 1/4 inch.

3.04 INSPECTION

Authorized representatives of the Department shall have access and the right to review the work at all times. At the completion of the work all holes in joints of masonry surfaces shall be filled with mortar and suitably tooled. Masonry walls shall be dry brushed at the end of each day's work and shall be left clean and free from mortar spots and droppings. Any cracks in masonry shall be repaired. Defective joints shall be cut out and repointed. Remove all scaffolding and equipment used in the work. Clean up all debris and refuse and surplus material and remove from premises.

END OF SECTION