SECTION 04220

CONCRETE UNIT MASONRY

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 03300 - Cast-In-Place Concrete.
2. 08100 - Steel Doors and Frames.
3. 09200 - Metal Studs, Lath, Suspension Ceiling, Plaster, and Stucco.
4. Furnishing of other items to be built-in - Under respective sections.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. A82-95a Specification for Steel Wire, Plain, for Concrete Reinforcement.
2. C55-96a Specification for Concrete Brick.
3. C90-96a Specification for Loadbearing Concrete Masonry Units.
5. C129-96a Specification for Non-Loadbearing Concrete Masonry Units.
9. C331-94 Specification for Lightweight Aggregates for Concrete Masonry Units.

1.03 SUBMITTALS

A. Submit properly identified product data on masonry units and each type of metal anchor and accessory, before starting work.

1.04 QUALITY ASSURANCE

A. Certifications: Provide certification from concrete unit masonry manufacturer stating the materials supplied meet specifications.

B. Mock-Ups: Erect, at a minimum or as otherwise directed by A/E for size or quantity, a 6 foot long by 4 foot high by
full thickness sample wall panel to represent completed exterior and interior masonry work for qualities of appearance, materials, and construction. Retain sample wall during construction for standard for completed masonry work.

C. U-block is not allowed.

1.05 PROJECT CONDITIONS

A. Environmental Conditions

1. Temperature: 40 degrees F. minimum and rising.
2. Weather: No application during precipitation.

PART 2 PRODUCTS

2.01 LOAD BEARING CONCRETE UNIT MASONRY

A. Weight: Normal.

B. Size: 8 inches x 16 inches x thickness indicated, 2 cell stretcher type with vertical mortar keys at each end.

C. Texture: Medium.

D. Grade: ASTM C90, Type I or II.

E. Unit Linear Shrinkage: Type I, 0.03 percent, ASTM C90.

F. Shapes: Appropriate to suit conditions.

2.02 NON-LOAD BEARING CONCRETE UNIT MASONRY

A. Weight: Normal.

B. Size: 8 inches x 16 inches x thickness indicated, 2 cell flush end type.

C. Texture: Medium.

D. Grade: ASTM C129, Type I or Type II.

E. Unit Linear Shrinkage: Type I, 0.03 percent, ASTM C90.

F. Shapes: Appropriate to suit conditions including partition top closures.

2.03 CONCRETE BRICK
A. Grade: ASTM C55, Grade N-I or N-II.
B. Size: Appropriate to suit conditions.

2.04 MORTAR
A. Portland Cement: ASTM C150, Type I, domestic.
B. Masonry Cement: ASTM C91, domestic.
C. Sand: ASTM C144.
D. Water: Potable.
E. Mortar Mix: ASTM C270, Type S, 1800 psi for above grade use, and Type M-2500 psi for below grade use. Mix accurately in following proportions by volume:

<table>
<thead>
<tr>
<th>Type S</th>
<th>Type M</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 part masonry cement</td>
<td>1 part masonry cement</td>
</tr>
<tr>
<td>1/2 part Portland cement</td>
<td>1 part Portland cement</td>
</tr>
<tr>
<td>4 parts sand</td>
<td>4-1/2 parts sand</td>
</tr>
</tbody>
</table>

2.05 REINFORCEMENT, ANCHORS, TIES, AND ACCESSORIES
A. Horizontal Joint Reinforcement: Continuous 9 gage truss design, deformed, galvanized steel, including preformed welded corners according to ASTM A82. Widths to suit thickness of block to within 1 inch of each face.

1. Acceptable manufacturers:
   a. Blok-Trus by A.A. Wire Products.
   b. Standard Truss by Dur-O-Wal.
   c. Trus-Mesh by Hohmann and Barnard, Inc.
B. Buck Anchors: 16 gage corrugated galvanized steel, 1-1/4" wide, 8 inch long leg, with 2 inch upturned end, punched for fastenings, complete with No.10 galvanized machine screws and metal expansion anchors for securement to concrete.
C. Dovetail Slots: 22 gage galvanized with filler, 1 inch wide x 1 inch deep.
D. Dovetail Anchors: 16 gage corrugated galvanized steel, 1 inch wide x 5-1/2" long, sized to fit dovetail slots.
PART 3 EXECUTION

3.01 LOCATION OF MASONRY SYSTEMS

A. Load Bearing Units: For partitions and walls 8 inches or greater.

B. Load Bearing Lightweight Units: For partitions and walls as indicated.

C. Non-Load Bearing Units: For partitions 4 or 6 inches.

D. Concrete Brick: Filling-in to suit conditions.

E. Corners and Special Shapes: As required to suit conditions, including corners, returns, offsets, and to maintain bond.

3.02 LOCATION OF REINFORCEMENT, ANCHORS, TIES, AND ACCESSORIES

A. Horizontal Joint Reinforcement:

1. Provide at every second course and at first joint above and below openings, for all masonry, interior or exterior.
2. Use Standard No.8 ladder type and truss type for all other masonry construction.

B. Buck Anchors: Every second block course for masonry walls and partitions abutting precast concrete and wherever dovetail anchors cannot be incorporated. Secure upturned ends to concrete with specified screws and anchors.

C. Dovetail Anchors: Every second block course for masonry walls and partitions abutting cast-in-place concrete with continuous dovetail anchor slots.

3.03 ERECTION

A. Laying Units:

1. Lay masonry plumb, true to line, with level and accurately spaced courses.
2. Keep bond plumb throughout.
3. Lay corners and reveals plumb and true.
4. Avoid overplumbing of corners and jambs to fit stretcher units after they are set in position.
5. Where adjustment must be made after mortar has started to harden, remove mortar and replace with fresh mortar.
6. Use concrete brick to course out walls concealed in the finished work.
7. Cut masonry units dry.
8. Use masonry saws for cuts exposed in the finished work.

B. Tolerances:
1. Plumb masonry work within tolerance of $\pm \frac{1}{8}''$ in 5 feet.
2. Level courses within tolerance of $\frac{1}{4}''$ in length of any run.

C. Bond:
1. Provide common bond, with vertical joints centered over masonry unit below, except where other bonds are indicated. (Provide stack bond with vertical joints centered over joints below).
2. Bond masonry at corners and intersections.

D. Joint Treatment:
1. Block Exposed to View: (Tooled concave joints) (float finished joints) mortar thoroughly compacted and pressed against edges of units and float finish joints.
2. Concealed Block: Joints struck flush.
3. Joint Thickness: 3/8''.

E. Jointing Methods:
1. Where concrete block cores are indicated to be filled with concrete, lay in full mortar beds and full mortar end joints.
2. Lay all other concrete block with full beds of mortar on vertical and horizontal face shells.
3. Furrowing of mortar not allowed.
5. Finish tooled joints to uniformly straight and true lines and surfaces, smooth and free of tool marks.
6. Uniformly rake joints between masonry and door frames to 3/8'' depth to receive caulking or sealant.
7. Rake joints around flush electrical outlets in wet locations to receive caulking or sealant.

F. Mortar Filled Units:
1. First cell of blocks abutting door jambs and window frames.
2. Cells of blocks at free ends of partitions and walls.
3. Where necessary for embedment of anchors, and where otherwise shown.
4. Voids around ducts, pipes, and other items passing through masonry work.
5. Hollow metal door frames and elevator hoistway door frames in masonry walls and partitions: Grout solid with mortar as masonry is laid. Include tops of door frames.

G. Load Bearing Masonry Walls:
1. Erect masonry before reinforced concrete building frame.
2. Close masonry top course cores under poured concrete beams with paper stuffing or metal caps.
3. Do not use flush end type units against columns or poured concrete walls.

H. Non-Load Bearing Masonry Wall and Partition Anchorage:
1. Erect masonry after steel and concrete frames are in place, and after concrete floors and roof decks are in place.
2. After forms are stripped, remove slot fillers.
3. At edges of non-bearing interior masonry walls and partitions abutting concrete columns and poured concrete walls, provide corrugated dovetail type anchors.
4. Grout dovetail slots and space between end of masonry units and concrete solid.
5. Point up all joints solid and flush on both sides of partitions.

I. Partition Heights:
1. Partitions to be continuous from floor to underside of floor or roof construction above where so indicated.
2. Full height partitions and walls to be wedged tight with tile or brick set in mortar.
3. Use brick or solid units for top masonry course.
4. Point up all joints solid and flush on both sides of walls and partitions.
5. Where suspended ceilings on both sides of partitions are indicated, the partitions other than those shown to be continuous may be terminated approximately four inches above the ceiling level.

J. Concrete Fill for Masonry Cores:
1. Coordinate masonry work to allow placing of pea rock concrete as indicated and as specified in Concrete section.
2. Fill top courses of concrete masonry walls with concrete before placing or use concrete brick for top courses to assure solid masonry.

K. Pipe Chase Walls and Partitions: Erect after pipes are in place, tested, and accepted.

L. Slots, Chases, Recesses and Openings: Provide as required for work of other trades.

M. Setting of Items Furnished Under Other Sections: Set anchors, bolts, sleeves, access panels, door frames, and other items occurring in masonry as the work proceeds.

N. Securing Hollow Metal Door Frames: Set in hollow metal frames on floor, floor clips secured and frames braced in proper position. Grout anchors into masonry joints as walls are erected.

O. Lintels: Set reinforced precast concrete or coordinate installation of cast-in-place concrete lintels as indicated. Precast concrete lintels to be set in full mortar beds with 8 inches minimum bearing each end.

P. Installation of Horizontal Wall Reinforcement:

1. In masonry areas indicated to have concrete filled cores, provide reinforcement in every horizontal joint.
2. At other areas, provide reinforcing in every second block course joint and at first joint above and below openings for exterior and interior masonry.
3. Cut corners and intersections as recommended by manufacturer.
4. Extend reinforcement 6 inches into concrete tie columns and concrete encasement of steel columns poured after block is in place.
5. Unless walls have cast-in-place concrete corner tie columns, make wall and partition joint reinforcing continuous around corners and at intersections according to manufacturer's published directions.
6. Lap splices in joint reinforcement no less than 6 inches. Reinforcement shall not be continuous through expansion joints.

Q. Covers: At work stoppage, provide waterproof covers
secured over exposed wall tops for weather protection.

R. Pointing: Point holes in masonry. Cut out and point up defective joints.

END OF SECTION