

REINFORCED CONCRETE UNIT MASONRY
SECTION 04 22 00

PART 1 GENERAL

1.01 SUMMARY

- A. Inclusions:
 - 1. Provisions set forth in Divisions 0 and 1;
 - 2. Concrete block work;
 - 3. Mortar and grout in connection with the installation of concrete block;
 - 4. Placement of steel reinforcing for concrete block;
 - 5. Supervision of dowel installation in concrete work;
 - 6. Setting and incorporating into the concrete block of all accessories, sheet metal work, miscellaneous iron, anchor bolts, etc. furnished by other trades;
 - 7. Associated hardware;
 - 8. Submittal preparation;
 - 9. Clean up.
- B. Related Sections:
 - 1. Section 03 21 00: Reinforcing Steel
 - a. Furnishing of reinforcing steel and installation of steel dowels cast in concrete for concrete block.
 - 2. Section 03 31 00: Structural Concrete Work
 - a. Footings for masonry walls.

1.02 SUBMITTALS

- A. Samples or Mock-ups:
 - 1. Submit one (1) sample of the manufacturer's complete custom color range to the Architect for color selection purposes prior to ordering material.

1.03 QUALITY ASSURANCE

- A. Tests and Inspections:
 - 1. Tests and Inspections shall be per Section 01 45 23 "Tests and Inspections".
 - 2. Continuous inspection of masonry shall be performed by special inspector approved by DSA during laying and grouting.
- B. Concrete Masonry Units:
 - 1. Furnish manufacturer's certificate attesting that units delivered to site meet material and property requirements specified, including linear shrinkage requirements; otherwise, concrete masonry units shall be sampled from material delivered to the site by the testing laboratory or project inspector,

and tested by the testing laboratory as specified in ASTM C140 for compliance, and tested for linear shrinkage according to ASTM C426. Testing shall be completed, and the units approved prior to placing units in the work.

2. Tolerances:
 - a. Unit masonry shall be placed within one-eighth (1/8") of noted dimensions>
 - b. Reinforcement shall be placed within tolerances recommended by ACI Detailing Manual – Special Publication, SP-66.

PART 2 PRODUCTS

2.01 MATERIALS

A. Concrete Block:

1. Concrete block shall comply with per ASTM C90, Type I, medium weight Requirements.
 - a. Color shall be as directed by Architect
 - b. Types and size of block shall be as shown on drawings (8x8x16 scored to emulate 8x8x8 block).
 - c. Block mix shall have a water repellant admixture, SPG # VL 25/25 or BASF Rheopel Plus.
2. Basalite Concrete Products, LLC, dba Basalite Selma, contact rep: David Willis e-mail: david.willis@paccoast.com, (559) 896-1649.
3. Desert Block, Bakersfield, contact rep: Roger Beckett, e-mail: info@desertblock.com, (661) 858-2072.
4. Or approved equal.

B. Portland Cement:

1. Portland cement shall conform to ASTM C-150, Type II, with the following exceptions:
 - a. The cement shall not contain more than 0.60 percent total alkali when calculated as Sodium Oxide.
 - b. The percentage of Tricalcium Silicate is not limited.

C. Grout:

1. Comply with ASTM C476, Coarse Aggregate
2. Coarse grout proportioned by weight shall contain not less than 564 pounds of cementitious material per cubic yard.
3. Strength: 2000 psi at 28 days.
4. Sika Grout Aid Type II shall be used in grout.

D. Hydrated Lime:

1. Hydrated lime shall conform to Type S per ASTM C270.

- E. Water:
 - 1. Water shall be clean, free from deleterious acids, alkali, oil, and organic matter.
- F. Mortar:
 - 1. Mortar Type "S" per ASTM C270, proportions based on loose volumes:
 - a. Portland Cement: 1 part
 - b. Hydrated lime or lime putty: 1/4 part (min.)
 - c. Sand (damp, loose volumes): Not less than 2 1/4 and not more than 3 times the sum of the separate volumes of cementitious materials.
 - 2. Pre-mixed Mortar Type "S" per ASTM C270
 - a. Amerimix
 - b. Spec-Mix
 - c. Or approved equal
 - 3. Mortar shall have a water repellant admixture; SPG # VL 25/25 or BASF Rheopel Plus.
 - 4. Mortar Strength:
 - a. Mortar shall attain a minimum compressive strength of 1800 psi at 28 days.
 - 5. Mortar Color:
 - a. Natural gray.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Start of work shall be considered as acceptance of existing conditions.

3.02 PREPARATION

- A. Masonry units shall be clean and free from dust, grease, or other objectionable material.

3.03 DELIVERY, STORAGE, AND HANDLING

- A. Cement shall be stored in such a manner as to protect it from inclusion of foreign material and damage by moisture.
- B. Only one (1) brand of cement shall be used for this work.

3.04 INSTALLATION OR APPLICATION

- A. Install per the manufacturer's latest written recommendations.

B. Joints

1. Block shall be laid with three-eighths inch (3/8") minimum thick mortar bed on entire horizontal surface of block.
2. Solidly fill head joints.
3. Mortar joints shall be straight, clean, and uniform in thickness and shall be tooled with a steel rod as required to obtain a concave-rodged joint.
 - a. Produce a dense joint surface well-bonded to the block at the edges.
4. Walls to receive plaster, or in concealed locations, shall have flush struck joints.
5. Joints to be concealed under paint shall be filled flush and then sacked to produce a dense surface without sheen.

C. Alignment:

1. Block shall be laid in running bond, unless otherwise indicated.
2. Block shall be laid in a manner that preserves an unobstructed vertical continuity of the cells to be filled.
3. Remove overhanging mortar or other obstruction from inside the cells and from the reinforcing.

D. Mortar:

1. Materials for mortar shall be measured in suitable calibrated devices.
 - a. Shovel measurements will not be accepted.
2. Lime shall be the last material added to the mix.
3. Mix for at least 3 minutes in a mechanical batch mixer.
4. Re-tempering of mortar shall be done only by adding water into a basin made with the mortar.
 - a. Carefully work the water into the mortar.
 - b. Mortar that is non-plastic or over 1-1/2 hours old shall not be used.

E. Placing of Reinforcement:

1. Clean reinforcement to be free of mortar, oil, dirt, loose mill scale, excessive rust, or other coatings that would destroy or reduce the bond.
2. Bends shall be made around a pin having a diameter of not less than four (4) times the bar diameter for stirrups and ties and six (6) times the bar diameter for other bars, except for bars larger than one-inch (1") which shall be eight (8) times the bar diameter.
 - a. Bars shall be bent cold.
3. Reinforcing shall be accurately placed.
4. Reinforcing shall be fully embedded in grout.
 - a. Do not embed in mortar or mortar joints, except for wall mesh as indicated on the drawings.
5. Maintain one-half inch (1/2") minimum clearance between any bar and masonry.

6. Where the low-lift grouting method is used, the vertical bars shall be placed prior to the erection of the wall and shall be held in position at top and bottom, and at intervals not exceeding 192 diameters of the reinforcement with at least No. 16 gauge annealed wire.
7. Reinforcement that will be included in a grout pour shall be positioned and wired in place before the cells are grouted.
 - a. It is not permissible to "stick" the bars in the grout.

F. Dowels:

1. Supervise and be responsible for the proper installation of reinforcing dowels by others.
 - a. Dowels shall not be bent to obtain the proper alignment.

G. Splicing:

1. Splices shall be made with a lap of at least seventy-two (72) bar diameters, unless otherwise noted.
2. Bars shall be placed in contact and wired together to maintain proper clearances.
3. Stagger horizontal splices at least four feet (4'-0").
4. No splices in the vertical reinforcement will be allowed, unless shown on the drawings

H. Embedded Items:

1. Cooperate with other tradesmen to ensure that conduit, anchor bolts, sleeves, inserts, hangers, hollow metal door frames, etc., are properly installed and secured in correct position.
2. Embedded items shall be thoroughly clean and free from rust, scale, oil, or other foreign matter.
3. Do not embed pipes, other than electrical conduit.
 - a. Rigid electrical conduit may be embedded in structural masonry where indicated on the approved drawings
4. Accurately secure embedded and secure items set in place before the grouting of the cells is started.
 - a. Set bolts in place by using a wood template.
5. Bolts shall be grouted in place, with not less than one inch of grout between the bolt and the masonry.

I. Low Lift Grouting:

1. The method of grouting, either the high lift or the low lift method, shall be as specified. Low lift grouting shall conform to Title 24, Section 2104A.5.1.2.1.1.
2. Proportioning:
 - a. Material: Cement
 - 1) Proportions: 1
 - b. Material: Sand
 - 1) Proportions: 2.25 to 3.0

- c. Material: Pea Gravel
 - 1) Proportions: 1.0 to 2.0 (Aggregates measured in a damp, loose volume)
- 3. Required Admixture: Sika Grout Aid Type II, BASF Rheopel Plus
- 4. Add water in the amount necessary to cause the grout to flow into all joints of the masonry without segregation.
- 5. Grout shall attain a minimum compressive strength of 2000 psi at 28 days.
- 6. Fill all cells with grout in lifts not exceeding 4'-0" in height.
 - a. Masonry units shall not be laid more than 4'-0" in height before grouting.
- 7. If grouting is stopped for one hour or more, horizontal construction joints shall be formed by stopping the grout 1 ½ " below the top of the unit.
- 8. Grout shall be rodded with a heavy reinforcing bar or vibrated with a mechanical vibrator immediately after placing.

3.05 CLEANING OR REPAIR

- A. Use care to keep the masonry clean.
 - 1. Mortar dropped or spattered on the work shall be removed immediately, and the surface washed clean.
- B. Remove all surplus material, equipment, and debris from the premises which result from this operation.

END OF SECTION 04 22 00