SECTION 04 22 00

CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section Includes: Provision of concrete masonry work, including but not limited to, masonry units, mortar, grout, reinforcing steel, control joints, testing and inspection.

B. Related Sections:

1. Section 03 20 00 – Concrete Reinforcing.

2. Section 03 30 00 – Cast-in-Place Concrete.

3. Section 05 12 00 – Structural Steel Framing.

4. Section 07180 – Water Repellant Coatings.

1.2 REFERENCES

A. Requirements of the GENERAL CONDITIONS and DIVISION NO. 1 apply to all Work in this Section.

B. Published specifications, standards, tests or recommended methods of trade, industry or governmental organizations apply to Work in this Section where cited by abbreviations noted below (latest editions apply).

1. California Building Code (CBC), 2016 Edition.

2. American Concrete Institute (ACI):

a) “Building Code Requirements for Masonry Structures,” ACI 530-08 / ASCE 5-08 / TMS 402-08 (ACI 530).

b) “Specifications for Masonry Structures,” ACI 530.1-08 / ASCE 6-08 / TMS 602-08 (ACI 530.1).

c) “Manual of Standard Practice for Detailing Reinforced Concrete Structures” (ACI 315).

3. American Society for Testing and Materials (ASTM).

a) “Specification for Quicklime for Structural Purposes” (ASTM C5).

b) “Specification for Load Bearing Masonry Units” (ASTM C90).

c) “Test Method Sampling and Testing Concrete Masonry and

Related Units" (ASTM C140).

d) "Specification for Portland Cement" (ASTM C150).

e) "Standard Specification for Aggregate for Masonry Mortar" (ASTM C144).

f) "Specification for Hydrated Lime for Masonry Purposes" (ASTM C207).

g) "Standard Specification for Mortar for Unit Masonry" (ASTM C270).

h) "Standard Specification for Aggregate for Masonry Grout" (ASTM C404).

i) "Specification for Grout for Masonry" (ASTM C476).

j) "Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry" (ASTM C780)

1.3 QUALITY ASSURANCE

A. All masonry work shall comply with the standards and requirements of the above references. Where discrepancies exist between the references and the Contract Documents, the requirements of the Contract Documents shall govern.

B. Allowable Tolerances:

1. Unit masonry shall be fabricated within 1/8-inch of dimensions noted.

2. The maximum variation from plumb of walls shall be 1/8" in 20 feet.

3. Joints shall have a uniform thickness of 3/8" unless otherwise noted. Joints shall not vary more than 1/16" in adjacent courses within two feet and shall not be less than 5/16" thick and not greater than 7/16" thick.

4. Constructed masonry shall comply with the tolerances specified in ACI 530.1, article 3.3.

C. Reinforcing Steel:

1. Reinforcing steel shall not be permitted to rust where there is danger of staining exposed surfaces of adjacent concrete.

2. The Contractor shall replace rust-stained concrete and/or masonry at his expense.

D. Examination Criteria: All examinations, selections and approval shall be for the purpose of achieving a final installation of the unit masonry with the greatest

possible uniformity of appearance and structural integrity based on the following criteria:

1. Testing and quality assurance measures outlined in this specification.

2. Color and texture shall match the approved mock-up for range, random variation and finish. The quality of construction shall match the approved mock-up.

3. Conformance to the contract documents and approved shop drawings within specified dimensions and tolerances.

4. Only one source for concrete masonry units shall be used throughout the work.

5. Other criteria as specified in this Section.

6. Non-conformance with any or all of the above criteria shall be grounds for removal and replacement of the work without expense to the Owner. The Architect shall determine if the work complies with the above criteria.

E. The Owner's Testing Agency will:

1. Collect plant certificates from the Contractor for concrete masonry units, stating that all units have been properly cured before shipment and that they conform to all the requirements of these specifications. All masonry units shipped without certification will be rejected.

2. Field test masonry unit moisture content prior to block installation. See Section 3.07, Field Quality Assurance.

3. Submit material test reports indicating and interpreting test results relative to compliance with the tests described in this Section and Section 3.7 Field Quality Assurance.

1.4 SUBMITTALS

A. Manufacturer's literature: Submit manufacturer's literature describing products, including mix designs, history of compression tests, and mixing requirements as they apply to each different masonry unit, accessory and other manufactured product to be used in the unit masonry construction. Literature shall include, but not be limited to, preformed rubber control joints and all additives.

B. Certificates:

1. Submit material certificates for the following signed by the manufacturer and the Contractor certifying that each material complies with requirements designated.

a) Each material and grade of reinforcing bars. See Section 03 20 00, Concrete Reinforcing.

b) Each type and size of anchors, inserts, ties and accessories.

2. The Contractor shall submit a certificate of compliance with the standards designated.

3. Submit plant certificates for all concrete masonry units to the Owner's Testing Agency and Architect, stating that all units have been properly cured before shipment and that they conform to all requirements of these specifications, including but not limited to, requirements for moisture content per ASTM C90.

C. Mix Designs: Submit mix designs for mortar and grout where the proportions do not comply with ASTM C270 Table 1 for mortar and ASTM C476 Table 1 for grout. Mix designs shall include a history of compression tests that substantiate the compressive strength of the mix in accordance with CBC section 19052. Submit the manufacturer's literature for grout admixtures. Where additives are to be added at the jobsite, the amount shall be stated on the mix design, along with revised slump range because of the additive.

D. Unit Samples: Submit sample concrete masonry units in each color and texture combination specified

E. Samples: Submit samples of all accessories embedded in masonry.

F. Mill Test: Submit mill test reports for all reinforcing steel.

G. Extreme Weather Procedures: Submit cold-weather and hot-weather construction procedures evidencing compliance with requirements specified in ACI 530.1, CBC, and these specifications.

H. Shop Drawings: Coordination and shop drawings for all concrete masonry unit walls. Drawings shall consist of elevations and sections indicating materials and assembly, color surface finish, courses and reinforcing. Shop drawings shall meet the following requirements:

1. The shop drawings shall illustrate detailing, fabrication, bending and placement of unit masonry reinforcing bars. Comply with ACI 315 showing bar schedules, stirrup spacing, diagrams of bent bars and arrangements of masonry reinforcement. The shop drawings shall also indicate the location of all conduit, plumbing and other items embedded in unit masonry walls and coordinate this work with the placement of the unity masonry reinforcement.

2. All shop drawings shall be drawn to scale.

I. Mock-Up: Prior to installing concrete masonry units, construct the following out-of-sequence mock-up for each form of construction and finish required to demonstrate aesthetic effects and qualities of materials and installation. Build mock-up to comply with the following requirements:

1. Submit shop drawings of the mock-up showing plan and elevation, mock

up wall footing and lateral bracing.

2. Locate on site in the location and size as directed by the Architect.

3. Notify the Architect 7 days in advance of the dates and times when mock-up will be constructed.

4. CMU exterior wall corner with installed window and precast sill: The mock-up shall be 8 feet long on one wall and 4 feet long on the other wall. The walls shall meet at an exterior outside corner. Both walls shall be 6'-0" high. The mock-up shall also demonstrate a vertical joint with the glazed curtain wall system, a vertical expansion joint with sealant and a continuous parapet cap over the CMU walls. The window shall be located in the center of the 8' wall of the mock-up. Include required application of masonry sealer or water repellant coating.

5. Demonstrate the proposed maximum range of color and texture variation and the quality of workmanship.

6. Obtain the Architect's approval of mock-ups before beginning installation.

7. Retain and maintain mock-up during construction in an undisturbed condition as a standard for judging the completed work. Remove from the site and properly dispose of mock-ups, with the Architect's approval, at the end of Substantial Completion.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver and store packaged material in original containers with seals unbroken and labels intact until time of use.

B. At the time of delivery to the site, masonry units shall conform to the linear shrinkage requirements of ASTM C90.

C. Unload and inspect each masonry unit carefully and store on raised platform protected from weather so as to meet ASTM C90 requirements at the time of laying and grouting. Reject and remove from the site all material not conforming to specification requirements. In addition to lack of conformance to manufacturers' specifications, masonry units shall be rejected if:

1. The color or texture of the concrete masonry units deviates from the range of colors and textures displayed on approved mock-up, as determined by the Architect.

2. Concrete masonry units are chipped, cracked, or otherwise damaged.

D. Protect cementitious materials against exposure to moisture. Use of cementitious or other materials that have become caked and hardened from absorption of moisture will not be permitted.

E. Prior to installation, unload concrete masonry units onto working pallets as

described in Section 3.02.E.

1.6 JOB CONDITIONS

A. Environmental Conditions:

1. Do not place unit masonry when temperature is below 40 degrees Fahrenheit, unless the Architect approves and the Contractor provides means for preventing damage from freezing before and after placement.

2. Do not place unit masonry when temperature is above 100 degrees Fahrenheit or above 90 degrees Fahrenheit with a wind velocity greater than 8 miles per hour, unless the Architect approves and the Contractor provides means for preventing damage from dryout before and after placement.

B. Protection:

1. Protect surrounding work as required against damage from masonry work.

2. Clean satisfactorily and correct damage to surrounding work resulting from masonry work.

3. The contractor shall take all means and precautions necessary to protect masonry units from moisture absorption during shipping, storage on site, placement prior to grouting of wall, during wall construction until the masonry wall is completed and water repellant coating is applied.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Hollow Load-Bearing Concrete Masonry Units: As manufactured by Basalite, Calstone, Angelus Block or approved equal. Light weight (105 pcf) open end type concrete block size 8 x 8 x 16-inches or 12 x 8 x 16-inches, conforming to ASTM C90, (0.065 maximum allowable linear shrinkage). Provide compressive strength as required by CBC Table 2105.2.2.1.2 for the specified compressive strength of masonry and type of mortar indicated on drawings.

1.

B. Portland Cement: ASTM C150, Type II.

C. Aggregates:

1. For Mortar: ASTM C144.

2. For Grout: ASTM C404.

D. Hydrated Lime; ASTM C207, Type S.

E. Quick Lime: ASTM C5.

F. Reinforcing Bars: Comply with the requirements of Section 03 20 00, Concrete Reinforcing.

G. Water: Clean and potable, free from impurities detrimental to mortar and grout.

H. Control Joints: Preformed rubber in profiles required or shown. Same as Sonneborn-Contech's "Masonry Control Joints"; Dur-O-Wal National Inc.'s "Rapid Control Joint"; or equal product substituted per Section 01630.

I. Mortar Coloring: Mineral oxide type.

J. Additives and Admixtures: Required in all grout to reduce early water loss to the masonry units and produce expansive action in the plastic grout to offset the initial shrinkage and promote bonding of grout to the interior masonry unit surfaces. Use Grout Aid by Sika Corporation or approved equal. Obtain approval of admixture by Architect, Structural Engineer and Owner's Testing Agency.

K. Water Repellant Coating: As specified in Section 07180, Water Repellant Coating.

2.2 FABRICATION

A. Concrete Masonry Units: Blocks shall have been air cured for not less than 28 days.

B. Reinforcement:

1. Shop-fabricate to comply with Drawings.

2. Conform to requirements of ACI 315 where specific details are not shown or where Drawings and Specifications are not more demanding.

2.3 MIXES AND MIXING

A. Mortar:

1. Conform to ASTM C270, Type S or M.

2. Mix in batch mechanical mixer permitting accurate control of water amounts. Site mixing of mortar shall not be permitted without review and acceptance of Contractor's procedure by the Owner's Testing Agency and the Structural Engineer.

a) Place approximately half of the required water and sand into the mixer while turning.

b) Add cement and remainder of the sand and water into mixer in that order and mix materials for at least three minutes with minimum of water to produce workable consistency.

c) Add lime and continue mixing as long as required to secure a uniform mass.

d) Total mixing time may not be less than 3 minutes or more than 10 minutes.

3. Use and place mortar in final position within 2½ hours after mixing. Mortar that have stiffened as a result of evaporation of water may be re-tempered with water as frequently as required to restore required consistency during this time period.

B. Grout:

1. Compressive Strength: Minimum 2,000 psi after 28 days.

2. Slump: 9- to 10-inches. Use sufficient water to make a workable mix that will flow into all joints of the masonry units with typical rates of absorption for ASTM C90. The slump of the grout should be approximately 9 to 10 inches depending on temperature and humidity conditions.

3. Proportions by Volume: Shall be per ASTM C476 Table 1. Alternately, the contractor shall submit a grout mix design with a history of compression tests that substantiate the compressive strength of the mix in accordance with CBC section 1905~~A~~.2.

4. Use grout aid in all grout to reduce early water loss to the masonry units and produce an expansive action in the grout sufficient to offset initial shrinkage. Mix grout admixture in accordance with the manufacturer's recommendations and requirements.

5. Grout to comply with ASTM C476 and CBC sections 2103.12.1, 2103.12.2, and 2103.12.3 for materials and mix requirements.

6. Site mixing of grout shall not be permitted without review and acceptance by the Structural Engineer.

C. General Mixing Requirements:

1. Measure materials accurately.

2. Shovel measurements will not be permitted.

3. Use mechanical mixer of at least one-sack capacity.

4. Completely empty drum before charging succeeding batch of materials.

5. Exercise extreme care in measuring ingredients for partial batches.

2.4 SOURCE QUALITY CONTROL

A. The Owner's Testing Agency will:

1. Collect mill test reports for reinforcements under Section 1.04.

2. Take samples of reinforcement and test per Specification 03 20 00, Section 1.03.D.

3. Sample and test concrete masonry units as required by the Unit Strength Method in conformance to CBC 2105.2.2.1.2, unless prism testing is performed in accordance with Section 3.07.C. Test for compressive strength, unit weight, absorption and moisture content in accordance with ASTM C140.

4. Test for moisture content and drying shrinkage in accordance with ASTM C426.

5. Take and test Portland cement grab sample per Section 03 30 00, 1.9.E.1.d.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine areas to receive masonry and verify the following:

1. Foundation surface is level to permit bed joint within range of 1/4 to 1 1/4 inch.

2. Edge is true to line to permit projection of masonry to less than 1/4-inch.

3. Projecting dowels are free from loose scale, dirt, concrete, or other bond-inhibiting substances and properly located.

B. Do not begin before unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean concrete surfaces to receive masonry.

B. Remove laitance or other foreign material lodged in surface by sandblasting or other means as required.

C. Ensure masonry units are clean and free from dust, dirt, or other foreign materials before laying.

D. Roughen concrete below walls to expose aggregate; remove loose particles and in hot weather, dampen concrete surfaces before laying blocks. Contact surfaces of all foundations and floors that are to receive masonry work are to be mechanically roughened to 1/4” amplitude.

E. Ensure random color variations in the installation of CMU. Unload from three delivered pallets onto a “working” pallet to be used for construction. Alternate among pallets when unloading to ensure a mix of CMU on the working pallet.

3.3 REINFORCEMENT

A. Place bars where noted in accordance with ACI 315, ACI 530 section 1.15, and ACI 530.1 section 3.4. Do not disturb after start of masonry placement.

B. All horizontal reinforcement shall be laid in bond beam units.

C. Minimum clearance between bar and CMU is ½-inch or one bar diameter, whichever is greater. Minimum clearance between parallel bars is 1-inch or one bar diameter, whichever is greater. Minimum clearance between vertical bars in a column or pilaster is 1½ -inch or one and one half bar diameters, whichever is greater.

D. Horizontal and vertical reinforcing shall be held in position by wire positioners or spacing devices near ends and at intervals not to exceed 200 bar diameters, and as required to prevent displacement by construction loads or placement of grout beyond the tolerances allowed by ACI 530.1 section 3.4B, item 8.

3.4 PLACEMENT

A. General Requirements:

1. Comply with CBC Section 2104.5.1.2.

2. Ensure masonry units are sound, clean and free of cracking, chipping and broken edges at time of placement.

3. Accurately cut and fit units as required to accommodate other work using masonry saws.

4. Lay masonry units plumb, true to line, with level courses accurately placed.

5. Adjust unit to final position while mortar is soft and plastic.

6. Align vertical cells accurately.

7. Remove units disturbed after stiffening of mortar, clean joints, and relay unit with fresh mortar.

8. In hot weather, moisten contact surfaces of the masonry units to receive mortar immediately before laying to prevent excessive drying of mortar.

9. Do not lay up one tier of wall more than 16-inches ahead of other tier.

10. Where necessary to stop longitudinal run, rack back one-half block length in each course.

11. Do not attach construction supports to walls, except where permitted by the Architect.

12. Install anchors, bolts, and other embedded items accurately as work progresses and prior to grouting.

13. Masonry installer and reinforcing steel installer shall meet and coordinate placement of reinforcing steel prior to placement of concrete or grout.

B. Joints:

1. Fill joints to thickness noted: Ensure full coverage of face shells in both horizontal and vertical joints and on webs.

2. Tool joints as specified on the drawings and achieve solid, smooth, watertight, compacted joints.

3. Joints Exposed to Weather: Point with pointing tools making solid, smooth, watertight joint well bonded to masonry at edges.

4. Immediately fill holes made by line pin with mortar when pin is withdrawn.

5. Remove surplus mortar from joints.

C. Cold Weather Requirements:

1. When daily temperature is below 40 degrees F., ensure reinforcing, masonry units, etc., contacting mortar, and grout are free of frost. Comply with CBC section 2104.3 and ACI 530.1 article 1.8C for cold weather requirements.

2. Protect all mortar and grout from freezing for at least 48 hours after installation whenever temperature falls below 40 degrees F.

3. Maintain mortar and grout at temperature no lower than 50 degrees F., while being used and until installed.

4. In freezing or near freezing weather, provide equipment of adequate size for heating of mortar and grout.

5. Do not add water to mix at temperature greater than 140 degrees F.

D. Hot Weather Requirements:

1. Implement the requirements of approved Hot Weather construction procedures when ambient air temperature exceeds 100 degrees F or 90 degrees F with a wind velocity greater than 8 mph. Comply with CBC section 2104.4 and ACI 530.1 article 1.8D for hot weather requirements

E. Protection:

1. Protect face materials against staining.

2. Remove misplaced grout or mortar immediately.

3. Protect sills, ledges, offsets, and similar items from mortar drippings or other damage during construction.

F. Requirements for Walls to be Grouted by High-Lift Method:

1. Lay up walls full story prior to grouting. Brace walls adequately to resist wind lateral and other forces.

2. Build vertical grout barriers or dam of solid masonry across grout space at no more than 25-feet on centers to control horizontal flow of grout.

3. Provide cleanouts by leaving out every other unit in bottom course; seal after inspection and before grouting. Face shell plugs shall have a 24 hour cure time and be adequately braced to resist grout pressure.

4. During laying up, remove mortar fins and other foreign matter from grout space with stick and compressed air.

5. Grout shall be a high slump workable mix placed by pumping.

6. Use mechanical vibrators for consolidation.

7. Grout is to be reconsolidated after it has taken on a plastic consistency but prior to taking on initial set.

8. A “pour” is considered as the entire height of grout fill placed in one day and is composed of a number of successive placed grout lifts. A “lift” is the layer of grout placed in a single continuous operation.

9. Maximum height of pour will be twelve feet for eight inch walls, sixteen feet for twelve inch walls.

G. Concrete Masonry Units:

1. Bond: Running bond, unless specifically noted otherwise.

2. Joint Thickness: 3/8-inch, both vertically and horizontally.

3. Joint Treatment:

a) Where exposed, all mortar joints shall be tooled joints.

b) Where concealed, cut off mortar flush with face of work using trowel.

4. Use double open ended beam units to the extent practical. At no time should blocks with closed ends be placed back to back. Use proper units to provide for windows, doors, bond beams, lintels, pilaster, etc., in order to minimize cutting.

5. Do not wet units.

6. Align vertical cells to provide continuous, unobstructed opening for grouting.

7. Corners: Provide standard masonry bond by overlapping units.

3.5 GROUTING

A. General Requirements:

1. Use high-lift or low-lift grouting, at the Contractor's option pending Enforcement Agency official approval. Do not pour grout until mortar has set sufficiently such that grouting will not cause movement in the mortar joints or masonry units. Grout walls as soon as possible after mortar has cured.

2. Grout all cells of concrete block.

3. Ensure grout flows into voids and completely surrounds reinforcing steel.

4. Stop grout approximately 1-1/2 inches below top of last course (1/2" at bond beams with horizontal steel), except at top course, bring grout flush with top of block.

5. Grout from inside face of masonry wherever possible.

6. Where necessary to stop longitudinal run, provide suitable dam to retain grout in place.

7. Do not wet down grout spaces prior to grouting.

B. Low-Lift Grouting:

1. Pour grout to a maximum height of 4-feet, stopping 1-1/2-inches below top of unit except at bond beam units with horizontal steel the grout shall be stopped 1/2-inch below top of unit.

2. Delay 3 to 5 minutes allowing the excess of water to be absorbed by the masonry unit, then consolidate by vibrating.

3. Layup and grout next 4-feet of wall height.

C. High Lift Grouting:

1. Ensure cleanout has been sealed before grouting.

2. Pour first lift to a depth not in excess of 4 feet, with a waiting period between subsequent lifts of thirty to sixty minutes, sufficient to permit grout to become plastic but not set.

3. Place the first lift of grout to a uniform height, wait 3 to 5 minutes, and mechanically vibrate thoroughly to fill all voids. Subsequent lifts should

be poured and alternate cells vibrated twelve inches to eighteen inches into the preceding lift.

4. Complete pour in sequence with other lifts not in excess of 4 feet.

5. If grout pour is 6-feet or less, it may be placed in one lift. If total pour exceeds 6-feet, the grout shall be placed in 4-foot lifts.

6. Grouting operations shall be conducted such that pours are limited to successive lifts which can be placed within one hour of the preceding lift.

7. Reconsolidate the top lift after the required waiting period to fill any space left by settlement and shrinkage.

8. Repeat the waiting, pouring, and reconsolidation steps until the top of the day's pour is reached.

9. Construction Joints: In the high lift grouting method, intermediate horizontal construction joints are not permitted. Plan the work for one continuous pour of grout to the top of the wall in four foot layers or lifts in the same working day. Should a blow-out, equipment breakdown, or any other emergency occur, cease the grouting operation. An alternate procedure may be used with the approval of the Architect or Structural Engineer.

10. The section of wall to be grouted in any one pour is limited to a length in which successive lifts can be placed within one hour of the preceding lifts. Vertical control barriers shall be placed between pour sections in locations approved by the Architect or Structural Engineer.

## 3.6 POINTING AND CLEANING

A. Point holes or defective mortar joints upon completion of work; where necessary, cut out and re-point defective joints.

B. At end of work day, fiber-brush new surfaces to remove mortar splotches, clean with mild detergent or enzymes, and rinse with clean water.

C. Do not use acid solution to remove green stain or efflorescence resulting from salts; follow recommendations of manufacturer for removal of such stains.

D. Upon completion of work, remove from site surplus materials, rubbish, and debris resulting from this work.

## 3.7 FIELD QUALITY ASSURANCE

A. Special Inspection: The Owner shall employ an approved, qualified masonry inspector to perform masonry inspection per CBC 1701 and 1704. Acceptance by a State or Municipality having a program of examining and certifying masonry inspectors will be considered adequate qualifications. The masonry inspector shall provide inspection of masonry construction in accordance with CBC 1704.5

and perform the following duties:

1. Review plans and specifications and meet with the Contractor to discuss requirements before work commences.

2. Before masonry work commences, meet with the Contractor and the Architect in a joint meeting to review the requirements for surveillance and quality control of the masonry work.

3. Check brand and type of cement, lime (if used) and source of sand.

4. Inspect the foundation or slab to ascertain that it is clean and ready to receive units.

5. Check reinforcing steel dowels for straightness, proper alignment, spacing, size and length.

6. Observe manner in which units are laid up to ensure that joints are full of mortar and kept tight during work. Inspect cells to assure that fins will not interfere with grouting or foaming. Instruct masons to keep cells clean of mortar droppings and inspect to determine compliance.

7. Observe placing of grout continuously.

8. Perform or supervise performance of required sampling and field testing as specified.

9. Keep complete record of inspection of work. Report daily to the Owner's Representative the progress of the masonry inspection.

B. Mortar and Grout Testing: The Owner's Testing Agency shall take and test mortar and grout samples as follows:

1. Take test samples of mortar and grout on each of three consecutive working days at the start of the project.

2. Take test samples at intervals not exceeding one week for the remainder of the project.

3. Take additional test samples whenever a change in materials or job conditions occurs.

4. Tests shall verify that the mortar and grout comply with their respective specified compressive strengths

C. Prism Test: At the contractor's option, masonry prism testing may be performed in lieu of mortar and grout testing as follows:

1. The Owner's Testing Agency will perform prism testing in accordance with CBC section 2105.2.2.2. Prior to construction, a set of 5 masonry prisms shall be built and tested using materials taken from those specified

for this project. During construction test 3 prisms for each 5,000 sq. ft. of wall area and as additionally required by the Architect.

**END OF SECTION**