

**World Plaza
Relocalización de Compactadora de Basura**

DIVISION - 4 MASONRY

SECTION - 04 20 00 CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 DESCRIPTION

- a. The work of this section shall be performed in accordance with the General Conditions of the Contract, which are made a part hereof by reference.
- b. This section consists of furnishing all labor, materials and equipment required for the installation of concrete masonry units as shown on drawings and specified herein.
- c. All material and installation performed under this section shall meet or exceed all codes and regulations set forth by the authorities having jurisdiction.

1.2 RELATED WORK

- a. Section 04 10 00: MORTAR AND GROUT.
- b. Section 05 50 00: METAL FABRICATIONS
- c. Section 07 60 00: FLASHING AND SHEET METAL.
- d. Section 07 92 00: SEALANTS AND CAULKING (Sealants and sealant installation).

1.3 SUBMITTALS

- a. Submit in accordance with Section 01 30 00, SUBMITTALS.
- b. Samples:
 - 1. Concrete masonry units, when exposed in finish work.
Anchors, and ties, two of each and strip reinforcing 48 inches long.
Joint reinforcement: One piece of each type of reinforcement 18 inches long, showing at least two cross joints.
- c. Shop Drawings:
 - 1. Special masonry shapes.
 - 2. Drawings, showing reinforcement, applicable dimensions and methods of hanging soffit or lintel masonry and reinforcing masonry for embedment of anchors for hung fixtures.
 - 3. Pre-built masonry panels, calculations, and details of connections showing design and erection prior to construction.

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- d. Certificates:**
 - 1. Certificates signed by manufacturer, including name and address of contractor, project location, and the quantity, and date or dates of shipment of delivery to which certificate applies.
 - 2. Indicating that the following items meet specification requirements:
 - a. Solid and load-bearing concrete masonry units, including fire-resistant rated units, stating grade and type classification.
 - 3. Testing laboratory facilities and qualifications of its principals and key personnel to perform tests specified.

- e. Manufacturer's Literature and Data:**
 - 1. Anchors, ties, and reinforcement.
 - 2. Shear keys.
 - 3. Reinforcing bars.

1.4 SAMPLE PANEL

- a.** Sample panel shall include reinforcing, ties and anchors.
- b.** Use sample panels approved by Architect for standard of workmanship of new masonry work.
- c.** Use sample panel to test cleaning methods.

1.5 PRODUCT HANDLING AND DELIVERY

- a.** All materials must be delivered and stored at the project site ensuring that all applicable environmental requirements are adequate.
- b.** Concrete masonry units delivered to the project site shall be neatly piled and protected from the weather and soil. Storage piles, stacks, or bins shall be protected against rewetting prior to installation by storing in weatherproof sheds or upon platforms raised free of the ground and protected by tarpaulin covers. Units that fail to meet moisture content limitation, or which have been rewetted by rain within the preceding seven (7) days will be considered too wet for use.
- c.** All masonry units shall be handled in a manner to prevent undue chipping and breakage. Any units that crack during handling or placing will be rejected and shall be removed from the site.

1.6 GUARANTEE

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- a. Guarantee exterior masonry walls against moisture leaks and subject to terms of "Guaranty" article in Section 01001, GENERAL CONDITIONS, except that guaranty period shall be five years.

1.7 APPLICABLE PUBLICATIONS

- a. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.
- b. American Society for Testing and Materials (ASTM):
 - A82-96 Steel Wire, Plain, for Concrete Reinforcement
 - A615/A615M-96a Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
 - C90-97 Load-Bearing Concrete Masonry Units
 - C612-93 Mineral Fiber Block and Board Thermal Insulation
 - C744-97 Prefaced Concrete and Calcium Silicate Masonry Units.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS

- a. Hollow and solid Load-Bearing Concrete Masonry Units: ASTM C90 Type I.
 - 1. Aggregate: Normal weight.
 - 2. Fire rated units for fire rated partitions.
 - 3. Sizes: Modular
 - 4. When used as a finished surface, use concrete masonry units with uniform fine to medium surface texture unless specified otherwise.
 - 5. Use concrete masonry units exposed in finished work with 1- inch minimum radius rounded vertical exterior corners.
 - 6. Customized units:
 - a. Sound-Absorbing Units:
 - 1) Vertical slots in face to core areas.
 - 2) Acoustical absorption insert: Mineral fiber and metal septum providing unit with NRC rating of 0.70.

2.2 ANCHORS, TIES, AND REINFORCEMENT

- a. Steel Reinforcing Bars: ASTM A615M, deformed bars, grade as shown.
- b. Strip Reinforcement:
 - 1. Form from wire complying with ASTM A82.
 - 2. Galvanized after fabrication.

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3. Width of strip reinforcement 1-5/8 inches less than nominal width of masonry wall or partition.
 4. Cross wires welded to longitudinal wires.
 5. Strip reinforcing at least 10 feet in length.
 6. Strip reinforcing in rolls is not acceptable.
 7. Strip reinforcing that is crimped to form drip is not acceptable.
 8. Maximum spacing of cross wires 16 inches to longitudinal wires.
 9. Ladder Design:
 - a. Longitudinal wires deformed 5/32 inch, 3/16-inch diameter wire.
 - b. Cross-wires 7/64-inch diameter.
 10. Trussed Design:
 - a. Longitudinal and cross wires not less than 9/64 diameter.
 - b. Longitudinal wires deformed.
- c.** Individual ties:
1. Rectangular ties: Form from 3/16 inch diameter galvanized steel rod to a rectangular shape not less than 2 inches wide by sufficient length for ends of ties to extend within 1 inch of each face of wall. Ties that are crimped to form drip are not permitted.
- d.** Adjustable Steel Column Anchor:
1. Two piece anchor consisting of a 6 mm (1/4 inch) diameter steel rod to be welded to steel with offset ends, rod to permit 100 mm (4 inch) vertical adjustment of wire anchor.
 2. Triangular shaped wire anchor 100 mm (4 inches) wide formed from 5 (3/16 inch) diameter galvanized wire, to extend at least 75 mm (3 inches) into joints of masonry.
- e.** Adjustable Steel Beam Anchor:
1. Z or C type steel strap, 1 1/4 inches wide, and 1/8 inch thick.
 2. Flange hook not less than 1 1/2 inches long.
 3. Length to embed in masonry not less than 2 inches in 4 inch nominal thick masonry and 4 inches in thicker masonry.
 4. Bend masonry end not less than 1 1/2 inches.
- f.** Ridge Wall Anchors:
1. Form from galvanized steel not less than 1 inch wide by 3/16 inch thick by 24 inches long, plus 2 inch bends.
 2. Other lengths as shown.

2.3 PREFORMED COMPRESSIBLE JOINT FILLER

- a.** Thickness and depth to fill the joint as specified.
- b.** Closed Cell Neoprene: ASTM D1056, Type 2, Class A, Grade 1, B2F1.

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- c. Non-Combustible Type: ASTM C612, Class 5, 1800 degrees F.

2.4 ACCESSORIES

- a. Masonry Cleaner:

- 1. Detergent type cleaner selected for each type masonry used.
- 2. Acid cleaners are not acceptable.

- b. Fasteners:

- 1. Concrete: FS FF-P-395, Types II, III, Class 1, or I Style, PC, power actuated pins.
- 2. Concrete Nails: FS-N-105, Type II, Style II, 3/4-inch minimum length.
- 3. Masonry Nails: FS FF-N-105, Type II, Style 17, 3/4-inch minimum length.
Screws: FS-FF-S-107, Type A, AB, SF thread forming or cutting.

PART 3 - EXECUTION

3.1 JOB CONDITIONS

- a. Inspect foundations and all surfaces supporting concrete masonry work to assure that they are at proper grades and elevations and free of all dirt, oil and other foreign matter or conditions that impede bonding.
- b. Protection:
 - 1. Cover tops of walls with non-staining waterproof covering, when work is not in progress. Secure to prevent wind blow off.
 - 2. On new work protect base of wall from mud, dirt, mortar droppings, and other materials that will stain face, until final landscaping or other site work is completed.

3.2 CONSTRUCTION TOLERANCES

- a. Lay masonry units plumb, level and true to line within the tolerances specified.
- b. Maximum variation from plumb:
 - 1. In 10 feet - 1/4 inch.
 - 2. In 20 feet - 3/8 inch.
 - 3. In 40 feet or more - 1/2 inch.
- c. Maximum variation from level:
 - 1. In any bay or up to 20 feet - 1/4 inch.

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2. In 40 feet or more - 1/2 inch.
- d.** Maximum variation from linear building lines:
1. In any bay or up to 20 feet - 1/2 inch.
 2. In 40 feet or more - 3/4 inch.
- e.** Maximum variation in cross-sectional dimensions of columns and thickness of walls from dimensions shown:
1. Minus 1/4 inch.
 2. Plus 1/2 inch.
- f.** Maximum variation in prepared opening dimensions:
1. Accurate to minus 0 inch.
 2. Plus 1/4 inch.

3.3 INSTALLATION GENERAL

- a.** Keep finish work free from mortar smears or spatters, and leave neat and clean.
- b.** Anchor masonry as indicated on drawings and as specified in Paragraph, ANCHORAGE.
- c.** Wall Openings:
1. Fill hollow metal frames built into masonry walls and partitions solid with mortar as laying of masonry progresses.
 2. If items are not available when walls are built, prepare openings for subsequent installation.
 3. Tooling Joints:
 - a. Do not tool until mortar has stiffened enough to retain thumbprint when thumb is pressed against mortar.
 - b. Tool while mortar is soft enough to be compressed into joints and not raked out.
 - c. Tool exposed interior joints in finish work concave unless specified otherwise.
- d.** Partition Height:
1. Extend partitions at least 4 inches above suspended ceiling or to overhead construction where no ceiling occurs.
 2. Extend following partitions to overhead construction.
 - a. Where noted smoke partitions, FHP (full height partition), and FP (fire partition) and smoke partitions (SP) on drawings.

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- b. Both walls at expansion joints.
 - c. Corridor walls.
 - d. Walls at stairway and stair halls, trash chute shafts, and other vertical shafts.
 - e. Walls at refrigerator space.
 - f. Reinforced masonry partitions
3. Extend finish masonry partitions at least four-inches above suspended ceiling and continue with concrete masonry units to overhead construction:
- e. Lintels:**
1. Lintels are not required for openings less than 3 feet, 4 inches wide that have hollow metal frames.
 2. Openings 3 feet 5 inches wide to 5 feet 4 inches) wide with no structural steel lintel or frames, require a lintel formed of concrete masonry lintel or bond beam units filled with 3000 psi concrete and reinforced with 1-#5 rod top and bottom for each 4 inches of nominal thickness unless shown otherwise.
 3. Precast lintels of 3000 psi concrete, of same thickness as partition, and with one Number 5 deformed bar top and bottom for each 4 inches of nominal thickness, may be used in lieu of reinforced CMU masonry lintels.
 4. Doors having overhead concealed door closers require a steel lintel, and a pocket for closer box.
 5. Length for minimum bearing of 8 inches at ends.
 6. Build masonry openings or arches over wood or metal centering and supports when steel lintels are not used.
- f. Wall, Furring, and Partition Units:**
1. Lay out field units to provide for running bonding of walls and partitions, with vertical joints in second course centering on first course units unless specified otherwise.
 2. Align head joints of alternate vertical courses.
 3. At sides of openings, balance head joints in each course on vertical centerlines of openings.
 4. Use no piece shorter than 4 inches long.
 5. On interior partitions provide a 1/4 inch open joint for caulking between existing construction, exterior walls, concrete work, and abutting masonry partitions.
 6. Use not less than 4 inches nominal thick masonry for free standing furring unless shown otherwise.
 7. Do not abut existing plastered surfaces except suspended ceilings with new masonry partitions.
- g. Use not less than 4 inches nominal thick masonry for fireproofing steel columns unless shown otherwise.**

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- h.** Before connecting new masonry with previously laid, remove loosened masonry or mortar, and clean and wet work in place as specified under wetting.
- i.** When new masonry partitions start on existing floors, machine cut existing floor finish material down to concrete surface.
- j.** Structural Steel Encased in Masonry:
 - 1. Where structural steel is encased in masonry and the voids between the steel and masonry are filled with mortar, provide a minimum one (1) inch mortar free expansion space between the masonry and the steel by applying a box board material to the steel before the masonry is laid.
 - 2. Do not place spacing material where steel is bearing on masonry or masonry is bearing on steel.

3.4 ANCHORAGE

- a.** Anchorage of Abutting Masonry:
 - 1. Anchor interior 4-inch thick masonry partitions to exterior masonry walls with wall ties. Space ties at 2-foot maximum vertical intervals. Extend ties 4 inches minimum into masonry.
 - 2. Anchor interior masonry bearing walls or interior masonry partitions over 4 inches thick to masonry walls with rigid wall anchors spaced at 16-inch maximum vertical intervals.
 - 3. Anchor abutting masonry walls and partitions to concrete with dovetail anchors. Install dovetail slots vertically in concrete at centerline of abutting wall or partition. Locate dovetail anchors at 16-inch maximum vertical intervals. Secure anchors to existing wall with two-3/8 inch by 3-inch expansion bolts or two power-driven fasteners.
 - 4. Anchor abutting interior masonry partitions to existing concrete and existing masonry construction, with corrugated wall ties. Extend ties at least 4 inches into joints of new masonry. Fastened to existing concrete and masonry construction, with powder actuated drive pins, nail or other means that provides rigid anchorage. Install anchors at sixteen (16) inch maximum vertical intervals.
- b.** Masonry Furring:
 - 1. Anchor masonry furring less than 4 inches nominal thickness to masonry walls or to concrete with corrugated wall ties or dovetail anchors.
 - 2. Space not over 2 feet on centers in both directions.
- c.** Anchorage to Steel Beams or Columns:
 - 1. Use adjustable beam anchors on each flange.

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intervals, and place wire ties in masonry courses at 16 inches maximum vertically.

3.5 REINFORCEMENT

- a. Steel Reinforcing Bars:
 - 1. Install in cells of hollow masonry units where required for vertical reinforcement and in bond beam units for lintels and bond beam horizontal reinforcement.
 - 2. Use grade 40 bars if not specified otherwise.
 - a. Bond Beams:
 - 1) Form Bond beams of load-bearing concrete masonry units filled with 3000 psi concrete, and reinforced with 2-#5 steel rods top and bottom unless shown otherwise.
 - 2) Brake bond beams at expansion joints and where shown at control joints.
 - b. Stack Bond:
 - 1) Locate reinforcement in vertical and horizontal joints as shown.
 - 2) Anchor vertical reinforcement in floor slab, and hold in place.
 - 3) Provide temporary bracing until masonry is completed.

3.6 BUILDING EXPANSION AND SEISMIC JOINTS

- a. Keep joint free of mortar. Remove mortar and other debris.
- b. Install non-combustible, compressible type joint filler to fill space completely except where sealant is shown on joints in exposed finish work.
- c. Where joints are on exposed faces, provide depth for backer rod and sealant as specified in Section, SEALANTS AND CAULKING, unless shown otherwise.

3.8 ISOLATION SEAL

- a. Where full height walls or partitions lie parallel or perpendicular to and under structural beams or shelf angles, provide a separation between walls or partitions and bottom of beams or shelf angles not less than the masonry joint thickness unless shown otherwise.
- b. Insert in the separation, a continuous full width strip of non-combustible type compressible joint filler.

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- c. Where exposed in finish work, cut back filler material in the joint enough to allow for the joint to be filled with sealant material specified in Section, SEALANTS AND CAULKING.

3.9 GROUTING

a. Placing:

1. Place grout by hand bucket, concrete hopper, or grout pump.
2. Consolidate each lift of grout after free water has disappeared but before plasticity is lost.
3. Do not slush with mortar or use mortar with grout.
4. Interruptions:
 - a. When grouting must be stopped for more than an hour, top off grout 1-1/2 inch below top of last masonry course.
 - b. Grout from dam to dam on high lift method.
 - c. A longitudinal run of masonry may be stopped off only by raking back one-half a masonry unit length in each course and stopping grout 4 inches back of rake on low lift method.

b. Low Lift Method:

1. Consolidate by puddling with a grout stick during and immediately after placing.
2. Grout the cores of concrete masonry units containing the reinforcing bars solid as the masonry work progresses.

c. High Lift Method:

1. Do not pour grout until masonry wall has properly cured a minimum of 72 hours.
2. Place grout in one continuous operation.
3. Complete in one day with no interruptions greater than one-hour sections of a wall between control barriers.
4. When vibrating succeeding lifts, extend vibrator 12 to 18 inches into the preceding lift to close any shrinkage cracks or separation from the masonry units.

3.10 CLEANING AND REPAIR

a. General:

1. Clean exposed masonry surfaces on completion.
2. Protect adjoining construction materials and landscaping during cleaning operations.

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3. Cut out defective exposed new joints to depth of approximately 3/4 inch and re-point.
 4. Remove mortar droppings and other foreign substances from wall surfaces.
- b.** Concrete Masonry Units:
1. Immediately following setting, brush exposed surfaces free of mortar or other foreign matter.
 2. Allow mud to dry before brushing.
- c.** Remove all equipment, scaffolding and other trade tools and utilities, leaving the work areas clean, free of obstructions and ready for the work of other trades of for the uses intended.

END OF SECTION