

PERMANENT CHANGES TO PROJECT DATED SPECIAL PROVISIONS

REVISION OF SECTION 607 CONCRETE MASONRY SOUND BARRIER

<u>DATE</u>	<u>AUTHOR</u>	<u>DESCRIPTION OF CHANGE</u>
1999	DLD	Created
12/15/1999	M.Nord	Added Log Sheet. Converted to standard template.
04.11.2023	M. Kayen	Revisions to make spec online ADA-compliant. 5.22.23 Additional ADA.

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Revise Section 607 of the Standard Specifications for this project to include the following:

DESCRIPTION

This work consists of constructing a Concrete Masonry Sound Barrier in accordance with the plans and specifications.

MATERIALS

- (a) *General.* References to the Uniform Building Code (UBC) shall refer to the 1997 Edition. Laboratory technicians involved in masonry testing shall be certified by the National Concrete Masonry Association as a "Certified Laboratory Technician for Concrete Masonry". Technicians shall possess records of certification at all times when on site, during sampling of materials, preparation of test specimens, and while conducting tests.
- (b) *Concrete Masonry Units.* Concrete masonry units (CMU) shall conform to the requirements of ASTM C 90 and the following:
1. Provide units that are Type II (non-moisture controlled), hollow, and normal weight.
 2. The compressive strength of CMU'S shall be as defined in ASTM C 90 or greater as required to attain f'm.
 3. Units shall be integrally and uniformly colored as defined in the plans.
 4. Units shall be the size and surface texture defined in the plans.
 5. Provide an approved water repellent additive in accordance with the manufacturer's recommendations.
 6. The Contractor shall sample and test CMUs in accordance with ASTM C 140 and provide the Engineer with complete test reports as outlined in Section 10 of C 140.
- (c) *Mortar.* Mortar for concrete masonry construction shall conform to the requirements of the ASTM C 270 and the following:
1. Provide Type S in accordance with the Proportion Specifications for Portland Cement, lime, and sand. Masonry cement will not be allowed.
 2. Quantities of sand, cement, and lime shall be accurately measured, shovel counts shall not be used.
 3. Mortar shall be integrally and uniformly colored to match the CMU's.
 4. Provide an approved water repellent additive in accordance with the manufacturer's recommendations.

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(d) *Grout.* Grout shall conform to the requirements of UBC Standard 21-19 and the following:

1. A 28 day compressive strength of 2000 psi or greater as required to attain f'm. The Contractor shall sample and test the grout for every 5000 square feet of wall as construction progresses in accordance with the requirements of UBC Standard 21-18. Test reports shall be submitted to the Engineer as outlined in Section 21.1806 of UBC Standard 21-18.
2. Air is not required.
3. Up to 20% by weight of the cement may be an approved fly ash.
4. Fine aggregate shall conform to the requirements of AASHTO M 6 as defined in Section 703.
5. The coarse aggregate shall conform to the requirements of AASHTO M 43, Size 7 or 8, as defined in Section 703 and shall be a minimum of 50% of the total aggregate.
6. Sufficient water (or a combination of water and water reducer) shall be added to the grout to attain a slump of 8 to 10 inches prior to placement.
7. Provide an approved water repellent additive in accordance with the manufacturer's recommendations.

(e) *Prism Testing.* The Contractor is responsible for providing a concrete masonry assemblage (a composite of CMU's, mortar, and grout) with a strength, f'm, of at least 2000 psi. Prism tests shall be conducted by the Contractor prior to starting and during construction to verify design compressive strength. Compressive strength of prisms shall be based on tests at 28 days and each set of prisms shall equal or exceed f'm. Compressive strength at seven days or three days may be used provided a relationship between seven-day and three-day and 28-day strength has been established for the project prior to the start of construction. Verification by masonry prism testing shall be as follows:

1. A set of five masonry prisms (grouted solid) shall be built and tested in accordance with U.B.C. Standard 21-17 prior to the start of construction. Materials used for the construction of the prisms shall be taken from those specified to be used for the project.
2. A set of three prisms (grouted solid) shall be built and tested during construction in accordance with UBC Standard 21-17 for each 5000 square feet of wall area, but not less than one set of three masonry prisms for the project. Prisms shall be constructed from materials randomly selected on the project site.

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3. Test reports shall be submitted to the Engineer as outlined in Section 21.1708 of UBC Standard 21-17.
 4. Those portions of the wall represented by tested prisms that do not attain f'm shall be removed and replaced with a wall that meets the requirements of this specification at the Contractors expense.
- (f) *Masonry Reinforcement.* Reinforcing Steel (Deformed Bars) shall conform to the requirements of Section 602 and shall be Grade 60.

Joint reinforcement shall be provided every other coarse or as shown on the plans and shall be hot dipped galvanized in accordance with ASTM A 153-Class B-2, ladder type with 9 gage side and cross rods. Lap splices for joint reinforcement shall be a minimum of 6 inches.

- (g) *Concrete Cap.* Reinforcing Steel shall conform to the requirements of Section 602 and shall be Grade 60. Concrete shall conform to the requirements of Section 601 and the following:
1. Concrete shall be Class DT with a minimum cement content of 565 pounds per cubic yard.
 2. Concrete shall be integrally and uniformly colored as defined in the plans.
 3. The concrete cap can be either precast or cast-in-place.
- (h) *Water Repellent.* An approved polymer water repellent shall be provided in all CMU's, mortar, and grout in accordance with the manufacturer's recommendations. The following polymer water repellent additives are approved:
1. Dry-Block by W.R. Grace.
 2. Addiment Block Plus.
- (i) *Control Joints.* Control joint material shall conform to the requirements of ASTM D 2000 2AA-805, ASTM D 1751 or as approved by the Engineer.

CONSTRUCTION REQUIREMENTS

- (a) *General.* Construction of the concrete masonry walls shall conform to the requirements of the Uniform Building Code (UBC) Section 2104 (1997 Edition), the plans and specifications.
- (b) *Sample Approval.* The Engineer shall approve in writing the following before concrete masonry wall construction begins:

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1. Color and texture of concrete masonry units. Four weeks before construction begins, provide the Engineer with two concrete masonry units of each color and texture required on the project.
2. Color of mortar and craftsmanship of concrete masonry construction.

A test panel is required at least three weeks prior to beginning concrete masonry construction. The panel shall represent the color and texture of CMU's, mortar, grout, pre-cast cap, craftsmanship, and finish of the sound barrier to be used throughout the project. The panel shall be constructed at a location designated by the Engineer and shall represent all materials to be used on the project. The panel shall be a minimum of 4 feet wide by 4 feet high. The Engineer shall be allowed one week to evaluate the acceptability of the panel materials and construction.

The Contractor shall adjust materials and workmanship as required by the Engineer. Concrete masonry construction shall not start until the Engineer has approved the samples in writing.

(c) Craftsmanship.

1. Concrete masonry unit construction shall be plumb and level.
2. CMUs shall be laid in a running (common) bond pattern.
3. All joints shall be concave tooled, except those at fluted CMUs which shall be cut flush. Joints shall be tooled after the excess moisture in the mortar has been absorbed but before plasticity is lost. Mortar fins (resulting from tooling joints) at the interface of the tooled joints and the CMUs shall be removed before the mortar sets. Tooled joints shall be left smooth.
4. Where masonry unit cutting is necessary, all cuts shall be made with a masonry saw to true neat lines.
5. Steel reinforcing shall be securely held in position at the top and bottom of the wall.
6. All cells shall be solidly filled with grout or as designated in the plans. Grout shall be consolidated mechanically to fill the cells of the CMU's and shall be reconsolidated by mechanical vibration after the excess moisture in the grout has been absorbed but before plasticity is lost. Walls shall be grouted full height. (The Contractor is responsible for the stability of the wall during construction.) Cleanouts shall be provided in the bottom course at every vertical bar, and they shall be sealed after cleaning, inspection, tying of the vertical bar, and before grouting.

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Close cleanouts using face shells and mortar matching the texture, color, and finish of the adjacent materials.

7. Remove all mortar and grout spillage from the wall at the end of each working day. After cleaning (Acids such as Muriatic Acid shall not be used.) there shall be no mortar or grout paste on CMUs.

METHOD OF MEASUREMENT

The Concrete Masonry Sound Barrier shall be measured by the number of square feet of one side completed and accepted. Measurement shall be from the top of the grade beam to the top of the concrete cap and along the top of the grade beam.

BASIS OF PAYMENT

The accepted quantities of Concrete Masonry Sound Barrier will be paid for at the contract unit price for the pay item listed below.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Fence Masonry (Sound Barrier)	Square Feet

Payment shall be full compensation for all materials, labor, equipment, and testing necessary to complete the Concrete Masonry Sound Barrier and shall include but is not limited to:

1. Concrete cap.
2. Reinforcing steel and joint reinforcement.
3. Control joint material.