

ITEM 610 CELLULAR RETAINING WALLS

- 610.01 Description**
- 610.02 Approval by City**
- 610.03 Materials**
- 610.04 Manufactured Units**
- 610.05 Excavation**
- 610.06 Backfill**
- 610.07 Wall Construction**
- 610.08 Method of Measurement**
- 610.09 Basis of Payment**

610.01 Description. This work consists of constructing retaining walls composed of a series of cells formed by assembling precast reinforced concrete or galvanized metal units to form stable walls.

Concrete cellular walls consist of a series of rectangular or triangular cells formed by building up tiers of precast reinforced concrete units.

Metal cellular retaining walls consists of pairs of columns, one column in the plane of the front of the wall and the other column in the plane of the rear of the wall. The column pairs are spaced longitudinally with overlapping S-shaped facing and rear members, and transversely with overlapping U-shaped members.

610.02 Approval by City. Submit to the Engineer for acceptance 15 days before the work is to begin, drawings of the units to be furnished, together with a proposed erection plan and schedule of operations. Only submit information for walls produced by manufacturers whose type of wall, and design of units comprising same, has been in successful commercial use for a period of at least 3 years.

610.03 Materials. Furnish manufactured units conforming to:

A. Concrete Cellular Wall. Use concrete conforming to Item 499, Class C. Use reinforcing steel conforming to 509.02.

B. Metal Cellular Wall. Provide units made from galvanized metal sheets. Use base metal conforming to AASHTO M 218. Ensure that both sides of the sheets are galvanized by the hot-dip process. Provide an average spelter coating of not less than 2 ounces per square foot (610 g/m^2) on each side of the sheet and a spelter coating of at least 1.8 ounces per square foot (550 g/m^2) on any $2 \frac{1}{4} \times 2 \frac{1}{2}$ -inch ($57 \times 64 \text{ mm}$) area on each side of double exposed surfaces. Provide finished sheets that are free from injurious defects, such as blisters, flux, and uncoated spots.

Use metal sheets with a minimum thickness of 0.057 inch (1.45 mm), unless otherwise shown on the plans.

Furnish three copies of the manufacturer's "Analysis and Coating Test Certificate" containing the following information covering each project or order on which galvanized metal walls are furnished.

1. Heat or heats used for units.
2. Analysis of each heat.
3. Amount of spelter coating for each heat.

610.04

4. Total units of each size and thickness.
5. Name of Contractor.
6. Name of street, road, or State route number, and section.
7. Project number or state purchase order number.

Send two copies to the Engineer. With each copy of the certificate, include a written statement, signed by a person having legal authority to bind the manufacturer, that the information and test results are correct and that the material complies with all contract requirements.

Furnish 5/8-inch (16 mm) diameter bolts, galvanized according to 711.02 and at least 1 1/4 inches (32 mm) long, measured from the underside of the bolt head.

610.04 Manufactured Units.

A. Concrete Cellular Wall. Cast concrete cellular wall units in substantial, unyielding steel forms. Properly assemble, clean, and oil the forms before placing concrete in the forms. During the placing and setting of the concrete, hold the forms rigidly in place on a smooth and level platform.

Secure the reinforcement to ensure that it remains in the required position while placing concrete.

Vibrate the fresh concrete to fill all space in the form with concrete, to densify the concrete, and to surround the reinforcement. Reject units with segregated areas.

Cure the units by covering with burlap, that is kept wet at least 7 days or by applying steam for at least 24 hours.

The Engineer will reject reinforced concrete units for any of the following reasons:

1. Exposure of the reinforcing.
2. Defects that indicate imperfect mixing, placing, or curing.
3. Fractures and cracks.

B. Metal Cellular Wall. Fabricate galvanized metal cellular wall units so that units of the same nominal size are fully interchangeable. Do not drill, punch, or drift holes to correct manufacturing defects. Replace all units with improperly punched holes.

If possible, maintain a minimum forming radius of 1 inch (25 mm). Hot-dip galvanize all units formed with less than 1-inch (25 mm) radius after forming.

610.05 Excavation. Excavate according to Item 203. Obtain the Engineer's approval that the bearing for the foundation of the walls is firm and to the proper elevation before erecting the wall.

610.06 Backfill. Below the elevation of the proposed ground line at the face of the wall, fill the cells formed by the units with soil as defined in 203.02.R. Above the elevation of the proposed ground line at the face of the wall, fill the cells with material conforming to 203 Granular Material Type B, except that the percent passing the No. 200 (75 μ m) sieve shall not exceed 5 percent.

Place the material in layers that compact to a depth not to exceed 6 inches (150 mm). Compact the material to the density established by the Engineer using approved tampers or compactors. Add water as directed by the Engineer.

Fill the space behind the wall according to 503.08, except as noted below.

Backfill around the wall and in the interior cells, concurrent with wall erection and as close to the wall elevation as allowed by the type of construction.

Do not use rolling equipment directly over a portion of the wall until placing at least 12 inches (0.3 m) of compacted fill.

610.07 Wall Construction. Construct the wall types as follows:

A. Concrete Cellular Wall. Place sills to the required grade and alignment, and support the entire sill length on the foundation material. Do not shim the sill.

Place and interlock the headers perpendicular to the sills and stretches. Use templates to ensure that members are placed in the proper position and with the proper face batter.

Before placing sills, spread two layers of asphalt impregnated paper on all points of contact between the sills and the foundation material to ensure a uniform bedding.

After constructing two tiers of the wall, check and, if necessary, adjust the alignment, grade, and batter of the units, and backfill to this height before adding subsequent units. Complete the remainder of the wall.

B. Metal Cellular Wall. Use templates to ensure that members are placed in the proper position and with the proper face batter.

After placing the columns and constructing two tiers of the wall, check and, if necessary, adjust the alignment, grade, and batter of the units, and backfill to this height before adding subsequent units. Complete the remainder of the wall.

Carefully handle members, and remove and replace damaged members.

610.08 Method of Measurement. The City will measure Cellular Retaining Wall by the number of square feet (square meters) of facial area complete in place.

610.09 Basis of Payment. Payment is full compensation for furnishing all materials, backfilling, including the interior filling, watering, and disposing of surplus materials.

The City will not pay for replacing any unit with improperly punched holes.

The City will not pay for removing or replacing members damaged during handling.

The City will pay for Excavation Not Including Embankment Construction under Item 203.

The City will pay for accepted quantities at the contract price as follows:

Item	Unit	Description
610	Square Foot (Square Meter)	Cellular Retaining Wall