



TECHNICAL SPECIFICATIONS FOR WELDED WIRE STEEPENED SLOPE

1.0 DESCRIPTION

This work shall consist of **Welded Wire Steepened Slope** constructed in accordance with these specifications and the lines, grades, design, and dimensions shown on the plans or established by the Owner’s Engineer.

2.0 MATERIALS

The Contractor shall make his own arrangements to purchase all **Welded Wire Steepened Slope** materials, including wire mesh reinforcement mats, facing mats, and all necessary incidentals from Hilfiker Retaining Walls, 1902 Hilfiker Lane, Eureka, CA 95503-5711, Telephone 707/443-5093.

2.1 Facing Mats

Wire mesh for facing shall be formed by a 45-degree bend and shall have a prebent tie to connect to the soil reinforcing mesh below. The reinforcing mesh shall be shop fabricated of cold drawn steel wire conforming to the minimum requirements of ASTM A-82 (AASHTO M-32) and shall be welded into the finished mesh fabric in accordance with ASTM A-185 (AASHTO M-55). Fabric for the Welded Wire Steepened Slope shall be as per project specifications, and will conform to only one of the following coating treatments: (A) brite basic (non-galvanized), or (B) commercial galvanized, or (C) hot dip galvanized (2.0 oz./SF, ASTM A-123 [AASHTO M-111]; 605 g/m²). Any damage done to the mesh galvanization prior to installation shall be repaired in an acceptable manner and in a galvanized coating comparable to that provided.

2.2 Wire Reinforcement Mesh

Where required, as shown on the plans, welded wire reinforcement mats shall be W4.5 vertical x W3.5 horizontal minimum (.239 x .211 – MW 29 x MW 23) welded wire fabric meeting ASTM A-185 (AASHTO M-55), and treated in accordance with (A), (B), or (C) in paragraph 2.1.

3.0 SELECT GRANULAR BACKFILL MATERIALS

As shown on the plans, select granular backfill materials for the **Welded Wire Steepened Slope** structure shall be reasonably free from organic and otherwise deleterious materials and shall conform to the following gradation limits as determined by ASTM D-422 (AASHTO T-27):

Sieve Designation	Percent by Weight Passing Standard Sieves (AASHTO T 27)
6 inches (152.4 mm)	100
3 inches (76.2 mm)	100 - 75
No. 200 (75 µm)	0 - 25*

* If the percent passing the No. 200 sieve is greater than 15 percent, the backfill shall conform to all of the following additional requirements:

- a. The Plasticity Index (P.I.), as determined by ASTM D-4318 (AASHTO T-90), shall not exceed 10.
- b. The fraction finer than 15 microns (0.015 mm), as determined by ASTM D-422 (AASHTO T-88) shall not exceed 15 percent.



- c. The material shall exhibit an angle of internal friction of not less than 34 degrees, as determined by the standard direct shear test ASTM D-3080-72 (AASHTO T-236), utilizing a sample of the material compacted to 90% percent of ASTM D-1557-92 (AASHTO T-90), at optimum moisture content.

In addition, backfill materials shall also meet the following corrosion requirements:

Resistivity	≥ 3000 OHM-cm (min)	ASTM G-57	AASHTO T 288
pH	5.0 to 10.0	ASTM G-51	AASHTO T 289
Chlorides	≤ 200 mg/kg (ppm)		AASHTO T 291
Sulfates	≤ 1000 mg/kg (ppm)		AASHTO T 290

No testing is required for backfill where 80 percent of the material is greater than ¾ inch (19 mm). If the resistivity is greater than or equal to 5,000 ohm-cm, the chlorides and sulfates requirements may be waived.

The Contractor shall furnish to the Owner’s Engineer a Certificate of Compliance certifying that the select granular backfill material complies with this section of the specifications. A copy of all test results performed by the Contractor, which are necessary to assure compliance with the specifications, shall also be furnished to the Owner’s Engineer.

The frequency of sampling of Select Granular Backfill necessary to assure the above-mentioned requirements shall be directed by the Owner’s Engineer.

Backfill not conforming to this specification shall not be used without written consent of the Engineer.

4.0 CONSTRUCTION REQUIREMENTS

4.1 Wall Excavation

Wall excavation shall be in accordance with the requirements of the Project specifications and in reasonably close conformity with the limits and construction stages shown on the plans. All excavation cuts and slopes shall be in accordance with governing safety regulations.

4.2 Foundation Preparation

The foundation for the structure shall be graded level for a width equal to or exceeding the length of the reinforcement mat or as shown on the plans. Prior to wall construction, the foundation, if not in rock, shall be compacted, as directed by the Owner’s Engineer.

Any unsuitable foundation material below the reinforced soil volume, as determined by the Owner’s Engineer, shall be excavated for the full length of mat reinforcements, and to a depth as directed by the Owner’s Engineer. Excavated unsuitable material shall be replaced as directed by the Owner’s Engineer.

The maximum calculated applied bearing pressure at the foundation level is as shown on the elevation view for each wall. It is the responsibility of the Owner’s Engineer to determine that this calculated applied bearing pressure is allowable for that location.

4.3 Wall Erection

Wire mesh reinforcement mats, and applicable facing materials, shall be placed in successive horizontal lifts in the sequence shown on the plans as backfill placement proceeds. Vertical tolerance (plumbness) and horizontal alignment tolerance shall not exceed two (2) inches (51 mm) when measured at the junction of the wire facing and soil reinforcement along a 10-foot (3 m) straight edge.

4.4 Backfill Placement

Backfill placement shall closely follow erection of each course of facing and reinforcement mats. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the wall materials or misalignment of the facing. Any wall materials that become damaged or disturbed during backfill placement shall be either removed and replaced at the Contractor's expense or corrected, as directed by the Engineer.

Backfill shall be compacted to 90 percent of the maximum density as determined by ASTM D-1557-78 (AASHTO T-99).

The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer. Backfill material shall have a placement moisture content less than or equal to the optimum moisture content. Backfill material with placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniformly acceptable throughout the entire lift. The optimum moisture content shall be determined in accordance with ASTM D-1557-78 (AASHTO T-99).

Backfill shall be placed in complete horizontal lifts. The maximum lift thickness after compaction shall not exceed twelve (12) inches (305 mm). The Contractor shall decrease this lift thickness, if necessary, to obtain the desired density.

Compaction within 3'-0" (914 mm) of the backface of the wall facing shall be achieved by at least three (3) passes of a lightweight mechanical tamper, roller or vibratory system. No soil density tests shall be taken within this area.

At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing to rapidly direct run-off of rainwater away from the wall face. In addition, the Contractor shall not allow surface run-off from adjacent areas to enter the wall construction.

5.0 METHOD OF MEASUREMENT

5.1 Wire Mesh Facing

The unit of measurement for furnishing and fabricating all materials for the walls, including wire mesh reinforcement mats, applicable facing materials and other incidentals will be the square foot of wall face area.

The quantity to be paid for shall be measured on the basis of wall face area shown on the plans.

Measurement and payment for excavation and backfill performed during **Welded Wire Steepened Slope** construction will be in accordance with the applicable sections of the contract specifications.

5.2 Wall Erection

The unit of measurement for wall erection will be the square foot of wall face area complete and in place. The quantity to be paid for will be the actual quantity erected in place at the site. Payment shall include compensation for all labor and materials required to prepare the wall foundation, place the reinforcement mats and facing mats as shown on the plans.

• End Section •

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4,266,890 4,391,557 4,154,554 4,260,296 4,505,621 OTHER PATENTS PENDING

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