



Vertical Geosynthetic-Reinforced MSE Solution for Electric Rail

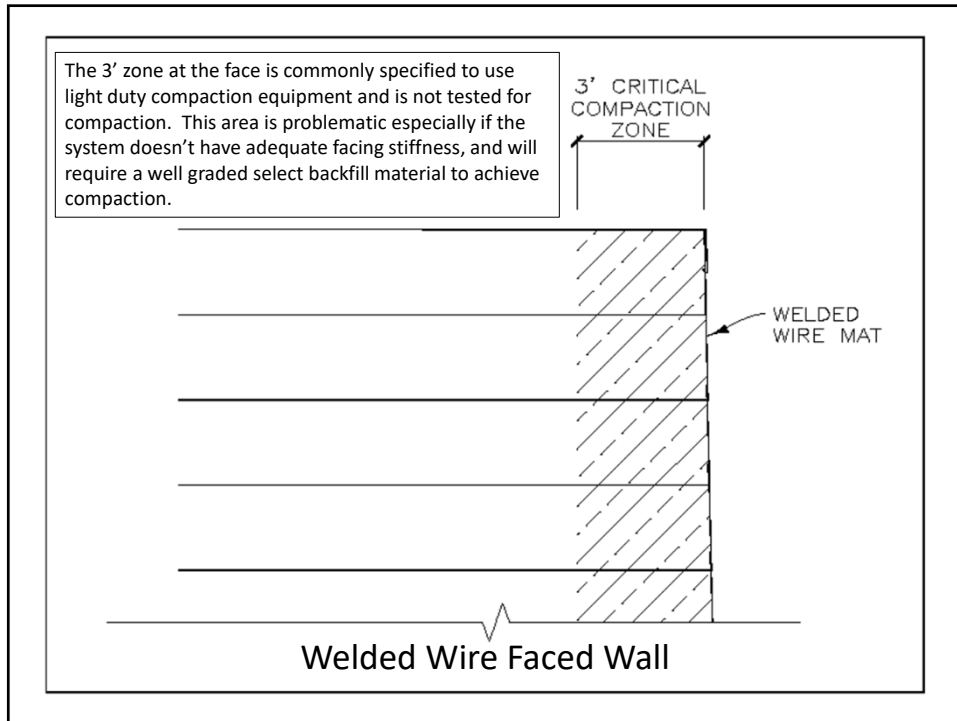
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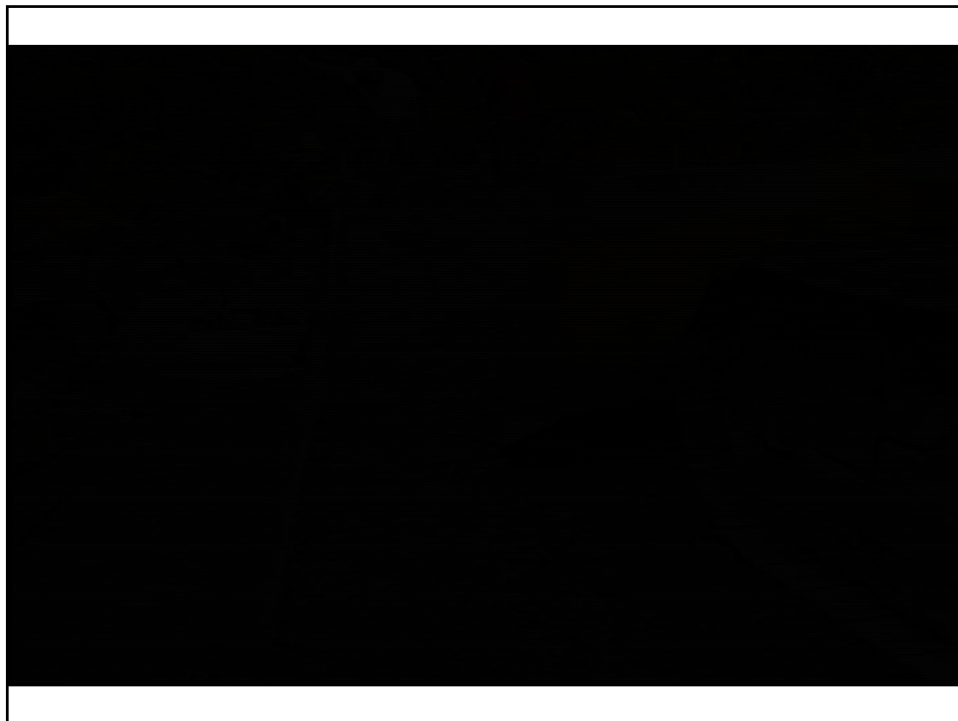
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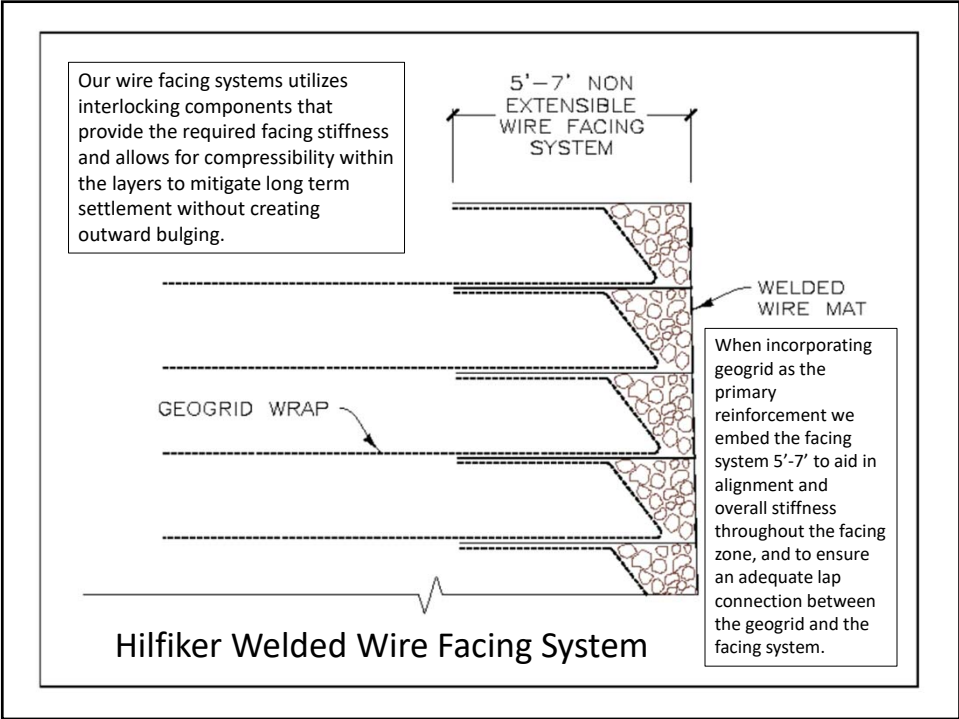
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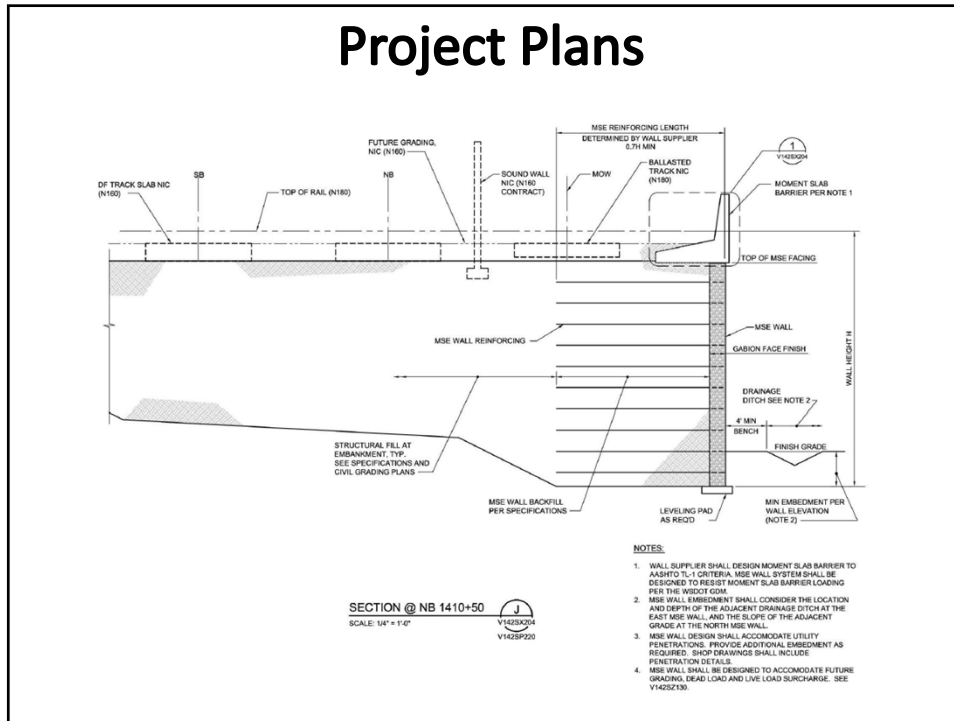
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- c. The design shall take into consideration application of all dead and live, construction phase and permanent loads, including consideration of loading from the traffic barrier and future phase loading as shown on the Contract Drawings. Construction phase loads shall include dynamic loading due to construction equipment and activities. Permanent loads include the future grade surcharge loading, track slab, and light rail vehicles and passengers (see DCM). Permanent loads may be installed in future contracts.
- g. Design shall ensure a design life of 100 years for the integrated wall system. Wire mesh facing system, all connection materials, wire screen, and steel and polymeric or geosynthetic reinforcement elements shall be designed to have corrosion resistance and durability to ensure a minimum design life of 100 years.
- 1) Submit corrosion resistance design calculations for all elements such that the elements maintain the required capacity, after corrosion loss, at the end of the minimum design life.
 - 2) Design of steel elements for corrosion resistance shall be in accordance with FHWA NHI-09-087. Design corrosion rates for ungalvanized plain steel shall be determined by the designer, but shall not be less than 1.0mils/year. Resin Bonded Epoxy and Polymeric Barrier coatings shall not be considered to contribute to the corrosion resistance of steel elements
- h. Contract Drawings indicate minimum requirements for subgrade drainage at MSE wall. Shop drawings shall include drainage system provisions, details, and routing required for a complete drainage system, including cleanout locations. MSE wall drainage system shall be coordinated and routed as required around adjacent new and existing utilities.

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b. Detail sheets containing all details for construction of the wall systems:

- 1) All modules and facing elements shall be detailed. Show all dimensions necessary to construct the element, all reinforcing items in the element, and the location of reinforcement element attachment devices connecting to the facing.
- 2) All details for construction of the wall shall be clearly shown.
- 3) Details of connections and joints between the subgrade geogrid, mesh, or strips and the facing materials.
- 4) Details of geosynthetic material installed to separate the MSE Wall Backfill Material from the Facing Fill Aggregate.
- 5) Details of conditions required to accommodate new or existing utilities adjacent to or penetrating the wall system.
- 6) Details for separation of dissimilar metals as required to prevent galvanic corrosion between adjoining elements.

- 7) Details of electrical interconnection or separation elements for soil reinforcing and facing units, including bonding cables, spiral ties, or coatings. Include product data for all coating systems.
- 8) All details for the traffic barrier at the top of the wall, including cross section geometry, construction joints, expansion joints, reinforcement, and attachments. Details shall show the interface of, and the interaction between, the barrier and the top layers of MSE soil reinforcements and wire mesh facing

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A. The completed walls shall meet the following tolerances:

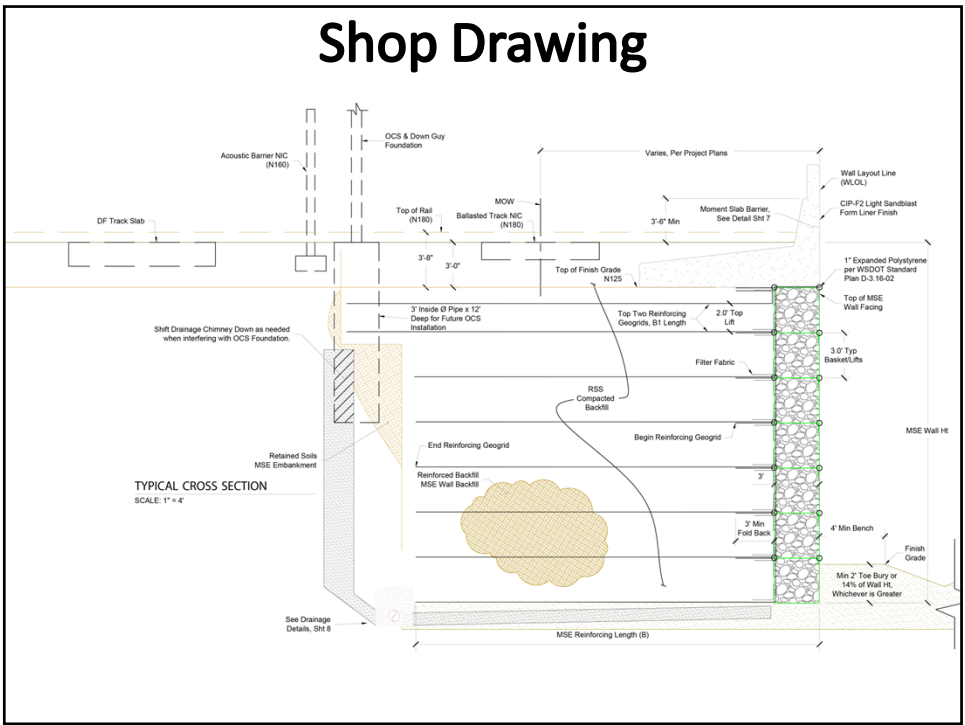
1. Vertical design batter for MSE Walls on this project shall be 0 degrees (vertical face).
2. Deviation from the horizontal alignment shall not exceed 2 inches when measured along a 10-foot horizontal straight edge.
3. Deviation from the overall vertical design batter of the wall shall not exceed 1-1/2 inches per 10 feet of wall height.
4. Maximum allowable offset in any facing joint shall be 1/2 inch.
5. Maximum outward bulge of the face between welded wire faced structural earth wall reinforcement layers shall not exceed 1 inch.
6. Base of retaining wall excavation shall be within 3 inches of staked elevations.
7. External wall dimensions shall be placed within 2 inches of staked locations.

1. Wire Mesh: Steel wire mesh material conforming to AASHTO M55. Wire gauge shall be sized for 100 year design lifespan. Wire mesh shall be prefabricated with the necessary panels, diaphragms, and connections, and secured as required for aggregate fill operations, placement, and erection. Minimum wire mesh facing element dimensions are as follows:
 - a. Width (parallel to wall face): 3'-0"
 - b. Height (vertical): Minimum: 1'-6". Maximum: 3'-0"
 - c. Minimum Wire Size: W4.5 (0.24" diameter)
2. Wire Mesh Corrosion Resistance: Mesh elements visible from the front wall face and exposed to weather shall be uncoated black steel without galvanization.
 - a. If subgrade steel reinforcing elements are proposed to be galvanized for corrosion protection, the connections between subgrade elements and facing wire mesh shall be designed and detailed for resistance to galvanic corrosion of dissimilar metals.
3. Wire Mesh Openings: Maximum wire spacing of mesh shall be 4 inches in any direction. Openings shall be square or rectangular.

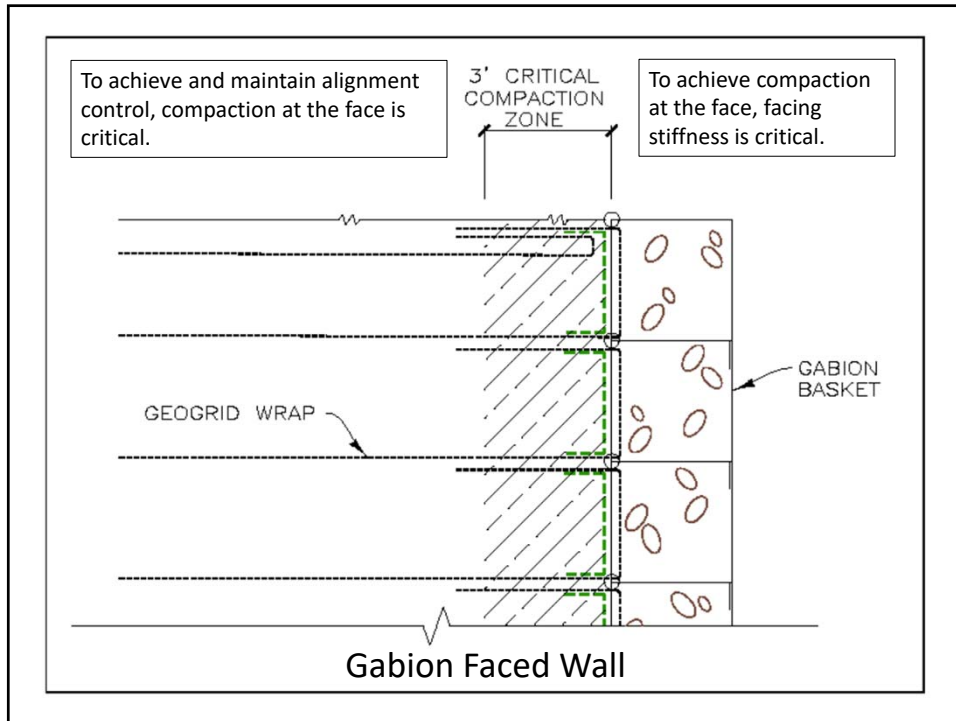
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- a. Wire mesh shall be supplied in a single layer at the wall face. Backing mats, secondary mesh layers, or hardware cloth material shall not be visible at the wall face.
 - 4. Internal Diaphragms and Connecting Wires: The wire mesh unit width shall be equally divided into cells less than or equal to 2 times the unit depth using diaphragms or connecting wires. Divider elements shall be connected to the front and back faces of the wire mesh unit, and shall be of similar materials and finish as the exposed face.
 - 5. Lacing Wire, Spiral Binders, Connecting Wire: Steel wire in gauge and strength to match wire mesh reinforcement, design life requirements, and per manufacturer's recommendation.
 - 6. Ring Fasteners: High tensile strength wire rings sized as required for strength and design life requirements and per manufacturer's recommendation.
 - 7. Wall Aesthetics: The finished wall system shall consist of wire mesh facing arranged in panels divided into a consistent repeating pattern. The facing fill aggregate shall be exposed and visible between individual wires of the facing mesh. Facing fill aggregate shall be of uniform gradation and color throughout the entire wall. Geogrid or geosynthetic elements, or other materials internal to the wall reinforcing or facing system shall not be visible at the completed wall face.
- All rock-filled wire mesh facing units shall be electrically interconnected. Electrical interconnection shall be achieved with continuous metallic connections, bonding wire, or other explicitly defined electrical continuity path between wire mesh units.

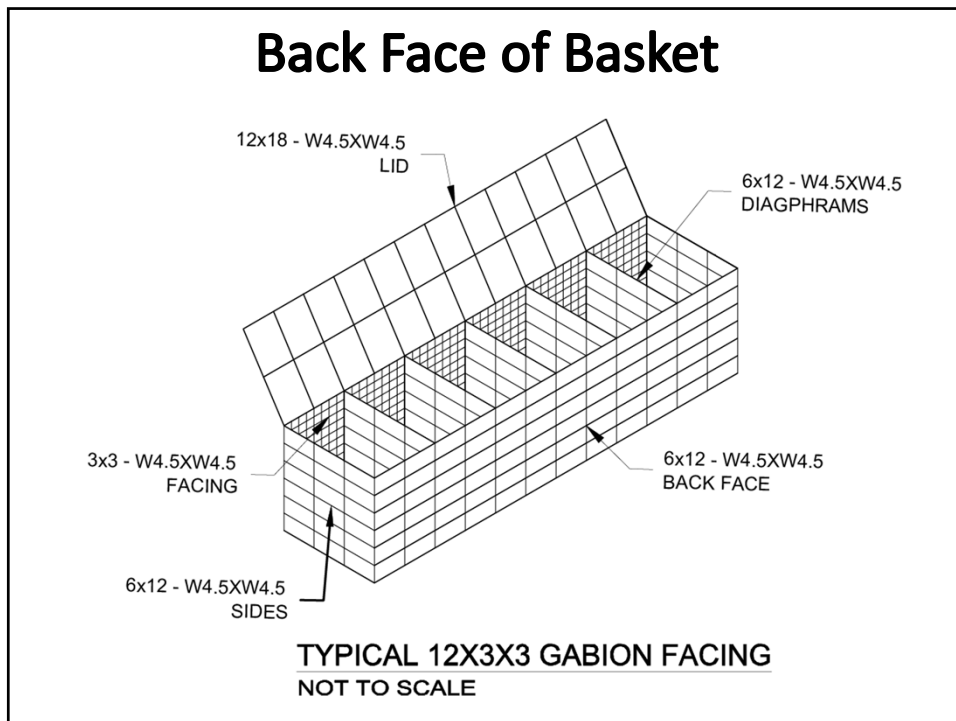
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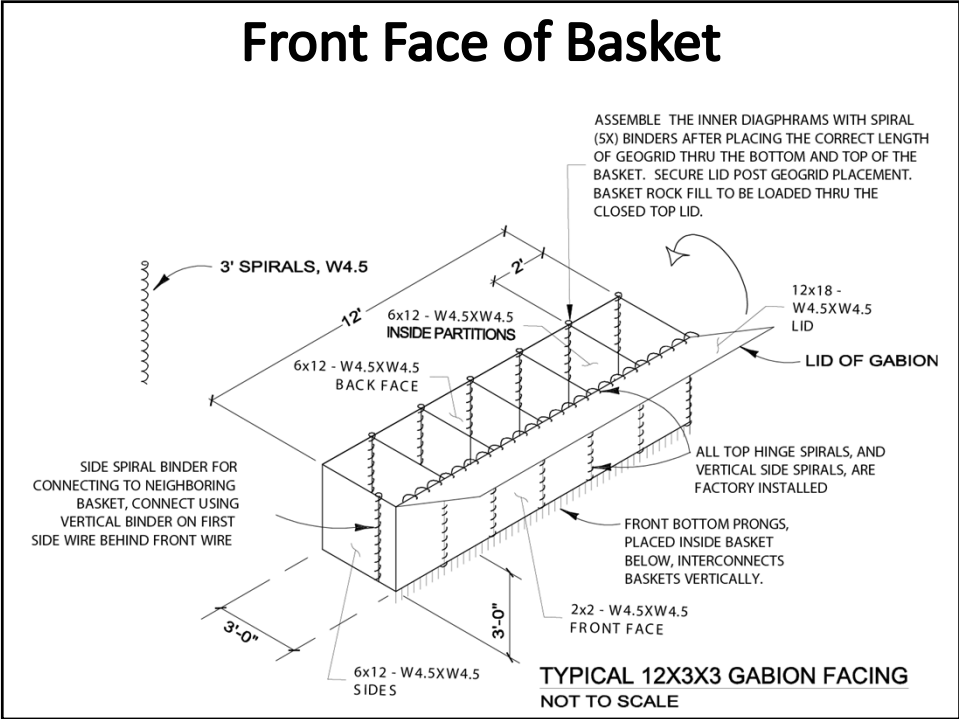
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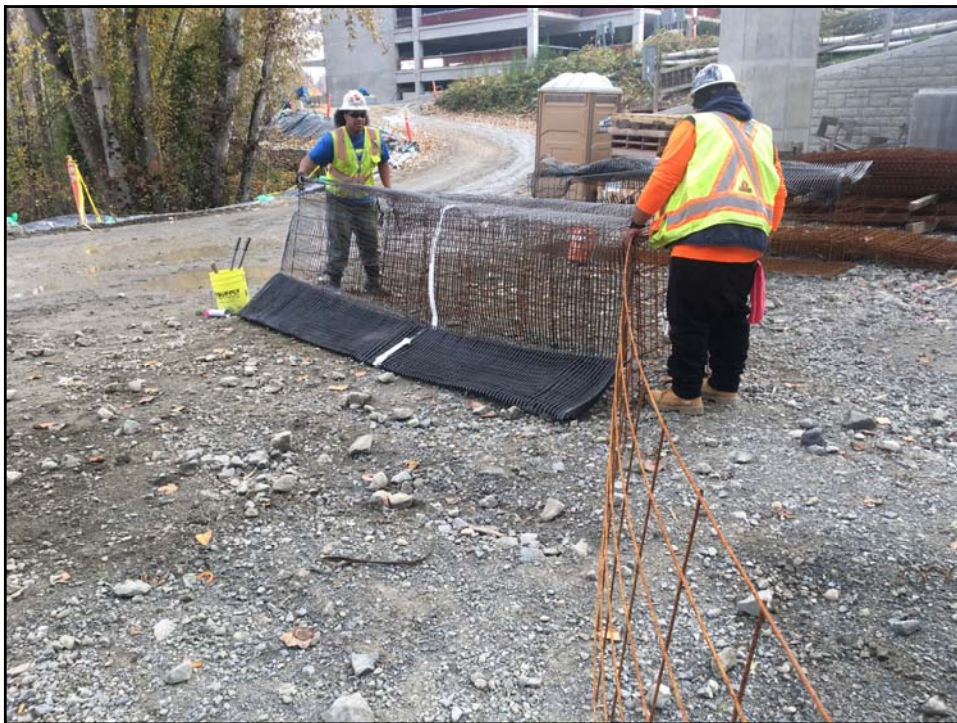
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THANK YOU

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