

1 **(November 17, 1997)**

2 **Geosynthetic Reinforced Slope Construction Requirements**

3 **Submittals**

4 The Contractor shall submit to the Engineer, a minimum of 14 calendar days prior
5 to beginning construction of each reinforced slope, detailed plans for each
6 reinforced slope and as a minimum, the submittals shall include the following:
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- 8 1. Detailed reinforced slope plans showing the actual lengths proposed for
9 the geosynthetic reinforcing layers and the locations of each geosynthetic
10 product proposed for use in each of the geosynthetic reinforcing layers.
11
- 12 2. The Contractor's proposed reinforced slope construction method,
13 including any proposed forming systems, types of equipment to be used
14 and proposed erection sequence.
15
- 16 3. Manufacturer's Certificate of Compliance, samples of the reinforced slope
17 geosynthetic(s) and sewn seams for the purpose of acceptance as
18 specified.
19
- 20 4. Details of geosynthetic reinforced slope corner construction, including
21 details of the positive connection between the slope sections on both
22 sides of the corner.
23
- 24 5. Details of terminating a top layer of reinforced slope geosynthetic and
25 backfill due to a changing reinforced slope profile.
26

27 Approval of the Contractor's proposed reinforced slope construction details and
28 methods shall not relieve the Contractor of their responsibility to construct the
29 reinforced slopes in accordance with the requirements of these Specifications.
30

31 **Reinforced Slope Construction**

32 The Contractor shall excavate for the reinforced slope in accordance with Section
33 2-09, and conforming to the limits and construction stages shown in the Plans.
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35 The Contractor shall direct all surface runoff from adjacent areas away from the
36 reinforced slope construction site.
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38 The Contractor shall begin reinforced slope construction at the lowest portion of the
39 excavation and shall place each layer horizontally as shown in the Plans. The
40 Contractor shall complete each layer entirely before beginning the next layer.
41

42 Geotextile splices shall consist of a sewn seam or a minimum 1 ft overlap. Geogrid
43 splices shall consist of adjacent geogrid strips butted together and fastened using
44 hog rings, or other methods approved by the Engineer, in such a manner to prevent
45 the splices from separating during geogrid installation and backfilling. The
46 Contractor shall offset geosynthetic splices in one layer from those in the other
47 layers such that the splices shall not line up vertically. Splices parallel to the slope
48 face will not be allowed, as shown in the Plans.
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50 Primary reinforcing geosynthetic shall be cut to the length shown in the Plans. For
51 geogrids, the end of the primary reinforcing located at the face of the slope shall be
52 cut so that the cut ribs extend no more than 0.6 inch but not less than 0.2 inch from

1 the cross ribs. For geogrids, the length of the reinforcement required as shown in
2 the Plans shall be defined as the distance between the geosynthetic facing and the
3 last geogrid node at the end of the reinforcement in the slope backfill.
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5 The Contractor shall stretch out the geosynthetic in the direction perpendicular to
6 the slope face to ensure that no slack or wrinkles exist in the geosynthetic prior to
7 backfilling. Soil piles or the geosynthetic manufacturer's recommended method
8 shall be used to hold the geosynthetic in place until the specified cover material is
9 placed.
10

11 The Contractor shall place fill material on the geosynthetic in lifts such that 6 inches
12 minimum of fill material is between the vehicle or equipment tires or tracks and the
13 geosynthetic at all times. The Contractor shall remove all particles within the
14 backfill material greater than 3 inches in size. Turning of vehicles on the first lift
15 above the geosynthetic will not be permitted. The Contractor shall not end dump fill
16 material directly on the geosynthetic without the prior approval of the Engineer.
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18 Should the geosynthetic be damaged or the splices disturbed, the backfill around
19 the damaged or displaced area shall be removed and the damaged strip of
20 geosynthetic replaced by the Contractor at no expense to the Contracting Agency.
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22 The Contractor shall place and compact the reinforced slope backfill in accordance
23 with the reinforced slope construction sequence detailed in the Plans. The
24 minimum compacted backfill lift thickness of the first lift above each geosynthetic
25 layer shall be 6 inches. The maximum compacted lift thickness anywhere within
26 the reinforced slope shall be 10 inches.
27

28 The Contractor shall compact each layer to 95 percent of maximum density. The
29 water content of the reinforced slope backfill shall not exceed the optimum water
30 content by more than 3 percent. The Contractor shall not use sheepsfoot rollers or
31 rollers with protrusions. Rollers which weigh more than 6,000 lbs shall be used
32 with the vibrator turned off. The Contractor may use rollers which weigh 6,000 lbs
33 or less with the vibrator turned on with the prior approval of the Engineer.
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35 The Contractor shall construct slope corners at the locations shown in the Plans,
36 and in accordance with the reinforced slope corner construction sequence and
37 method submitted by the Contractor and approved by the Engineer. Slope angle
38 points with an interior angle of less than 150 degrees shall be considered to be a
39 corner. The slope corner shall provide a positive connection between the sections
40 of the reinforced slope on each side of the corner such that the slope backfill
41 material cannot spill out through the corner at any time during the design life of the
42 reinforced slope. The Contractor shall construct the slope corner such that the
43 reinforced slope sections on both sides of the corner attain the full geosynthetic
44 layer embedment lengths shown in the Plans.
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46 Where required by reinforced slope profile grade, the Contractor shall terminate top
47 layers of reinforced slope geosynthetic and backfill in accordance with the method
48 submitted by the Contractor and approved by the Engineer. The end of each layer
49 at the top of the slope shall be constructed in a manner which prevents slope
50 backfill material from spilling out the face of the slope throughout the life of the
51 reinforced slope. If the profile of the top of the slope changes at a rate of 1V:1H or
52 steeper, this change in top of slope profile shall be considered to be a corner.

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Tolerances

The Contractor shall complete the base of the reinforced slope excavation to within plus or minus 3 inches of the staked elevations unless otherwise directed by the Engineer. The Contractor shall place the external slope dimensions to within plus or minus 2 inches of that staked on the ground. The Contractor shall space the reinforcement layers vertically to within plus or minus 1 inch of that shown in the Plans.

The completed reinforced slope(s) shall meet the following tolerances:

	<u>Tolerance</u>
Deviation from the design slope and horizontal alignment for the slope face, when measured along a 10-foot straight edge at the midpoint of each reinforced slope layer, shall not exceed:	5 inches
Deviation from the overall design slope per 10 feet of reinforced slope height shall not exceed:	3 inches