GUIDE SPECIFICATIONS FOR ROADWAY EDGE DRAINAGE
GEOCOMPOSITE EDGE DRAIN SYSTEM

Section 33 41 16.16 – Geocomposite Edge Drain

{NOTE TO SPECIFIER: These specifications were current at the time of publication but are subject to change at any time without notice. Please confirm the accuracy of these specifications with the manufacturer and/or distributor prior to installation.}

PART I GENERAL

1.01 SECTION INCLUDES

A. Prefabricated geocomposite edge drainage system for water collection and transportation

1.02 RELATED SECTIONS

A. Section 31 23 00 – Excavation and Fill
B. Section 32 30 00 – Site Improvements
C. Section 33 41 00 – Subdrainage

1.03 REFERENCES

A. ASTM International (ASTM)
   1. ASTM D4355 - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus ASTM D1777 - Standard Test Method for Thickness of Textile Materials
   2. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity
   3. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
   4. ASTM D4716 - Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
   5. ASTM D4716 - Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
   6. ASTM D5199 - Standard Test Method for Measuring the Nominal Thickness of Geosynthetics
   7. ASTM D6241 - Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe
   8. ASTM D6364 - Standard Test Method for Determining Short-Term Compression Behavior of Geosynthetics
B. American Association of State Highway and Transportation Officials (AASHTO)
   1. AASHTO M288 - Standard Specification for Geosynthetic Specification for Highway Applications

1.04 SUBMITTALS

A. Submit under provisions of Section 01 30 00 Submittal Procedures
B. Product Information: Submit manufacturer's literature for each product used, including:
   1. Product data sheet
   2. Installation guidelines

3. Standard details
4. Storage and handling requirements
5. Standard warranty

{NOTE TO SPECIFIER: Delete or modify shop drawing requirement as appropriate. If no project specific shop drawings are required, delete 1.04 C. in its entirety.}

C. Shop Drawings: Submit details for project conditions not covered by manufacturer's standard details
D. Samples: Submit representative samples of prefabricated geocomposite edge drain
E. Certification: Submit manufacturer's certificate of compliance that geocomposite edge drain meets or exceeds specified physical and performance properties
F. Test Reports: Submit test reports conducted by a qualified independent testing laboratory confirming:
    a. Compressive strength of geocomposite edge drain core meets or exceeds specified value
    b. In-plane flow rate of geocomposite edge drain core meets or exceeds specified value

1.05 QUALITY ASSURANCE

A. Installation shall be performed by a company with experience performing work of this type
B. Prior to installation, a meeting shall be held to clarify and coordinate installation procedures
    1. Attendees shall include:
        a. Contractor
        b. Representatives from related trades or trades with work adjacent to geocomposite edge drainage system.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Delivery
    1. Materials shall be delivered in original, unopened, undamaged packing containers bearing manufacturer's name and product identification
B. Storage and Protection
    1. Material shall remain in original packaging until time of installation.
    2. Store materials in protected environment.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Protect material from exposure to direct sunlight during storage
B. Limit material UV exposure to less than 14 days during installation
C. Do not install during high wind events
D. Do not install when ambient temperatures are below 20 degrees Fahrenheit or above 100 degrees Fahrenheit.

PART 2 PRODUCTS

{NOTE TO SPECIFIER: Product recommendations below are based on proprietary specification methods. Use of "or equal", "or approved equal", or similar terminology may result in ambiguity in specifications and should be avoided if possible.}

2.01 ACCEPTABLE MANUFACTURERS

A. All products of this section:
    1. **American Wick Drain Corporation**: 1209 Airport Rd., Monroe, NC 28110, Phone: +1 (704) 238-9200, Fax: +1 (704) 238-0220, Email: info@awd-usa.com, Website: www.awd-usa.com
    2. Substitutions: Not permitted.

2.02 MATERIALS

{NOTE TO SPECIFIER: Edit / Add / Delete products from the sections below as appropriate for the project}

{NOTE TO SPECIFIER: Please contact American Wick Drain at +1 (704) 238-9200 for product selection assistance}

A. Prefabricated Geocomposite Edge Drain

{NOTE TO SPECIFIER: Default recommendation is SITEDRAIN Strip 9600 Series}

1. SITEDRAIN Strip 9400 Series
   a. Model
      1) SITEDRAIN Strip 9406
         a) Roll width: 6 in
         b) Roll length: 150 ft
      2) SITEDRAIN Strip 9412
         a) Roll width: 12 in
         b) Roll length: 150 ft or 500 ft
      3) SITEDRAIN Strip 9418
         a) Roll width: 18 in
         b) Roll length: 150 ft
      4) SITEDRAIN Strip 9424
         a) Roll width: 24 in
         b) Roll length: 150 ft or 500 ft
      5) SITEDRAIN Strip 9436
         a) Roll width: 36 in
         b) Roll length: 100 ft
   b. Fabric Properties (Minimum Average Roll Value (MARV))
      1) Material: Polypropylene, needle-punched nonwoven
      2) Survivability: Class 3 per AASHTO M288
      3) Grab Tensile Strength: 120 lbs per ASTM D4632
      4) Grab Elongation: 50% per ASTM D4632
      5) CBR Puncture: 340 lbs per ASTM D6241
      6) Trapezoidal Tear: 50 lbs per ASTM D4533
      7) UV Resistance: 70% after 500 hours per ASTM D4355
      8) Apparent Opening Size: 70 sieve (MaxARV) per ASTM D4751
      9) Permittivity: 1.7 sec^{-1} per ASTM D4491
      10) Water Flow Rate: 140 gpm/ft^2 per ASTM D4491
   c. Core Properties (Typical Value)
      1) Compressive Strength: 9,500 psf per ASTM D6364
      2) Thickness: 1.0 in per ASTM D5199
      3) In-Plane Flow Rate: 21 gpm/ft per ASTM D4716 (measured at 3,600 psf compressive load and a hydraulic gradient of 0.1)

2. SITEDRAIN Strip 9400-T Series
   a. Model
      1) SITEDRAIN Strip 9406-T
         a) Roll width: 6 in
         b) Roll length: 150 ft
      2) SITEDRAIN Strip 9412-T
         a) Roll width: 12 in
         b) Roll length: 150 ft or 500 ft
      3) SITEDRAIN Strip 9418-T

a) Roll width: 18 in
b) Roll length: 150 ft
4) SITEDRAIN Strip 9424-T
a) Roll width: 24 in
b) Roll length: 150 ft or 500 ft
5) SITEDRAIN Strip 9436-T
a) Roll width: 36 in
b) Roll length: 100 ft

b. Fabric Properties (Minimum Average Roll Value (MARV))
1) Material: Polypropylene, spunbonded nonwoven
2) Survivability: Class 3 per AASHTO M288
3) Grab Tensile Strength: 130 lbs per ASTM D4632
4) Grab Elongation: 50% per ASTM D4632
5) CBR Puncture: 276 lbs per ASTM D6241
6) Trapezoidal Tear: 60 lbs per ASTM D4533
7) UV Resistance: 70% after 500 hours per ASTM D4355
8) Apparent Opening Size: 60 sieve (MaxARV) per ASTM D4751
9) Permittivity: 1.7 sec^{-1} per ASTM D4491
10) Water Flow Rate: 60 gpm/ft^2 per ASTM D4491

c. Core Properties (Typical Value)
1) Compressive Strength: 9,500 psf per ASTM D6364
2) Thickness: 1.0 in per ASTM D5199
3) In-Plane Flow Rate: 21 gpm/ft per ASTM D4716 (measured at 3,600 psf compressive load and a hydraulic gradient of 0.1)

3. SITEDRAIN Strip 9600 Series
a. Model
1) SITEDRAIN Strip 9606
a) Roll width: 6 in
b) Roll length: 150 ft
2) SITEDRAIN Strip 9612
a) Roll width: 12 in
b) Roll length: 150 ft or 500 ft
3) SITEDRAIN Strip 9618
a) Roll width: 18 in
b) Roll length: 150 ft
4) SITEDRAIN Strip 9624
a) Roll width: 24 in
b) Roll length: 150 ft or 500 ft
5) SITEDRAIN Strip 9636
a) Roll width: 36 in
b) Roll length: 100 ft

b. Fabric Properties (Minimum Average Roll Value (MARV))
1) Material: Polypropylene, needle-punched nonwoven
2) Survivability: Class 2 per AASHTO M288
3) Grab Tensile Strength: 160 lbs per ASTM D4632
4) Grab Elongation: 50% per ASTM D4632
5) CBR Puncture: 410 lbs per ASTM D6241
6) Trapezoidal Tear: 60 lbs per ASTM D4533
7) UV Resistance: 70% after 500 hours per ASTM D4355
8) Apparent Opening Size: 70 sieve (MaxARV) per ASTM D4751
9) Permittivity: 1.5 sec^{-1} per ASTM D4491
10) Water Flow Rate: 110 gpm/ft^2 per ASTM D4491

c. Core Properties (Typical Value)
1) Compressive Strength: 9,500 psf per ASTM D6364
2) Thickness: 1.0 in per ASTM D5199

3) In-Plane Flow Rate: 21 gpm/ft per ASTM D4716 (measured at 3,600 psf compressive load and a hydraulic gradient of 0.1)

4. SITEDRAIN Strip 9800 Series
   a. Model
      1) SITEDRAIN Strip 9806
         a) Roll width: 6 in
         b) Roll length: 150 ft
      2) SITEDRAIN Strip 9812
         a) Roll width: 12 in
         b) Roll length: 150 ft or 500 ft
      3) SITEDRAIN Strip 9818
         a) Roll width: 18 in
         b) Roll length: 150 ft
      4) SITEDRAIN Strip 9824
         a) Roll width: 24 in
         b) Roll length: 150 ft or 500 ft
      5) SITEDRAIN Strip 9836
         a) Roll width: 36 in
         b) Roll length: 100 ft
   b. Fabric Properties (Minimum Average Roll Value (MARV))
      1) Material: Polypropylene, needle-punched nonwoven
      2) Survivability: Class 1 per AASHTO M288
      3) Grab Tensile Strength: 205 lbs per ASTM D4632
      4) Grab Elongation: 50% per ASTM D4632
      5) CBR Puncture: 535 lbs per ASTM D6241
      6) Trapezoidal Tear: 80 lbs per ASTM D4533
      7) UV Resistance: 70% after 500 hours per ASTM D4355
      8) Apparent Opening Size: 80 sieve (MaxARV) per ASTM D4751
      9) Permittivity: 1.4 sec^{-1} per ASTM D4491
      10) Water Flow Rate: 100 gpm/ft^2 per ASTM D4491
   c. Core Properties (Typical Value)
      1) Compressive Strength: 9,500 psf per ASTM D6364
      2) Thickness: 1.0 in per ASTM D5199
      3) In-Plane Flow Rate: 21 gpm/ft per ASTM D4716 (measured at 3,600 psf compressive load and a hydraulic gradient of 0.1)

B. Fittings & Accessories
   1. Universal End Outlet: Fitting for in-line connection of geocomposite edge drain to 4” smooth (PVC) or corrugated (HDPE) outlet pipe
   2. Universal Tee Outlet: Fitting for tee connection of geocomposite edge drain to 4” smooth (PVC) or corrugated (HDPE) outlet pipe
   3. 4” Wide Underground-Rated Tape: For securing fittings and splices

PART 3 EXECUTION

3.01 EXAMINATION

A. Site Verification of Conditions
   1. Verify that site conditions are acceptable for installation of geocomposite edge drain material
   2. Do not proceed with installation of geocomposite edge drain material until unacceptable conditions have been corrected

{NOTE TO SPECIFIER: Determine appropriate installation method for project. Edit/Delete installation requirements as needed. Please contact American Wick Drain for installation method assistance.}

3.02 TRENCHING

A. Excavate minimum 4”-wide trench to plan depth and specifications, removing loose material from trench

3.03 GEOCOMPOSITE EDGE DRAIN INSTALLATION

A. Place geocomposite edge drain in vertical orientation at bottom of trench, with primary collection (dimple) side of geocomposite edge drain oriented to intercept water from direction from which majority of inflow is expected
B. Connections
    1. Splice Connection
        a. Peel back fabric from roll ends to be spliced ends
        b. Overlap two rows of dimpled core. Secure dimples in place with rubber hammer
        c. Overlap fabric over joint and secure with underground-rated tape
    2. Tee Outlet
        a. Use manufacturer standard Universal Tee Outlet fitting to connect geocomposite edge drain to 4” PVC (Schedule 40) pipe or 4” corrugated HDPE pipe for outlet perpendicular to geocomposite edge drain
        b. Slide end of outlet pipe no less than 2” into connector
        c. Secure fitting connections with underground-rated tape to maintain connection and prevent soil intrusion during backfill and compaction
    3. End Outlet
        a. Use manufacturer standard Universal End Outlet fitting to connect geocomposite edge drain to 4” PVC (Schedule 40) pipe or 4” corrugated HDPE pipe for outlet parallel (in-line) with geocomposite edge drain
        b. Slide end of outlet pipe no less than 2” into connector
        c. Secure fitting connections with underground-rated tape to maintain connection and prevent soil intrusion during backfill and compaction

3.04 BACKFILLING AND COMPACTION

A. Place geocomposite edge drain vertical and flush to side of trench identified in plans and specifications
B. Ensuring no bends, crimps or sags, place approved backfill material in trench
C. Compact backfill material using a method approved by the project engineer, ensuring that the geocomposite edge drain is not damaged during compaction

END OF SECTION