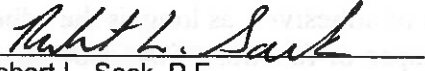


SUPERSEDED BY EB 15-031 EFFECTIVE 9/28/15		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 13-014								
Title: STANDARD SPECIFICATION SECTION 207 – GEOSYNTHETICS											
Target Audience: <table border="0"> <tr> <td>☐ Manufacturers (18)</td> <td>☐ Surveyors (33)</td> </tr> <tr> <td>☒ Local Govt. (31)</td> <td>☒ Consultants (34)</td> </tr> <tr> <td>☒ Agencies (32)</td> <td>☒ Contractors (39)</td> </tr> <tr> <td></td> <td>☐ _____ ()</td> </tr> </table>		☐ Manufacturers (18)	☐ Surveyors (33)	☒ Local Govt. (31)	☒ Consultants (34)	☒ Agencies (32)	☒ Contractors (39)		☐ _____ ()	Approved:  18 JUL 13 Robert L. Sack, P.E. Date Deputy Chief Engineer (Research)	
☐ Manufacturers (18)	☐ Surveyors (33)										
☒ Local Govt. (31)	☒ Consultants (34)										
☒ Agencies (32)	☒ Contractors (39)										
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ADMINISTRATIVE INFORMATION:

- This Engineering Instruction (EI) is effective beginning with projects submitted for the letting of January 9, 2014.
- This EI supersedes a portion of EI 08-006.
- The revisions issued with this EI will be incorporated into the next update of the Standard Specifications.

PURPOSE: The purpose of this EI is to issue revised Standard Specification Section 207 *Geosynthetics*.

TECHNICAL INFORMATION:

- A revision to the Standard Specification 737 *Geosynthetics* is being issued concurrently via EI 13-015.
- The revisions to the Standard Specification Section 207 *Geosynthetics* include the following:
 1. §207-2 *Materials* was revised to include “Adhesives used for joining geotextiles shall be fast-tacking, not be detrimental to the performance, lifespan or function of the geotextile, and create a bond strong enough to meet AASHTO M288 requirements for seam efficiency”.
 2. §207-3.01 A. *General* was revised to include the following statement:
“Geotextiles that are joined using adhesive shall be lapped a minimum of 4 in.”
- The cost impact of the specification change is expected to be negligible.

IMPLEMENTATION:

- The Main Office Design Quality Assurance Bureau will insert these standard specification revisions into contract proposals beginning with projects submitted for the letting of January 9, 2014.

TRANSMITTED MATERIALS: Revisions to Standard Specification Section 207 *Geosynthetics*. Both metric and US Customary revisions are attached.

BACKGROUND: The general term geosynthetics encompasses the subfamilies of geotextiles, geogrids, geocells, geocomposites, and geomembranes. Various construction practices incorporate geosynthetics to take advantage of their properties and ease of installation. Geosynthetics have six primary functions: filtration, drainage, separation, reinforcement, fluid barrier, and protection. The type of geosynthetic used on a particular project will depend on its intended primary function in the installation, and thus its critical properties.

To further develop the existing specification, the Geotechnical Engineering Bureau audited recent Departmental contracts utilizing these items to determine deficiencies. The following was identified:

- Additional Acceptable Material – the specification states that geotextiles may be joined by either sewing or overlapping. However, another acceptable manner to join geotextiles would be with the use of adhesives, as long as the adhesive was found not to be detrimental to the performance, lifespan or function of the geotextile, and could create a bond strength strong enough to meet AASHTO M288 requirements for seam efficiency.

Specific changes to the specification are outlined in the Technical Information section.

CONTACT: Questions or comments regarding this issuance should be directed to Randall J. Romer, P.E., of the Geotechnical Engineering Bureau at (518) 457-4714, or via e-mail at randy.romer@dot.ny.gov. Questions or comments regarding the technical aspects of the revision to the Standard Specification should be directed to Don Dwyer, P.E., of the Geotechnical Engineering Bureau at (518) 457-4724, don.dwyer@dot.ny.gov.

SECTION 207 – GEOSYNTHETICS

Make the following changes to the Standard Specifications dated May 1, 2008 as modified by EI 08-006:

Page 189 through 192, under SECTIONS 207 – GEOTEXTILES AND PREFABRICATED COMPOSITE DRAINS FOR STRUCTURES, **Remove** the entire section and **Replace** it with the following:

SECTION 207 – GEOSYNTHETICS

207-1 DESCRIPTION

207-1.01 Geotextiles. The work shall consist of furnishing and installing approved Geotextile of the Class and Type indicated, at the locations, and in the manner shown on the plans or as directed by the Engineer, in writing, prior to performing the work.

207-1.02 Geomembranes. The work shall consist of furnishing and installing approved Geomembrane, including the preparation of the surface upon which the Geomembrane is placed, at the locations and in the manner shown on the plans or as directed by the Engineer, in writing, prior to performing the work.

207-1.03 Prefabricated Composite Drains for Structures. The work shall consist of furnishing and installing an approved Prefabricated Composite Structural Drain (PCSD) or Prefabricated Composite Integral Abutment Drain (PCIAD) as specified at the location (s) shown on the contract documents or as directed by the Engineer, in writing, prior to performing the work.

Prior to installation, the Contractor shall furnish the Engineer with copies of the manufacturer's literature with details and installation requirements for the PCSD or PCIAD. If not included in the manufacturer's literature, a letter identifying the geotextile wrap shall also be provided to the Engineer.

207-2 MATERIALS. Materials shall meet the requirements specified in the following subsections of Section 700 – Materials.

Geotextiles	§737-01
Geotextile Bedding	§737-01 A.
Geotextile Separation	§737-01 B.
Geotextile Drainage	§737-01 C.
Geotextile Slope Protection	§737-01 D.
Geotextile Stabilization	§737-01 E.
Turbidity Curtain	§737-01 F.
Silt Fence	§737-01 G.
Geomembranes	§737-02
Prefabricated Composite Structural Drains	§737-04
Prefabricated Composite Integral Abutment Drains	§737-05

Materials shall be subject to the Department's Quality Assurance (QA) program outlined in Section 737.

Adhesives used for joining geotextiles shall be fast-tacking, not be detrimental to the performance, lifespan or function of the geotextile, and create a bond strong enough to meet AASHTO M288 requirements for seam efficiency.

207-3 CONSTRUCTION DETAILS

SECTION 207 – GEOSYNTHETICS

207-3.01 Geotextiles

A. General. The Geotextiles shall be protected from exposure to sunlight during transport and storage. After placement, the Geotextile shall not be left uncovered for more than two (2) weeks.

Traffic or construction equipment will not be permitted directly on the Geotextile. Geotextiles may be joined by sewing, using adhesive or overlapping. Sewn seams shall be lapped a minimum of 4 in. and double sewn. The thread used to sew the seam shall be nylon or polypropylene. Geotextiles that are joined using adhesive shall be lapped a minimum of 4 in. Overlapped seams shall have a minimum overlap of 20 in. except when placed under water where the overlap shall be a minimum of 3 ft. All seams shall be subject to the approval of the Engineer. Geotextile which becomes torn or damaged due to the Contractor's operations shall be replaced or patched at no cost to the State. The patch shall extend 3 ft. beyond the perimeter of the tear or damage.

B. Bedding and Slope Protection. The Geotextile shall be placed and anchored on a prepared surface approved by the Engineer. The Geotextile shall be laid loosely but in intimate contact with the soil so that placement of the overlying materials will not stretch or tear the Geotextile. Where Geotextile is placed above water, the backfill placement shall begin at the toe and proceed up the slope.

Where Geotextile is placed under water, the long dimension (provided that the width dimension is wider than the channel width) shall be placed parallel to the direction of flow. If the width dimension is not wider than the channel width, the long dimension shall be placed perpendicular to the direction of flow. Successive Geotextile sheets shall be overlapped so that the upstream sheet is placed over the downstream sheet. As the Geotextile is placed under water, the backfill material shall be placed on it to the required thickness. The Geotextile placement shall not progress more than 50 ft. ahead of the backfill placement.

Rip-rap, stone filling (Heavy) or stone filling (Medium) shall not be dropped onto the Geotextile from a height greater than 1 ft. Slope protection and smaller sizes of stone filling shall not be dropped onto the Geotextile from a height exceeding 3 ft.

C. Separation and Stabilization. The Geotextile shall be placed as directed by the Engineer. The Geotextile shall be laid loosely but in intimate contact with the soil so that placement of the overlying material will not stretch or tear the Geotextile.

D. Drainage. The Geotextile shall be placed to conform loosely to the shape of the trench.

After placing the filter material, the Geotextile shall be folded over the top of the filter material to produce a minimum overlap of 12 in. The Geotextile shall then be covered with the subsequent course.

207-3.02 Geomembranes. The Geomembrane shall be protected during transport and storage. The surface upon which the Geomembrane is to be placed shall be within reasonable conformity to the proposed grade. Traffic or construction equipment will not be permitted directly on the Geomembrane. Care shall be exercised by workers when walking or working on the Geomembrane.

Seams shall be sealed as per the manufacturer's recommendations and to the satisfaction of the Engineer. The edges of the Geomembrane shall be secured in the manner shown on the contract plans or as directed by the Engineer.

Geomembrane which becomes torn or damaged shall be replaced or patched as ordered by the Engineer. The patch shall extend 3 ft. beyond the perimeter of the tear or damage and the seams shall be approved by the Engineer.

207-3.03 Prefabricated Composite Drains for Structures. The Contractor shall install the drain in conformance with the manufacturer's installation procedures. The drain shall be installed so that the backfill, when placed, will be in contact with the geotextile and forms a continuous drainage layer without

SECTION 207 – GEOSYNTHETICS

interruption within the drain's plane. In installations where concrete is to be poured against the prefabricated composite drain, only drains with impermeable cores will be allowed. At all locations, a positive outlet for the water in the drain shall be provided. This may involve making a hole in the core at the weep hole locations for approved drains with an impermeable core. Do not puncture the geotextile. Any damaged geotextile shall be repaired.

Adhesive shall be applied to the wall surface, and not directly to the drain.

During all periods of shipment and storage, the drain shall be wrapped and protected from direct exposure to sunlight, mud, dirt and debris.

Care shall be exercised while backfilling to prevent damage to the drain. Repairs or replacements of drain damaged by construction operations shall be performed, as directed by the Engineer, at no cost to the State.

207-4 METHOD OF MEASUREMENT

207-4.01 Geotextiles

A. General. The quantity of Geotextile will be the number of square yards computed from the payment lines indicated in the contract documents. Measurement will not be made for Geotextile used for repairs, seams, or overlaps. If taken, the amount of quality assurance samples will be added to this quantity.

B. Drainage. The quantity of Geotextile will be measured in area based on the theoretical perimeter determined from the typical section indicated in the contract documents.

207-4.02 Geomembranes. The quantity of Geomembrane will be the number of square yards computed from the payment lines indicated in the contract documents. Measurement will not be made for Geomembranes used for repairs, seams, or overlaps.

207-4.03 Prefabricated Composite Drains for Structures. The quantity of PCSD or PCIAD will be measured in square yards installed computed from the payment lines indicated in the contract documents.

207-5 BASIS OF PAYMENT

207-5.01 Geotextiles. The unit price bid shall include the cost of furnishing all labor, equipment, and materials necessary to complete the work, including the cost of preparing the surface upon which the Geotextile is placed. No payment will be made for replacement or repairs.

207-5.02 Geomembranes. The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work, including the cost of preparing the surface upon which the Geomembrane is placed and securing the edges of the Geomembrane. No payment will be made for replacement or repairs.

207-5.03 Prefabricated Composite Drains for Structures. The unit price bid shall include the cost of furnishing all labor, equipment, and material necessary to complete the work. No payment will be made for repairs or replacement.

Payment will be made under:

Item No.	Item	Pay Unit
207.20	Geotextile Bedding	Square Yard
207.21	Geotextile Separation	Square Yard
207.22	Geotextile Drainage	Square Yard

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207.23	Geotextile Slope Protection	Square Yard
207.24	Geotextile Stabilization	Square Yard
207.25	Geomembrane	Square Yard
207.26	Prefabricated Composite Structural Drain	Square Yard
207.27	Prefabricated Composite Integral Abutment Drain	Square Yard

SECTION 207 – GEOSYNTHETICS

Make the following changes to the Standard Specifications dated May 4, 2006 as modified by EI 08-006:

Page 181 through 183, under SECTIONS 207 – GEOTEXTILES AND PREFABRICATED COMPOSITE DRAINS FOR STRUCTURES, **Remove** the entire section and **Replace** it with the following:

SECTION 207 – GEOSYNTHETICS

207-1 DESCRIPTION

207-1.01 Geotextiles. The work shall consist of furnishing and installing approved Geotextile of the Class and Type indicated, at the locations, and in the manner shown on the plans or as directed by the Engineer, in writing, prior to performing the work.

207-1.02 Geomembranes. The work shall consist of furnishing and installing approved Geomembrane, including the preparation of the surface upon which the Geomembrane is placed, at the locations and in the manner shown on the plans or as directed by the Engineer, in writing, prior to performing the work.

207-1.03 Prefabricated Composite Drains for Structures. The work shall consist of furnishing and installing an approved Prefabricated Composite Structural Drain (PCSD) or Prefabricated Composite Integral Abutment Drain (PCIAD) as specified at the location (s) shown on the contract documents or as directed by the Engineer, in writing, prior to performing the work.

Prior to installation, the Contractor shall furnish the Engineer with copies of the manufacturer's literature with details and installation requirements for the PCSD or PCIAD. If not included in the manufacturer's literature, a letter identifying the geotextile wrap shall also be provided to the Engineer.

207-2 MATERIALS. Materials shall meet the requirements specified in the following subsections of Section 700 – Materials.

Geotextiles	§737-01
Geotextile Bedding	§737-01 A.
Geotextile Separation	§737-01 B.
Geotextile Drainage	§737-01 C.
Geotextile Slope Protection	§737-01 D.
Geotextile Stabilization	§737-01 E.
Turbidity Curtain	§737-01 F.
Silt Fence	§737-01 G.
Geomembranes	§737-02
Prefabricated Composite Structural Drains	§737-04
Prefabricated Composite Integral Abutment Drains	§737-05

Materials shall be subject to the Department's Quality Assurance (QA) program outlined in Section 737.

Adhesives used for joining geotextiles shall be fast-tacking, not be detrimental to the performance, lifespan or function of the geotextile, and create a bond strong enough to meet AASHTO M288 requirements for seam efficiency.

207-3 CONSTRUCTION DETAILS

SECTION 207 – GEOSYNTHETICS

207-3.01 Geotextiles

A. General. The Geotextiles shall be protected from exposure to sunlight during transport and storage. After placement, the Geotextile shall not be left uncovered for more than two (2) weeks.

Traffic or construction equipment will not be permitted directly on the Geotextile. Geotextiles may be joined by sewing, using adhesive or overlapping. Sewn seams shall be lapped a minimum of 100 mm and double sewn. The thread used to sew the seam shall be nylon or polypropylene. Geotextiles that are joined using adhesive shall be lapped a minimum of 100 mm. Overlapped seams shall have a minimum overlap of 500 mm except when placed under water where the overlap shall be a minimum of 1 m. All seams shall be subject to the approval of the Engineer. Geotextile which becomes torn or damaged due to the Contractor's operations shall be replaced or patched at no cost to the State. The patch shall extend 1 m beyond the perimeter of the tear or damage.

B. Bedding and Slope Protection. The Geotextile shall be placed and anchored on a prepared surface approved by the Engineer. The Geotextile shall be laid loosely but in intimate contact with the soil so that placement of the overlying materials will not stretch or tear the Geotextile. Where Geotextile is placed above water, the backfill placement shall begin at the toe and proceed up the slope.

Where Geotextile is placed under water, the long dimension (provided that the width dimension is wider than the channel width) shall be placed parallel to the direction of flow. If the width dimension is not wider than the channel width, the long dimension shall be placed perpendicular to the direction of flow. Successive Geotextile sheets shall be overlapped so that the upstream sheet is placed over the downstream sheet. As the Geotextile is placed under water, the backfill material shall be placed on it to the required thickness. The Geotextile placement shall not progress more than 15 m ahead of the backfill placement.

Rip-rap, stone filling (Heavy) or stone filling (Medium) shall not be dropped onto the Geotextile from a height greater than 0.3 m. Slope protection and smaller sizes of stone filling shall not be dropped onto the Geotextile from a height exceeding 1 m.

C. Separation and Stabilization. The Geotextile shall be placed as directed by the Engineer. The Geotextile shall be laid loosely but in intimate contact with the soil so that placement of the overlying material will not stretch or tear the Geotextile.

D. Drainage. The Geotextile shall be placed to conform loosely to the shape of the trench.

After placing the filter material, the Geotextile shall be folded over the top of the filter material to produce a minimum overlap of 300 mm. The Geotextile shall then be covered with the subsequent course.

207-3.02 Geomembranes. The Geomembrane shall be protected during transport and storage. The surface upon which the Geomembrane is to be placed shall be within reasonable conformity to the proposed grade. Traffic or construction equipment will not be permitted directly on the Geomembrane. Care shall be exercised by workers when walking or working on the Geomembrane.

Seams shall be sealed as per the manufacturer's recommendations and to the satisfaction of the Engineer. The edges of the Geomembrane shall be secured in the manner shown on the contract plans or as directed by the Engineer.

Geomembrane which becomes torn or damaged shall be replaced or patched as ordered by the Engineer. The patch shall extend 3 ft. beyond the perimeter of the tear or damage and the seams shall be approved by the Engineer.

207-3.03 Prefabricated Composite Drains for Structures. The Contractor shall install the drain in conformance with the manufacturer's installation procedures. The drain shall be installed so that the backfill, when placed, will be in contact with the geotextile and forms a continuous drainage layer without interruption within the drain's plane. In installations where concrete is to be poured against the

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prefabricated composite drain, only drains with impermeable cores will be allowed. At all locations, a positive outlet for the water in the drain shall be provided. This may involve making a hole in the core at the weep hole locations for approved drains with an impermeable core. Do not puncture the geotextile. Any damaged geotextile shall be repaired.

Adhesive shall be applied to the wall surface, and not directly to the drain.

During all periods of shipment and storage, the drain shall be wrapped and protected from direct exposure to sunlight, mud, dirt and debris.

Care shall be exercised while backfilling to prevent damage to the drain. Repairs or replacements of drain damaged by construction operations shall be performed, as directed by the Engineer, at no cost to the State.

207-4 METHOD OF MEASUREMENT

207-4.01 Geotextiles

A. General. The quantity of Geotextile will be the number of square meters computed from the payment lines indicated in the contract documents. Measurement will not be made for Geotextile used for repairs, seams, or overlaps. If taken, the amount of quality assurance samples will be added to this quantity.

B. Drainage. The quantity of Geotextile will be measured in area based on the theoretical perimeter determined from the typical section indicated in the contract documents.

207-4.02 Geomembranes. The quantity of Geomembrane will be the number of square meters computed from the payment lines indicated in the contract documents. Measurement will not be made for Geomembranes used for repairs, seams, or overlaps.

207-4.03 Prefabricated Composite Drains for Structures. The quantity of PCSD or PCIAD will be measured in square meters installed computed from the payment lines indicated in the contract documents.

207-5 BASIS OF PAYMENT

207-5.01 Geotextiles. The unit price bid shall include the cost of furnishing all labor, equipment, and materials necessary to complete the work, including the cost of preparing the surface upon which the Geotextile is placed. No payment will be made for replacement or repairs.

207-5.02 Geomembranes. The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work, including the cost of preparing the surface upon which the Geomembrane is placed and securing the edges of the Geomembrane. No payment will be made for replacement or repairs.

207-5.03 Prefabricated Composite Drains for Structures. The unit price bid shall include the cost of furnishing all labor, equipment, and material necessary to complete the work. No payment will be made for repairs or replacement.

Payment will be made under:

Item No.	Item	Pay Unit
207.20	Geotextile Bedding	Square Meter
207.21	Geotextile Separation	Square Meter
207.22	Geotextile Drainage	Square Meter
207.23	Geotextile Slope Protection	Square Meter

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207.24	Geotextile Stabilization	Square Meter
207.25	Geomembrane	Square Meter
207.26	Prefabricated Composite Structural Drain	Square Meter
207.27	Prefabricated Composite Integral Abutment Drain	Square Meter