This HydroTurf® Specification document has been prepared to provide the Owner, Design Engineer, Construction Quality Assurance Professional of Record, and the Contractor / Installer with a general guidance specification. All information, recommendations and suggestions appearing in this specification concerning the use of our products are based upon experience, tests and data believed to be reliable; however, this information should not be used or relied upon for any specific application without independent professional examination and verification of its accuracy, suitability and applicability. The independent professional shall edit this document to suit the site specific project design criteria. Since the actual use by others is beyond our control, no guarantee or warranty of any kind, expressed or implied, is made by Watershed Geosynthetics LLC as to the effects of such use or the results to be obtained, nor does Watershed Geosynthetics LLC assume any liability in connection herewith. Any statement made herein may not be absolutely complete since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations. HydroTurf® product (US Patent Nos. 7,682,105, 8,585,322, and 9,163,375; Canadian Patent No. 2,663,170; and other Patents Pending) and trademark are the property of Watershed Geosynthetics LLC. Nothing herein is to be construed as permission to grant license or as a recommendation to infringe any patent.

Note to Author: This Specification should be edited in all places where it may be in conflict with other contract requirements. Specific areas of concern are highlighted throughout this document where site specific contract requirements may change. The engineer of record is responsible for ensuring this document conforms to all professional, contract and regulatory requirements. Please make any site specific changes, and then delete highlighted notes in the final issued specification.

SECTION 03 49 01

HYDROTURF® HYDROBINDER® INFILL SPECIFICATION

PART 1: GENERAL

1.01 SUMMARY

A. Section Includes:

1. Specifications for the HydroBinder® Infill Component of the patented HydroTurf® System.

1.02 RELATED SECTIONS

Select Appropriate Sections based on HydroTurf CS or HydroTurf Z

Section 31 23 13 - Subgrade Preparation
Section 01 42 00 - HydroTurf CS References and Definitions
Section 01 42 00 - HydroTurf Z References and Definitions
Section 01 73 19 - HydroTurf CS Structured Geomembrane Specifications
Section 01 73 19 - HydroTurf CS MicroSpike Geomembrane Specification
Section xx xx xx - HydroTurf CS Engineered Turf Specifications
Section xx xx xx - HydroTurf Z Engineered Turf Specifications
Section 03 05 59 - Penetrating Catalyzed Colloidal Silicate Concrete Treatment for HydroTurf
1.03 REFERENCES

B. See Section 01 42 00 - References and Definitions

1.04 SUBMITTALS

A. HYDROBINDER INSTALLER
   1. HYDROBINDER INSTALLER shall submit a certificate stating that the HydroBinder meets or exceeds the requirements outlined in the project specifications, including:
      a. That the type of cement meeting the requirements of ASTM C150 (AASHTO M85) Type I or Type II; and
      b. That the cementitious infill mix shall have a minimum 28-day compressive strength of 5000 psi in accordance with ASTM C 387 as tested in accordance with ASTM C 109.

PART 2: PRODUCTS

2.01 HYDROTURF HYDROBINDER INFILL COMPONENT

A. DESCRIPTION
   1. HydroBinder is a proprietary cementitious product used as the infill component of the HydroTurf system.
   2. HydroBinder shall be supplied by Watershed Geosynthetics as a component of the HydroTurf Revetment System.

B. MATERIALS
   1. The infill will be HydroBinder Cementitious Infill;
   2. The infill material may be delivered in either pallet form of 80 lb. bags, 1000 lb. bulk bags, or 3000 lb. bulk bag super sacks;
   3. Cement, except as otherwise specified herein, will be a brand of Portland Cement, meeting ASTM C 150 and will be Type I or Type II;
   4. Only one brand of cement will be used throughout the duration of this Contract;
   5. The cementitious infill mix will conform to the requirements of ASTM C 387.
for high strength mortars;

6. The cementitious infill mix will have a minimum 28-day compressive strength of 5000 psi as measured in accordance with ASTM C109; and

Select whether the Catalyzed Colloidal Silicate Concrete Treatment is needed, it is used in areas of Freeze Thaw

7. Freeze-thaw properties of the HydroTurf system with the HydroBinder infill treated with the Catalyzed Colloidal Silicate Concrete Treatment shall have been tested in accordance to ASTM C666 with the results of 0.2% loss (avg.) at 100 cycles and <3.0% loss (avg.) at 300 cycles.

PART 3: EXECUTION:

3.01 INSTALLERS

A. Installer shall be trained by Watershed Geosynthetics, LLC.

3.02 HYDROBINDER PLACEMENT

A. Placement of HydroBinder infill shall be performed as follows:

a. HydroBinder is delivered to the jobsite on pallets in either 3000# bulk bags (1 per pallet) or 80# bags (42 per pallet). It is delivered on a flatbed with 16 pallets (typical) per truckload.

b. The HydroBinder shall be installed into the turf while it is in a dry state.

c. Prior to placing the HydroBinder, the engineered turf shall be dry. If the turf is wet from rain or dew, the installer shall wait until it is dry. The installer may attempt to speed up the drying process by using a blower (i.e., leaf blower, industrial blower, etc.).

d. HydroBinder shall not be installed in inclement, wet or rainy weather, or the threat of inclement weather. Also, the HydroBinder shall not be installed in cold weather as defined by American Concrete Institute (ACI) 306.

e. The HydroBinder infill shall be placed at a minimum thickness of ¾-in. This thickness is achieved by placing approximately 6 to 7 lbs/sf of the dry HydroBinder over the engineered synthetic turf.

f. The infill is to be placed / spread using a manual drop spreader, top-dresser and/or drop spreader attached to low ground pressure equipment.
with adequate dust control. Alternative methods can be used to spread and place the infill as approved by the Owner’s Representative and/or Engineer. Contractor shall explain in detail in the pre-construction meeting the method of infill deployment to be used. The Owner’s Representative and/or Engineer shall approve the method.

g. Manual hand spreading is acceptable when equipment is not practical.

B. The HydroBinder infill will need to be worked into the turfs of the engineered turf such that the turf fibers are in an upright position. This can be achieved as follows:

h. The infill shall be worked into the tuft fibers so the tuft fibers are in an upright position with the infill at a measurable 7/8-inch minimum depth. This is achieved with common mechanical turf broom, power broom, shop broom, yard rakes, or greens groomer rakes.

i. Brushing should be performed in all four directions starting with the direction against the lay of the fibers. Multiple passes may be required.

j. The HydroBinder may need to be placed in 2 to 4 lifts with brushing in between lifts to effectively work the material into the tufts and achieve fibers that are upright.

k. The engineered turf shall be visually inspected to confirm that the turf fibers are upright and that there are no trapped fibers.

l. Thickness measurements of the HydroBinder infill shall be taken using a caliper or equivalent device. Measurements shall be taken at a minimum frequency of 5 measurements per 1,000 sf (for smaller projects) or 20 per acre (for larger projects) of installed area.

m. The desired HydroBinder infill thickness shall be achieved prior to the hydration process.

C. The HydroBinder infill shall be hydrated in place as follows:

n. The hydration process shall occur on the same day as the HydroBinder infill placement.

o. The infill shall be hydrated thoroughly with a light and consistent spray of water to avoid displacement of the non-hydrated infill. Estimated application rate is between 0.12 and 0.20 gallons per square foot of area.

p. The installer shall not overhydrate the infill so that water begins to runoff and cause loss of cement infill during the process. The general objective is to soak the area to start the hydration process but not to inundate with water beyond saturation of the infill.
q. The Owner’s Representative shall visually verify that the HydroBinder infill has been fully hydrated, and not over hydrated. Visually observe that the top of the HydroBinder has a wet sheen (denoting saturation) but that water is not ponding on top. Also, excavate (with finger or small tool) into the HydroBinder to confirm full hydration of the section has been achieved.

r. To improve curing, the hydrated area may be covered with plastic sheeting.

s. If cold weather temperatures are expected, the hydrated area should be covered with heated blankets and plastic sheeting. Procedures in ACI 306 shall be followed for cold weather HydroBinder installation.

t. The HydroBinder infill shall harden within 24 hours following hydration, and shall reach its maximum compressive strength at 28 days. If the HydroBinder has not hardened in 24 hours, it will need to be removed and replaced.

u. Personnel access on the HydroTurf shall be prohibited following the hydration of the HydroBinder until it sets up hard (approximately 24 hours).

D. Once hydration is completed and the HydroBinder has set up (min. 24 hours); backfill and compaction of the remaining perimeter anchor trenches may be performed. The HydroBinder infill layer may be placed using appropriate equipment capable of completing the work;

E. Manual hand spreading and raking is acceptable when mechanical equipment is not practical;

F. CQA PERSONNEL shall verify the following:

   1. INSTALLER shall explain in detail in the pre-construction meeting the method of HydroBinder infill deployment;
   
   2. Installation of HydroBinder infill will only be performed by a Watershed Geosynthetics’ trained installer;
   
   3. HydroBinder shall not be installed in inclement, wet or rainy weather, or the threat of inclement weather;
   
   4. The HydroBinder shall not be installed in freezing temperatures;
   
   5. The HydroBinder will be installed into the turf while it is in a dry state;
6. The HydroBinder will be worked into the tufts so the tufts are in an upright position;

7. The HydroBinder infill will be placed dry at a minimum thickness of ¾ inch.;

8. Do not backfill anchor trenches until turf has been infilled with HydroBinder infill;

9. The hydration process must occur the day of the HydroBinder infill placement;

10. The desired HydroBinder infill thickness will be achieved and confirmed by measurements prior to the hydration process;

11. The cemented infill is hydrated thoroughly however care must be taken to avoid displacement of the non-hydrated infill;

12. Hydration shall start at the upstream or upslope portion and move downstream or downslope;

13. The objective is to soak the area to start the hydration process but not to inundate with water beyond saturation;

14. Once hydration is completed as described, backfill and compaction of the anchor trenches should take place;

15. HydroBinder that does not set up within 24 hours on account of improper hydration shall be removed and replaced;

16. Cold weather installation of HydroBinder shall be performed in accordance with American Concrete Institute (ACI) - 306R-10 Guide to Cold Weather Concreting; and,

17. For projects where Catalyzed Colloidal Silicate Concrete Treatment is required. Once hydration has been completed, and the HydroBinder has cured for a minimum of 24 hours and has fully set up; the HydroBinder Catalyzed Colloidal Silicate Concrete Treatment shall be sprayed onto the HydroTurf System in accordance with Section 03 05 59 of these Specifications.