Watershed Geo®
Unearthing Solutions

TECHNICAL NOTE

SLIP, SKID, AND SLIDE RESISTANCE OF THE HYDROTURF® ADVANCED REVETMENT TECHNOLOGY

HydroTurf® will resist pedestrian and vehicle slipping, skidding, and sliding. HydroTurf has a 33-degree interface friction angle (min Peak), and its coefficient of friction (COF) against sliding is 0.84 (dry) and 0.51-0.54 (wet).

The slip, skid and slide resistance of HydroTurf is an important property since it is used on parking areas, trails / paths, access roads, slopes, and other areas that may have pedestrian and/or vehicle traffic. To evaluate the slip, skid and slide resistance of HydroTurf, Watershed Geo had static coefficient of friction (COF) testing performed on the system in accordance with ASTM C 1028 by an independent laboratory. HydroTurf outperforms the COF against sliding for most other outdoor surfaces (see Table 2).

In accordance with the Engineer Manual on the Design and Construction of Levees published by the US Army Corps of Engineers [1], the access roads should be all weather roads. This will allow vehicles appropriate access for inspection, maintenance, and flood-fighting operation. The manual states that "road should be surfaced with a suitable gravel or crushed stone base course". Table 2 shows the COF for "Gravel / Dirt Road". HydroTurf significantly outperforms the gravel road with respect to skid and sliding resistance. HydroTurf exceeds the US Army Corps of Engineers design criteria for access road surfacing.

The US Department of Justice (DOJ) published the ADA Standards for Accessible Design in accordance with the Americans with Disabilities Act. Per Section 302.1 of Chapter 3 of these ADA Standards, floor and ground surfaces "shall be stable, firm and slip resistant". HydroTurf is a stable, firm and slip resistant surface. The 5,000-psi compressive strength mortar infill (referred to as "HydroBinder® Infill") meets the requirements for stable and firm. Also, HydroTurf meets the slip resistant requirements

[1] US Army Corps of Engineers, Engineer Manual EM 1110-2-1913, "Design and Construction of Levees", April 30, 2000.

11400 Atlantis Place, Ste 200
Alpharetta, GA 30022
770-777-0386
www.watershedgeo.com

based on its COF which is higher than most other outdoor surfaces (see Table 2). HydroTurf is compliant with the ADA Standards.

Table 2 – Coefficient of Friction for HydroTurf Compared to Other Road Surfaces

Condition	HydroTurf COF	Asphaltic Concrete COF [2]	Concrete COF [3]	Gravel / Dirt Road COF [4]	Natural Grass COF
Dry	0.84	0.65	0.75	0.35	0.36 [5]
Wet	0.51 - 0.54	0.50	0.60	NP	0.20 [6]

LIMITATIONS

HydroTurf® is a U.S. registered trademark which designates a product from Watershed Geosynthetics LLC. This product is the subject of issued U.S. and foreign patents and/or pending U.S. and foreign patent applications. All information, recommendations and suggestions appearing in this literature concerning the use of our products are based upon 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. 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. Nothing herein is to be construed as permission or as a recommendation to infringe any patent.

[2] Noon, R.K. (1994) – "Engineering Analysis of Vehicular Accidents", CRC Press, Boca Raton.
[3] Noon, R.K. (1994) – "Engineering Analysis of Vehicular Accidents", CRC Press, Boca Raton.
[4] Noon, R.K. (1994) – "Engineering Analysis of Vehicular Accidents", CRC Press, Boca Raton.
[5] Engineers Edge – "Coefficient of Friction Equation and Table Chart".
[6] Noon, R.K. (1994) – "Engineering Analysis of Vehicular Accidents", CRC Press, Boca Raton.