

**TABLE 1. GEOTEXTILE STRENGTH PROPERTY REQUIREMENTS<sup>(1)</sup>**

**CLASS 2 GEOTEXTILE**

	TEST METHODS	UNITS	NONWOVEN	MONOFILAMENT
			ELONGATION ≥ 50% <sup>(2)</sup>	WOVEN ELONGATION < 50% <sup>(2)</sup>
GRAB STRENGTH	ASTM D 4632	(LBS.)	160	250
SEWN SEAM STRENGTH	ASTM D 4632	(LBS.)	140	220
TEAR STRENGTH	ASTM D 4533	(LBS.)	55	55
PUNCTURE STRENGTH	ASTM D 4833	(LBS.)	55	90

**PROPERTY NOTES FOR TABLE 1**

1. ALL NUMERIC VALUES IN TABLE 1 REPRESENT MINIMUM AVERAGE ROLL VALUES (MARV) IN THE WEAKER PRINCIPAL DIRECTION.
2. AS MEASURED IN ACCORDANCE WITH ASTM D 4632.

**TABLE 2. SUBSURFACE DRAINAGE GEOTEXTILE REQUIREMENTS**

**CLASS 2 GEOTEXTILES**

	TEST METHODS	UNITS	REQUIREMENTS PERCENT IN-SITU SOIL PASSING NO. 200 <sup>(1)</sup>		
			< 15	15 TO 50	> 50
PERMITTIVITY <sup>(4)</sup>	ASTM D 4491	sec <sup>-1</sup>	0.5	0.2	0.1
APPARENT OPENING SIZE <sup>(3)</sup>	ASTM D 4751	mm	0.43	0.25	0.22 <sup>(2)</sup>
ULTRAVIOLET STABILITY (RETAINED STRENGTH)	ASTM D 4355	%	50% AFTER 500 HRS. OF EXPOSURE		

**PROPERTY NOTES FOR TABLE 2.**

1. BASED ON GRAIN SIZE ANALYSIS OF IN-SITU SOIL IN ACCORDANCE WITH AASHTO T 88.
2. FOR COHESIVE SOILS WITH A PLASTICITY INDEX GREATER THAN 7, GEOTEXTILE MAXIMUM AVERAGE ROLL VALUE FOR APPARENT OPENING SIZE IS 0.30 mm.
3. MAXIMUM AVERAGE ROLL VALUE.
4. MINIMUM AVERAGE ROLL VALUE (MARV) IN THE WEAKER PRINCIPAL DIRECTION.

CERTIFICATION SHALL BE FURNISHED IN ACCORDANCE WITH 101.03 (CERTIFIED TEST DATA) OF THE SPECIFICATIONS AND PER AASHTO M 288; ALL BEFORE THE FABRIC IS PLACED. THE ENGINEER MAY REQUIRE SAMPLING FOR TESTING PURPOSES AS DIRECTED BY THE LABORATORY AND PER THE APPLICABLE PORTIONS OF AASHTO M 288.

**CONSTRUCTION REQUIREMENTS**

**GEOTEXTILE PACKAGING AND STORING.** THE GEOTEXTILE ROLLS SHALL BE FURNISHED WITH SUITABLE WRAPPING FOR PROTECTION AGAINST MOISTURE, EXTENDED ULTRAVIOLET EXPOSURE, CONTAMINANTS AND DAMAGE DUE TO SHIPPING. EACH ROLL SHALL BE LABELED OR TAGGED TO PROVIDE PRODUCT IDENTIFICATION SUFFICIENT FOR FIELD INVENTORY AND QUALITY CONTROL PURPOSES. ROLLS SHALL BE STORED IN A MANNER WHICH PROTECTS THEM FROM THE ELEMENTS. IF STORED OUTDOORS, THEY SHALL BE ELEVATED AND PROTECTED WITH A WATERPROOF COVER.

**GEOTEXTILE EXPOSURE FOLLOWING PLACEMENT.** EXPOSURE OF GEOTEXTILES TO THE ELEMENTS BETWEEN LAYDOWN AND COVER SHALL BE KEPT TO A MINIMUM. GEOTEXTILES SHALL BE PLACED AND COVERED AS QUICKLY AS POSSIBLE. IN ANY CASE, EXPOSURE SHALL NOT EXCEED SEVEN (7) DAYS.

**SEWN SEAMS.** BOTH FACTORY AND FIELD SEWN SEAMS SHALL CONFORM TO THE STRENGTH REQUIREMENTS OF THE "MATERIALS" SECTION SPECIFIED HEREIN. ALL SEAMS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. THREADS USED FOR SEWING SHALL CONSIST OF HIGH STRENGTH POLYPROPYLENE OR POLYESTER. NYLON THREAD SHALL NOT BE USED. THE THREAD SHALL BE OF CONTRASTING COLOR TO THAT OF THE GEOTEXTILE ITSELF. FOR SEAMS WHICH ARE SEWN IN THE FIELD, THE CONTRACTOR SHALL PROVIDE AT LEAST A SIX (6) FOOT LENGTH OF SEWN SEAM FOR SAMPLING BY THE ENGINEER BEFORE THE GEOTEXTILE IS INSTALLED. FOR SEAMS WHICH ARE SEWN IN THE FACTORY, THE ENGINEER SHALL OBTAIN SAMPLES OF THE FACTORY SEAMS AT RANDOM FROM ANY ROLL OF GEOTEXTILE WHICH IS USED ON THE PROJECT. FOR SEAMS THAT ARE FIELD SEWN, THE SEAMS SEWN FOR SAMPLING

SHALL BE SEWN USING THE SAME EQUIPMENT AND PROCEDURES AS WILL BE USED FOR THE PRODUCTION SEAMS. IF SEAMS ARE SEWN IN BOTH THE MACHINE AND CROSS MACHINE DIRECTION, SAMPLES OF SEAMS FROM BOTH DIRECTIONS SHALL BE PROVIDED. THE SEAM ASSEMBLY DESCRIPTION SHALL BE SUBMITTED BY THE CONTRACTOR ALONG WITH THE SAMPLE OF THE SEAM. THE DESCRIPTION SHALL INCLUDE THE SEAM TYPE, STITCH TYPE, SEWING THREAD AND STITCH DENSITY.

**SITE PREPARATION.** THE INSTALLATION SITE SHALL BE PREPARED IN ACCORDANCE WITH ITEM 204 - SUBGRADE COMPACTION. REMOVE ALL SHARP OBJECTS AND LARGE STONES FROM THE SUBGRADE.

**INSTALLATION.** THE GEOTEXTILE SHALL BE UNROLLED AND LAID AS SMOOTHLY AS POSSIBLE ON THE PREPARED AND ACCEPTED SUBGRADE IN THE DIRECTION OF CONSTRUCTION TRAFFIC. WRINKLES OR FOLDS SHALL BE AVOIDED. ADJACENT GEOTEXTILE ROLLS SHALL BE OVERLAPPED TWO (2) FEET IN THE DIRECTION OF SUBBASE PLACEMENT. THE GEOTEXTILE MAY BE HELD IN PLACE PRIOR TO SUBBASE PLACEMENT BY PINS, STAPLES, OR PILES OF SUITABLE SUBBASE MATERIAL. ON CURVES, THE GEOTEXTILE MAY BE FOLDED OR CUT TO CONFORM TO THE CURVES. THE FOLD OR OVERLAP SHALL BE IN THE DIRECTION OF CONSTRUCTION AND HELD IN PLACE AS PRESCRIBED ABOVE.

**DAMAGE REPAIR.** PRIOR TO COVERING, THE GEOTEXTILES SHALL BE INSPECTED BY A CERTIFIED INSPECTOR OF THE ENGINEER TO ENSURE THAT THE GEOTEXTILE HAS NOT BEEN DAMAGED (i.e., HOLES, TEARS, RIPS) DURING THE INSTALLATION. DAMAGED GEOTEXTILES, AS IDENTIFIED BY THE ENGINEER, SHALL BE REPAIRED IMMEDIATELY. COVER THE DAMAGED AREA WITH A GEOTEXTILE PATCH, WHICH EXTENDS TWO (2) FEET BEYOND THE DAMAGED AREA.

**SUBBASE PLACEMENT.** THE SUBBASE SHALL BE PLACED BY END DUMPING ONTO THE GEOTEXTILE FROM THE EDGE OF THE GEOTEXTILE, OR OVER PREVIOUSLY PLACED SUBBASE AGGREGATE. CONSTRUCTION VEHICLES SHALL NOT BE ALLOWED DIRECTLY ON THE GEOTEXTILE. USING A MOTOR GRADER OR BULLDOZER, SPREAD THE SUBBASE MATERIAL FROM THE BACK-DUMPED PILE. MAINTAIN A MINIMUM LIFT THICKNESS OF SIX (6) INCHES BETWEEN THE GEOTEXTILE AND EQUIPMENT TIRES OR TRACKS AT ALL TIMES. ANY SUDDEN STOPS, STARTS OR TURNS ON THE SUBBASE MATERIAL BY CONSTRUCTION EQUIPMENT SHALL BE AVOIDED. IF VIBRATORY COMPACTORS ARE USED, REASONABLE COMPACTION AND RUT STABILITY MUST FIRST BE ESTABLISHED BY THE SUBBASE SPREADING EQUIPMENT. ANY RUTS OCCURRING DURING CONSTRUCTION SHALL BE FILLED WITH ADDITIONAL SUBBASE MATERIAL, AND COMPACTION TO THE SPECIFIED DENSITY. IF PLACEMENT OF BACKFILL MATERIAL CAUSES DAMAGE TO THE GEOTEXTILE, THE DAMAGED AREA SHALL BE REPAIRED IMMEDIATELY. CLEAR THE DAMAGED AREA, PLUS AN ADDITIONAL THREE (3) FEET AROUND THE DAMAGED AREA OF ALL FILL MATERIAL. COVER THE DAMAGED AREA WITH A GEOTEXTILE PATCH AS PREVIOUSLY DESCRIBED IN THE "DAMAGE REPAIR" SECTION HEREIN. REPLACE THE REMOVED SUBBASE MATERIAL, COMPACTION TO THE SPECIFIED DENSITY. ALL SUBSEQUENT SUBBASE PLACEMENT PROCEDURES SHALL BE MODIFIED, AS REQUIRED, TO ELIMINATE FURTHER DAMAGE FROM TAKING PLACE (i.e., INCREASE INITIAL LIFT THICKNESS, DECREASE EQUIPMENT LOADS, ETC.).

**ITEM 605 - 6" BASE PIPE UNDERDRAINS WITH FABRIC WRAP, AS PER PLAN**

THE FOLLOWING SIX (6) INCH PERFORATED PIPE MATERIAL MAY BE USED: 706.06, 706.08, 707.41, 707.42 (PERFORATED PER 707.31) AND 707.45 (PERORATED PER 707.31). WHERE DIRECTED/APPROVED BY THE ENGINEER, 707.31 MAY BE USED FOR RADIUS RETURNS AT INTERSECTIONS.

THE SIZE OF UNDERDRAIN PIPE SHALL NOT BE REDUCED FROM THE SIZE SPECIFIED IN THE PLANS/PROPOSAL.

GRANULAR BACKFILL MATERIAL SHALL BE LIMITED TO LIMESTONE.

THE FABRIC WRAP SHALL BE A NON-WOVEN OR MONOFILAMENT WOVEN GEOTEXTILE FABRIC MEETING THE REQUIREMENTS OF AASHTO M 288, TABLE 1 (CLASS 3) AND TABLE 2. SEE DETAIL ON THE CUYAHOGA COUNTY ENGINEER'S CONSTRUCTION DRAWING MD-1C.

**SPECIFICATIONS**

ALL PAVEMENT AND GRADING CONSTRUCTED WITHIN THE PROPOSED RIGHT-OF-WAY SHALL BE PERFORMED IN ACCORDANCE WITH THESE DRAWINGS AND THE 2013 CONSTRUCTION AND MATERIAL SPECIFICATIONS OF THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION (O.D.O.T.), INCLUDING ALL CHANGES, REVISIONS, SUPPLEMENTAL SPECIFICATIONS AND SUPPLEMENTAL CONSTRUCTION DRAWINGS REFERENCED HEREIN. REFERENCE CURRENT VERSION OF O.D.O.T. SUPPLEMENTAL SPECIFICATION SS 800 FOR THE APPLICABLE UPDATES TO THE 2013 SPECIFICATIONS.

**ELEVATION DATUM**

ELEVATIONS SHOWN ARE BASED ON CLEVELAND REGIONAL GEODETIC SURVEY (C.R.G.S.) DATA. MONUMENTS ARE DESCRIBED ON THE PLANS.

**UNDERGROUND UTILITIES**

THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS AS REQUIRED BY SECTION 153.64 O.R.C.

CALL THE OHIO UTILITIES PROTECTION SERVICE (OUPS) TWO (2) WORKING DAYS BEFORE YOU DIG; TOLL FREE NO. 1-800-362-2764. NONMEMBERS MUST BE CALLED DIRECTLY.

CALL THE OHIO OIL & GAS PRODUCERS UNDERGROUND PROTECTION SERVICE (OGPUPS) TWO (2) WORKING DAYS BEFORE YOU DIG; TOLL FREE NO. 1-800-925-0988.

**DUST CONTROL**

THE CONTRACTOR SHALL FURNISH AND APPLY ITEM 616 WATER AND ITEM 616 CALCIUM CHLORIDE FOR DUST CONTROL AS DIRECTED BY THE ENGINEER.

**MONUMENT ASSEMBLIES**

AT THE LOCATIONS SHOWN ON THE PLANS, MONUMENT ASSEMBLIES CONFORMING TO THE CUYAHOGA COUNTY ENGINEER'S CONSTRUCTION DRAWING MB-2C SHALL BE ENTIRELY INSTALLED, INCLUDING THE "MONUMENT PIN", BY THE CONTRACTOR UNDER THE SUPERVISION OF A LICENSED SURVEYOR.

**ITEM 304 - AGGREGATE BASE, AS PER PLAN**

MATERIAL FURNISHED FOR THIS ITEM SHALL BE LIMITED TO CRUSHED CARBONATE STONE.

AGGREGATE BASE MATERIAL MAY BE SPREAD UPON THE SUBGRADE ONLY AFTER THE PRESCRIBED SUBGRADE AND SUBBASE DRAINAGE HAS BEEN PLACED.

REFERENCE IS ALSO MADE TO THE "SUBGRADE PLACEMENT" REQUIREMENTS OF THE "ITEM SPECIAL - SUBGRADE GEOTEXTILE FABRIC" PLAN NOTE.

**ITEM SPECIAL - SUBGRADE GEOTEXTILE FABRIC**

**DESCRIPTION**

THIS WORK SHALL CONSIST OF FURNISHING AND PLACING A NONWOVEN OR A MONOFILAMENT WOVEN GEOTEXTILE FABRIC BETWEEN THE COMPLETED/ACCEPTED SUBGRADE AND THE AGGREGATE BASE (SUBBASE) FOR USE AS A PERMEABLE SEPARATOR WHICH ALLOWS LONG-TERM PASSAGE OF WATER WHILE RETAINING IN-SITU SOIL WITHOUT CLOGGING; ALL IN ACCORDANCE WITH THESE SPECIFICATIONS, THE APPLICABLE PROVISIONS OF AASHTO M 288, THE MANUFACTURER'S RECOMMENDATIONS AND AT THE DIRECTION OR APPROVAL OF THE ENGINEER.

**MATERIALS**

FIBERS USED IN THE MANUFACTURE OF THE GEOTEXTILES, AND THE THREADS USED IN JOINING GEOTEXTILES BY SEWING, SHALL BE RESISTANT TO CHEMICAL ATTACK, MILDEW, AND ROT; AND SHALL CONSIST OF LONG-CHAIN SYNTHETIC POLYMERS, COMPOSED OF AT LEAST 95 PERCENT BY WEIGHT OF POLYOLEFINS OR POLYESTERS. THEY SHALL BE FORMED INTO A STABLE NETWORK SUCH THAT THE FILAMENTS OR YARNS RETAIN THEIR DIMENSIONAL STABILITY RELATIVE TO EACH OTHER, INCLUDING SELVAGES. ACCEPTABLE/APPROVED NONWOVEN OR MONOFILAMENT WOVEN GEOTEXTILES USED FOR THIS PURPOSE (SUBGRADE/SUBBASE-SEPARATION/FILTRATION) SHALL MINIMALLY CONFORM TO THE APPLICABLE PHYSICAL REQUIREMENTS OF AASHTO M 288, "TABLE 1 (CLASS 2)" AND "TABLE 2" FOR "CLASS 2 GEOTEXTILES" AS SHOWN HEREINAFTER.

**CUYAHOGA COUNTY ENGINEER**

**MINIMUM CONSTRUCTION STANDARDS FOR TOWNSHIP SUBDIVISION STREETS (LOCAL) TYPE 451 PAVEMENT**

**DATE**  
08-28-07  
10-10-08  
08-01-09  
07-19-10  
06-16-11  
11-15-13

**STANDARD CONSTRUCTION DRAWING**

**DWG. NO. 3 OF 4**