Additional Required Drawings to be Included in Design Package

1. Plan View (including topo) identifying location and extent of road work
2. Profile and Cross Section (cut/fill volumes recommended)
3. Pollution/Erosion Control drawings (as required)
4. Quantities – cut/fill volumes, aggregate, getotextile, riprap, concrete, pipe (as req'd)

TABLE 1. REQUIRED DEPTH OF SURFACING ROCK*

RELATIVE QUALITY OF ROADBED SOIL	MINIMUM AGGREGATE THICKNESS *		FINES
	W/GEOTEXTILE	W/O GEOTEXTILE	MAX (%)
All Surfaces	3"	3"	7 – 12%

* See TABLE 3 for Standard Gradation Specifications for SURFACE COURSE AGGREGATE

TABLE 2. REQUIRED DEPTH OF AGGREGATE*

RELATIVE QUALITY OF ROADBED SOIL	MINIMUM AGGREGATE THICKNESS *		FINES
	W/GEOTEXTILE	W/O GEOTEXTILE	MAX (%)
Very Good (rocky or full bench)	not required	3" to 4"	0 – 7%
Good (typical drained forest soil)	4"	8"	0 – 7%
Fair (well drained clay or silt)	8"	12"	0 – 7%
Poor (wet clay or silt)	14"	22"	0 – 7%
Very Poor (wetland)	16"	34"	0 – 7%
AASHTO Designation M-145. Soil Classification for site may be obtained from the USDA NRCS Web Soil Survey.			

* See TABLE 4a or 4b for Standard Gradation Specifications for BASE AGGREGATE

TABLE 3. Standard Gradation Specifications for SURFACE COARSE AGGREGATE for all Roads

SIEVE SIZE	PERCENT PASSING		
	1.5 inch	1 inch	3/4 inch *
2"	100	---	---
1.5"	95–100	100	---
1"	80–95	95–100	100
3/4"	70–90	75–95	90–100
1/4" or #4	40–60	50–75	50–75
#10	25–40	25–50	30–55
#40	8–16***	8–16**	8–16**

TABLE 4a. Standard Gradation Specifications for BASE AGGREGATE for use on Wet Weather Haul Roads and Roads that drain to Streams/Rivers

SIEVE SIZE	PERCENT PASSING		
	3 inch	2 inch	1.5 inch ***
4"	100	---	---
3"	95–100	100	---
2"	---	95–100	100
1.5"	70–90	---	95–100
1"	---	70–90	---
3/4"	50–80	---	70–90
1/4" or #4	35–60	50–80	40–60
#10	25–50	25–50	30–50
#40	5–15	5–20	10–20

TABLE 4b. Standard Gradation Specifications for BASE AGGREGATE on Non-Environmentally Sensitive Roads or Light Use Roads

SIEVE SIZE	PERCENT PASSING	
	3 inch	2 inch
4"	100	---
3"	95–100	100
2"	---	95–100
1.5"	70–90	---
1"	---	70–90
3/4"	50–70	---
1/4" or #4	---	20–60
#10	0–30	0–30
#40	0–10	0–10

* Standard for spur if quarry can produce it.
** Use of higher very fine percentage for road grades over 15%.
*** Standard for 1–layer surfacing on higher use roads.

TABLE 5. Standard Specifications for GEOTEXTILES

Woven Geotextiles

Property	Test Method	Units	Class I	Class II	Class III	Class IV
Grab Tensile Strength	ASTM D 4632	pounds	247 min.	180 min.	180 min.	315 min.
Elongation at Failure	ASTM D 4632	percent	< 50	<50	<50	<50
Trapezoidal Tear Strength	ASTM D 4533	pounds	90 min.	67 min.	67 min.	112 min.
Puncture Strength	ASTM D 6241	pounds	495 min.	371 min.	371 min.	618 min.
Ultraviolet Stability (retained strength)	ASTM D 4355	percent	50 min.	50 min.	50 min.	50 min.
Permittivity	ASTM D 4491	sec^{-1}	as specified			
Apparent Opening Size (AOS) 2/	ASTM D 4751	mm	as specified			
Percent Open Area (POA)	USACE CWO-02215	percent	as specified			

1/ All values are minimum average roll values (MARV) in the weakest principal direction, unless otherwise noted.
2/Maximum average roll value. Note: CWO is a USACE reference.

Nonwoven Geotextiles

Property	Test Method	Units	Class I 2/	Class II 2/	Class III 2/	Class IV 2/
Grab Tensile Strength	ASTM D 4632	pounds	202 min.	157 min.	112 min.	202 min.
Elongation at Failure	ASTM D 4632	percent	50 min.	50 min.	50 min.	50 min.
Trapezoidal Tear Strength	ASTM D 4533	pounds	79 min.	56 min.	40 min.	79 min.
Puncture Strength	ASTM D 6241	pounds	433 min.	309 min.	223 min.	433 min.
Ultraviolet Stability (retained strength)	ASTM D 4355	percent	50 min.	50 min.	50 min.	50 min.
Permittivity	ASTM D 4491	sec^{-1}	0.7 min. or as specified			
Apparent Opening Size (AOS) 3/	ASTM D 4751	mm	0.22 max. or as specified			

1/ All values are minimum average roll values (MARV) in the weakest principal direction, unless otherwise noted.
2/ Needle punched geotextiles may be used for all classes. Heat-bonded or resin-bonded geotextiles may be used for classes III and IV only. They are particularly well suited to class IV.
3/ Maximum average roll value.

Date
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Title

ACCESS ROAD JOBSHEET
AGGREGATE & GEOTEXTILE TABLES
PRACTICE STANDARD 560 – ACCESS ROADS

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Natural Resources Conservation Service
United States Department of Agriculture

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