



WOVEN GEOTEXTILE FILTER FABRIC SPECIFICATIONS AND PHYSICAL PROPERTIES

GRAB STRENGTH	1275 N
ELONGATION (FAILURE)	15%
PUNCTURE STRENGTH	275 N
BURST STRENGTH	3.6 MPa
TRAPEZOIDAL TEAR	475 N
MINIMUM FABRIC LAP TO BE	1000 mm

NON-WOVEN GEOTEXTILE FILTER FABRIC SPECIFICATIONS AND PHYSICAL PROPERTIES

	CLASS 1M, 1, 2	CLASS 3
GRAB STRENGTH	650 N	875 N
ELONGATION (FAILURE)	50%	50%
PUNCTURE STRENGTH	275 N	550 N
BURST STRENGTH	2.1 MPa	2.7 MPa
TRAPEZOIDAL TEAR	250 N	350 N
MINIMUM FABRIC LAP TO BE	300 mm	

- ### GENERAL NOTES
- GENERAL**
- DIMENSIONS ARE GIVEN IN MILLIMETRES UNLESS NOTED OTHERWISE.
 - THIS DRAWING PROVIDES GENERAL INFORMATION ONLY AND IS APPLICABLE TO CULVERTS WITH A DIAMETER OF 3.0 METRES OR LESS. SITE SPECIFIC DETAILS ARE REQUIRED FOR CULVERTS WITH A DIAMETER GREATER THAN 3.0 METRES.
 - THIS DRAWING WILL BE SUPPLEMENTED OR SUPERSEDED BY THE SITE SPECIFIC DESIGN DRAWING(S), ASSEMBLY DRAWINGS, SPECIAL PROVISIONS, AND ENVIRONMENTAL REQUIREMENTS WHERE APPLICABLE.
 - ADDITIONAL "NON-STANDARD" NOTES (*NOTES) HAVE ALSO BEEN PROVIDED ON THE DRAWING TO SERVE AS REMINDERS WHERE A SPECIFIC DETAIL MAY NEED TO BE DEVELOPED FOR THE DESIGN DRAWINGS.
- ASSEMBLY**
- CSP SECTIONS SHALL BE POSITIONED SO THAT THE ENDS ARE IN CLOSE CONTACT. COUPLERS SHALL BE WELL FITTED AND EVENLY TIGHTENED ALL AROUND THE PIPE. WHERE REQUIRED JOINTS SHALL BE SEALED USING APPROVED MATERIAL SUPPLIED BY THE CONTRACTOR.
 - SPCSP SHALL BE ASSEMBLED AS SHOWN ON THE ASSEMBLY DRAWINGS AND AS OUTLINED BELOW:
 - ASSEMBLY, LOOSE BOLTING AND RING CLOSURE SHALL PROGRESS FROM ONE END WITH EACH RING CHECKED AND ADJUSTED TO DESIGN GEOMETRY WITH FULLY NESTED PLATES IMMEDIATELY UPON CLOSURE OF INDIVIDUAL RINGS. WHERE TEMPORARY SUPPORTS OR TIE CABLES ARE USED, ADEQUATE MEANS SHALL BE TAKEN TO DISTRIBUTE LOADS ALONG THE PIPE WALL TO PREVENT LOCAL DISTORTION AND MAINTAIN DESIGN SHAPE.
 - ALL BOLTED SEAMS SHALL BE PROPERLY LAPPED AND PLATES SHALL BE IN CONTACT FOR THE FULL WIDTH AND LENGTH OF THE LAP. THE BOLTS IN THE VALLEY OF EACH LONGITUDINAL SEAM SHALL BE NEAREST TO THE VISIBLE EDGE OF THE PLATE.
 - THE VERTICAL AXIS SHALL BE UPRIGHT AND THE LONGITUDINAL SEAMS SHALL BE STRAIGHT. ROTATION OF THE PIPE AND/OR SPIRALING OF THE LONGITUDINAL SEAMS SHALL NOT BE PERMITTED.
 - BOLTS SHALL BE TORQUED TO AND MAINTAINED AT NOT LESS THAN 200 N.m. AND NOT MORE THAN 340 N.m.
 - DISTORTION OF BOLT HOLES CAUSED BY OVER-TORQUING, OR POOR ASSEMBLY METHODS WILL NOT BE PERMITTED. WHERE ADDITIONAL HOLES ARE REQUIRED, THEY SHALL BE DRILLED, EXTRA HOLES AND MINOR SURFACE DAMAGE SHALL RECEIVE 2 BRUSH APPLIED COATS OF ZINC RICH PAINT.
 - BOLTS ON PEDESTRIAN OR STOCK UNDERPASSES SHALL BE INSTALLED WITH THE BOLT HEADS INSIDE THE STRUCTURE.
 - USE SOFT SLINGS AND HANDLE WITH CARE TO AVOID SCRATCHING, BRUISING, AND DISTORTION OF THE PIPE. DEFORMATION DURING CONSTRUCTION SHALL NOT EXCEED A 2% UPWARD OR DOWNWARD DEFLECTION FROM THE DESIGN RISE. IF STRUTS OR CABLES ARE USED TO MAINTAIN THE PIPE'S SHAPE, THEY SHALL BE REMOVED BEFORE THEY RESTRICT DOWNWARD MOVEMENT OF THE CROWN.
- BACKFILL**
- BACKFILL SHALL CONSIST OF APPROVED GRANULAR MATERIAL. NON-ORGANIC CLAY SHALL BE USED FOR THE CLAY SEALS AT EACH END OF THE PIPE. BACKFILL MATERIAL SHALL BE PLACED AND COMPACTED IN AN UNFROZEN CONDITION, MEET THE SPECIFIED GRADATION, CONTAIN NO ROCKS EXCEEDING 80 mm IN DIAMETER, AND SHALL BE FREE OF LARGE OR FROZEN LUMPS, WOOD, OR OTHER UNSUITABLE MATERIAL. BACKFILLING IS NOT ALLOWED ON FROZEN SUBSTRATE OR WHEN AIR TEMPERATURE IS BELOW 0°C.
 - PRE-APPROVED GRANULAR MATERIAL SHALL MEET THE FOLLOWING GRADATION SPECIFICATIONS:

PIT RUN GRAVEL MATERIAL DESIGNATION 6, CLASS 80		CRUSHED AGGREGATE MATERIAL DESIGNATION 2, CLASS 40	
µm	SIEVE SIZE % BY WEIGHT PASSING	µm	SIEVE SIZE % BY WEIGHT PASSING
80 000	100%	40 000	100%
50 000	55 - 100	25 000	70 - 94
25 000	38 - 100	16 000	55 - 85
16 000	32 - 85	10 000	44 - 74
5 000	20 - 65	5 000	32 - 62
315	6 - 30	1 250	17 - 43
80	2 - 10	630	12 - 34
		315	8 - 26
		80	5 - 18
			2 - 10
% FRACTURES BY WEIGHT (2 FACES)		N/A	
PLASTICITY INDEX		NP-8	
LA ABRASION LOSS PERCENT MAXIMUM		N/A	
		% FRACTURES BY WEIGHT (2 FACES)	
		50 +	
		PLASTICITY INDEX	
		NP-6	
		LA ABRASION LOSS PERCENT MAXIMUM	
		50	

- HEAVY ROCK RIPRAP**
- HEAVY ROCK RIPRAP SHALL COVER THE AREA SHOWN AND SHALL BE PLACED TO THE FOLLOWING MINIMUM THICKNESS:
- | CLASS OF ROCK | 1M | 1 | 2 | 3 |
|----------------|-----|-----|-----|------|
| THICKNESS (mm) | 300 | 450 | 800 | 1100 |
- REFER TO THE CURRENT VERSION OF B354 SECTION 10 "HEAVY ROCK RIPRAP" OF THE SPECIFICATIONS FOR BRIDGE CONSTRUCTION FOR ADDITIONAL INFORMATION.
 - PLACE NON-WOVEN GEOTEXTILE FILTER FABRIC UNDER ALL HEAVY ROCK RIPRAP.
- UNDERPASSES**
- PIT RUN GRAVEL "DESIGNATION 6, CLASS 80", SHALL BE PLACED TO A THICKNESS OF 200 mm ON THE APPROACHES FROM THE PIPE TO THE EDGE OF RIGHT OF WAY. DO NOT USE HEAVY ROCK RIPRAP UNLESS SPECIFIED.
 - CONCRETE FLOOR WITH ROUGH TEXTURED SURFACE OR COMPACTED GRANULAR FLOOR SHALL BE PLACED TO A DEPTH OF 150 mm AT THE INVERT. ACP FLOORS MAY BE CONSIDERED FOR PEDESTRIAN OR VEHICLE UNDERPASSES.
 - CLAY SEALS ARE NOT REQUIRED FOR UNDERPASSES.
 - LOCATE AND SLOPE UNDERPASSES TO PROVIDE POSITIVE DRAINAGE AND TO PREVENT PONDING OF WATER.

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	DESIGNER	CHECKER	RECOMMENDED DIRECTOR BRIDGE ENGINEERING		Alberta TRANSPORTATION INSTALLATION OF LARGE METAL PIPES
	DATE: July 9, 2003	DATE: July 9, 2003	APPROVED EXECUTIVE DIRECTOR TECHNICAL STANDARDS BRANCH		