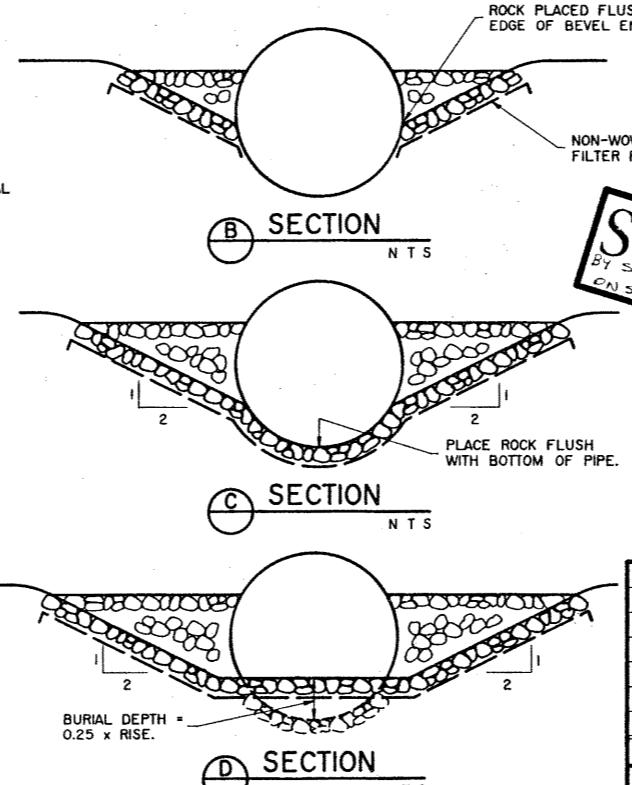
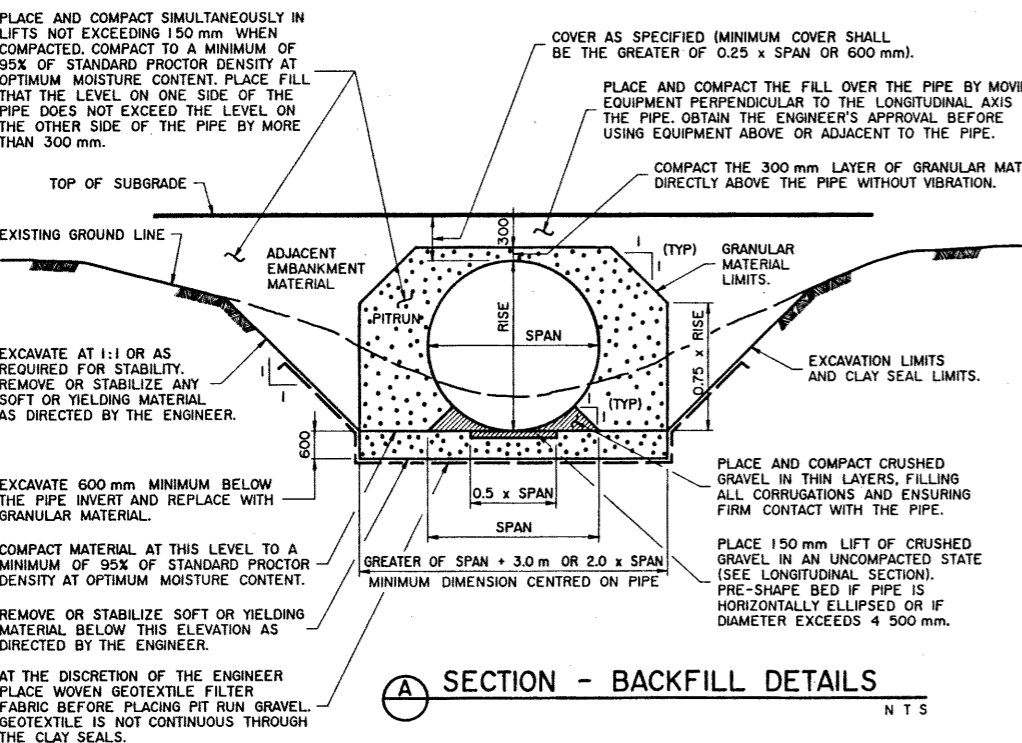
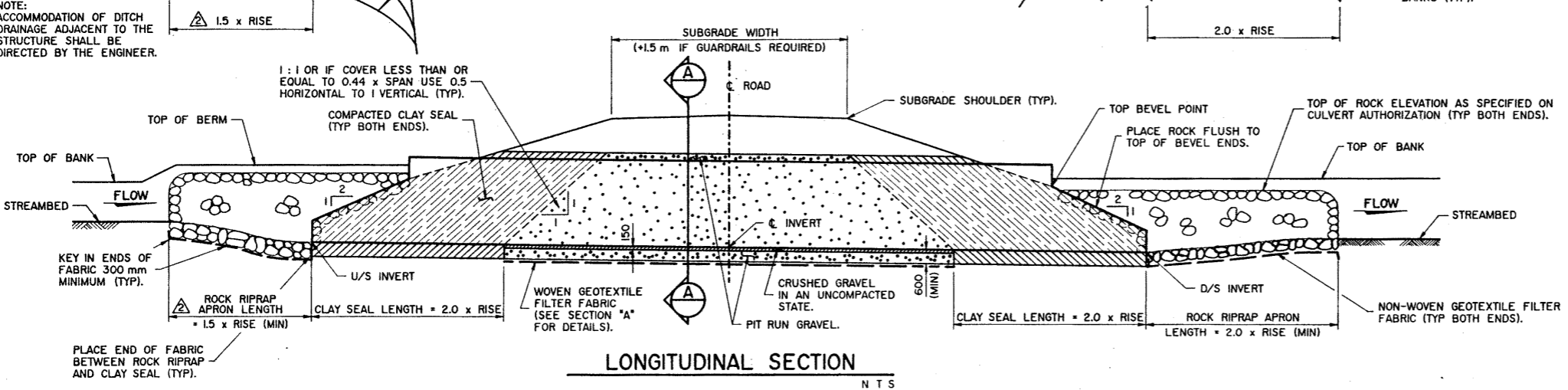
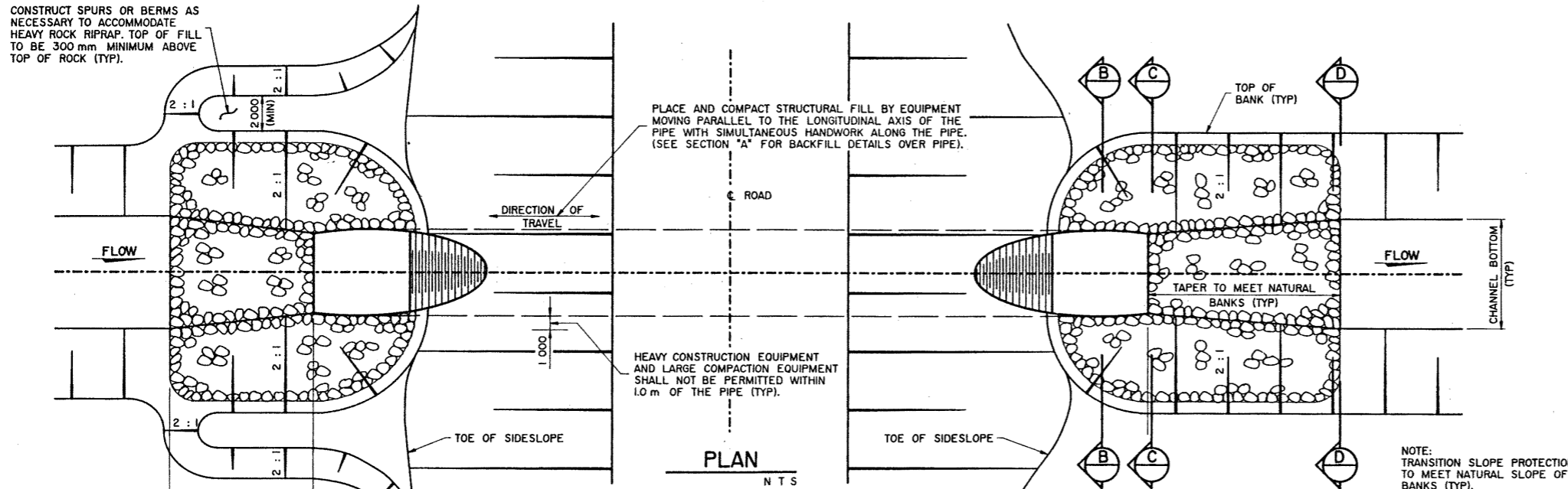


CONSTRUCT SPURS OR BERMS AS NECESSARY TO ACCOMMODATE HEAVY ROCK RIPRAP. TOP OF FILL TO BE 300 mm MINIMUM ABOVE TOP OF ROCK (TYP).



GENERAL NOTES

- GENERAL**
- DIMENSIONS ARE GIVEN IN MILLIMETRES UNLESS NOTED OTHERWISE.
 - THIS DRAWING PROVIDES GENERAL INFORMATION ONLY AND IS APPLICABLE TO CULVERTS WITH AN EQUIVALENT DIAMETER LESS THAN 3 000 mm. IT WILL BE SUPPLEMENTED WITH AND/OR SUPERSEDED BY DETAILS IN THE CULVERT AUTHORIZATION AND WHERE NECESSARY BY SPECIAL PROVISIONS, DESIGN DRAWINGS, ASSEMBLY DRAWINGS, AND ENVIRONMENTAL PERMITS OR LICENCES.
 - INSTALLATION SHALL BE IN ACCORDANCE WITH THE CURRENT VERSION OF SPECIFICATION B269 "INSTALLATION OF LARGE STEEL PIPES", SECTION 21 OF THE BRIDGE CONSTRUCTION SPECIFICATIONS.
 - CONTACT THE ENGINEER IF ADDITIONAL DIRECTION IS REQUIRED.
- ASSEMBLY**
- CSP SECTIONS SHALL BE LAID SO THAT THE ENDS ARE IN CLOSE CONTACT. COUPLERS SHALL BE WELL FITTED AND EVENLY TIGHTENED ALL AROUND THE PIPE.
 - SPCSP SHALL BE ASSEMBLED AS SHOWN ON THE ASSEMBLY DRAWINGS AND AS OUTLINED BELOW:
 - 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 NEARER TO THE VISIBLE EDGE OF THE PLATE THAN THE BOLTS ON THE CREST.
 - AT NO TIME SHALL TIGHTENING PROCEED IF LAPPED PLATES ARE NOT FULLY NESTED. ADJUSTMENTS SHALL BE MADE TO PRODUCE DESIGN DIMENSIONS WITH FULLY NESTED PLATES.
 - 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.
 - DISTORTION OF BOLT HOLES CAUSED BY OVER-TORQUING OR POOR ASSEMBLY METHODS SHALL NOT BE PERMITTED. WHERE ADDITIONAL HOLES ARE REQUIRED THEY SHALL BE DRILLED. TORCH CUTTING HOLES OR WELDING ON THE PIPE IS NOT PERMITTED.
 - BOLTS SHALL BE TORQUED TO AND THE TORQUE MAINTAINED AT NOT LESS THAN 200 NEWTON METRES AND NOT MORE THAN 340 NEWTON METRES.
 - BOLTS ON PEDESTRIAN OR STOCK UNDERPASSES SHALL BE INSTALLED WITH THE BOLT HEADS INSIDE THE STRUCTURE.
 - THE RISE OF ALL PIPES (CSP AND SPCSP) SHALL BE MAINTAINED WITHIN THE FOLLOWING TOLERANCES OF THE DESIGN RISE (DR):

ASSEMBLED PIPE	DR ± 2%
DURING BACKFILL	DR TO DR + 4% (TEMPORARY CONDITION ONLY)
COMPLETED BACKFILL	DR TO DR + 2%

BACKFILL MATERIAL

- BACKFILL MATERIAL SHOWN IN THE LONGITUDINAL SECTION SHALL CONSIST OF GRANULAR MATERIAL. INORGANIC CLAYS SHALL FORM THE CLAY SEALS AT EACH END. BACKFILL MATERIAL SHALL BE NON-CORROSIVE AND CONTAIN NO FROZEN MATERIAL, ROCKS EXCEEDING 80 mm IN DIAMETER, ROOTS, SOD, RUBBISH OR ORGANIC MATERIAL.
- GRANULAR MATERIAL SHALL MEET THE FOLLOWING GRADATION SPECIFICATIONS:

PIT RUN GRAVEL DESIGNATION 6, CLASS 80			CRUSHED GRAVEL DESIGNATION 2, CLASS 40		
µm	SIETVE SIZE	% BY WEIGHT PASSING	µm	SIETVE SIZE	% BY WEIGHT PASSING
80 000		100%	40 000		100%
50 000		55 - 100	16 000		55 - 85
25 000		38 - 100	10 000		44 - 74
16 000		32 - 85	5 000		32 - 62
5 000		20 - 65	1 250		17 - 43
315		6 - 30	630		12 - 34
80		2 - 10	315		8 - 26
			160		5 - 18
			80		2 - 10

FOR CRUSHED GRAVEL "DESIGNATION 2, CLASS 40" - 50% OR MORE OF THE MATERIAL BY WEIGHT RETAINED ON THE 5000 (#4) SIEVE SHALL HAVE TWO OR MORE FRACTURED FACES.

CLAY SEALS (CLAY SEEPAGE CUTOFFS)

- CLAY SEALS SHALL BE PLACED AT EACH END OF THE PIPE FOR A LENGTH OF TWICE THE RISE (2.0 x RISE). THE CLAY SEALS SHALL EXTEND FROM THE BOTTOM OF THE EXCAVATION TO 300 mm ABOVE THE TOP OF THE PIPE, AND FOR THE FULL WIDTH OF THE EXCAVATION.

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 "HEAVY ROCK RIPRAP" SECTION 10 OF THE BRIDGE CONSTRUCTION SPECIFICATIONS FOR ADDITIONAL INFORMATION.

UNDERPASSES

- A THIN LAYER OF GRANULAR MATERIAL, PIT RUN "DESIGNATION 6, CLASS 80", SHALL BE PLACED TO A THICKNESS OF 200 mm ON THE APPROACHES TO THE PIPE. DO NOT USE ROCK RIPRAP UNLESS SPECIFIED.
- CONCRETE FLOOR WITH ROUGH TEXTURED SURFACE OR COMPACTED GRANULAR FLOOR AS SPECIFIED SHALL BE PLACED TO A DEPTH OF 150 mm AT THE INVERT.
- CLAY SEALS ARE NOT REQUIRED FOR UNDERPASSES.

SUPERSEDED
BY S-1418-93
ON SHEET (C) BY REVISION
97-12-01

DESIGNED J.A.E. J.O'B.		DRAWN W.A.B.	DATE 93-02-03	CHECKED C.T.C.	DATE 93-02-03	STREAM	LOCATION	HIGHWAY	FILE	SHEET 1 of 1	DRAWING S-1418-93
APPROVED ORIGINAL DRAWING APPROVED BY T. BELKE EXECUTIVE DIRECTOR BRIDGE ENGINEERING FEB. 05, 1993						Alberta TRANSPORTATION AND UTILITIES BRIDGE ENGINEERING BRANCH INSTALLATION OF LARGE STEEL PIPES					