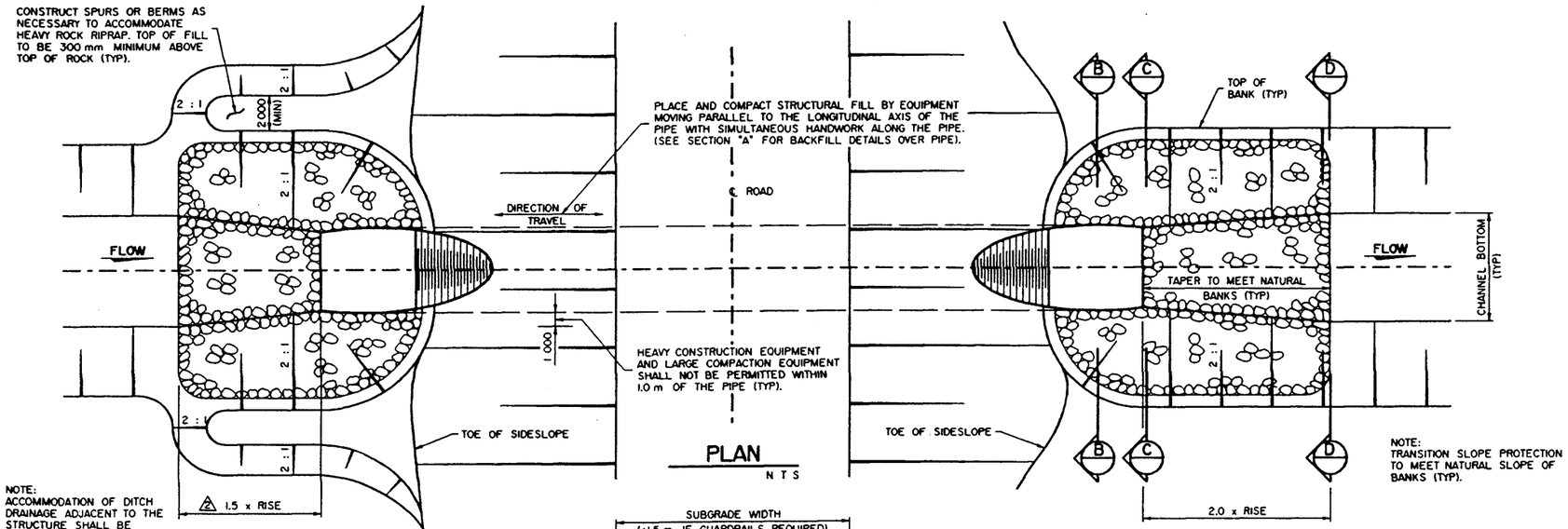

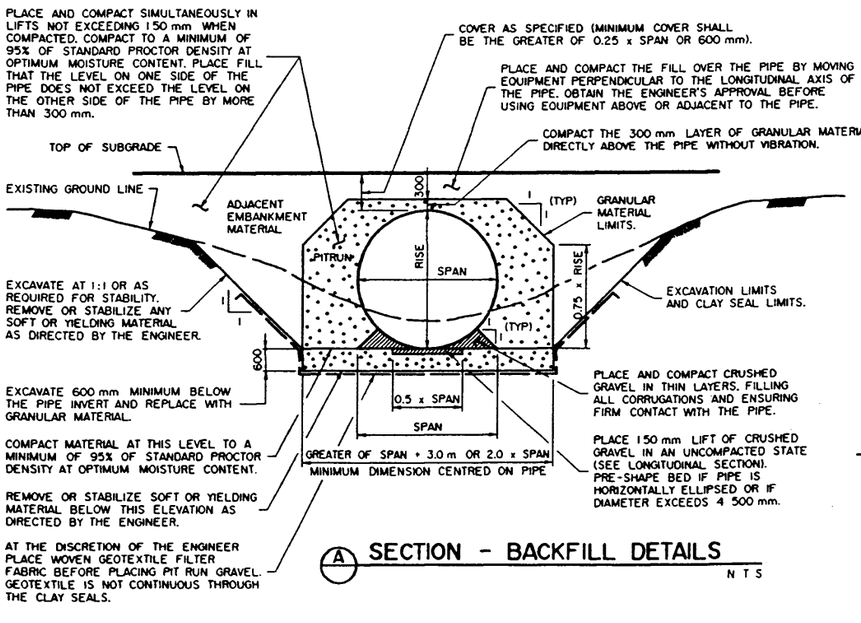

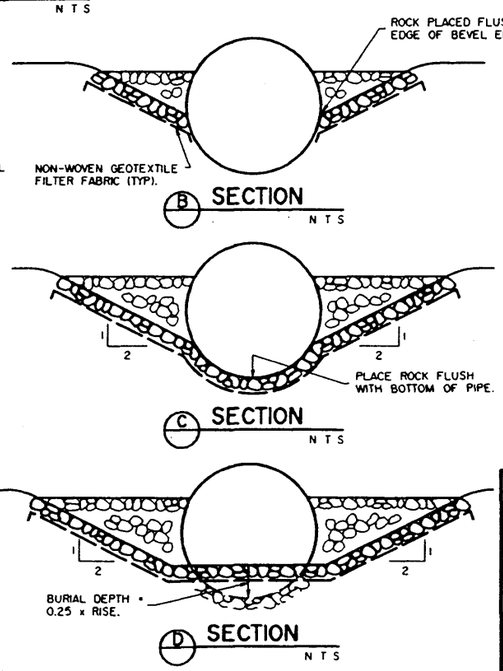

GENERAL NOTES

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 IT WILL BE SUPPLEMENTED WITH AND/OR SUPERSEDED BY DETAILS IN THE CULVERT AUTHORIZATION AND WHERE NECESSARY BY SPECIAL PROVISIONS, DESIGN DRAWINGS, ASSEMBLY DRAWINGS, AND ENVIRONMENTAL PERMITS OR LICENCES.
- ⚠4 INSTALLATION SHALL BE IN ACCORDANCE WITH THE CURRENT VERSION OF SPECIFICATION B361 "CONSTRUCTION OF CSP AND SPCSP STRUCTURES", SECTION 18.
- 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 :
  - A) 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.
  - B) 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.
  - C) 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.
  - D) DISTORTION OF BOLT HOLES CAUSED BY OVER-TOROING, 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.
  - E) BOLTS SHALL BE TORQUED TO AND THE TORQUE MAINTAINED AT NOT LESS THAN 200 NEWTON METRES AND NOT MORE THAN 340 NEWTON METRES.
  - F) 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	
µm SIEVE SIZE	% BY WEIGHT PASSING
80 000	100%
50 000	55 - 100
25 000	38 - 100
16 000	32 - 85
5 000	20 - 65
315	6 - 30
80	2 - 10
% FRACTURES BY WEIGHT (2 FACES)	N/A
PLASTICITY INDEX	NP-8
LA ABRASION LOSS PERCENT MAXIMUM	N/A

CRUSHED GRAVEL DESIGNATION 2, CLASS 40	
µm SIEVE SIZE	% BY WEIGHT PASSING
40 000	100%
25 000	70 - 94
16 000	55 - 85
10 000	44 - 74
5 000	32 - 62
1 250	17 - 43
630	12 - 34
315	8 - 26
160	5 - 18
80	2 - 10
⚠4 % FRACTURES BY WEIGHT (2 FACES)	50 +
PLASTICITY INDEX	NP-6
LA ABRASION LOSS PERCENT MAXIMUM	50

⚠4 ⚠2

- ⚠4 GEOTEXTILE FILTER FABRIC SHOWN SHALL MEET THE FOLLOWING REQUIREMENTS.

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	

⚠4

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		

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 CROWN 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.
- PLACE APPROVED NON-WOVEN GEOTEXTILE FILTER FABRIC UNDER ALL HEAVY ROCK RIPRAP.

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.

7

REV	DATE	REVISIONS	BY
⚠5			
⚠4			
⚠3	99-03-25	BEB CHANGED TO TSB	RY
⚠2	97-12-01	GEOTEXTILE FABRIC AND GRAVEL TABLES	RY
⚠1	97-05-05	GENERAL NOTES - INSTALLATION SPEC	CTC
⚠	94-06-02	U/S RIPRAP APRON LENGTH AND BACKFILL SPEC.	C.T.C.
1	93-02-03	REDRAWN FROM S-1418-86 REV. 2	M.E.K. C.T.C.

APPROVED
ORIGINAL DRAWING APPROVED BY
T. BELKE
EXECUTIVE DIRECTOR BRIDGE ENGINEERING
FEB. 05, 1993

Alberta TRANSPORTATION AND UTILITIES
TECHNICAL STANDARDS BRANCH ⚠3

INSTALLATION OF LARGE STEEL PIPES

DESIGNED	DRAWN	DATE	CHECKED	DATE	STREAM	LOCATION	HIGHWAY	FILE	SHEET	DRAWING
J.A.E. J.O'B.	W.A.B.	93-02-03	C.T.C.	93-02-03					1 of 1	S-1418-93

PLOTTED MARCH 25, 1998 DATA:\SB2530\USRL\STANDARDS\S1418-93.DV 2

NOTE: THIS DRAWING HAS BEEN REDUCED TO 22" x 34". DO NOT SCALE