



7715 EDGAR INDUSTRIAL COURT
RED DEER (ALBERTA) CANADA T4P 4B2
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July 10/14

GENERAL NOTES (CONT.)

LIMITATIONS AND CONDITIONS FOR USE

- IT IS THE INTENT OF THIS DRAWING THAT THE MINIMUM THICKNESS OF CONCRETE BETWEEN THE EXTERIOR CRESTS OF THE LINER CORRUGATIONS AND THE INTERIOR CRESTS OF THE CULVERT CORRUGATIONS SHALL BE 70 mm AT ANY LOCATION AROUND THE CIRCUMFERENCE OF THE LINER

INITIALIZATION PROCEDURE

- CONFIRM THAT PROPOSED POSITION OF 'EARS' AND 'SHOES' (SECTION A) PROVIDES ADEQUATE CLEARANCE TO ANY DEFLECTIONS/BULGES OR IRREGULARITIES NOTED ALONG LENGTH OF CULVERT. OBTAIN THE APPROVAL OF AN ENGINEER TO RELOCATE 'EARS' OR 'SHOES'

RECOMMENDED INSTALLATION PROCEDURE

- INCIDENTAL EQUIPMENT SUPPLIED BY THE CONTRACTOR MAY INCLUDE BUT IS NOT LIMITED TO CRAWLER TRACTORS, BACKHOES, ROLLING SCAFFOLDING, BLOCK AND TACKLE, TIRFORS, HYDRAULIC JACKS, CLAMPS, CABLES, CHAINS, COME-ALONGS, LIGHTING, HEATING AND VENTILATING MECHANISMS
- DEWATER EXISTING CULVERT AND CLEAN INTERIOR OF ALL SEDIMENT AND DEBRIS
- WELD OR BOLT 'EARS' (c/w HEX NUTS) AND 'SHOES' TO OUTSIDE OF LINER (SECTION A). 'EARS' SHALL BE CONTINUOUS. ENSURE CONCRETE LEAKAGE DOES NOT OCCUR AT HOLES MADE BY THE CONTRACTOR
- CUT CIRCULAR HOLES AND WELD 102.3 mm ID FLANGED END COUPLERS TO CROWN OF LINER AT MAXIMUM 3000 mm SPACING (SECTION A AND DETAIL R)
- DRILL 28 mm DIA HOLES IN CROWN OF LINER AT 6000 mm INTERVALS TO RECEIVE INSPECTION TUBES. DRILL 8 mm DIA INSPECTION HOLES AT MAXIMUM 3000 mm SPACING ALONG SIDES OF LINER AT 2, 4, 6 AND 10 O'CLOCK POSITIONS (DETAIL P). POSITION INSPECTION HOLES AND TUBES AWAY FROM FLANGED END COUPLERS TO AVOID CONCRETE SPRAY
- INSERT THREADED RODS IN HEX NUTS WELDED TO 'EARS' AND EXTEND RODS OUT TO CULVERT WALL TO LIMIT LINER MOVEMENT DURING PUMPING (SECTION A)
- INSERT 19 mm ID INSPECTION TUBES IN 25 mm HOLES AND EXTEND UP TO CROWN OF CULVERT (DETAIL S). WELD/AFFIX TUBES TO LINER
- CONSTRUCT BULKHEADS AT ENDS OF LINER

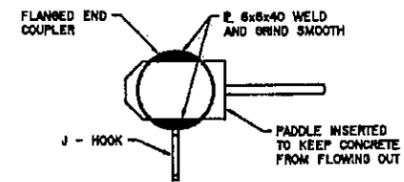
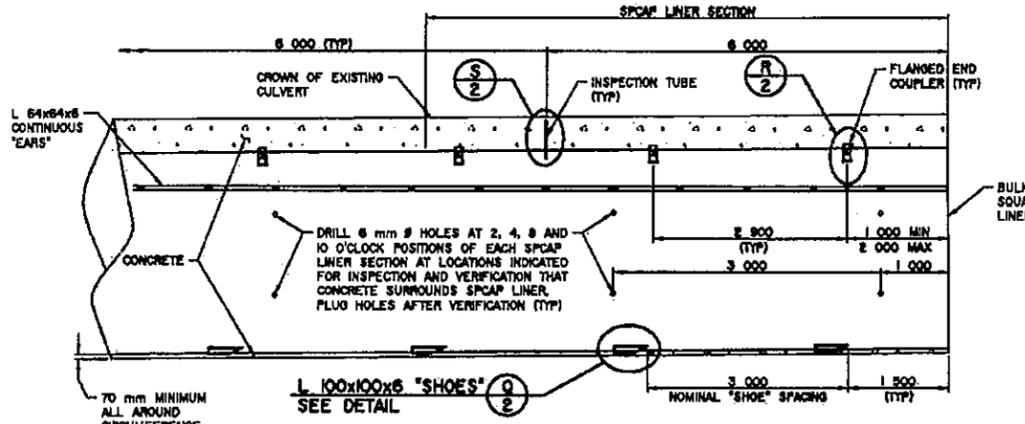
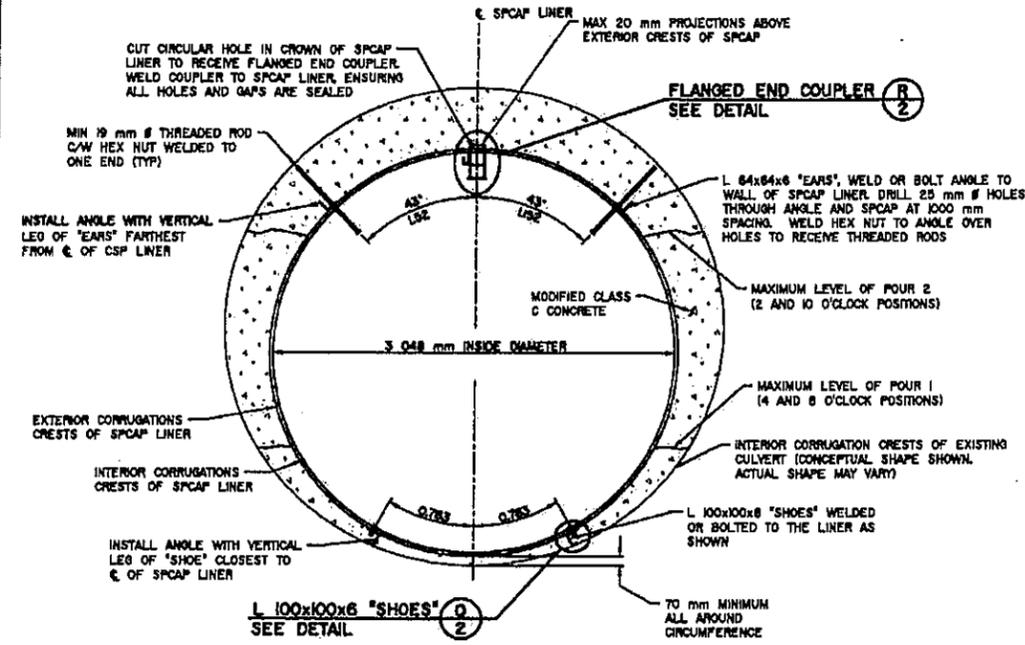
CONCRETE PLACEMENT

- CONCRETE SHALL BE IN ACCORDANCE WITH BC MINISTRY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, SECTION 210. ENSURE A PUMP-ABLE MIX IS PROVIDED. CONCRETE TO BE PLACED WITH A CONCRETE PUMP. CONCRETE TO BE MINIMUM 2 MPa WITH A NOMINAL AGGREGATE SIZE OF 14 TO 5 mm MAXIMUM GROUTING PRESSURE AT CULVERT LOCATION 10 KPa
- CONCRETE TO BE PLACED AT DOWNSTREAM END OF LINER FIRST AND WORKED TOWARDS THE UPSTREAM END. ATTACH PUMP HOSE TO FLANGED END COUPLER AND SECURE HOSE TO J-HOOK. LIMIT MAXIMUM PUMPING PRESSURE BETWEEN LINER AND CULVERT TO 40 psi (270 KPa) DURING FINAL CONCRETE POUR. DISPLACEMENT OR DEFORMATION OF LINER DURING CONCRETE PLACEMENT WILL NOT BE PERMITTED
- VERIFY EXTENT OF CONCRETE MOVEMENT FROM VARIOUS INSPECTION HOLES AND TUBES AS REQUIRED. SEAL HOLES AND TUBES AFTER VERIFICATION. USE OF ALTERNATING FLANGED END COUPLERS DURING CONCRETE POURS MAY BE APPROPRIATE PROVIDED THAT MOVEMENT AND SPREAD OF CONCRETE CAN BE CONFIRMED DURING EACH POUR
- PLACE CONCRETE IN STAGES TO DEPTHS INDICATED FOR EACH CONCRETE POUR (SECTION A). THE DEPTH OF FIRST STAGE POUR SHALL NOT BE ABOVE THE 4 AND 8 O'CLOCK POSITIONS OF LINER. ALLOW MINIMUM 5 HOURS BETWEEN ALL CONCRETE POURS. CLEAN CONCRETE FROM INSIDE FLANGED END COUPLERS IF SUBSEQUENT USE IS REQUIRED. INSERT PADDLE THROUGH COUPLER BEFORE REMOVING HOSE
- LINER MAY REQUIRE INTERNAL STRUTS AND BRACING OR SHALLOWER DEPTH OF INITIAL CONCRETE POUR TO AVOID BENDING ALONG LINES OF 'EARS'
- THE SHAPE OF THE LINER SHALL BE CONTINUOUSLY MONITORED DURING PUMPING FOR DEFLECTIONS OR DISTORTIONS. IN THE EVENT OF ANY MOVEMENT, ALL PUMPING MUST CEASE AND THE DEPARTMENT REPRESENTATIVE SHALL BE NOTIFIED IMMEDIATELY
- ALLOW CONCRETE TO SET BEFORE CUTTING OFF THREADED RODS, FLANGED END COUPLERS AND INSPECTION TUBES
- THE CONTRACTOR SHALL CONFIRM THAT CONCRETE EXTENDS COMPLETELY AROUND AND ALONG THE FULL LENGTH OF THE LINER. FILL VOIDS WITH GROUT PUMPED UNDER LOW PRESSURE AS DETERMINED BY AN ENGINEER

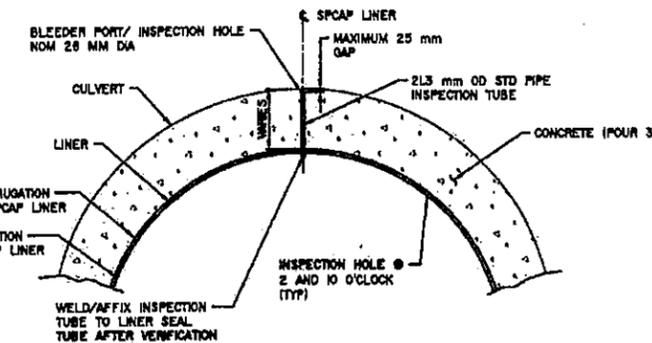
HEAVY ROCK RIPRAP

- HEAVY ROCK RIPRAP SHALL COVER THE AREAS SHOWN AND BE PLACED AT MINIMUM THICKNESSES IN ACCORDANCE WITH B.C. MINISTRY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, SECTION 205 (TABLE 205-A)
- PLACE NON-WOVEN GEOTEXTILE FILTER FABRIC UNDER ALL HEAVY ROCK RIPRAP
- GEOTEXTILE FILTER FABRIC SHALL MEET THE FOLLOWING REQUIREMENTS:

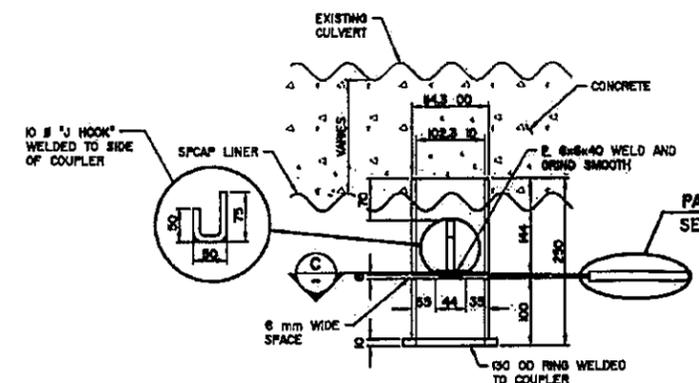
NON-WOVEN GEOTEXTILE FILTER FABRIC	
SPECIFICATIONS AND PHYSICAL PROPERTIES	
GRAB STRENGTH	650 N
ELONGATION (FAILURE)	50 %
PUNCTURE STRENGTH	275 N
BUST STRENGTH	2.1 MPa
TRAPEZOIDAL TEAR	250 N
MINIMUM FABRIC LAP TO BE 300 mm	



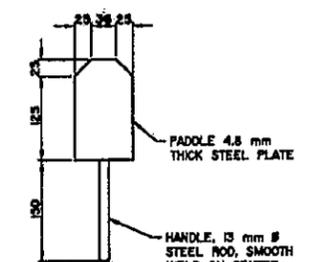
(C) SECTION 1:5



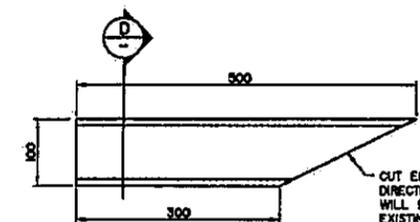
(S) DETAIL 1:25



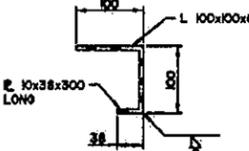
(R) DETAIL - FLANGED END COUPLER 1:5



(T) DETAIL - PADDLE 1:5 (1 REQ'D PER COUPLER)



(Q) DETAIL - SHOE 1:5



(D) SECTION 1:5

NOTE:
1. A CONTINUOUS RAIL OR OTHER SYSTEM MAY BE USED, IF ANOTHER SYSTEM IS USED IN LIEU OF THE 'SHOE' THEN FEATURES MUST BE INCORPORATED INTO THE DESIGN TO ENSURE THAT THE VOID BETWEEN THE LINER THE CULVERT INVERTS (AND AROUND RAIL) IS COMPLETELY FILLED WITH CONCRETE

QUANTITY ESTIMATE		
ITEM	UNIT	ESTIMATE
HEAVY ROCK RIPRAP - CLASS 900 kg	m ³	428
CLASS C CONCRETE (25 MPa)	m ³	200

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

REAL PROPERTY SERVICES PACIFIC REGION

Project No./Titre du projet
ALASKA HIGHWAY, km 300.4
BRITISH COLUMBIA

BIG BEAVER CREEK BRIDGE CULVERT LINER INSTALLATION

Approved by/Approuvé par
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Client/Client

Drawing No./Titre du dessin

INFORMATION SHEET

Project No./No. du projet	Sheet/Feuille	Revision no./No. de révisions
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