

FISHERIES CONSTRUCTION NOTES:

- INSTREAM WORK SHALL ONLY PROCEED FOLLOWING REVIEW BY DEPARTMENT OF FISHERIES AND OCEANS CANADA. PERMIT FOR WORK TO BE SECURED BY OTHERS.
- ALL WORK SHALL BE IN COMPLIANCE WITH THE ENVIRONMENTAL PROCEDURES OF THE SPECIFICATIONS (SECTION 01 35 43.)
- ALL WORK WITHIN THE HIGH-WATER LINE SHALL BE DONE DURING THE FISHERIES WINDOWS UNLESS APPROVED OTHERWISE BY THE OWNER'S ENVIRONMENTAL MONITOR (OEM).
- THE CONTRACTOR SHALL PROVIDE 10 DAYS' NOTICE TO THE DEPARTMENTAL REPRESENTATIVE (DR) FOR THE OEM TO ISOLATE WORK SITES BELOW HIGH LINE WITH 5mm MESH STOP NETS AS NEEDED TO PREVENT COLONIZATION BY FISH AND AMPHIBIANS.
- THE OEM SHALL SALVAGE AND RELOCATE FISH AND AMPHIBIANS FROM ISOLATED WORK SITES TO SUITABLE HABITAT UPSTREAM.
- WATER SHALL BE DIVERTED AROUND THE CONSTRUCTION SITE USING METHODS APPROVED BY OEM.
- ALL PUMP INTAKES IN FISH-BEARING WATERS SHOULD BE SCREENED TO AVOID ENTRAINING AND IMPINGING FISH DURING OPERATION.
- ALL MATERIALS USED SHALL BE FREE OF INVASIVE SPECIES.
- SPAWNING GRAVEL SHALL BE AS SPECIFIED IN SECTION 31 05 16, AGGREGATE MATERIALS.
- RIFFLES SHALL BE CONSTRUCTED TO DETAILS SHOWN ON SHEET F-1.
- REFUEL, SERVICE MACHINERY AND STORE FUEL AND OTHER DELETERIOUS MATERIALS IN SUCH A WAY AS TO PREVENT ANY DELETERIOUS SUBSTANCES FROM ENTERING WATERCOURSES.
- ENSURE THAT MACHINERY ARRIVES ON SITE IN A CLEAN CONDITION AND IS MAINTAINED FREE OF FLUID LEAKS, INVASIVE SPECIES AND NOXIOUS WEEDS.
- NOT ALL SITES ARE FISH-BEARING AND NOT ALL FISH-BEARING SITES ARE INCLUDED IN PRESERVES.

EROSION & SEDIMENT CONTROL NOTES:

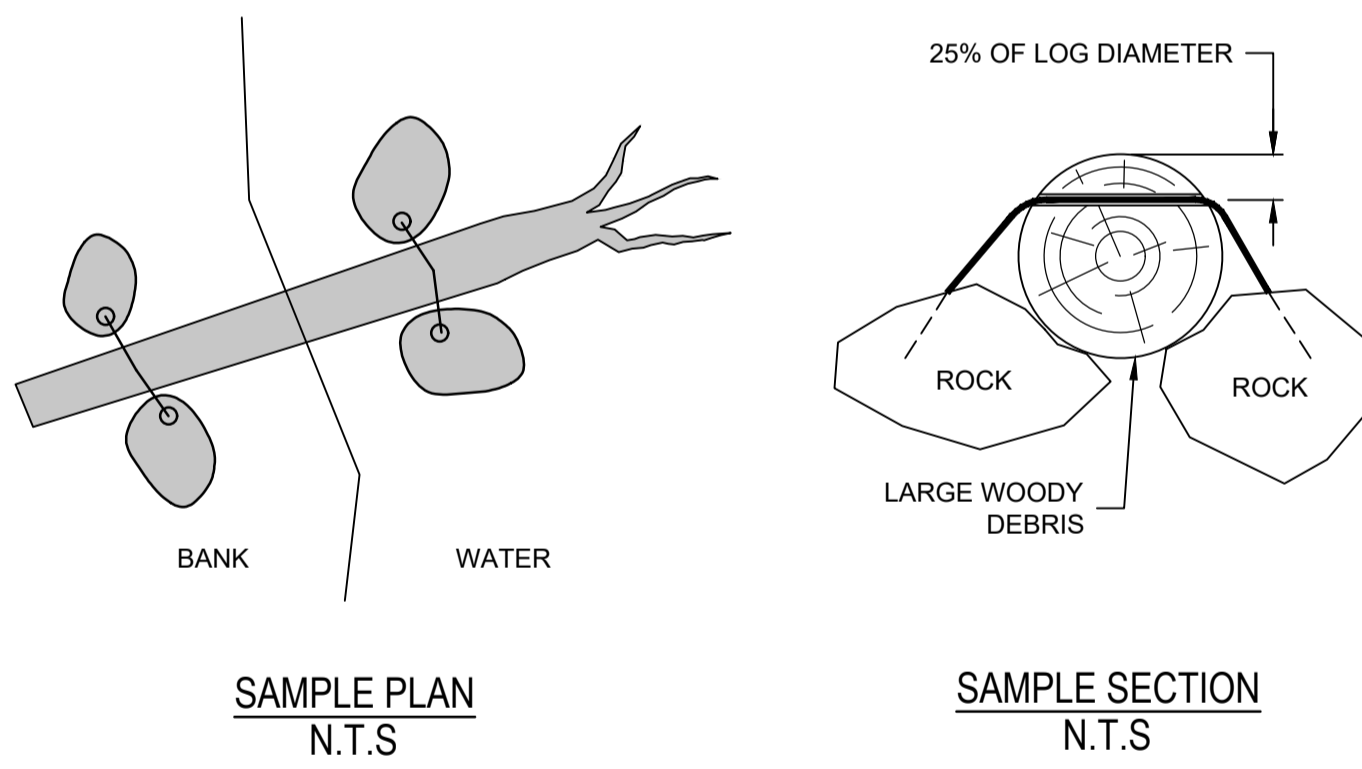
- IN-STREAM WORKS ARE TO BE APPROPRIATELY ISOLATED FROM STREAM FLOWS THROUGH WATER DIVERSION METHODS THAT MAY INCLUDE:
 - ALLOWING WATER TO MOVE PASSIVELY AROUND WORK AREAS WHERE POSSIBLE THROUGH EXISTING DITCHES, OR TEMPORARY BY-PASS CHANNELS, PIPES, OR FLUMES.
 - WHERE WATER MUST BE ACTIVELY PUMPED AROUND WORK AREAS, UP- AND DOWN-STREAM COFFER DAMS WILL BE INSTALLED AND CLEAN WATER WILL BE CONVEYED AROUND THE WORK AREA.
 - IF SMALL AMOUNTS OF SEDIMENT LADEN WATER ACCUMULATE WITHIN AN ISOLATED WORK AREA IT MAY BE PUMPED TO NEARBY VEGETATION FOR INFILTRATION PRIOR TO RELEASE DOWNSTREAM SUBJECT TO APPROVAL FROM THE DR AND OEM
 - IF THE PRODUCTION OF SEDIMENT LADEN WATER CANNOT BE AVOIDED IT WILL BE DETAINED IN SUITABLY SIZED SUMPS OR DETENTION PONDS, ISOLATED FROM CLEAN FLOWS, UNTIL SUCH A TIME THAT THE WATER IS DETERMINED TO BE WITHIN ACCEPTABLE TURBIDITY LIMITS.
 - SHOULD SUMPS AND DETENTION PONDS PROVE INSUFFICIENT TO BRING WATER QUALITY TO WITHIN ACCEPTABLE LIMITS, ADDITIONAL TREATMENT FACILITIES WILL BE USED (E.G. FLOCCULATION TANKS, SETTLING BASINS, OR OTHER TREATMENT FACILITIES AS REQUIRED).
 - THE CONTRACTOR SHALL HAVE BACK-UP PUMPS AVAILABLE ON-SITE TO DEAL WITH EXCESS WATER OR PUMP FAILURES.
 - ENDS OF DISCHARGE HOSES WILL BE PLACED ON AN ENERGY DISSIPATER TO AVOID CAUSING SCOUR.
 - WATERBARS WILL BE CONSTRUCTED ACROSS ROADS TO DIVERT SEDIMENT LADEN WATER INTO ADJACENT VEGETATED AREAS WHERE APPROPRIATE.
 - SEDIMENT FENCING WILL BE INSTALLED WHERE APPROPRIATE ALONG WORK ZONE EDGES TO REDUCE RUN-OFF, SLOW WATER AND PREVENT INSTREAM SEDIMENTATION FROM OCCURRING.
- ROCK CHECK DAMS, SETTLING PONDS, GEOTEXTILES, FRENCH DRAINS, INTERCEPTION DITCHES, AND SILT FENCING SHOULD BE USED AS NEEDED ON A SITE-SPECIFIC BASIS TO CONTROL EROSION. FILTRATION CAN BE ACCOMPLISHED BY SEEDING CHECK DAMS WITH CLEAN GRAVEL.
- SOIL STOCKPILES SHALL REQUIRE PRE-APPROVAL FROM DR AND WILL BE PLACED IN DESIGNATED SITES WHERE EROSION AND SEDIMENT RUNOFF CANNOT OCCUR.
- SOIL STOCKPILES SHALL BE COVERED WITH POLY SHEETING. OTHER TECHNIQUES, SUCH AS TERRACING OR SURFACE ROUGHENING CAN GREATLY REDUCE SURFACE EROSION ON STEEPER SLOPES MAY ALSO BE REQUIRED.
- PERMANENT EXPOSED SOIL AREAS AND EROSION-PRONE SLOPES THAT MAY POTENTIALLY ERODE INTO WATERCOURSES SHOULD BE PROTECTED WITH NATIVE ALL NATURAL EROSION CONTROL BLANKETS.
- CONTROL SEDIMENT SOURCES AND PREVENT OFF-SITE RELEASE OF SEDIMENT BY MINIMIZING TRUCK AND EQUIPMENT ACCESS, SWEEPING CONTAMINATED PAVED SURFACES, AND MINIMIZING UNPROTECTED EXPOSED SURFACES. INCREASE FREQUENCY OF ROAD SWEEPING AS REQUIRED.

RIFFLE CONSTRUCTION NOTES:

- RIFFLE CRESTS ARE GENERALLY LOCATED 1.5 TO 2.0 TIMES THE NATURAL CHANNEL WIDTH DOWNSTREAM OF THE CROSSING OUTLET.
- BUILD RIFFLE WITH 500mm DIA BOULDERS AND KEY THE CREST AND TOE BOULDERS BELOW SCOUR DEPTH.
- KEY THE RIFFLE CREST INTO OPPOSING BANKS TO AVOID FLANKING.
- SEED THE RIFFLE WITH A MIX OF 300mm MINUS ROUNDED COBBLE AND 76mm MINUS CLEAN PIT RUN. WASH-IN USING 2" GAS POWERED PUMP AND FIRE NOZZLE.
- CONSTRUCT DOWNSTREAM FACE OF RIFFLE AT A SHALLOW SLOPE THAT MIMICS LOCAL NATURAL RIFFLES (10:1 TO 15:1 SLOPE)
- CONSTRUCT THE CREST AND DOWNSTREAM FACE IN A V-SHAPE DOWNWARDS TO THE CENTER OF THE RIFFLE (300mm DEPTH.) POOL DIMENSIONS VARY AND DIMENSIONS ARE SHOWN ON THE INDIVIDUAL SITE DRAWINGS.
- PLACE LARGE ROCKS RANDOMLY ON THE DOWNWARD FACE 20 TO 30 CM APART TO DISSIPATE ENERGY AND CREATE LOW FLOW FISH PASSAGE CHANNELS.
- RIP RAP BOTH BANKS WITH EMBEDDED ROUNDED BOULDERS AND COBBLES TO THE HIGH-WATER LINE.
- PLACE SPAWNING GRAVEL 500mm THICK IN THE FLOOR OF THE 300mm DEEP POND.
- WHERE POOLS ARE CREATED DOWNSTREAM, THE POOLS SHALL BE CONSTRUCTED TO PROVIDE A FINAL MINIMUM DEPTH OF 300mm DEPTH.
- WHERE DIRECTED BY THE DR A MAT OF 50kg RIP RAP SHALL BE PLACED IMMEDIATELY DOWNSTREAM OF THE CULVERT OUTLET.

LWD & BALLAST SPECIFICATIONS:

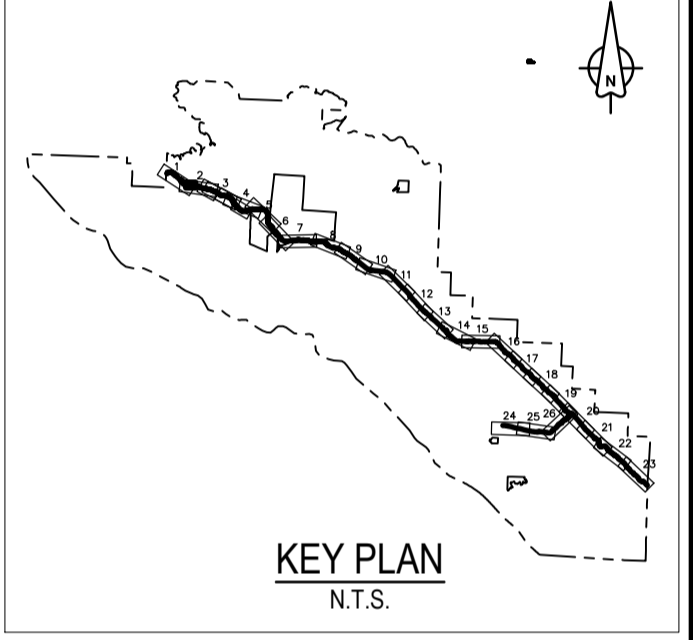
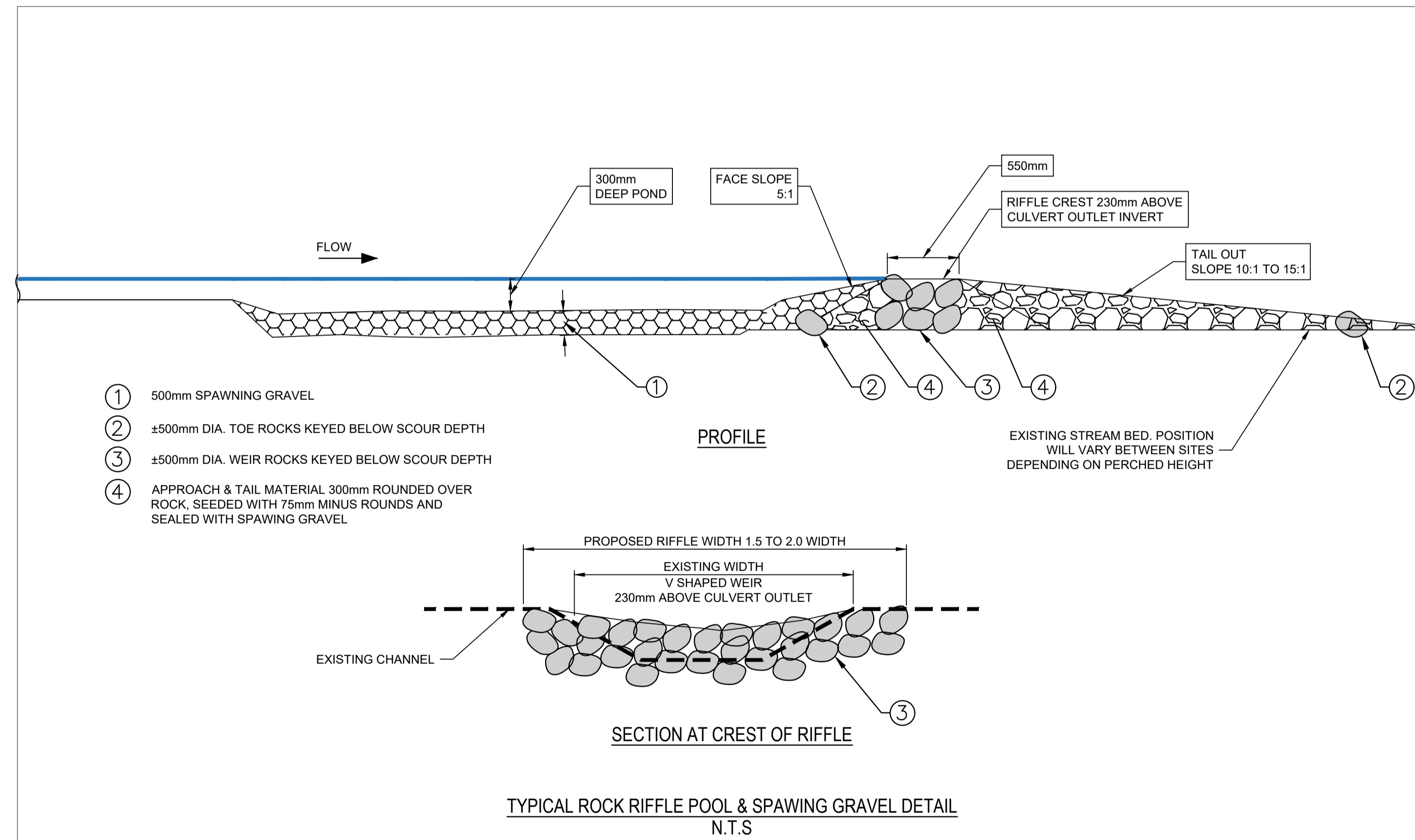
- 3/4" GALVANIZED WIRE CORE WIRE ROPE.
- LENGTH OF WIRE ROPE TO BE DETERMINED IN THE FIELD.
- WIRE ROPE TO BE THREADED THROUGH 3/4" HOLES AUGERED THROUGH UPPER 25% PORTION OF LOG AS SHOWN.
- ENSURE NO SLACK IN COMPLETED ASSEMBLY.
- USING 5/8" DIA ROCK BIT DRILL 300mm (MIN) DEEP.
- CLEAN BORE HOLES AS PER MANUFACTURER'S SPECIFICATIONS TO PREP FOR ADHESIVE.
- ATTACH CABLES TO BOULDERS WITH HILTI RE500 ADHESIVE OR EQUIVALENT. FOLLOW MANUFACTURER'S PROCEDURES.



NOTES:

- LARGE WOODY DEBRIS (LWD) SHOULD BE 600mm DIA (MIN) AND SIZED FOR RESTORATION SITES.
- ROOT WADS ATTACHED ARE PREFERABLE AND LOGS ARE ACCEPTABLE.
- LWD SHOULD BE WESTERN RED CEDAR OR DOUGLAS FIR.
- TOTAL ROCK BALLAST FOR EACH LWD STRUCTURE SHOULD BE CALCULATED AS PER D'AOUST & MILLAR (1999)

¹ D'AOUST, S.G., AND R.G. MILLAR. 1999. LARGE WOODY DEBRIS FISH HABITAT STRUCTURE PERFORMANCE AND BALLASTING REQUIREMENTS. WATERSHED RESTORATION MANAGEMENT REPORT No. 8. 199 PP.



Revision	Description/Description	Date/Date
3	ISSUED FOR TENDER	18/12/2016
2	ISSUED FOR TENDER	27/12/2016
1	ISSUED FOR TENDER	30/11/2017
0	ISSUED FOR TENDER	27/11/2017

Client/Client	Parks Canada / L'Agence Parcs Agency / Canada
Client/Client	Western and Northern Region / Ouest et Nord du Canada

Project title/Titre du projet
TOFINO
PACIFIC RIM NATIONAL PARK RESERVE
ᑭᐱᓱᓴᓴ ᓂᓄᓴᓴ
(Ups-cheek ta-shee)
"Going in the right direction on the trail"

Consultant Signature Only

Designed by/Concept par
 DON CHALMERS / 2016-11

Drawn by/Dessiné par
 DAVID COX / 2017-08

PCA Project Manager/Technical Authority
 Administrateur de Projets APC
 JACKIE HICKS

Drawing title/Titre du dessin
ᑭᐱᓱᓴᓴ ᓂᓄᓴᓴ (Ups-cheek ta-shee)
"Going in the right direction on the trail"
CONSTRUCTION PLAN
FISHERIES WORK

Project No./No. du projet
PCA #1522

Sheet/Feuille
F-1
 OF 15

Revision no./La Révision no.
3

