

**FISHERIES CONSTRUCTION NOTES:**

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

**EROSION & SEDIMENT CONTROL NOTES:**

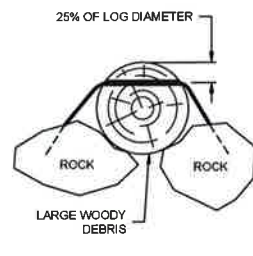
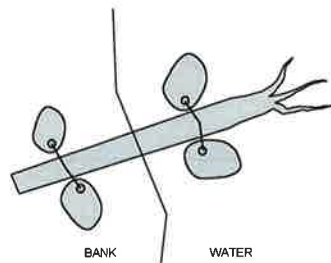
1. IN-STREAM WORKS ARE TO BE APPROPRIATELY ISOLATED FROM STREAM FLOWS THROUGH WATER DIVERSION METHODS THAT MAY INCLUDE:
  2. ALLOWING WATER TO MOVE PASSIVELY AROUND WORK AREAS WHERE POSSIBLE THROUGH EXISTING DITCHES, OR TEMPORARY BY-PASS CHANNELS, PIPES, OR FLUMES.
  3. WHERE WATER MUST BE ACTIVELY PUMPED AROUND WORK AREAS, UP- AND DOWN-STREAM COFFER DAMS WILL BE INSTALLED AND CLEAN WATER WILL BE CONVEYED AROUND THE WORK AREA.
  4. 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.
  5. 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.
  6. SUMP 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).
  7. THE CONTRACTOR SHALL HAVE BACK-UP PUMPS AVAILABLE ON-SITE TO DEAL WITH EXCESS WATER OR PUMP FAILURES.
  8. ENDS OF DISCHARGE HOSES WILL BE PLACED ON AN ENERGY DISSIPATER TO AVOID CAUSING SCOUR.
  9. WATERBARS WILL BE CONSTRUCTED ACROSS ROADS TO DIVERT SEDIMENT LADEN WATER INTO ADJACENT VEGETATED AREAS WHERE APPROPRIATE.
  10. SEDIMENT FENCING WILL BE INSTALLED WHERE APPROPRIATE ALONG WORK ZONE EDGES TO REDUCE RUN-OFF, SLOW WATER AND PREVENT INSTREAM SEDIMENTATION FROM OCCURRING.
11. 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.
12. SOIL STOCKPILES SHALL REQUIRE PRE-APPROVAL FROM DR AND WILL BE PLACED IN DESIGNATED SITES WHERE EROSION AND SEDIMENT RUNOFF CANNOT OCCUR.
13. 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.
14. PERMANENT EXPOSED SOIL AREAS AND EROSION-PRONE SLOPES THAT MAY POTENTIALLY ERODE INTO WATERCOURSES SHOULD BE PROTECTED WITH NATIVE ALL NATURAL EROSION CONTROL BLANKETS.
15. 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:**

1. RIFFLE CRESTS ARE GENERALLY LOCATED 1.5 TO 2.0 TIMES THE NATURAL CHANNEL WIDTH DOWNSTREAM OF THE CROSSING OUTLET.
2. BUILD RIFFLE WITH 500mm DIA BOULDERS AND KEY THE CREST AND TOE BOULDERS BELOW SCOUR DEPTH.
3. KEY THE RIFFLE CREST INTO OPPOSING BANKS TO AVOID FLANKING.
4. 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.
5. CONSTRUCT DOWNSTREAM FACE OF RIFFLE AT A SHALLOW SLOPE THAT MIMICS LOCAL NATURAL RIFFLES (10:1 TO 15:1 SLOPE)
6. 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.
7. PLACE LARGE ROCKS RANDOMLY ON THE DOWNWARD FACE 20 TO 30 CM APART TO DISSIPATE ENERGY AND CREATE LOW FLOW FISH PASSAGE CHANNELS.
8. RIP RAP BOTH BANKS WITH EMBEDDED ROUNDED BOULDERS AND COBBLES TO THE HIGH-WATER LINE.
9. PLACE SPAWNING GRAVEL 500mm THICK IN THE FLOOR OF THE 300mm DEEP POOL.
10. WHERE POOLS ARE CREATED DOWNSTREAM, THE POOLS SHALL BE CONSTRUCTED TO PROVIDE A FINAL MINIMUM DEPTH OF 300mm DEPTH.
11. WHERE DIRECTED BY THE DR A MAT OF 50kg RIP RAP SHALL BE PLACED IMMEDIATELY DOWNSTREAM OF THE CULVERT OUTLET.

**LWD & BALLAST SPECIFICATIONS:**

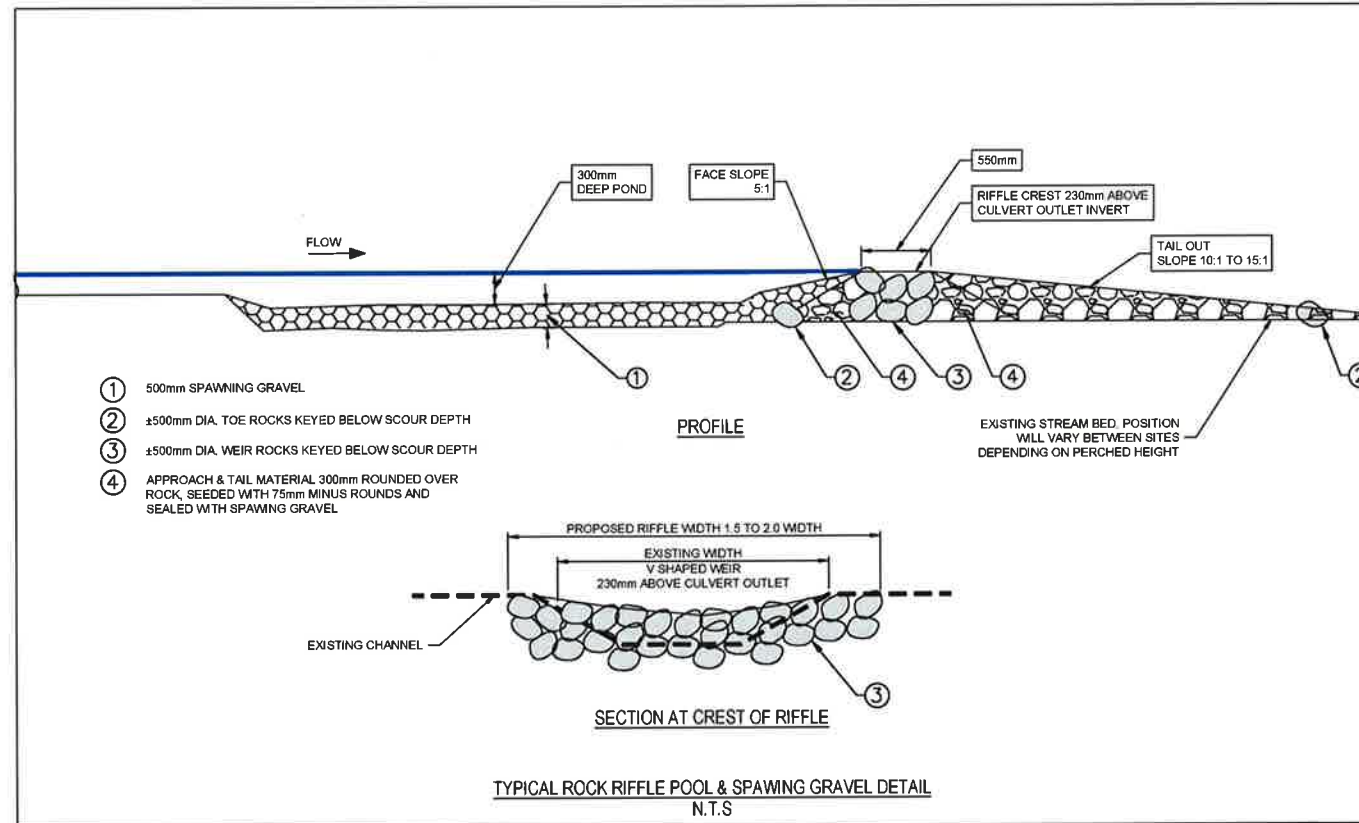
- 1/2" GALVANIZED WIRE CORE WIRE ROPE.
- LENGTH OF WIRE ROPE TO BE DETERMINED IN THE FIELD.
- WIRE ROPE TO BE THREADED THROUGH 1/2" HOLES AUGERED THROUGH UPPER 25% PORTION OF LOG AS SHOWN.
- ENSURE NO SLACK IN COMPLETED ASSEMBLY.
- USING 1/4" DIA ROCK BIT DRILL 300mm (MIN) DEEP.
- CLEAN BORE HOLES AS PER MANUFACTURER'S SPECIFICATIONS TO PREP FOR ADHESIVE.
- ATTACH CABLES TO BOULDERS WITH HILTI RES50 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)<sup>1</sup>

<sup>1</sup> 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.



Version/Iteration	Description/Description	Date/Date
2	ISSUED FOR TENDER	16/11/2014
3	ISSUED FOR TENDER	27/12/2014
1	ISSUED FOR TENDER	25/11/2011
0	ISSUED FOR TENDER	27/11/2011

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Agency Canada  
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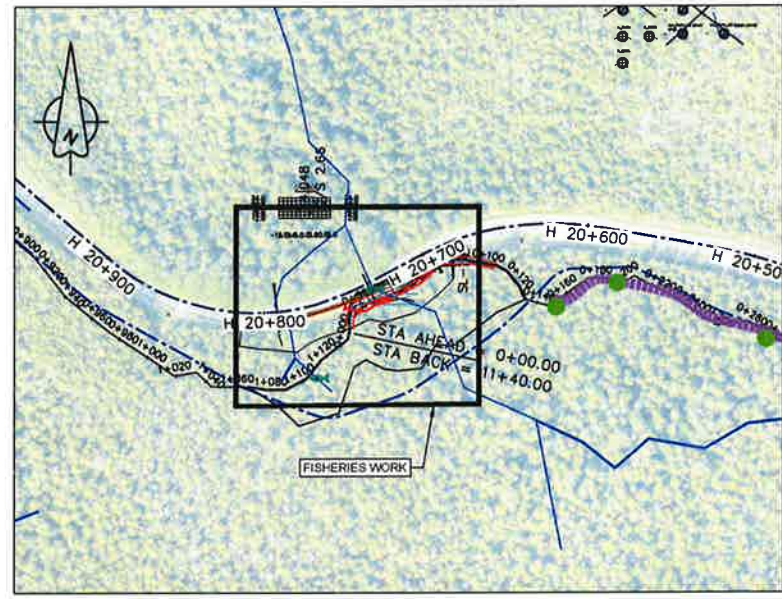
Projet site/Titre du projet  
TOFINO  
**PACIFIC RIM NATIONAL PARK RESERVE**  
**?apscilik fasii (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**

Consultant Signature Only  
Designed by/Conçue par  
DON CHALMERS / 2016-11  
Drawn by/Dessiné par  
DAVID COX / 2017-08  
PCA Project Manager/Technicien Admistrateur de Projets APC  
JACKIE HICKS

Drawing title/Titre de dessin  
**?apscilik fasii (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**  
**CONSTRUCTION PLAN FISHERIES WORK**

Project No./No. de projet  
PCA #1522  
Sheet/Feuille  
F-1  
of 15  
Revision no./No. de Révision  
3





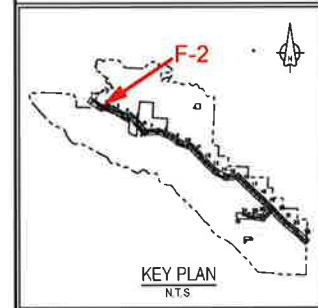
LOCATION PLAN  
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**NOTES:**

1. REFER TO SHEET F-1 FOR ENVIRONMENTAL AND FISHERIES NOTES.
2. ALL WORK WITHIN THE HIGH WATER MARK SHALL BE DONE DURING THE FISHERIES WINDOWS UNLESS APPROVED OTHERWISE BY THE OWNER'S ENVIRONMENTAL MONITOR (OEM).
3. WATER SHALL BE DIVERTED AROUND THE CONSTRUCTION SITE USING METHODS APPROVED BY OEM.
4. ALL MATERIALS USED SHALL BE FREE OF INVASIVE SPECIES.
5. SPANNING GRAVEL SHALL BE AS SPECIFIED IN SECTION 31 05 16, AGGREGATE MATERIALS.
6. WEIRS SHALL BE CONSTRUCTED TO DETAILS SHOWN ON SHEET F-1.1.
7. ROOT WADS AND LARGE WOODY DEBRIS TO BE SUITABLY BALLASTED AS DETAILED ON SHEET F-1.1 OR EMBEDDED A MINIMUM OF 75% INTO BANK (WHERE APPLICABLE).
8. EXISTING STUMPS, ROOTWADS, LOGS, ETC. SHOULD BE RETAINED AND USED FOR HABITAT COMPLEXING.
9. RED SHOWS PROPOSED WORKS.

Sheet F-2 Fisheries Enhancement	
<b>Existing Culvert # 3 Information</b>	
Location:	Hwy #4 - Station H20+720 (Site A)
Material:	CSP Galvanized Coating
Diameter:	800 mm Circular
Length:	16.7 metres
Cover over culvert:	1.8 metres
Extend 1.5 metres	Extend 1.5 metres
<b>Proposed Enhancements</b>	
Create 16 Sq.m. resting pond with spawning gravel	
Add woody debris and root wads	

**PARSONS**



Revision/Description	Date/Date
1	ISSUED FOR TENDER 09/11/2011
2	ISSUED FOR TENDER 08/12/2010
3	ISSUED FOR TENDER 07/11/2010

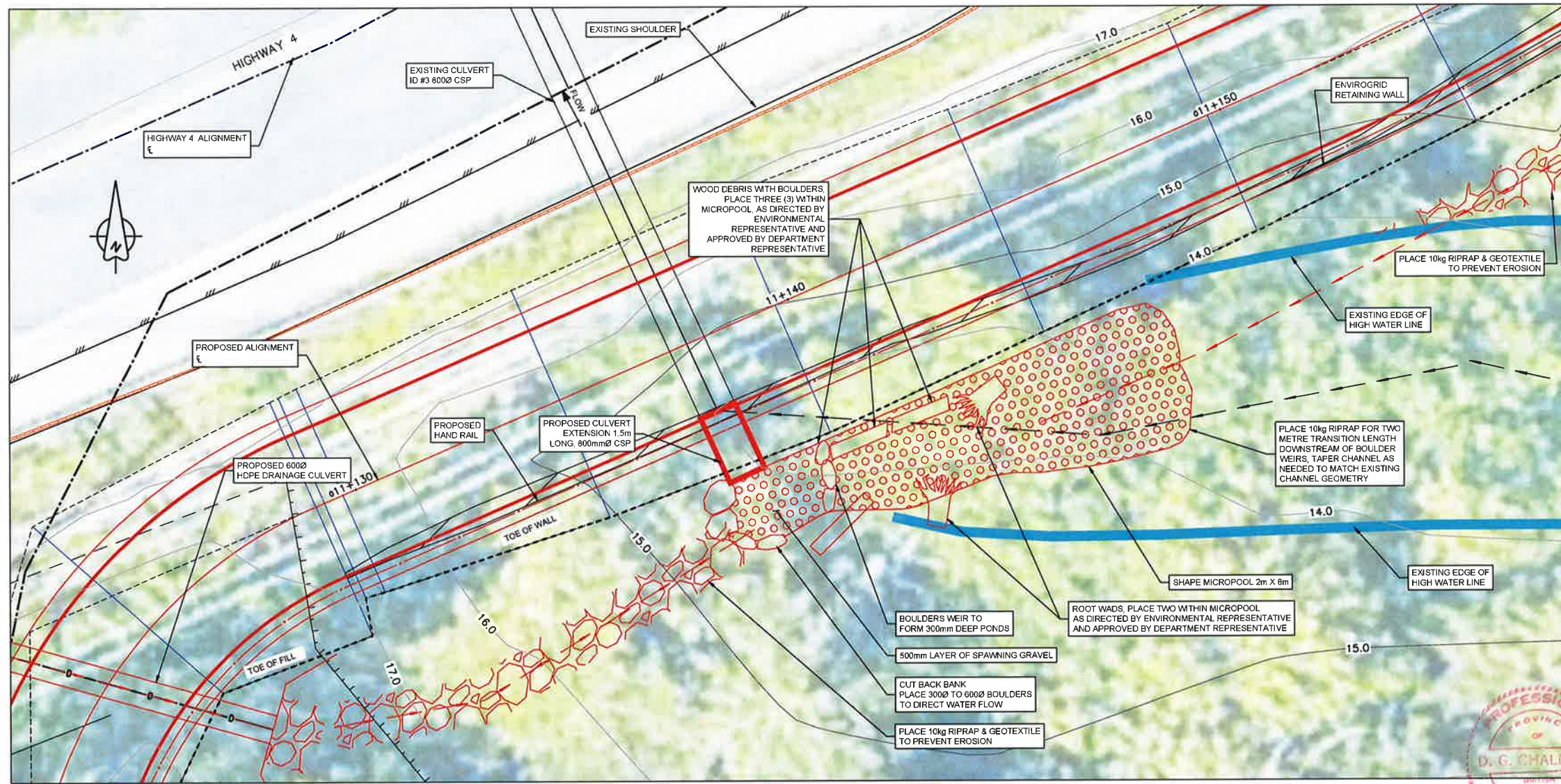
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Agency Canada  
Western and Northern Region Ouest et Nord du Canada

Projet titre / Titre du projet  
TOFINO  
**PACIFIC RIM NATIONAL PARK RESERVE**  
ʔapsc̓iik fas̓ii (Ups-cheek ta-shee)  
"Going in the right direction on the trail"

Conseiller 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  
ʔapsc̓iik fas̓ii (Ups-cheek ta-shee)  
"Going in the right direction on the trail"  
**CONSTRUCTION PLAN**  
**FISHERIES WORK**  
CULVERT 3'  
HIGHWAY 4 STA H20+720

Projet No./No. du projet PCA #1522	Sheet/Feuille F-2 OF 15	Revision no./ Révision no. 2
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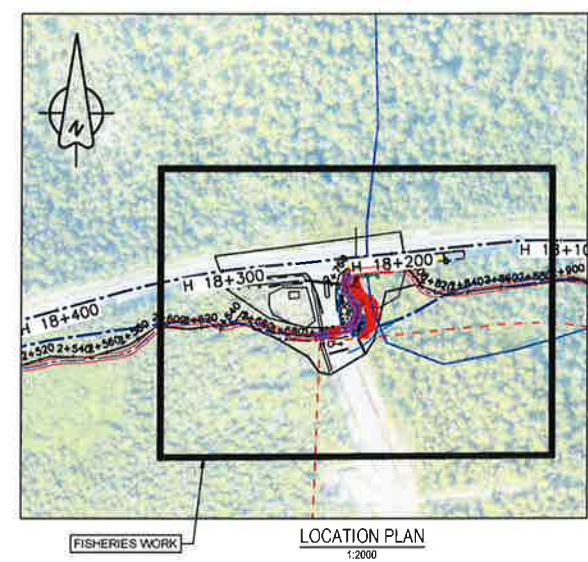
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1:50

1:50 0 1 3m

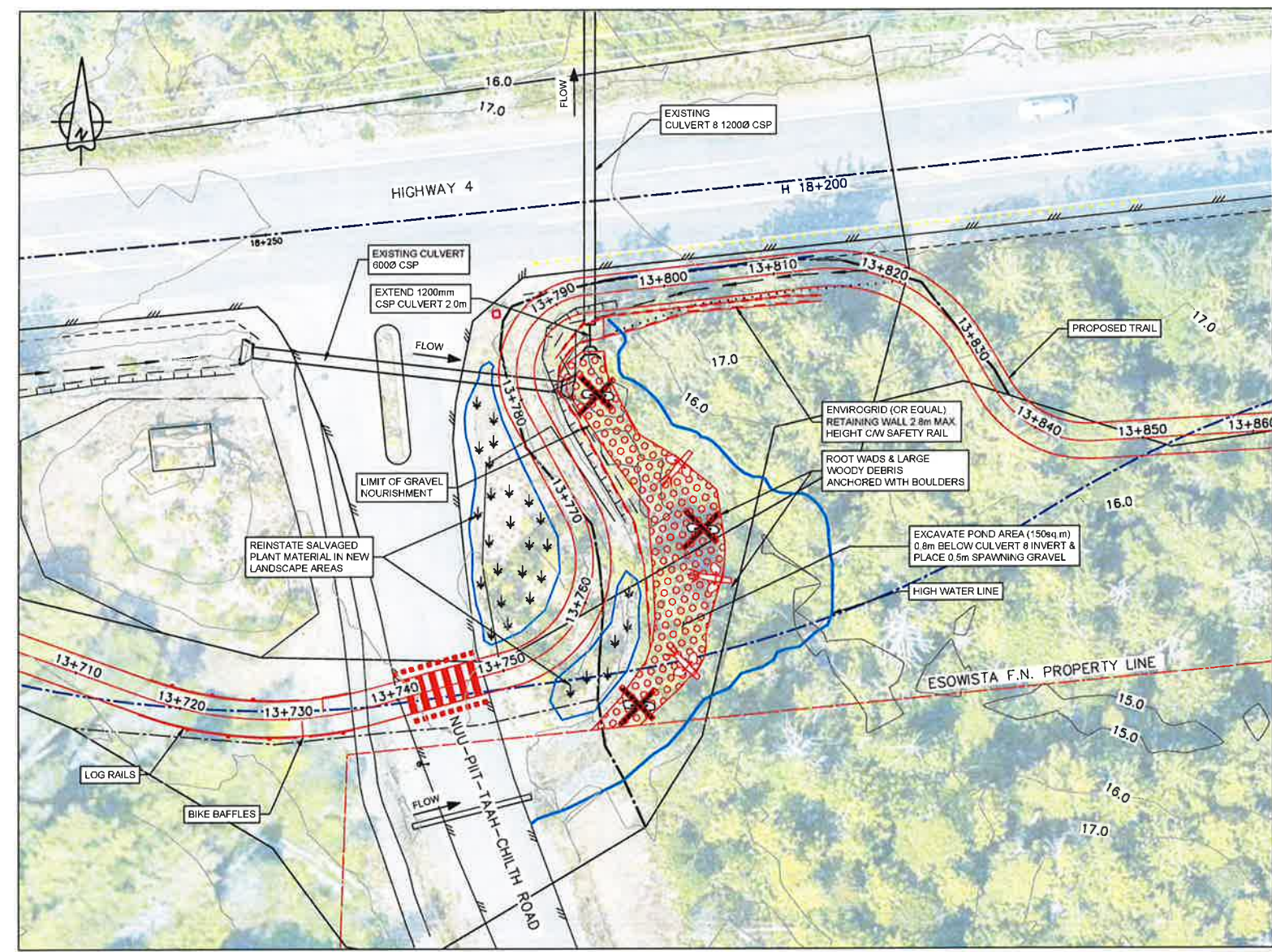
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PROVINCE OF  
D. G. CHALMERS  
COLUMBIA  
DEC 1 8 2018



**PARSONS**



1:1000 0 20 60m



PLAN 1:250 0 5 15m



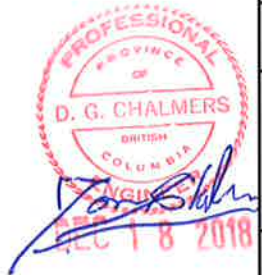
Sheet F- 4 Fisheries Enhancement	
<b>Existing Culvert #8 Information</b>	
Location:	Hwy #4 - Station H18+221 (Site L)
Material:	CSP Galvanized
Diameter:	1,200 mm Circular
Length:	21 metres
Cover over culvert:	1.8 metres
Comments:	Extend 2 metres
<b>Proposed Enhancements</b>	
Minimize extension with use of retaining wall	
Supplement existing root wads and woody debris	
Place spawning gravel in pond area	

- NOTES:**
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  - WATER SHALL BE DIVERTED AROUND THE CONSTRUCTION SITE USING METHODS APPROVED BY OEM.
  - ALL MATERIALS USED SHALL BE FREE OF INVASIVE SPECIES.
  - SPAWNING GRAVEL SHALL BE AS SPECIFIED IN SECTION 31 05 16. AGGREGATE MATERIALS.
  - WEIRS SHALL BE CONSTRUCTED TO DETAILS SHOWN ON SHEET F-1.1.
  - ROOT WADS AND LARGE WOODY DEBRIS TO BE SUITABLY BALLASTED AS DETAILED ON SHEET F-1.
  - EXISTING STUMPS, ROOTWADS, LOGS, ETC. SHOULD BE RETAINED AND USED FOR HABITAT COMPLEXING.
  - RED SHOWS PROPOSED WORKS.

Rev	Description	Date
2	ISSUED FOR TENDER	8/13/2016
1	ISSUED FOR TENDER	26/11/2011
0	ISSUED FOR TENDER	27/11/2011

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

Designed by/Conçue par  
DON CHALMERS / 2016-11  
Drawn by/Dessiné par  
DAVID COX / 2017-08  
PCA Project Manager/Technical Authority  
Administrateur de Projets APC  
JACKIE HICKS

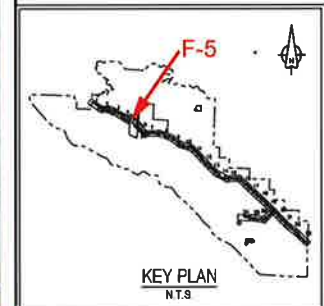


Drawing title/Titre du dessin  
**?apsciik tasli (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**  
**CONSTRUCTION PLAN**  
**FISHERIES WORK**  
CULVERT #8  
HIGHWAY 4 STA H18+221

Project No./No. du projet PCA #1522	Sheet/Feuille F-4 of 15	Revision no./No. de Révision 2
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**PARSONS**



Revision	Description/Description	Date/Date
2	ISSUED FOR TENDER	8/13/2018
1	ISSUED FOR TENDER	05/11/2017
0	ISSUED FOR TENDER	07/11/2015

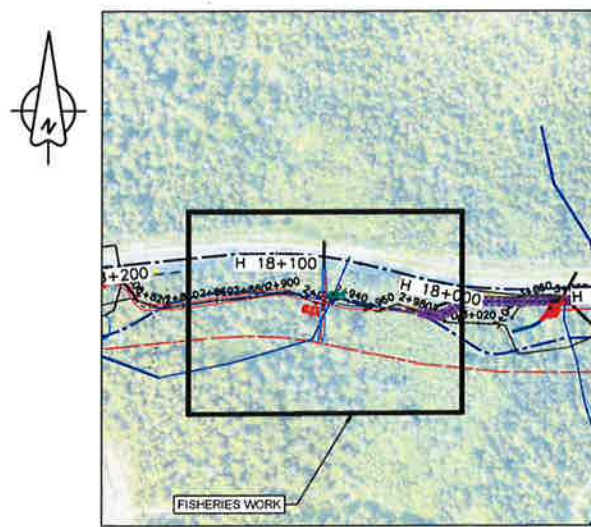
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Agency Canada  
Western and Northern Region Ouest et Nord du Canada

Projet/Titre du projet  
TOFINO  
**PACIFIC RIM NATIONAL PARK RESERVE**  
**ʔapcɪɪk taʃɪl**  
**(Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**

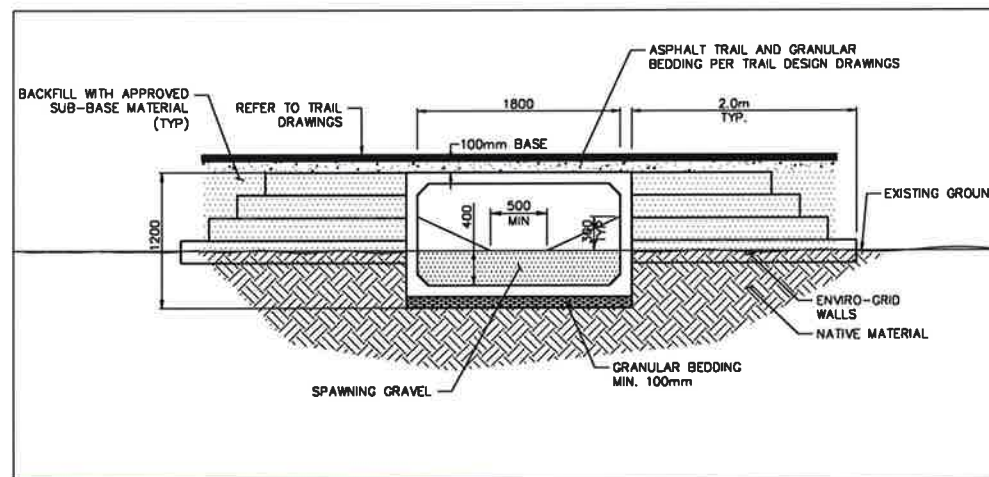
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Designed by/Conçue par  
DON CHALMERS / 2018-11  
Drawn by/Desiné par  
DAVID COX / 2017-08  
PCA Project Manager/Technicien Responsable  
Administrateur de Projets APC  
JACKIE HIGGS

Drawing title/Titre du dessin  
**ʔapcɪɪk taʃɪl (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**  
**CONSTRUCTION PLAN**  
**FISHERIES WORK**  
CULVERT #9  
HIGHWAY 4 STA H18+072

Project No./No. de projet  
PCA #1522  
Sheet/Feuille  
F-5  
of 18  
Drawing No./No. de dessin  
2



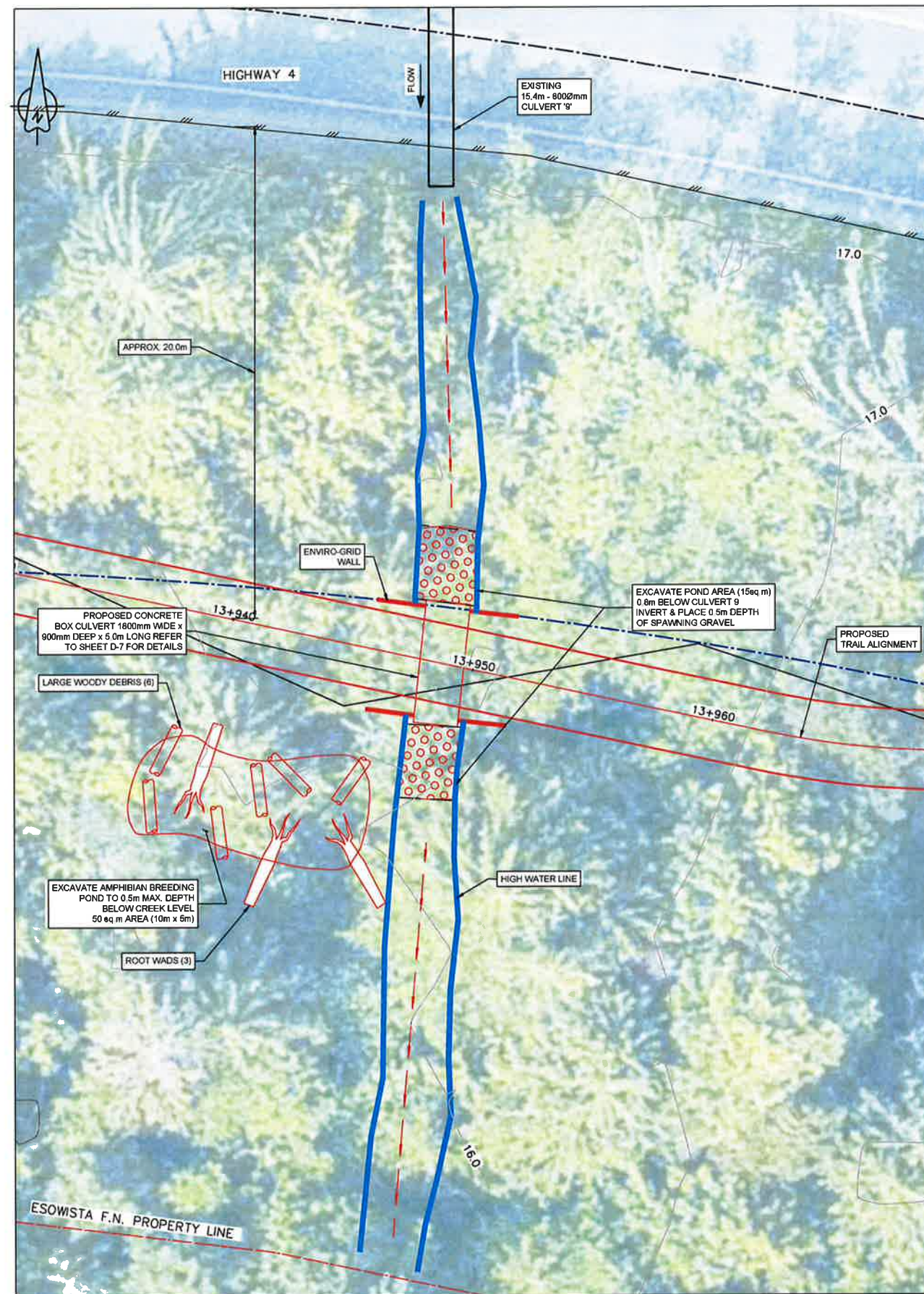
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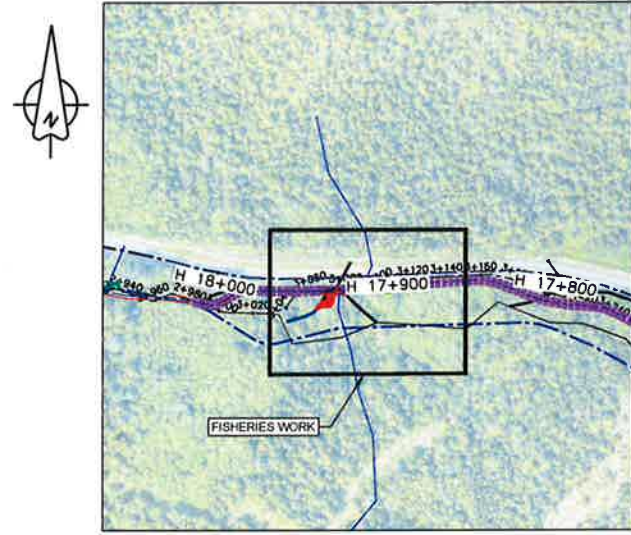
Sheet F- 5 Fisheries Enhancement	
<b>Existing Culvert #9 Information</b>	
Location:	Hwy #4 - Station H18+072
Material:	CSP Galvanized
Diameter:	800 mm Circular
Length:	13.9 metres
Cover over culvert:	0.6 metres
Comments:	Trail located away from culvert
<b>Proposed Enhancements</b>	
construct amphibian breeding pond with woody debris	

**NOTES:**

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- EXISTING STUMPS, ROOTWADS, LOGS, ETC. SHOULD BE RETAINED AND USED FOR HABITAT COMPLEXING.
- RED SHOWS PROPOSED WORKS.



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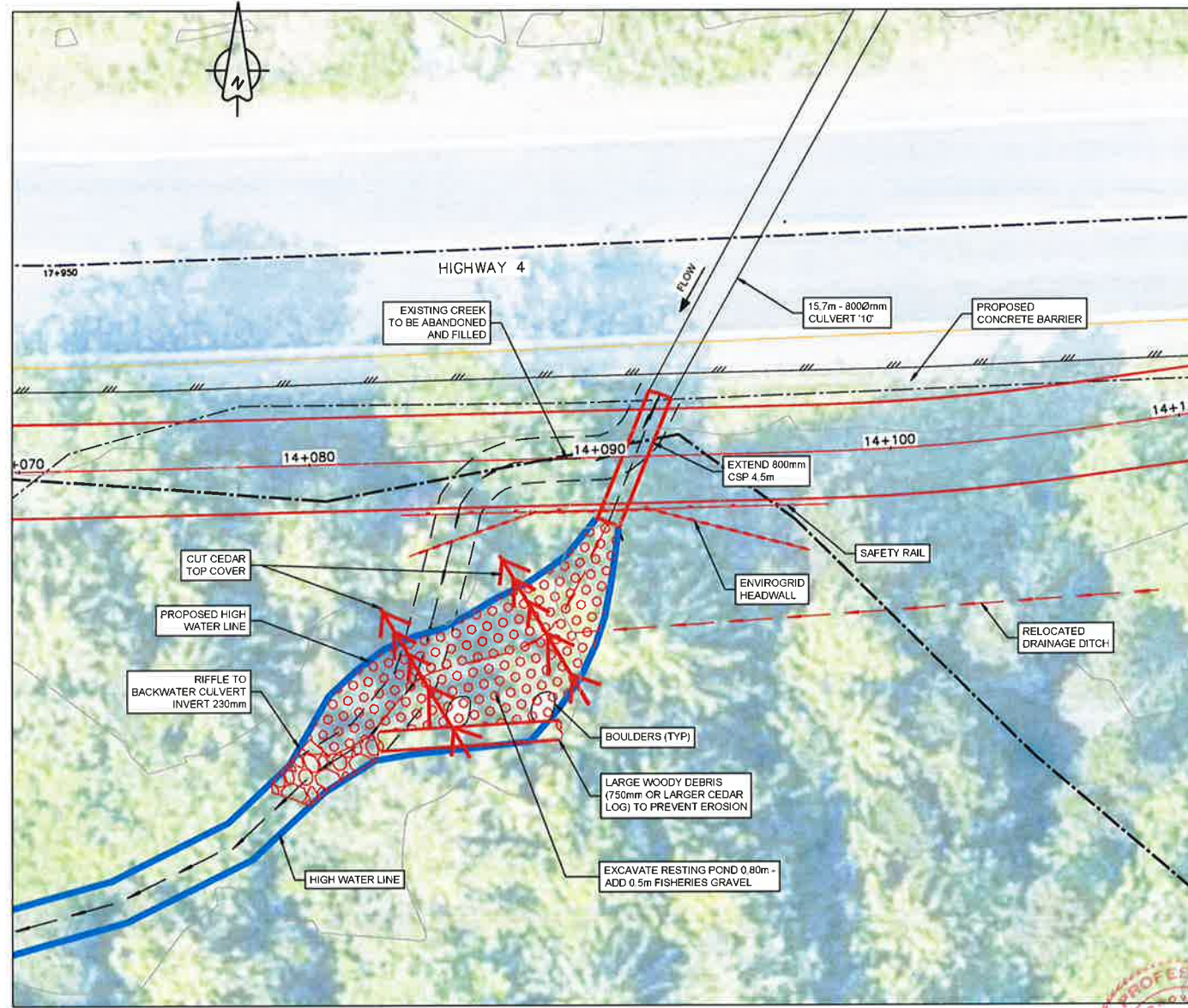


1:2000 0 40 120m LOCATION PLAN 1:2000

Sheet F- 6 Fisheries Enhancement	
<b>Existing Culvert #10 Information</b>	
Location:	Hwy #4 - Station H17+929
Material:	CSP Galvanized
Diameter:	800 mm Circular
Length:	15,7 metres
Cover over culvert:	1.0 metres
Comments:	Extend 4.5 metres
<b>Proposed Enhancements</b>	
construct pond with spawning gravel and woody debris	
reduce 90 degree bend in flow channel	

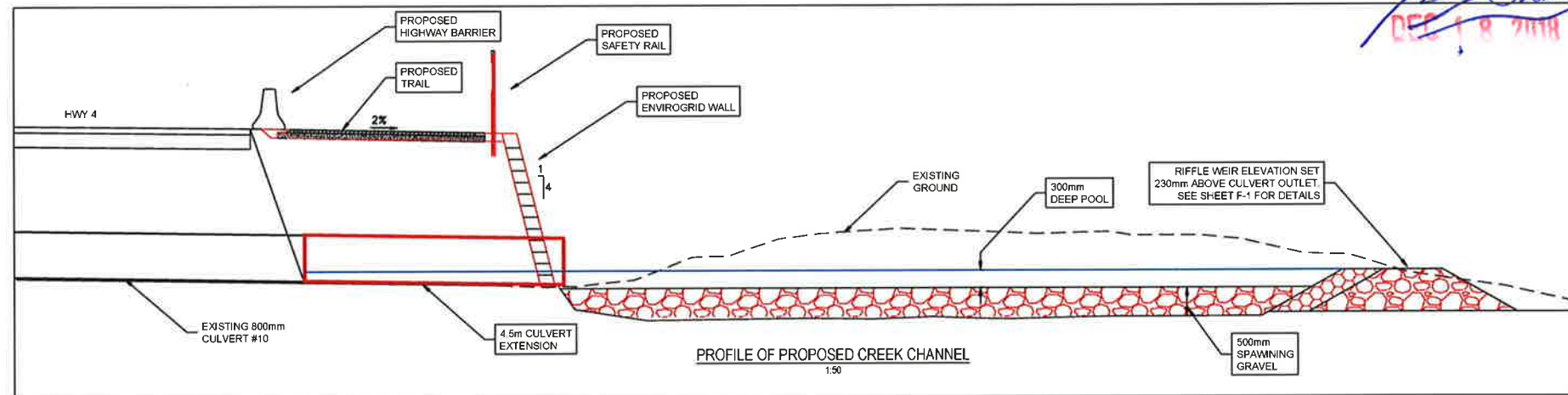
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9. RED SHOWS PROPOSED WORKS.



1:100 0 1 2 6m PLAN 1:100

PROFESSIONAL ENGINEER OF BRITISH COLUMBIA  
 D. G. CHALMERS  
 DEC 18 2018



Version/No.	Description/Description	Date/Date
1	ISSUED FOR TENDER	18/12/2018
2	ISSUED FOR TENDER	18/12/2018
3	ISSUED FOR TENDER	20/11/2018
4	ISSUED FOR TENDER	27/11/2018

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

Project Name/Titre du projet  
 TOFINO  
 PACIFIC RIM NATIONAL PARK RESERVE  
 ?apsciik fasii (Ups-cheek ta-shee)  
 "Going in the right direction on the trail"

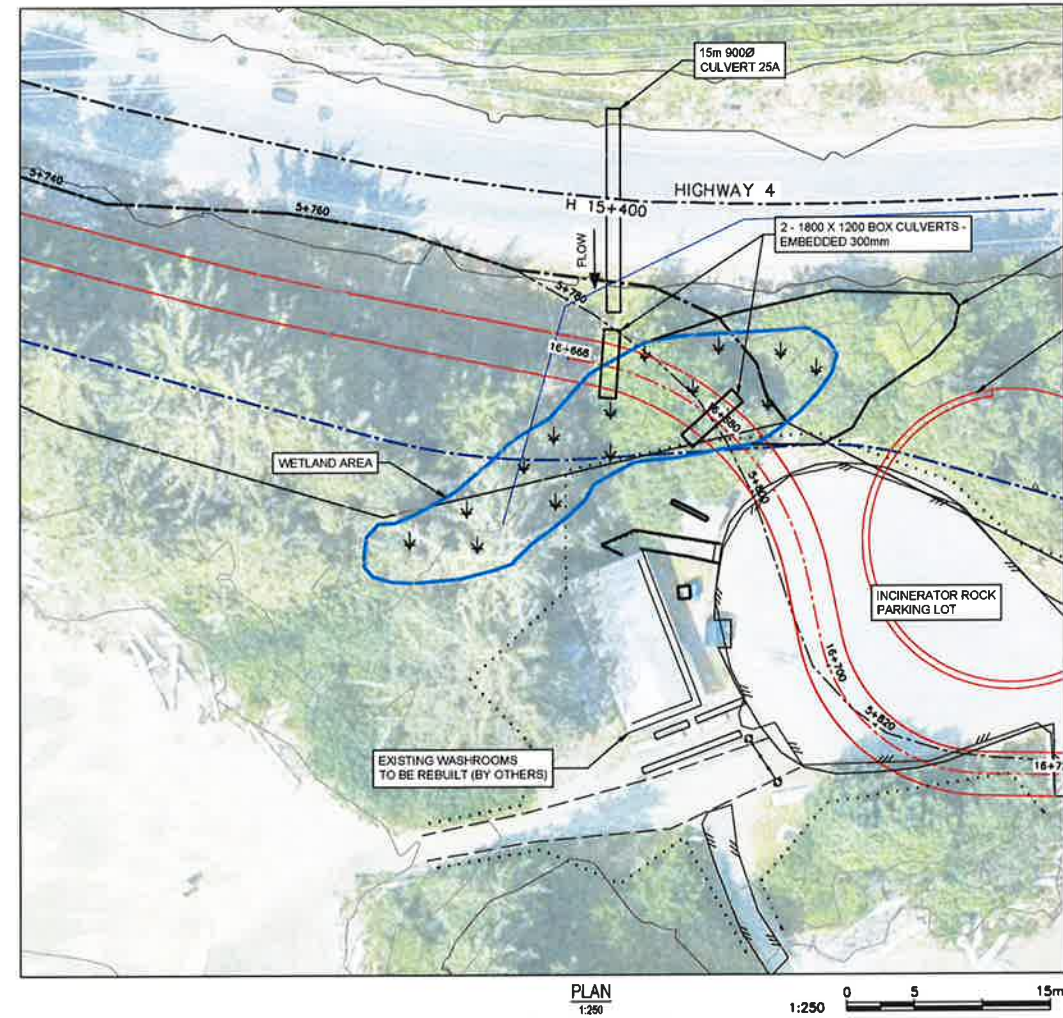
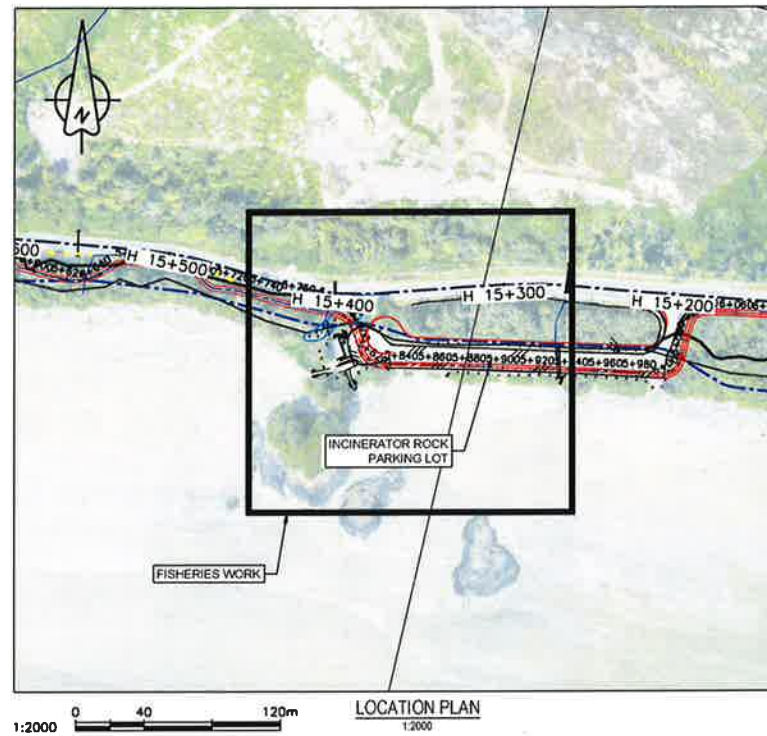
Designed by/Conçue par  
 DON CHALMERS / 2018-11  
 Drawn by/Dessiné par  
 DAVID COX / 2017-08  
 PCA Project Manager/Technical Authority  
 Administrateur de Projets APC  
 JACKIE HICKS

Drawing title/Titre du dessin  
 ?apsciik fasii (Ups-cheek ta-shee)  
 "Going in the right direction on the trail"  
 CONSTRUCTION PLAN  
 FISHERIES WORK  
 CULVERT #10  
 HIGHWAY 4 STA H17+929

Project No./No. du projet	Sheet/Feuille	Revision no./No. Révision
PCA #1522	F-6 OF 15	3

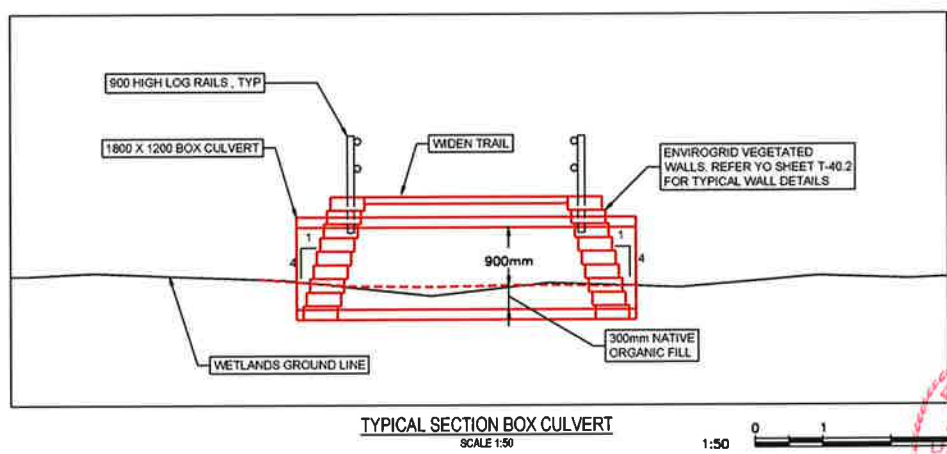
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**PARSONS**



Sheet F- 7 Fisheries Enhancement	
<b>Existing Culvert # 15 Information</b>	
Location:	Hwy #4 - Station H15+400
Material:	CSP Galvanized
Diameter:	900 mm Circular
Length:	13 metres
Cover over culvert:	1.0 metres
Comments:	Trail located away from culvert
<b>Proposed Enhancements</b>	
Trail footprint minimized wetland area	
Minimize impacts to nutrient contributing wetland	

- NOTES:**
- REFER TO SHEET F-1 FOR CONSTRUCTION NOTES AND EROSION AND SEDIMENT CONTROL NOTES.
  - FOR ELEVATED TRAIL STRUCTURE SEE STRUCTURAL DRAWINGS S-2.1, S-2.2, S-2.3, S-2.4 & S-2.5.
  - FOR ELEVATED TRAIL CONSTRUCTION SEQUENCE SEE STRUCTURAL DRAWING S-26-G
  - REFER TO SHEET F-1 FOR ENVIRONMENTAL AND FISHERIES NOTES.
  - ALL WORK WITHIN THE HIGH WATER MARK SHALL BE DONE DURING THE FISHERIES WINDOWS UNLESS APPROVED OTHERWISE BY THE OWNER'S ENVIRONMENTAL MONITOR (OEM).
  - WATER SHALL BE DIVERTED AROUND THE CONSTRUCTION SITE USING METHODS APPROVED BY OEM.
  - ALL MATERIALS USED SHALL BE FREE OF INVASIVE SPECIES.
  - SPAWNING GRAVEL SHALL BE AS SPECIFIED IN SECTION 31 05 16, AGGREGATE MATERIALS.
  - WEIRS SHALL BE CONSTRUCTED TO DETAILS SHOWN ON SHEET F-1.1.
  - ROOT WADS AND LARGE WOODY DEBRIS TO BE SUITABLY BALLASTED AS DETAILED ON SHEET F-1.
  - EXISTING STUMPS, ROOTWADS, LOGS, ETC. SHOULD BE RETAINED AND USED FOR HABITAT COMPLEXING.
  - RED SHOWS PROPOSED WORKS.



**PROFESSIONAL**  
OF  
**G. CHALMERS**  
BRITISH COLUMBIA  
DEC 1 '8 2018

Revision/Description	Date/Date
4	ISSUED FOR TENDER 18/12/2018
3	ISSUED FOR TENDER 30/11/2018
2	ISSUED FOR TENDER 18/12/2017
1	ISSUED FOR TENDER 30/11/2017
0	ISSUED FOR TENDER 27/11/2017

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

Projet Site/Titre du projet  
**TOFINO**  
**PACIFIC RIM NATIONAL PARK RESERVE**  
**?apsclik tašil (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**

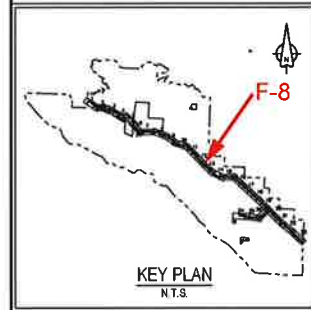
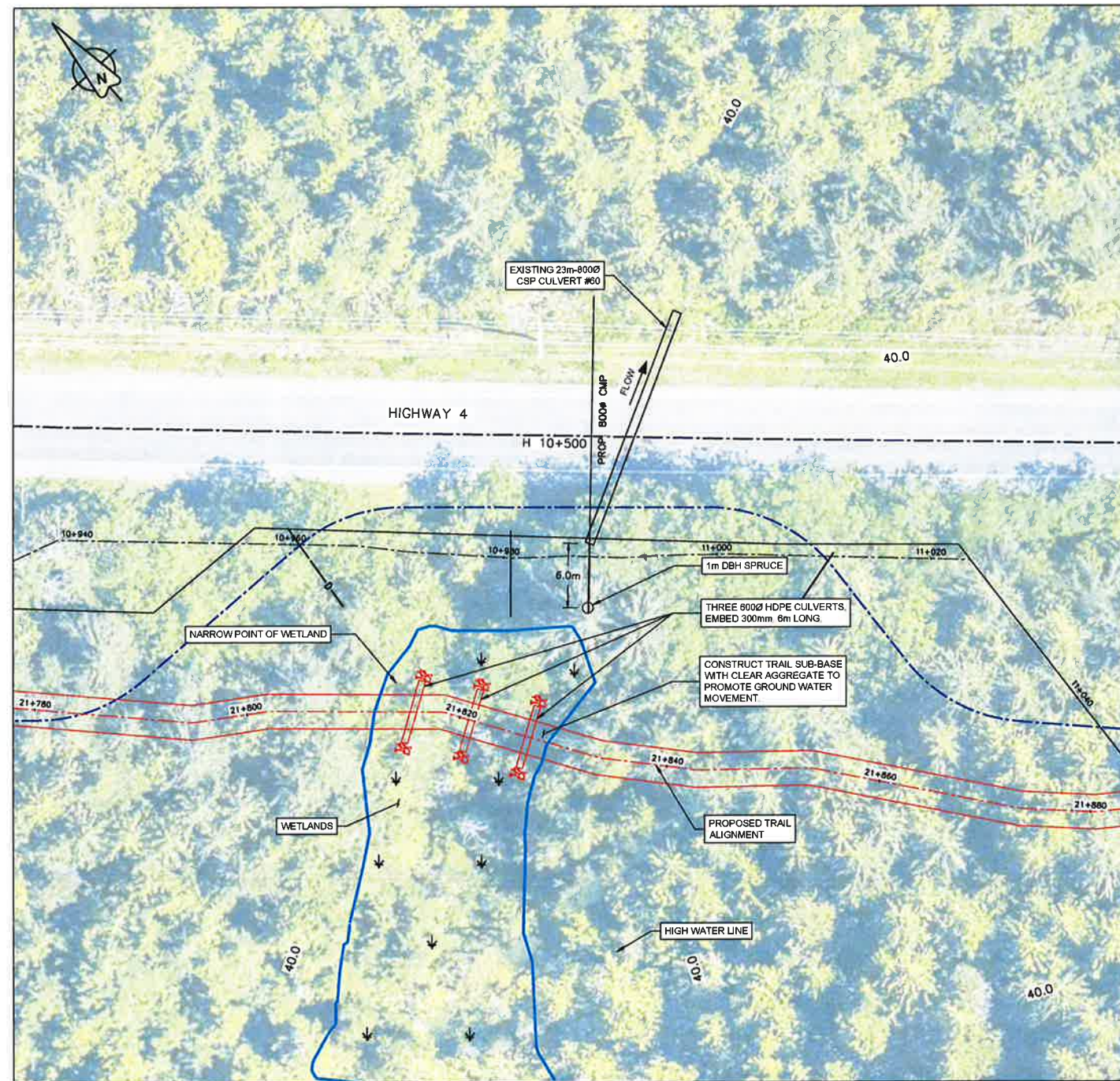
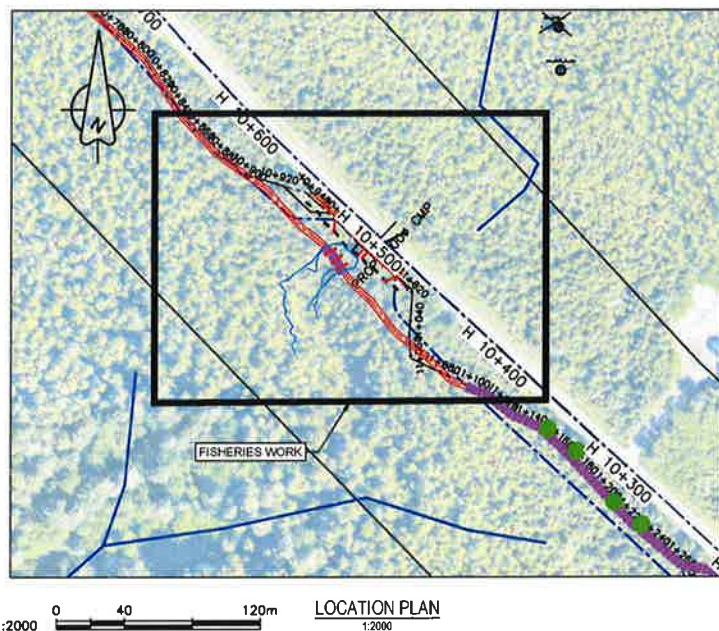
Designed by/Conçue par  
DON CHALMERS / 2018-11  
Drawn by/Dessiné par  
DAVID COX / 2017-08  
PCA Project Manager/Responsable du projet  
Administrateur de Projets APC  
JACQUE HICKS

Drawing Site/Titre du dessin  
**?apsclik tašil (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**  
**CONSTRUCTION PLAN**  
**FISHERIES WORK**  
INCINERATOR ROCK AREA  
HIGHWAY 4 STA H10+496

Project No./No. du projet <b>PCA #1522</b>	Sheet/Feuille <b>F-7</b> of 15	Revision No./No. de la révision <b>4</b>
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G:\V\1522 - INCINERATOR ROCK AREA\DRAWINGS\1522-F-7-FISHERIES WORK.DWG PLOTTED ON 2018/12/14 10:28am BY P032836C

**PARSONS**



Sheet F- 8 Fisheries Enhancement	
<b>Existing Culvert # 60 Information</b>	
Location:	Hwy #4 - Station H10+497 (Site H)
Material:	CSP Galvanized
Diameter:	800 mm Circular
Length:	23 metres
Cover over culvert:	3.0 metres
Comments:	No Extension
<b>Proposed Enhancements</b>	
Trail located away from culvert to cross narrow part of wetland. Construct water relief culverts	

**NOTES:**

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- RED SHOWS PROPOSED WORKS.

**PROFESSIONAL**  
**D. G. CHALMERS**  
 BRITISH COLUMBIA  
 18 DECEMBER 2018

Revision	Description	Date
0	ISSUED FOR TENDER	07/11/2014
1	ISSUED FOR TENDER	05/11/2015
2	ISSUED FOR TENDER	08/12/2016

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

Projet No./Titre du projet  
**TOFINO**  
**PACIFIC RIM NATIONAL PARK RESERVE**  
**?apsčlik fasil (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**

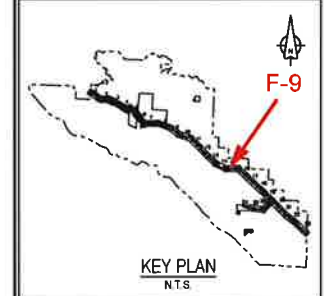
Designed by/Conçue par  
 DON CHALMERS / 2016-11  
 Drawn by/Dessine par  
 DAVID COX / 2017-08  
 PCA Project Manager/Technical Authority  
 Administrateur de Projets APC  
 JACQUE HICKS

Drawing title/Titre du dessin  
**?apsčlik fasil (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**  
**CONSTRUCTION PLAN FISHERIES WORK**  
 CULVERT '00  
 HIGHWAY 4 STA H10+498

Project No./No. du projet	Sheet/Feuille	Revision no./No. de révision
<b>PCA #1522</b>	<b>F-8</b> OF 15	<b>2</b>



**PARSONS**



Revision/Description	Date/Date
2	ISSUED FOR TENDER 10/12/2011
1	ISSUED FOR TENDER 05/11/2011
0	ISSUED FOR TENDER 07/11/2011

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

Projet/Title du projet  
**TOFINO**  
**PACIFIC RIM NATIONAL PARK RESERVE**  
**?apsclik fasli (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**

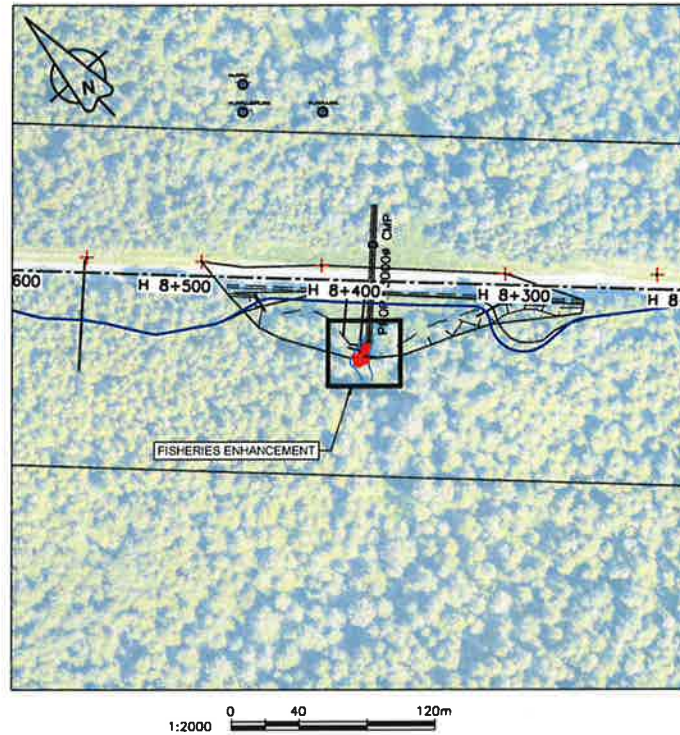
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Designed by/Conçue par  
DON CHALMERS / 2016-11  
Drawn by/Dessiné par  
DAVID COX / 2017-08  
PCA Project Manager/Technical Authority  
Administrateur de Projets APC  
JACKIE HICKS

Drawing Title/Title du dessin  
**?apsclik fasli (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**  
**CONSTRUCTION PLAN**  
**FISHERIES WORK**  
**CULVERT #7**  
**HIGHWAY 4 STA H8+400**

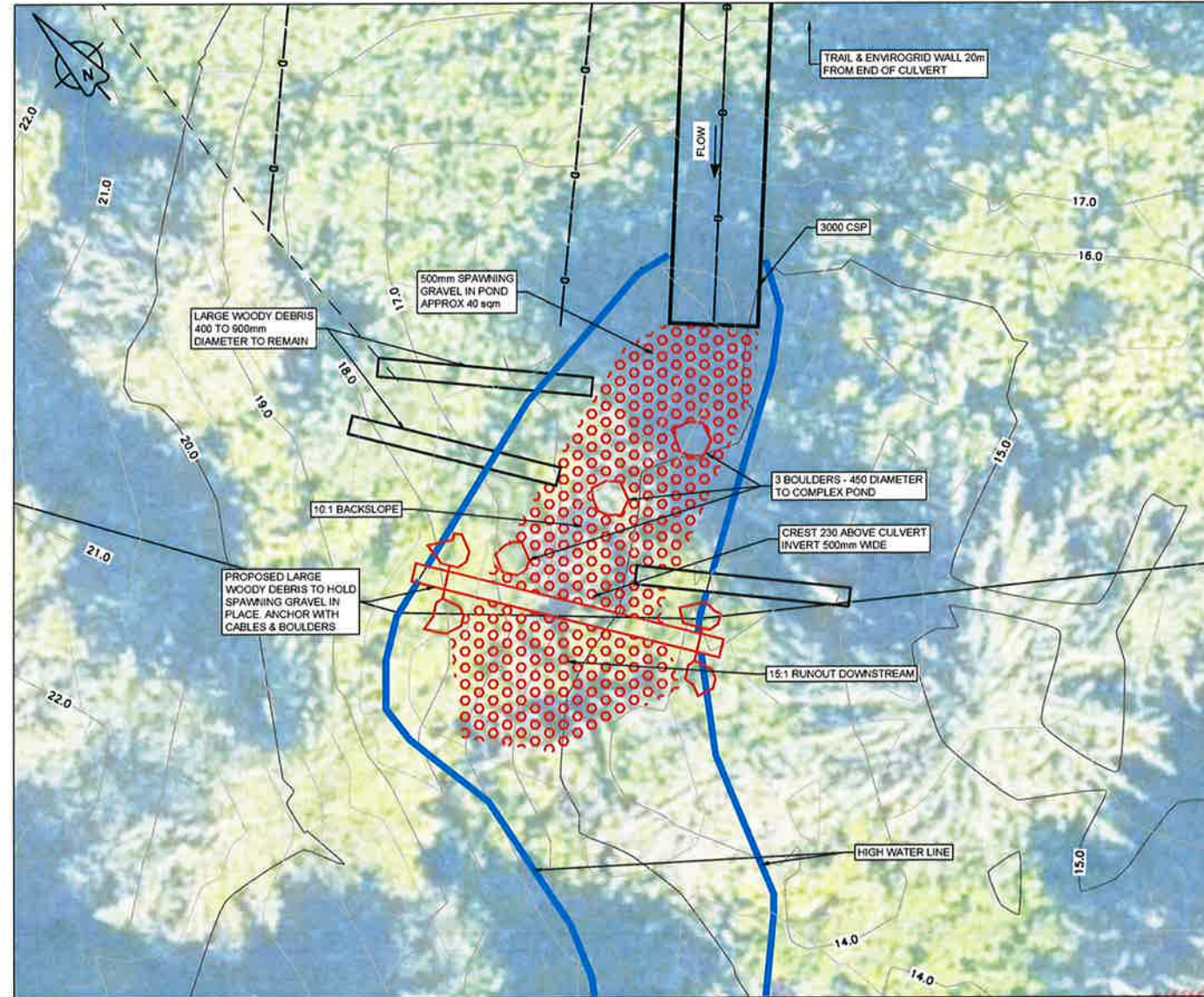
Project No./No. de projet  
**PCA #1522**

Sheet/Feuille  
**F-9**  
of 15

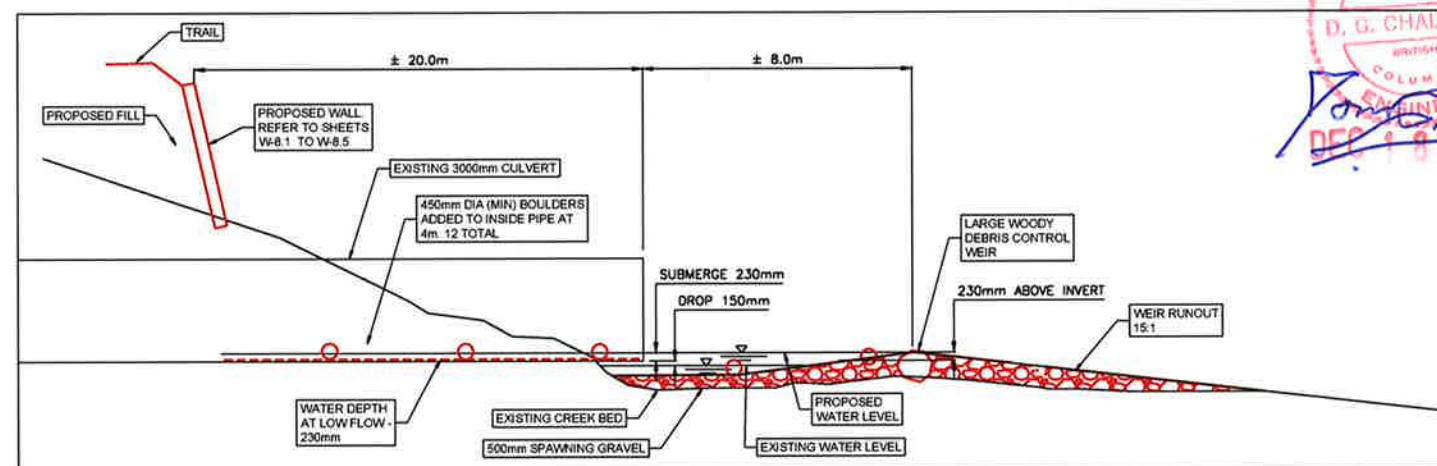
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**2**



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PLAN  
N.T.S.

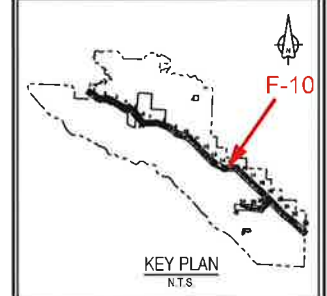
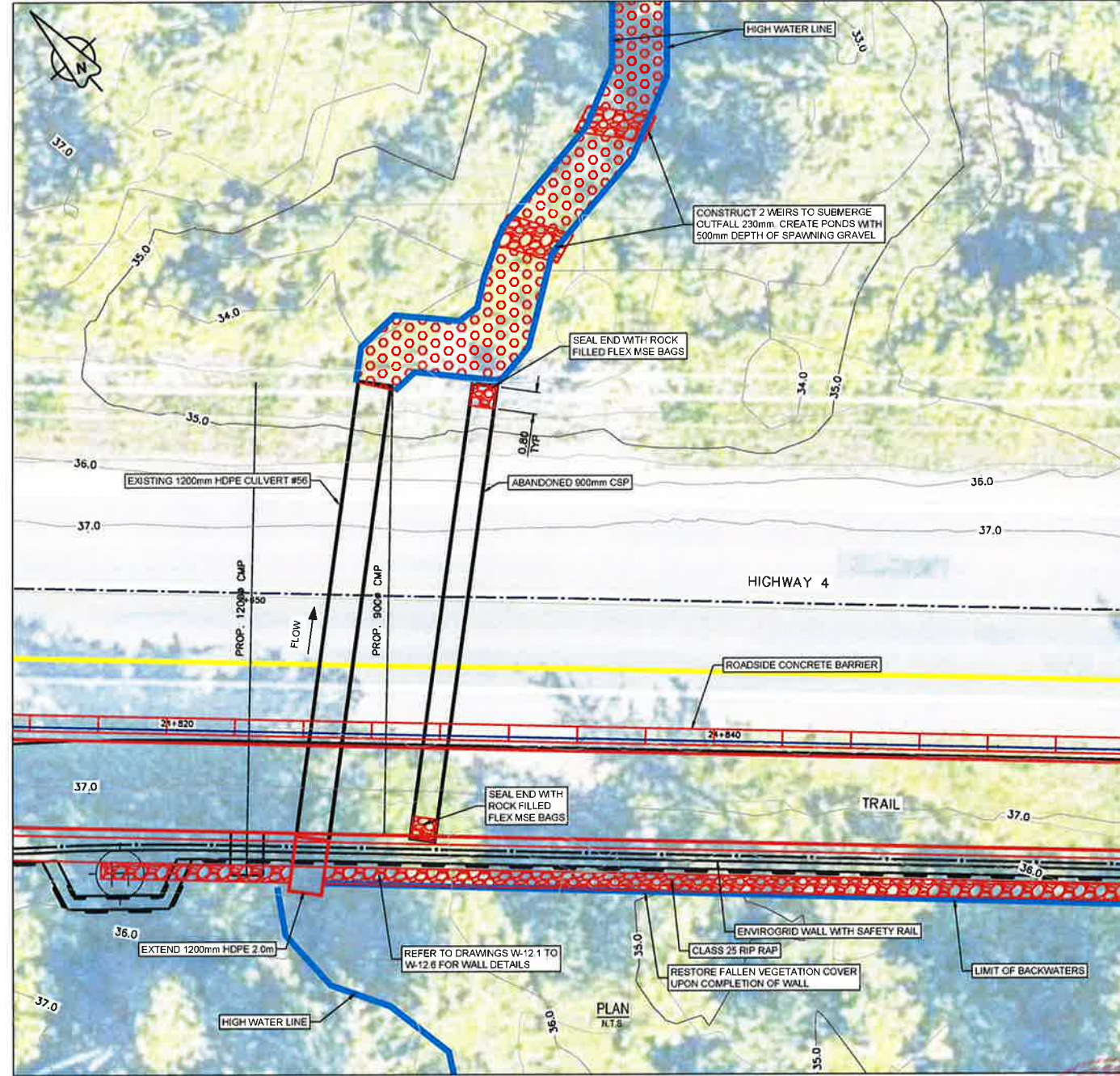
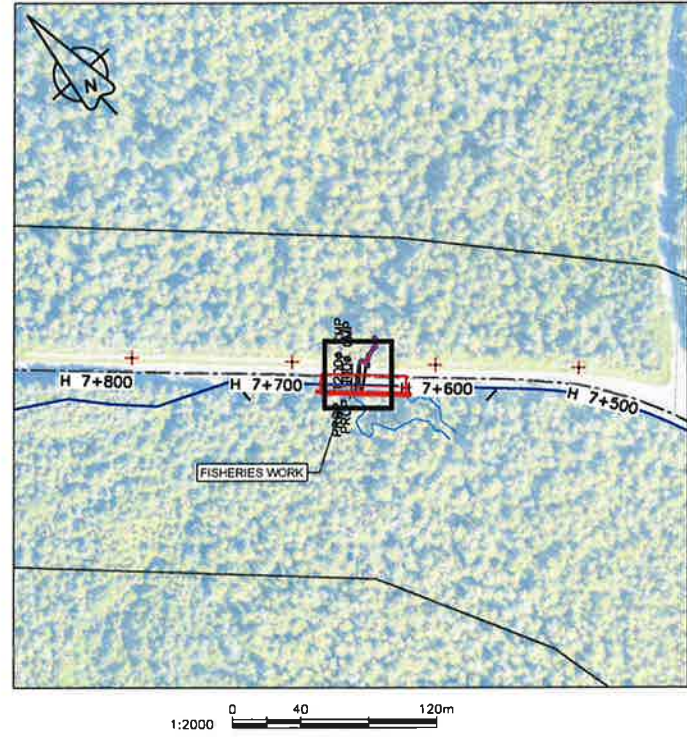


PROFILE  
N.T.S.

Fisheries Enhancement	
Existing Culvert Information	
Locations:	Highway #4 - Station H4+400 at Wall # 8
Material:	CSP Galvanized Coating
Diameter:	3,000 mm Circular
Length:	80 to 90 metres
Cover over culvert:	11 metres
Comments:	Perched end
Proposed Enhancements	
Eliminate Perched End	
Provide additional spawning gravel	
Add boulder baffles inside culvert	

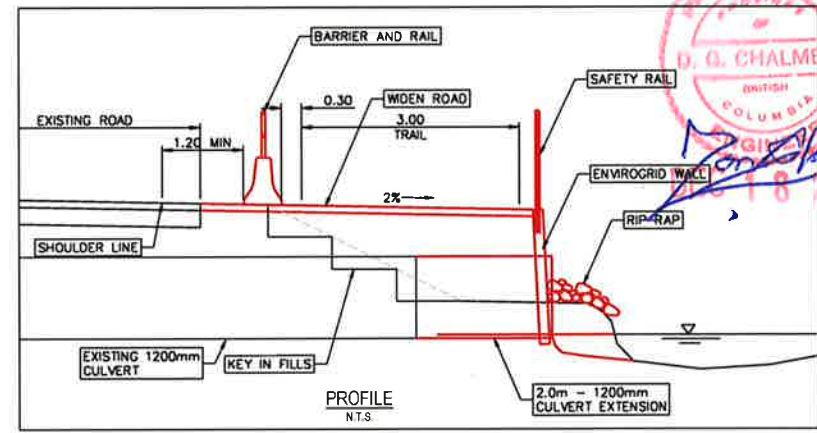
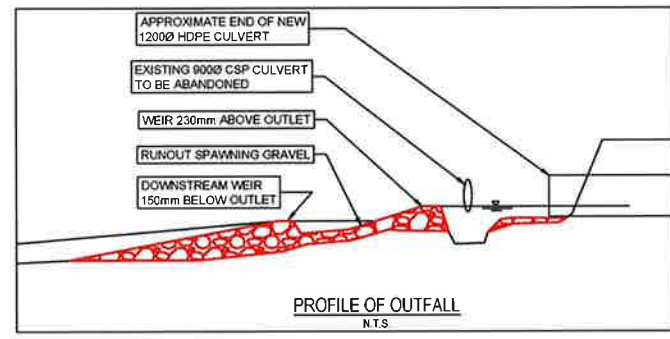
- FISHERIES CONSTRUCTION NOTES**
1. REFER TO SHEET F-1 FOR ENVIRONMENTAL AND FISHERIES NOTES
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  5. SPAWNING GRAVEL SHALL BE AS SPECIFIED IN SECTION 31 05 16, AGGREGATE MATERIALS
  6. WEIRS SHALL BE CONSTRUCTED TO DETAILS SHOWN ON SHEET F-1.1
  7. ROOT WADS AND LARGE WOODY DEBRIS TO BE SUITABLY BALLASTED AS DETAILED ON SHEET F-1.
  8. EXISTING STUMPS, ROOT WADS, LOGS, ETC. SHOULD BE RETAINED AND USED FOR HABITAT COMPLEXING
  9. RED SHOWS PROPOSED WORKS

01/10/2011 - 10:00 AM - PROJECT: TOFINO - PACIFIC RIM NATIONAL PARK RESERVE - FISHERIES WORK - STA H8+400 - PROJECT NO. PCA #1522 - SHEET: F-9 OF 15 - DRAWN BY: DAVID COX - CHECKED BY: JACKIE HICKS - DATE: 08/11/2017



Fisheries Enhancement	
<b>Existing Cuvlert Information</b>	
Locations:	Highway #4 - Station H7+630 at Culvert 56
Material:	HDPE (New Cuv't), CSP (Aband)
Diameter:	1,200 mm (New), 900 mm (Aband)
Length:	16.4 metres (New and Aband)
Cover over culvert:	1.5 metres (New), 1.7 m (Aband)
Comments:	Extend new 2 metres. Seal abandoned Culvert Perched outfall
<b>Proposed Enhancements</b>	
Limit required extension to 2.0m with retaining wall	
Eliminate perched outfall	

- FISHERIES CONSTRUCTION NOTES**
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  9. RED SHOWS PROPOSED WORKS



Revision	Description/Description	Date/Date
3	ISSUED FOR TENDER	8/13/2016
2	ISSUED FOR TENDER	8/11/2016
1	ISSUED FOR TENDER	6/11/2016
0	ISSUED FOR TENDER	3/11/2016

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

Project title/Titre du projet: TOFINO  
**PACIFIC RIM NATIONAL PARK RESERVE**  
**?apsciiik tasii (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**

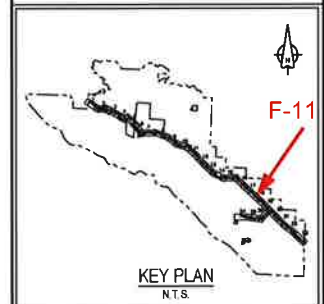
Designed by/Conçue par: DON CHALMERS / 2016-11  
Drawn by/Dessiné par: DAVID COX / 2017-08  
PCA Project Manager/Technical Authority/Administrateur de Projets APC: JACKIE HICKS

Drawing title/Titre du dessin: ?apsciiik tasii (Ups-cheek ta-shee)  
**"Going in the right direction on the trail"**  
**CONSTRUCTION PLAN**  
**FISHERIES WORK**  
CULVERT #56  
HIGHWAY 4 STA H7+630

Project No./No. du projet: PCA #1522  
Sheet/Feuille: F-10  
Revision no./Révision no.: 3  
of 15

PCA #1522 - PACIFIC RIM NATIONAL PARK RESERVE TOFINO FISHERIES WORK - CULVERT #56 - HIGHWAY 4 STA H7+630 - SHEET F-10

**PARSONS**



Revision/Description	Date
2	ISSUED FOR TENDER 06/12/2016
1	ISSUED FOR TENDER 06/11/2015
0	ISSUED FOR TENDER 07/11/2014

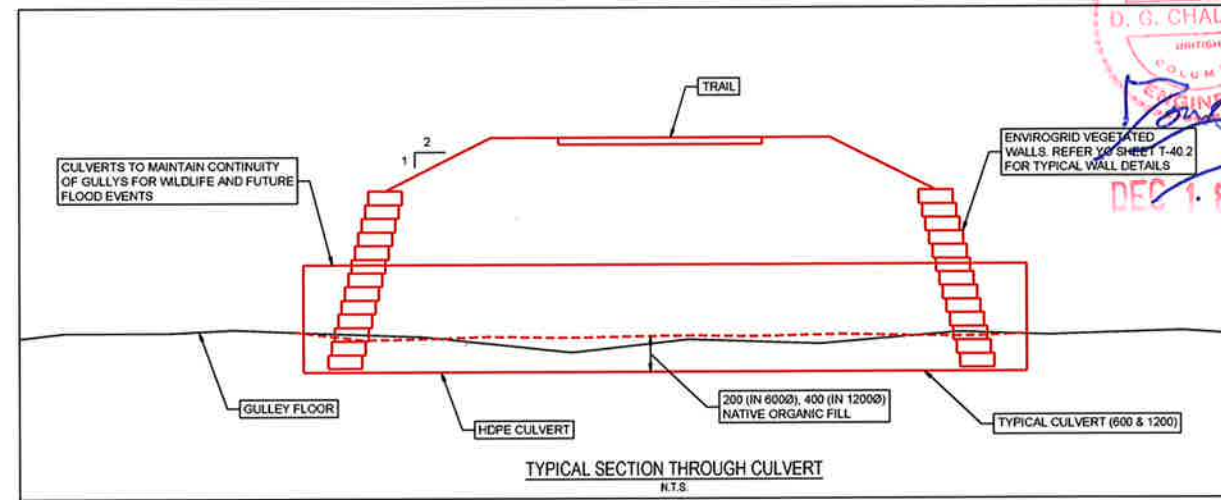
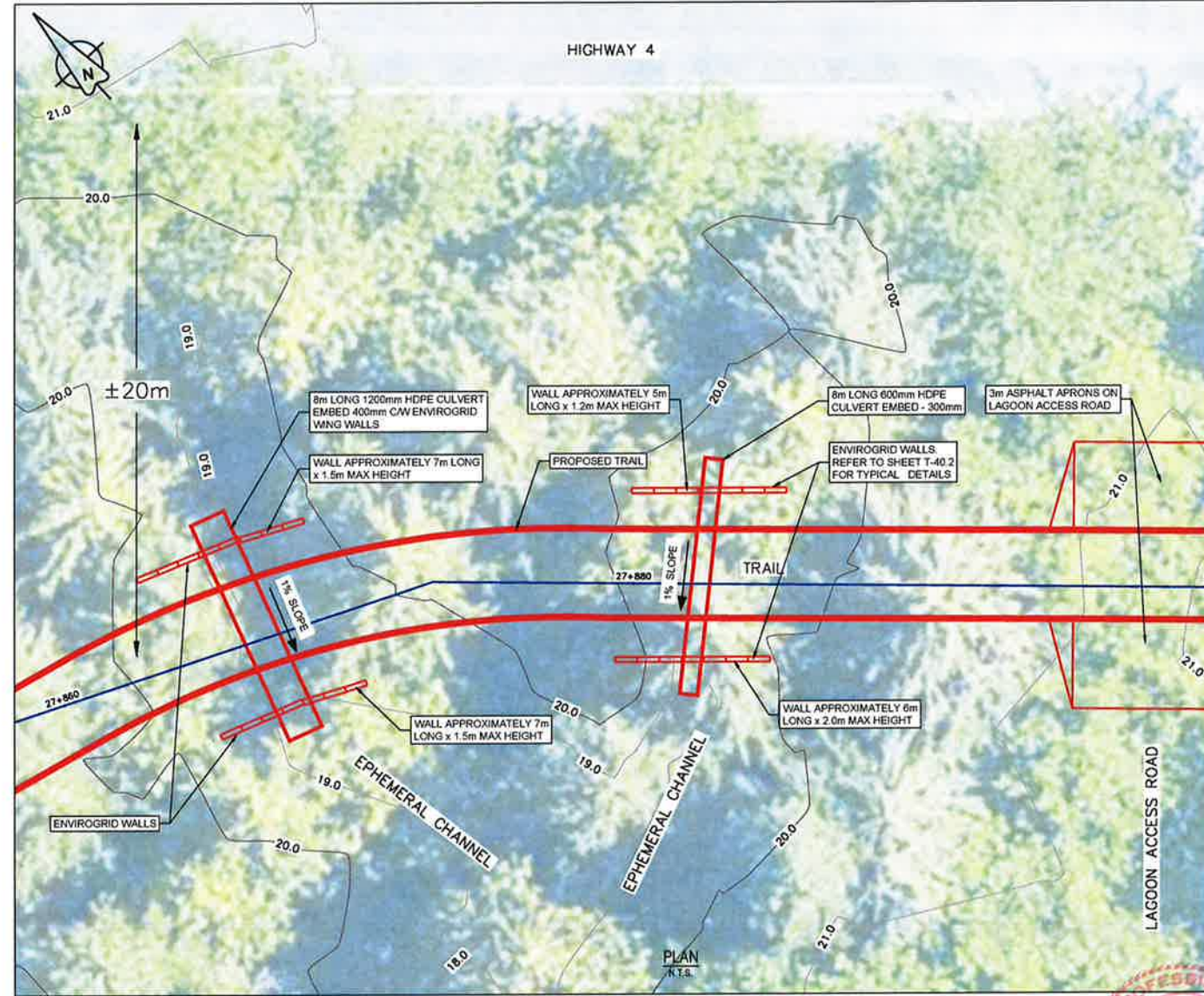
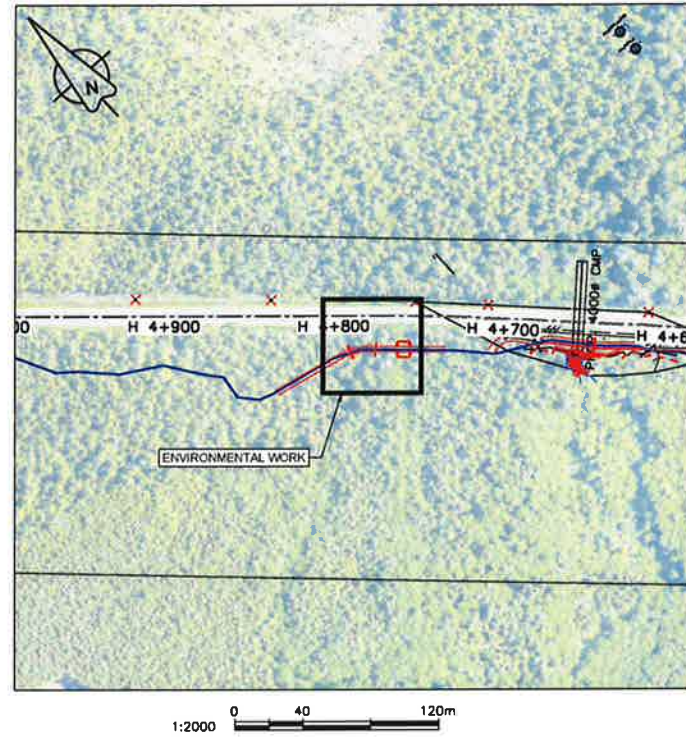
Parcs Canada L'Agence Parcs  
 Agency Canada  
 Western and Northern Region Ouest et Nord du Canada

Projet titre / titre du projet  
**TOFINO**  
**PACIFIC RIM NATIONAL PARK RESERVE**  
**ʔapscilik fašii (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**

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  
**ʔapscilik fašii (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**  
**CONSTRUCTION PLAN**  
**FISHERIES WORK**  
 HIGHWAY 4 STA H4+800

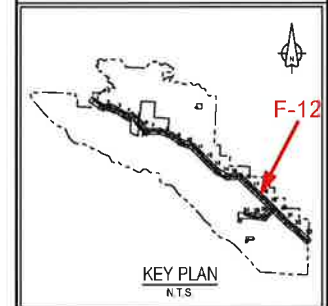
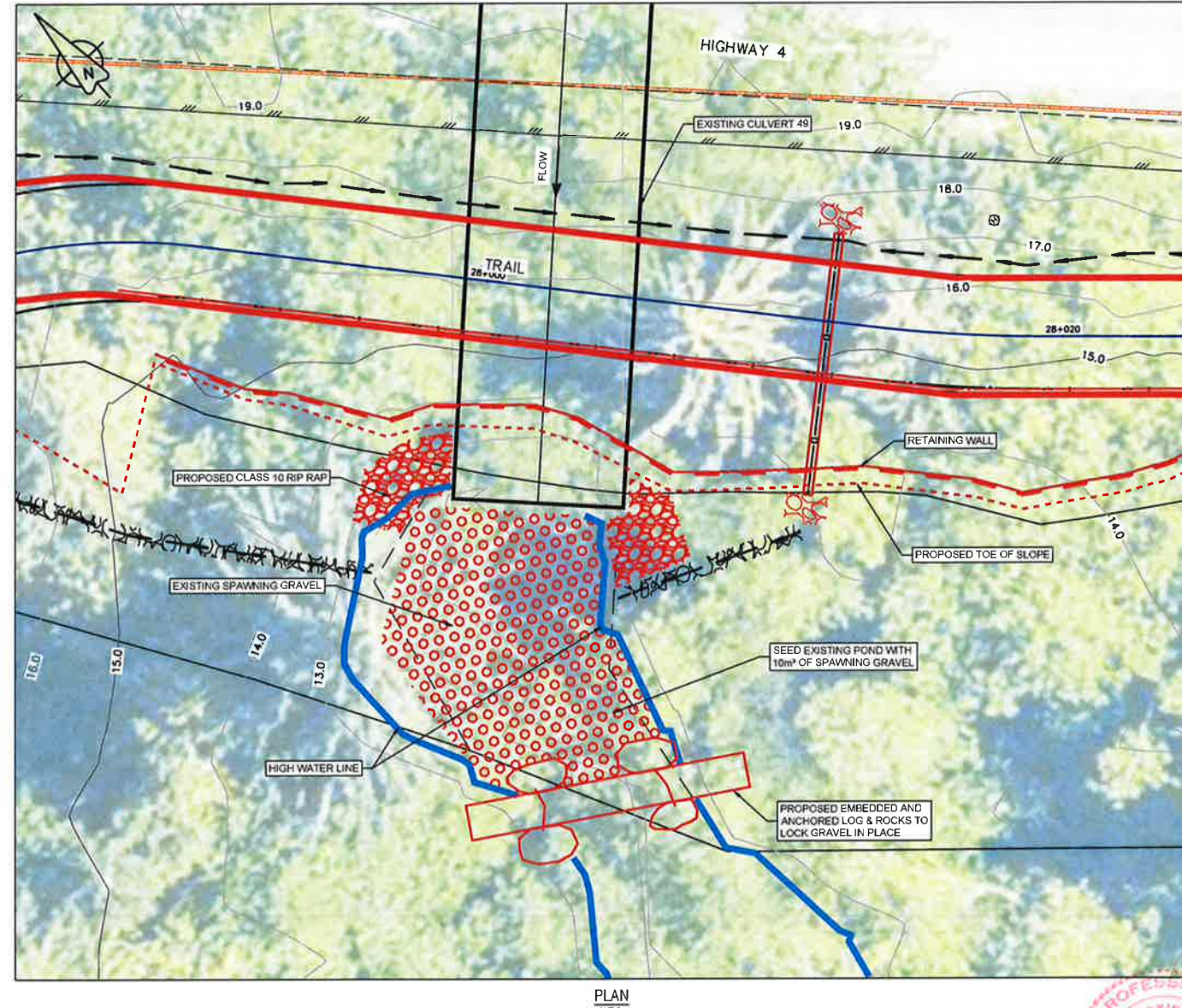
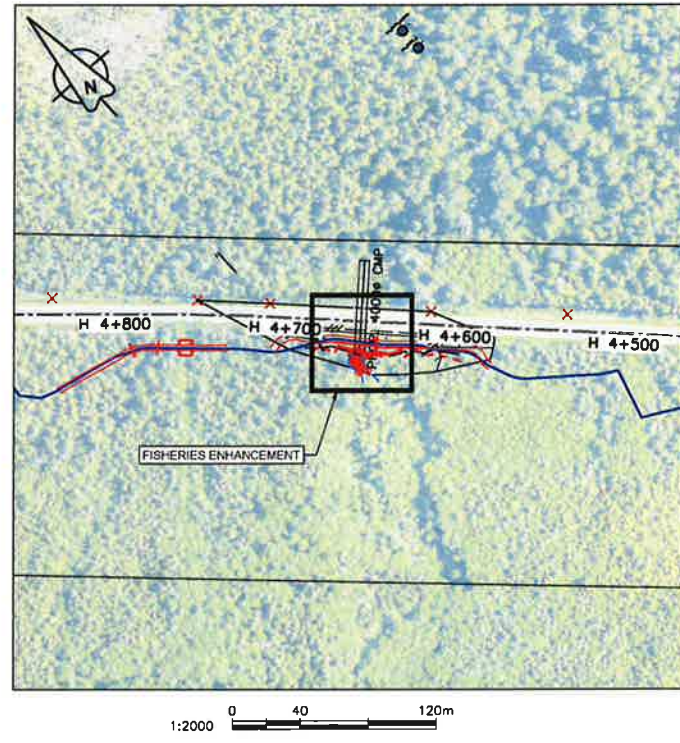
Project No./No. du projet  
**PCA #1622**  
 Sheet/Feuille  
**F-11**  
 of 15  
 Revision no./Le Révision  
**2**



- FISHERIES CONSTRUCTION NOTES**
1. REFER TO SHEET F-1 FOR ENVIRONMENTAL AND FISHERIES NOTES
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  3. WATER SHALL BE DIVERTED AROUND THE CONSTRUCTION SITE USING METHODS APPROVED BY OEM
  4. ALL MATERIALS USED SHALL BE FREE OF INVASIVE SPECIES
  5. SPawning GRAVEL SHALL BE AS SPECIFIED IN SECTION 31 05 16, AGGREGATE MATERIALS
  6. WEIRS SHALL BE CONSTRUCTED TO DETAILS SHOWN ON SHEET F-1.1
  7. ROOT WADS AND LARGE WOODY DEBRIS TO BE SUITABLY BALLASTED AS DETAILED ON SHEET F-1.
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03/17/2017 11:45:00 AM - PROJECT: PCA #1622 - TOFINO NATIONAL PARK RESERVE - FISHERIES WORK - SHEET F-11 - DRAWN BY: DAVID COX

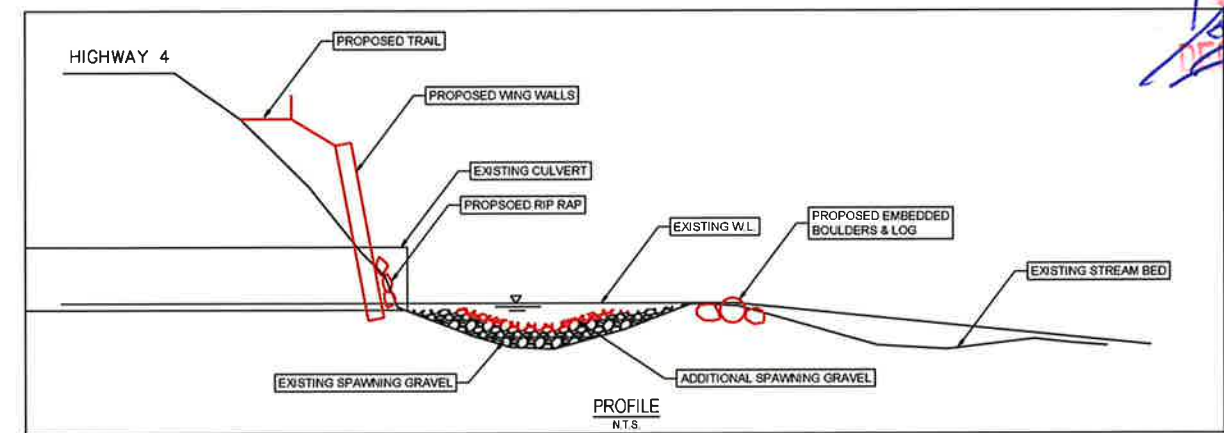
**PARSONS**



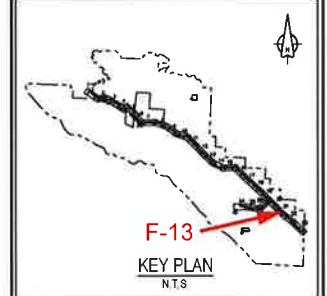
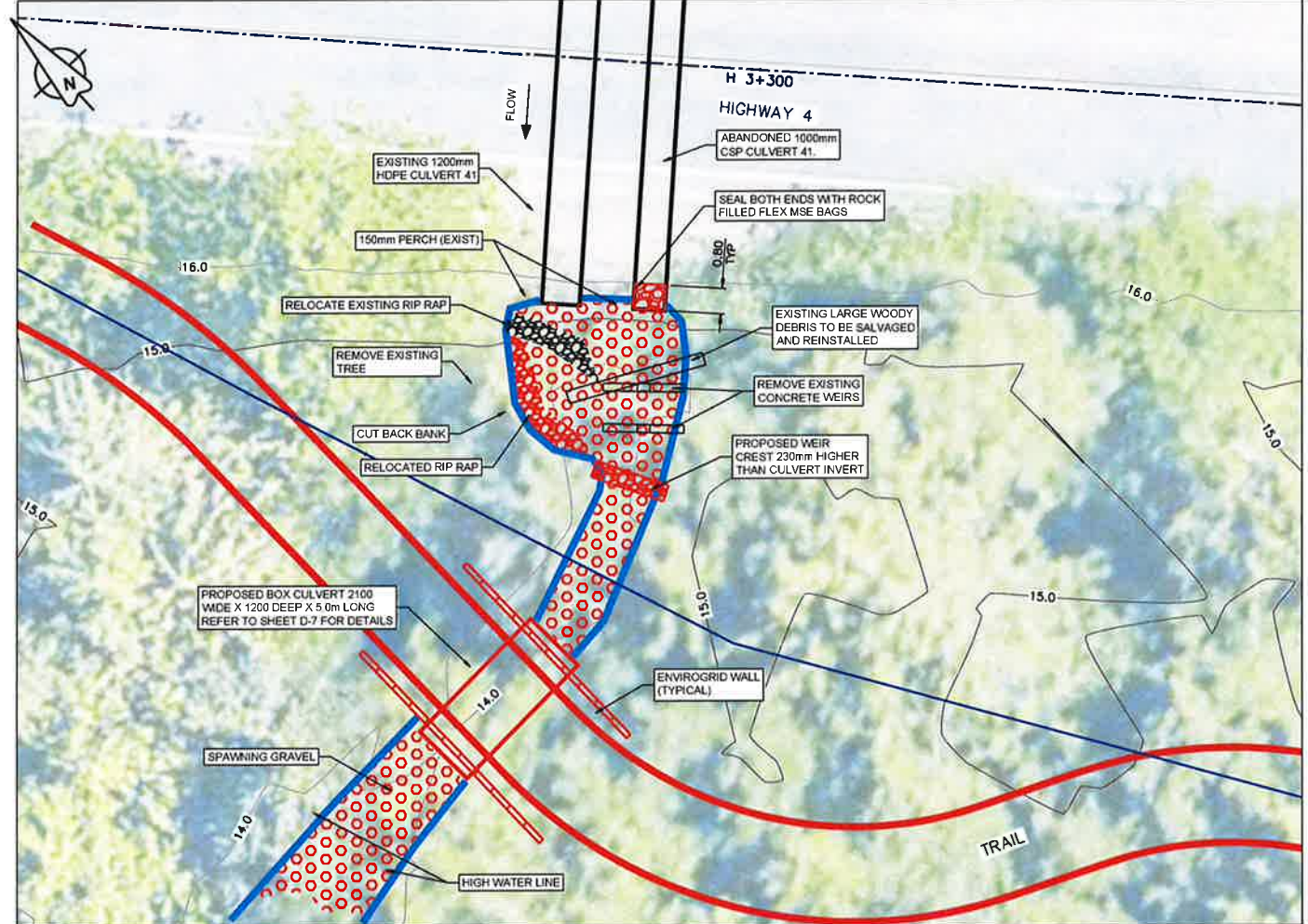
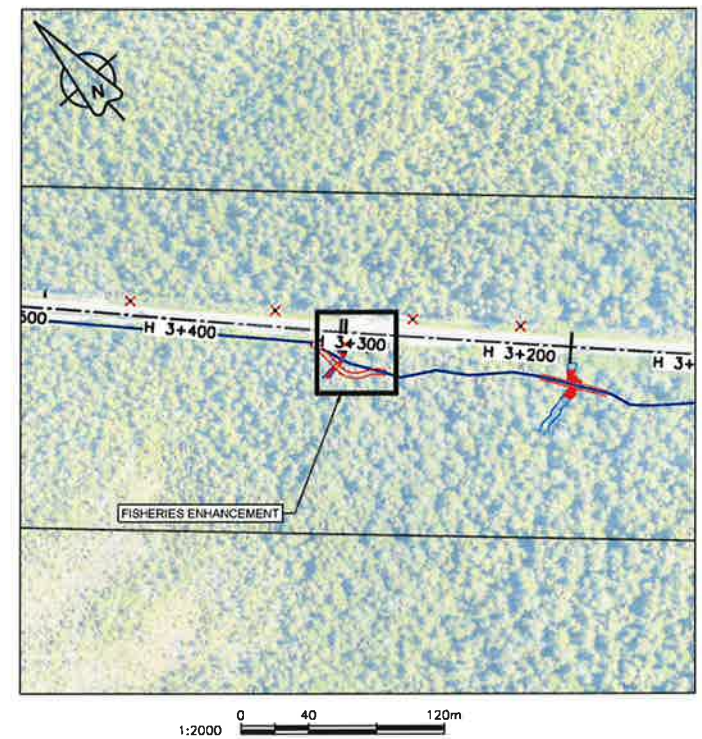
Issued For	Date
2	ISSUED FOR TENDER 8/12/2016
1	ISSUED FOR TENDER 3/11/2016
0	ISSUED FOR TENDER 3/11/2016

Fisheries Enhancement	
Existing Cuvlert Information	
Locations:	Highway #4 - Station H4+655 at Cuvlert 49
Material:	SPCSP Galvanized
Diameter:	5900 (Span) x 3700 (Rise) Arch
Length:	55 metres
Cover over cuvlert:	3.5 metres
Comments:	No extension Required
Proposed Enhancements	
Embed log & rocks downstream to lock spawning gravel in place	
Place stockpile of spawning gravel near stream for future use	

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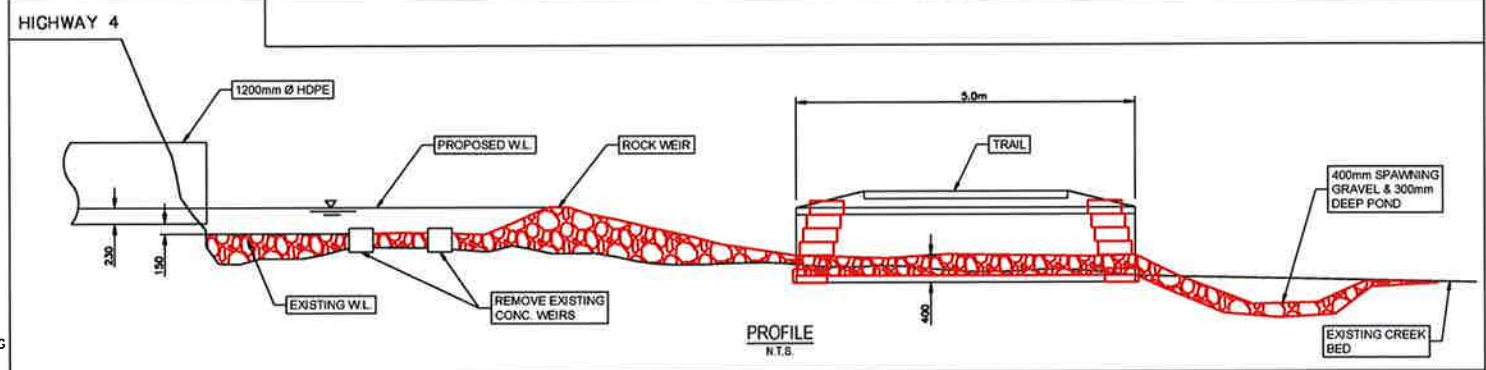
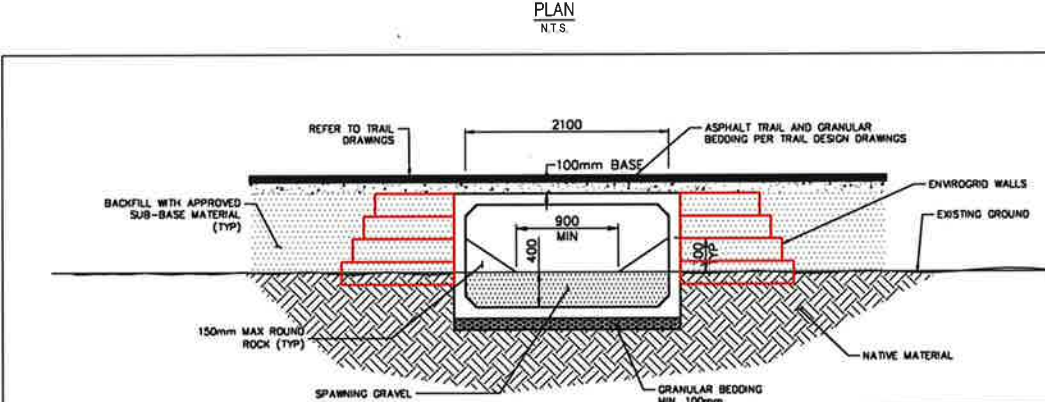


PROFESSIONAL  
OF  
**D. G. CHALMERS**  
COLUMBIA  
BRITISH COLUMBIA  
2016 2010



Fisheries Enhancement	
<b>Existing Culvert Information</b>	
Locations:	Highway #4 - Station H3+304 at Culvert 41
Material:	HDPE (2015 Clv't), CSP (Aband)
Diameter:	1,200 mm (2015), 1,000 mm (Aband)
Length:	18 metres (2015 and Aband)
Cover over culvert:	1.4 metres (2015), 1.5m (Aband)
Comments:	Trail located 10 m from culvert and Highway 150 mm Perched Invert
<b>Proposed Enhancements</b>	
Embed box culvert	
Create weir and submerge inlet of culvert	
Place spawning gravel & create ponds in stream	

- FISHERIES CONSTRUCTION NOTES**
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**PROFESSIONAL**  
 PROVINCE OF  
**D. G. CHALMERS**  
 CIVIL ENGINEER  
 19th Feb 2016

Revisions	Description	Date
2	ISSUED FOR TENDER	18/12/2015
1	ISSUED FOR TENDER	10/11/2015
0	ISSUED FOR TENDER	27/11/2015

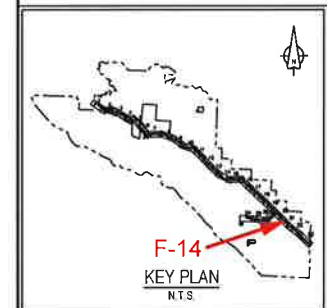
**Parks Canada L'Agence Parcs**  
 Agency Canada  
 Western and Northern Region Ouest et Nord du Canada

Project Title/Titre du projet  
**TOFINO**  
**PACIFIC RIM NATIONAL PARK RESERVE**  
**ʔəpsciik tašii (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**  
 Consultant Signature Only

Designed by/Conçue par  
 DON CHALMERS / 2016-11  
 Drawn by/Dessiné par  
 DAVID COX / 2017-08  
 PCA Project Manager/Technical Authority  
 Administrateur de Projets APC  
 JACKIE HICKS

Project No./No. de projet PCA #1522	Sheet/Feuille F-13 OF 15	Revision no./no. de révision 2
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**PARSONS**



Revision/Description	Date
3	ISSUED FOR TENDER 04/12/2016
2	ISSUED FOR TENDER 28/11/2014
1	ISSUED FOR TENDER 20/11/2011
0	ISSUED FOR TENDER 27/11/2011

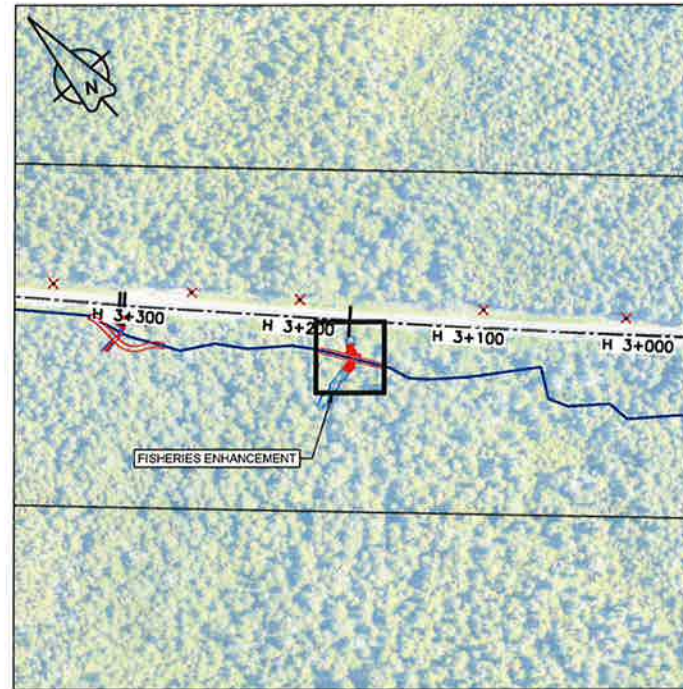
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Projet / Titre du projet  
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**ʔapsciiik fašii (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**

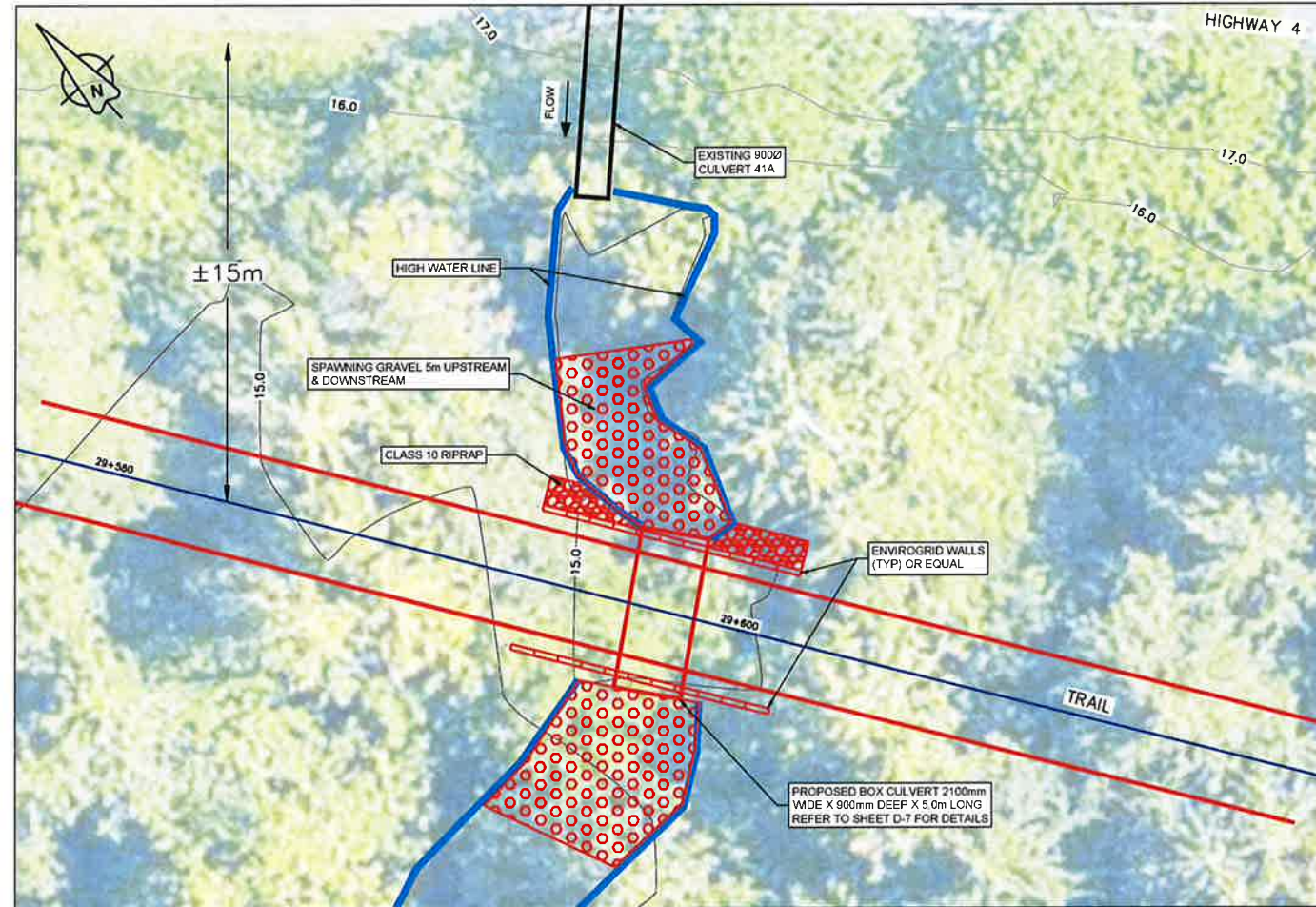
Consultant Signature Only  
Designed by/Conçue par  
DON CHALMERS / 2016-11  
Drawn by/Dessiné par  
DAVID COX / 2017-08  
PCA Project Manager/Technical Authority  
Administrateur de Projets APC  
JACKIE HICKS

Drawing No./Titre de dessin  
**ʔapsciiik fašii (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**  
**CONSTRUCTION PLAN**  
**FISHERIES WORK**  
CULVERT '41A'  
HIGHWAY 4 STA H3+180

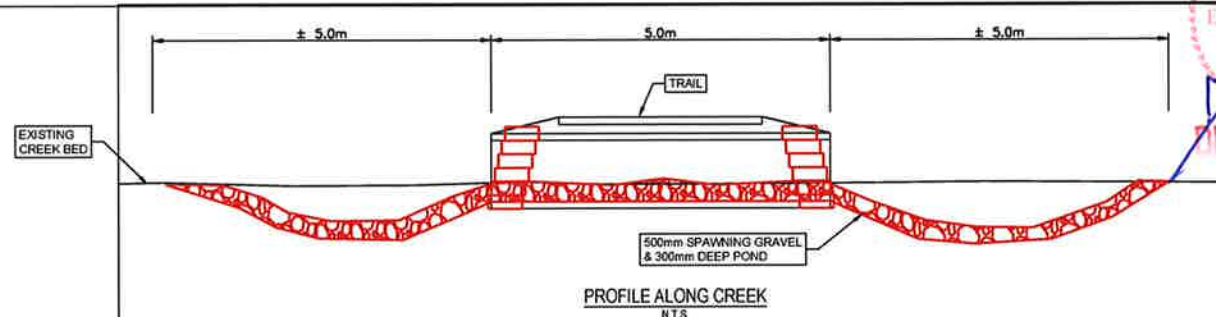
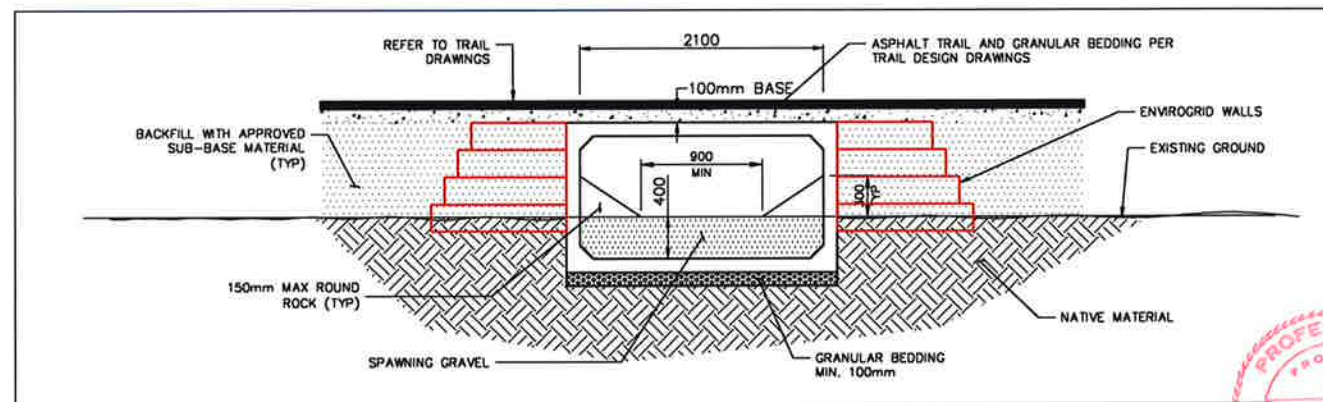
Project No./No. du projet  
PCA #1522  
Sheet/Feuille  
**F-14**  
of 15  
Revision no./La Révision  
**3**



1:2000  
0 40 120m



PLAN  
N.T.S.



PROFILE ALONG CREEK  
N.T.S.

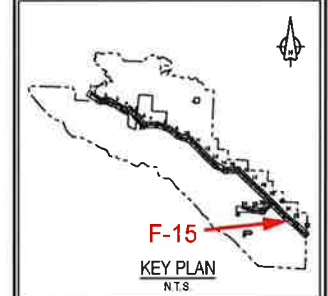
Fisheries Enhancement	
Existing Culvert Information	
Locations:	Highway #4 - Station H3+180 at Culvert 41A
Material:	CSP Galvanized Coating
Diameter:	900mm Circular
Length:	18 metres
Cover over culvert:	0.5 metres
Comments:	Water Passage
Proposed Enhancements	
Crossing located away from culvert to avoid extension	
Embed box culvert	
Add spawning gravel to channel	

**FISHERIES CONSTRUCTION NOTES**

1. REFER TO SHEET F-1 FOR ENVIRONMENTAL AND FISHERIES NOTES
2. ALL WORK WITHIN THE HIGH WATER MARK SHALL BE DONE DURING THE FISHERIES WINDOWS UNLESS APPROVED OTHERWISE BY THE OWNER'S ENVIRONMENTAL MONITOR (OEM)
3. WATER SHALL BE DIVERTED AROUND THE CONSTRUCTION SITE USING METHODS APPROVED BY OEM
4. ALL MATERIALS USED SHALL BE FREE OF INVASIVE SPECIES
5. SPawning GRAVEL SHALL BE AS SPECIFIED IN SECTION 31 05 16, AGGREGATE MATERIALS
6. WEIRS SHALL BE CONSTRUCTED TO DETAILS SHOWN ON SHEET F-1.1
7. ROOT WADS AND LARGE WOODY DEBRIS TO BE SUITABLY BALLASTED AS DETAILED ON SHEET F-1.1
8. EXISTING STUMPS, ROOT WADS, LOGS, ETC. SHOULD BE RETAINED AND USED FOR HABITAT COMPLEXING
9. RED SHOWS PROPOSED WORKS
10. FOR BRIDGE WORK, REFER TO SHEETS S-1.1 TO S-5.11



**PARSONS**



Revision/Description	Date
3	ISSUED FOR TENDER 01/12/2016
1	ISSUED FOR TENDER 05/11/2014
0	ISSUED FOR TENDER 07/11/2013

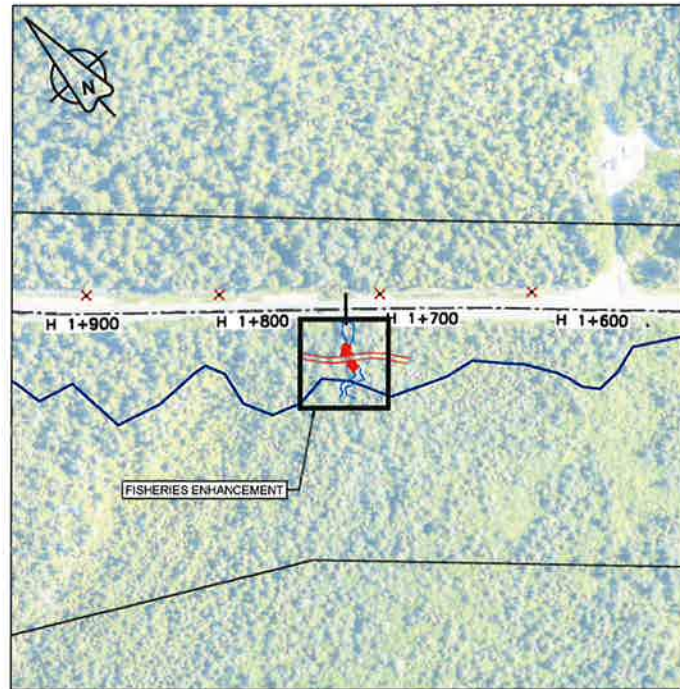
Client/Client  
Parks Canada L'Agence Parcs  
Agency Canada  
Western and Northern Region Ouest et Nord du Canada

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

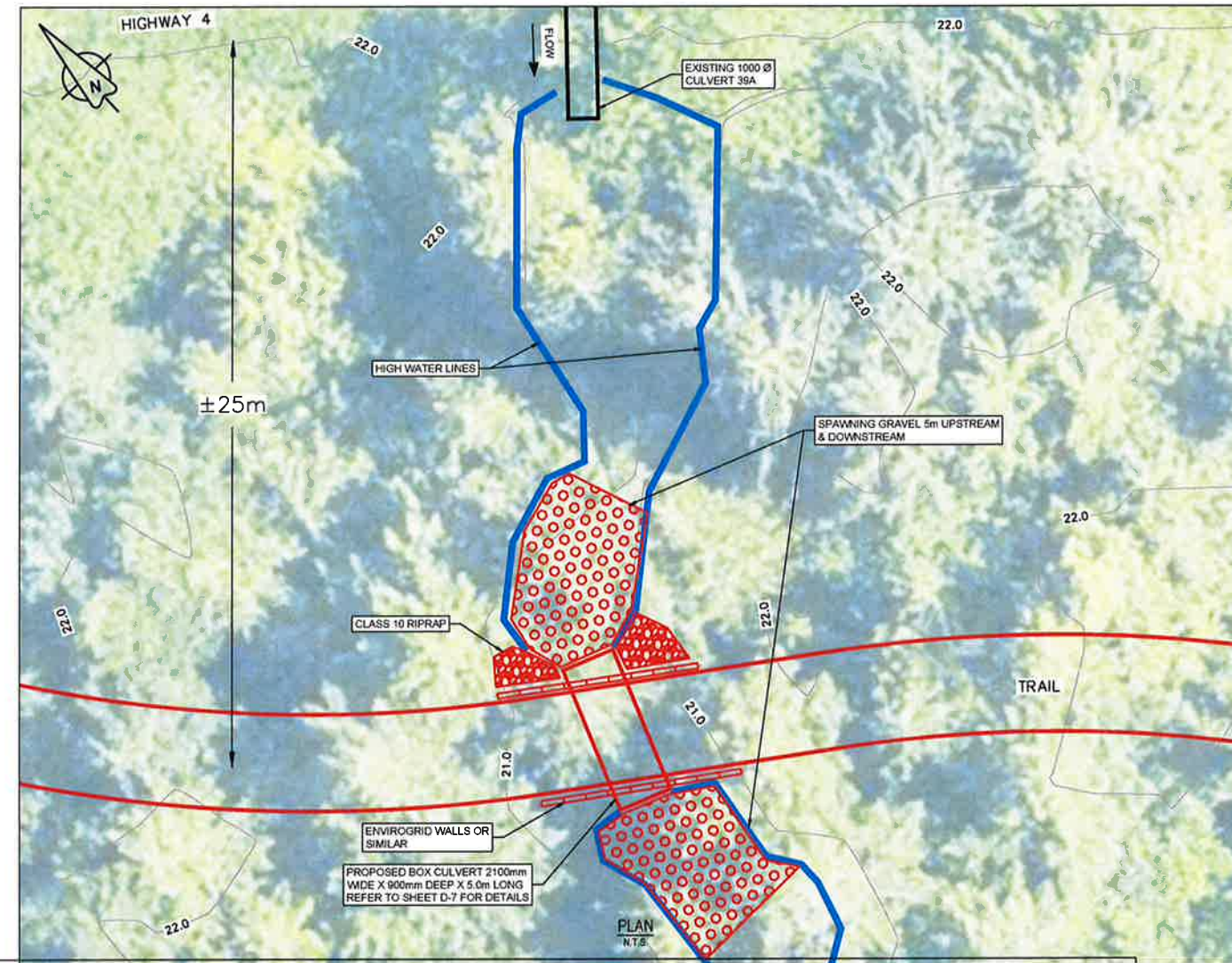
Consultant Signature Only  
Designed by/Conçue par  
DON CHALMERS / 2016-11  
Drawn by/Dessiné par  
DAVID COX / 2017-08  
PCA Project Manager/Technicien Intégrité  
Administrateur de Projets APC  
JACQUE HICKS

Drawing title/Titre du dessin  
**?apsclik faeli (Ups-cheek ta-shee)**  
**"Going in the right direction on the trail"**  
**CONSTRUCTION PLAN**  
**FISHERIES WORK**  
**CULVERT '39A'**  
**HIGHWAY 4 STA H1+744**

Project No./No. de projet  
PCA #1522  
Revision no./Le Numéro  
F-15  
Sheet/Feuille  
2  
OF 15

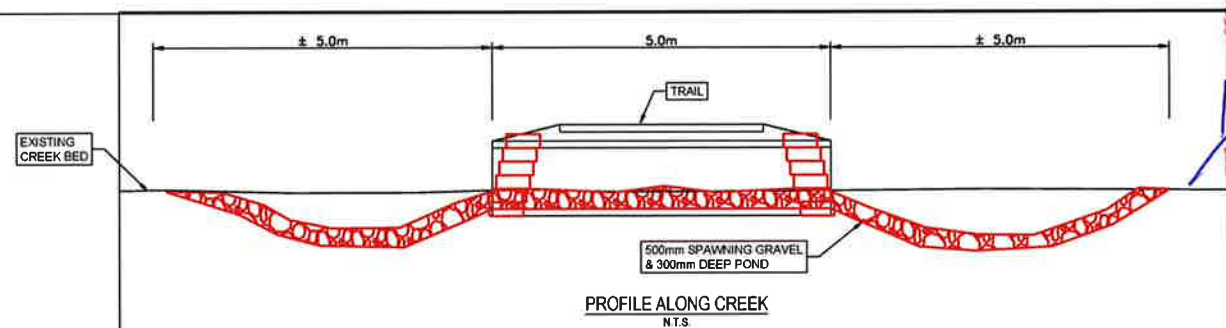
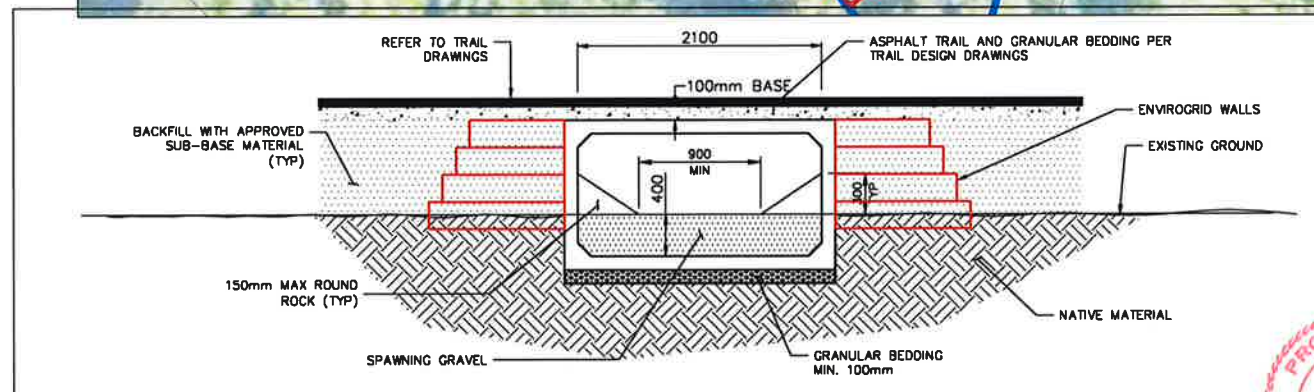


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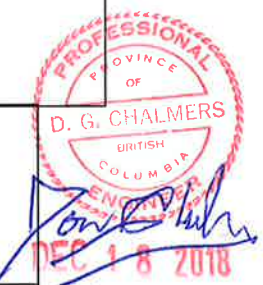
PLAN N.T.S.

Fisheries Enhancement	
Existing Culvert Information	
Locations:	Highway #4 - Station H1+744 at Culvert 39A
Material:	CSP Galvanized Coating
Diameter:	1,000 mm Circular
Length:	17 metres
Cover over culvert:	0.5 metres
Comments:	Trail located 25m from culvert and Highway
Proposed Enhancements	
Embed box culvert	
Place spawning gravel & create ponds in stream	



PROFILE ALONG CREEK N.T.S.

- FISHERIES CONSTRUCTION NOTES**
1. REFER TO SHEET F-1 FOR ENVIRONMENTAL AND FISHERIES NOTES
  2. ALL WORK WITHIN THE HIGH WATER MARK SHALL BE DONE DURING THE FISHERIES WINDOWS UNLESS APPROVED OTHERWISE BY THE OWNER'S ENVIRONMENTAL MONITOR (OEM)
  3. WATER SHALL BE DIVERTED AROUND THE CONSTRUCTION SITE USING METHODS APPROVED BY OEM
  4. ALL MATERIALS USED SHALL BE FREE OF INVASIVE SPECIES
  5. SPAWNING GRAVEL SHALL BE AS SPECIFIED IN SECTION 31 05 16, AGGREGATE MATERIALS
  6. WEIRS SHALL BE CONSTRUCTED TO DETAILS SHOWN ON SHEET F-1.1
  7. ROOT WADS AND LARGE WOODY DEBRIS TO BE SUITABLY BALLASTED AS DETAILED ON SHEET F-1.
  8. EXISTING STUMPS, ROOT WADS, LOGS, ETC. SHOULD BE RETAINED AND USED FOR HABITAT COMPLEXING
  9. RED SHOWS PROPOSED WORKS



04/10/2013 - 10:00 AM - PROJECT: TOFINO - PACIFIC RIM NATIONAL PARK RESERVE - FISHERIES WORK - STA H1+744 - SHEET: F-15 - SCALE: 1:2000 - DRAWN BY: DAVID COX - CHECKED BY: DON CHALMERS - DATE: 01/12/2016