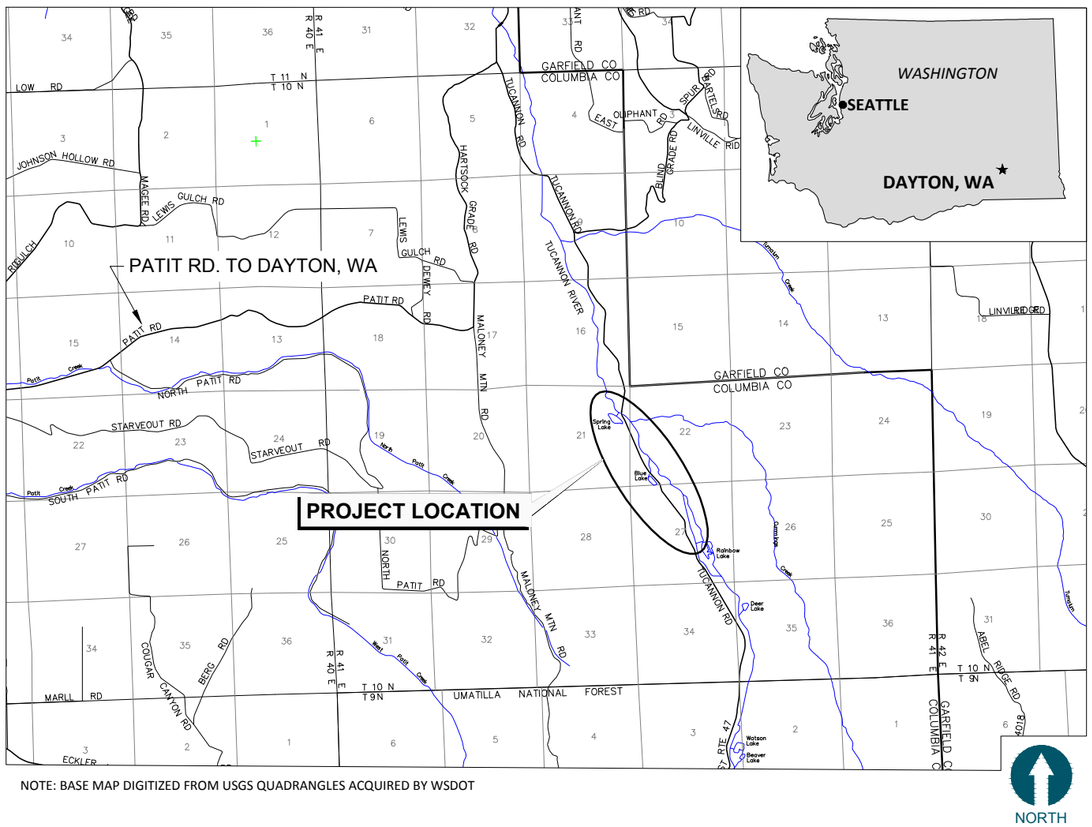
CONSTRUCTION DRAWINGS

TUCANNON PROJECT AREA 14

SNAKE RIVER SALMON RECOVERY BOARD

VICINITY MAP



NOTE: BASE MAP DIGITIZED FROM USGS QUADRANGLES ACQUIRED BY WSDOT

DRAWING INDEX		
SHEET NUMBER	SHEET	SHEET TITLE
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17	C-15	BAR APEX RACKING (BAr) ELJ DETAILS
18	C-16	BAR APEX (BA) ELJ DETAILS
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ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY
STATE OF WASHINGTON
40803
REGISTERED PROFESSIONAL ENGINEER

REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: -
DATE: 01-11-2013

FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

COVER SHEET

T-01

SHEET NO. 01 OF 22

B:\Projects\Snake River Salmon Recovery Board\CAD\Project Area 14\120850-01-T-cover sheet.dwg 01 COVER SHEET
Jan 11, 2013 11:44am dgaffney

ESTIMATED QUANTITIES
(CONTRACTOR RESPONSIBLE FOR VERIFYING QUANTITIES)

DESCRIPTION	UNIT	QTY.
EARTHWORK, EXCAVATION, BULK	CY	3,500
EARTHWORK, BACKFILL, NATIVE	CY	3,500
INCLUDED IN TOTAL EXCAVATION VOLUME:		
PILOT CHANNEL CUT B	CY	100
PILOT CHANNEL CUT C	CY	16
PILOT CHANNEL CUT D	CY	160
PILOT CHANNEL CUT E	CY	57
ROOTWAD LOG, 1.25' DIA. 40' L LOG, 3.75' DIA. 2.5' L RW	EA	404
ROOTWAD LOG, 1.5' DIA. 40' L LOG, 4.5' DIA. 3' L RW	EA	33
ROOTWAD LOG, 2' DIA. 40' L LOG, 6' DIA. 4' L RW	EA	16
ROOTWAD LOG, 3' DIA. 50' L LOG, 9' DIA. 6' L RW	EA	12
LOG POLE, 1' DIA., 40' L	EA	4
LOG POLE, 1.25' DIA., 40' L	EA	16
LOG POLE, 1.5' DIA., 40' L	EA	88
LOG POLE PILE, DOUGLAS FIR OR LARCH, 1' DIA. 40' L	EA	6
SLASH AND SMALL WOODY DEBRIS	CY	220
BOULDER, 5.6' INTERMEDIATE DIA.	EA	44
BOULDER, 4' INTERMEDIATE DIA.	EA	28
BOULDER, 3.8' INTERMEDIATE DIA.	EA	6
BOULDER, 3.5' INTERMEDIATE DIA.	EA	288
BOULDER, 3.0' INTERMEDIATE DIA.	EA	40
MANILA ROPE, 3 STRAND, 1/2" DIA.	LF	4,500
GALVANIZED STEEL WIRE ROPE, 3/8" DIA., 7X19 STRAND CORE	LF	2,800
GALVANIZED STEEL WIRE ROPE, 1/2" DIA., 6X19, EIPS, IWRC	LF	1,000
GALVANIZED STEEL WIRE ROPE CLIPS, 3/8" CAP.	EA	630
GALVANIZED STEEL WIRE ROPE CLIPS, 1/2" CAP.	EA	240
GALVANIZED STEEL STAPLES, 3/8" X 4" LENGTH	EA	1,300
GALVANIZED ROPE THIMBLES, HEAVY DUTY, 3/8" CAP.	EA	72
CONCRETE ANCHOR, FOUR-WAY EXPANSION TYPE, 3/4"-10 THREAD	EA	118
STEEL EYE BOLT, FOR LIFTING, GALVANIZED, 3/4"-10 THREAD, 3" L	EA	118

QTY NOTES:

1. OVERALL LENGTH OF A ROOTWAD LOG IS THE SUM OF THE LOG LENGTH AND THE ROOTWAD LENGTH.
2. SEE SPECIFICATIONS FOR ALLOWABLE LOG DIAMETER TOLERANCES AND TAPER RATES FOR EACH STRUCTURE TYPE.

EXISTING LEGEND

- CONTOUR MAJOR (FT)
- CONTOUR MINOR (FT)
- TYPICAL ORDINARY HIGH WATER LINE
- FLOW PATH
- OUTFALL OR CREEKS
- EXISTING ROAD
- 108+00 — RIVER ALIGNMENT
- 3+00 — FLOODPLAIN FLOW PATH EXCAVATION ALIGNMENT
- APPROX. LWD LOCATION (AS OF 2010)

PROPOSED LEGEND

- PLANTING AREA
- SPOIL PILE REMOVAL
- SUGGESTED STAGING AREA
- GRAVEL HAUL ROUTE
- SUGGESTED CONST. ACCESS ROUTE
- SINGLE (S) LWD FEATURE
- TOE HABITAT (TH) LWD FEATURE
- TOE HABITAT (THb) LWD FEATURE
- SEDIMENT RETENTION (SRp) LWD FEATURE
- SEDIMENT RETENTION (SRb) LWD FEATURE
- BANK BARB PILE (BBp) ELJ DETAILS
- BANK BARB (BB) ELJ STRUCTURE
- BAR APEX RACKING (BAr) ELJ DETAILS
- BAR APEX (BA) ELJ STRICTURE
- BAR APEX BANK (BAb) ELJ STRICTURE
- CHANNEL GRADE (CG) ELJ STRCUTRE
- CHANNEL SPANNING (CS) ELJ STRUCTURE

GENERAL CONSTRUCTION NOTES:

1. CONTRACT DOCUMENTS INCLUDE THESE DRAWINGS AND PROJECT SPECIFICATIONS.
2. CONTRACTOR SHALL FURNISH ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY TO COMPLETE ALL WORK AS INDICATED ON THE CONTRACT DOCUMENTS.
3. CONTRACTOR SHALL VISIT THE JOB SITE AND BE RESPONSIBLE FOR ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION.
4. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE CONTRACTING OFFICER PRIOR TO PROCEEDING WITH THE WORK.
5. THE CONTRACTOR SHALL RECEIVE, IN WRITING, AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
6. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE BY THE CONTRACTING OFFICER OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
7. ALL WORK PERFORMED AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
8. CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK, USING THE BEST SKILLS AND ATTENTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THIS CONTRACT.
10. DETAILS ARE INTENDED TO SHOW THE FINAL RESULT OF THE DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB SITE DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
11. THE CONTRACTOR SHALL MAKE ALL NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, ROADWAY, DRAINAGE WAYS, CULVERTS, AND VEGETATION UNTIL SUCH ITEMS ARE TO BE DISTURBED OR REMOVED AS INDICATED ON THE CONTRACT DOCUMENTS.
12. CONTRACTOR SHALL KEEP PROJECT AREA CLEAN AND HAZARD-FREE. CONTRACTOR SHALL DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH FOR DURATION OF THE WORK. UPON COMPLETION OF WORK, CONTRACTOR SHALL REMOVE ALL MATERIAL AND EQUIPMENT NOT SPECIFIED AS REMAINING WITHIN THE PROJECT AREA.
13. REPRESENTATIONS OF TRUE NORTH SHALL NOT BE USED TO IDENTIFY OR ESTABLISH THE BEARING OF TRUE NORTH AT THIS JOB SITE.
14. WHERE A CONSTRUCTION DETAIL IS NOT SHOWN OR NOTED, THE DETAIL SHALL BE THE SAME AS FOR OTHER SIMILAR WORK.
15. NOTES AND DETAILS ON THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE OVER GENERAL NOTES HEREON.
16. DIMENSION CALLOUTS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON THE CONTRACT DOCUMENTS.
17. THE CONTRACT DOCUMENTS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURES, WORKERS, AND THE PUBLIC DURING CONSTRUCTION.
18. ASTM, AASHTO, AND OTHER STANDARD SPECIFICATIONS NOTED ON THE CONTRACT DOCUMENTS SHALL BE OF THE LATEST VERSION, UNLESS NOTED OTHERWISE.
19. WORK DONE BY OTHERS:
    FISH RESCUE AND RECOVERY BY OTHERS.
    PLANTINGS BY OTHERS.
20. THE CONTRACTING AGENCY SHALL FURNISH THE FOLLOWING ITEMS FOR USE IN CONSTRUCTION. AT THE OPTION OF THE AGENCY, THE AGENCY MAY REQUEST THE CONTRACTOR TO FURNISH ADDITIONAL MATERIALS. REFER TO THE SPECIFICATIONS FOR FURTHER DETAIL.

    THE ROOTWAD LOGS AND LOG POLES. CONTRACTOR SHALL INCORPORATE THESE LOGS INTO THE DESIGN WHERE POSSIBLE AS THE LOGS MEET THE SIZE AND SPECIFICATION REQUIREMENTS FOR THE APPLICATIONS.
21. TRAFFIC CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR THROUGHOUT THE DURATION OF THE PROJECT AND SUBJECT TO ALL LOCAL, STATE, AND/OR FEDERAL REGULATIONS.
22. IN-STREAM WORK IS ONLY ALLOWED BETWEEN THE DATES PROVIDED IN THE PERMIT DOCUMENTS. SEE SPECIFICATIONS FOR FURTHER DETAIL.
23. CONTRACTOR SHALL ATTEND A PRE-CONSTRUCTION MEETING PRIOR TO COMMENCEMENT OF THE CONSTRUCTION. MEETING LOCATION, DATE, AND TIME TO BE DETERMINED BY THE CONTRACTING AGENCY.

STANDARD CIVIL NOTES:

1. ALL SITE WORK SHALL BE AS INDICATED ON THE CONTRACT DOCUMENTS.
2. DO NOT EXCAVATE OR DISTURB BEYOND THE JOB SITE AREA UNLESS NOTED OTHERWISE.
3. RUBBISH, DEBRIS, GARBAGE, AND OTHER REFUSE SHALL BE REMOVED FROM THE JOB SITE AND DISPOSED OF LEGALLY.
4. NO TOPSOIL, ORGANIC SPOILS, FILL, EXCAVATED MATERIAL, RIPRAP, CONSTRUCTION MATERIAL, EQUIPMENT, OR ANY OTHER SUCH ITEMS SHALL BE PLACED, STOCKPILED, OR PARKED IN THE ROADWAY SUCH THAT IT WOULD PREVENT A MINIMUM WIDTH OF 12-FEET FOR TRAFFIC CLEARANCE.
5. ANY BACKFILL, NOT OTHERWISE DESCRIBED ON THE CONTRACT DOCUMENTS, MUST BE PLACED WITH A MAXIMUM LIFT DEPTH OF 12-INCHES OR AS INSTRUCTED BY CONTRACTING OFFICER.
6. CONTRACTOR AND ITS EMPLOYEES SHALL PROVIDE SAFETY TRAINING FOR THE WORK CREW PRIOR TO STARTING THE PROJECT.
7. THE AREAS OF THE JOB SITE DISTURBED BY THE WORK SHALL BE GRADED SMOOTH TO THE PRE-CONSTRUCTION GRADE, DECOMPACTED AND PROTECTED AND/OR REVEGETATED AS SPECIFIED HEREON.
8. ALL MATERIALS SHALL BE NEW AND UNDAMAGED, UNLESS OTHERWISE APPROVED BY THE CONTRACTING OFFICER. THE SAME MANUFACTURER OF EACH ITEM SHALL BE USED THROUGHOUT THE WORK UNLESS OTHERWISE APPROVED BY THE CONTRACTING OFFICER.

UTILITY NOTES:

1. THE LOCATIONS OF EXISTING UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE. THE LOCATIONS OF EXISTING UTILITIES HAVE NOT BEEN FIELD VERIFIED. THE CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT THE UTILITY LOCATION REQUEST CENTER (ONE-CALL CENTER) AT 1-800-424-5555 FOR UTILITY LOCATIONS NOT LESS THAN TWO (2) BUSINESS DAYS BEFORE THE SCHEDULED DATE FOR EARTHWORK OR TRENCHING THAT MAY IMPACT EXISTING UTILITIES, UNLESS OTHERWISE NOTED.
2. ALL ABANDONED UTILITIES WHICH INTERFERE WITH THE EXECUTION OF THE WORK SHALL BE VERIFIED BY THE CONTRACTING OFFICER AND THE UTILITY FRANCHISE PRIOR TO DISTURBING THE UTILITIES. ONLY AFTER WRITTEN APPROVAL OF DISTURBANCE OR MODIFICATION OF THE UTILITY FROM THE UTILITY FRANCHISE IS RECEIVED BY THE CONTRACTING OFFICER MAY THE CONTRACTOR TAKE ACTION.
3. SIZE, LOCATION, AND TYPE OF ANY UNDERGROUND UTILITIES OR IMPROVEMENTS SHALL BE ACCURATELY NOTED AND PLACED ON AS-BUILT DRAWINGS BY THE CONTRACTOR AND ISSUED TO THE USBR AND/OR ENGINEER AT COMPLETION OF THE PROJECT.

SURVEY NOTES:

1. TOPOGRAPHIC DATA FROM 2010 AERIAL LIDAR, PROVIDED BY SRSRB.
2. DATUM IS WASHINGTON STATE PLANE SOUTH NAD83 FEET.
3. 2010 AERIAL PHOTO PROVIDED BY SRSRB.
4. PROJECT STATIONING IS IN FEET FROM RIVER MILE 37.15.

PROJECT INFORMATION:

PROJECT LOCATION: TUCANNON RIVER PROJECT AREA 14
EAST OF DAYTON, WA IN COLUMBIA COUNTY
T10N, R41E, SEC 21,22,27

CONTRACTING AGENCY: WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
1300 NE HENLEY CT, PULLMAN, WA 999163
PHONE: (509) 332-0892
CONTACT: BRUCE HEINER AND DAVE KARL

ENGINEER: ANCHOR QEA, LLC
1605 CORNWALL AVENUE
BELLINGHAM, WA 98225
PHONE: (360) 733-4311
CONTACT: TRACY DRURY, P.E.

ABBREVIATIONS

ABB.	TERM
ABB.	ABBREVIATION
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
CCD	COLUMBIA CONSERVATION DISTRICT
CFS	CUBIC FEET PER SECOND
CONC.	CONCRETE
CONT.	CONTINUED OR CONTINUOUS
CP	CONTROL POINT (AS IN SURVEY)
CY	CUBIC YARD
DBH	DIAMETER AT BREAST HEIGHT
DIA.	DIAMETER
DIV.	DIVERSION
EA.	EACH
EIPS	EXTRA IMPROVED PLOW STEEL
EL.	ELEVATION
EX	EXISTING
FT.	FOOT OR FEET
GALV.	GALVANIZED
HDPE	HIGH DENSITY POLYETHYLENE
IN.	INCH OR INCHES
IWRC	INDEPENDENT WIRE ROPE CORE
LWD	LARGE WOODY DEBRIS
LWM	LARGE WOODY MATERIAL
MAX.	MAXIMUM
MIN.	MINIMUM
O.C.	ON CENTER
OHWL	ORDINARY HIGH WATER LINE
P.E.	PROFESSIONAL ENGINEER
PVC	POLYVINYL CHLORIDE
QTY.	QUANTITY
RW	ROOTWADS
S	SLOPE
SF	SQUARE FOOT OR FEET
SPEC.	SPECIFICATION
STA.	STATION
STRUCT.	STRUCTURE
SY	SQUARE YARD
TYP.	TYPICAL
WDFW	WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
WSEL	WATER SURFACE ELEVATION

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY — STATE OF WASHINGTON — 40803 — REGISTERED PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: -
DATE: 01-11-2013

FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

GENERAL NOTES, LEGEND, & ESTIMATED QUANTITIES

G-01

SHEET NO. 02 OF 22

B:\Projects\Snake River Salmon Recovery Board\CAD\Project Area 14\120850-01-G-notes.dwg 02 GENERAL NOTES LEGEND & ESTIMATED QUANTITIES
Jan 11, 2013 11:44am dgaffney

NOTES:

1. CONTOUR INTERVAL 5 FT.
2. 2010 AERIAL PHOTO PROVIDED BY COLUMBIA CONSERVATION DISTRICT.

NORTH

0 150 300
SCALE IN FEET

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

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SCALE: 1"=150'
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FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

EXISTING CONDITIONS (1 OF 2)

C-01

SHEET NO. **03** OF **22**

B:\Projects\Snake River Salmon Recovery Board\CAD\Project Area 14\120850-01-C-existing conditions.dwg 03 EXISTING CONDITIONS (1 OF 2)
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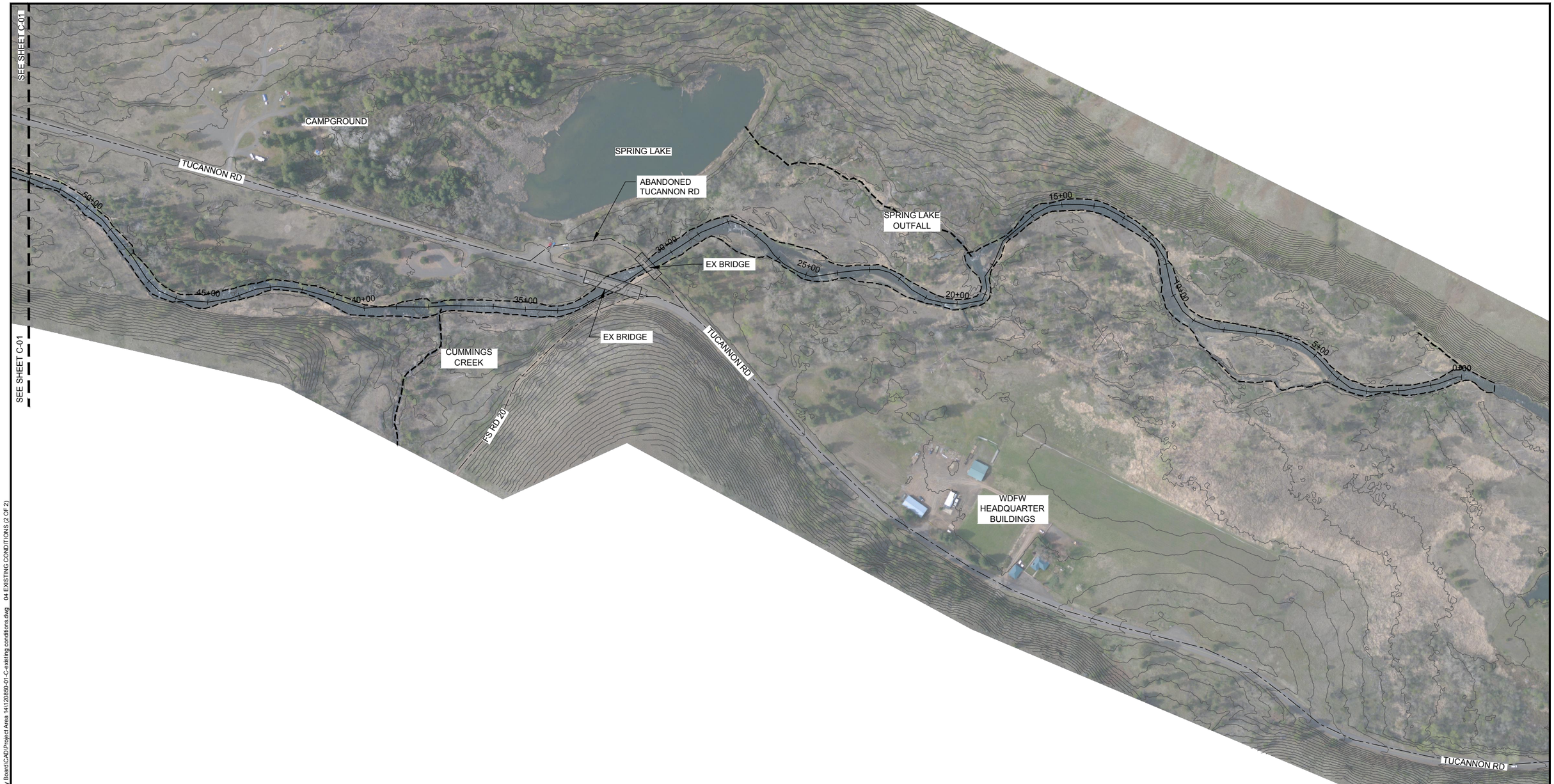

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NORTH

0 150 300
SCALE IN FEET

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

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FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

EXISTING CONDITIONS (2 OF 2)

C-02

SHEET NO. **04** OF **22**

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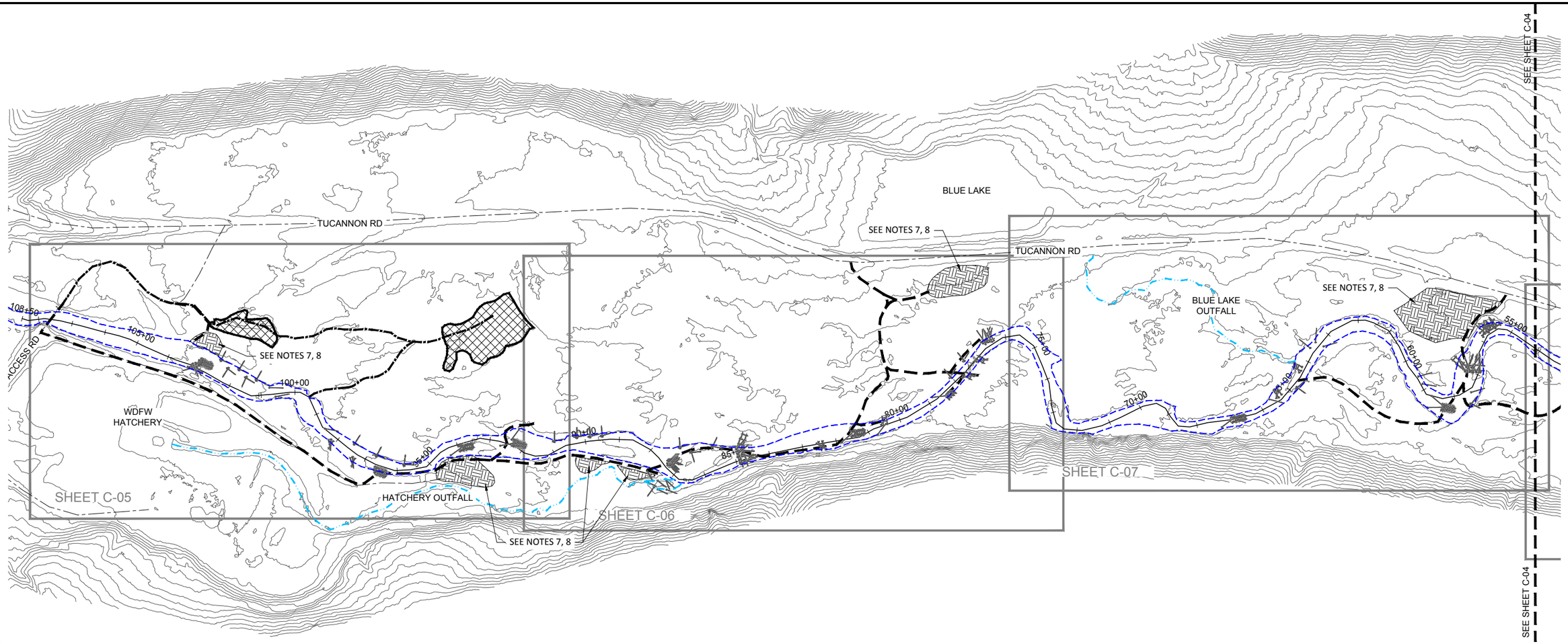
Jan 11, 2013 11:46am dgaffney



NOTES:

1. CONTOUR INTERVAL 5FT.
2. SITE ACCESS, STAGING AND CARE OF WATER PLAN SHOWN IS A RECOMMENDATION AND MAY NOT CONTAIN ALL NECESSARY MEASURES TO MEET CONSTRUCTION PERMIT CONDITIONS. CONTRACTOR IS RESPONSIBLE FOR DEVELOPMENT OF A FINAL PLAN THAT SATISFIES ALL PERMIT REQUIREMENTS.
3. RECOMMENDED ACCESS ROUTES ARE SHOWN THROUGH THE FLOODPLAIN AND ACROSS THE RIVER IN SOME LOCATIONS. ACCESS MAY BE PERMITTED UP AND DOWN THE CHANNEL EITHER ON GRAVEL BARS OR IN FLOWING WATER, REFER TO PERMIT CONDITIONS FOR SPECIFIC REQUIREMENTS FOR IN WATER WORK.
4. FISH RESCUE AND RECOVERY REQUIRED IN ALL IN-WATER WORK AREAS; TO BE COMPLETED BY CONTRACTING AGENCY AND/OR ITS AUTHORIZED AGENTS. (SEE SPECIFICATIONS)
5. DISCHARGE DEWATERING WATER IN VEGETATED BUFFERS FOR INFILTRATION IN ACCORDANCE WITH APPROVED PLANS.
6. EXCAVATION MAY ENCOUNTER BEDROCK WITHIN THE PROJECT AREA. CONTRACTOR SHALL IMMEDIATELY NOTIFY CONTRACTING OFFICER UPON ENCOUNTERING BEDROCK THAT IMPEDES THE PROGRESS OF WORK USING NORMAL CONSTRUCTION METHODS. WORK MAY PROCEED AFTER CONTRACTING OFFICER APPROVES CHANGES TO THE WORK, WHERE APPLICABLE.
7. CLEARING LIMITS SHALL NOT EXCEED THE EXTENTS NECESSARY TO COMPLETE THE WORK, AND NOT GREATER THAN 10' IN WIDTH FOR ACCESS ROUTES. CLEARING OF VEGETATION, ESPECIALLY TREES, SHALL REQUIRE PRIOR APPROVAL BY THE CONTRACTING OFFICER.
8. NO TREES GREATER THAN 3 INCHES IN DIAMETER WILL BE REMOVED TO ESTABLISH STAGING AREAS.

NORTH

0 150 300
SCALE IN FEET

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

B:\Projects\Snake River Salmon Recovery Board\CAD\Project Area 14\120850-01-C-site access TESC.dwg 05 SITE ACCESS, STAGING, TESC & CARE OF WATER (1 OF 2)

Jan 11, 2013 11:46am dgaffney

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY
STATE OF WASHINGTON
40803
REGISTERED PROFESSIONAL ENGINEER

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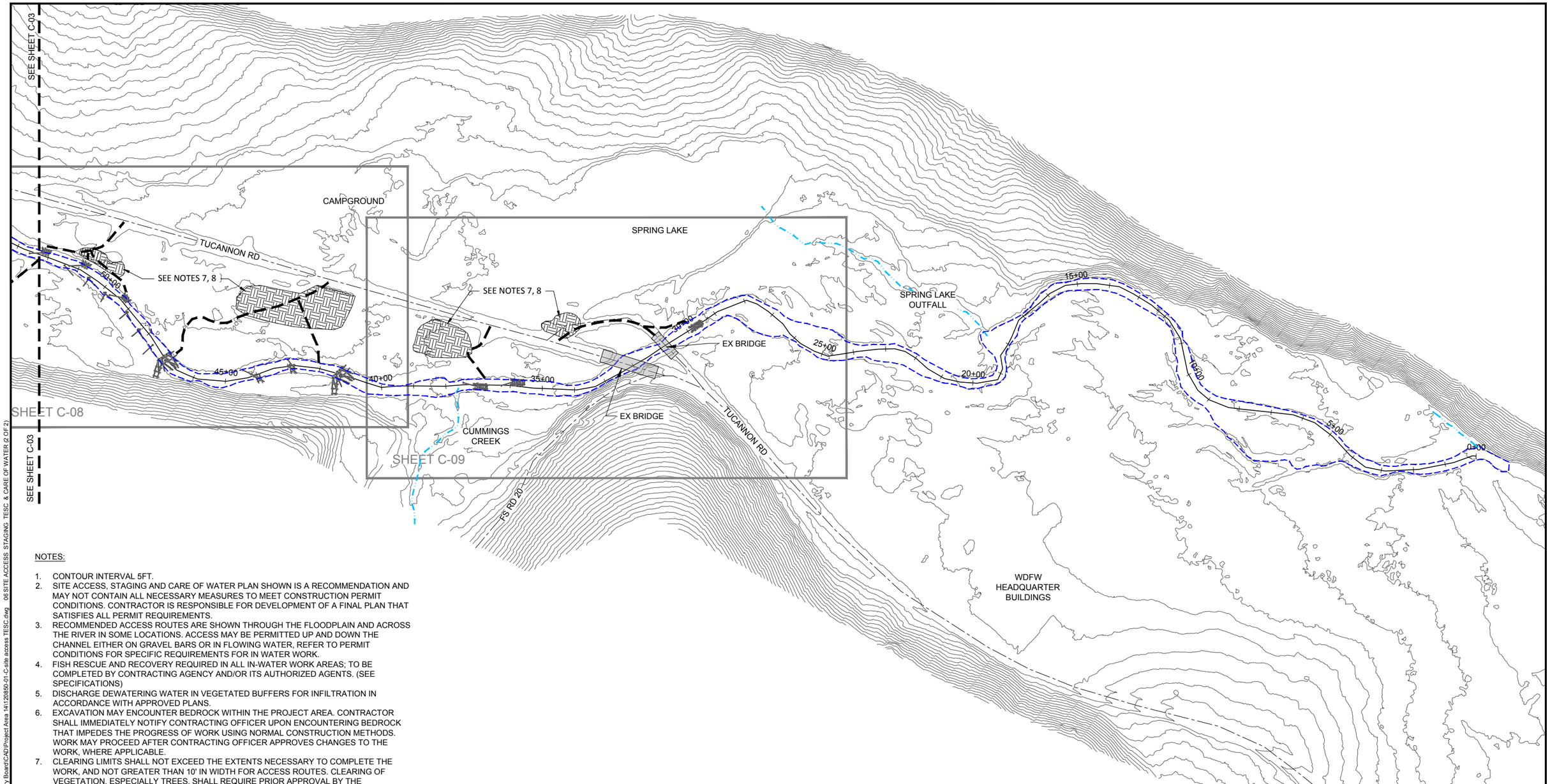
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=150'
DATE: 01-11-2013

FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

SITE ACCESS, STAGING, TESC, & CARE OF WATER (1 OF 2)

C-03

SHEET NO. **05** OF **22**



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7. CLEARING LIMITS SHALL NOT EXCEED THE EXTENTS NECESSARY TO COMPLETE THE WORK, AND NOT GREATER THAN 10' IN WIDTH FOR ACCESS ROUTES. CLEARING OF VEGETATION, ESPECIALLY TREES, SHALL REQUIRE PRIOR APPROVAL BY THE CONTRACTING OFFICER.
8. NO TREES GREATER THAN 3 INCHES IN DIAMETER WILL BE REMOVED TO ESTABLISH STAGING AREAS.

B:\Projects\Snake River Salmon Recovery Board\CAD\Project Area 14\120850-01-C-site access TESC.dwg 06 SITE ACCESS STAGING TESC & CARE OF WATER (2 OF 2)

Jan 11, 2013 11:46am dgaffney

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY — STATE OF WASHINGTON — 40803 — REGISTERED PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

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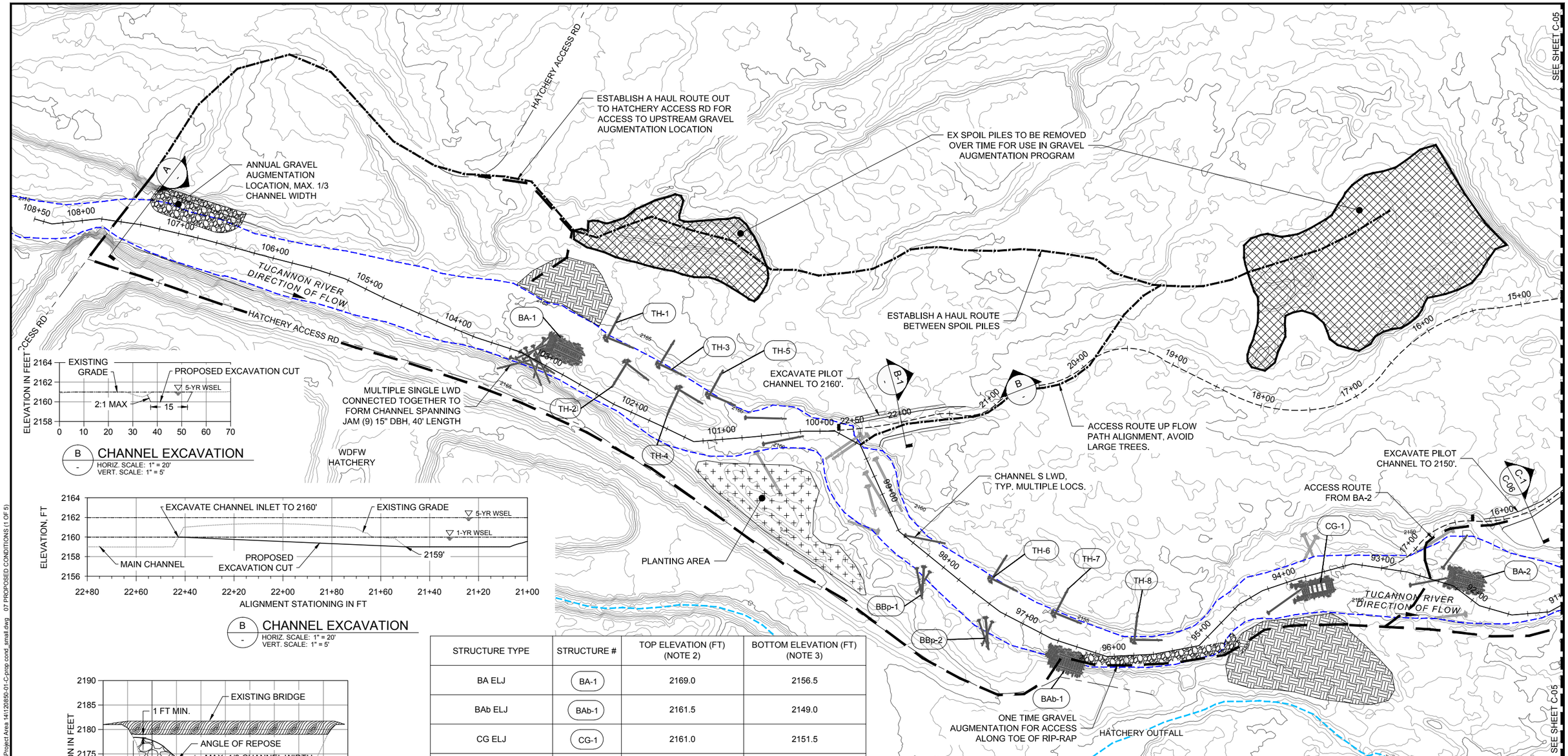
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=150'
DATE: 01-11-2013

FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

SITE ACCESS, STAGING, TESC, & CARE OF WATER (2 OF 2)

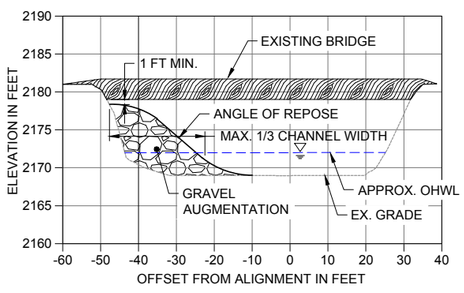
C-04

SHEET NO. **06** OF **22**



B / - CHANNEL EXCAVATION
HORIZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 5'

B / - CHANNEL EXCAVATION
HORIZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 5'



A / - ANNUAL GRAVEL AUGMENTATION TYP. SECTION
HORIZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 10'

STRUCTURE TYPE	STRUCTURE #	TOP ELEVATION (FT) (NOTE 2)	BOTTOM ELEVATION (FT) (NOTE 3)
BA ELJ	BA-1	2169.0	2156.5
BAb ELJ	BAb-1	2161.5	2149.0
CG ELJ	CG-1	2161.0	2151.5
BA ELJ	BA-2	2155.0	2142.5

STRUCTURE TYPE	# OF LOCATIONS	BOTTOM ELEVATION
TH LWD	8	PLACE AT EXISTING GRADE
BBp ELJ	2	PLACE AT EXISTING GRADE
S LWD	15	PLACE AT EXISTING GRADE

NOTES:

1. CONTOUR INTERVAL 1 FOOT.
2. TOP ELEVATION IS MEASURED AT THE TOP OF THE LAST LAYER.
3. BOTTOM ELEVATION MEASURED AT THE TOP OF LAYER 1.
4. PLACE NO MORE THAN 500 CY OF EX. SPOIL PILE MATERIAL INTO RIVER ON AN ANNUAL BASIS. DO NOT BLOCK MORE THAN 1/3 OF THE EXISTING CHANNEL WIDTH. MAXIMUM HEIGHT OF AUGMENTATION 1 FT BELOW THE LOW CORD OF THE BRIDGE. ADJUST LENGTH OF AUGMENTATION ACCORDINGLY TO PLACE SPECIFIED VOLUME OF SEDIMENT.
5. WOODY MATERIAL CLEARED FROM ACCESS ROUTES, PILOT CHANNEL EXCAVATIONS AND STRUCTURE/FEATURE FOOTPRINTS SHALL BE EITHER INCORPORATED INTO STRUCTURES/FEATURES OR DISTRIBUTED OVER THE CLEARED AREA AS APPROVED BY THE ENGINEER.

NORTH

0 50 100
SCALE IN FEET

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY
STATE OF WASHINGTON
40803
REGISTERED PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=50'
DATE: 01-11-2013

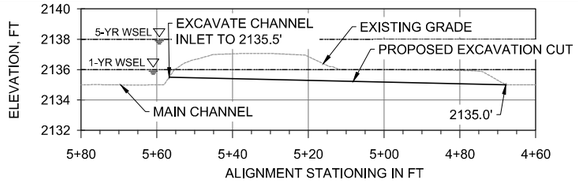
FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

PROPOSED CONDITIONS (1 OF 5)

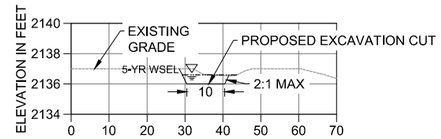
C-05

SHEET NO. 07 OF 22

B:\Projects\Snake River Salmon Recovery Board\CAD\Project Area 14\120890-01-C-prop cond_small.dwg 07 PROPOSED CONDITIONS (1 OF 5)
Jan 11, 2013 11:46am dgaffney



D
-
CHANNEL EXCAVATION
HORIZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 5'



D-1
-
CHANNEL EXCAVATION
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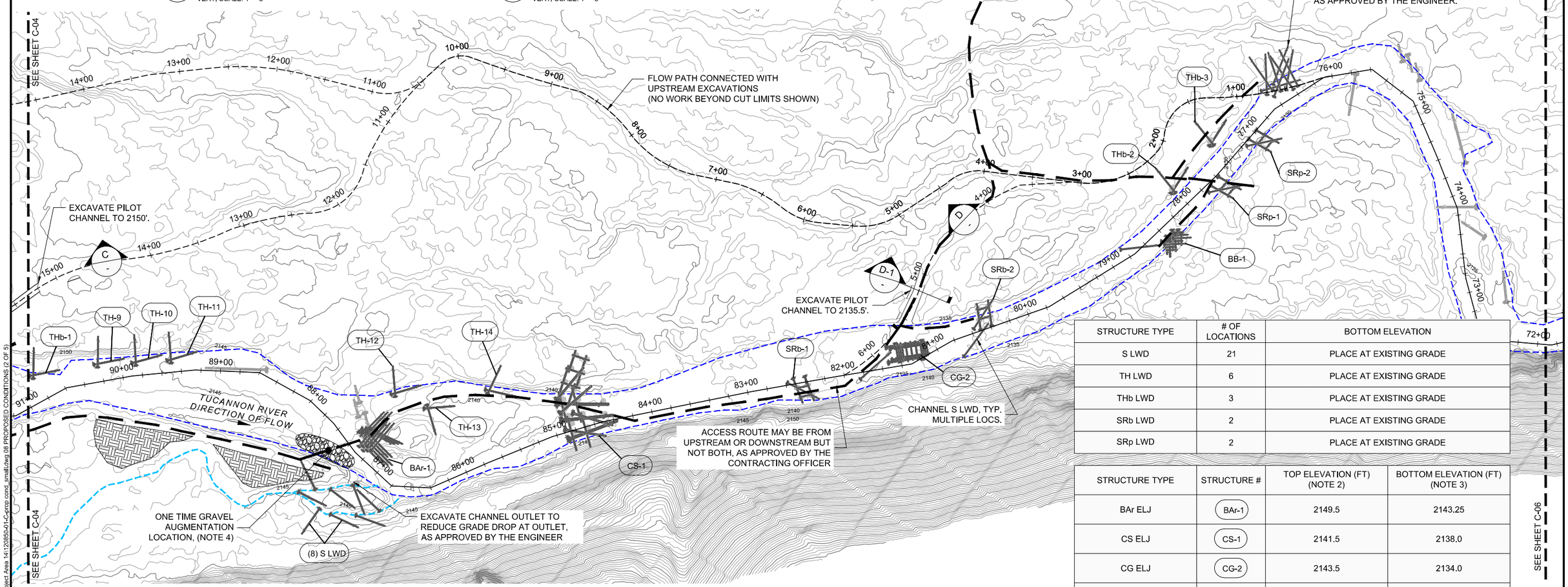
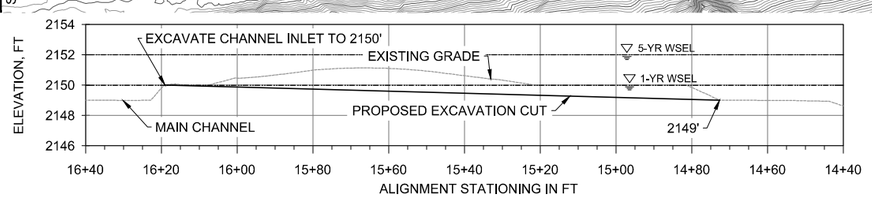
VERT. SCALE: 1" = 5'

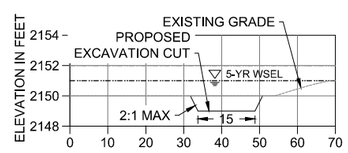


STRUCTURE TYPE	# OF LOCATIONS	BOTTOM ELEVATION
S LWD	21	PLACE AT EXISTING GRADE
TH LWD	6	PLACE AT EXISTING GRADE
THb LWD	3	PLACE AT EXISTING GRADE
SRb LWD	2	PLACE AT EXISTING GRADE
SRp LWD	2	PLACE AT EXISTING GRADE

STRUCTURE TYPE	STRUCTURE #	TOP ELEVATION (FT) (NOTE 2)	BOTTOM ELEVATION (FT) (NOTE 3)
BAr ELJ	BAr-1	2149.5	2143.25
CS ELJ	CS-1	2141.5	2138.0
CG ELJ	CG-2	2143.5	2134.0
BB ELJ	BB-1	2135.75	2124.5



C
-
CHANNEL EXCAVATION
HORIZ. SCALE: 1"=20'
VERT. SCALE: 1" = 5'



C-1
C-05
CHANNEL EXCAVATION
HORIZ. SCALE: 1"=20'
VERT. SCALE: 1" = 5'

NOTES:

1. CONTOUR INTERVAL 1 FOOT.
2. TOP ELEVATION IS MEASURED AT THE TOP OF THE LAST LAYER.
3. BOTTOM ELEVATION MEASURED AT THE TOP OF LAYER 1.
4. MOVE EX. SPOIL PILE INTO RIVER BED AS A ONE TIME GRAVEL AUGMENTATION DURING CONSTRUCTION. DO NOT BLOCK MORE THAN 1/3 OF THE EXISTING CHANNEL WIDTH. HEIGHT OF AUGMENTATION TO NOT EXCEED THE SURROUNDING LOW FLOODPLAIN ELEVATION. ADJUST LENGTH OF AUGMENTATION ACCORDINGLY.
5. WOODY MATERIAL CLEARED FROM ACCESS ROUTES, PILOT CHANNEL EXCAVATIONS AND STRUCTURE/FEATURE FOOTPRINTS SHALL BE EITHER INCORPORATED INTO STRUCTURES/FEATURES OR DISTRIBUTED OVER THE CLEARED AREA AS APPROVED BY THE ENGINEER.

NORTH

0 50 100
SCALE IN FEET

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY
STATE OF WASHINGTON
40861
REGISTERED PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=50'
DATE: 01-11-2013

FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

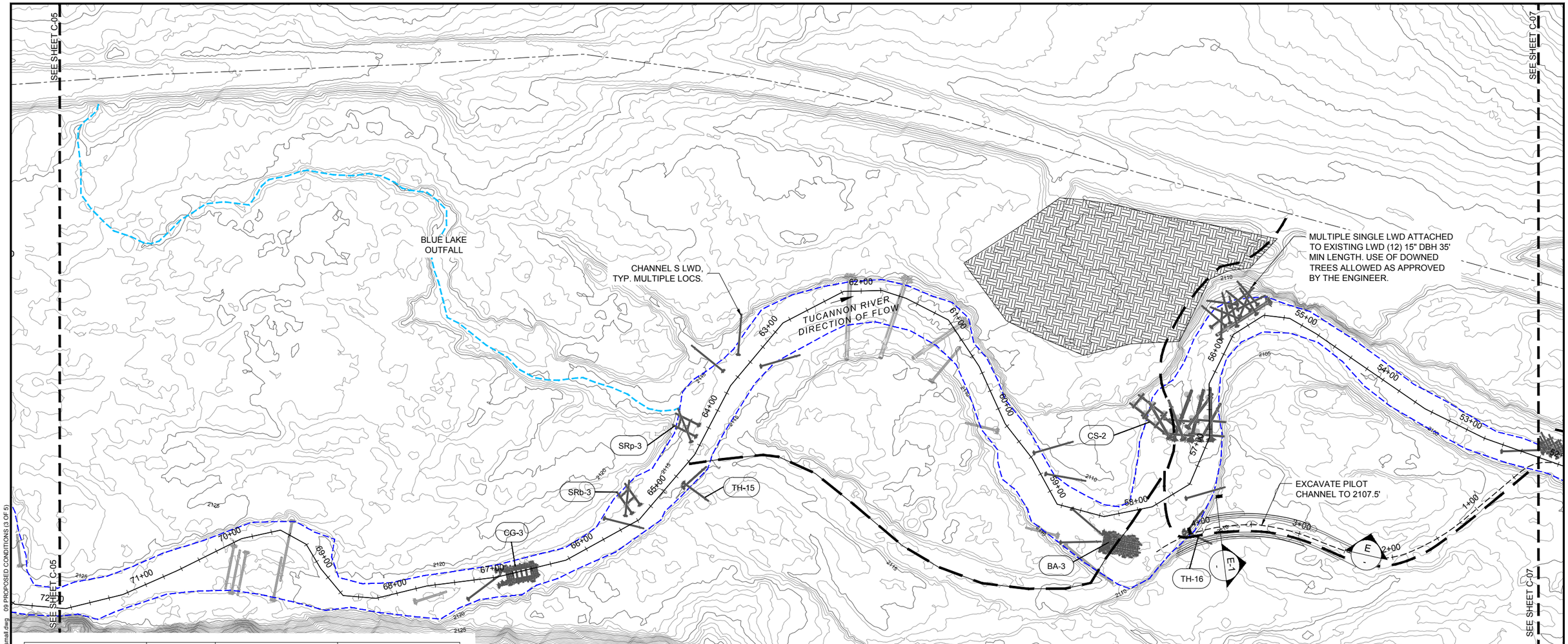
PROPOSED CONDITIONS (2 OF 5)

C-06

SHEET NO. 08 OF 22

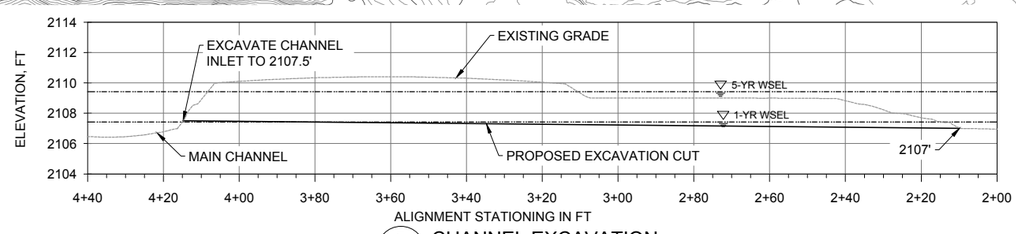
B:\Projects\Snake River Salmon Recovery Board\CAD\Project Area 14\120850-01-C-prop cond_small.dwg 08 PROPOSED CONDITIONS (2 OF 5)

Jan 11, 2013 11:52am djgaffney

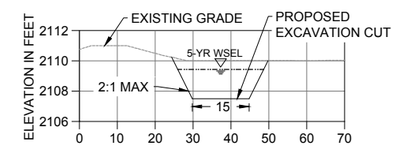


STRUCTURE TYPE	STRUCTURE #	TOP ELEVATION (FT) (NOTE 2)	BOTTOM ELEVATION (FT) (NOTE 3)
CG ELJ	CG-3	2126.5	2117.0
BA ELJ	BA-3	2113.5	2101.0
CS ELJ	CS-2	2107.5	2104.0

STRUCTURE TYPE	# OF LOCATIONS	BOTTOM ELEVATION
TH LWD	2	PLACE AT EXISTING GRADE
SRb LWD	1	PLACE AT EXISTING GRADE
SRp LWD	1	PLACE AT EXISTING GRADE
S LWD	23	PLACE AT EXISTING GRADE



E / - CHANNEL EXCAVATION
HORIZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 5'



E-1 / - CHANNEL EXCAVATION
HORIZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 5'

NOTES:

1. CONTOUR INTERVAL 1 FOOT.
2. TOP ELEVATION IS MEASURED AT THE TOP OF THE LAST LAYER.
3. BOTTOM ELEVATION MEASURED AT THE TOP OF LAYER 1.
4. WOODY MATERIAL CLEARED FROM ACCESS ROUTES, PILOT CHANNEL EXCAVATIONS AND STRUCTURE/FEATURE FOOTPRINTS SHALL BE EITHER INCORPORATED INTO STRUCTURES/FEATURES OR DISTRIBUTED OVER THE CLEARED AREA AS APPROVED BY THE ENGINEER.

NORTH

0 50 100
SCALE IN FEET

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY
STATE OF WASHINGTON
40860
REGISTERED PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=50'
DATE: 01-11-2013

FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

PROPOSED CONDITIONS (3 OF 5)

C-07

SHEET NO. 09 OF 22

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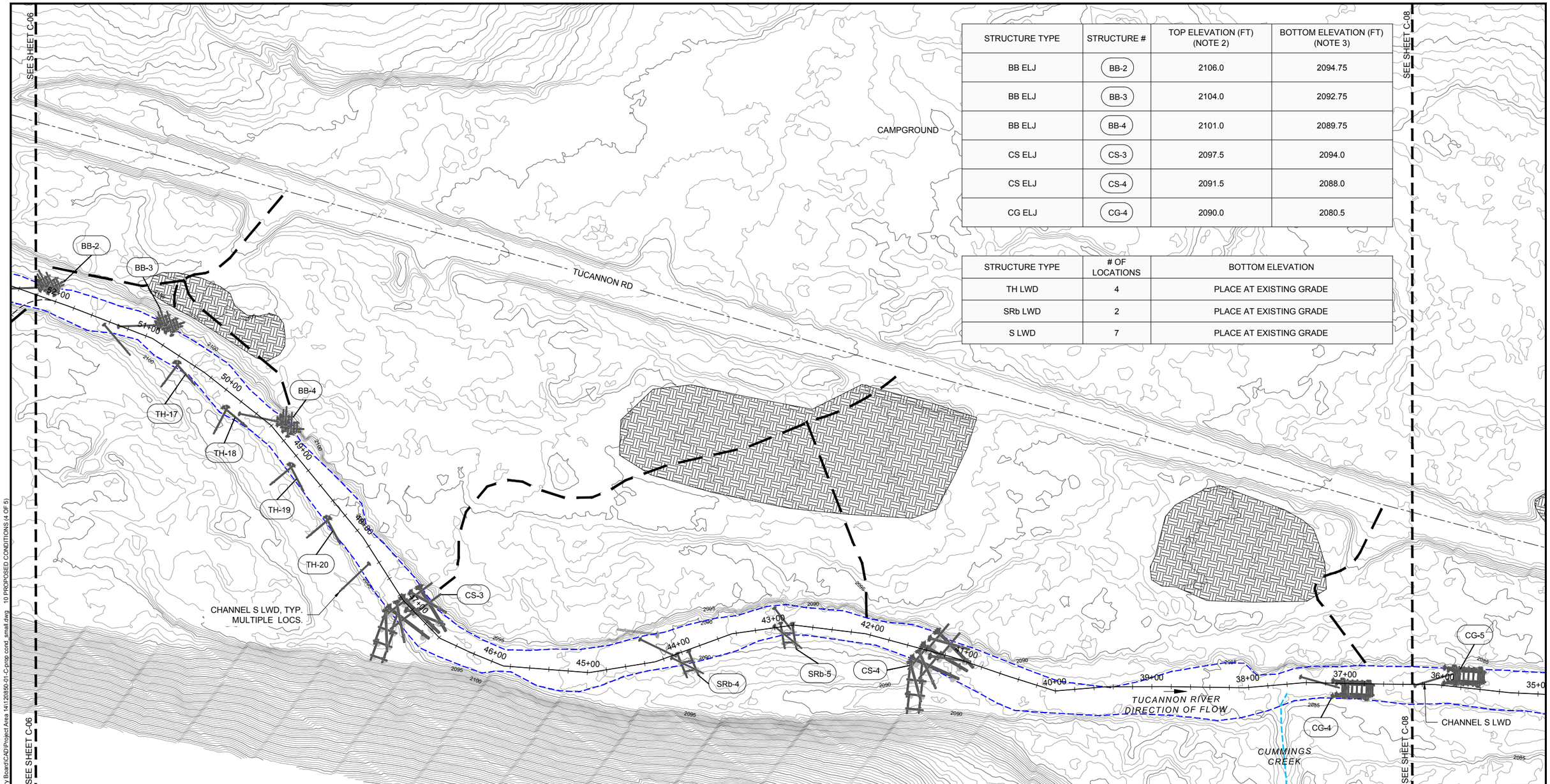
Jan 11, 2013 11:47am dgaffney



STRUCTURE TYPE	STRUCTURE #	TOP ELEVATION (FT) (NOTE 2)	BOTTOM ELEVATION (FT) (NOTE 3)
BB ELJ	BB-2	2106.0	2094.75
BB ELJ	BB-3	2104.0	2092.75
BB ELJ	BB-4	2101.0	2089.75
CS ELJ	CS-3	2097.5	2094.0
CS ELJ	CS-4	2091.5	2088.0
CG ELJ	CG-4	2090.0	2080.5

STRUCTURE TYPE	# OF LOCATIONS	BOTTOM ELEVATION
TH LWD	4	PLACE AT EXISTING GRADE
SRb LWD	2	PLACE AT EXISTING GRADE
S LWD	7	PLACE AT EXISTING GRADE

NOTES:

1. CONTOUR INTERVAL 1 FOOT.
2. TOP ELEVATION IS MEASURED AT THE TOP OF THE LAST LAYER.
3. BOTTOM ELEVATION MEASURED AT THE TOP OF LAYER 1.
4. WOODY MATERIAL CLEARED FROM ACCESS ROUTES, PILOT CHANNEL EXCAVATIONS AND STRUCTURE/FEATURE FOOTPRINTS SHALL BE EITHER INCORPORATED INTO STRUCTURES/FEATURES OR DISTRIBUTED OVER THE CLEARED AREA AS APPROVED BY THE ENGINEER.

NORTH

0 50 100
SCALE IN FEET

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY
STATE OF WASHINGTON
40803
REGISTERED PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=50'
DATE: 01-11-2013

FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

PROPOSED CONDITIONS (4 OF 5)

C-08

SHEET NO. **10** OF **22**

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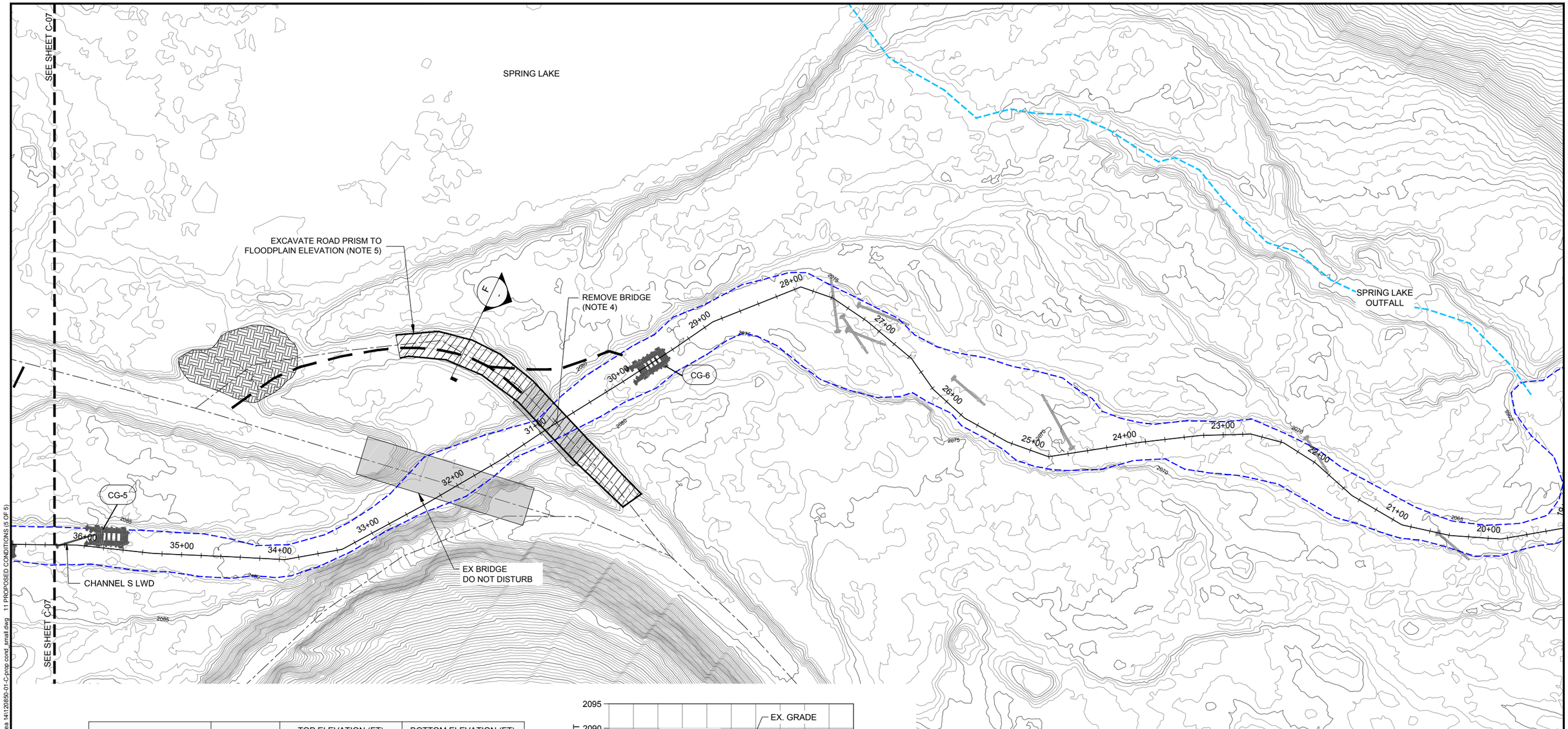
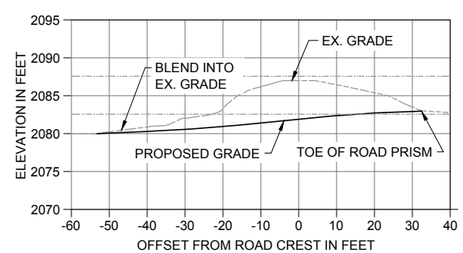
Jan 11, 2013 11:47am djgaffney



STRUCTURE TYPE	STRUCTURE #	TOP ELEVATION (FT) (NOTE 2)	BOTTOM ELEVATION (FT) (NOTE 3)
CG ELJ	CG-5	2089.0	2079.5
CG ELJ	CG-6	2083.0	2073.5

STRUCTURE TYPE	# OF LOCATIONS	BOTTOM ELEVATION
S LWD	1	PLACE AT EXISTING GRADE



F / - ROAD FILL REMOVAL TYP. SECTION

HORIZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 10'

NOTES:

1. CONTOUR INTERVAL 1 FOOT.
2. TOP ELEVATION IS MEASURED AT THE TOP OF THE LAST LAYER.
3. BOTTOM ELEVATION MEASURED AT THE TOP OF LAYER 1.
4. REMOVE THE ABANDONED TUCANNON RD BRIDGE AND ALL ASSOCIATED CONCRETE ABUTMENTS, FOOTINGS, AND PIERS. SEE SPECIFICATIONS FOR DISPOSAL REQUIREMENTS.
5. REMOVE AND DISPOSE OF ROAD SURFACING. EXCAVATE AND GRADE ROAD PRISM DOWN TO THE SURROUNDING FLOODPLAIN ELEVATION. EXCAVATED MATERIAL MAY BE SUITABLE FOR REUSE IN OTHER PROJECT FEATURES AS APPROVED BY THE ENGINEER.
6. WOODY MATERIAL CLEARED FROM ACCESS ROUTES, PILOT CHANNEL EXCAVATIONS AND STRUCTURE/FEATURE FOOTPRINTS SHALL BE EITHER INCORPORATED INTO STRUCTURES/FEATURES OR DISTRIBUTED OVER THE CLEARED AREA AS APPROVED BY THE ENGINEER.

NORTH

0 50 100
SCALE IN FEET

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY
STATE OF WASHINGTON
40803
REGISTERED PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=50'
DATE: 01-11-2013

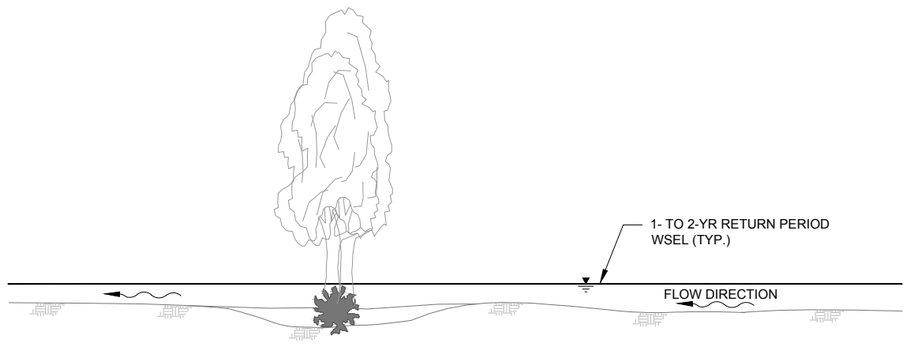
FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

PROPOSED CONDITIONS (5 OF 5)

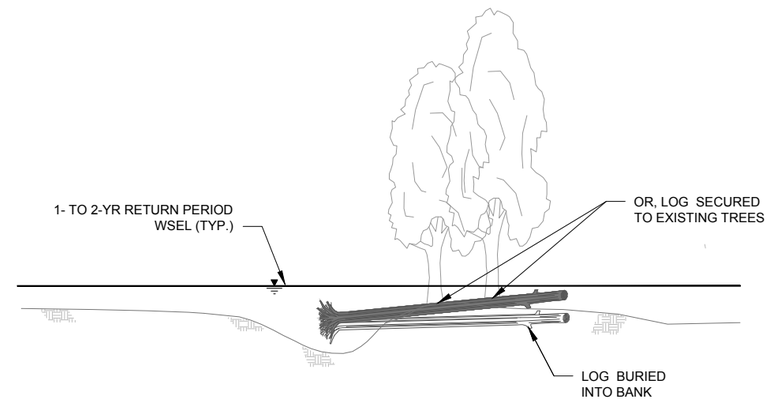
C-09

SHEET NO. 11 OF 22

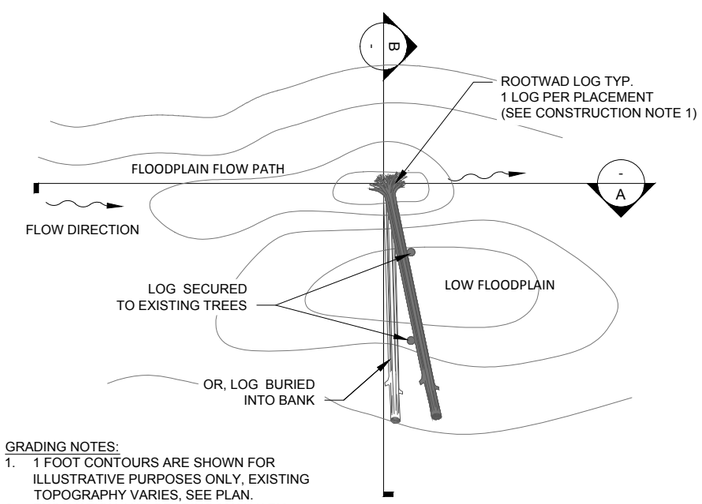
B:\Projects\Snake River Salmon Recovery Board\CAD\Project Area 14\120850-01-C-prop cond_small.dwg 11 PROPOSED CONDITIONS (5 OF 5)
Jan 11, 2013 11:47am dgaffney



A / - S LWD FEATURE TYPICAL PROFILE
SCALE: 1" = 10'



B / - S LWD FEATURE TYPICAL SECTION
SCALE: 1" = 10'



GRADING NOTES:
1. 1 FOOT CONTOURS ARE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY, EXISTING TOPOGRAPHY VARIES, SEE PLAN.
2. EXCAVATION AND GRADING MAY VARY DEPENDING ON SITE CONDITIONS.

1 / VARIES S LWD FEATURE TYPICAL PLAN
SCALE: 1" = 10'

CONSTRUCTION NOTES:

1. S LWD WILL BE FIELD LOCATED AT TIME OF CONSTRUCTION BY THE ENGINEER.
2. EXCAVATE TRENCH FOR LOG.
3. PLACE ROOTWAD LOG IN TRENCH AND BACKFILL TO EXISTING GRADE. PLACE EXCESS MATERIAL IN LEE OF STRUCTURE.
4. ALTERNATIVELY, LOG MAY BE PLACED BETWEEN EXISTING TREES AND SECURED IN PLACE, SEE DETAIL 6 ON SHEET 22.
   4.1. USE 1/2" DIA. MANILA ROPE AND APPROVED KNOTS PER SECTION 02948.
5. DISTANCE BETWEEN TREES MAY VARY BETWEEN 10 AND 25 FEET.

RE-VEGATATION NOTE

6. CONTRACTOR SHALL COORDINATE WITH RE-VEGETATION CREWS FOR INSTALLATION OF PLANTS. PLANTS WILL BE INSTALLED BY OTHERS WITHIN AND AROUND THE STRUCTURE NEAR THE GROUNDWATER LEVEL. CARE SHALL BE TAKEN NOT TO DAMAGE PLANTINGS INSTALLED PRIOR TO COMPLETION OF THE STRUCTURE.

TYP. S LWD FEATURE LWM QUANTITIES

ITEM	LOG DIA. (IN)	ROOTWAD DIA. (IN)	MIN. LOG LENGTH (FT)	QUANTITY
ROOTWAD LOG OR DOWNED TREE	15	45	30	1

TABLE NOTES:
1. MINIMUM LENGTHS ARE REPORTED FOR MATERIAL PROCUREMENT PURPOSES. ALL LWM SHALL BE CUT TO FIT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
2. ROOTWAD LOG LENGTHS DO NOT INCLUDE THE LENGTH OF THE ROOTWAD MASS.
3. ROOTWAD LOG DIAMETER IS MEASURED AT BREAST HEIGHT.
4. SEE SECTION 02947 FOR DIAMETER TOLERANCES AND TAPER RATES.

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY — STATE OF WASHINGTON — 40861 — REGISTERED PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=10'
DATE: 01-11-2013

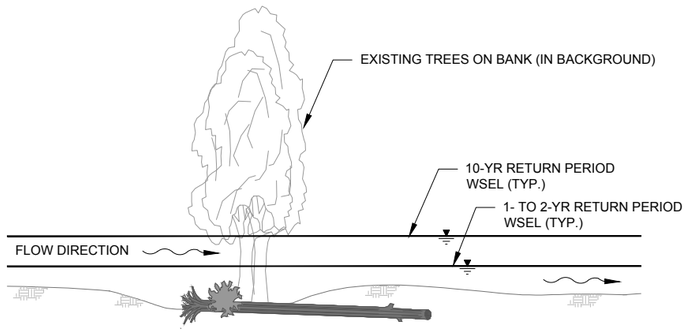
FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

SINGLE (S) LWD DETAILS

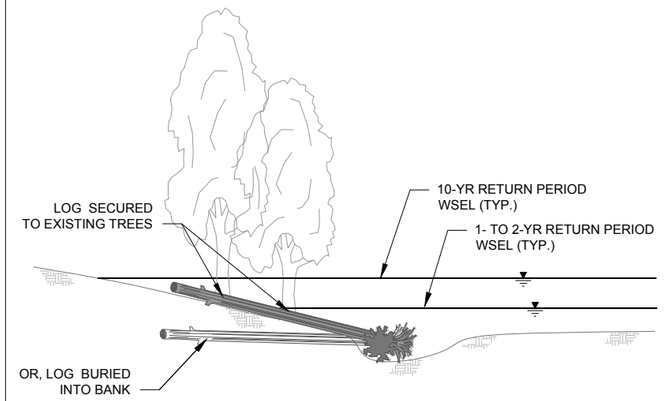
C-10

SHEET NO. 12 OF 22

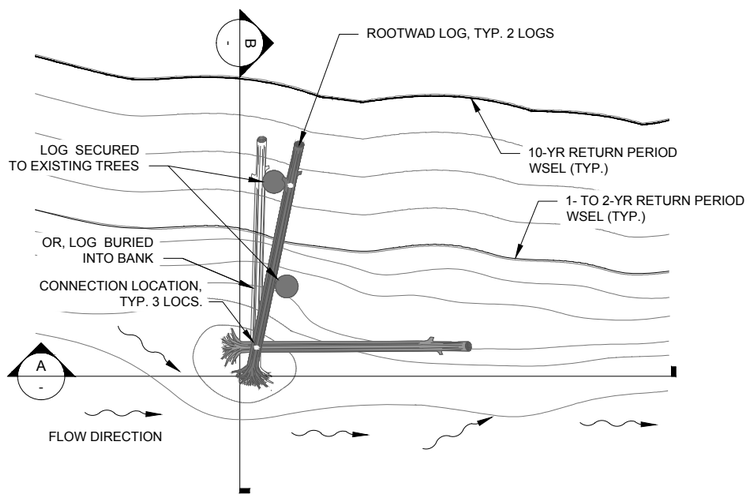
B:\Projects\Snake River Salmon Recovery Board\CAD\Project Area 14\120850-01-C-typical details.dwg 12 SINGLE (S) LWD DETAILS
Jan 11, 2013 11:47am dgaffney



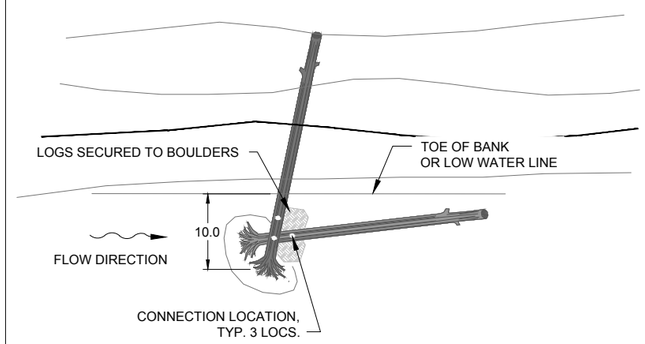
A - TH LWD FEATURE TYPICAL PROFILE
SCALE: 1" = 10'



B - TH LWD FEATURE TYPICAL SECTION
SCALE: 1" = 10'



2A VARIES - TH LWD FEATURE TYPICAL PLAN
SCALE: 1" = 10'



2B VARIES - THb LWD FEATURE TYPICAL PLAN
SCALE: 1" = 10'

TYP. THb LWD FEATURE ROCK QUANTITIES				
LOCATION	ITEM	INTERMEDIATE DIA. (FT)	MIN. DRY WEIGHT (LB)	QUANTITY
AT TOE	BOULDER	3.8 (-0.0/+0.7)	4,500	2

GRADING NOTES:
1. CONTOUR INTERVALS ARE 1 FOOT.
2. POOL EXCAVATION AND GRADING MAY VARY DEPENDING ON SITE CONDITIONS.

CONSTRUCTION NOTES:

ALL TH AND THb LWD WILL BE FIELD LOCATED AT TIME OF CONSTRUCTION BY THE ENGINEER.

FOR TH LWD BURIED INTO THE BANK
1. EXCAVATE TRENCH FOR LOG PERPENDICULAR TO FLOW AS APPROVED BY THE ENGINEER.
2. PLACE THE ROOTWAD LOG PARALLEL TO FLOW AT THE TOE OF THE BANK AS SHOWN.
3. PLACE THE ROOTWAD LOG PERPENDICULAR TO THE BANK INTO THE TRENCH AND POSITION OVER THE PARALLEL TO FLOW ROOTWAD LOG AS SHOWN. ALTERNATIVELY A LOG POLE MAY BE USED AS APPROVED BY THE CONTRACTING OFFICER.
4. DRILL A HOLE THROUGH BOTH ROOTWAD LOGS AT THEIR INTERSECTION AND CONNECT THE ROOTWAD LOGS TOGETHER USING 1/2" DIA. MANILA ROPE AND APPROVED KNOTS PER SECTION 02948.
5. BACKFILL THE TRENCH OVER THE BOLE OF THE ROOTWAD LOG.

FOR TH LWD PLACED BETWEEN EXISTING TREES
6. PLACE THE ROOTWAD LOG PARALLEL TO FLOW AT THE TOE OF THE BANK AS SHOWN.
7. PLACE THE ROOTWAD LOG PERPENDICULAR TO THE BANK BETWEEN EXISTING TRESS DISTANCE BETWEEN TREES MAY VARY BETWEEN 8 AND 15 FT. ALTERNATIVELY A LOG POLE MAY BE USED AS APPROVED BY THE CONTRACTING OFFICER
8. LASH THE ROOTWAD LOG TO THE EXISTING TREES USING 1/2" DIA. MANILA ROPE AND APPROVED KNOTS PER SECTION 02948.

FOR THb (WITH BOULDERS)
9. INSTALL ROCK ANCHORS AND EYE BOLTS, ONE EACH PER BOULDER
10. PLACE BOULDERS AT LOCATIONS SHOWN WITH EYE BOLTS NEAR THE TOP OF THE BOULDER
11. PLACE ROOTWAD LOGS AS SHOWN. A LOG POLE MAY BE USED IN LAYER 2 AS APPROVED BY THE CONTRACTING OFFICER.
12. DRILL A HOLE THROUGH BOTH ROOTWAD LOGS AT THEIR INTERSECTION AND CONNECT THE ROOTWAD LOGS TOGETHER USING 1/2" DIA. MANILA ROPE AND APPROVED KNOTS PER SECTION 02948.
13. DRILL HOLE THROUGH ROOTWAD LOGS NEAR EYE BOLTS AND CONNECT TOGETHER USING 1/2" DIA. MANILA ROPE AND APPROVED KNOTS PER SECTION 02948.

RE-VEGATATION NOTE
14. CONTRACTOR SHALL COORDINATE WITH RE-VEGETATION CREWS FOR INSTALLATION OF PLANTS. PLANTS WILL BE INSTALLED BY OTHERS WITHIN AND AROUND THE STRUCTURE NEAR THE GROUNDWATER LEVEL. CARE SHALL BE TAKEN NOT TO DAMAGE PLANTINGS INSTALLED PRIOR TO COMPLETION OF THE STRUCTURE.

TYP. TH AND THb LWD FEATURE LWM QUANTITIES					
LAYER	ITEM	LOG DIA. (IN)	ROOTWAD DIA. (IN)	MIN. LOG LENGTH (FT)	QUANTITY
1	ROOTWAD LOG	15	45	30	1
2	ROOTWAD LOG	15	45	30	1
ALTERNATE ITEM					
2	LOG POLE OR DOWNED TREE	15	–	30	1

TABLE NOTES:
1. MINIMUM LENGTHS ARE REPORTED FOR MATERIAL PROCUREMENT PURPOSES. ALL LWM SHALL BE CUT TO FIT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
2. ROOTWAD LOG LENGTHS DO NOT INCLUDE THE LENGTH OF THE ROOTWAD MASS.
3. ROOTWAD LOG DIAMETER IS MEASURED AT BREAST HEIGHT.
4. SEE SECTION 02947 FOR DIAMETER TOLERANCES AND TAPER RATES.

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. ORURY — STATE OF WASHINGTON — 40803 — REGISTERED PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=10'
DATE: 01-11-2013

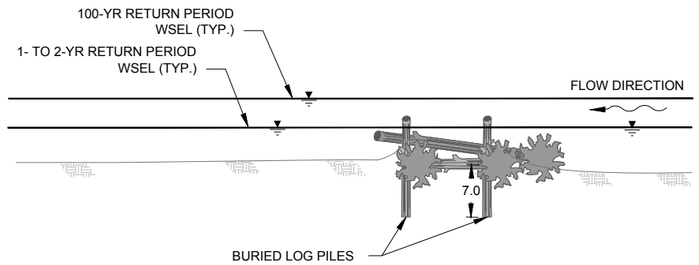
FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

TOE HABITAT (TH & THb) LWD DETAILS

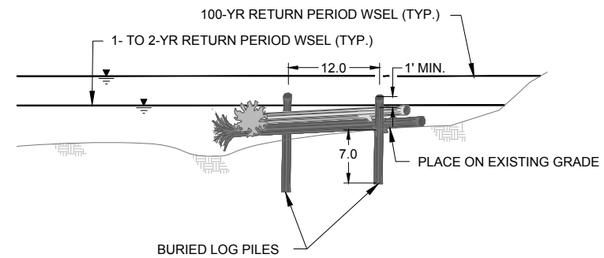
C-11

SHEET NO. 13 OF 22

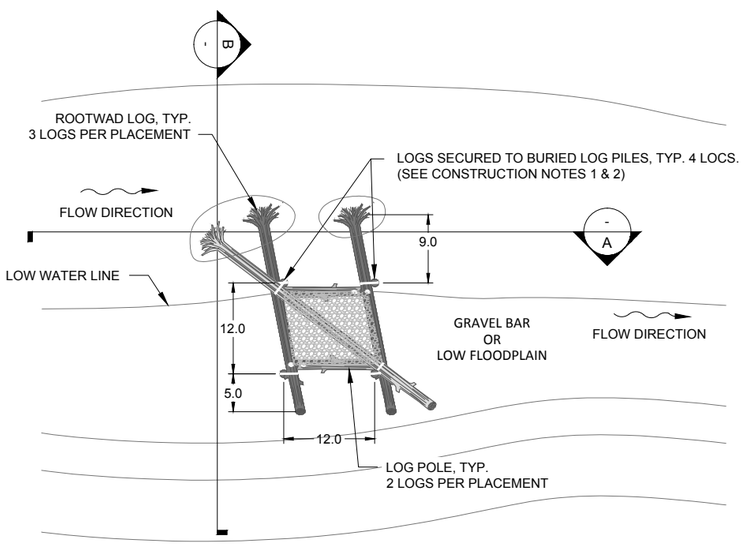
B:\Projects\Snake River Salmon Recovery Board\CAD\Project Area 14\120850-01-C-typical details.dwg 13 TOE HABITAT (TH & THb) LWD DETAILS
Jan 11, 2013 11:47am dgaffney



A / - SR LWD FEATURE TYPICAL PROFILE
SCALE: 1" = 10'

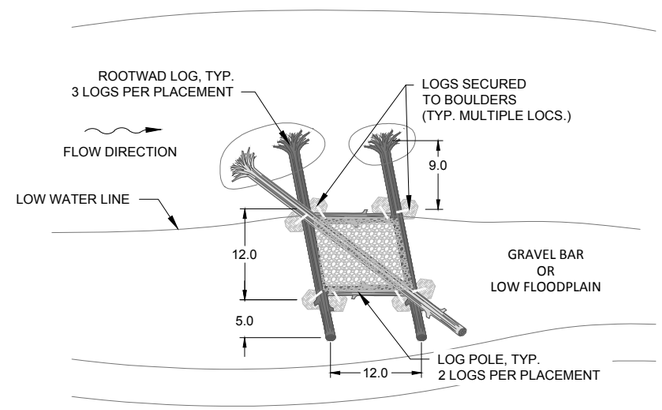


B / - SR LWD FEATURE TYPICAL SECTION
SCALE: 1" = 10'



3A / VARIES SRp LWD FEATURE TYPICAL PLAN (WITH PILES)
SCALE: 1" = 10'

GRADING NOTES:
1. 1 FOOT CONTOURS ARE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY, EXISTING TOPOGRAPHY VARIES, SEE PLAN.
2. POOL EXCAVATION AND GRADING MAY VARY DEPENDING ON SITE CONDITIONS.



3B / VARIES SRb LWD FEATURE TYPICAL PLAN (WITH BOULDERS)
SCALE: 1" = 10'

TYP. SRB LWD FEATURE ROCK QUANTITIES				
LOCATION	ITEM	INTERMEDIATE DIA. (FT)	MIN. DRY WEIGHT (LB)	QUANTITY
AS SHOWN	BOULDER	3.0 (-0.0/+1.0)	2,200	8

CONSTRUCTION NOTES:

FOR SRp LWD
1. INSTALL BURIED LOG PILES (SECTION 02947) TO DEPTH SHOWN. CONTRACTOR RESPONSIBLE FOR EXCAVATION SUPPORT AND PROTECTION. PLACE LOG PILE BUT END DOWN. BACKFILL AROUND BURIED LOG PILES TO EXISTING GRADE IN ACCORDANCE WITH SECTION 02318.
2. EXCAVATE TO PLACE ROOTWAD.
3. PLACE ROOTWAD LOGS AND LOG POLES FLUSH WITH EXISTING GRADE. ROOTWAD LOGS AND LOG POLES ON LAYER ONE SHALL BE IN CONTINUOUS CONTACT WITH THE GROUND SURFACE ON THE UNDERSIDE OF THE BOLE EXCEPT WHERE SHOWN AROUND THE ROOTWAD.
4. PLACE THE DIAGONAL ROOTWAD LOG AS SHOWN WITH ROOTWAD FACING UPSTREAM.
5. SECURE ALL ROOTWAD LOGS AND LOG POLES TOGETHER AND TO THE BURIED LOG PILES PER DETAILS 1, 2, AND 4 ON SHEET 22.
   5.1. USE 1/2" DIA. MANILA ROPE AND APPROVED KNOTS PER SECTION 02948.
6. BACKFILL INTERIOR OF STRUCTURE WITH NATIVE SANDS AND GRAVELS FLUSH WITH THE TOP OF LAYER ONE. DO NOT COMPACT BACKFILL.

FOR SRb LWD
7. INSTALL ROCK ANCHORS AND EYE BOLTS, ONE EACH PER BOULDER
8. PLACE BOULDERS AT LOCATIONS SHOWN WITH EYE BOLTS NEAR THE TOP OF THE BOULDER
9. PLACE ROOTWAD LOGS AS SHOWN.
10. DRILL A HOLE THROUGH BOTH ROOTWAD LOGS AT THEIR INTERSECTION AND CONNECT THE ROOTWAD LOGS TOGETHER USING 1/2" DIA. MANILA ROPE AND APPROVED KNOTS PER SECTION 02948.
11. DRILL HOLE THROUGH ROOTWAD LOGS NEAR EYE BOLTS AND CONNECT TOGETHER USING 1/2" DIA. MANILA ROPE AND APPROVED KNOTS PER SECTION 02948.
12. BACKFILL INTERIOR OF STRUCTURE WITH NATIVE SANDS AND GRAVELS FLUSH WITH THE TOP OF LAYER ONE. DO NOT COMPACT BACKFILL.

RE-VEGATATION NOTE
13. CONTRACTOR SHALL COORDINATE WITH RE-VEGETATION CREWS FOR INSTALLATION OF PLANTS. PLANTS WILL BE INSTALLED BY OTHERS WITHIN THE STRUCTURE NEAR THE GROUNDWATER LEVEL. CARE SHALL BE TAKEN NOT TO DAMAGE PLANTINGS INSTALLED PRIOR TO COMPLETION OF THE STRUCTURE.

TYP. SR LWD FEATURE LWM QUANTITIES						
FEATURE	LAYER	ITEM	LOG DIA. (IN)	ROOTWAD DIA. (IN)	MIN. LOG LENGTH (FT)	QUANTITY
SRp	-	BURIED LOG PILE	12	-	15	4
	1	ROOTWAD LOG	15	45	25	2
	1	LOG POLE	15	-	15	2
	2	ROOTWAD LOG	15	45	35	1
SRb	1	ROOTWAD LOG	15	45	25	2
	1	LOG POLE	15	-	15	2
	2	ROOTWAD LOG	15	45	35	1

TABLE NOTES:
1. MINIMUM LENGTHS ARE REPORTED FOR MATERIAL PROCUREMENT PURPOSES. ALL LWM SHALL BE CUT TO FIT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
2. ROOTWAD LOG LENGTHS DO NOT INCLUDE THE LENGTH OF THE ROOTWAD MASS.
3. ROOTWAD LOG DIAMETER IS MEASURED AT BREAST HEIGHT.
4. LOG POLE DIAMETER IS MEASURED AT THE MID POINT ALONG THE LENGTH OF THE LOG.
5. SEE SECTION 02947 FOR DIAMETER TOLERANCES AND TAPER RATES.

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY
STATE OF WASHINGTON
40803
REGISTERED PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=10'
DATE: 01-11-2013

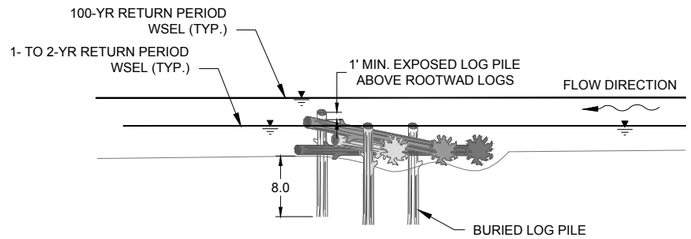
FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

SEDIMENT RETENTION (SRp & SRb) LWD DETAILS

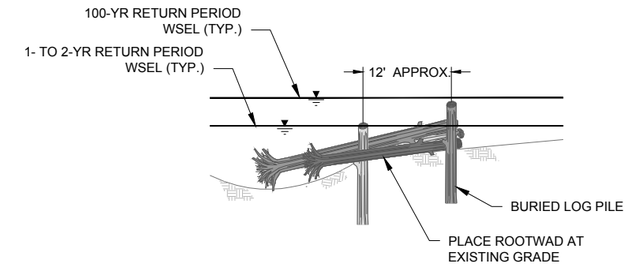
C-12

SHEET NO. 14 OF 22

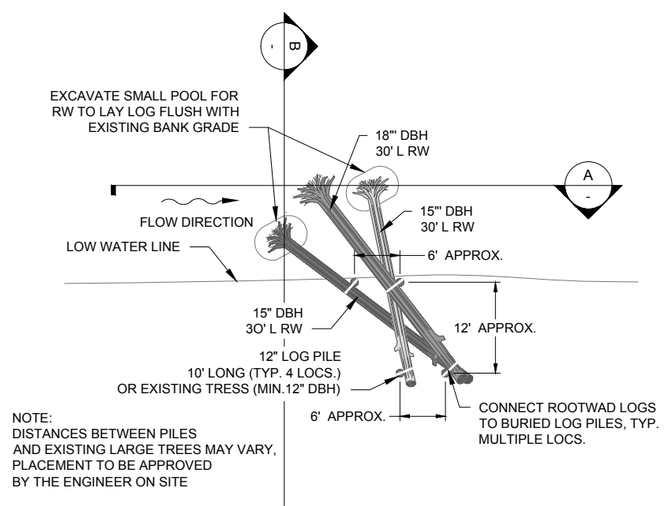
B:\Projects\Snake River Salmon Recovery Board\CAD\Project Area 14\120850-01-C-typical details.dwg 14 SEDIMENT RETENTION (SRp & SRb) LWD DETAILS
Jan 11, 2013 11:47am dgaffney



A / - BBp ELJ TYPICAL PROFILE
SCALE: 1" = 10'



B / - BBp ELJ TYPICAL SECTION
SCALE: 1" = 10'



6 / VARIES BBp ELJ TYPICAL PLAN
SCALE: 1" = 10'

CONSTRUCTION NOTES:

1. INSTALL BURIED LOG PILES (SECTION 02947) TO DEPTH SHOWN. CONTRACTOR RESPONSIBLE FOR EXCAVATION SUPPORT AND PROTECTION. PLACE LOG PILE BUT END DOWN. BACKFILL AROUND BURIED LOG PILES TO EXISTING GRADE IN ACCORDANCE WITH SECTION 02318.
2. ALTERNATIVELY, ROOTWAD LOGS MAY BE SECURED TO EXISTING STANDING TREES WITH A MINIMUM 12 INCH DBH, AS APPROVED BY THE ENGINEER.
3. PLACE ROOTWAD LOGS AND LOG POLES FLUSH WITH EXISTING GRADE. ROOTWAD LOGS ON LAYER ONE (1) AND TWO (2) SHALL BE IN CONTINUOUS CONTACT WITH THE GROUND SURFACE ON THE UNDERSIDE OF THE BOLE EXCEPT WHERE SHOWN AROUND THE ROOTWAD.
4. PLACE THE DIAGONAL ROOTWAD LOG AS SHOWN IN LAYER 3 WITH ROOTWAD FACING UPSTREAM.
5. SECURE ALL ROOTWAD LOGS TOGETHER AND TO THE BURIED LOG PILES PER DETAILS 1, 2, AND 4 ON SHEET 22.
   5.1. USE 1/2" DIA. MANILA ROPE AND APPROVED KNOTS PER SECTION 02948.

RE-VEGATATION NOTE

6. CONTRACTOR SHALL COORDINATE WITH RE-VEGETATION CREWS FOR INSTALLATION OF PLANTS. PLANTS WILL BE INSTALLED BY OTHERS WITHIN THE STRUCTURE NEAR THE GROUNDWATER LEVEL. CARE SHALL BE TAKEN NOT TO DAMAGE PLANTINGS INSTALLED PRIOR TO COMPLETION OF THE STRUCTURE.

TYP. BBp ELJ STRUCTURE LWM QUANTITIES

LAYER	ITEM	LOG DIA. (IN)	ROOTWAD DIA. (IN)	MIN. LOG LENGTH (FT)	QUANTITY
-	LOG POLE	12	-	15	4
1	ROOTWAD LOG	15	45	30	1
2	ROOTWAD LOG	15	45	25	1
3	ROOTWAD LOG	18	54	30	1

TABLE NOTES:

1. MINIMUM LENGTHS ARE REPORTED FOR MATERIAL PROCUREMENT PURPOSES. ALL LWM SHALL BE CUT TO FIT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
2. ROOTWAD LOG LENGTHS DO NOT INCLUDE THE LENGTH OF THE ROOTWAD MASS.
3. ROOTWAD LOG DIAMETER IS MEASURED AT BREAST HEIGHT.
4. LOG POLE DIAMETER IS MEASURED AT THE MID POINT ALONG THE LENGTH OF THE LOG.
5. SEE SECTION 02947 FOR DIAMETER TOLERANCES AND TAPER RATES.

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY
STATE OF WASHINGTON
40804
REGISTERED
PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=10'
DATE: 01-11-2013

FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

BANK BARB PILE (BBp) ELJ DETAILS

C-13

SHEET NO. 15 OF 22

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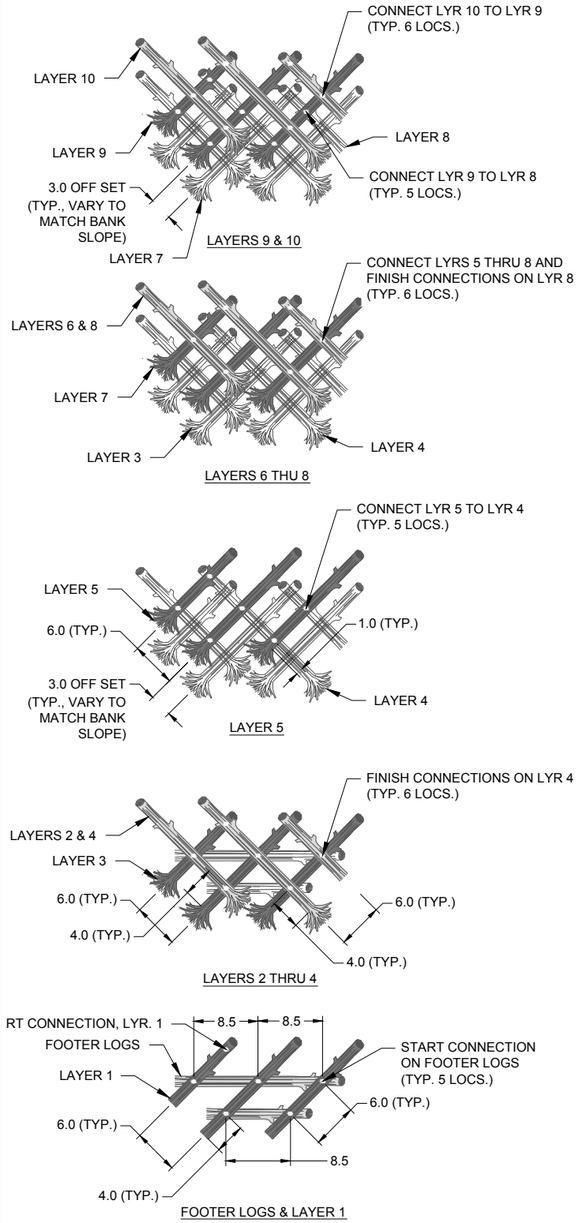
Jan 11, 2013 11:47am dgaffney



C
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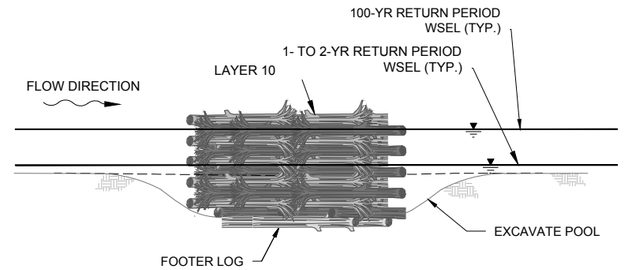
BB ELJ TYPICAL LAYER CONFIGURATION
SCALE: 1" = 10'



A
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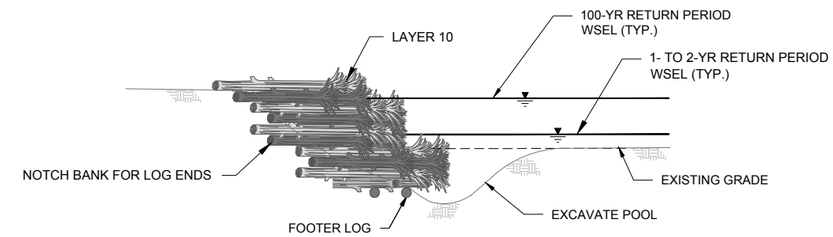
BB ELJ TYPICAL PROFILE
SCALE: 1" = 10'



B
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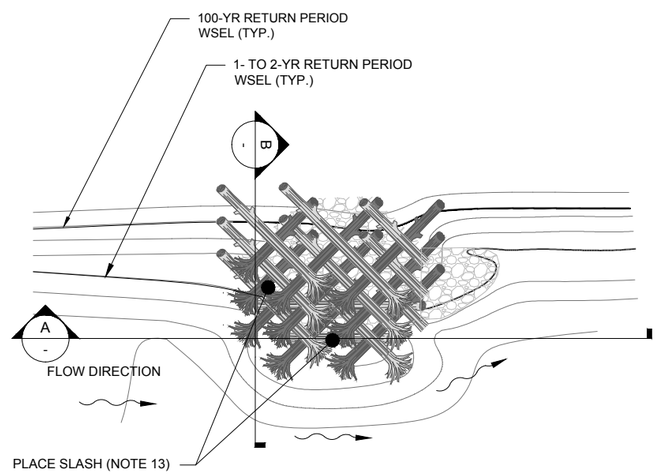
BB ELJ TYPICAL SECTION
SCALE: 1" = 10'



GRADING NOTES:
1. CONTOUR INTERVALS ARE 1 FOOT.
2. POOL EXCAVATION AND BACKFILL GRADING MAY VARY DEPENDING ON SITE CONDITIONS.

5
VARIES
BB ELJ TYPICAL PLAN
SCALE: 1" = 10'

CONSTRUCTION NOTES:

1. EXCAVATE TO DEPTH SUFFICIENT TO PLACE THE FOOTER LOG AND ROOTWAD LOGS IN LAYER ONE LEVEL AT DEPTH SHOWN ON PLANS.
2. USE 3/8" DIA. GALVANIZED WIRE ROPE AND ASSOCIATED HARDWARE PER SECTION 02948 FOR ALL CONNECTIONS.
3. SECURE WIRE ROPE TO LOGS IN LAYER ONE IN LOCATIONS SHOWN, PER CONNECTION DETAILS ON SHEET 22.
4. PLACE LOGS IN LAYERS 2 AND 3 AS SHOWN. THREAD WIRE ROPE THROUGH HOLES DRILLED IN LOGS PER CONNECTION DETAIL 4 ON SHEET 22.
5. BACKFILL WITHIN STRUCTURE UP TO THE TOP OF LAYER 2.
6. PLACE LOGS IN LAYER 4 AS SHOWN AND FINISH WIRE ROPE CONNECTION OF TOP OF LAYER 4 IN LOCATIONS SHOWN, PER CONNECTION DETAIL ON SHEET 22.
7. PLACE LOGS IN LAYER 5 AND SECURE TO LAYER 4 AT INDICATED LOCATIONS, PER CONNECTION DETAIL 4 ON SHEET 22.
5. BACKFILL WITHIN STRUCTURE UP TO THE TOP OF LAYER 4.
6. PLACE LOGS IN LAYER 6 AND SECURE TO LAYER 5 AT INDICATED LOCATIONS, PER CONNECTION DETAIL 4 ON SHEET 22
7. BACKFILL WITHIN STRUCTURE TO THE BOTTOM OF LAYER 6.
8. PLACE LOGS IN LAYER 7 AND SECURE TO LAYER 6 AT INDICATED LOCATIONS, PER CONNECTION DETAIL 4 ON SHEET 22.
9. PLACE LOGS IN LAYER 8 AND SECURE TO LAYER 7 AT INDICATED LOCATIONS, PER CONNECTION DETAIL 4 ON SHEET 22.
9. BACKFILL WITHIN STRUCTURE TO THE BOTTOM OF LAYER 8.
10. PLACE LOGS IN LAYER 9 AND SECURE TO LAYER 8 AT INDICATED LOCATIONS, PER CONNECTION DETAIL 4 ON SHEET 22.
11. PLACE LOGS IN LAYER 10 AND SECURE TO LAYER 9 AT INDICATED LOCATIONS, PER CONNECTION DETAIL 4 ON SHEET 22.
12. BACKFILL WITHIN STRUCTURE AS SHOWN AND TO THE FINISHED GRADE SHOWN ON THE PLANS.
13. PLACE LOGGING SLASH AND SMALL WOODY DEBRIS IN FRONT OF STRUCTURE AND IN GAPS BETWEEN LAYERS OR AS APPROVED BY THE ENGINEER. PLACEMENT SHALL OCCUR THROUGHOUT THE LAYER CONSTRUCTION PROCESS, PROVIDED IT DOES NOT INTERFERE WITH LOG FITMENT AND ROPE CONNECTIONS.

RE-VEGATATION NOTE

14. CONTRACTOR SHALL COORDINATE WITH RE-VEGETATION CREWS FOR INSTALLATION OF PLANTS. PLANTS WILL BE INSTALLED BY OTHERS WITHIN AND AROUND THE STRUCTURE NEAR THE GROUNDWATER LEVEL. CARE SHALL BE TAKEN NOT TO DAMAGE PLANTINGS INSTALLED PRIOR TO COMPLETION OF THE STRUCTURE.

TYP. BB ELJ STRUCTURE LWM QUANTITIES

LAYER	ITEM	LOG DIA. (IN)	ROOTWAD DIA. (IN)	MIN. LOG LENGTH (FT)	QUANTITY	MIN. LOG LENGTH (FT)	QUANTITY
FOOTER	LOG POLE	15	-	20	1	15	1
1	LOG POLE	15	45	20	2	15	1
2	ROOTWAD LOG	15	45	20	2	-	-
2	LOG POLE	15	-	15	1	-	-
3	ROOTWAD LOG	15	45	20	2	15	1
4	ROOTWAD LOG	15	45	20	2	-	-
4	LOG POLE	15	-	15	1	-	-
5	ROOTWAD LOG	15	45	20	2	15	1
6	ROOTWAD LOG	15	45	20	2	-	-
6	LOG POLE	15	-	15	1	-	-
7	ROOTWAD LOG	15	45	20	2	15	1
8	ROOTWAD LOG	15	45	20	2	-	-
8	LOG POLE	15	-	15	1	-	-
9	ROOTWAD LOG	15	45	20	2	15	1
10	ROOTWAD LOG	15	45	20	2	-	-
10	LOG POLE	15	-	15	1	-	-

TABLE NOTES:
1. MINIMUM LENGTHS ARE REPORTED FOR MATERIAL PROCUREMENT PURPOSES. ALL LWM SHALL BE CUT TO FIT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
2. ROOTWAD LOG LENGTHS DO NOT INCLUDE THE LENGTH OF THE ROOTWAD MASS.
3. ROOTWAD LOG DIAMETER IS MEASURED AT BREAST HEIGHT.
4. LOG POLE DIAMETER IS MEASURED AT THE MID POINT ALONG THE LENGTH OF THE LOG.
5. SEE SECTION 02947 FOR DIAMETER TOLERANCES AND TAPER RATES.

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY
STATE OF WASHINGTON
40803
REGISTERED PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=10'
DATE: 01-11-2013

FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

BANK BARB (BB) ELJ DETAILS

C-14

SHEET NO. 16 OF 22

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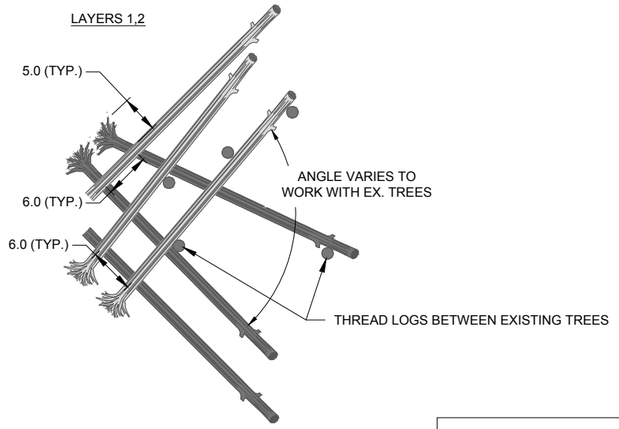
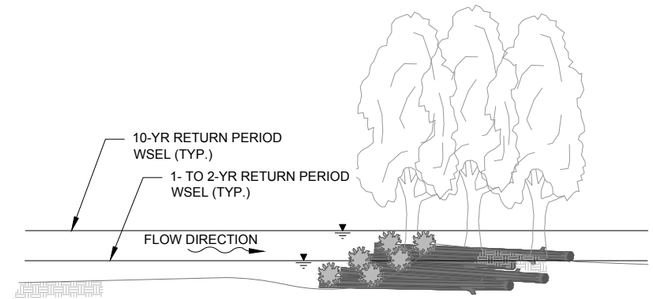
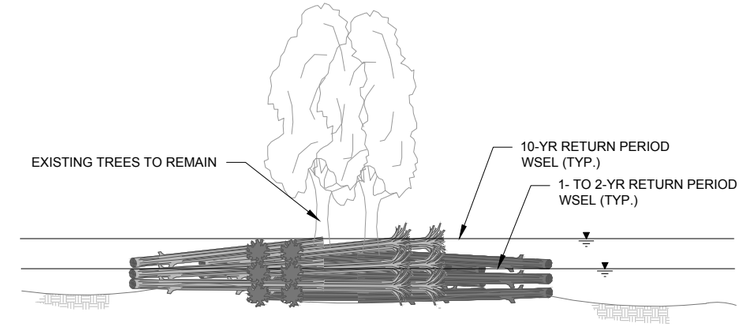
Jan 11, 2013 11:48am dgaffney

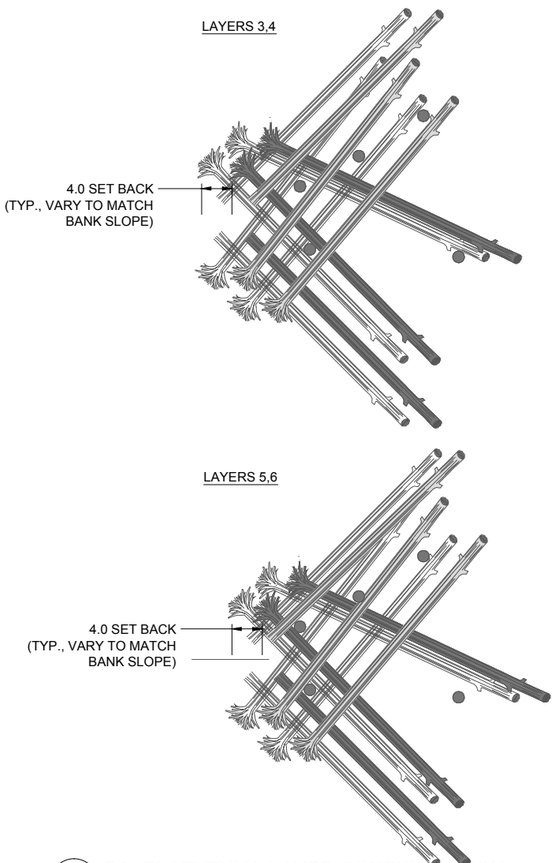




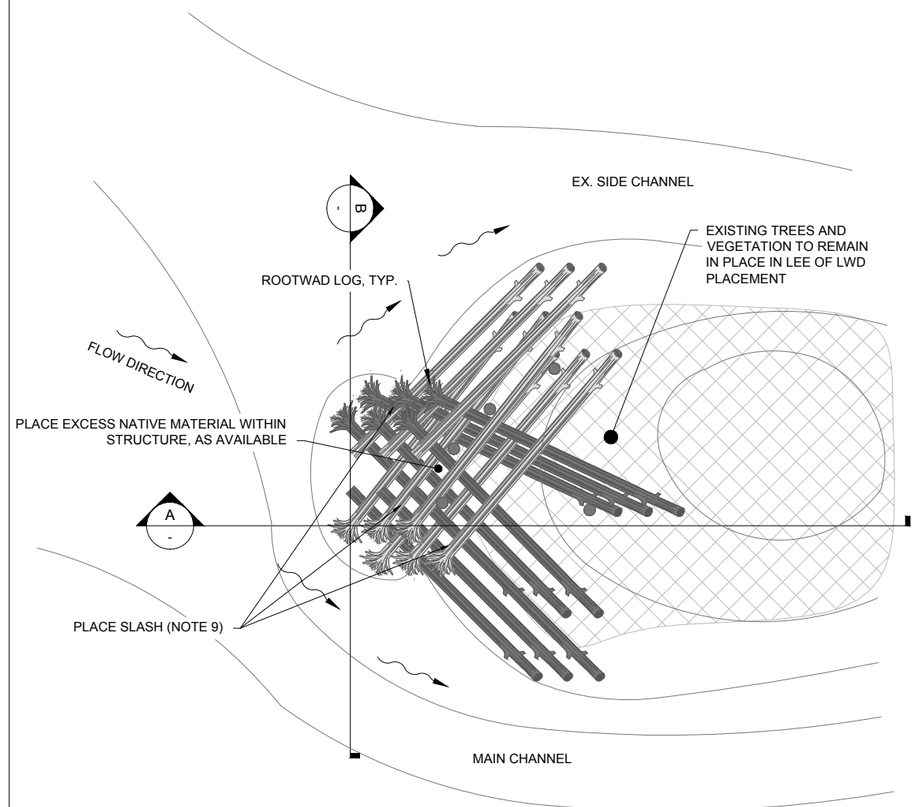
A - BAr ELJ TYPICAL PROFILE
SCALE: 1" = 10'



B - BAr ELJ TYPICAL SECTION
SCALE: 1" = 10'



C - BAr ELJ TYPICAL LAYER CONFIGURATION
SCALE: 1" = 10'



6 VARIES - BAr ELJ TYPICAL PLAN
SCALE: 1" = 10'

CONSTRUCTION NOTES:

1. NOTCH BANK AND BED TO PLACE LAYER 1 ROOTWAD LOGS IN CONTINUOUS CONTACT WITH THE GROUND AND AT ROUGHLY THE SAME ELEVATION AS APPROVED BY THE ENGINEER.
2. PLACE ROOTWAD LOGS IN LAYERS 1 AND 2 AS SHOWN OR AS APPROVED BY THE ENGINEER.
3. PLACE LOGS IN LAYER 3 AS SHOWN OR AS APPROVED BY THE ENGINEER.
4. PLACE NATIVE BACKFILL OR BOULDERS WITHIN THE STRUCTURE FLUSH WITH THE TOP OF LAYER 2 AS APPROVED BY THE ENGINEER. DO NOT BACKFILL AROUND ROOTWADS.
5. PLACE LOGS IN LAYERS 4 AND 5 AS SHOWN OR AS APPROVED BY THE ENGINEER.
6. PLACE NATIVE BACKFILL OR BOULDERS WITHIN THE STRUCTURE FLUSH WITH THE TOP OF LAYER 4 AS APPROVED BY THE ENGINEER. DO NOT BACKFILL AROUND ROOTWADS.
7. PLACE LOGS IN LAYER 6 AS SHOWN OR AS APPROVED BY THE ENGINEER.
8. RE-GRADE AREAS SOUNDING THE STRUCTURE BACK TO EXISTING GRADE AS APPROVED BY THE ENGINEER. BACKFILLING WHERE PRACTICABLE WITHIN THE STRUCTURE FLUSH WITH THE TOP OF LAYER 6.
9. PLACE LOGGING SLASH AND SMALL WOODY DEBRIS IN FRONT OF STRUCTURE AND IN GAPS BETWEEN LAYERS OR AS APPROVED BY THE ENGINEER. PLACEMENT SHALL OCCUR THROUGHOUT THE LAYER CONSTRUCTION PROCESS, PROVIDED IT DOES NOT INTERFERE WITH LOG FITMENT AND ROPE CONNECTIONS.

RE-VEGATATION NOTE

10. CONTRACTOR SHALL COORDINATE WITH RE-VEGETATION CREWS FOR INSTALLATION OF PLANTS. PLANTS WILL BE INSTALLED BY OTHERS WITHIN AND AROUND THE STRUCTURE NEAR THE GROUNDWATER LEVEL. CARE SHALL BE TAKEN NOT TO DAMAGE PLANTINGS INSTALLED PRIOR TO COMPLETION OF THE STRUCTURE.

TYP. BAr ELJ STRUCTURE LWM QUANTITIES

LAYER	ITEM	LOG DIA. (IN)	ROOTWAD DIA. (IN)	MIN. LOG LENGTH (FT)	QUANTITY
1	ROOTWAD LOG	15	45	35	2
1	LOG POLE OR DOWNED TREE	15	-	35	1
2	ROOTWAD LOG	15	45	35	2
2	LOG POLE OR DOWNED TREE	15	-	35	1
3	ROOTWAD LOG	15	45	35	2
3	LOG POLE OR DOWNED TREE	15	-	35	1
4	ROOTWAD LOG	15	45	35	2
4	LOG POLE OR DOWNED TREE	15	-	35	1
5	ROOTWAD LOG	15	45	35	2
5	LOG POLE OR DOWNED TREE	15	-	35	1
6	ROOTWAD LOG	15	45	35	2
6	LOG POLE OR DOWNED TREE	15	-	35	1

TABLE NOTES:

1. MINIMUM LENGTHS ARE REPORTED FOR MATERIAL PROCUREMENT PURPOSES. ALL LWM SHALL BE CUT TO FIT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
2. ROOTWAD LOG LENGTHS DO NOT INCLUDE THE LENGTH OF THE ROOTWAD MASS.
3. ROOTWAD LOG DIAMETER IS MEASURED AT BREAST HEIGHT.
4. LOG POLE DIAMETER IS MEASURED AT THE MID POINT ALONG THE LENGTH OF THE LOG.
5. SEE SECTION 02947 FOR DIAMETER TOLERANCES AND TAPER RATES.

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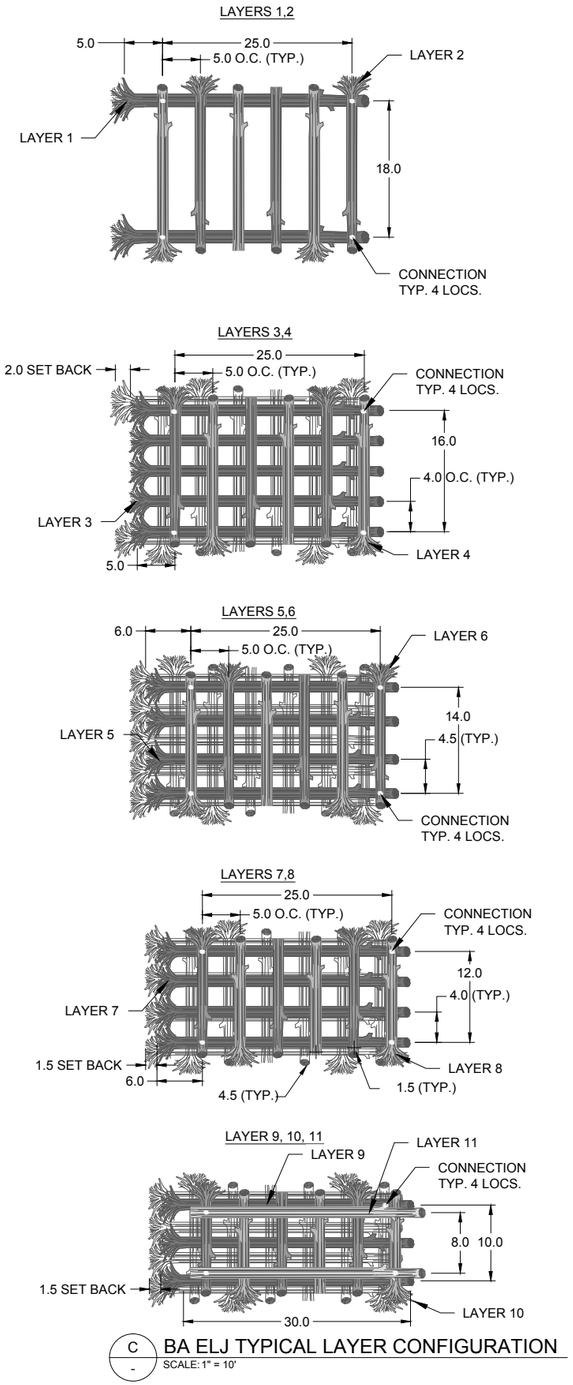
FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

BAR APEX RACKING (BAr) ELJ DETAILS

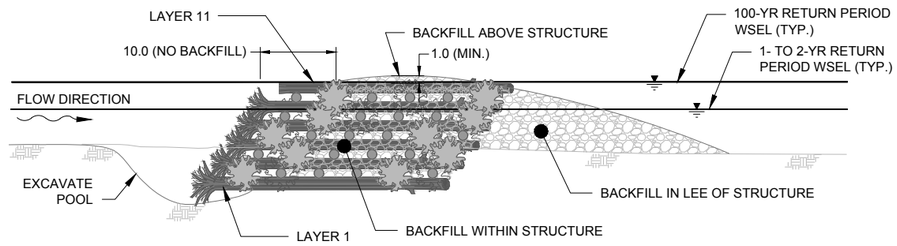
C-15

SHEET NO. 17 OF 22

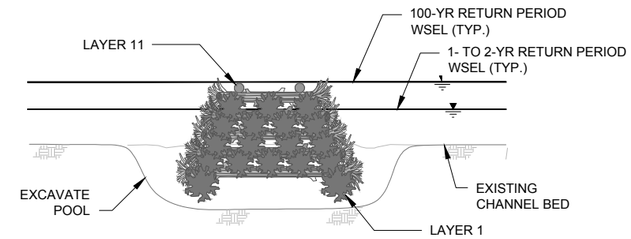
B:\Projects\Snake River Salmon Recovery Board\CAD\Project Area 14\120850-01-C-typical details.dwg 17-BAR APEX RACKING (BAr) ELJ DETAILS
Jan 11, 2013 11:48am dgaffney



C - BA ELJ TYPICAL LAYER CONFIGURATION
SCALE: 1" = 10'

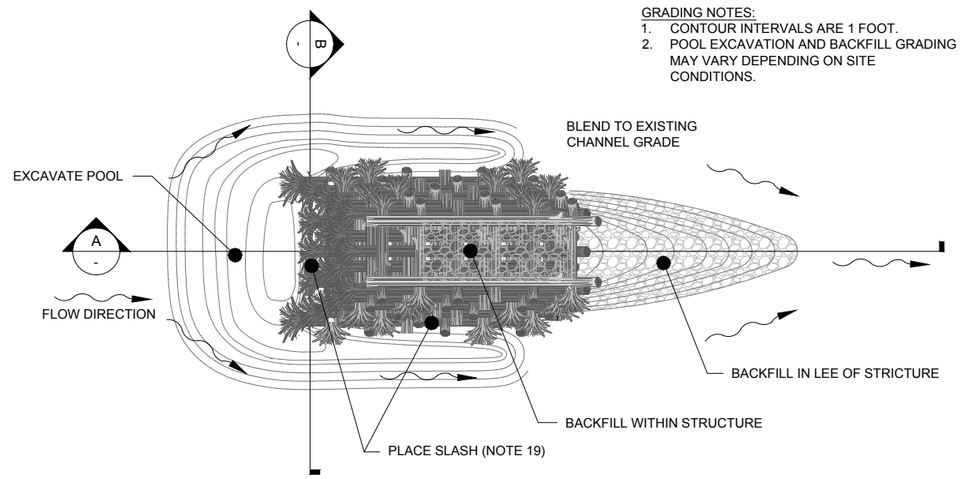


A - BA ELJ TYPICAL PROFILE
SCALE: 1" = 10'



B - BA ELJ TYPICAL SECTION
SCALE: 1" = 10'

GRADING NOTES:
1. CONTOUR INTERVALS ARE 1 FOOT.
2. POOL EXCAVATION AND BACKFILL GRADING MAY VARY DEPENDING ON SITE CONDITIONS.



4 VARIES - BA ELJ TYPICAL PLAN
SCALE: 1" = 10'

TYP. BA ELJ STRUCTURE LWM QUANTITIES

LAYER	ITEM	LOG DIA. (IN)	ROOTWAD DIA. (IN)	MIN. LOG LENGTH (FT)	QUANTITY
1	ROOTWAD LOG	18	54	30	2
2	ROOTWAD LOG	15	45	20	4
2	LOG POLE	15	-	25	2
3	ROOTWAD LOG	15	45	30	5
4	ROOTWAD LOG	15	45	20	4
4	LOG POLE	15	-	20	2
5	ROOTWAD LOG	15	45	30	4
6	ROOTWAD LOG	15	45	20	4
6	LOG POLE	15	-	20	2
7	ROOTWAD LOG	15	45	30	4
8	ROOTWAD LOG	15	45	15	4
8	LOG POLE	15	-	15	2
9	ROOTWAD LOG	15	45	30	2
10	ROOTWAD LOG	15	45	15	4
10	LOG POLE	15	-	15	2
11	LOG POLE	15	45	30	2

TABLE NOTES:
1. MINIMUM LENGTHS ARE REPORTED FOR MATERIAL PROCUREMENT PURPOSES. ALL LWM SHALL BE CUT TO FIT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
2. ROOTWAD LOG LENGTHS DO NOT INCLUDE THE LENGTH OF THE ROOTWAD MASS.
3. ROOTWAD LOG DIAMETER IS MEASURED AT BREAST HEIGHT.
4. LOG POLE DIAMETER IS MEASURED AT THE MID POINT ALONG THE LENGTH OF THE LOG.
5. SEE SECTION 02947 FOR DIAMETER TOLERANCES AND TAPER RATES.

CONSTRUCTION NOTES:

1. EXCAVATE TO DEPTH SUFFICIENT TO PLACE LAYER 1 ROOTWAD LOGS LEVEL AT ELEVATION SHOWN ON PLANS. CONTRACTOR RESPONSIBLE FOR EXCAVATION SUPPORT AND PROTECTION.
2. SEE CONNECTION DETAIL 3 ON SHEET 22 FOR CONNECTIONS IN THIS STRUCTURE.
3. USE 1/2" DIA. GALVANIZED WIRE ROPE AND ASSOCIATED HARDWARE PER SECTION 02948 FOR ALL CONNECTIONS IN THIS STRUCTURE.
4. SECURE WIRE ROPE TO ROOTWAD LOGS IN LAYER 1 AT LOCATIONS SHOWN.
5. PLACE ROOTWAD LOGS IN LAYER 1 AT DESIGN ELEVATION.
6. THREAD WIRE ROPE LEADS THROUGH HOLES DRILLED IN LAYER 2 ROOTWAD LOGS AT LOCATIONS SHOWN. PLACE ROOTWAD LOGS IN LAYER 2 AS SHOWN.
7. PLACE LOGS IN LAYERS 3 AND 4 AS SHOWN AND CONTINUE THREADING WIRE ROPE UP THROUGH HOLES DRILLED IN ROOTWAD LOGS.
8. BACKFILL WITHIN STRUCTURE AS SHOWN UP TO THE BOTTOM OF LAYER 4.
9. PLACE LOGS IN LAYERS 5 AND 6 AS SHOWN AND CONTINUE THREADING WIRE ROPE UP THROUGH HOLES DRILLED IN ROOTWAD LOGS.
10. BACKFILL WITHIN STRUCTURE AS SHOWN UP TO THE BOTTOM OF LAYER 6.
11. PLACE LOGS IN LAYERS 7 AND 8 AS SHOWN AND CONTINUE THREADING WIRE ROPE UP THROUGH HOLES DRILLED IN ROOTWAD LOGS.
12. BACKFILL WITHIN STRUCTURE AS SHOWN UP TO THE BOTTOM OF LAYER 8.
13. PLACE LOGS IN LAYERS 9 AND 10 AS SHOWN AND CONTINUE THREADING WIRE ROPE UP THROUGH HOLES DRILLED IN ROOTWAD LOGS.
14. BACKFILL WITHIN STRUCTURE AS SHOWN UP TO THE BOTTOM OF LAYER 9.
15. PLACE LWM IN LAYER 11 AS SHOWN AND FINISH WIRE ROPE CONNECTION.
16. BACKFILL WITHIN STRUCTURE AS SHOWN TO FLUSH WITH THE TOP OF THE LAST LAYER.
17. EXCAVATE POOL TO FINISHED GRADE AS SHOWN.
18. PLACE EXCESS MATERIAL FROM EXCAVATION BEHIND STRUCTURE AS SHOWN.
19. PLACE SMALL WOODY DEBRIS AND SLASH WITHIN VOID SPACES ALONG FRONT INTERIOR, SIDES, AND FRONT OF STRUCTURE, OR AS APPROVED BY THE ENGINEER. PLACEMENT SHALL OCCUR THROUGHOUT THE LAYER CONSTRUCTION PROCESS, PROVIDED IT DOES NOT INTERFERE WITH BACKFILLING, LOG FITMENT, AND WIRE ROPE CONNECTIONS.

RE-VEGATATION NOTE

20. CONTRACTOR SHALL COORDINATE WITH RE-VEGETATION CREWS FOR INSTALLATION OF PLANTS. PLANTS WILL BE INSTALLED BY OTHERS WITHIN AND AROUND THE STRUCTURE NEAR THE GROUNDWATER LEVEL. CARE SHALL BE TAKEN NOT TO DAMAGE PLANTINGS INSTALLED PRIOR TO COMPLETION OF THE STRUCTURE.

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY — STATE OF WASHINGTON — 40904 — REGISTERED PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=10'
DATE: 01-11-2013

FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

BAR APEX (BA) ELJ DETAILS

C-16

SHEET NO. 18 OF 22

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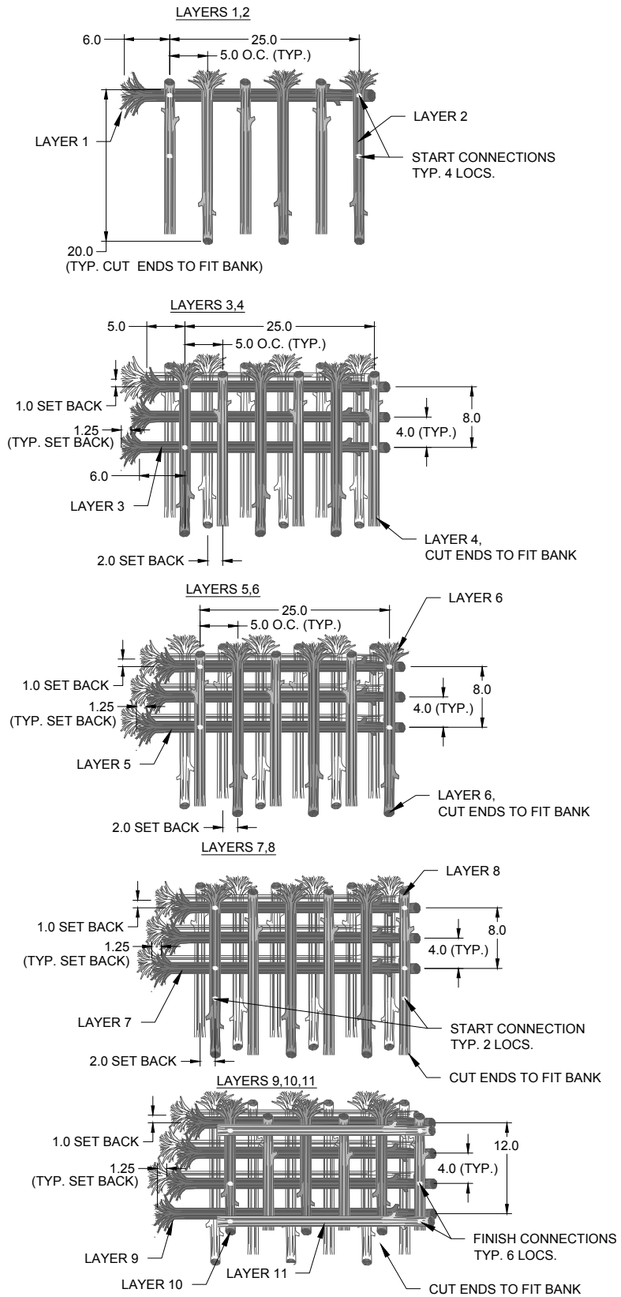
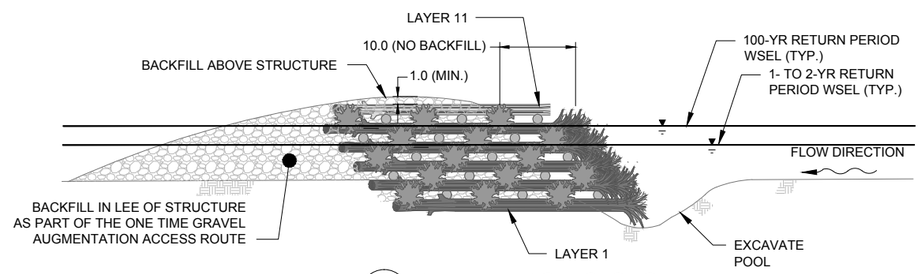
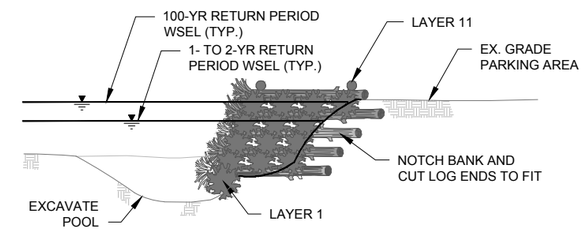
Jan 11, 2013 11:48am dgaffney



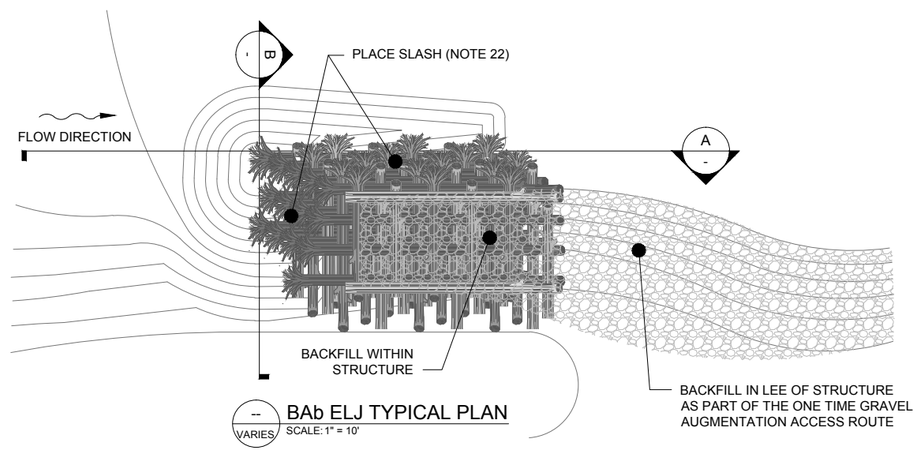
C / - BAb ELJ TYPICAL LAYER CONFIGURATION
SCALE: 1" = 10'



A / - BAb ELJ TYPICAL SECTION
SCALE: 1" = 10'



B / - BAb ELJ TYPICAL SECTION
SCALE: 1" = 10'



-- / VARIES BAb ELJ TYPICAL PLAN
SCALE: 1" = 10'

TYP. BAb ELJ STRUCTURE LWM QUANTITIES					
LAYER	ITEM	LOG DIA. (IN)	ROOTWAD DIA. (IN)	MIN. LOG LENGTH (FT)	QUANTITY
1	ROOTWAD LOG	18	54	30	1
2	ROOTWAD LOG	15	45	20	3
2	LOG POLE	15	-	20	3
3	ROOTWAD LOG	15	45	35	3
4	ROOTWAD LOG	15	45	20	3
4	LOG POLE	15	-	20	3
5	ROOTWAD LOG	15	45	35	3
6	ROOTWAD LOG	15	45	20	3
6	LOG POLE	15	-	20	3
7	ROOTWAD LOG	15	45	35	3
8	ROOTWAD LOG	15	45	20	3
8	LOG POLE	15	-	20	3
9	ROOTWAD LOG	15	45	35	4
10	ROOTWAD LOG	15	45	15	3
10	LOG POLE	15	-	15	3
11	LOG POLE	15	-	30	2

TABLE NOTES:
1. MINIMUM LENGTHS ARE REPORTED FOR MATERIAL PROCUREMENT PURPOSES. ALL LWM SHALL BE CUT TO FIT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
2. ROOTWAD LOG LENGTHS DO NOT INCLUDE THE LENGTH OF THE ROOTWAD MASS.
3. ROOTWAD LOG DIAMETER IS MEASURED AT BREAST HEIGHT.
4. LOG POLE DIAMETER IS MEASURED AT THE MID POINT ALONG THE LENGTH OF THE LOG.
5. SEE SECTION 02947 FOR DIAMETER TOLERANCES AND TAPER RATES.

CONSTRUCTION NOTES:

1. EXCAVATE TO DEPTH SUFFICIENT TO PLACE THE LAYER 1 ROOTWAD LOG LEVEL AT ELEVATION SHOWN ON PLANS. CONTRACTOR RESPONSIBLE FOR EXCAVATION SUPPORT AND PROTECTION.
2. SEE CONNECTION DETAIL 3 ON SHEET 22 FOR CONNECTIONS IN THIS STRUCTURE.
3. USE 1/2" DIA. GALVANIZED WIRE ROPE AND ASSOCIATED HARDWARE PER SECTION 02948 FOR ALL CONNECTIONS IN THIS STRUCTURE.
4. SECURE WIRE ROPE TO ROOTWAD LOG IN LAYER 1 AT LOCATIONS SHOWN.
5. PLACE ROOTWAD LOG IN LAYER 1 AT DESIGN ELEVATION.
6. SECURE WIRE ROPE TO THE LOGS IN LAYER 2 AT LOCATIONS SHOWN.
7. THREAD WIRE ROPE LEADS THROUGH HOLES DRILLED IN LAYER 2 LOGS AT LOCATIONS SHOWN. PLACE LOGS IN LAYER 2 AS SHOWN.
8. PLACE LOGS IN LAYERS 3 AND 4 AS SHOWN AND CONTINUE THREADING WIRE ROPE UP THROUGH HOLES DRILLED IN LOGS.
9. BACKFILL WITHIN STRUCTURE AS SHOWN UP TO THE BOTTOM OF LAYER 4.
10. PLACE LOGS IN LAYERS 5 AND 6 AS SHOWN AND CONTINUE THREADING WIRE ROPE UP THROUGH HOLES DRILLED IN LOGS.
11. BACKFILL WITHIN STRUCTURE AS SHOWN UP TO THE BOTTOM OF LAYER 6.
12. PLACE LOGS IN LAYERS 7 AND 8 AS SHOWN AND CONTINUE THREADING WIRE ROPE UP THROUGH HOLES DRILLED IN LOGS.
13. CONNECT WIRE ROPE LEADS TO LOGS IN LAYER 8 AT LOCATIONS SHOWN PER DETAIL 3 ON SHEET 22.
14. BACKFILL WITHIN STRUCTURE AS SHOWN UP TO THE BOTTOM OF LAYER 8.
15. PLACE LOGS IN LAYERS 9 AND 10 AS SHOWN AND CONTINUE THREADING WIRE ROPE UP THROUGH HOLES DRILLED IN LOGS.
16. FINISH CONNECTION IN INTERIOR OF STRUCTURE ON LAYER 10 IN LOCATIONS SHOWN.
17. BACKFILL WITHIN STRUCTURE AS SHOWN UP TO THE BOTTOM OF LAYER 9.
18. PLACE LOGS IN LAYER 11 AS SHOWN AND FINISH WIRE ROPE CONNECTIONS IN LOCATIONS SHOWN.
19. BACKFILL WITHIN STRUCTURE AS SHOWN FLUSH WITH THE TOP OF THE LAST LAYER.
20. EXCAVATE POOL TO FINISHED GRADE AS SHOWN.
21. PLACE EXCESS MATERIAL FROM EXCAVATION BEHIND STRUCTURE AS SHOWN.
22. PLACE SMALL WOODY DEBRIS AND SLASH WITHIN VOID SPACES ALONG FRONT INTERIOR, SIDES, AND FRONT OF STRUCTURE, OR AS APPROVED BY THE ENGINEER. PLACEMENT SHALL OCCUR THROUGHOUT THE LAYER CONSTRUCTION PROCESS, PROVIDED IT DOES NOT INTERFERE WITH BACKFILLING, LOG FITMENT, AND WIRE ROPE CONNECTIONS.

RE-VEGATATION NOTE

23. CONTRACTOR SHALL COORDINATE WITH RE-VEGETATION CREWS FOR INSTALLATION OF PLANTS. PLANTS WILL BE INSTALLED BY OTHERS WITHIN AND AROUND THE STRUCTURE NEAR THE GROUNDWATER LEVEL. CARE SHALL BE TAKEN NOT TO DAMAGE PLANTINGS INSTALLED PRIOR TO COMPLETION OF THE STRUCTURE.

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY
STATE OF WASHINGTON
40803
REGISTERED PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=10'
DATE: 01-11-2013

FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

BAR APEX BANK (BAb) ELJ DETAILS

C-17

SHEET NO. 19 OF 22

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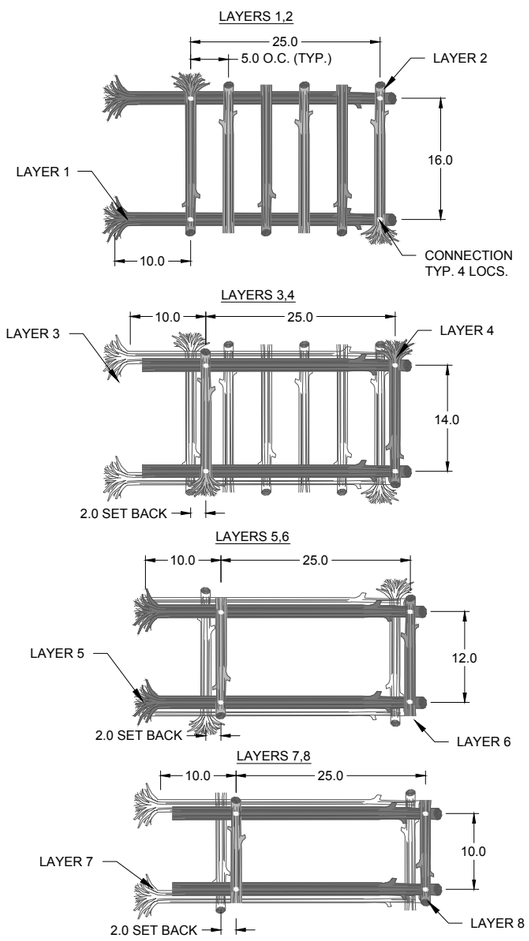
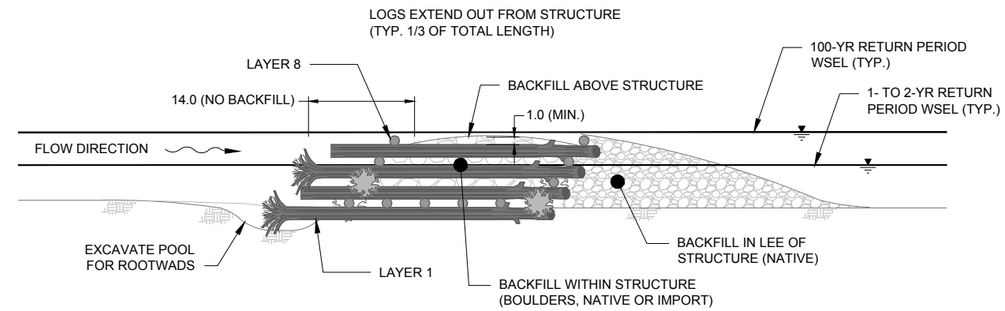
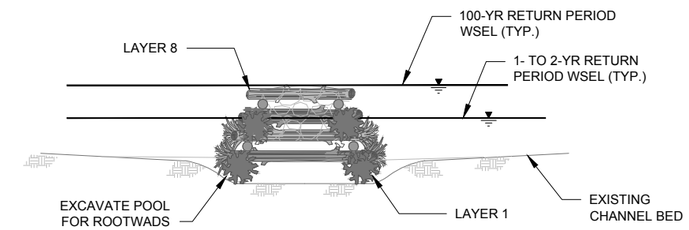


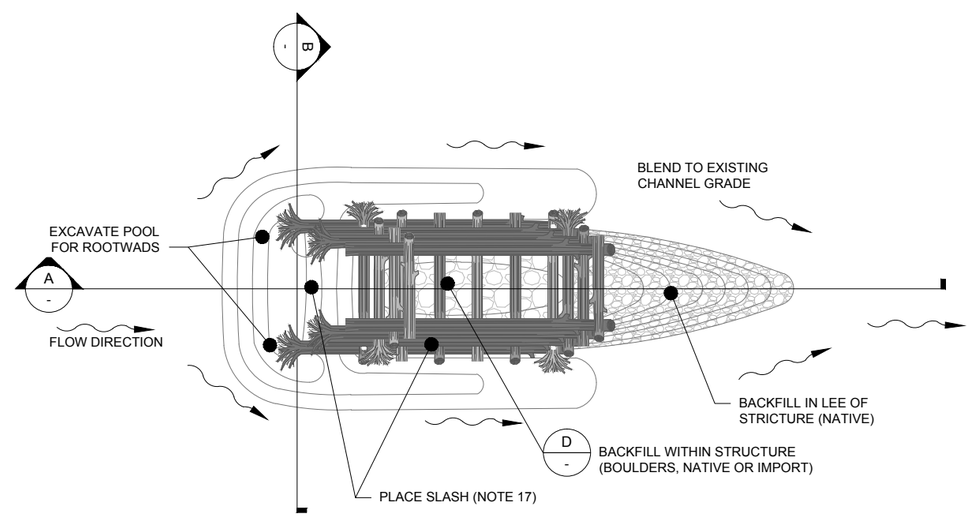
C / - CG ELJ TYPICAL LAYER CONFIGURATION
SCALE: 1" = 10'



A / - CG ELJ TYPICAL PROFILE
SCALE: 1" = 10'



B / - CG ELJ TYPICAL SECTION
SCALE: 1" = 10'



5 / VARIES CG ELJ TYPICAL PLAN
SCALE: 1" = 10'

GRADING NOTES:
1. CONTOUR INTERVALS ARE 1 FOOT.
2. POOL EXCAVATION AND BACKFILL GRADING MAY VARY DEPENDING ON SITE CONDITIONS.

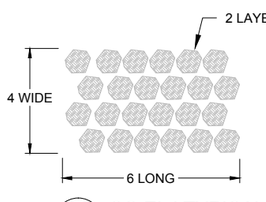
CONSTRUCTION NOTES:

1. EXCAVATE TO DEPTH SUFFICIENT TO PLACE LAYER 1 ROOTWAD LOGS LEVEL AT ELEVATION SHOWN ON PLANS. CONTRACTOR RESPONSIBLE FOR EXCAVATION SUPPORT AND PROTECTION.
2. SEE CONNECTION DETAIL 3 ON SHEET 22 FOR CONNECTIONS IN THIS STRUCTURE.
3. USE 1/2" DIA. GALVANIZED WIRE ROPE AND ASSOCIATED HARDWARE PER SECTION 02948 FOR ALL CONNECTIONS IN THIS STRUCTURE.
4. SECURE WIRE ROPE TO ROOTWAD LOGS IN LAYER 1 AT LOCATIONS SHOWN.
5. PLACE ROOTWAD LOGS IN LAYER 1 AT DESIGN ELEVATION.
6. THREAD WIRE ROPE LEADS THROUGH HOLES DRILLED IN LAYER 2 ROOTWAD LOGS AT LOCATIONS SHOWN. PLACE ROOTWAD LOGS IN LAYER 2 AS SHOWN.
7. PLACE LOGS IN LAYERS 3 AND 4 AS SHOWN AND CONTINUE THREADING WIRE ROPE UP THROUGH HOLES DRILLED IN LOGS.
8. BACKFILL WITHIN STRUCTURE AS SHOWN UP TO THE BOTTOM OF LAYER 4.
9. PLACE LOGS IN LAYERS 5 AND 6 AS SHOWN AND CONTINUE THREADING WIRE ROPE UP THROUGH HOLES DRILLED IN LOGS.
10. BACKFILL WITHIN STRUCTURE AS SHOWN UP TO THE BOTTOM OF LAYER 6.
11. PLACE LOGS IN LAYERS 7 AND 8 AS SHOWN AND CONTINUE THREADING WIRE ROPE UP THROUGH HOLES DRILLED IN LOGS.
12. BACKFILL WITHIN STRUCTURE AS SHOWN UP TO THE TOP OF LAYER 8.
13. PLACE LOGS IN LAYER 9 AS SHOWN AND FINISH WIRE ROPE CONNECTION.
14. BACKFILL WITHIN STRUCTURE AS SHOWN TO A MINIMUM OF 1 FOOT ABOVE THE TOP LAYER.
15. EXCAVATE POOL TO FINISHED GRADE AS SHOWN.
16. PLACE EXCESS MATERIAL FROM EXCAVATION BEHIND STRUCTURE AS SHOWN.
17. PLACE SMALL WOODY DEBRIS AND SLASH WITHIN VOID SPACES ALONG FRONT INTERIOR, SIDES, AND FRONT OF STRUCTURE, OR AS APPROVED BY THE ENGINEER. PLACEMENT SHALL OCCUR THROUGHOUT THE LAYER CONSTRUCTION PROCESS, PROVIDED IT DOES NOT INTERFERE WITH BACKFILLING, LOG FITMENT, AND WIRE ROPE CONNECTIONS.

TYP. CG ELJ STRUCTURE LWM QUANTITIES

LAYER	ITEM	LOG DIA. (IN)	ROOTWAD DIA. (IN)	MIN. LOG LENGTH (FT)	QUANTITY
1	ROOTWAD LOG	18	54	35	2
2	ROOTWAD LOG	15	45	20	2
2	LOG POLE	15	-	20	4
3	LOG POLE	18	-	35	2
4	ROOTWAD LOG	15	45	20	2
5	ROOTWAD LOG	18	54	35	2
6	LOG POLE	15	-	15	2
7	LOG POLE	18	-	35	2
8	LOG POLE	15	-	15	2

TABLE NOTES:
1. MINIMUM LENGTHS ARE REPORTED FOR MATERIAL PROCUREMENT PURPOSES. ALL LWM SHALL BE CUT TO FIT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
2. ROOTWAD LOG LENGTHS DO NOT INCLUDE THE LENGTH OF THE ROOTWAD MASS.
3. ROOTWAD LOG DIAMETER IS MEASURED AT BREAST HEIGHT.
4. SEE SECTION 02947 FOR DIAMETER TOLERANCES AND TAPER RATES.



TYP. STRUCTURE ROCK QUANTITIES

LOCATION	ITEM	INTERMEDIATE DIA. (FT)	MIN. DRY WEIGHT (LB)	QUANTITY
IN ELJ	BOULDER	3.5 (-0.0 / +1.0)	3,500	48

D / - CG ELJ TYPICAL BOULDER CONFIGURATION
SCALE: 1" = 10'

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY
STATE OF WASHINGTON
40801
REGISTERED PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=10'
DATE: 01-11-2013

FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

CHANNEL GRADE (CG) ELJ DETAILS

C-18

SHEET NO. 20 OF 22

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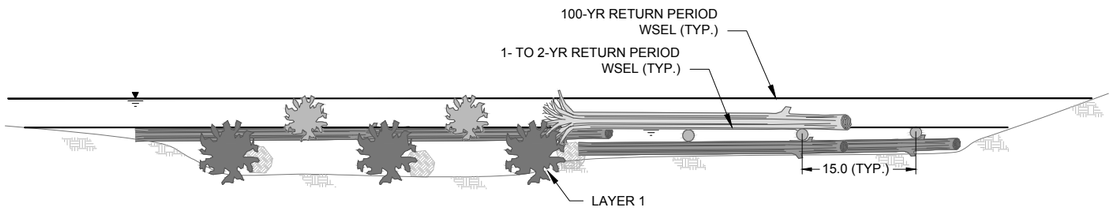
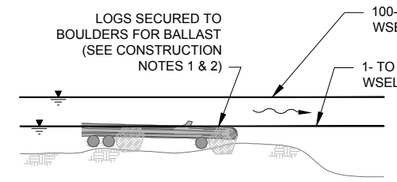
Jan 11, 2013 11:48am dgaffney



A / - CS ELJ TYPICAL PROFILE
SCALE: 1" = 10'



B / - CS ELJ TYPICAL SECTION
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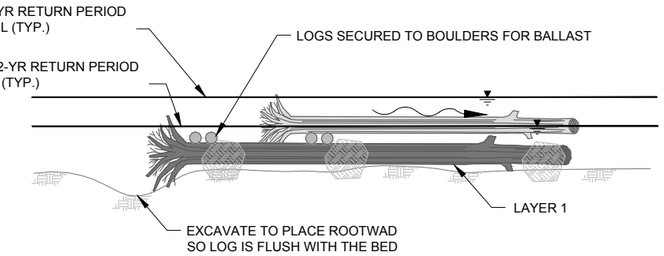

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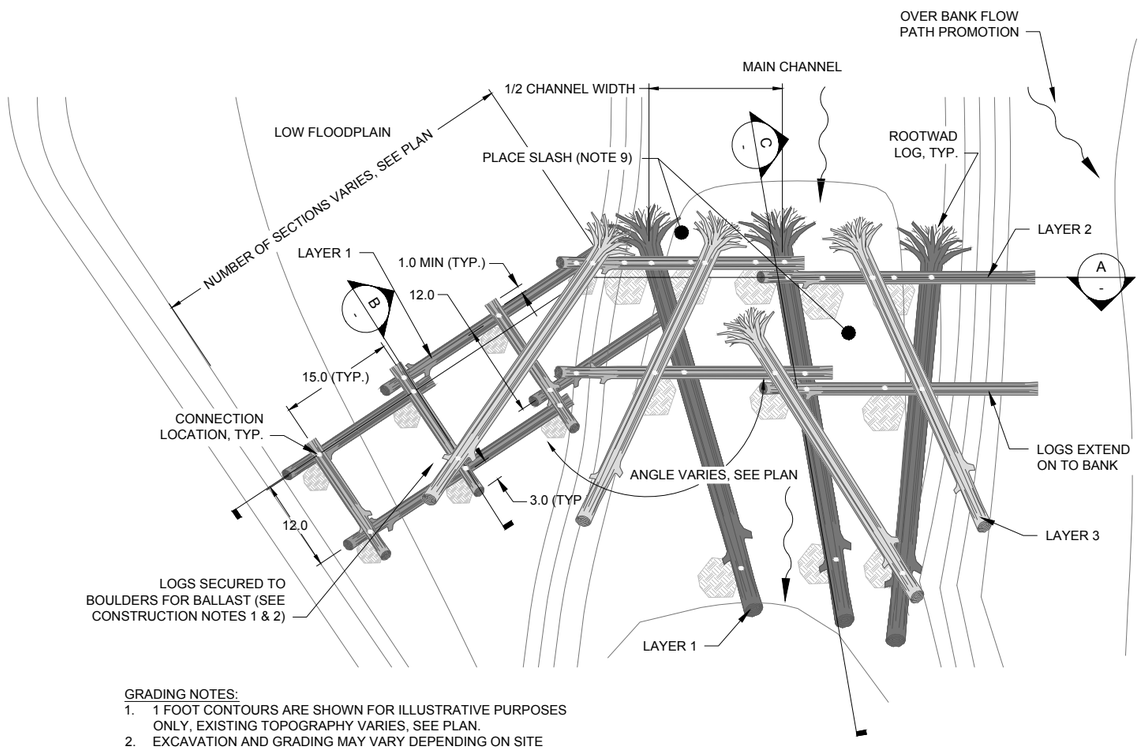

GRADING NOTES:
1. 1 FOOT CONTOURS ARE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY, EXISTING TOPOGRAPHY VARIES, SEE PLAN.
2. EXCAVATION AND GRADING MAY VARY DEPENDING ON SITE CONDITIONS.

6 / VARIES CS ELJ TYPICAL PLAN
SCALE: 1" = 10'

CONSTRUCTION NOTES:

1. EXCAVATE FOR ROOTWADS IN LAYER 1 AS SHOWN.
2. INSTALL EYE BOLTS INTO BOULDERS.
3. PLACE BOULDERS ON THE BED IN LOCATIONS SHOWN.
4. PLACE ROOTWADS IN LAYER 1 AS SHOWN WITH THE BOLE FLUSH WITH THE BED OR SLIGHTLY BELOW THE BED TO PROVIDE CONTINUOUS CONTACT WITH THE GROUND SURFACE ON THE UNDERSIDE OF THE BOLE EXCEPT WHERE SHOWN AROUND THE ROOTWAD.
5. CLEAR VEGETATION NECESSARY TO PLACE LOW FLOODPLAIN PORTION OF THE STRUCTURE IN LOCATION SHOWN ON THE PLAN. THE ANGLE, LENGTH AND SIDE OF THE STRUCTURE THE FLOODPLAIN PORTION IS PLACED ON MAY VARY FROM TYPICAL SHOWN, SEE PLAN FOR CONFIGURATION.
6. ENGINEER'S APPROVAL IS REQUIRED FOR CLEARING OF ALL TREES LARGER THAN 6 INCHES IN DIAMETER. SEE SPECIFICATIONS FOR FURTHER DETAIL.
7. CONTINUE PLACEMENT OF OTHER LOGS IN LAYERS 1, 2, AND 3.
8. MAKE CONNECTIONS BETWEEN LOGS AND TO THE BOULDERS IN LOCATIONS SHOWN.
   - 8.1. USE TWO LOG CORNER JOINT FOR CONNECTIONS BETWEEN LOGS AND ROOTWAD LOGS
   - 8.2. USE WIRE ROPE WRAP AND BOULDER ANCHOR CONNECTIONS TO SECURE STRUCTURE TO BOULDERS.
   - 8.3. FOR ALL CONNECTIONS USE 3/8" DIA. GALVANIZED WIRE ROPE AND ASSOCIATED HARDWARE PER SECTION 02948.
   - 8.4. MAKE A MINIMUM OF TWO CONNECTIONS PER LWM MEMBER
9. PLACE SMALL WOODY DEBRIS AND SLASH WITHIN VOID SPACES ALONG FRONT AND INTERIOR OF THE STRUCTURE, OR AS APPROVED BY THE ENGINEER. PLACEMENT SHALL OCCUR THROUGHOUT THE LAYER CONSTRUCTION PROCESS, PROVIDED IT DOES NOT INTERFERE WITH BACKFILLING, LOG FITMENT, AND WIRE ROPE CONNECTIONS.

RE-VEGATATION NOTE

10. CONTRACTOR SHALL COORDINATE WITH RE-VEGETATION CREWS FOR INSTALLATION OF PLANTS. PLANTS WILL BE INSTALLED BY OTHERS WITHIN THE STRUCTURE NEAR THE GROUNDWATER LEVEL. CARE SHALL BE TAKEN NOT TO DAMAGE PLANTINGS INSTALLED PRIOR TO COMPLETION OF THE STRUCTURE.

TYP. CS ELJ STRUCTURE LWM QUANTITIES

LAYER	ITEM	LOG DIA. (IN)	ROOTWAD DIA. (IN)	MIN. LOG LENGTH (FT)	QUANTITY
1	ROOTWAD LOG	30	90	50	3
1	LOG POLE	18	-	35	2
1	LOG POLE	18	-	25	2
2	LOG POLE	18	-	40	4
2	LOG POLE	18	-	20	3
3	ROOTWAD LOG	24	72	40	4

TYP. CS ELJ STRUCTURE ROCK QUANTITIES

LOCATION	ITEM	INTERMEDIATE DIA. (FT)	MIN. DRY WEIGHT (LB)	QUANTITY
CHANNEL	BOULDER	5.6	14,500	11
FLOODPLAIN	BOULDER	4.0	5,300	7

TABLE NOTES:
1. MINIMUM LENGTHS ARE REPORTED FOR MATERIAL PROCUREMENT PURPOSES. ALL LWM SHALL BE CUT TO FIT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
2. ROOTWAD LOG LENGTHS DO NOT INCLUDE THE LENGTH OF THE ROOTWAD MASS.
3. ROOTWAD LOG DIAMETER IS MEASURED AT BREAST HEIGHT.
4. LOG POLE DIAMETER IS MEASURED AT THE MID POINT ALONG THE LENGTH OF THE LOG.
5. SEE SECTION 02947 FOR DIAMETER TOLERANCES AND TAPER RATES.

ONE INCH
AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

Washington Department of FISH and WILDLIFE

TRACY A. DRURY
STATE OF WASHINGTON
40803
REGISTERED PROFESSIONAL ENGINEER

REVISIONS

REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: JRG
DRAWN BY: DJG
CHECKED BY: TAD
APPROVED BY: TAD
SCALE: 1"=10'
DATE: 01-11-2013

FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

CHANNEL SPANNING (CS) ELJ DETAILS

C-19

SHEET NO. 21 OF 22

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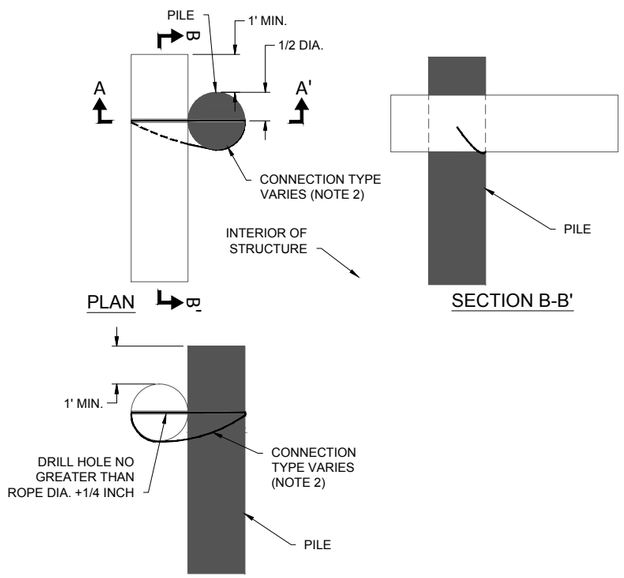
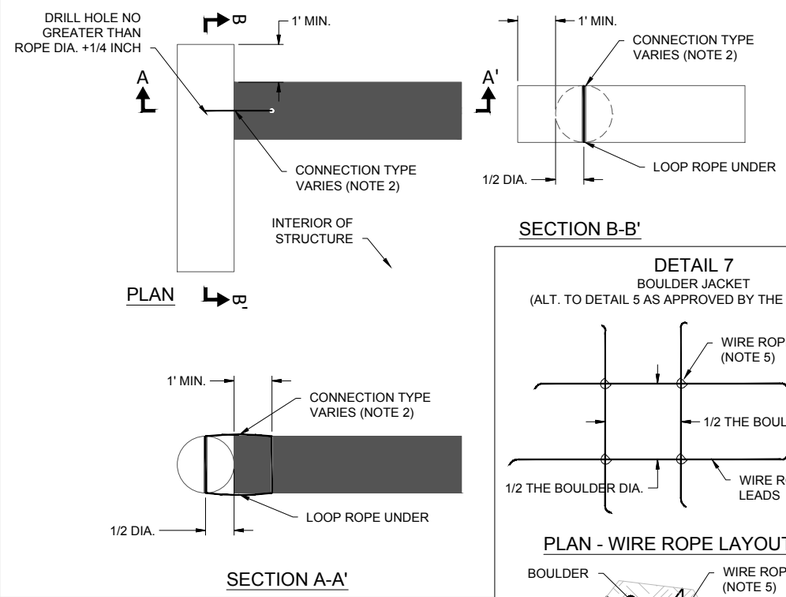
Jan 11, 2013 11:48am dgaffney

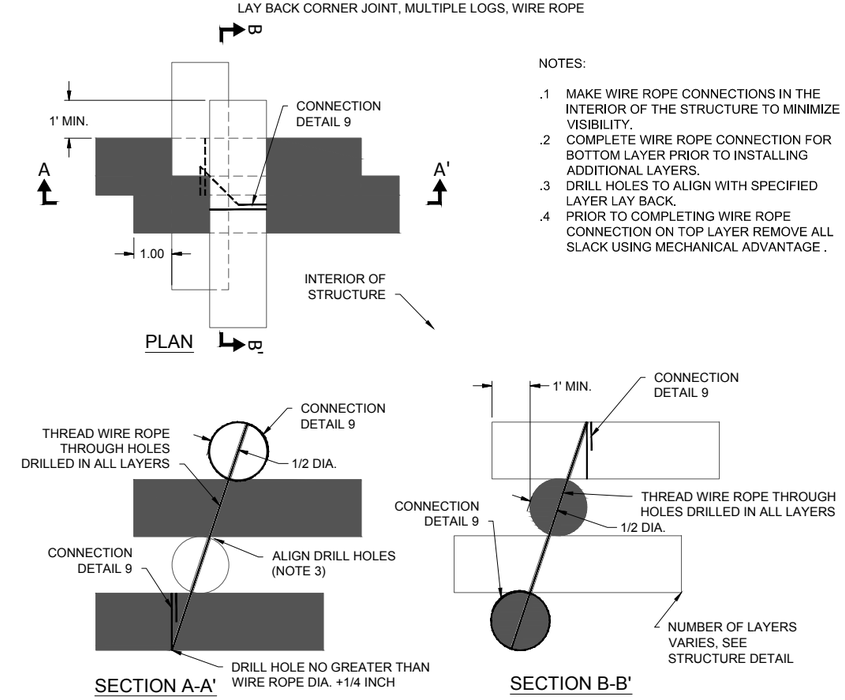
DETAIL 1
LOG TO PILE JOINT, WIRE ROPE OR MANILA ROPE



DETAIL 2
BUTTED JOINT, WIRE ROPE OR MANILA ROPE



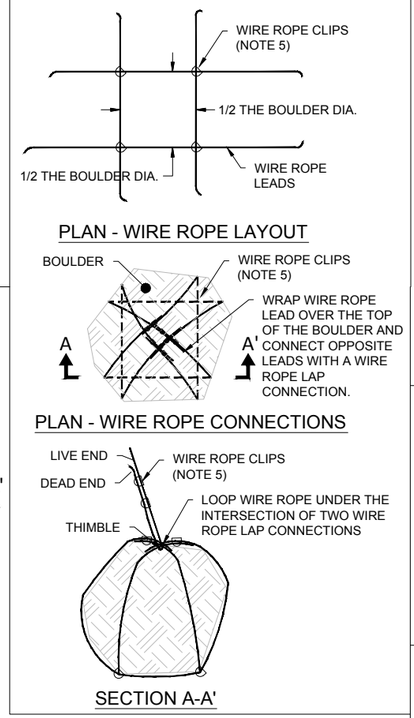
DETAIL 3
LAY BACK CORNER JOINT, MULTIPLE LOGS, WIRE ROPE



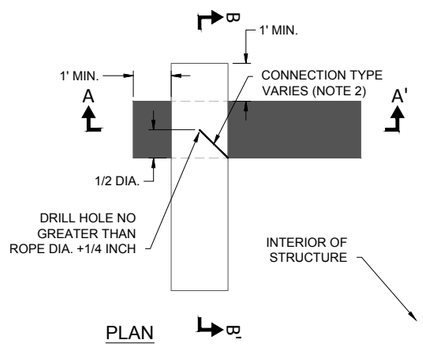
NOTES:

.1 MAKE WIRE ROPE CONNECTIONS IN THE INTERIOR OF THE STRUCTURE TO MINIMIZE VISIBILITY.
.2 COMPLETE WIRE ROPE CONNECTION FOR BOTTOM LAYER PRIOR TO INSTALLING ADDITIONAL LAYERS.
.3 DRILL HOLES TO ALIGN WITH SPECIFIED LAYER LAY BACK.
.4 PRIOR TO COMPLETING WIRE ROPE CONNECTION ON TOP LAYER REMOVE ALL SLACK USING MECHANICAL ADVANTAGE .

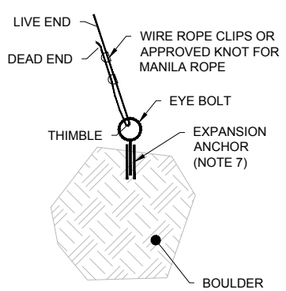
DETAIL 7
BOULDER JACKET
(ALT. TO DETAIL 5 AS APPROVED BY THE ENGINEER)



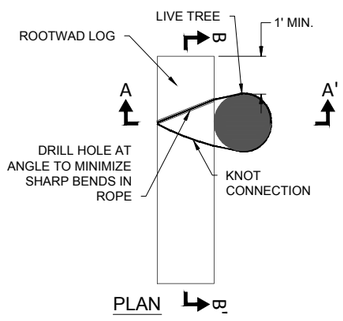
DETAIL 4
TWO LOG, CORNER JOINT, WIRE ROPE OR MANILA ROPE



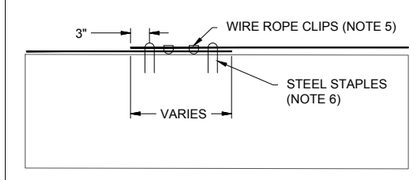
DETAIL 5
BOULDER ANCHOR
(WIRE ROPE OR MANILA ROPE)



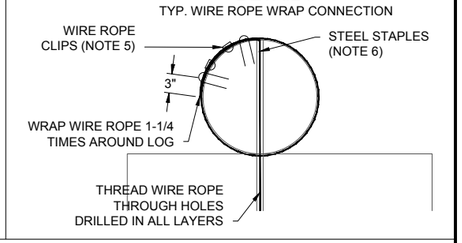
DETAIL 6
LASHING TO LIVE TREE, MANILA ROPE

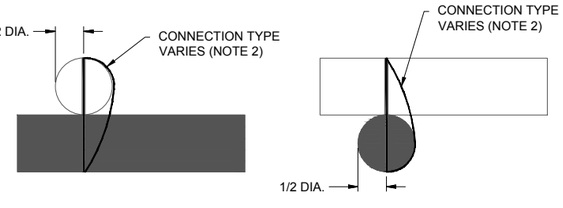


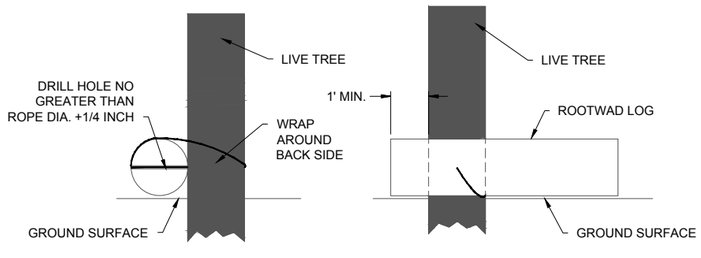
DETAIL 8
TYP. WIRE ROPE LAP CONNECTION



DETAIL 9
TYP. WIRE ROPE WRAP CONNECTION







NOTES

1. ALL CONNECTIONS SHALL BE APPROVED BY THE ENGINEER.
2. WHERE WIRE ROPE IS SPECIFIED USE WIRE ROPE LAP CONNECTION (DETAIL 8), UNLESS OTHER WISE NOTED. WHERE MANILA ROPE IS SPECIFIED USE A KNOT APPROVED BY THE ENGINEER. ACCEPTABLE KNOT TYPES INCLUDE BUT ARE NOT LIMITED TO; RETHREADED FIGURE EIGHT KNOT, WATER KNOT, AND DOUBLE FISHERMAN'S KNOT.
3. WIRE ROPE SHALL BE GALVANIZED STEEL.
4. MANILA ROPE SHALL BE 1/2" DIAMETER THREE STRAND.
5. WIRE ROPE CLIPS SHALL BE FORGED GALVANIZED STEEL, SIZED TO ACCOMMODATE TWO(2) STRANDS OF WIRE ROPE.
   - 5.1. FOR 3/8" DIA. WIRE ROPE USE TWO (2) WIRE ROPE CLIPS PER CONNECTION.
   - 5.2. FOR 1/2" DIAMETER WIRE ROPE USE THREE (3) WIRE ROPE CLIPS PER CONNECTION.
   - 5.3. FOLLOW WIRE ROPE CLIP MANUFACTURER RECOMMENDED INSTALLATION METHODS.
6. STAPLES SHALL BE GALVANIZED STEEL SIZED TO FIT TWO (2) STRANDS OF ROPE AND BE AT LEAST 4" LONG.
   - 6.1. DRIVE ONE STAPLE ON EACH SIDE OF THE CONNECTION TO SECURE CONNECTION TO THE LOG(S). DO NOT DRIVE STAPLES INTO LIVING TREES.
7. EXPANSION ANCHORS SHALL BE 4 WAY, 3/4 IN. - 10 INTERNALLY THREADED, ALTERNATIVELY ADHESIVE STYLE ANCHORS MAY BE USED AS APPROVED BY THE ENGINEER, SEE SPECIFICATIONS.
8. EYE BOLTS SHALL BE GALVANIZED STEEL, FOR LIFTING, 3/4 IN. - 10 THREAD, SEE SPECIFICATIONS.
9. THIMBLES SHALL BE GALVANIZED STEEL, SIZED TO ACCOMODATE THE SPECIFIED ROPE DIAMETER, SEE SPECIFICATIONS.
10. PROVIDE SUFFICIENT LENGTH OF ROPE TO MAKE CONNECTION, WRAP LOG, AND FINALIZE CONNECTION ON LOG AS SHOWN.
11. PRIOR TO INSTALLING WIRE ROPE CLIPS OR TYING KNOTS REMOVE ALL SLACK FROM THE CONNECTION USING MECHANICAL ADVANTAGE. EXCEPT FOR CONNECTIONS MADE TO LIVE TREES, THEN LEAVE SLACK IN CONNECTION TO ALLOW FOR TREE GROWTH PER THE DIRECTION OF THE ENGINEER.
12. SEE SPECIFICATIONS FOR FURTHER INFORMATION.

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TRACY A. DRURY — STATE OF WASHINGTON — 40803 — REGISTERED PROFESSIONAL ENGINEER

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FOR CONSTRUCTION
TUCANNON PROJECT AREA 14

CONNECTION DETAILS

C-20

SHEET NO. 22 OF 22

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Jan 11, 2013 11:48am dgaffney