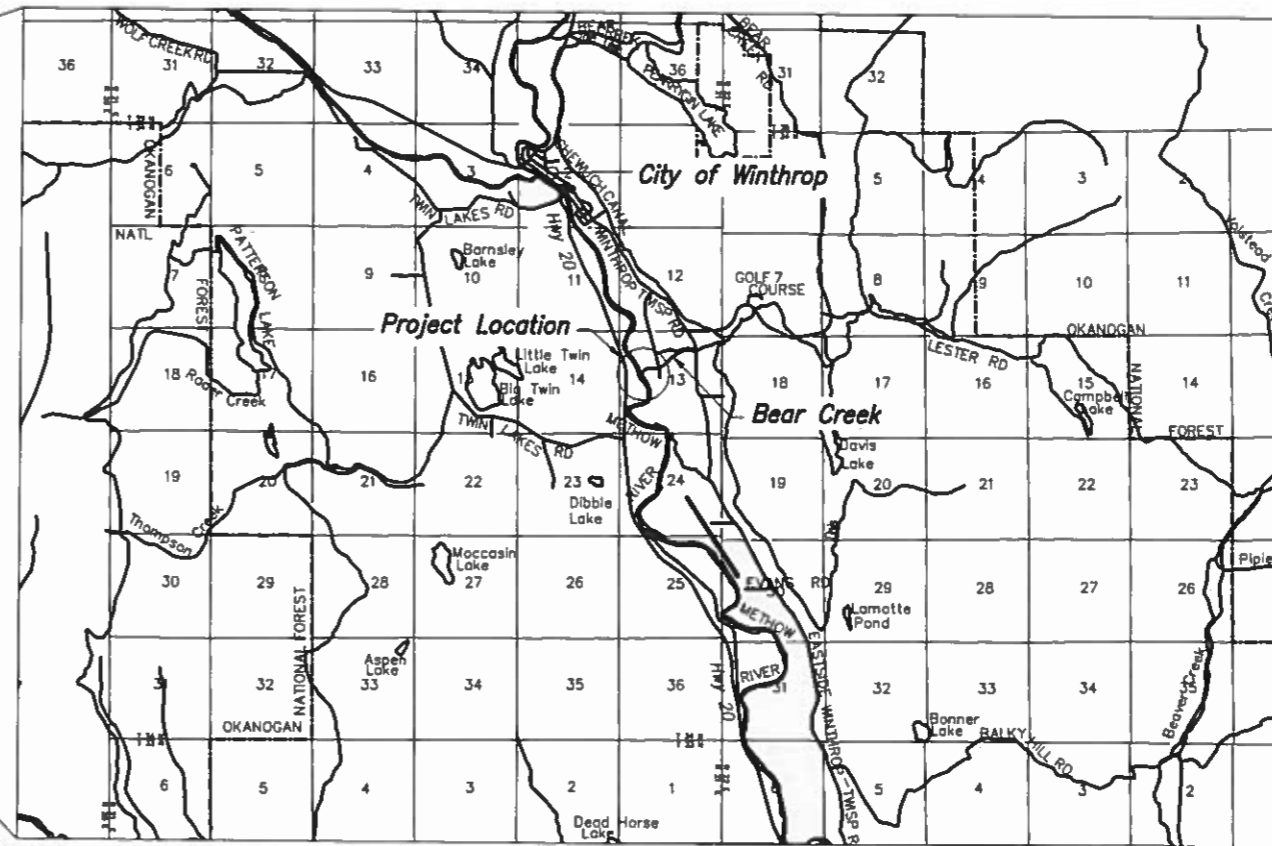


KEY MAP



VICINITY MAP

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
WASHINGTON

METHOW SUBBASIN
BARKLEY BEAR HABITAT IMPROVEMENT PROJECT
COVER SHEET

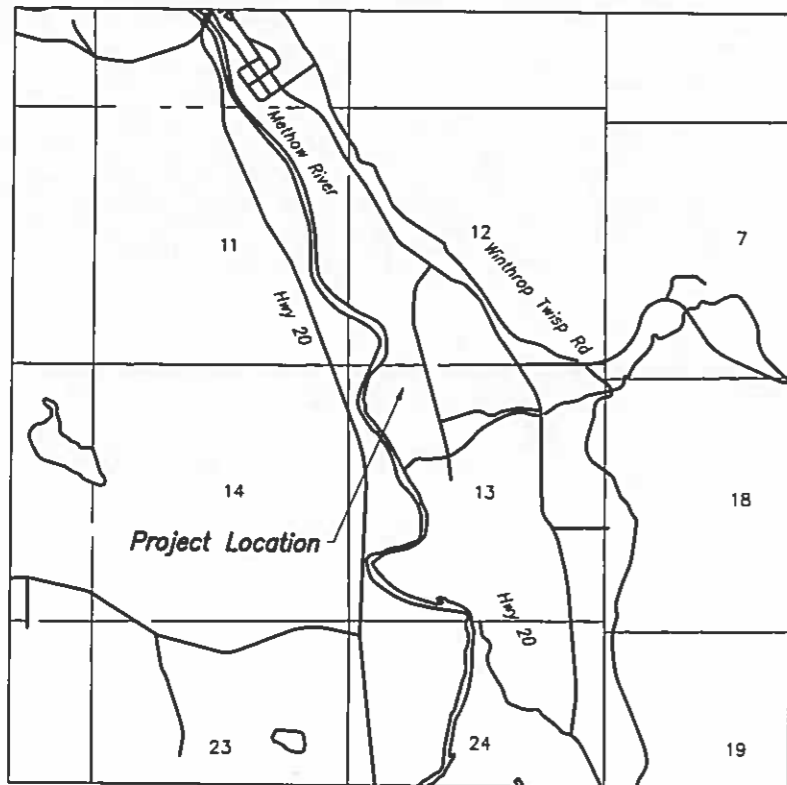
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COVER SHEET

TBD

SHEET 1 OF 19



VICINITY MAP

SITE SUMMARY

T34N R21E, Sections 12 and 13
Okanogan County

Sheet List Table	
Sheet Number	Sheet Title
1	COVER SHEET
2	GENERAL NOTES & ESTIMATED QUANTITIES
3	BEST MANAGEMENT PRACTICES
4	EXISTING CONDITIONS & SURVEY CONTROL
5	SITE ACCESS, STAGING, & CARE OF WATER PLAN
6	DEMOLITION PLAN
7	PROPOSED CONDITIONS AND GRADING - UPPER
8	PROPOSED CONDITIONS AND GRADING - MIDDLE
9	PROPOSED CONDITIONS AND GRADING - LOWER
10	PROFILE 1 AND CROSS-SECTIONS A-A', B-B' AND C-C'
11	PROFILE 2, CROSS-SECTIONS D-D', E-E', F-F' AND G-G'
12	PROFILE 3
13	CROSS-SECTION H-H' AND DETAILS
14	WOOD FEATURE TYPICAL SHEET
15	ISLAND APEX ELJ DETAILS
16	SIDE CHANNEL ELJ DETAILS
17	BANK COMPLEXITY ELJ DETAILS
18	BANK BARB STRUCTURE DETAILS
19	CHANNEL BARB STRUCTURE DETAILS

USBR Contract No: R13PC10013
MSRF Contract No: --
Consultant Project No: 180261-01

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ESTIMATED QUANTITIES TABLE:

(Contractor Responsible for Verifying Quantities)			
DESCRIPTION	UNIT	QTY.	ALT QTY
TOTAL - EARTHWORK, EXCAVATION, BULK (INCLUDING RIPRAP)	CY	16,155	16,155
TOTAL - EARTHWORK, FILL, NATIVE	CY	2,224	2,224
TOTAL - EARTHWORK, ON-SITE SPOIL	CY	8734	8734
TOTAL - EARTHWORK, OFF-SITE HAUL (INCLUDING RIPRAP)	CY	5,197	5,197
TOTAL - DEMOLITION AND HAUL, EXISTING STRUCTURES	CY	300	300
BEAR CREEK - EARTHWORK, EXCAVATION, BULK	CY	2,064	2,064
BEAR CREEK - EARTHWORK, ON-SITE SPOIL	CY	1,872	1,872
BEAR CREEK - EARTHWORK, FILL NATIVE	CY	192	192
LEVEE - EARTHWORK, EXCAVATION, NON RIPRAP	CY	1,697	1,697
LEVEE - EARTHWORK, EXCAVATION, RIPRAP	CY	3,500	3,500
LEVEE - EARTHWORK, OFF-SITE HAUL	CY	192	192
FLOODPLAIN SPOILS AND UPPER CANAL BENCHING - EARTHWORK, EXCAVATION, BULK	CY	3,600	3,600
FLOODPLAIN SPOILS AND UPPER CANAL BENCHING - EARTHWORK, ON-SITE SPOIL	CY	3,600	3,600
SIDE CHANNEL - EARTHWORK, EXCAVATION, BULK	CY	1,736	1,736
SIDE CHANNEL - EARTHWORK, ON-SITE SPOIL	CY	1,736	1,736
FLOODPLAIN SCALLOP - EARTHWORK, EXCAVATION, BULK	CY	3,558	3,558
FLOODPLAIN SCALLOP - EARTHWORK, ON-SITE SPOIL	CY	1,526	1,526
FLOODPLAIN SCALLOP - EARTHWORK, FILL, NATIVE	CY	2,032	2,032
ROOTWAD LOG, 1.5" DIA. 20' L LOG, 4.5" DIA. 3' L RW	EA	36	36
ROOTWAD LOG, 1.5" DIA. 25' L LOG, 4.5" DIA. 3' L RW	EA	6	6
ROOTWAD LOG, 1.5" DIA. 30' L LOG, 4.5" DIA. 3' L RW	EA	68	68
ROOTWAD LOG, 1.5" DIA. 40' L LOG, 4.5" DIA. 3' L RW	EA	54	0
ROOTWAD LOG, 2" DIA. 20' L LOG, 6' DIA. 4' L RW	EA	2	2
ROOTWAD LOG, 2" DIA. 30' L LOG, 6' DIA. 4' L RW	EA	26	26
LOG POLE, 1.5" DIA., 25' L	EA	18	18
LOG POLE, 1.5" DIA., 30' L	EA	10	10
LOG POLE, 1.5" DIA., 40' L	EA	27	0
GRADED TIMBER PILE, DOUGLAS FIR OR LODGEPOLE, 1.5" DIA. 35' L	EA	52	10
GRADED TIMBER PILE, DOUGLAS FIR OR LODGEPOLE, 1.5" DIA. 30' L	EA	30	30
NON-GRADED TIMBER PILE, DOUGLAS FIR OR LODGEPOLE 1.5" DIA 25' L	EA	16	16
BOULDER, 2.0' INTERMEDIATE DIA.	CY	750	0
7/8-INCH STEEL THREADED ROD	LF	950	530
STEEL PLATE AND LOCKNUT	EA	190	212

QUALITY TABLE NOTES:

- Alternate Quantities describe materials necessary for construction of project without the Optional Bid Item "Bank Barb ELJs (3)" shown on sheets 7 & 18.
- Rootwad log lengths do not include the rootwad mass, see specifications.
- See specifications for allowable log diameter tolerances and taper rates for each structure type.

GENERAL CONSTRUCTION NOTES:

- Contract documents include these drawings and project specifications.
- Contractor shall furnish all materials (except those materials listed in note 20 as supplied by the Contracting Agency), equipment, and labor necessary to complete all work as indicated on the contract documents.
- 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.
- Any discrepancies are to be brought to the attention of the Contracting Officer prior to proceeding with the work.
- The Contractor shall receive, in writing, authorization to proceed before starting work on any item not clearly defined or identified by the contract documents.
- 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.
- All work performed and materials installed shall be in strict accordance with all applicable codes, regulations, and ordinances.
- 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.
- 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. 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.
- 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.
- Contractor shall keep job site 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 on the property.
- Provide environmentally compatible dust control and abatement during construction at all staging and access routes. Prevent, control, and abate dust pollution on rights-of-way provided by the Contracting Officer or elsewhere during performance of Work. Provide labor, equipment, and materials, and use efficient methods wherever and whenever required to prevent dust nuisance or damage to persons, property, or activities. The Contractor shall be responsible for damages resulting from dust originating from Contractor operations.
- Representations of true north shall not be used to identify or establish the bearing of true north at this job site.
- Where a construction detail is not shown or noted, the detail shall be the same as for other similar work.
- Notes and details on the contract documents shall take precedence over general notes hereon.
- Dimension callouts shall take precedence over scales shown on the contract documents.
- 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.
- ASTM, AASHTO, and other standard specifications noted on the contract documents shall be of the latest version, unless noted otherwise.
- Work done by others:
 - Fish rescue and recovery by others.
- 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.
 - 21.1. The rootwad logs, log poles, and timber piles. Contractor shall incorporate these logs into the design where possible as the logs meet the size and specification requirements for the applications.
- 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.
- In-stream work is only allowed during the permit windows. Work must comply with all permits. See the Contract Documents for more information about the work window.
- 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 CML NOTES:

- All site work shall be as indicated on the contract documents.
- Do not excavate or disturb beyond the job site area unless noted otherwise.
- Rubbish, debris, garbage, and other refuse shall be removed from the job site and disposed of legally.
- 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.
- 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.
- Contractor and its employees shall provide safety training for the work crew prior to starting the project.
- 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.
- 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:

- 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.
- 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.
- 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:

- Parcel data provided by USBR.
- Topographic data provided by USBR in GIS format comprised of multiple data sources of various temporal resolution.
- Datum is Washington State Plane North NAD83 feet.

PROJECT INFORMATION:

Project Location: Barkley Bear Habitat Improvement Project
Northeast of Twisp, WA in Okanogan County
T34N, R21E, Sec 12 and 13

Contracting Agency: Methow Salmon Recovery Foundation
PO Box 755, Winthrop, WA 98862
Phone: (509) 996-2787
Contact: Chris Johnson

Engineer: United States Department of Interior
Bureau of Reclamation
Pacific Northwest Region
1150 North Curtis Road, Suite 100
Boise, ID 83705
Phone: (208) 378-5237
Contact: Kira Christensen

Engineer's Consultant: Anchor OEA, LLC
1605 Cornwall Avenue
Bellingham, WA 98225
Phone: (360) 715-2703
Contact: Tracy Drury, P.E.

ABBREVIATIONS

ABB.	TERM
ABB.	Abbreviation
ASTM	American Society for Testing and Materials
BPA	Bonneville Power Administration
CFS	Cubic Feet per Second
CONC.	Concrete
CWA	Clean Water Act
CY	Cubic Yard
DBH	Diameter at Breast Height
Dia.	Diameter
EA	Each
EIPS	Extra Improved Plow Steel
ELEV.	Elevation
ELJ	Engineered Log Jam
ESA	Endangered Species Act
EX.	Existing
FT.	Foot or Feet
Galv.	Galvanized
HDPE	High Density Polyethylene
HIP	Habitat Improvement Program
I.E.	Invert Elevation
IN.	Inch or Inches
LWD	Large Woody Debris
LS	Lump Sum
Max.	Maximum
Min.	Minimum
MSRF	Methow Salmon Recovery Foundation
O.C.	On Center
OHWL	Ordinary High Water Line
P.E.	Professional Engineer
QTY.	Quantity
S	Slope
S.C.	Side Channel
SF	Square Foot or Feet
Spec.	Specification
Sta.	Station
SY	Square Yard
TESC	Temporary Erosion and Sedimentation Control
Typ.	Typical
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
WDFW	Washington Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation
WSEL	Water Surface Elevation

RECLAMATION
Managing Water in the West

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METHOW SUBBASIN
BARKLEY BEAR HABITAT IMPROVEMENT PROJECT
GENERAL NOTES & ESTIMATED QUANTITIES

DRAFT 100% DESIGN
NOT FOR CONSTRUCTION

Boise, ID 2020-01-01

GENERAL NOTES & ESTIMATED QUANTITIES

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SHEET 2 OF 19

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HIP III GENERAL CONSERVATION MEASURES (APPLICABLE TO ALL ACTIONS)

The activities described in these plans are intended to protect and restore fish and wildlife habitat with long-term benefits to the ESA-listed species. However, project construction may have short-term adverse effects on ESA-listed species and associated critical habitat. To minimize these short-term adverse effects and make them predictable for the purposes of programmatic analysis, the BPA will include in all projects implemented under this HIP III proposed action the following General Conservation Measures.

- Documentation:** Items to be posted onsite by the Contractor in a location visible to the public:
- A. Name(s), phone number(s), and address(es) of the person(s) responsible for the oversight.
 - B. A description of hazardous materials that will be used, including inventory, storage, and handling procedures.
 - C. Procedures to contain and control a spill of any hazardous material generated, used or stored on-site, including notification of proper authorities.
 - D. A standing order to cease work in the event of high flows except necessary to minimize resource damage (above those addressed in the design and implementation plans) or exceedance of take or water quality limitations.

Inspections and Monitoring: The Contracting Agency or designated representative will provide implementation monitoring to ensure compliance with best management practices, including, but not limited to, verifying general conservation measures and protection design criteria are adequately followed; and effects to ESA-listed species are not greater than predicted and take limitations are not exceeded.

State and Federal Permits: All applicable regulatory permits and official project authorizations will be obtained by the Contracting Agency before project implementation. These permits and authorizations include, but are not limited to, National Environmental Policy Act, National Historic Preservation Act, and the appropriate state agency removal and fill permit, USACE Clean Water Act (CWA) 404 permits, and CWA Section 401 Water Quality Certifications.

Timing of In-Water Work: Washington Department of Fish and Wildlife (WDFW), guidelines for timing of in-water work will be followed. Refer to contract documents for exact timing of water work window.

- Site Layout and Flagging:** Prior to construction, the action area will be clearly flagged by the Contracting Officer to identify the following:
- A. Sensitive resource areas, such as areas below ordinary high water, spawning areas, springs, wetlands;
 - B. Equipment entry and exit points;
 - C. Road and stream crossing alignments;
 - D. Staging, storage, and stockpile areas; and
 - E. No-spray areas and buffers.

- Temporary Access Roads and Paths:**
- A. Existing access roads and paths will be preferentially used whenever reasonable, and the numbers and length of temporary access roads and paths through riparian areas and floodplains will be minimized to lessen soil disturbance and compaction, and impacts to vegetation.
 - B. Temporary access roads and paths will not be built on slopes where grade, soil, or other features suggest likelihood of excessive erosion or failure. If slopes are steeper than 30%, then the road will be designed by a civil engineer with experience in steep road design.
 - C. The removal of riparian vegetation during construction of temporary access roads will be minimized. When temporary vegetation removal is required, vegetation will be cut at ground level (not grubbed).

- D. At project completion, all temporary access roads and paths will be decommissioned unless otherwise noted, and the soil will be stabilized and revegetated. Road and path obliteration refers to the most comprehensive degrees of decommissioning and involves recompacting the surface and ditch, pulling the fill material onto the running surface, and reshaping to match the original contour.
- E. Temporary roads and paths in wet areas or areas prone to flooding will be obliterated by the end of the in-water work window.

- Temporary Stream Crossings:**
- A. Temporary stream crossings shall only occur at locations shown on these plans or as adjusted by the Contracting Officer in the field.
 - B. Vehicles and machinery will cross streams at right angles to the main channel wherever possible.
 - C. No stream crossings will occur at active spawning sites, when holding adult listed fish are present, or when eggs or alevins are in the gravel.
 - D. After project completion, temporary stream crossings will be obliterated and the stream channel and banks restored.

- Staging, Storage, and Stockpile Areas:**
- A. Staging areas (used for construction equipment storage, vehicle storage, fueling, servicing, and hazardous material storage) will be only at locations shown on these plans or as adjusted by the Contracting Officer in the field.
 - B. Any material not reused in other components of this project, and not native to the floodplain, shall be removed and properly disposed of at a location outside of the 100-year floodplain for disposal.

- Equipment:** Mechanized equipment and vehicles will be selected, operated, and maintained in a manner that minimizes adverse effects on the environment (e.g. minimally-sized, low pressure tires; minimal hard-turn paths for tracked vehicles; temporary mats or plates within wet areas or on sensitive soils). All vehicles and other mechanized equipment will be:
- A. Stored, fueled, and maintained in a vehicle staging area placed 150 feet or more from any natural water body or wetland or on an adjacent, established road area;
 - B. Refueled in a vehicle staging area placed 150 feet or more from a natural waterbody or wetland, or in an isolated hard zone, such as a paved parking lot or adjacent, established road;
 - C. Biodegradable lubricants and fluids shall be used, if possible, on equipment operating in and adjacent to the stream channel and live water.
 - D. Inspected daily for fluid leaks before leaving the vehicle staging area.
 - E. Thoroughly cleaned before operation below ordinary high water, and as often as necessary during operation, to remain grease free.

- Spill prevention, Control, and Counter Measures:** The Contractor shall adhere to the following measures:
- A. A description of hazardous materials that will be used, including inventory, storage, and handling procedures shall be available on-site.
 - B. Written procedures for notifying environmental response agencies shall be posted at the work site.
 - C. Spill containment kits (including instructions for cleanup and disposal) adequate for the types and quantity of hazardous materials used at the site shall be available at the work site.
 - D. Workers shall be trained in spill containment procedures and informed of the location of spill containment kits.
 - E. Any waste liquids generated at the staging areas will be temporarily stored under an

impervious cover until they can be properly transported to and disposed of at a facility that is approved for receipt of hazardous materials.

- Invasive Species Control:** The following measures will be followed to avoid introduction of invasive plants and noxious weeds into project areas:
- A. Prior to entering the site, all vehicles and equipment will be power washed, allowed to fully dry, and inspected to make sure no plants, soil, or other organic material adheres to the surface.
 - B. Watercraft, waders, boots, and any other gear to be used in or near water will be inspected for aquatic invasive species.
 - C. Wading boots with felt soles shall not be used due to their propensity for aiding in the transfer of aquatic invasive species.

Minimize Time and Extent of Disturbance: Earthwork (including drilling, excavation, dredging, filling and compacting) in which mechanized equipment is in stream channels, riparian areas, and wetlands will be completed as quickly as possible. To the extent feasible, mechanized equipment will work from the top of the bank, unless work from another location would result in less habitat disturbance.

- Cessation of Work:** Project operations will cease under the following conditions:
- A. High flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.
 - B. When allowable water quality impacts, as defined by the State CWA Section 401 Water Quality Certification, have been exceeded; or
 - C. When "incidental take" limitations have been reached or exceeded.

Site Restoration: When construction is complete: All streambanks, soils, and vegetation will be cleaned up and restored as shown on these plans. All project related waste will be removed. All temporary access roads, crossings, and staging areas will be obliterated and restored. All disturbed areas will be rehabilitated as shown on these plans.

Turbidity Monitoring: If at any time, monitoring, inspections, or observations/samples show that the turbidity controls are ineffective, immediately mobilize work crews to repair, replace, or reinforce control as necessary and notify the Contracting Officer. Contractor is responsible for controlling turbidity on site. Contracting Officer will be responsible for turbidity reporting.

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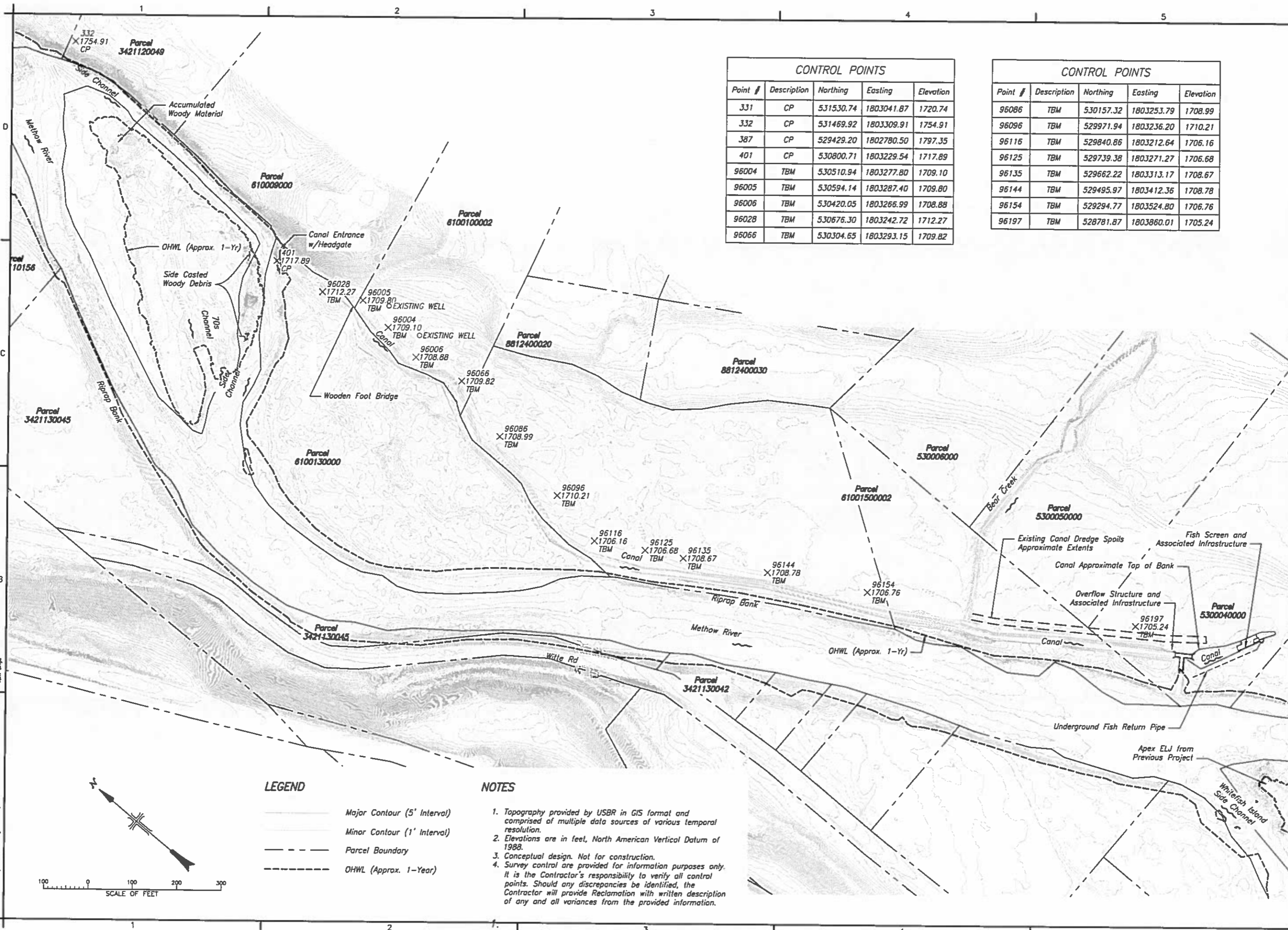
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WASHINGTON

METHOW SUBBASIN
BARKLEY BEAR HABITAT IMPROVEMENT PROJECT
BEST MANAGEMENT PRACTICES

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CONTROL POINTS				
Point #	Description	Northing	Easting	Elevation
331	CP	531530.74	1803041.87	1720.74
332	CP	531469.92	1803309.91	1754.91
387	CP	529429.20	1802780.50	1797.35
401	CP	530800.71	1803229.54	1717.89
96004	TBM	530510.94	1803277.80	1709.10
96005	TBM	530594.14	1803287.40	1709.80
96006	TBM	530420.05	1803266.99	1708.88
96028	TBM	530676.30	1803242.72	1712.27
96066	TBM	530304.65	1803293.15	1709.82

CONTROL POINTS				
Point #	Description	Northing	Easting	Elevation
96086	TBM	530157.32	1803253.79	1708.99
96096	TBM	529971.94	1803236.20	1710.21
96116	TBM	529840.86	1803212.64	1706.16
96125	TBM	529739.38	1803271.27	1706.68
96135	TBM	529662.22	1803313.17	1708.67
96144	TBM	529495.97	1803412.36	1708.78
96154	TBM	529294.77	1803524.80	1706.76
96197	TBM	528781.87	1803860.01	1705.24

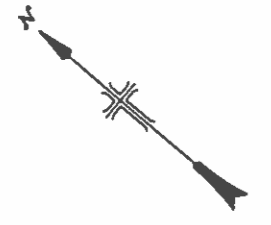
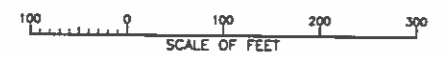


LEGEND

	Major Contour (5' Interval)
	Minor Contour (1' Interval)
	Parcel Boundary
	OHWL (Approx. 1-Year)

- NOTES**
1. Topography provided by USBR in GIS format and comprised of multiple data sources of various temporal resolution.
 2. Elevations are in feet, North American Vertical Datum of 1988.
 3. Conceptual design. Not for construction.
 4. Survey control are provided for information purposes only. It is the Contractor's responsibility to verify all control points. Should any discrepancies be identified, the Contractor will provide Reclamation with written description of any and all variances from the provided information.

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ACCESS, STAGING, AND CARE OF WATER NOTES

1. 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.
2. Fish rescue and recovery required in all in-water work areas; to be completed by Contracting Agency and/or its authorized Agents. (See specifications)
3. Discharge dewatering water in vegetated buffers for infiltration in accordance with approved plans.
4. Access routes through delineated wetlands shall incorporate measures to protect the wetland, limit soil compaction, and confine vegetation disturbance. Protection methods shall be approved by the Contracting Officer prior to development of the access route. (See specifications).
5. Staging limits to be located a minimum of 150' from surface water at all times.

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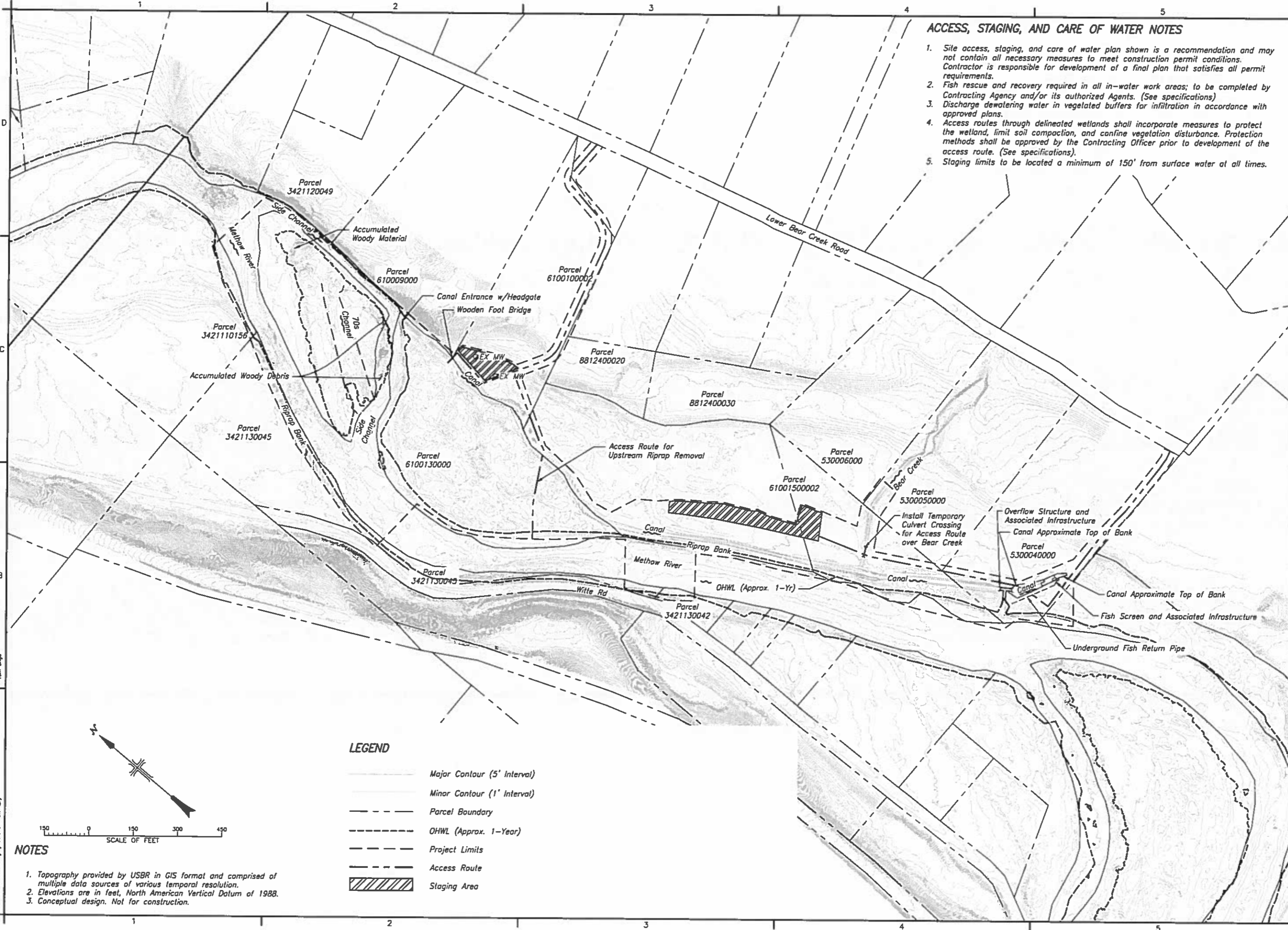
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SITE ACCESS, STAGING, & CARE OF WATER PLAN

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SITE ACCESS, STAGING, & CARE OF WATER PLAN

SHEET 3 OF 18

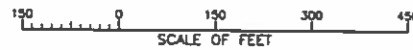


LEGEND

- Major Contour (5' Interval)
- - - Minor Contour (1' Interval)
- Parcel Boundary
- · - · - OHWL (Approx. 1-Year)
- Project Limits
- - - Access Route
- ▨ Staging Area

NOTES

1. Topography provided by USBR in GIS format and comprised of multiple data sources of various temporal resolution.
2. Elevations are in feet, North American Vertical Datum of 1988.
3. Conceptual design. Not for construction.



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DEMOLITION NOTES

1. Segregate and stockpile excavation materials that most nearly conform to backfill material requirements in the Specifications for onsite reuse and backfill.
2. Excavation may encounter bedrock in 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.

Excess material should be graded to generally match the slope and grade of the valley floor

Stockpile Material to Match Valley Slopes

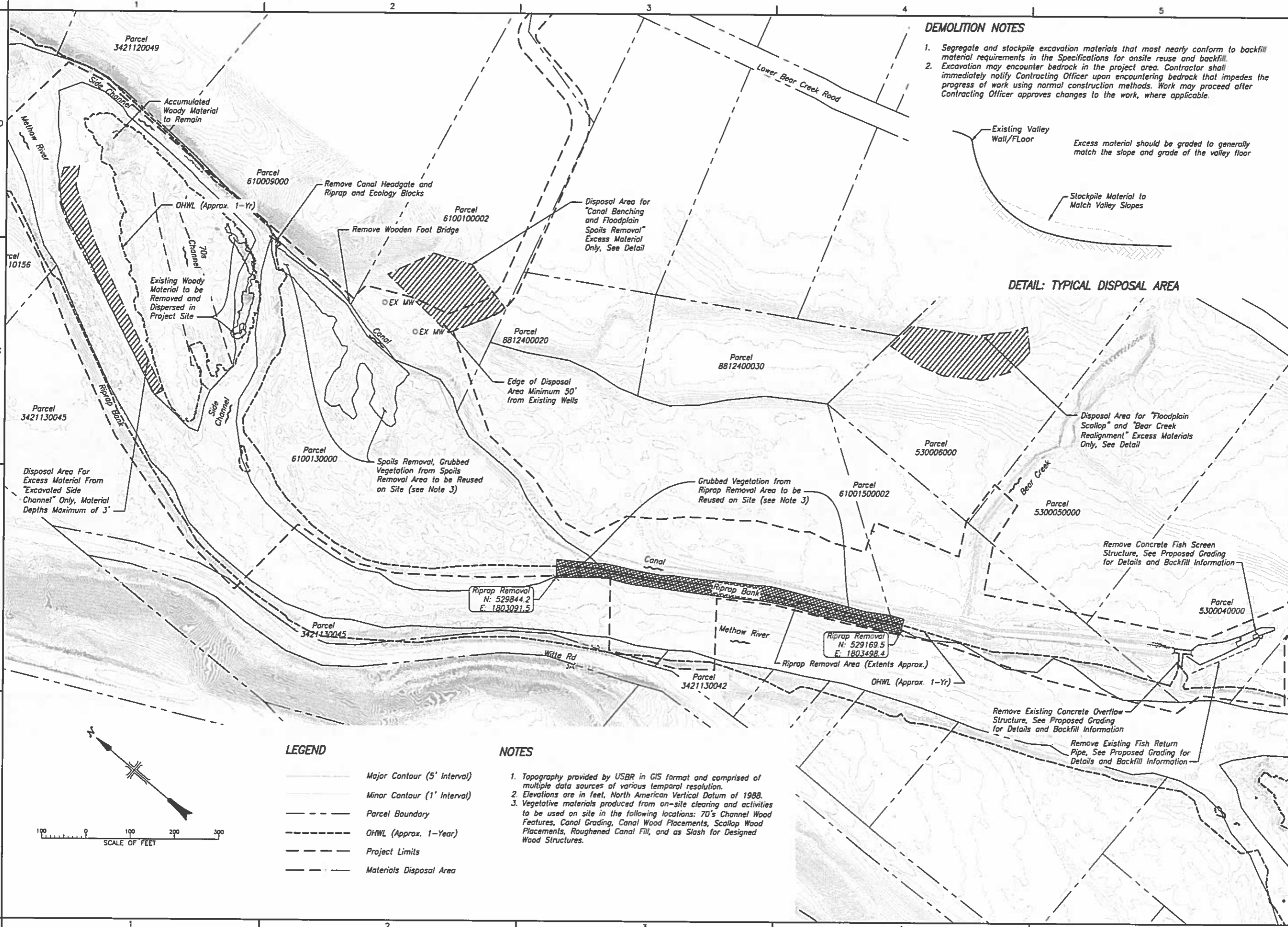
DETAIL: TYPICAL DISPOSAL AREA

Disposal Area for "Floodplain Scallop" and "Bear Creek Realignment" Excess Materials Only, See Detail

Remove Concrete Fish Screen Structure, See Proposed Grading for Details and Backfill Information

Remove Existing Fish Return Pipe, See Proposed Grading for Details and Backfill Information

Remove Existing Concrete Overflow Structure, See Proposed Grading for Details and Backfill Information

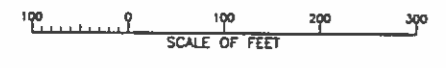


NOTES

1. Topography provided by USBR in GIS format and comprised of multiple data sources of various temporal resolution.
2. Elevations are in feet, North American Vertical Datum of 1988.
3. Vegetative materials produced from on-site clearing and activities to be used on site in the following locations: 70's Channel Wood Features, Canal Grading, Canal Wood Placements, Scallop Wood Placements, Roughened Canal Fill, and as Slash for Designed Wood Structures.

LEGEND

- Major Contour (5' Interval)
- Minor Contour (1' Interval)
- Parcel Boundary
- OHWL (Approx. 1-Year)
- Project Limits
- Materials Disposal Area



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METHOW SUBBASIN
BARKLEY BEAR HABITAT IMPROVEMENT PROJECT
DEMOLITION PLAN

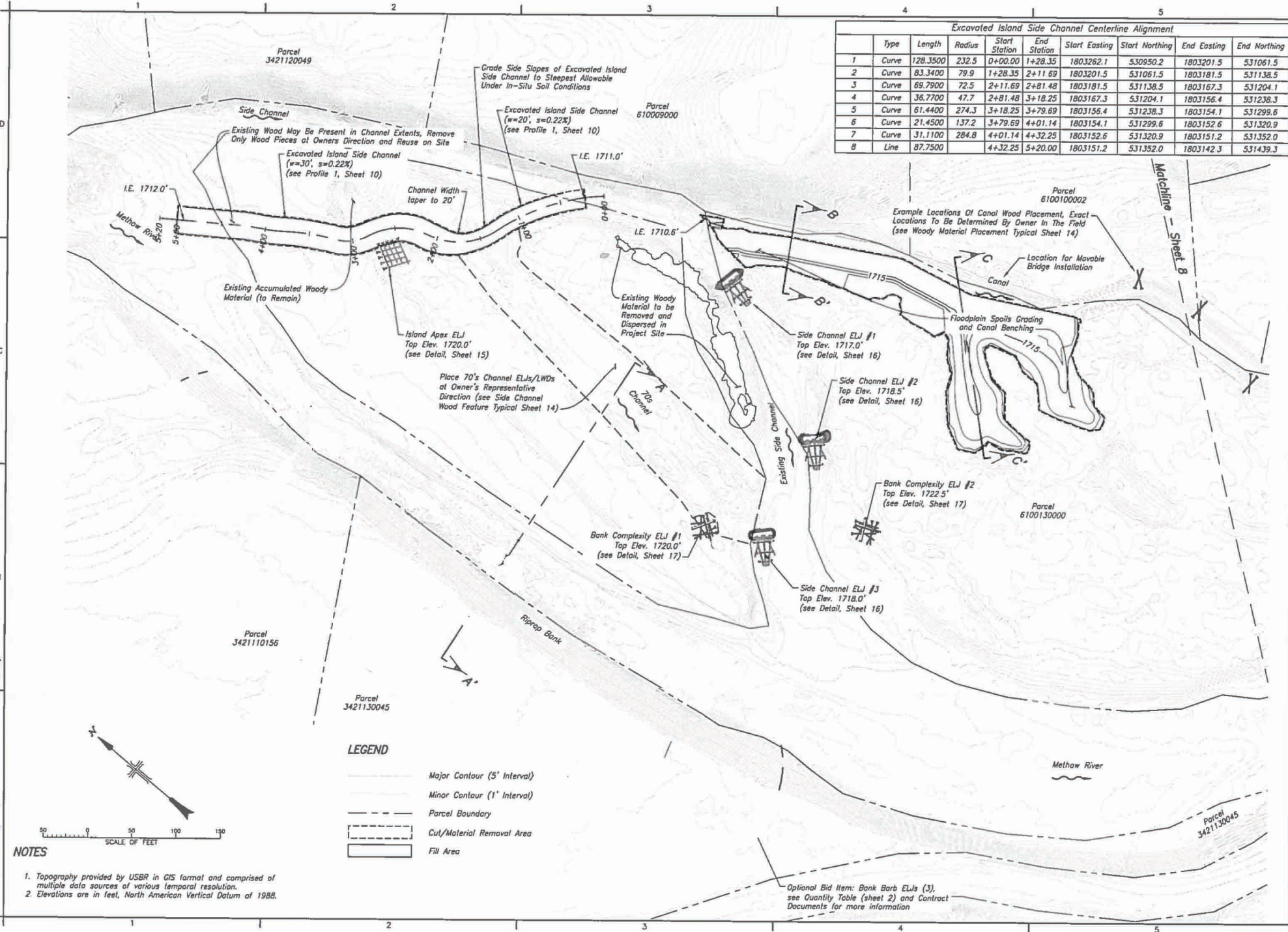
DRAFT 100% DESIGN
NOT FOR CONSTRUCTION

DEMOLITION PLAN

SHEET 6 OF 18

K:\Projects\2021-1-18 Bureau of Reclamation\Barkley River Habitat Improvement\2021-1-18 Demolition Plan
DATE AND TIME PLOTTED
1/17/2020 4:28 PM
PLOTTED BY
Tom Origo

Excavated Island Side Channel Centerline Alignment									
Type	Length	Radius	Start Station	End Station	Start Easting	Start Northing	End Easting	End Northing	
1	Curve	128.3500	232.5	0+00.00	1+28.35	1803262.1	530950.2	1803201.5	531061.5
2	Curve	83.3400	79.9	1+28.35	2+11.69	1803201.5	531061.5	1803181.5	531138.5
3	Curve	69.7900	72.5	2+11.69	2+81.48	1803181.5	531138.5	1803167.3	531204.1
4	Curve	36.7700	47.7	2+81.48	3+18.25	1803167.3	531204.1	1803156.4	531238.3
5	Curve	61.4400	274.3	3+18.25	3+79.69	1803156.4	531238.3	1803154.1	531299.6
6	Curve	21.4500	137.2	3+79.69	4+01.14	1803154.1	531299.6	1803152.6	531320.9
7	Curve	31.1100	284.8	4+01.14	4+32.25	1803152.6	531320.9	1803151.2	531352.0
8	Line	87.7500		4+32.25	5+20.00	1803151.2	531352.0	1803142.3	531439.3



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METHOW SUBBASIN
BARKLEY BEAR HABITAT IMPROVEMENT PROJECT
PROPOSED CONDITIONS AND GRADING - UPPER

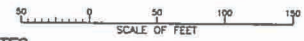
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NOT FOR CONSTRUCTION

PROPOSED CONDITIONS AND GRADING - UPPER

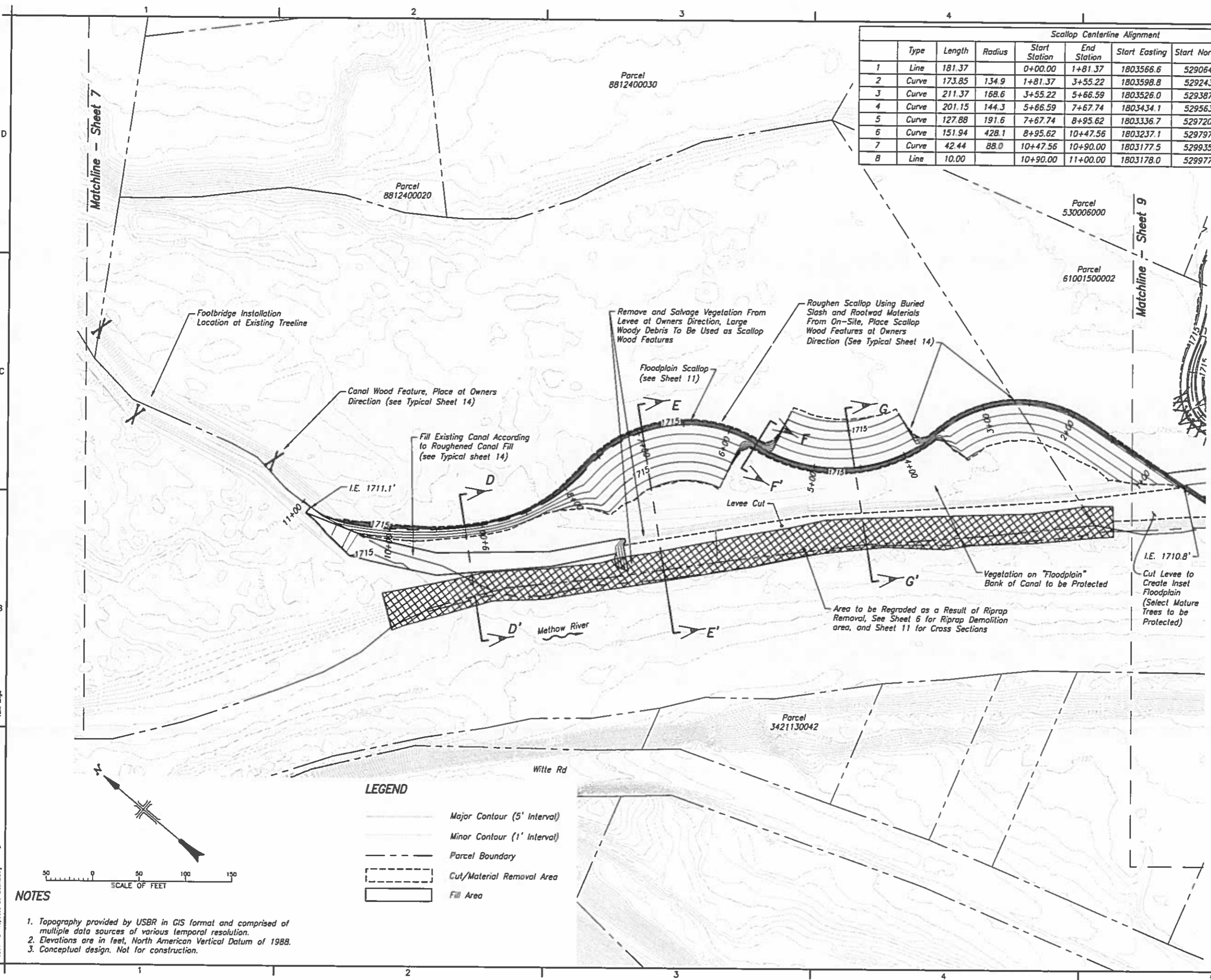
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 Title: Final Dwg

- NOTES**
1. Topography provided by USBR in GIS format and comprised of multiple data sources of various temporal resolution.
 2. Elevations are in feet, North American Vertical Datum of 1988.

- LEGEND**
- Major Contour (5' Interval)
 - Minor Contour (1' Interval)
 - Parcel Boundary
 - Cut/Material Removal Area
 - Fill Area



Scallop Centerline Alignment									
	Type	Length	Radius	Start Station	End Station	Start Easting	Start Northing	End Easting	End Northing
1	Line	181.37		0+00.00	1+81.37	1803566.6	529064.6	1803598.8	529243.1
2	Curve	173.85	134.9	1+81.37	3+55.22	1803598.8	529243.1	1803526.0	529387.9
3	Curve	211.37	168.6	3+55.22	5+66.59	1803526.0	529387.9	1803434.1	529563.1
4	Curve	201.15	144.3	5+66.59	7+67.74	1803434.1	529563.1	1803336.7	529720.7
5	Curve	127.88	191.6	7+67.74	8+95.62	1803336.7	529720.7	1803237.1	529797.0
6	Curve	151.94	428.1	8+95.62	10+47.56	1803237.1	529797.0	1803177.5	529935.9
7	Curve	42.44	88.0	10+47.56	10+90.00	1803177.5	529935.9	1803178.0	529977.9
8	Line	10.00		10+90.00	11+00.00	1803178.0	529977.9	1803180.9	529987.5



LEGEND

- Major Contour (5' Interval)
- Minor Contour (1' Interval)
- Parcel Boundary
- Cut/Material Removal Area
- Fill Area

NOTES

1. Topography provided by USBR in GIS format and comprised of multiple data sources of various temporal resolution.
2. Elevations are in feet, North American Vertical Datum of 1988.
3. Conceptual design. Not for construction.

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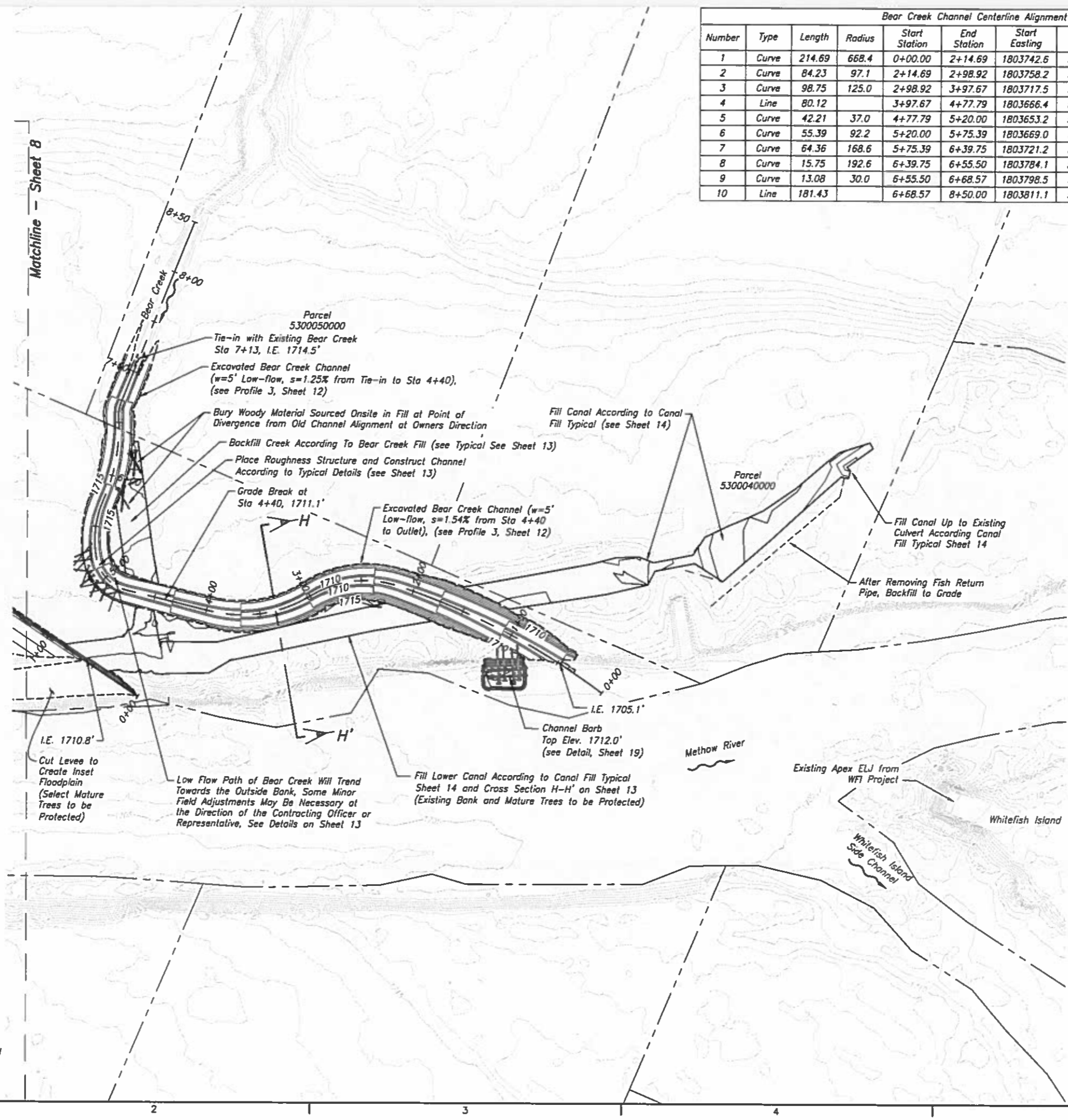
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WASHINGTON

METHOW SUBBASIN
BARKLEY BEAR HABITAT IMPROVEMENT PROJECT
PROPOSED CONDITIONS AND GRADING - MIDDLE

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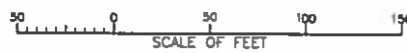
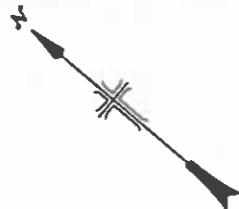
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 1/17/2020 4:21 PM
 PLOTTED BY:
 Tom Gage

Bear Creek Channel Centerline Alignment									
Number	Type	Length	Radius	Start Station	End Station	Start Easting	Start Northing	End Easting	End Northing
1	Curve	214.69	668.4	0+00.00	2+14.69	1803742.6	528669.8	1803758.2	528883.0
2	Curve	84.23	97.1	2+14.69	2+98.92	1803758.2	528883.0	1803717.5	528953.8
3	Curve	98.75	125.0	2+98.92	3+97.67	1803717.5	528953.8	1803666.4	529035.3
4	Line	80.12		3+97.67	4+77.79	1803666.4	529035.3	1803653.2	529114.3
5	Curve	42.21	37.0	4+77.79	5+20.00	1803653.2	529114.3	1803669.0	529151.1
6	Curve	55.39	92.2	5+20.00	5+75.39	1803669.0	529151.1	1803721.2	529166.9
7	Curve	64.36	168.6	5+75.39	6+39.75	1803721.2	529166.9	1803784.1	529178.7
8	Curve	15.75	192.6	6+39.75	6+55.50	1803784.1	529178.7	1803798.5	529185.1
9	Curve	13.08	30.0	6+55.50	6+68.57	1803798.5	529185.1	1803811.1	529188.2
10	Line	181.43		6+68.57	8+50.00	1803811.1	529188.2	1803992.4	529192.2



LEGEND

- Major Contour (5' Interval)
- Minor Contour (1' Interval)
- Parcel Boundary
- Cut/Material Removal Area
- Fill Area



NOTES

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2. Elevations are in feet, North American Vertical Datum of 1988.
3. Conceptual design. Not for construction.

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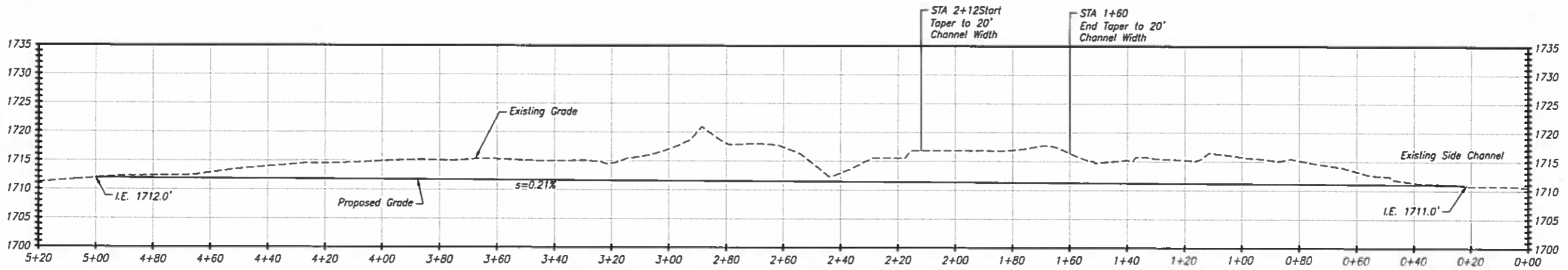
METHOW SUBBASIN
BARKLEY BEAR HABITAT IMPROVEMENT PROJECT
PROPOSED CONDITIONS AND GRADING - LOWER

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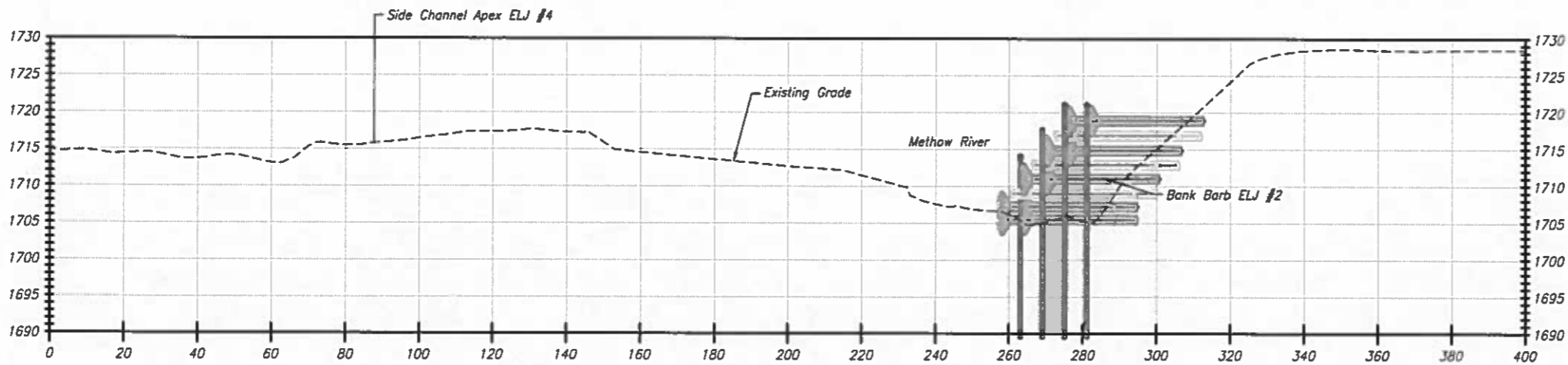
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PROPOSED CONDITIONS AND GRADING - LOWER

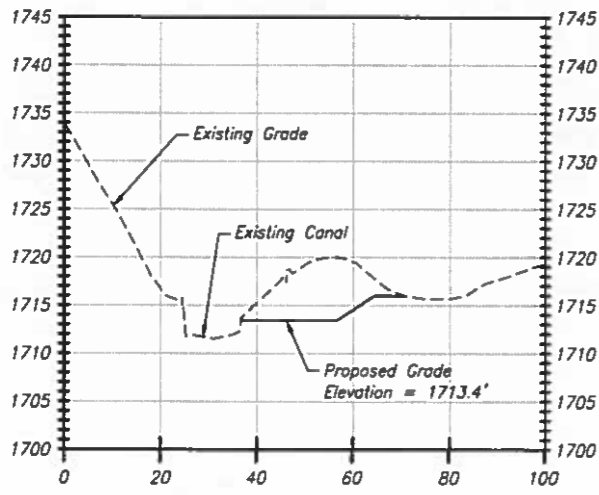
SHEET 9 OF 19



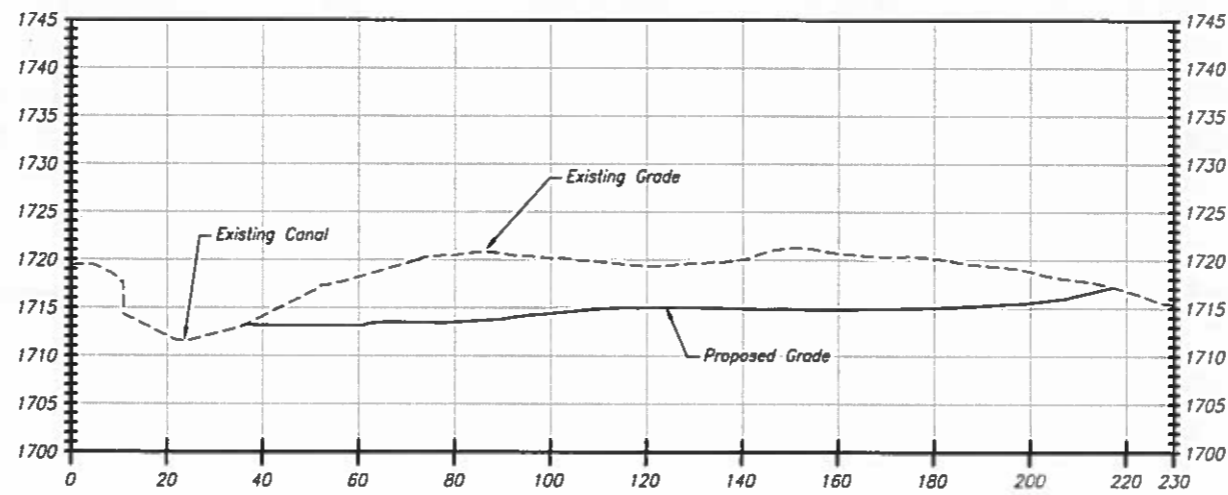
Profile 1 - Excavated Island Side Channel (Sheet 7)
Horizontal Scale: 1"=20'
Vertical Scale: 1"=10'



Cross-Section A-A' - Upper Mainstem and Island Side Channel (Sheet 7)
Horizontal Scale: 1"=20'
Vertical Scale: 1"=10'



Cross-Section B-B' - Spoils (Sheet 7)
Horizontal Scale: 1"=20'
Vertical Scale: 1"=10'



Cross-Section C-C' - Spoils (Sheet 7)
Horizontal Scale: 1"=20'
Vertical Scale: 1"=10'

LEGEND

- Existing Grade
- _____ Proposed Grade

NOTES

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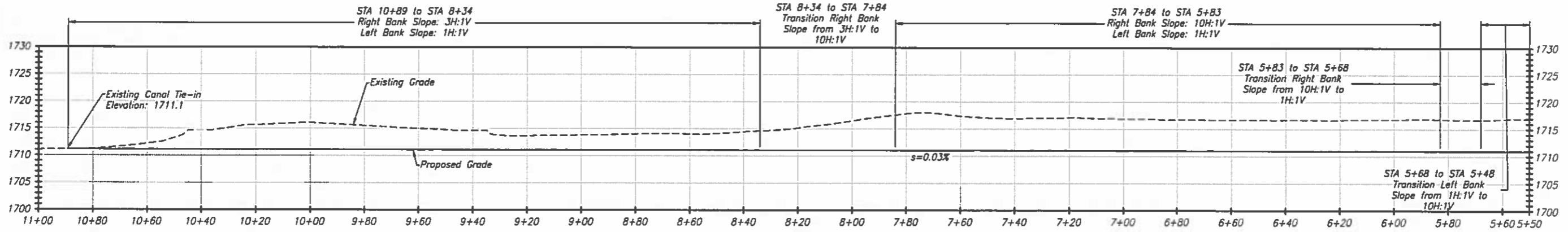
METHOW SUBBASIN
BARKLEY BEAR HABITAT IMPROVEMENT PROJECT
PROFILE 1 AND CROSS-SECTIONS A-A', B-B' AND C-C'

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NOT FOR CONSTRUCTION

Sheet ID 2020-01-1

PROFILE 1 AND
CROSS-SECTIONS A-A',
B-B' AND C-C'

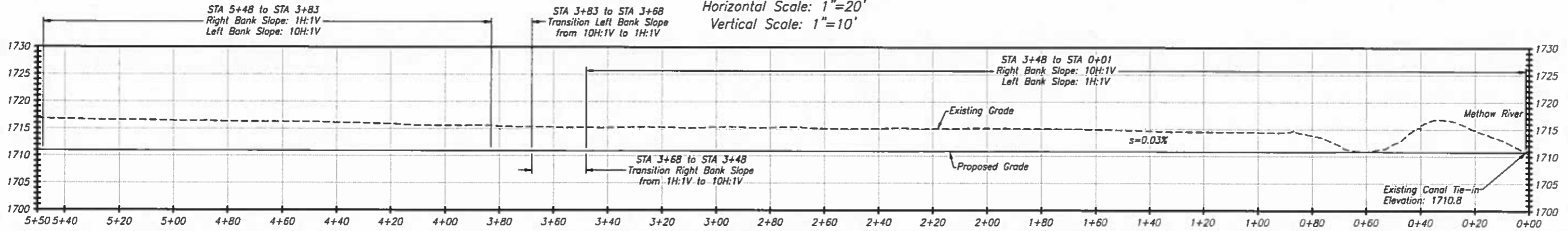
SHEET 10 OF 10



Profile 2 - Floodplain Scallop Stations 11+00 to 5+50 (Sheet 8)

Horizontal Scale: 1"=20'

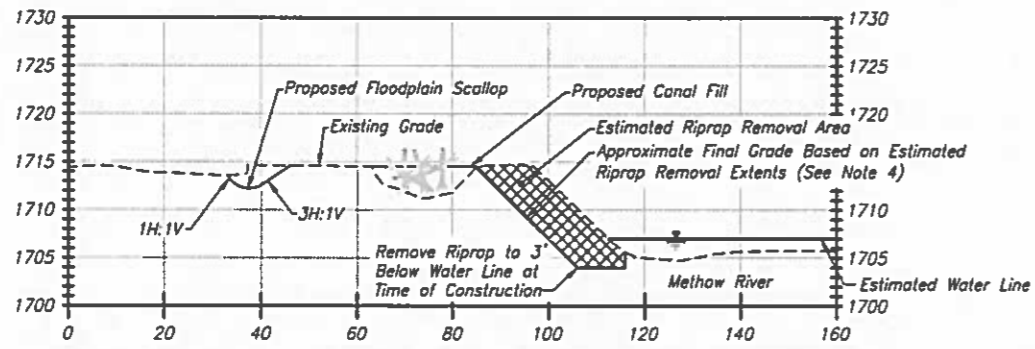
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Profile 2 - Floodplain Scallop Stations 5+50 to 0+00 (Sheet 8)

Horizontal Scale: 1"=20'

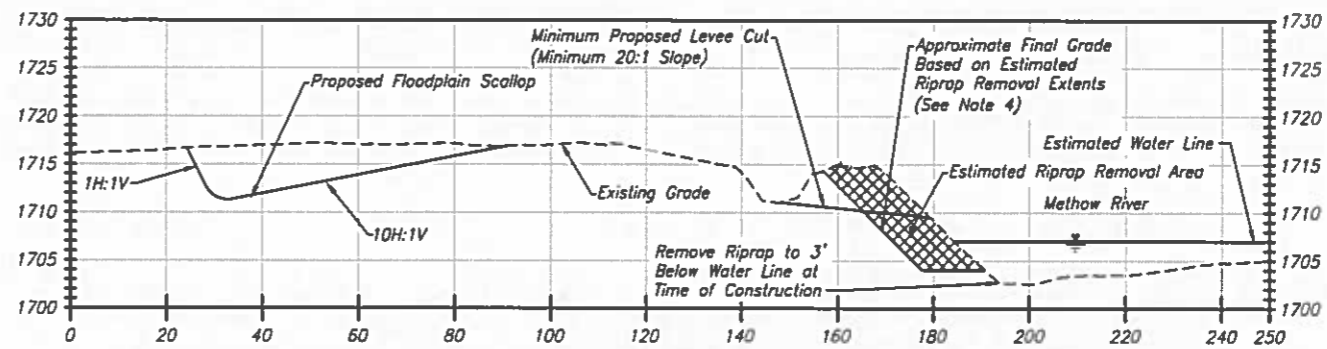
Vertical Scale: 1"=10'



Cross-Section D-D' - Floodplain Scallop and Canal Fill (Sheet 8)

Horizontal Scale: 1"=20'

Vertical Scale: 1"=10'



Cross-Section E-E' - Floodplain Scallop and Levee Cut (Sheet 8)

Horizontal Scale: 1"=20'

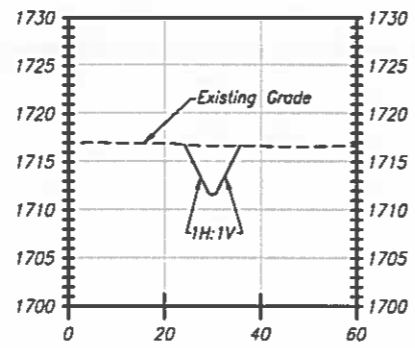
Vertical Scale: 1"=10'

LEGEND

- Existing Grade
- Proposed Grade

NOTES

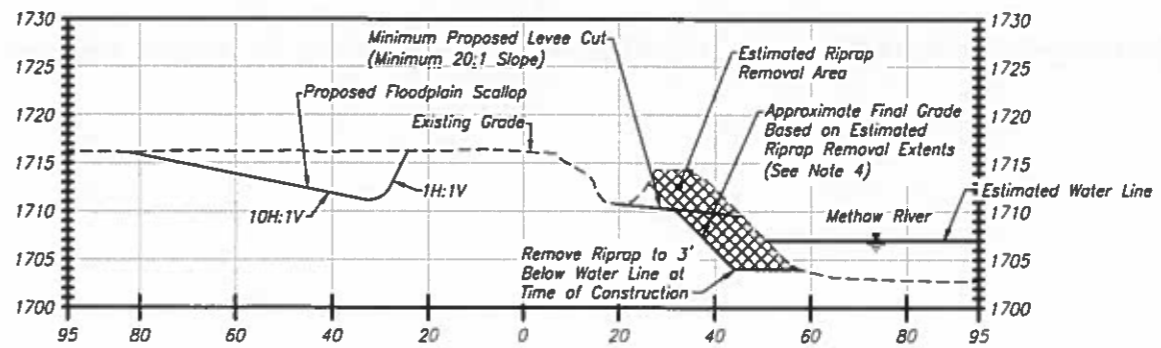
1. Topography provided by USBR in GIS format and comprised of multiple data sources of various temporal resolution.
2. Elevations are in feet, North American Vertical Datum of 1988.
3. Low water lines are estimates only. Water level at time of construction may be different depending on flows.
4. The "Approximate Final Grade" shown represents the final grade based on estimates of riprap removal extents. The actual grade will depend on the actual depth and extents of the riprap with no further grading beneath that. The "Minimum Proposed Levee Cut" will be the minimum final grade regardless of riprap extents.



Cross-Section F-F' - Floodplain Scallop (Sheet 8)

Horizontal Scale: 1"=20'

Vertical Scale: 1"=10'



Cross-Section G-G' - Floodplain Scallop and Levee Cut (Sheet 8)

Horizontal Scale: 1"=20'

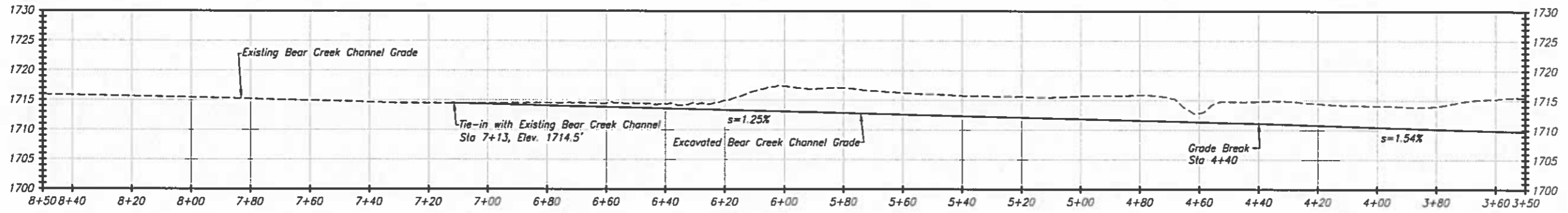
Vertical Scale: 1"=10'

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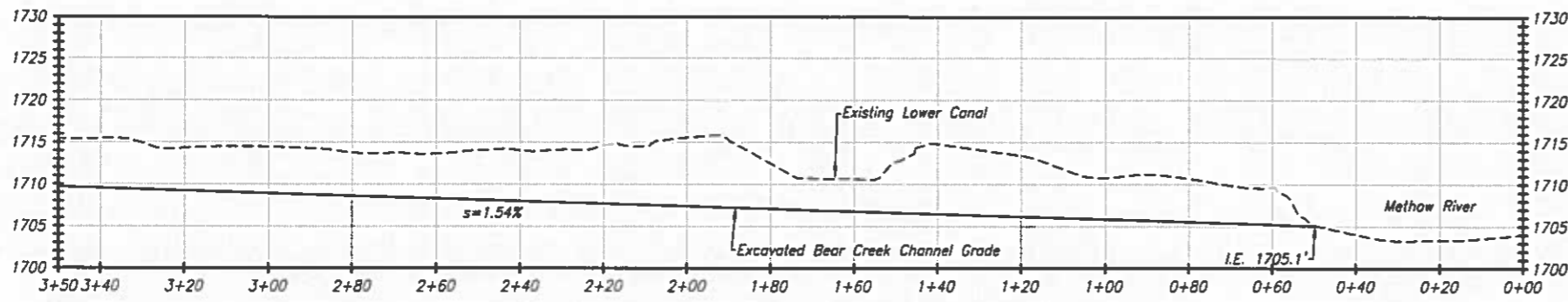
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WASHINGTON

METHOW SUBBASIN
BARKLEY BEAR HABITAT IMPROVEMENT PROJECT
PROFILE 2, CROSS-SECTIONS D-D', E-E', F-F' AND G-G'

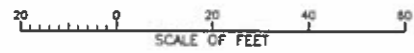
DRAFT 100% DESIGN
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Profile 3 - Bear Creek Stations 8+50 to 3+50 (Sheet 9)
Horizontal Scale: 1"=20'
Vertical Scale: 1"=10'



Profile 3 - Bear Creek Stations 3+50 to 0+00 (Sheet 9)
Horizontal Scale: 1"=20'
Vertical Scale: 1"=10'



NOTES

1. Topography provided by USBR in GIS format and comprised of multiple data sources of various temporal resolution.
2. Elevations are in feet, North American Vertical Datum of 1988.

LEGEND

- Existing Grade
- Proposed Grade

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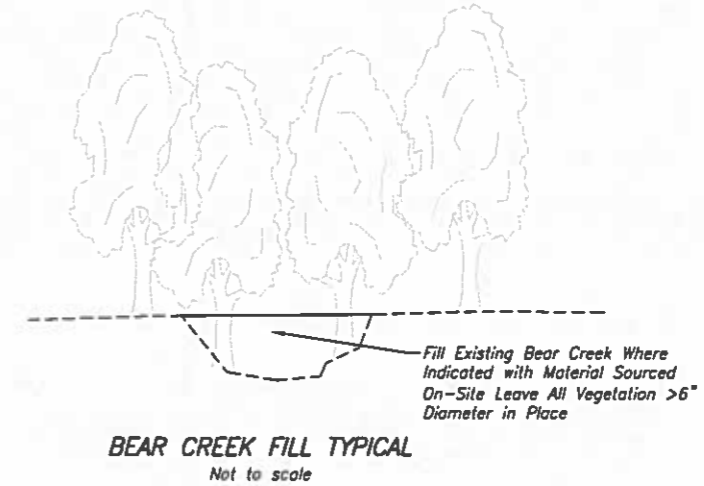
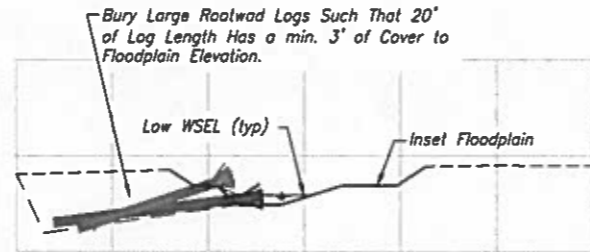
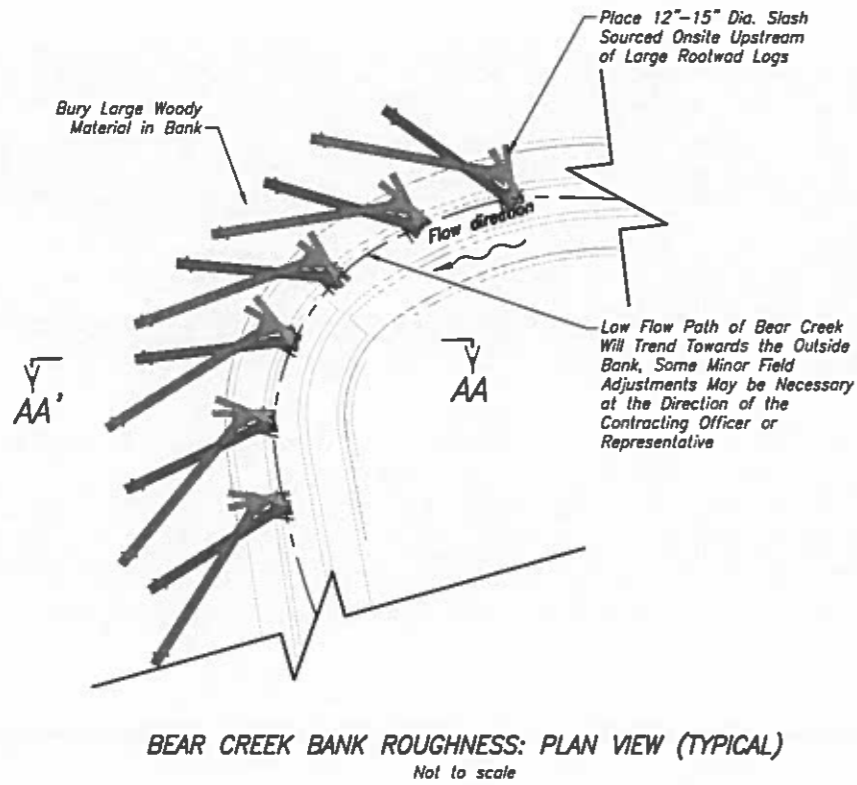
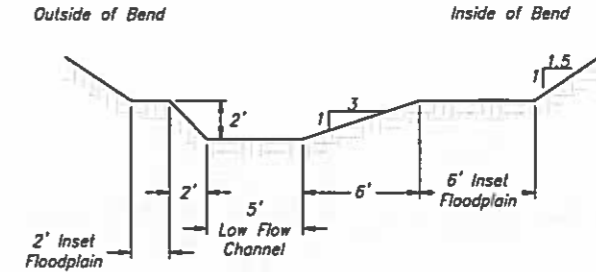
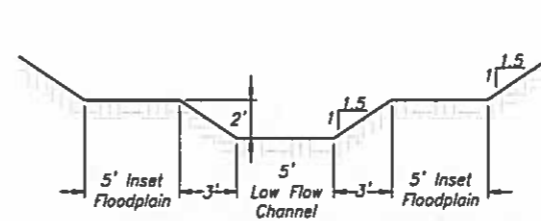
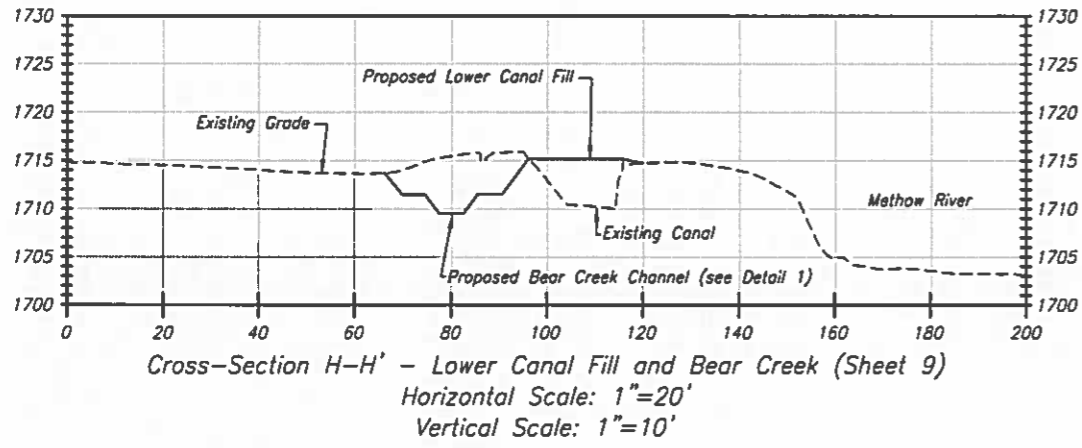
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METHOW SUBBASIN
BARKLEY BEAR HABITAT IMPROVEMENT PROJECT
PROFILE 3

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Date: 10/20/20 2020-01-

PROFILE 3

SHEET 12 OF 19



LEGEND

- Existing Grade
- Proposed Grade

NOTES

1. Topography provided by USBR in GIS format and comprised of multiple data sources of various temporal resolution.
2. Elevations are in feet, North American Vertical Datum of 1988.

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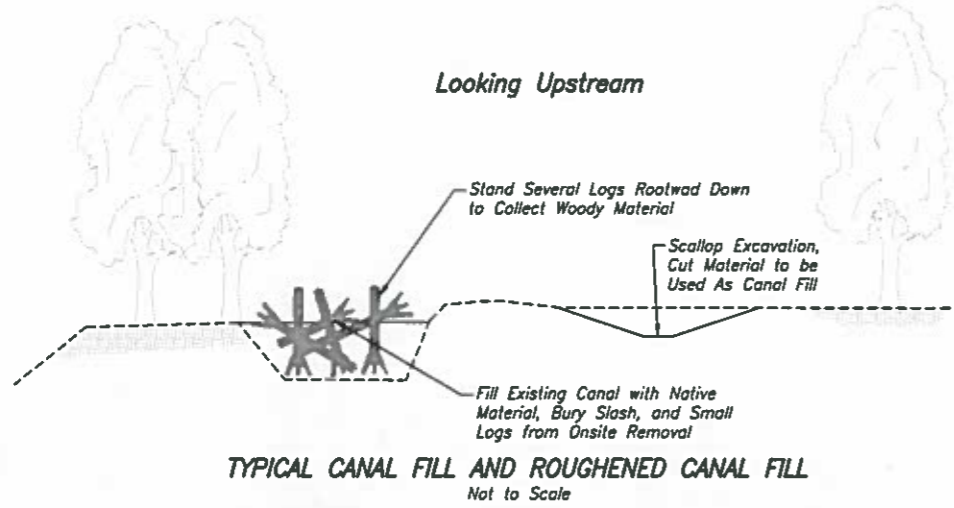
U.S. DEPARTMENT OF THE INTERIOR
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COLUMBIA/SWACRE RIVER SALMON RECOVERY PROGRAM
WASHINGTON
METHOW SUBBASIN
BARKLEY BEAR HABITAT IMPROVEMENT PROJECT
CROSS-SECTION H-H' AND DETAILS

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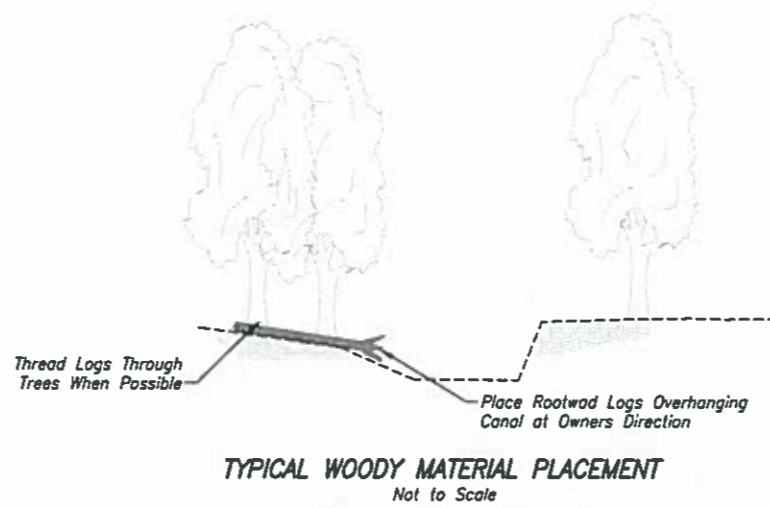
CROSS-SECTION H-H'
AND DETAILS

SHEET 13 OF 19

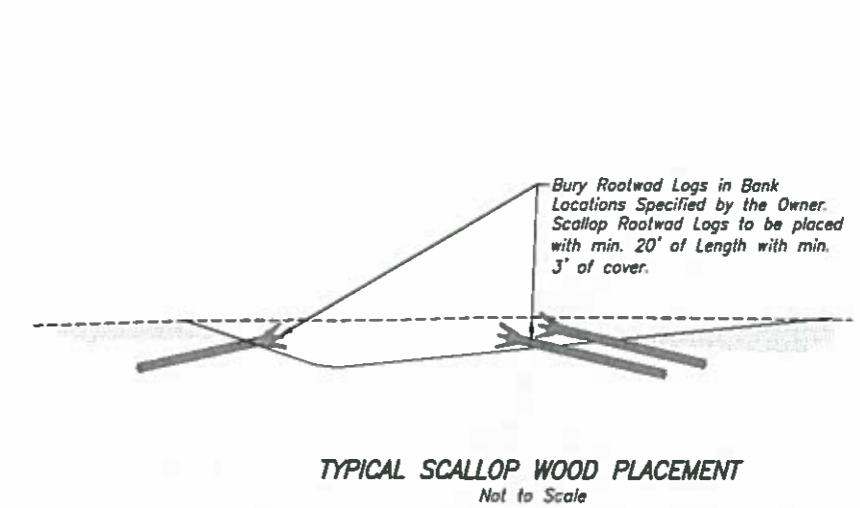
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TYPICAL CANAL FILL AND ROUGHENED CANAL FILL
Not to Scale



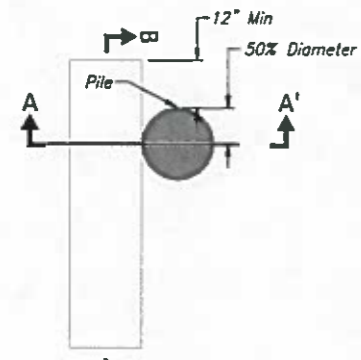
TYPICAL WOODY MATERIAL PLACEMENT
Not to Scale



TYPICAL SCALLOP WOOD PLACEMENT
Not to Scale

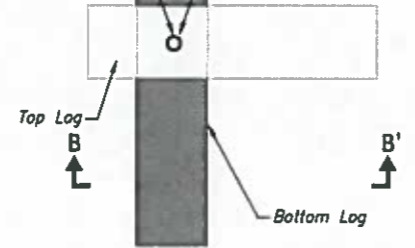
NOTES

1. Typical Canal Fill may not include pictured rootwad logs and native material. Backfill typical canal areas to grade.



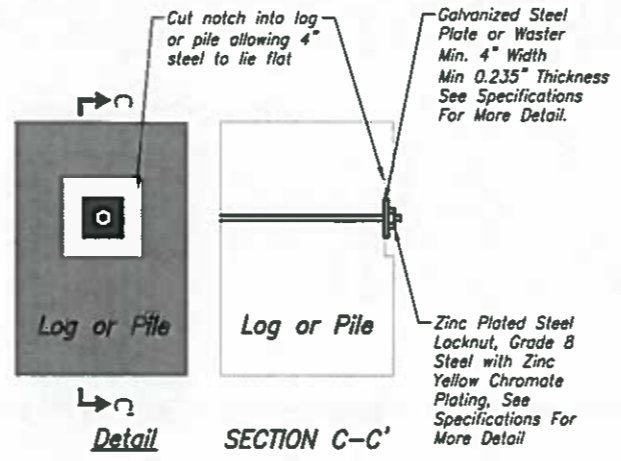
Secure Threaded Rod With 7/8" Galvanized Steel Nut and Galvanized Steep Plate See Connection Detail For More Information

Drill Through Center of Pile, Normal to Connecting Log

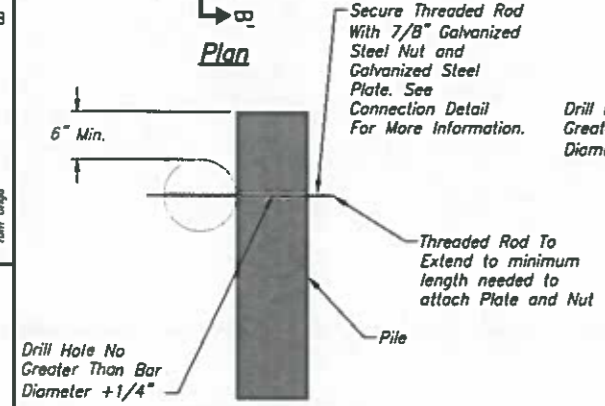


Drill Hole No Greater Than Bar Diameter +1/4"

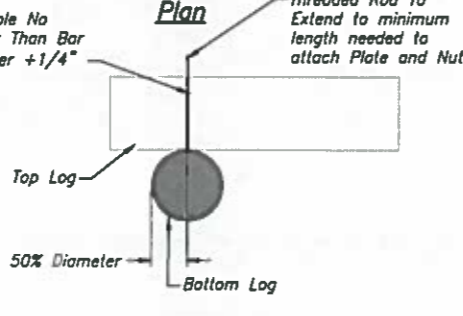
Threaded Rod To Extend to minimum length needed to attach Plate and Nut



CONNECTION DETAIL
Not to Scale



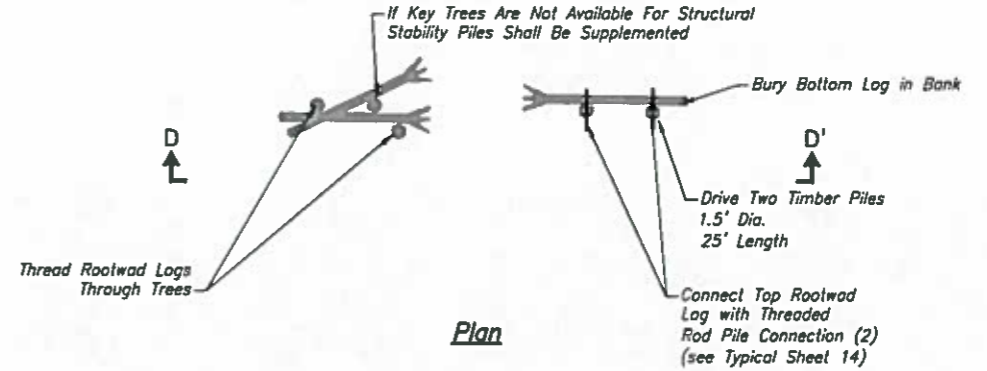
SECTION A-A'
THREADED ROD PILE CONNECTION
Not to Scale



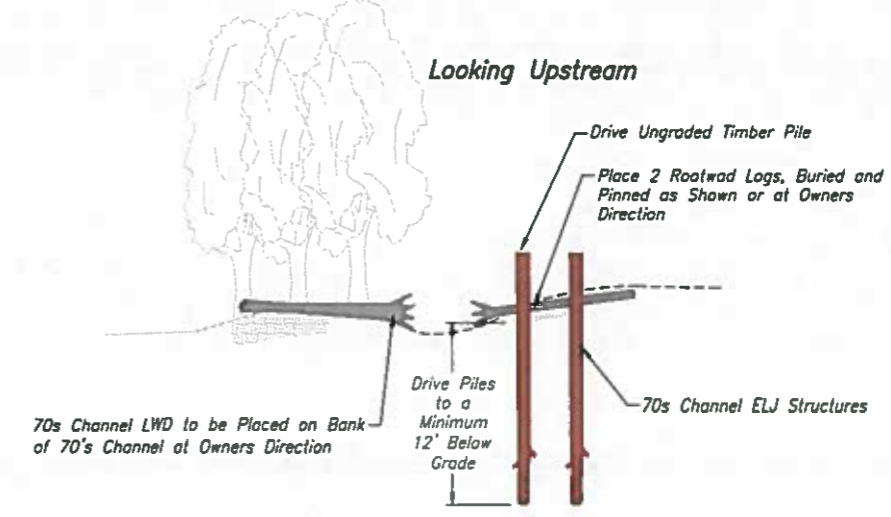
SECTION B-B'
THREADED ROD VERTICAL CONNECTION
Not to Scale

NOTES

1. All Connections Shall Be Approved By The Engineer.
2. Steel Threaded Rod Shall Be 7/8-inch Grade 8 Galvanized Steel, Meeting The Requirements Of ASTM 354BD. See Specifications For More Information.
3. Plates Shall be Galvanized Steel And Shall Be Sized To Fit The Threaded Rod. See Specifications For More Information
4. Locknuts Shall be Zinc Yellow Chromate Plated Grade 8 And Be Sized To Fit The Threaded Rod. See Specifications For More Information



Plan



SECTION D-D'

70'S CHANNEL FEATURES TYPICAL
Not to Scale

LEGEND

- Existing Grade
- Proposed Grade

NOTE

1. Both the LWD and ELJ versions of the the 70's channel features may require minor excavation and backfill for the placement of rootwad logs at the direction of the Engineer or Owner

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METHOW SUBBASIN
BARKLEY BEAR HABITAT IMPROVEMENT PROJECT
WOOD FEATURE TYPICAL SHEET

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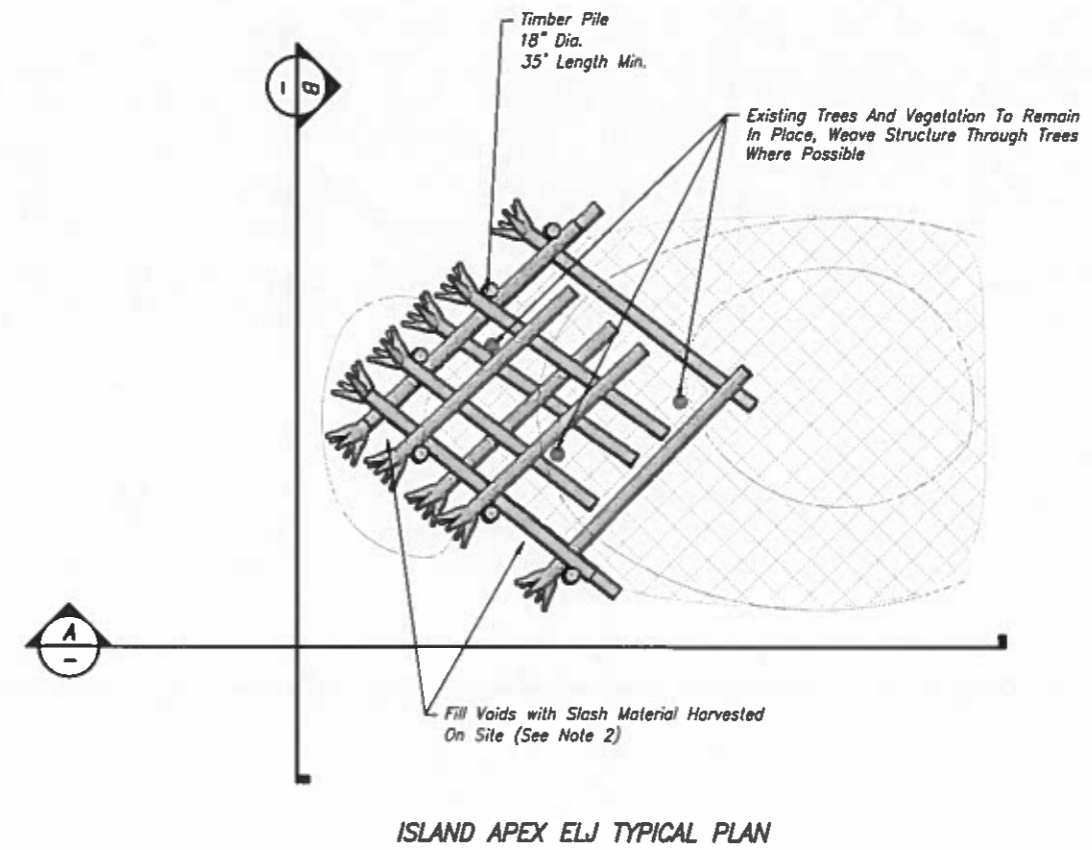
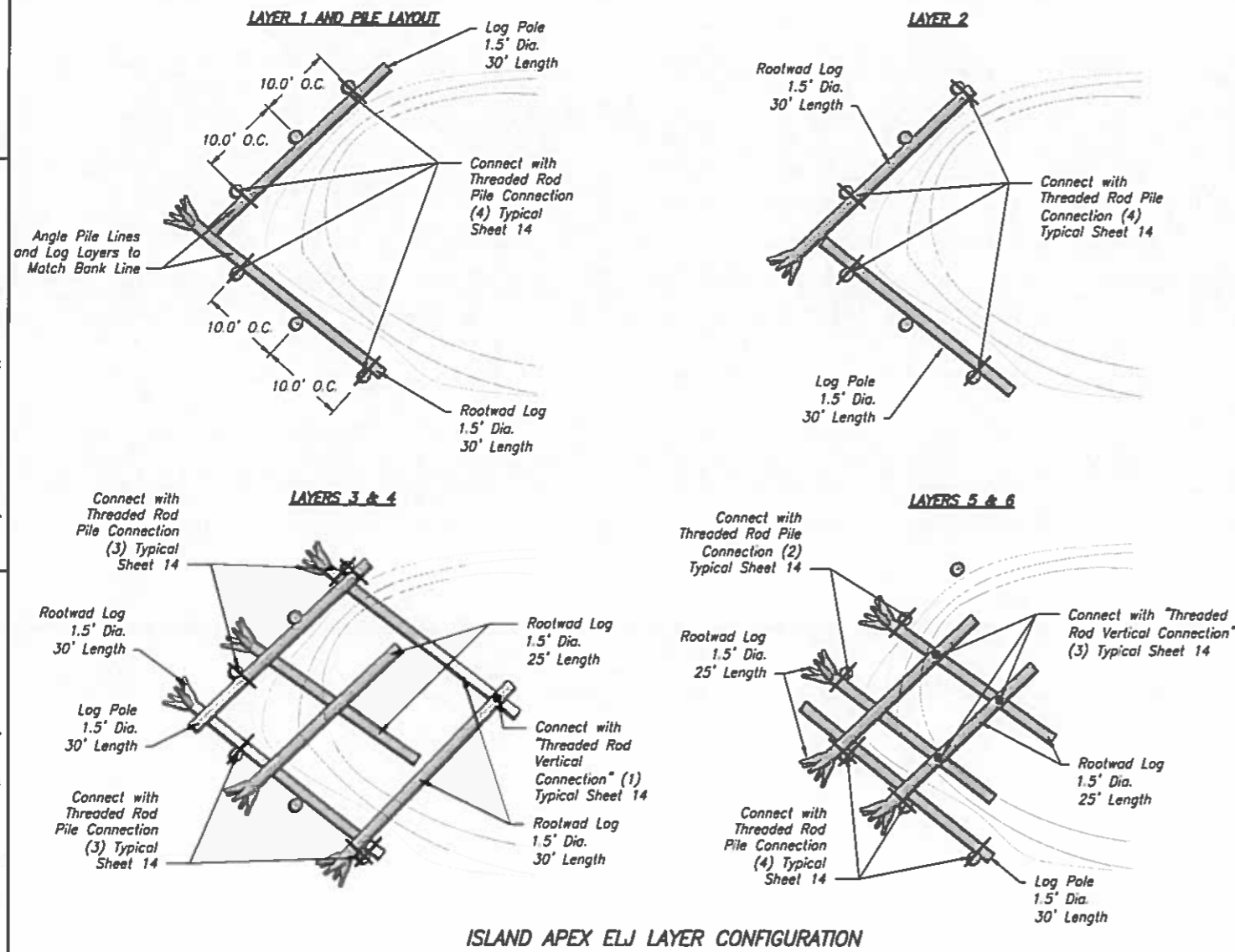
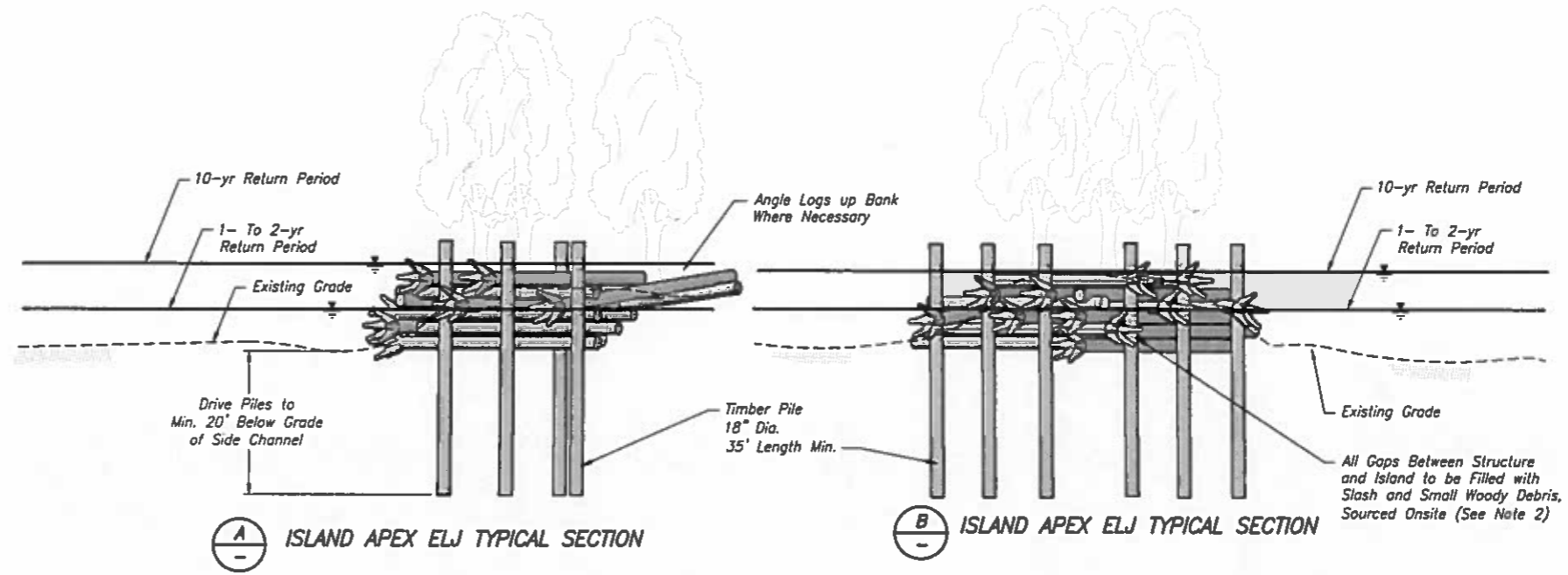
WOOD FEATURE TYPICAL SHEET

TBD
SHEET 14 OF 19

CAD FILENAME: 0261-PA-Structures/Details/wood/Features/Byg

TYPICAL STRUCTURE LWM QUANTITIES					
Layer	Item	Log Dia.	Rootwad Dia.	Min. Log Length	Quantity
-	Timber Pile	1.5'	-	30'	6
1	Rootwad Log	1.5'	4.5'	30'	1
1	Log Pole	1.5'	-	30'	1
2	Rootwad Log	1.5'	4.5'	30'	1
2	Log Pole	1.5'	-	30'	1
3	Rootwad Log	1.5'	4.5'	30'	2
3	Rootwad Log	1.5'	4.5'	25'	1
4	Rootwad Log	1.5'	4.5'	30'	1
4	Rootwad Log	1.5'	4.5'	25'	1
4	Log Pole	1.5'	-	30'	1
5	Rootwad Log	1.5'	4.5'	25'	2
5	Log Pole	1.5'	-	30'	1
6	Rootwad Log	1.5'	4.5'	25'	2

Typical Structure Connections
Threaded Rod Pile Connections: 20
Threaded Rod Vertical Connections: 4



NOTES

- The pile locations and structure layout shown in the Island Apex ELJ detail are estimates. The exact pile locations and structure layout will be determined by existing conditions at the time of construction and as directed by the owner.
- Slash should be added throughout the construction of the structure and incorporated into voids as layers of the structure is built. Only adding slash after the structure has been built is not acceptable.

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BARKLEY BEAR HABITAT IMPROVEMENT PROJECT
ISLAND APEX ELJ DETAILS

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ISLAND APEX ELJ DETAIL

TBD

SHEET 15 OF 19

CAD FILENAME: 0261-PR-Structure Detail Small Bank Apex ELJ.dwg

D

C

B

PLANNED BY: Tom Draper

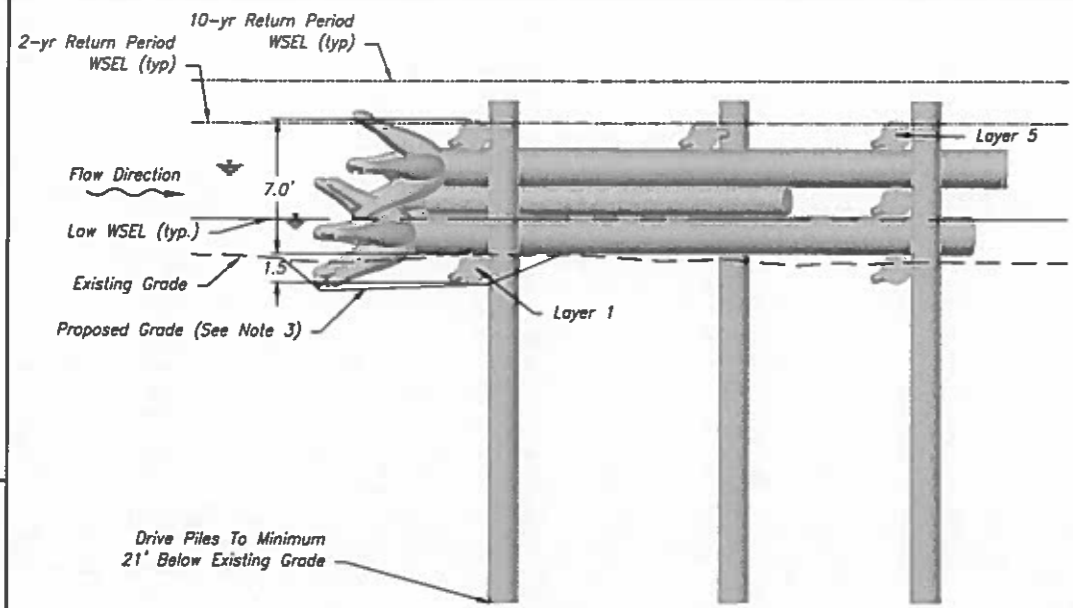
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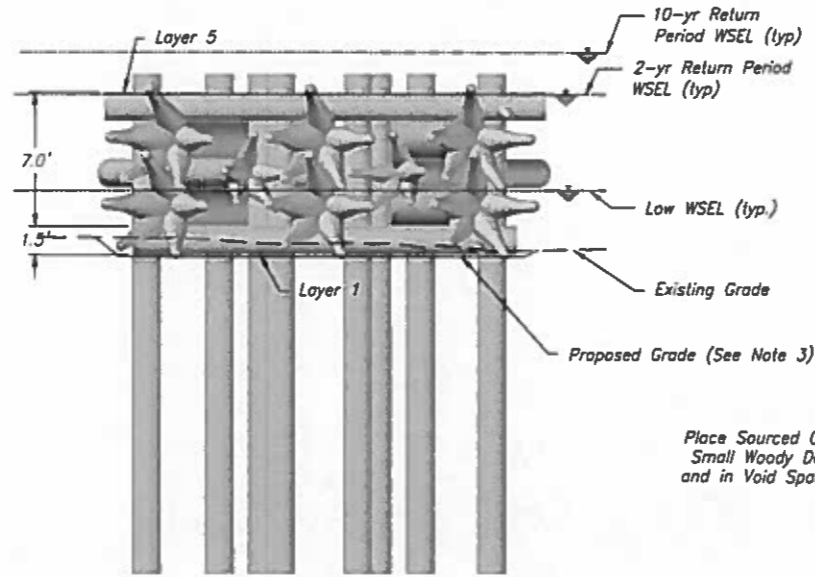
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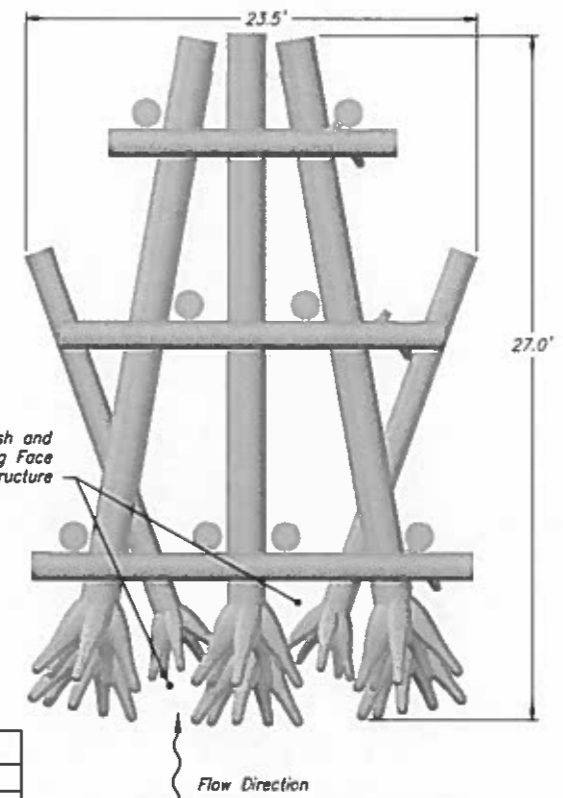
5



SIDE CHANNEL APEX - SIDE VIEW



SIDE CHANNEL APEX - FRONT VIEW



SIDE CHANNEL APEX PLAN

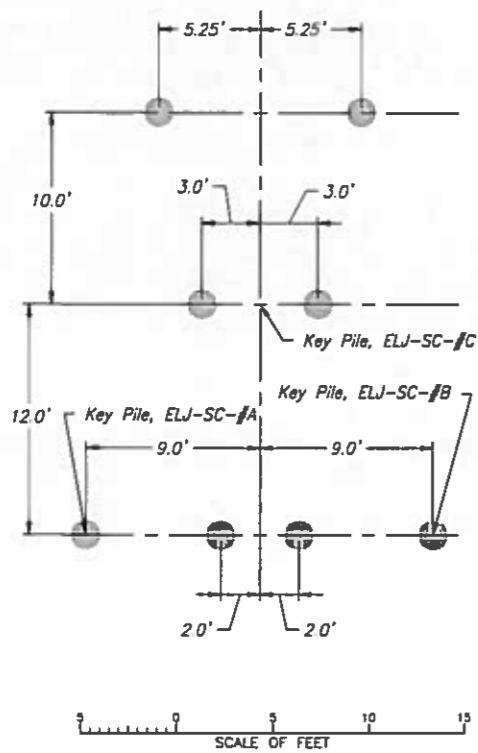
NOTE

1. Pile location dimensions are approximate relative to the key pile locations. Exact pile locations will be field fit based on the realistic size and diameters of the Rootwad logs and log poles.
2. Slash should be added throughout the construction of the structure and incorporated into voids as layers of the structure is built. Only adding slash after the structure has been built is not acceptable.
3. Excavate to install footer log as close as possible to flush with existing grade, while remaining level, maximum excavation dept of 1.5'. Minor additional excavation may be required for the rootwads of the second layer to be installed flush with the footer log.

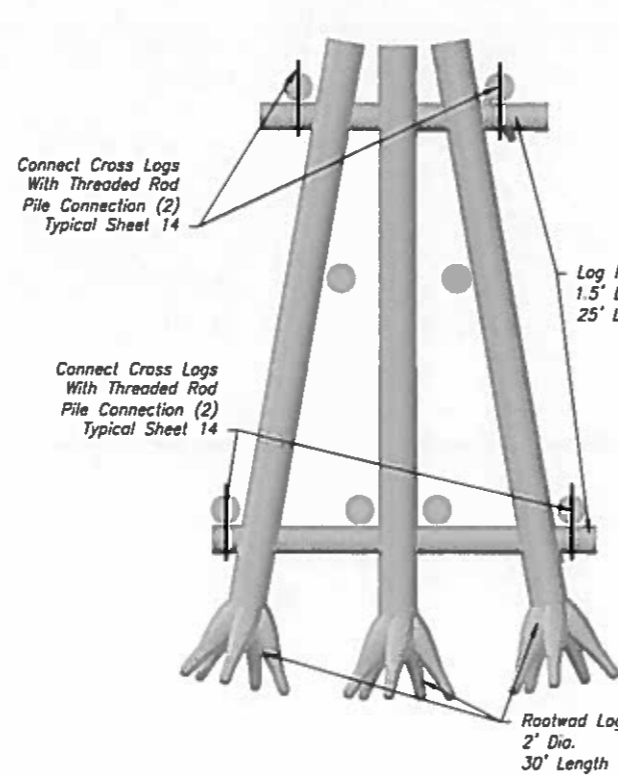
ELJ CONTROL POINTS		
Control Point	Northing	Easting
ELJ-SC-1A	530780.0	1803197.0
ELJ-SC-1B	530792.0	1803183.5
ELJ-SC-1C	530777.0	1803182.5
ELJ-SC-2A	530654.0	1803032.0
ELJ-SC-2B	530671.0	1803027.0
ELJ-SC-2C	530659.0	1803018.0
ELJ-SC-3A	530690.0	1802914.0
ELJ-SC-3B	530707.0	1802909.0

TYPICAL STRUCTURE LWM QUANTITIES					
Layer	Item	Log Dia.	Rootwad Dia.	Min. Length	Quantity
-	Timber Pile	1.5'	-	30'	8
1	Log Pole	1.5'	-	25'	2
2	Rootwad Log	2'	6'	30'	3
3	Rootwad Log	1.5'	4.5'	20'	2
3	Log Pole	1.5'	-	25'	1
4	Rootwad Log	2'	6'	30'	3
5	Log Pole	1.5'	-	25'	3

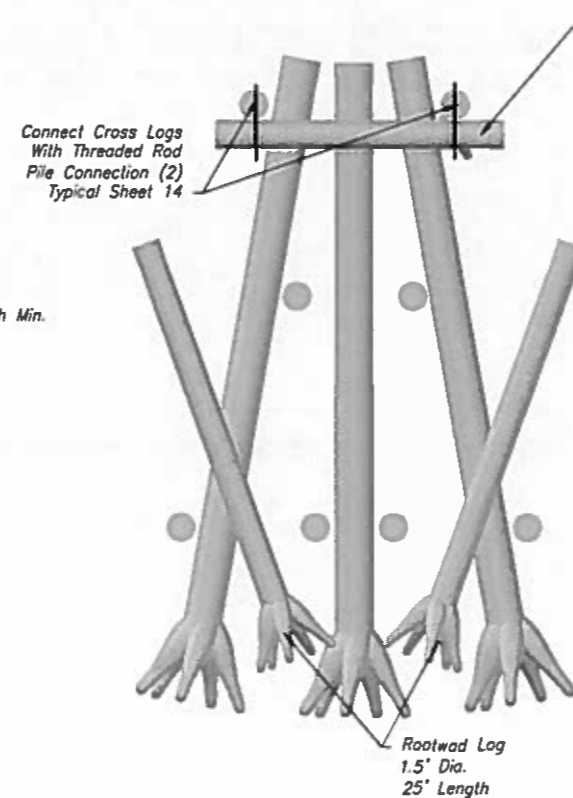
Typical Structure Connections
Threaded Rod Pile Connections: 14



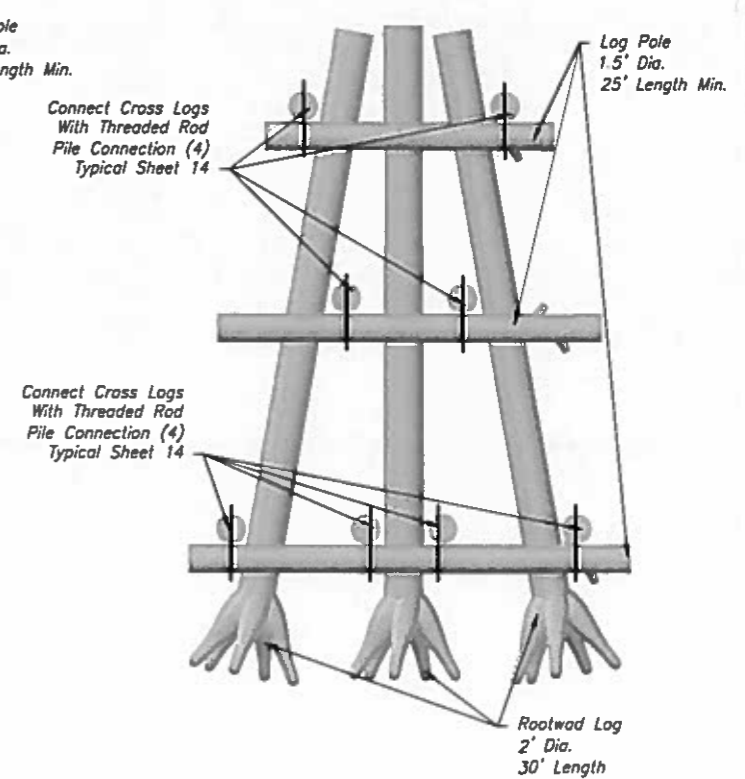
SIDE CHANNEL APEX - PILE LAYOUT



SIDE CHANNEL APEX - LAYERS 1 & 2



SIDE CHANNEL APEX - LAYERS 2 & 3



SIDE CHANNEL APEX - LAYER 4 & 5

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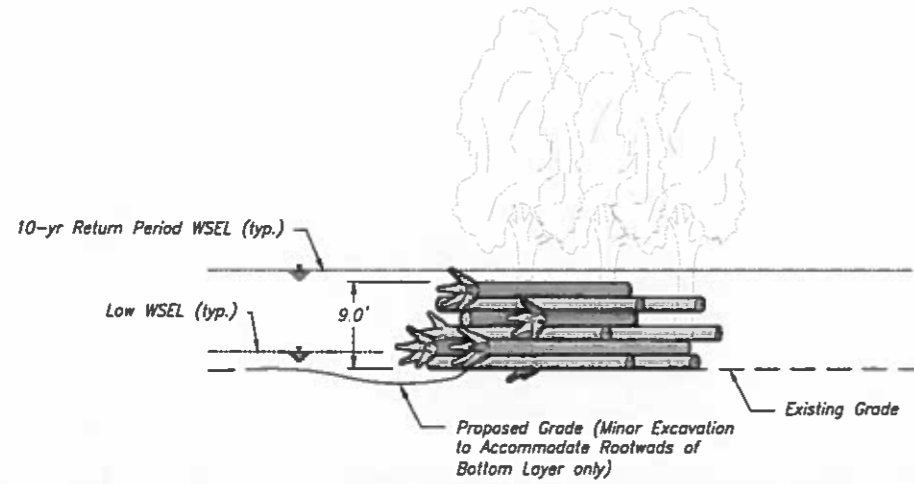
U.S. DEPARTMENT OF THE INTERIOR
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WASHINGTON
METHOW SUBBASIN
BARKLEY BEAR HABITAT IMPROVEMENT PROJECT
SIDE CHANNEL ELJ DETAILS

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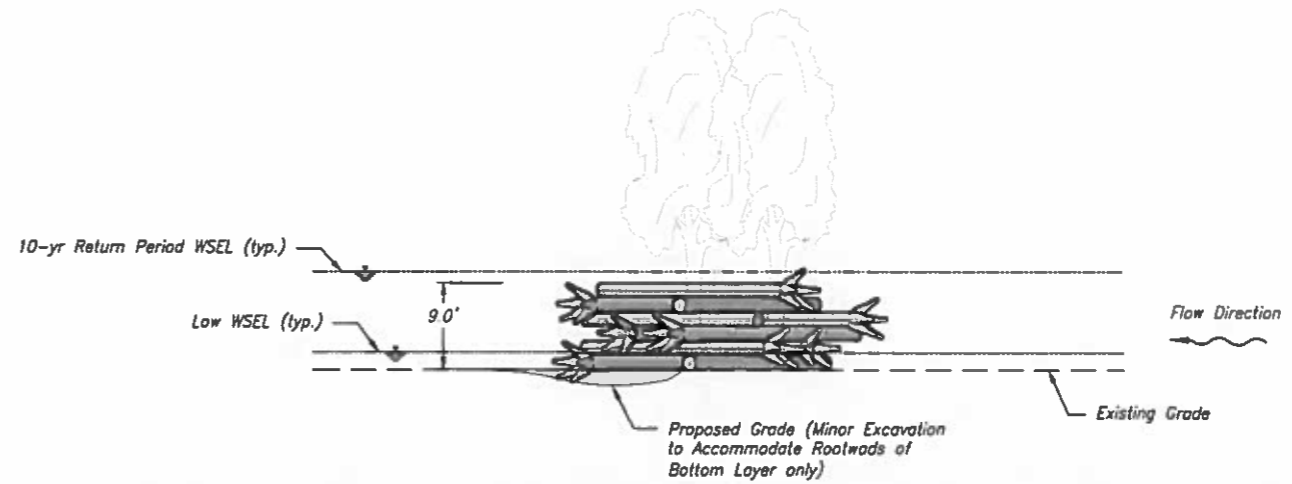
SIDE CHANNEL ELJ DETAILS

TBD

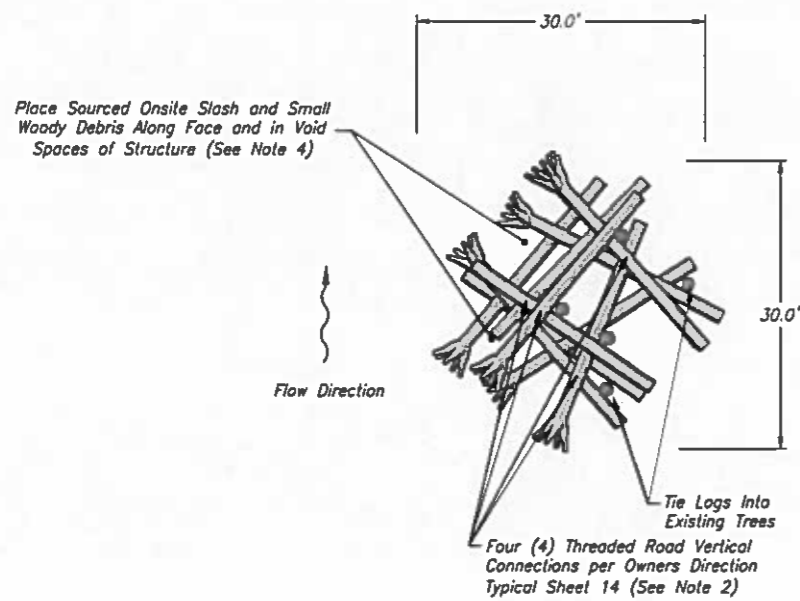
SHEET 16 OF 19



BANK COMPLEXITY ELJ - FRONT VIEW



BANK COMPLEXITY ELJ - SIDE VIEW



BANK COMPLEXITY ELJ - PLAN VIEW

NOTES:

1. Locations and orientations of logs are estimates. Exact locations will be determined by the Owner in the field based on the locations and availability of trees
2. Each Bank Complexity ELJ will include 4 "Threaded Rod Vertical Connections" as shown on Sheet 14. Locations of Connections to be determined in the field by the Owner.
3. Contractor shall be responsible for all work to ensure the connections are drilled and secured in a manner that meets the requirements of the Vertical Threaded Rod detail, and the relevant specifications.
4. Slash should be added throughout the construction of the structure and incorporated into voids as layers of the structure is built. Only adding slash after the structure has been built is not acceptable.

TYPICAL STRUCTURE LWM QUANTITIES					
Layer	Item	Log Dia.	Rootwad Dia.	Min. Length	Quantity
1	Log Pole	1.5'	-	30'	1
1	Rootwad Log	1.5'	4.5'	30'	1
2	Rootwad Log	1.5'	4.5'	30'	2
3	Rootwad Log	1.5'	4.5'	30'	2
4	Log Pole	1.5'	-	30'	1
4	Rootwad Log	1.5'	4.5'	30'	1
5	Log Pole	1.5'	-	30'	1
5	Rootwad Log	1.5'	4.5'	30'	1
6	Rootwad Log	1.5'	4.5'	30'	1

Typical Structure Connections
Threaded Rod Vertical Connections: 4



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BANK COMPLEXITY ELJ DETAILS

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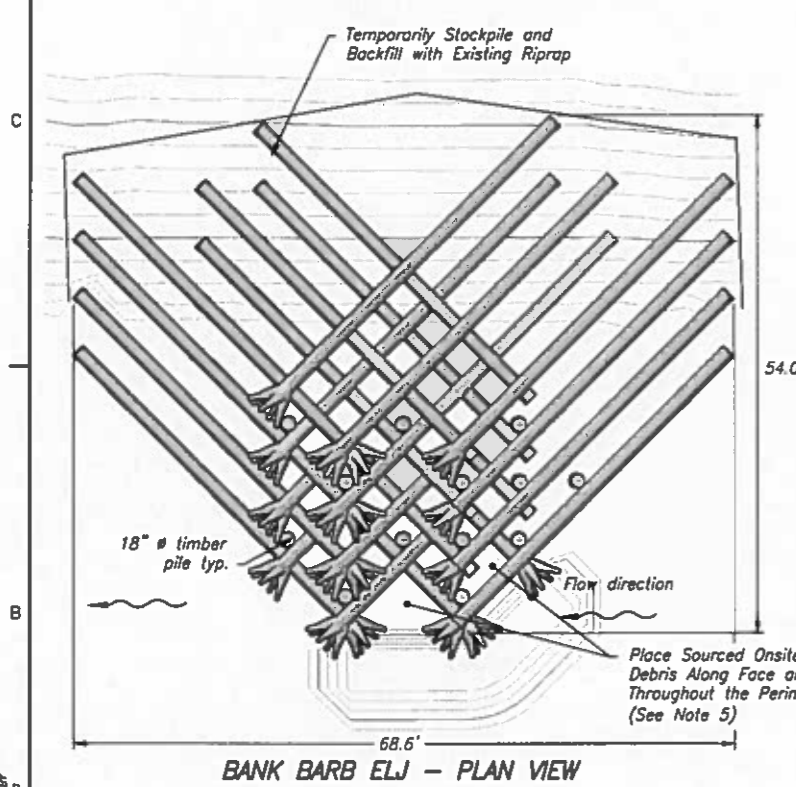
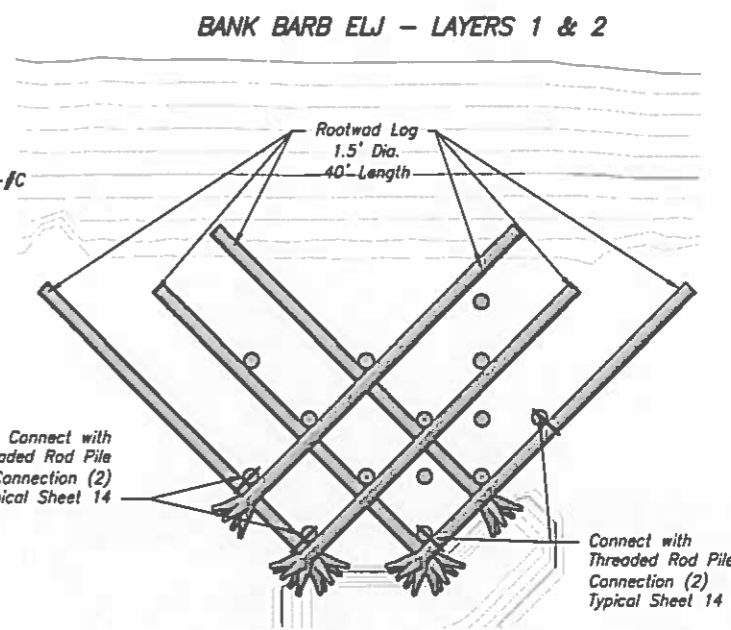
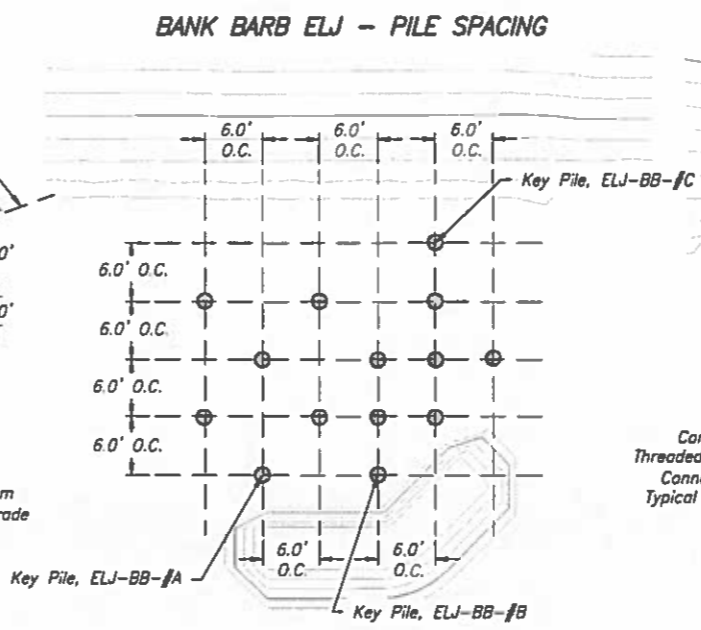
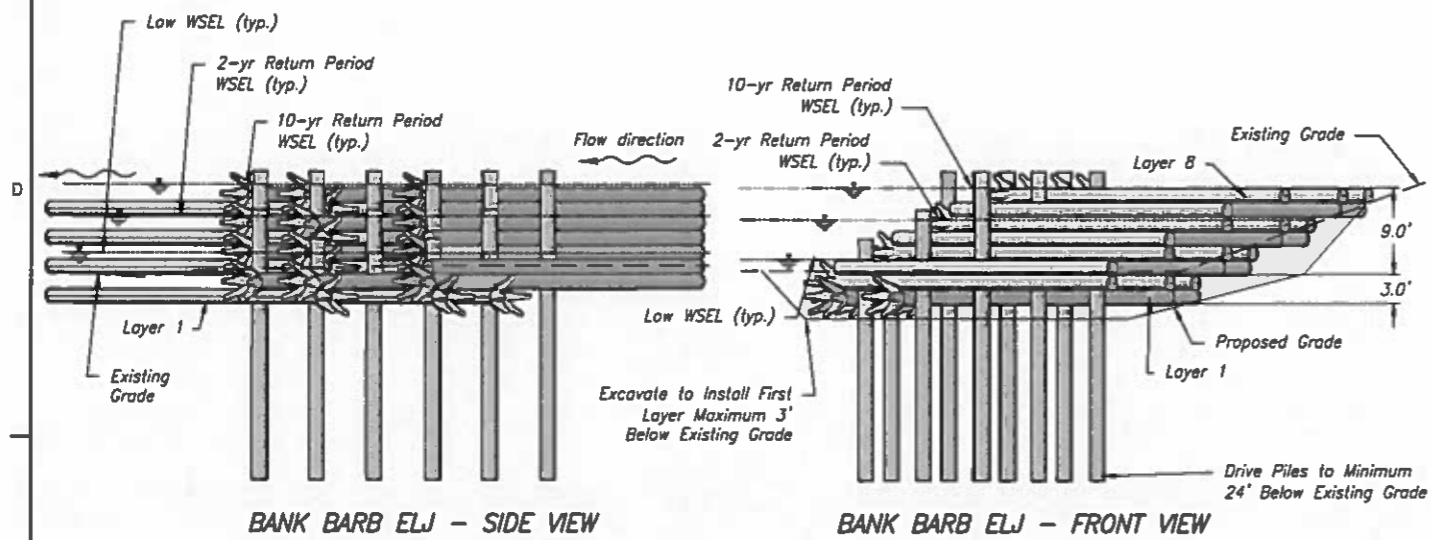
Sheet ID: 2020-01-

BANK COMPLEXITY ELJ
DETAILS

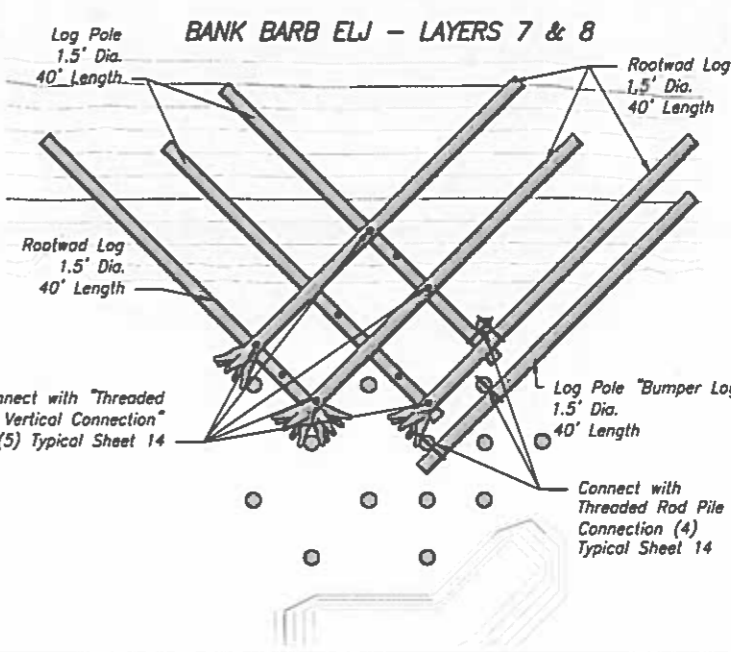
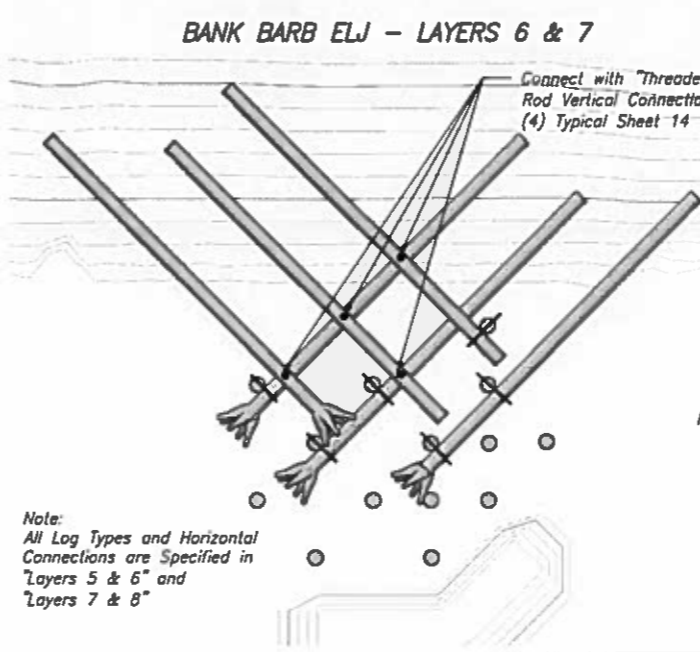
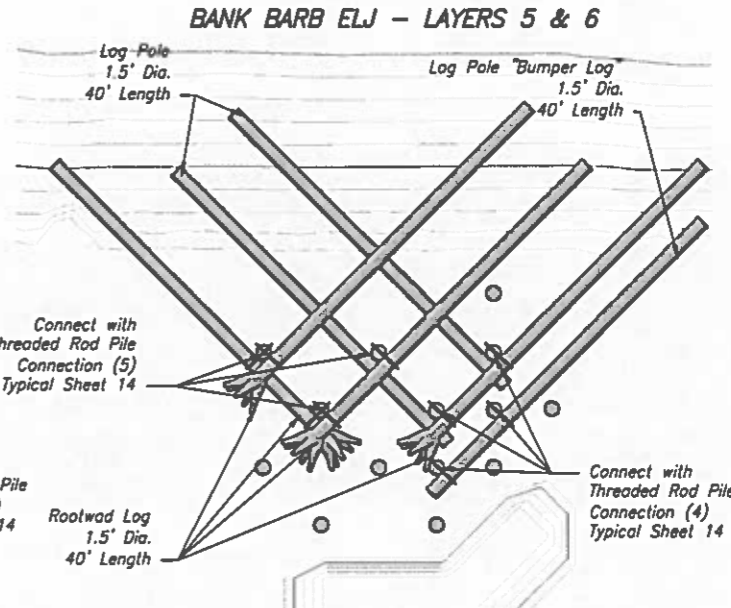
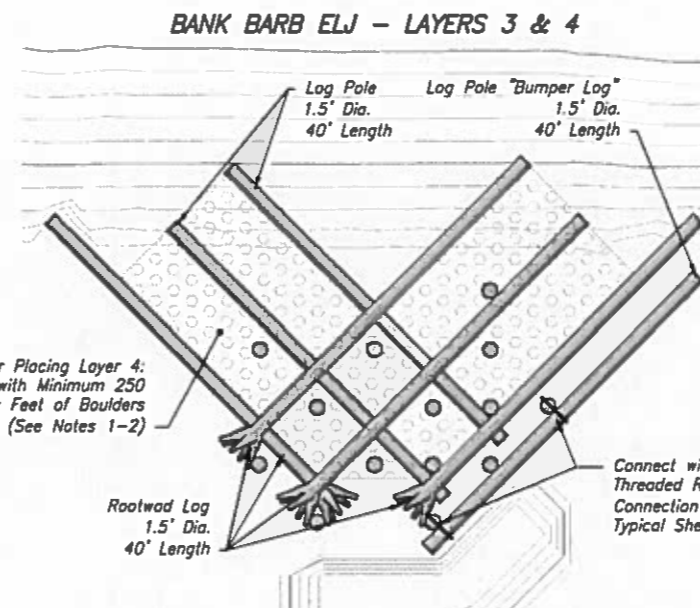
TBD

SHEET 17 OF 19

CAD FILENAME: 0281-P1-Structure Details Bank Complexity ELJ.dwg
 PLOTTED BY: Tom Crisp



ELJ CONTROL POINTS		
Control Point	Northing	Easting
ELJ-BB-1A	531206.0	1802925.5
ELJ-BB-1B	531217.0	1802929.5
ELJ-BB-1C	531230.5	1802908.5
ELJ-BB-2A	530977.5	1802825.5
ELJ-BB-2B	530989.0	1802829.5
ELJ-BB-2C	531002.0	1802808.5
ELJ-BB-3A	530744.5	1802727.5
ELJ-BB-3B	530756.0	1802731.0
ELJ-BB-3C	530769.5	1802710.5



TYPICAL STRUCTURE LWM QUANTITIES					
Layer	Item	Log Dia.	Rootwad Dia.	Min. Log Length	Quantity
-	Timber Pile	1.5'	-	35'	14
1	Rootwad Log	1.5'	4.5'	40'	3
2	Rootwad Log	1.5'	4.5'	40'	3
3	Rootwad Log	1.5'	4.5'	40'	1
3	Log Pole	1.5'	-	40'	3
4	Rootwad Log	1.5'	4.5'	40'	3
5	Rootwad Log	1.5'	4.5'	40'	1
5	Log Pole	1.5'	-	40'	3
6	Rootwad Log	1.5'	4.5'	40'	3
7	Rootwad Log	1.5'	4.5'	40'	1
7	Log Pole	1.5'	-	40'	3
8	Rootwad Log	1.5'	4.5'	40'	3

Typical Structure Connections
Threaded Rod Pile Connections: 19
Threaded Rod Vertical Connections: 9

- SCALE OF FEET
- NOTES**
- Boulders shall be native and shall not exceed 2.5' minimum dimension.
 - Contractor shall be responsible for placing and shifting boulders in the structures void spaces to construct the structure as shown.
 - Contractor shall be responsible for ensuring all connections meet the requirements of the connection detail and specifications.
 - Pile location dimensions are approximate relative to the key pile locations. Exact pile locations will be field fit based on the realistic size and diameters of the rootwad logs and log poles.
 - Slash should be added throughout the construction of the structure and incorporated into voids as layers of the structure is built. Only adding slash after the structure has been built is not acceptable.

Note:
All Log Types and Horizontal Connections are Specified in "Layers 5 & 6" and "Layers 7 & 8"

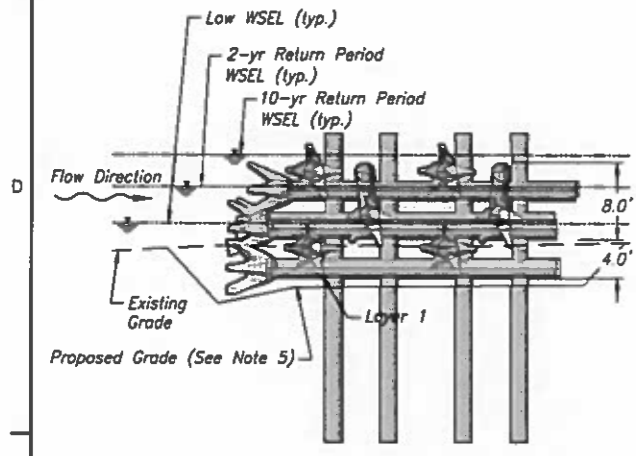
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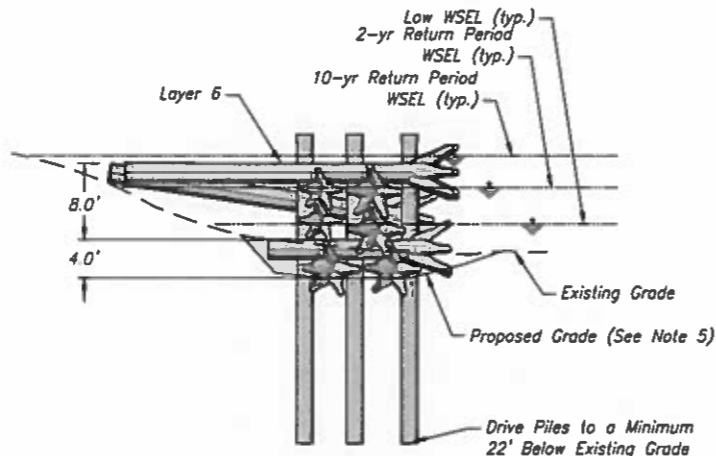
METHOW SUBBASIN
BARKLEY BEAR HABITAT IMPROVEMENT PROJECT
BANK BARB STRUCTURE DETAILS

DRAFT 100% DESIGN
NOT FOR CONSTRUCTION

DRAWN BY: JLD
CHECKED BY: JLD
REVIEWED BY: JLD
DATE: 10/1/20

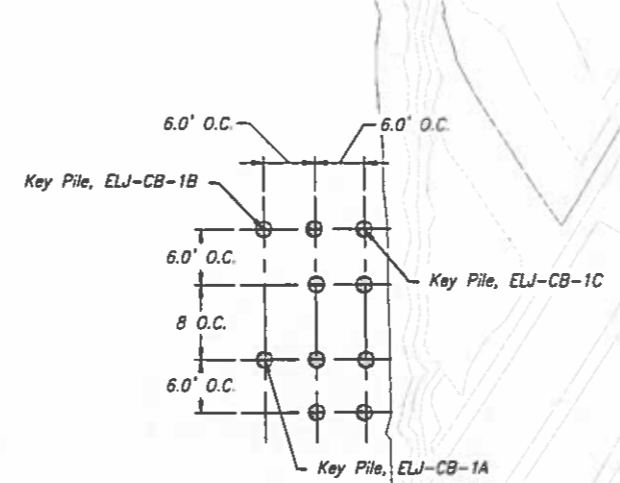


CHANNEL BARB ELJ - SIDE VIEW

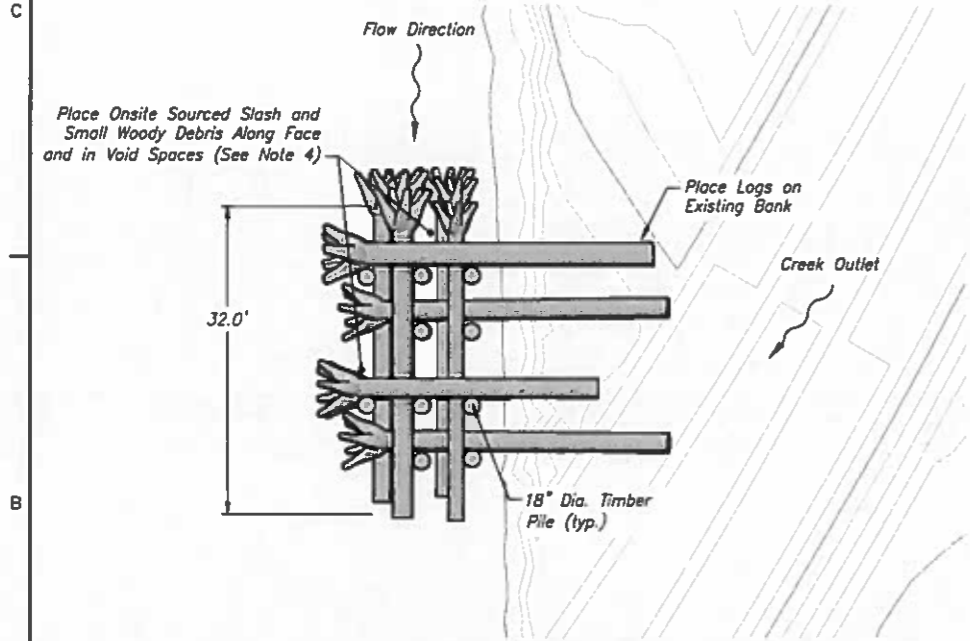
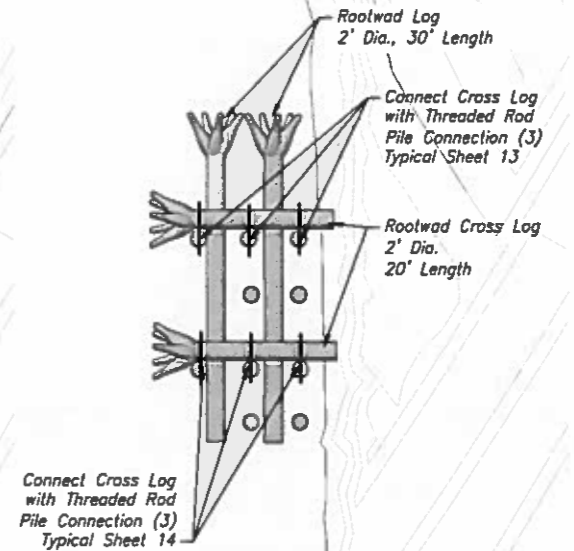


CHANNEL BARB ELJ - FRONT VIEW

CHANNEL BARB ELJ - PILE SPACING



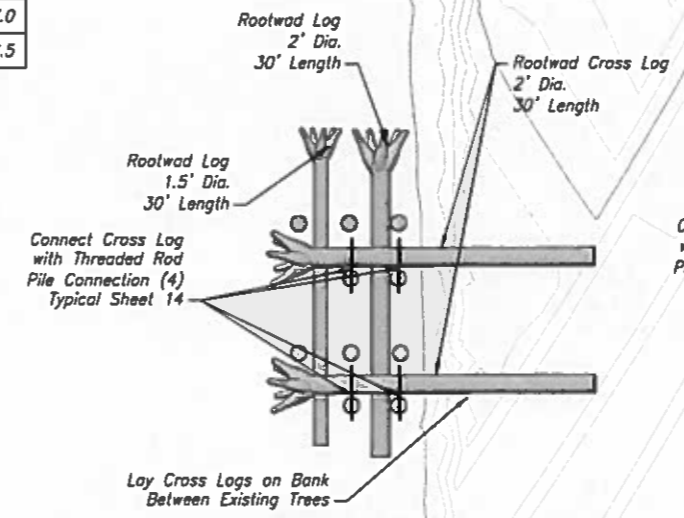
CHANNEL BARB ELJ - LAYERS 1 & 2



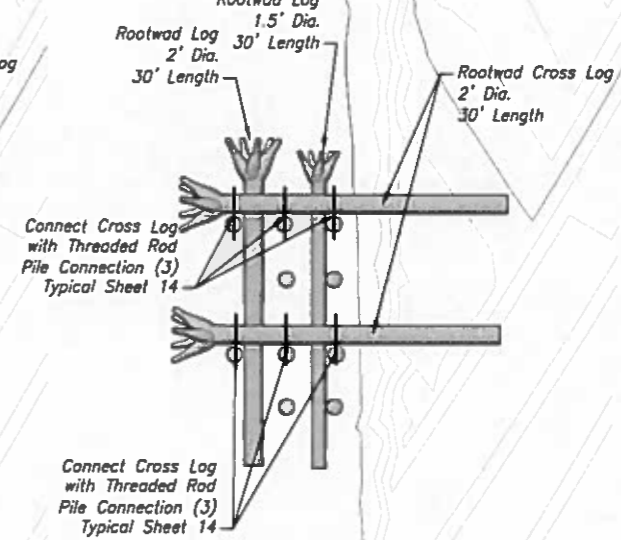
CHANNEL BARB ELJ - PLAN VIEW

ELJ CONTROL POINTS		
Control Point	Northing	Easting
ELJ-CB-1A	528749.0	1803723.0
ELJ-CB-1B	528761.0	1803717.0
ELJ-CB-1C	528766.0	1803726.5

CHANNEL BARB ELJ - LAYERS 3 & 4



CHANNEL BARB ELJ - LAYERS 5 & 6



TYPICAL STRUCTURE LWM QUANTITIES					
Layer	Item	Log Dia.	Rootwad Dia.	Min. Log Length	Quantity
-	Timber Pile	1.5'	-	35'	10
1	Rootwad Log	2'	6	30'	2
2	Rootwad Log	2'	6	20'	2
3	Rootwad Log	1.5'	4.5'	30'	1
3	Rootwad Log	2'	6	30'	1
4	Rootwad Log	2'	6	30'	2
5	Rootwad Log	1.5'	4.5'	30'	1
5	Rootwad Log	2'	6	30'	1
6	Rootwad Log	2'	6	30'	2

Typical Structure Connections
Threaded Rod Pile Connections: 16

NOTES

1. Rootwad cross logs on layers 4 and 6 shall be placed to interact with existing trees on the bank. Final placement shall be at owners discretion
2. Contractor shall be responsible for ensuring all connections meet the requirements of the connection detail and specifications.
3. Pile location dimensions are approximate relative to the key pile locations. Exact pile locations will be field fit based on the realistic size and diameters of the rootwad logs and log poles.
4. Slash should be added throughout the construction of the structure and incorporated into voids as layers of the structure is built. Only adding slash after the structure has been built is not acceptable.
5. Excavate to install maximum 4' below existing grade. Depths may be slightly less and may be adjusted in the field by the contracting officer or engineer depending on actual on-site conditions.

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CHANNEL BARB STRUCTURE DETAILS

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CHANNEL BARB STRUCTURE DETAILS

TBD
SHEET 18 OF 19

CAD FILENAME: C2011-11-Structure Details Bank and Channel Barb ELJ.dwg
 PLOTTED BY: Tom Crigo
 Date: 11/11/11