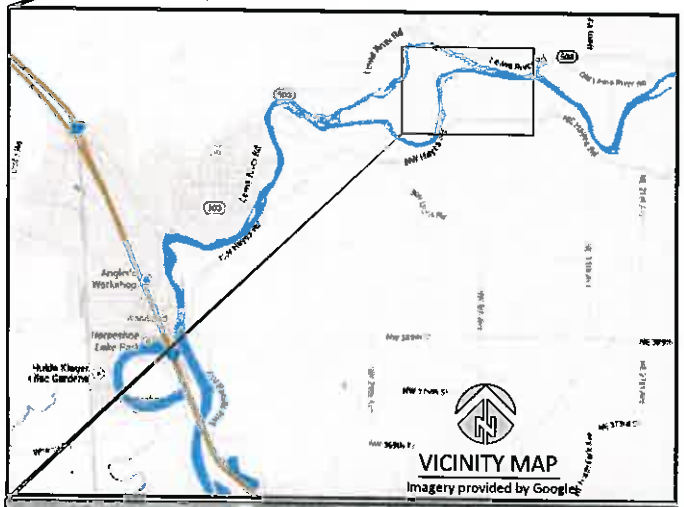
LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL DESIGN



Washington Department of FISH and WILDLIFE

SHEET INDEX

1 Cover, Sheet Index, and Vicinity Map
2 General Notes
3 Summary of Quantities and Material Specifications
4 Existing Conditions, Ownership, and Survey Control
5 Access, Staging, Wetland Impacts, and Erosion Control Measures
6 Erosion and Sedimentation Control Typical Details
7 Sheet Index and Proposed Conditions Plan & Profile
8 Proposed Conditions STA 0+10 to 3+25
9 Proposed Conditions STA 3+50 to 10+25
10 Proposed Conditions STA 10+25 to 13+70
11 Grading Cross-Sections STA 1+00 to 13+00
12 Typical Details
13 Typical Details
14 Typical Details
15 Typical Details
16 Typical Details
17 Revegetation Plan

PROJECT LOCATION:

COUNTY: CLARK
WATERBODY: LEWIS RIVER
TRIBUTARY OF: COLUMBIA RIVER

COORDINATES
LATITUDE 45°56'11.00"N
LONGITUDE 122°41'9.58"W

MICHAEL R. McALLISTER
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

NO.	BY	DATE	REVISION DESCRIPTION

MJ,DF	MM,GJ	GJ
DRAWN	DESIGNED	CHECKED
MM	2/13/15	11-02-07
APPROVED	DATE	PROJECT

LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

inter-fluve
501 Portway Ave, Suite 201
Hood River, OR 97031
541.386.9003
www.interfluve.com

COVER, SHEET INDEX, AND VICINITY MAP

G:\U-Z\WDFW Chum Channels 110207\Drawings\IFI_WDFW_CHUM_Construction.dwg

EXISTING DATA

GENERAL TOPOGRAPHIC INFORMATION IS PROVIDED FROM LIDAR (US ARMY CORPS OF ENGINEERS, PORTLAND DISTRICT, 2009) AND SPECIFIC PROJECT AREA SURVEY PERFORMED BY INTER-FLUVE, INC.

SOILS

LEWIS RIVER ALLUVIUM.

UTILITIES

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR HAVING UTILITIES LOCATED PRIOR TO CONSTRUCTION ACTIVITIES.

THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE AFFECTED UTILITY SERVICE TO REPORT ANY DAMAGED OR DESTROYED UTILITIES. THE CONTRACTOR SHALL PROVIDE EQUIPMENT OR LABOR TO AID THE AFFECTED UTILITY SERVICE IN REPAIRING DAMAGED OR DESTROYED UTILITIES AT NO COST TO THE OWNER.

WORK AREA CONDITION

THE CONTRACTOR SHALL KEEP THE WORK AREAS IN A NEAT AND SIGHTLY CONDITION FREE OF DEBRIS AND LITTER FOR THE DURATION OF THE PROJECT.

ALL EQUIPMENT, MATERIALS AND PERSONNEL SHALL REMAIN WITHIN THE LIMITS OF DISTURBANCE.

SWPPP

A CONSTRUCTION STORMWATER GENERAL PERMIT IS REQUIRED FOR THE PROJECT SITE (GREATER THAN 1 ACRE OF DISTURBANCE).

IN ACCORDANCE WITH THE GENERAL PERMIT, CONTRACTOR IS REQUIRED TO DEVELOP A STORMWATER POLLUTION PREVENTION (SWPPP) PLAN.

THE FOLLOWING NOTES PROVIDE GUIDANCE FOR DEVELOPMENT OF SWPPP. CONTRACTOR IS RESPONSIBLE FOR DEVELOPING AND IMPLEMENTING THE SWPPP IN COMPLIANCE WITH THE GENERAL PERMIT REQUIREMENTS.

PRESERVE VEGETATION/MARK CLEARING LIMITS

BEFORE BEGINNING CLEARING ACTIVITIES, CLEARLY MARK ALL CLEARING LIMITS, WATERWAYS AND DRAINAGES NOT TO BE DISTURBED, SENSITIVE AREAS, AND THEIR BUFFERS, AND TREES THAT ARE TO BE PRESERVED WITHIN THE CONSTRUCTION AREA.

TREES MARKED FOR PRESERVATION SHALL NOT BE DEBARKED OR DAMAGED DURING CLEARING ACTIVITIES.

THE DUFF LAYER, NATIVE TOP SOIL, AND NATURAL VEGETATION SHALL BE RETAINED IN AN UNDISTURBED STATE TO THE MAXIMUM EXTENT PRACTICABLE.

TREE SALVAGE

ANY REMOVED VEGETATION GREATER THAN 6 INCHES DIAMETER AND 15 FEET LONG SHOULD BE APPROVED BY THE ENGINEER AND INCORPORATED INTO THE CONSTRUCTED CHANNEL ACCORDING TO THE PLANS. CONTRACTOR IS RESPONSIBLE FOR REMOVING SMALLER CLEARING AND GRUBBING DEBRIS FROM THE SITE AT THE END OF THE PROJECT UNLESS DIRECTED BY THE ENGINEER.

ESTABLISH CONSTRUCTION ACCESS

THE CONTRACTOR SHALL ENTER THE SITE FROM NW HAYES ROAD. VEHICLE ACCESS AND EXIT SHALL BE LIMITED TO ONE ROUTE, IF POSSIBLE.

CONTRACTOR SHALL ESTABLISH ACCESS INCLUDING TEMPORARY REMOVAL AND REPLACEMENT OF GATES, TRIMMING AND REMOVAL OF TREES, AND MAINTENANCE OF ACCESS ROADS IN ACCORDANCE WITH LANDOWNER ACCESS AGREEMENTS.

ACCESS POINT(S) SHALL BE STABILIZED WITH A PAD OF QUARRY SPALLS, CRUSHED ROCK, OR OTHER EQUIVALENT BMP TO MINIMIZE TRACKING OF SEDIMENT ONTO PUBLIC ROADS.

LOCATE WHEEL WASH OR TIRE BATHS ON SITE, IF THE STABILIZED CONSTRUCTION ENTRANCE IS NOT EFFECTIVE IN PREVENTING TRACKING OF SEDIMENT ONTO ROADS.

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING ANY REQUIRED TRAFFIC CONTROL INCLUDING, BUT NOT LIMITED TO, SIGNAGE AND FLAGGERS.

ALL SAPLINGS AND TREES TO BE TRANSPLANTED OR REMOVED ALONG THE ACCESS ROUTE SHALL BE APPROVED BY THE ENGINEER AND CLEARLY MARKED.

PUBLIC RIGHTS-OF-WAY SHALL BE KEPT IN A CLEAN AND SERVICEABLE CONDITION AT ALL TIMES. IN THE EVENT MATERIALS ARE INADVERTENTLY DEPOSITED ON ROADWAYS THE MATERIAL SHALL BE PROMPTLY REMOVED. MATERIALS ARE TO BE SWEPT AND REMOVED PRIOR TO ANY STREET FLUSHING.

INSTALL EROSION AND SEDIMENT CONTROLS

THE CONTRACTOR IS ADVISED THAT THE PROJECT AREA DRAINS TO A SALMON BEARING STREAM AND/OR STATE WATERS AND THAT THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE RECEIVING WATERS FROM DELETERIOUS EFFECTS OF CONSTRUCTION.

THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE EROSION AND SEDIMENT CONTROL MEASURES SHOWN OR DESCRIBED IN THE CONTRACT DOCUMENTS AND ANY ADDITIONAL MEASURES THAT MAY BE REQUIRED BY THE CONTRACTOR'S MEANS AND METHODS OF CONSTRUCTION TO PREVENT VIOLATION OF SURFACE WATER QUALITY, GROUND WATER QUALITY, OR SEDIMENT MANAGEMENT STANDARDS. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCING OF OTHER LAND DISTURBING ACTIVITIES AND SHALL BE MAINTAINED THROUGHOUT THE COURSE OF CONSTRUCTION AND UNTIL ALL DISTURBED FARTH IS STABILIZED IN FINISH GRADES.

CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING ALL NECESSARY EROSION AND SEDIMENT CONTROL FACILITIES TO COMPLY WITH APPLICABLE EROSION AND SEDIMENT CONTROL (ESC) REGULATIONS.

THE FOLLOWING RECOMMENDATIONS WILL PROVIDE GUIDANCE FOR THE CONTRACTOR TO DEVELOP AND IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES AS REQUIRED BY THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP). CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THE SWPPP IS DEVELOPED AND IMPLEMENTED IN ACCORDANCE WITH APPLICABLE REGULATIONS.

A. THE IMPLEMENTATION OF THESE RECOMMENDATIONS FOR THE SWPPP AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED, AND VEGETATION IS ESTABLISHED.

B. ESC FACILITIES AS APPROXIMATELY SHOWN ON THIS PLAN ARE TO BE CONSTRUCTED PRIOR TO OTHER CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, OR VIOLATE APPLICABLE WATER STANDARDS.

C. THE ESC FACILITIES SHALL BE UPGRADED AS NEEDED TO CONTROL THE AMOUNT, FREQUENCY, INTENSITY, AND DURATION OF STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.

D. DIRECT STORMWATER RUNOFF FROM DISTURBED AREAS THROUGH A SEDIMENT POND OR OTHER APPROPRIATE SEDIMENT REMOVAL BMP, BEFORE RUNOFF LEAVES THE CONSTRUCTION SITE.

E. LOCATE BMPS INTENDED TO TRAP SEDIMENT ON-SITE IN A MANNER TO AVOID INTERFERENCE WITH THE MOVEMENT OF JUVENILE SALMONIDS.

F. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.

STABILIZE SOILS

FROM MAY 1 THROUGH SEPTEMBER 30, ALL EXPOSED SOILS SHALL BE PROTECTED FROM EROSION BY MULCHING, PLASTIC SHEETING, SODDING, HYDROSEED COVERING, EROSION CONTROL FABRICS, OR OTHER APPROVED MEASURES WITHIN ONE WEEK OF GRADING. FROM OCTOBER 1 THROUGH APRIL 30, ALL EXPOSED SOILS MUST BE PROTECTED WITHIN 2 DAYS OF GRADING.

SOILS SHALL BE STABILIZED BEFORE A WORK SHUTDOWN, HOLIDAY OR WEEKEND IF NEEDED BASED ON THE WEATHER FORECAST. SOIL STOCKPILES MUST BE STABILIZED AND PROTECTED WITH SEDIMENT TRAPPING MEASURES. HYDROSEED AS SOON AS PRACTICAL ALL DISTURBED AREAS NOT INDICATED IN THE CONTRACT DOCUMENTS FOR OTHER PERMANENT STABILIZATION MEASURES. STOCKPILES SHOULD BE LOCATED AWAY FROM WATERWAYS AND DRAINAGE CHANNELS.

SOIL COMPACTION SHALL BE MINIMIZED, UNLESS INFEASIBLE, TO PRESERVE TOPSOIL.

CONTROL POLLUTANTS

CONTRACTOR SHALL DESCRIBE THE SPILL PREVENTION AND POLLUTANT CONTROL MEASURES TO BE IMPLEMENTED AT THE SITE AS REQUIRED BY THE SWPPP.

CONTRACTOR SHALL INSTALL, IMPLEMENT, AND MAINTAIN EFFECTIVE POLLUTION PREVENTION MEASURES TO PREVENT THE DISCHARGE OF POLLUTANTS FROM ENTERING WATERWAYS.

CHEMICAL WASTES SHALL BE STORED AND DISPOSED OF IN A MANNER APPROVED BY REGULATORY AGENCIES AND AS IDENTIFIED IN THE SWPPP.

ALL POLLUTANT DISCHARGES OTHER THAN SEDIMENT THAT OCCUR ON SITE DURING CONSTRUCTION SHALL BE HANDLED AND DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORMWATER, GROUNDWATER, OR SOILS TO REMAIN ON SITE.

THE USE OF LIME, FLY ASH, OR OTHER SOIL AMENDMENTS THAT COULD ALTER THE PH OF DISCHARGE WATERS IS PROHIBITED.

CONTROL DEWATERING

PROJECT AREA WILL BE ISOLATED FROM THE LEWIS RIVER BY LEAVING IN PLACE AN EARTHEN BERM AT THE DOWNSTREAM END OF THE CONSTRUCTED CHANNEL.

PRIOR TO REMOVAL OF THE EARTHEN BERM, WORK AREA SHALL BE ISOLATED BY A COFFERDAM INSTALLED DOWNSTREAM OF CHANNEL OUTLET.

PUMPING SHALL BE PERFORMED TO KEEP WORK AREA DEWATERED TO THE EXTENT NECESSARY TO CONSTRUCT THE PROJECT.

HIGHLY TURBID OR CONTAMINATED DEWATERING WATER FROM CONSTRUCTION EQUIPMENT OPERATION SHALL BE PREVENTED FROM DELIVERING SEDIMENT TO THE RIVER. DISPOSAL OPTIONS FOR DEWATERING DISCHARGE INCLUDE:

1. SEDIMENT-LADEN WATER MAY BE PUMPED TO AN UPLAND AREA AND ALLOWED TO SHEET FLOW OVER UNDISTURBED GROUND THROUGH EXISTING VEGETATION TO INFILTRATE INTO THE GROUND. IF NECESSARY TO PREVENT EROSION, THE DEWATERING PIPE OUTLET SHALL BE STABILIZED.

2. USE OF AN APPROPRIATELY SIZED AND MAINTAINED SEDIMENTATION BAG (DIRTBAG) OR OTHER SEDIMENTATION FACILITY WITH OUTFALL TO A DITCH OR SWALE FOR SMALL VOLUMES OF LOCALIZED DEWATERING.

INSPECTIONS, MONITORING, MAINTENANCE, AND REPAIR

ALL BEST MANAGEMENT PRACTICES (BMPs) SHALL BE INSPECTED, MAINTAINED, AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION IN ACCORDANCE WITH THE SWPPP. ALL ON-SITE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF RAIN PER 24 HOUR PERIOD.

SITE INSPECTIONS AND MONITORING SHALL BE CONDUCTED IN ACCORDANCE WITH THE CONSTRUCTION STORMWATER GENERAL PERMIT.

AFTER FINAL SITE STABILIZATION

ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BMPs ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE REMOVED FROM THE SITE OR INCORPORATED INTO FINISHED GRADING. DISTURBED SOIL AREAS RESULTING FROM REMOVAL SHALL BE PERMANENTLY STABILIZED.

MICHAEL R. McALLISTER
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

EXPIRES 12/31/2015

NO.	BY	DATE	REVISION DESCRIPTION

MJ,DF	MM,GJ	GJ
DRAWN	DESIGNED	CHECKED
MM	2/13/15	11-02-07
APPROVED	DATE	PROJECT

LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

inter-fluve
501 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

GENERAL NOTES

SHEET 2 OF 17

G:\U-Z\WDFW Chum Channels 110207\Drawings\IFI_WDFW_CHUM_Construction.dwg

	Qty		
Chum Channel	**Total**	**Above OHW**	**Below OHW**
Excavation to subgrade	8174 CY	8144 CY	30 CY
Timber piles (furnished, delivered, installed)*	196	194	2
Toe logs (furnished, delivered, installed)	8500 LF	8482 LF	2 LF
Rock for Erosion Control and Scour Protection, Class A (entry pool)	26 CY	26 CY	0 CY
Spawning gravel mix	1205 CY	1176 CY	29 CY
8' Sheet pile for control weirs	60 LF	60 LF	0 LF
Rock for Erosion Control and Scour Protection, Class A (control weirs)	21 CY	21 CY	0 CY
Steel 'C'-Channel for adult fish screen mounting slots	36 LF	36 LF	0 LF
Backfill behind log walls (native material)	1581 CY	1580 CY	1 CY
Surplus native fill material (to be disposed of onsite, above floodplain)	6015 CY	0 CY	0 CY
Chum Channel Net Cut(-) / Fill (+)	-5341 CY	-5341 CY	0 CY

*** Actual number of piles depends on layout of bank toe logs. Minimum numbers could be derived by dividing linear feet of channel banks by average log length without regard to variations in log length that may be necessary to accommodate channel curvature effectively. The numbers presented in this table are based on the layout shown in the drawings. Contractor may alter log orientation to fit channel curvature more efficiently, but should anticipate needing to cut some logs to appropriate lengths, and estimate two piles per log.**

Flow Supplementation System	**Total**	**Above OHW**	**Below OHW**
Infiltration Gallery			
Excavation of riverbank to subgrade	956 CY	902 CY	54 CY
Rock for Erosion Control and Scour Protection, Class A	74 CY	24 CY	50 CY
16" PVC well screen pipe	160 LF	0 LF	160 LF
16" PVC pipe caps	2	2	0
24" HDPE-S tee	1	1	0
24"x18" HDPE-S eccentric reducers	2	2	0
18" Marmac Dissimilar Pipe Couplers	2	2	0
Drain rock (or spawning gravel mix)	61 CY	61 CY	0 CY
Conveyance Pipe			
24" HDPE-S conveyance and riser pipe	180 LF	180 LF	0 LF
24" HDPE-S tee	1	1	0
24" HDPE-S riser lid	1	1	0
24" canal gate (Waterman C-20 or equivalent)	1	1	0
24" trash rack	1	1	0
Conveyance pipe trenching and backfill	160 LF	160 LF	0 LF
Riverbank Log Structure			
Logs w/ roots (furnished, delivered, installed)	18	12	6
Timber piles (furnished, delivered, installed)	40	38	2
Logs (furnished, delivered, installed)	21	14	7
Backfill around and over logs with native material	598 CY	598 CY	0 CY
Surplus native fill material (to be disposed of onsite, above floodplain)	352 CY	0 CY	0 CY
Flow Supplementation System Net Cut(-) / Fill (+)	-223 CY	-219 CY	-4 CY
Floodplain Wood			
Logs w/ roots (furnished, delivered, installed)	18	18	0
Timber piles (furnished, delivered, installed)	48	48	0
Logs (furnished, delivered, installed)	30	30	0
Total Project Net Cut(-) / Fill (+)	-5564 CY	-5560 CY	-4 CY

NOTES

CONTRACTOR SHALL SUBMIT STAMPED DRAWINGS FOR SHEETPILE CONTROL WEIRS.

ALL WOOD SHALL BE DOUGLAS FIR.

TIMBER PILES SHALL HAVE DIAMETER RANGING 12-15" AT SCALED END.

HORIZONTAL TOE LOG DIAMETER SHALL BE WITHIN A RANGE OF 14-22" AT SCALED END.

FLOODPLAIN WOOD SHALL HAVE MINIMUM LENGTH OF 30' AND DIAMETERS RANGING 18-24" AT SCALED END. LOGS WITH ROOTS SHALL HAVE ROOT FAN DIAMETER EXCEEDING 5'.

LOGS FOR RIVERBANK LOG STRUCTURE SHALL HAVE DIAMETERS RANGING 18-24" AT SCALED END. LOGS WITH ROOTS SHALL HAVE ROOT FAN DIAMETER EXCEEDING 5'.

CABLE AND HARDWARE FOR LOG TO LOG AND LOG TO PILE CONNECTIONS TO BE USED IN BANK TOE, FLOODPLAIN WOOD, AND RIVER BANK LOG STRUCTURE ARE INCIDENTAL.

WELL SCREEN SHALL BE 16" DIAMETER SCH40 OR SDR26 SLOTTED PVC WELL SCREEN A MINIMUM 133 SQUARE INCHES OPEN AREA PER LINEAR FOOT OF PIPE.

SPAWNING GRAVEL SHALL BE A CLEAN, FREE-DRAINING, ROUND RIVER ROCK NATURALLY OCCURRING. MATERIAL SHALL COME FROM A RECOGNIZED AND ESTABLISHED BORROW SITE. THE MATERIAL SHALL BE FREE OF ALL OBJECTIONABLE COATING. MATERIAL SHALL BE GRADED ACCORDING TO THE FOLLOWING TABLE:

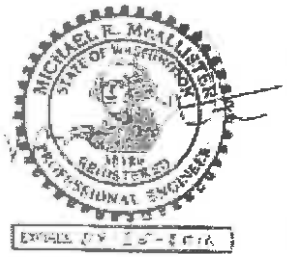
Diameter of gravel	Percent by Volume
4 - 6 inch rock	2
2.5 - 4 inch rock	13
1 - 2.5 inch rock	35
3/4 - 1 inch rock	35
3/8 - 3/4 inch rock	10
No.4 - 3/8 inch rock	5
No.10 - No.4 material	0

CLASS A RIPRAP SHALL BE PER 9-13.4 - ROCK FOR EROSION CONTROL AND SCOUR PROTECTION, CLASS A, GRADED ACCORDING TO THE FOLLOWING TABLE:

Approximate Size (inches)[1]	Percent Passing (smaller)
18	100
16	80-95
12	50-80
8	15-50
4	15 max

DRAIN ROCK SHALL CONFORM TO WSDOT SPECIFICATION 9-03.12(5) - GRAVEL BACKFILL FOR DRYWELLS, GRADED ACCORDING TO THE FOLLOWING TABLE (WSDOT SPECIFICATION 9-03.12(4)):

Sieve Size	Percent Passing
1"	99-100
3/4"	80-100
3/8"	0-40
No.4	0-4
No.200	0-2



NO.	BY	DATE	REVISION DESCRIPTION

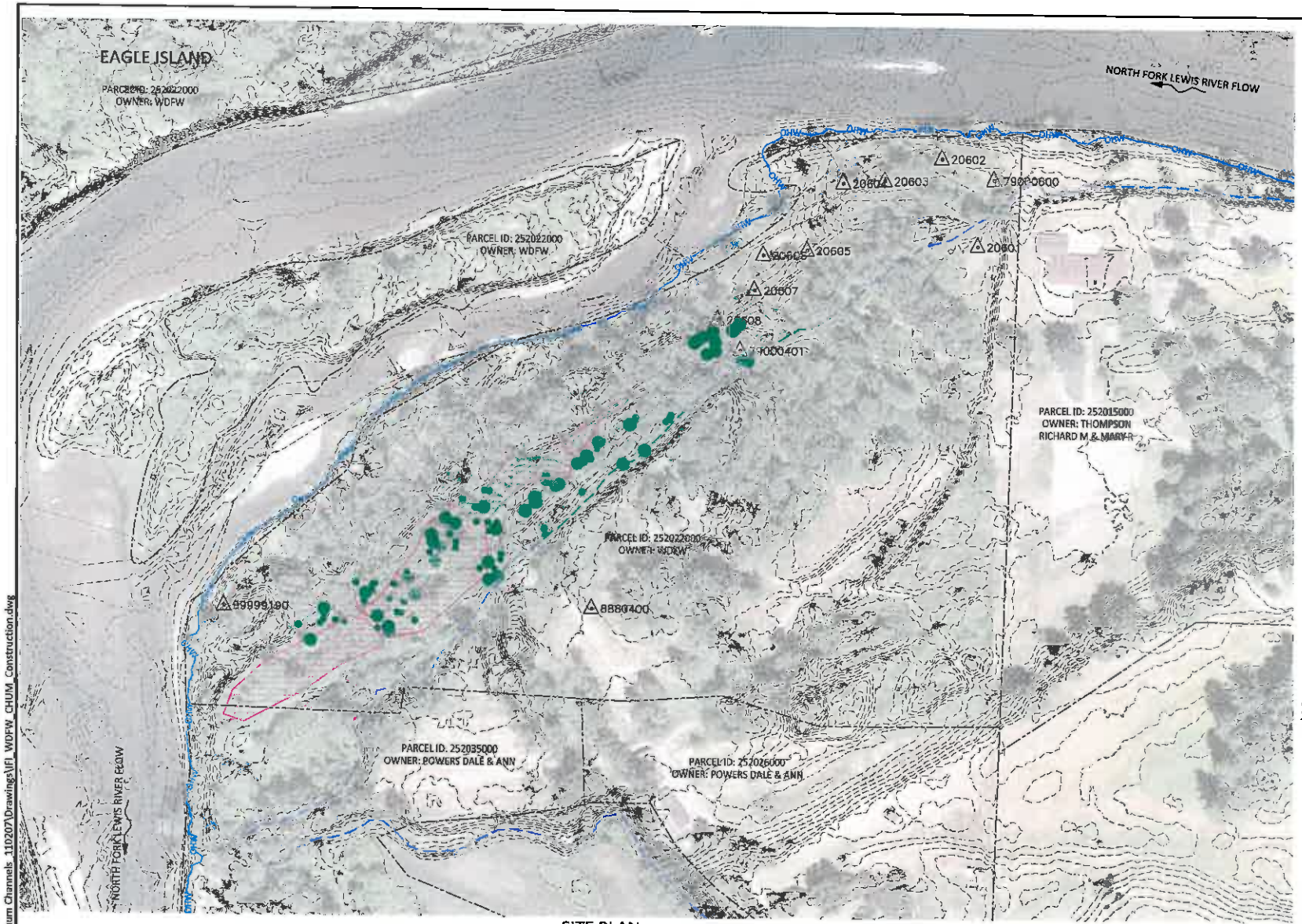
MJ,DF	MM,GJ	GJ
DRAWN	DESIGNED	CHECKED
MM	2/13/15	11-02-07
APPROVED	DATE	PROJECT

LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

inter-fluve
501 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

SUMMARY OF QUANTITIES AND MATERIAL SPECIFICATIONS

G:\U-Z\WDFW Chum Channels_110207\Drawings\IFI_WDFW_CHUM_Construction.dwg



SITE PLAN

0 150 300
SCALE IN FEET

LEGEND

- CP600 — SURVEY CONTROL POINT
- OHW — ORDINARY HIGH WATER
- EDGE OF EXISTING FLOODPLAIN
- EXISTING CONTOURS (1FT INTERVALS)
- PROPERTY LINES
- WETLAND - PALUSTRINE FORESTED (43,356 SQUARE FEET)
- EXISTING TREES

SURVEY CONTROL

POINT #	NORTHING	EASTING	ELEV.	DESC.
20601	227958.97	1084979	35.3342	cp601
20602	228093.074	1084924	31.9123	cp602
20603	228038.741	1084836	31.7896	cp603
20604	228054.871	1084772	31.0508	cp604
20605	227951.448	1084717	31.7058	cp605
20606	227943.902	1084550	28.1589	cp606
20607	227889.161	1084636	29.4303	cp607
20608	227842.826	1084580	33.5998	cp608
8880400	227397.62	1084368	37.5836	cp400
79000401	227795.747	1084615	29.0248	cp401
79000600	228060.609	1085003	31.3948	CP600
79000601	227958.951	1084979	35.2958	cp601
99999190	227397.76	1083326	28.9523	cp90

G:\U-Z\WDFW Chum Channels_110207\Drawings\IFI_WDFW_CHUM_Construction.dwg

NO.	BY	DATE	REVISION DESCRIPTION

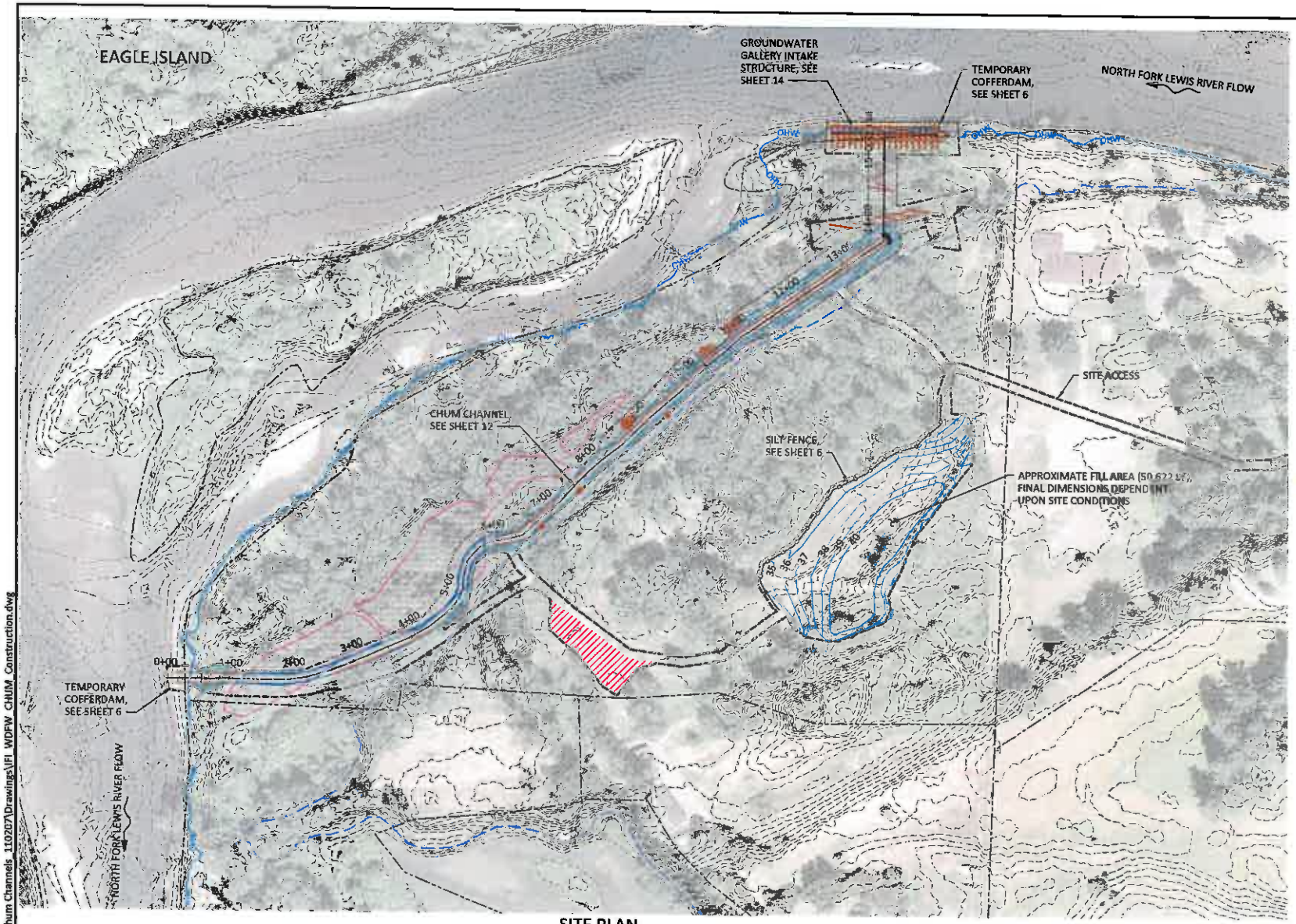
MJ,DF DRAWN	MM,GJ DESIGNED	GJ CHECKED
MM APPROVED	2/13/15 DATE	11-02-07 PROJECT

LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

inter-fluve
901 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.inter-fluve.com

EXISTING CONDITIONS, OWNERSHIP, AND SURVEY CONTROL

SHEET 4 OF 17



SITE PLAN

0 150 300
SCALE IN FEET

LEGEND

- ORDINARY HIGH WATER
- EXISTING CONTOURS (1FT INTERVALS)
- PROPOSED CONTOURS (1FT INTERVALS)
- PROPERTY LINES
- EDGE OF EXISTING FLOODPLAIN
- LIMITS OF DISTURBANCE
- WETLAND - PALUSTRINE FORESTED (43,356 SQUARE FEET)
- IMPACTED WETLAND (3882 SF, 288 CY)
- TEMPORARY STAGING / STOCKPILE AREA
- TEMPORARY COFFERDAM
- SILT FENCE

MICHAEL R. McALLISTER
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER

EXPIRES 09-15-2016

G:\U-Z\WDFW Chum Channels_110207\Drawings\IFI_WDFW_CHUM_Construction.dwg

NO.	BY	DATE	REVISION DESCRIPTION

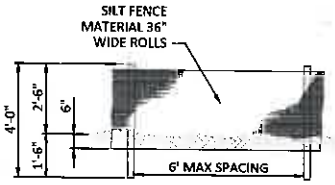
MJ,DF	MM,GJ	GJ
DRAWN	DESIGNED	CHECKED
MM	2/13/15	11-02-07
APPROVED	DATE	PROJECT

LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

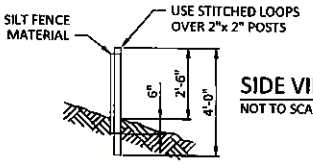
inter·fluve
501 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

ACCESS, STAGING, WETLAND IMPACTS, AND EROSION CONTROL MEASURES

SHEET 5 OF 17



FRONT VIEW
NOT TO SCALE



SIDE VIEW
NOT TO SCALE

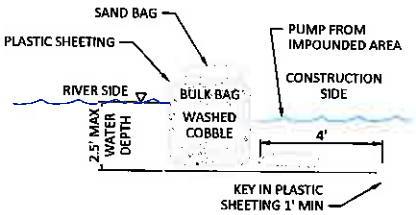
TOP VIEW
NOT TO SCALE

TYPICAL SILT FENCE DETAIL

NOT TO SCALE

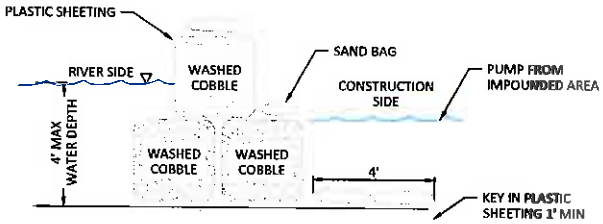
SILT FENCES:

1. THE SILT FENCE SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, SILT FENCE SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6 INCH OVERLAP, AND BOTH ENDS SECURELY FASTENED TO THE POST. ALTERNATIVELY, OVERLAP AND INTERLOCK TWO POSTS WITH ATTACHED FABRIC AS REQUIRED TO MEET APPLICABLE REGULATIONS.
2. THE SILT FENCE IS TO BE INSTALLED AT LOCATIONS SHOWN ON THE PLAN ALONG THE DOWNHILL PERIMETER OF CONSTRUCTION AREAS. THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 24 INCHES.
3. THE SILT FENCE SHALL HAVE A MINIMUM VERTICAL BURIAL OF 6 INCHES. ALL EXCAVATED MATERIAL FROM SILT FENCE INSTALLATION SHALL BE BACK-FILLED AND COMPACTED ALONG THE ENTIRE DISTURBED AREA.
4. STANDARD OR HEAVY DUTY SILT FENCE SHALL HAVE MANUFACTURED STITCHED LOOPS FOR 2 INCHES X 2 INCHES POST INSTALLATION.
5. SILT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY PROTECTED AND STABILIZED, OR AS DIRECTED BY OWNER'S REPRESENTATIVE.



TEMPORARY COFFER DAM SECTION A-A'

NOT TO SCALE

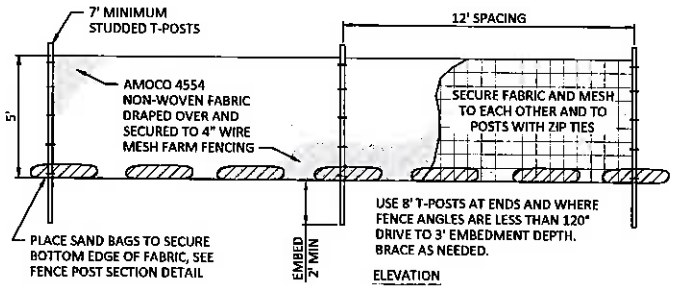


COFFER DAM SECTION IN WATER DEPTHS GREATER THAN 2.5'

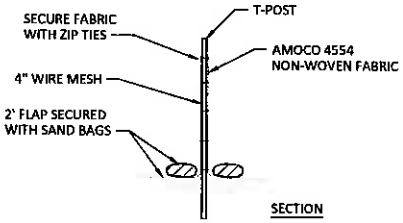
NOT TO SCALE

BULK BAG NOTES:

1. BULK BAG COFFERDAM SHALL BE CONSTRUCTED OF SEVERAL UNITS OF BULK BAGS FILLED WITH WASHED GRAVEL, AND ABUTTED SIDE BY SIDE TO CREATE A ROW THAT ISOLATES THE CONSTRUCTION SITE.
2. IF WATER DEPTH EXCEEDS 85% OF THE BULK BAG HEIGHT, AN ADDITIONAL TOP ROW OF BULK BAGS SHALL BE INSTALLED, SUPPORTED BY TWO BOTTOM ROWS OF BULK BAGS. BULK BAG COFFERDAM SHALL BE SEALED BY COVERING THE COFFERDAM WITH PLASTIC SHEETING HELD IN PLACE BY STANDARD SANDBAGS PLACED IN ROWS ON TOP OF COFFERDAM, AND AT TOE OF COFFERDAM.
3. THE PLASTIC SHEETING SHALL BE DRAPED ALONG THE CHANNEL BOTTOM ON BOTH SIDES OF THE COFFERDAM WITH OUTWARD EDGE OF SHEETING MINIMUM 4-FEET FROM TOE OF COFFERDAM. THE DRAPED PORTION OF PLASTIC SHEETING SHALL BE PINNED TO THE CHANNEL BED BY MINIMUM TWO ROWS OF STANDARD SANDBAGS.
4. THE CONSTRUCTION SIDE EDGE OF PLASTIC SHEETING SHALL BE TOED INTO THE CHANNEL BED MINIMUM 1-FT. TOEING IN THE OUTWARD EDGE OF PLASTIC SHEETING SHALL OCCUR AFTER THE COFFERDAM IS CLOSED TO PREVENT TURBIDITY RELEASE TO THE WATERWAY.
5. THE TERMINAL ENDS OF BULK BAG COFFERDAM, WHERE IT CONNECTS TO CHANNEL BANK OR HIGH GROUND, SHALL BE SEALED WITH PLASTIC SHEETING AND STANDARD SANDBAGS.
6. BULK BAGS SHALL BE CUBE-SHAPED POLYPROPYLENE WOVEN FABRIC BAGS WITH FULLY OPEN TOP, FLAT BOTTOM, FOUR LOOPS, MINIMUM 2-TON WEIGHT CAPACITY, MINIMUM 5:1 SAFETY FACTOR.
7. PLASTIC SHEETING SHALL BE MINIMUM 6-MIL THICKNESS. ROLL LENGTH SHALL BE LONG ENOUGH TO ENSURE THAT ENTIRE LENGTH OF COFFERDAM WILL BE COVERED WITHOUT A SEAM. MINIMUM 12-FT WIDE ROLL SHALL BE USED FOR SINGLE LAYER BULK BAG COFFERDAM. MINIMUM 16-FT WIDE ROLL SHALL BE USED FOR 2-LAYER STACKED BULK BAG COFFERDAM.
8. BULK BAG COFFERDAM SHALL BE COMPLETELY REMOVED AFTER CONSTRUCTION IS COMPLETED AND TURBIDITY HAS BEEN REMOVED.
9. MEASUREMENT AND PAYMENT FOR BULK BAG COFFERDAM, SAND BAGS, PLASTIC SHEETING, WASHED GRAVEL PLACEMENT, MAINTENANCE AND REMOVAL OF ALL MATERIALS SHALL BE INCIDENTAL TO THE LUMP SUM ALL INCLUSIVE COST FOR DIVERSION AND DEWATERING.
10. ALTERNATE COFFERDAM MATERIALS AND CONFIGURATIONS MAY BE ALLOWED BUT SHALL NOT BE IMPLEMENTED WITHOUT REVIEW AND APPROVAL BY THE OWNER'S REPRESENTATIVE. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS AND/OR VENDOR CUT SHEETS FOR SUBSTITUTIONS.



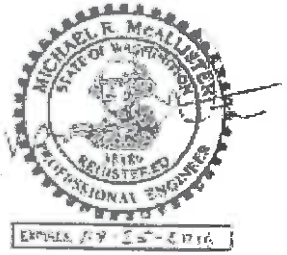
ELEVATION



SECTION

TURBIDITY CURTAIN TYPICAL DETAILS

NOT TO SCALE



NO.	BY	DATE	REVISION DESCRIPTION

MJ,DF	MM,GJ	GJ
DRAWN	DESIGNED	CHECKED
MM	2/13/15	11-02-07
APPROVED	DATE	PROJECT

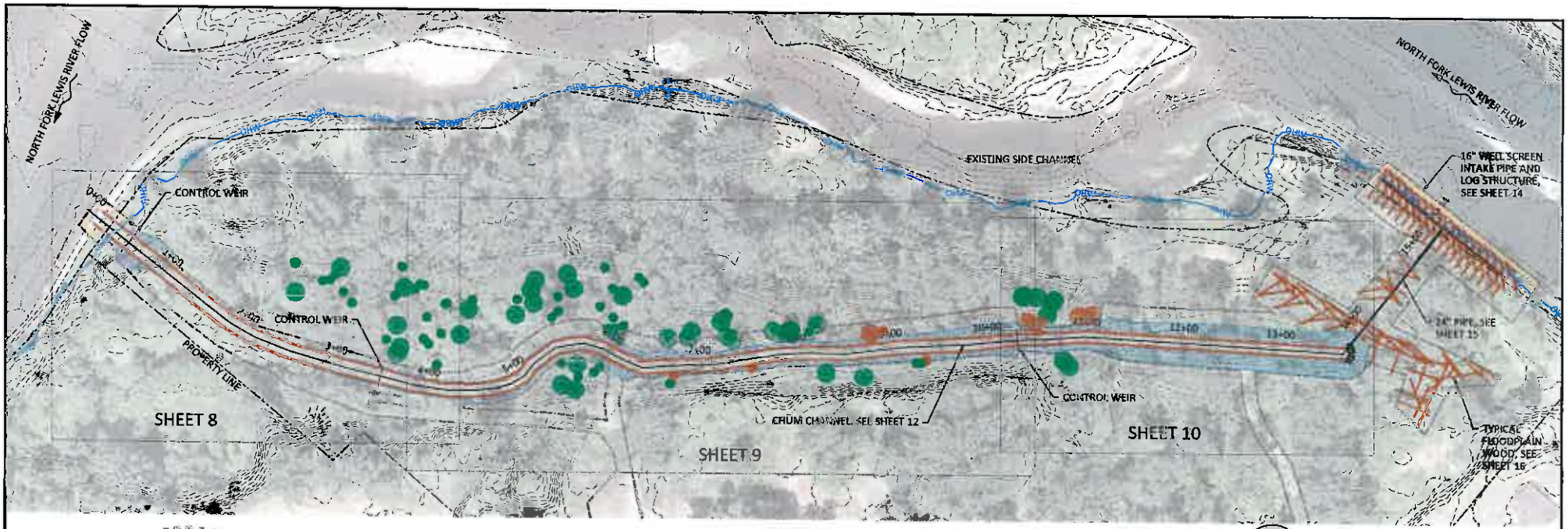
LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

inter-fluve
501 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

EROSION AND SEDIMENTATION CONTROL TYPICAL DETAILS

SHEET 6 OF 17

G:\U-Z\WDFW Chum Channels_110207\Drawings\IFI_WDFW_CHUM_Construction.dwg



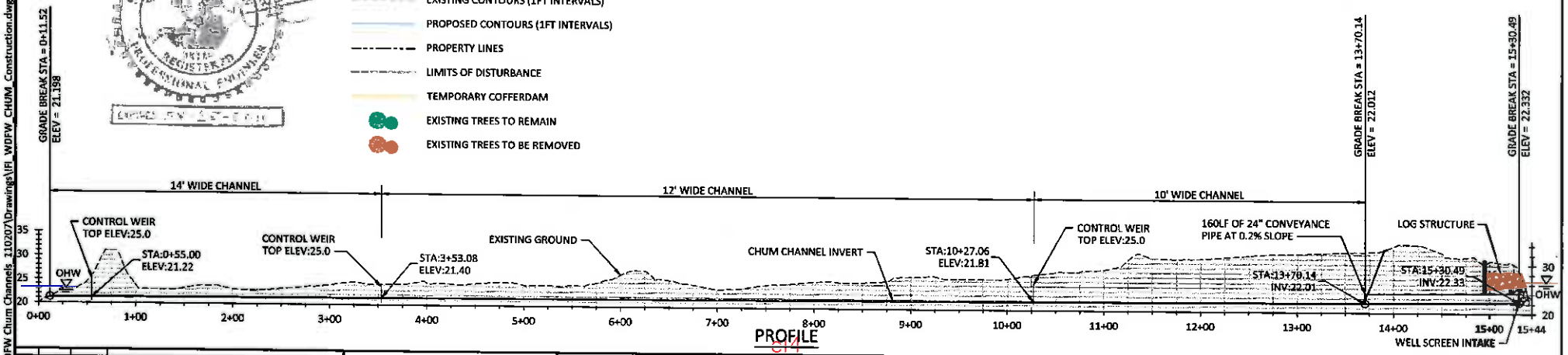
PLAN

10 EXISTING TREES TO BE REMOVED.

0 100 200
SCALE IN FEET

LEGEND

- OHW — ORDINARY HIGH WATER
- EXISTING CONTOURS (1FT INTERVALS)
- PROPOSED CONTOURS (1FT INTERVALS)
- PROPERTY LINES
- LIMITS OF DISTURBANCE
- TEMPORARY COFFERDAM
- EXISTING TREES TO REMAIN
- EXISTING TREES TO BE REMOVED



PROFILE

NO.	BY	DATE	REVISION DESCRIPTION

MJ,DF	MM,GJ	GJ
DRAWN	DESIGNED	CHECKED
MM	2/13/15	11-02-07
APPROVED	DATE	PROJECT

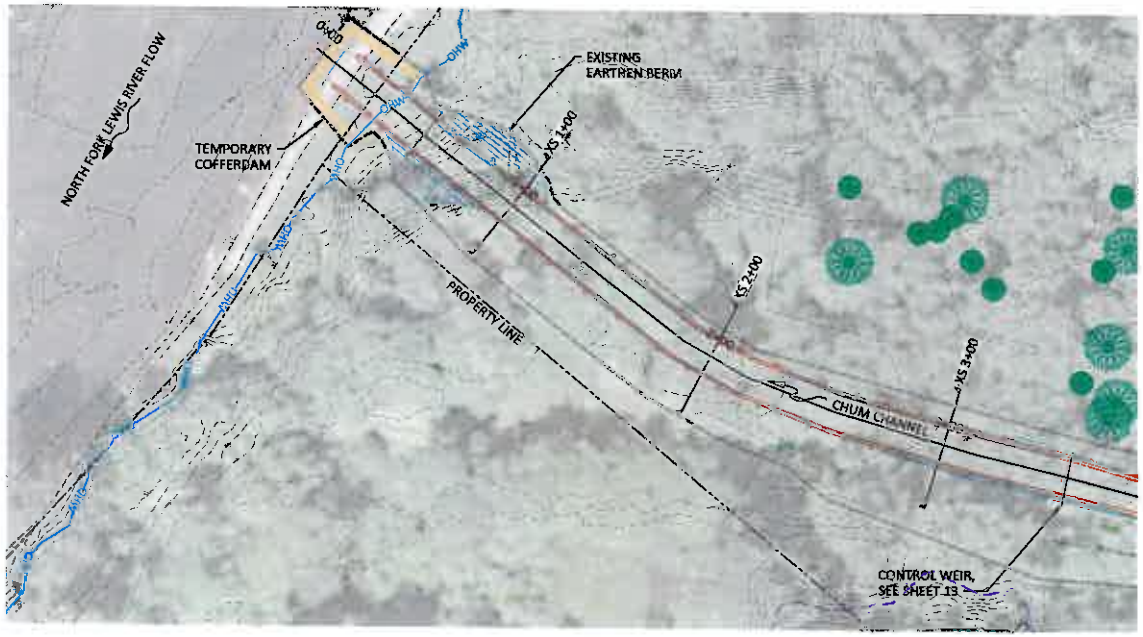
LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

inter-fluve
501 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

SHEET INDEX AND
PROPOSED CONDITIONS
PLAN & PROFILE

SHEET 7 OF 17

G:\U-Z\WDFW Chum Channels_110207\Drawings\FI_WDFW_CHUM_Construction.dwg



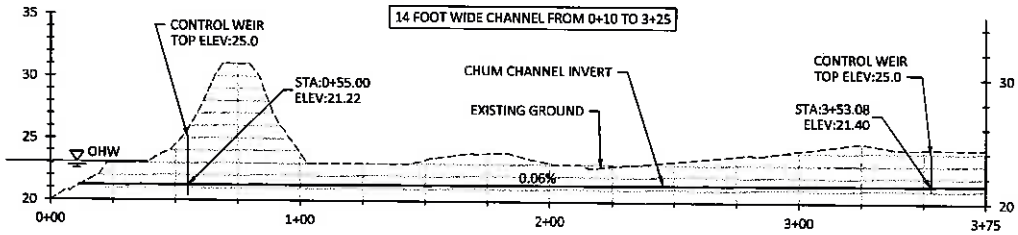
PLAN

SEE SHEET 11 FOR GRADING CROSS SECTIONS.

0 50 100
SCALE IN FEET

LEGEND

- OHW — ORDINARY HIGH WATER
- EDGE OF EXISTING FLOODPLAIN
- EXISTING CONTOURS (1FT INTERVALS)
- PROPOSED CONTOURS (1FT INTERVALS)
- PROPERTY LINES
- LIMITS OF DISTURBANCE
- TEMPORARY COFFERDAM
- XS 3+00 — GRADING CROSS SECTIONS, SEE SHEET 11
- EXISTING TREES TO REMAIN



PROFILE

0.06%

NO.	BY	DATE	REVISION DESCRIPTION

MJ,DF	MM,GJ	GJ
DRAWN	DESIGNED	CHECKED
MM	2/13/15	11-02-07
APPROVED	DATE	PROJECT

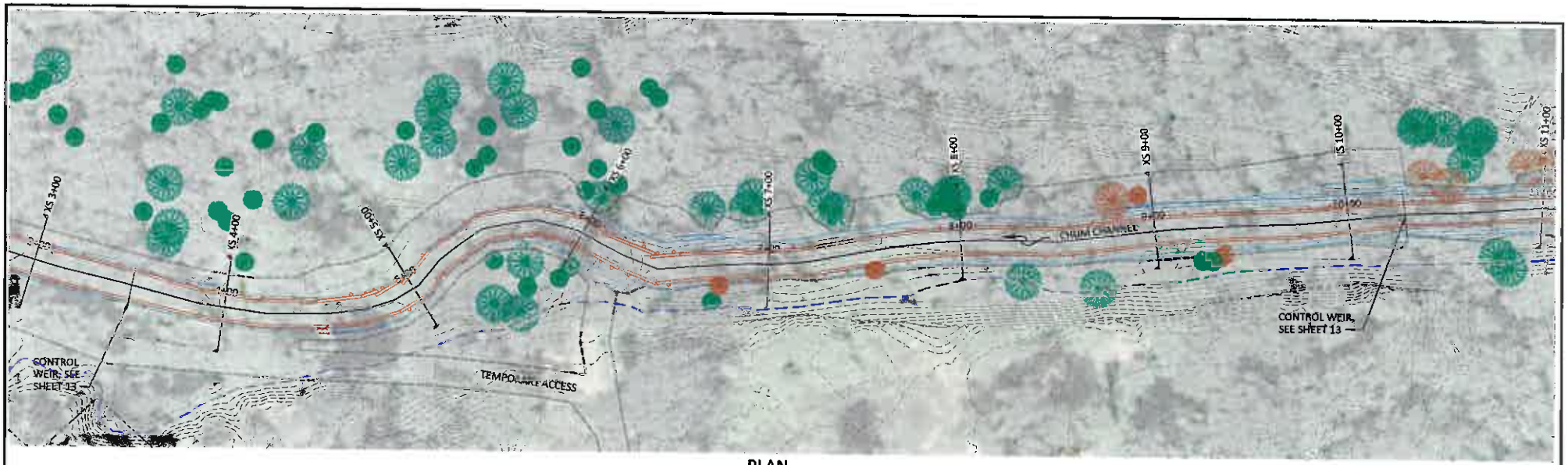
LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

inter-fluve
501 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

PROPOSED CONDITIONS
STA 0+10 TO 3+25

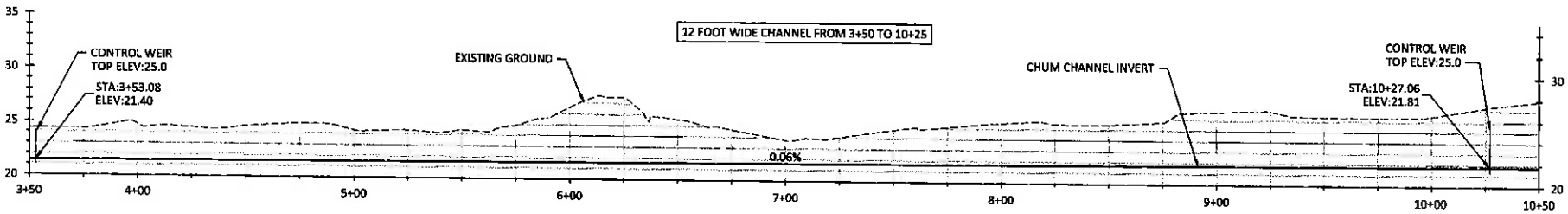
SHEET 8 OF 17

G:\U-Z\WDFW Chum Channels_110207\Drawings\IFI_WDFW_CHUM_Construction.dwg



PLAN

SEE SHEET 11 FOR GRADING CROSS SECTIONS.



PROFILE

LEGEND

- OHW — ORDINARY HIGH WATER
- EDGE OF EXISTING FLOODPLAIN
- EXISTING CONTOURS (1FT INTERVALS)
- PROPOSED CONTOURS (1FT INTERVALS)
- PROPERTY LINES
- LIMITS OF DISTURBANCE
- XS 3+00 — GRADING CROSS SECTIONS, SEE SHEET 11
- EXISTING TREES TO REMAIN
- EXISTING TREES TO BE REMOVED

0 50 100
SCALE IN FEET

MICHAEL R. McALLISTER
STATE OF WASHINGTON
38789
REGISTERED
PROFESSIONAL ENGINEER

NO.	BY	DATE	REVISION DESCRIPTION

MJ,DF	MM,GJ	GJ
DRAWN	DESIGNED	CHECKED
MM	2/13/15	11-02-07
APPROVED	DATE	PROJECT

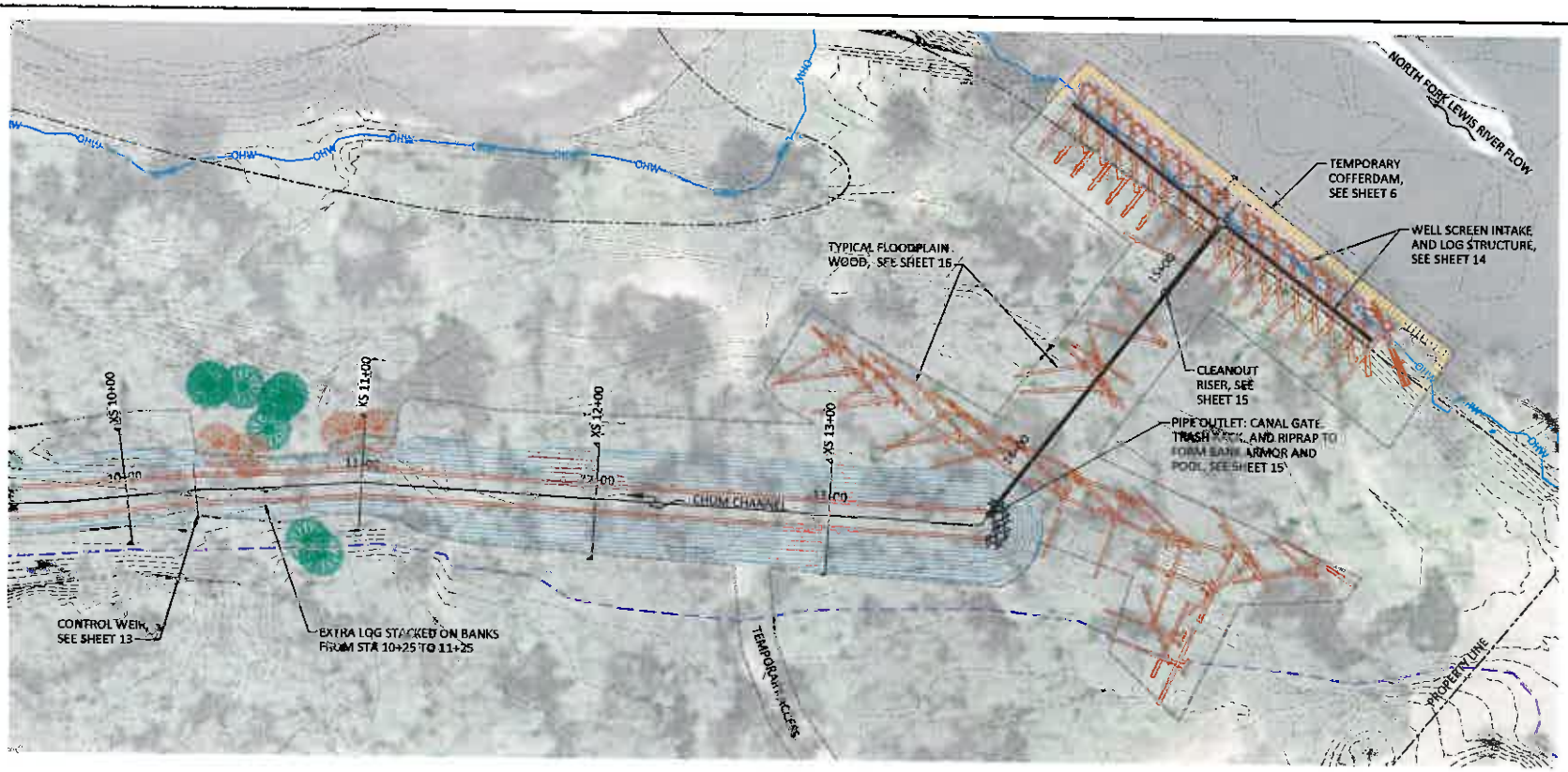
LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

inter·fluve
501 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

PROPOSED CONDITIONS
STA 3+50 TO 10+25

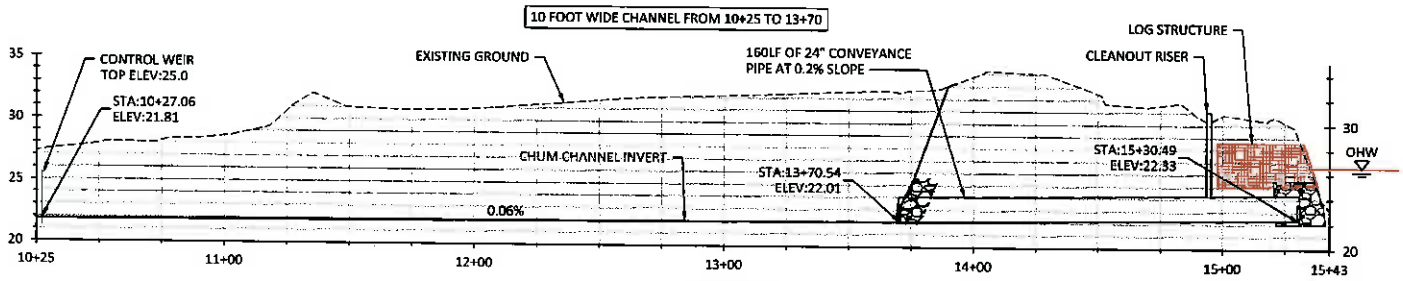
SHEET 9 OF 17

G:\U-Z\WDFW Chum Channels_110207\Drawings\IFI_WDFW_CHUM_Construction.dwg



PLAN

SEE SHEET 11 FOR GRADING CROSS SECTIONS.

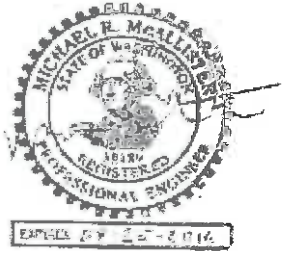


PROFILE

0 50 100
SCALE IN FEET

LEGEND

- ORDINARY HIGH WATER
- EDGE OF EXISTING FLOODPLAIN
- EXISTING CONTOURS (1FT INTERVALS)
- PROPOSED CONTOURS (1FT INTERVALS)
- PROPERTY LINES
- LIMITS OF DISTURBANCE
- TEMPORARY COFFERDAM
- XS 3+00 GRADING CROSS SECTIONS, SEE SHEET 11
- EXISTING TREES TO REMAIN
- EXISTING TREES TO BE REMOVED



EXPIRES 11-2-2016

NO.	BY	DATE	REVISION DESCRIPTION

MJ,DF DRAWN	MM,GJ DESIGNED	GJ CHECKED
MM APPROVED	2/13/15 DATE	11-02-07 PROJECT

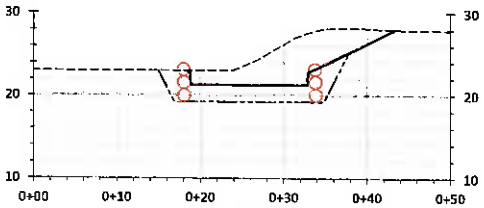
LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

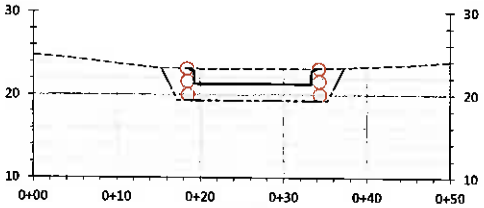
inter-fluve
501 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

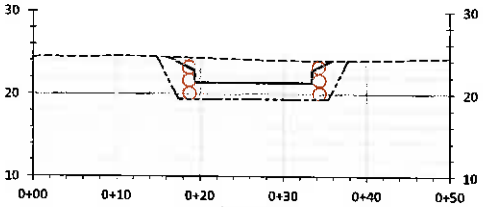
PROPOSED CONDITIONS
STA 10+25 TO 13+70

SHEET 10 OF 17

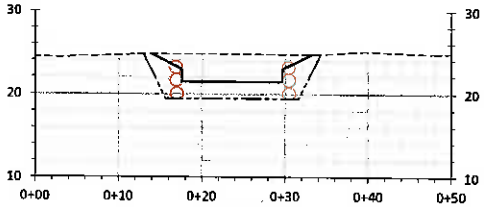
G:\U-Z\WDFW Chum Channels_110207\Drawings\IFI_WDFW_CHUM_Construction.dwg

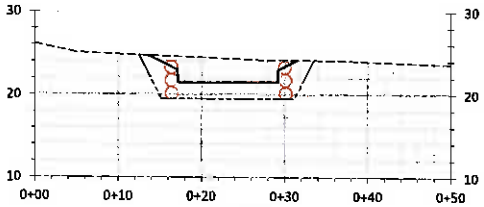


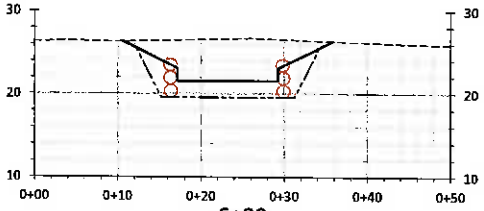


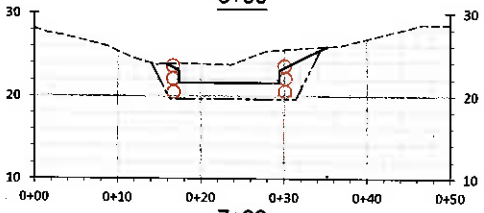


14 FOOT WIDE CHANNEL FROM 0+10 TO 3+25





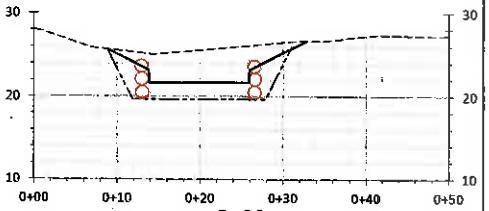


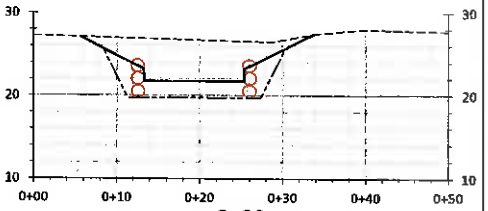


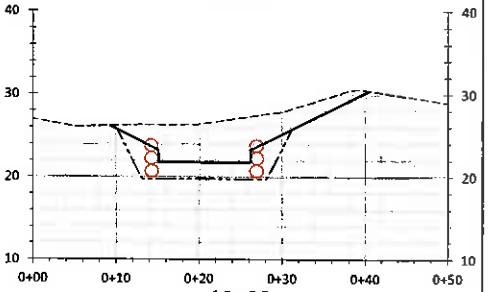
LEGEND

EXISTING GROUND
PROPOSED GROUND
SUBGRADE

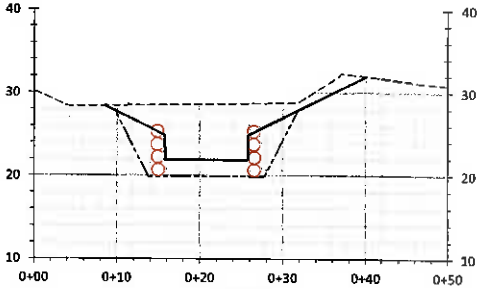
SCALE (IN FEET) 15 15

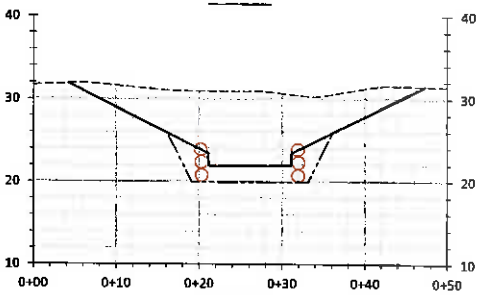


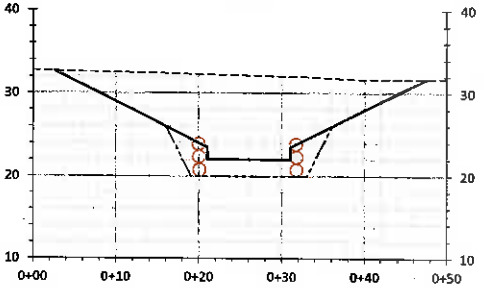




12 FOOT WIDE CHANNEL FROM 3+50 TO 10+25







10 FOOT WIDE CHANNEL FROM 10+25 TO 13+70

NO.	BY	DATE	REVISION DESCRIPTION

MJ,DF	MM,GJ	GJ
DRAWN	DESIGNED	CHECKED
MM	2/13/15	11-02-07
APPROVED	DATE	PROJECT

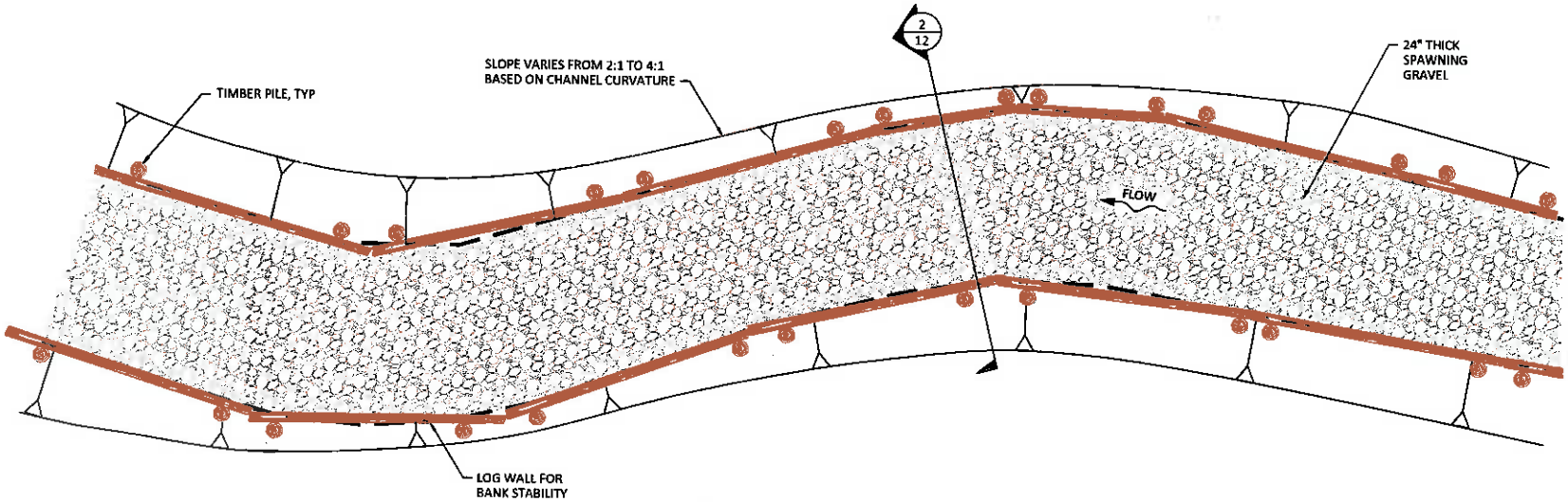
LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

inter·fluve
501 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

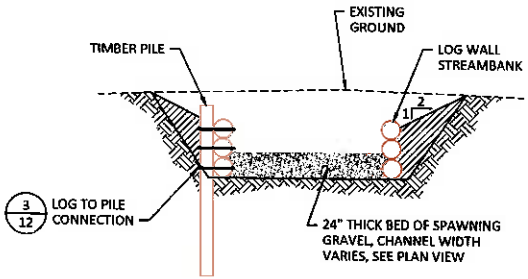
GRADING CROSS-SECTIONS
STA 1+00 TO 13+00

SHEET 11 OF 17

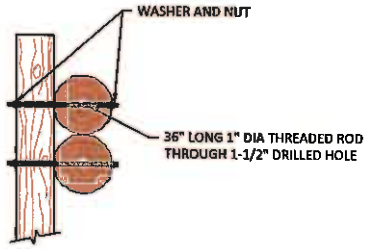
G:\U-Z\WDFW Chum Channels_110207\Drawings\IFI_WDFW_CHUM_Construction.dwg



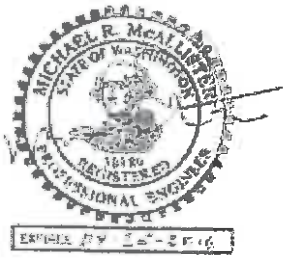
1/12 TYPICAL PLAN
NOT TO SCALE



2/12 SECTION
NOT TO SCALE



3/12 LOG TO PILE CONNECTION
NOT TO SCALE



G:\U-Z\WDFW Chum Channels_110207\Drawings\IFI_WDFW_CHUM_Construction.dwg

NO.	BY	DATE	REVISION DESCRIPTION

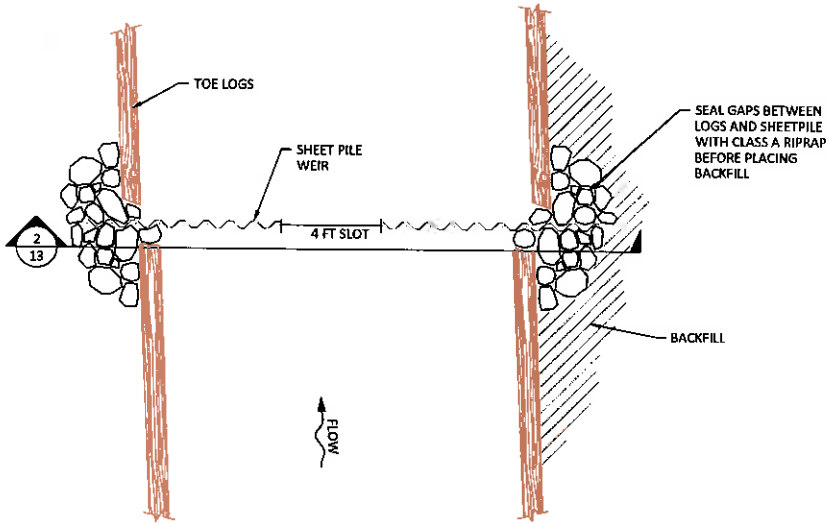
MJ,DF	MM,GJ	GJ
DRAWN	DESIGNED	CHECKED
MM	2/13/15	11-02-07
APPROVED	DATE	PROJECT

LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

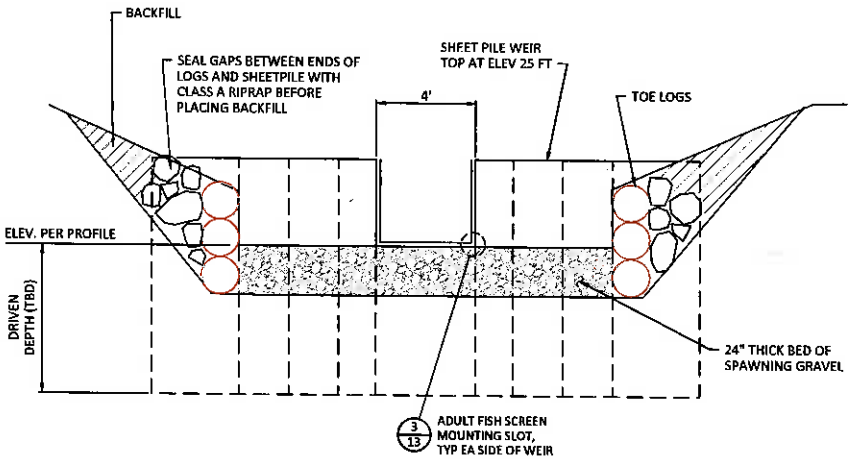
inter·fluve
501 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

TYPICAL DETAILS

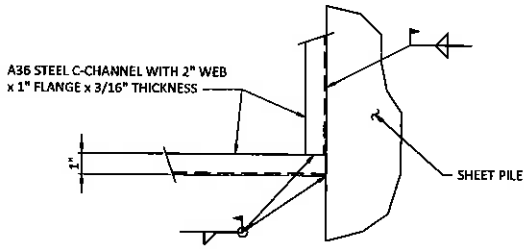
SHEET
12 OF 17



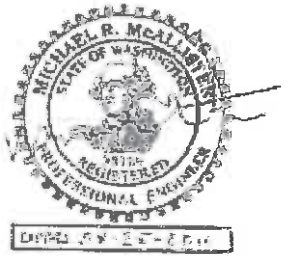
1/13 PLAN - CONTROL WEIR
NOT TO SCALE



2/13 SECTION - CONTROL WEIR
NOT TO SCALE



3/13 FISH SCREEN SLOT
NOT TO SCALE



NO.	BY	DATE	REVISION DESCRIPTION

MJ,DF	MM,GJ	GJ
DRAWN	DESIGNED	CHECKED
MM	2/13/15	11-02-07
APPROVED	DATE	PROJECT

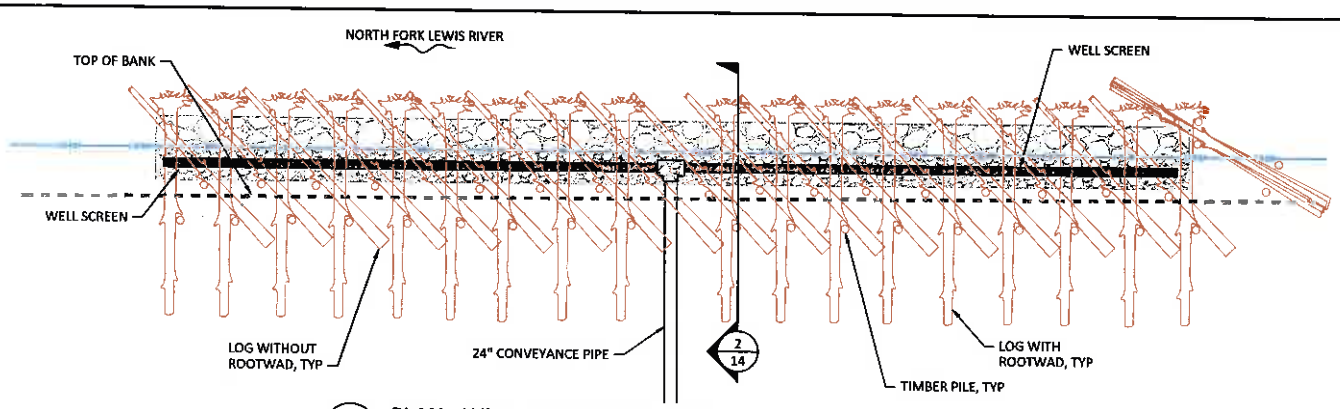
LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

inter-fluve
501 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

TYPICAL DETAILS

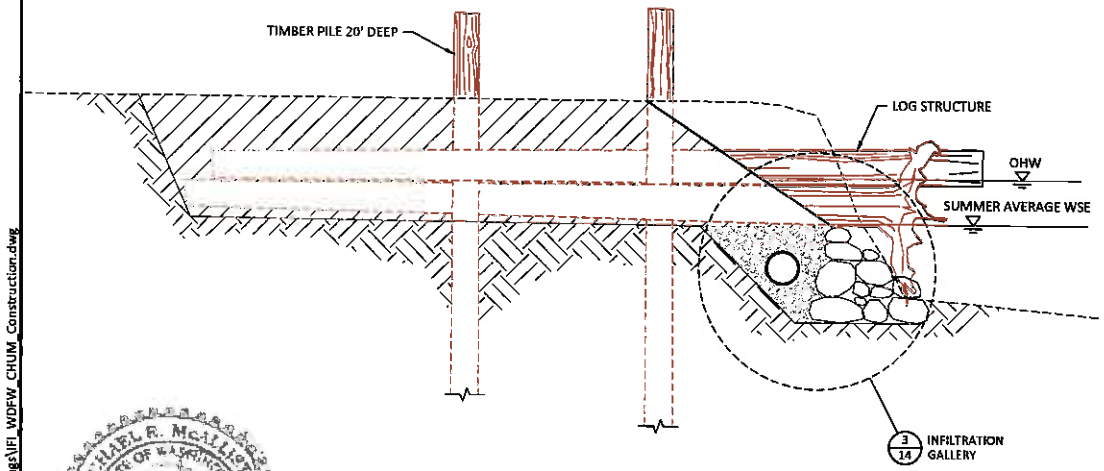
SHEET 13 OF 17

G:\U-Z\WDFW Chum Channels_110207\Drawings\IFI_WDFW_CHUM_Construction.dwg

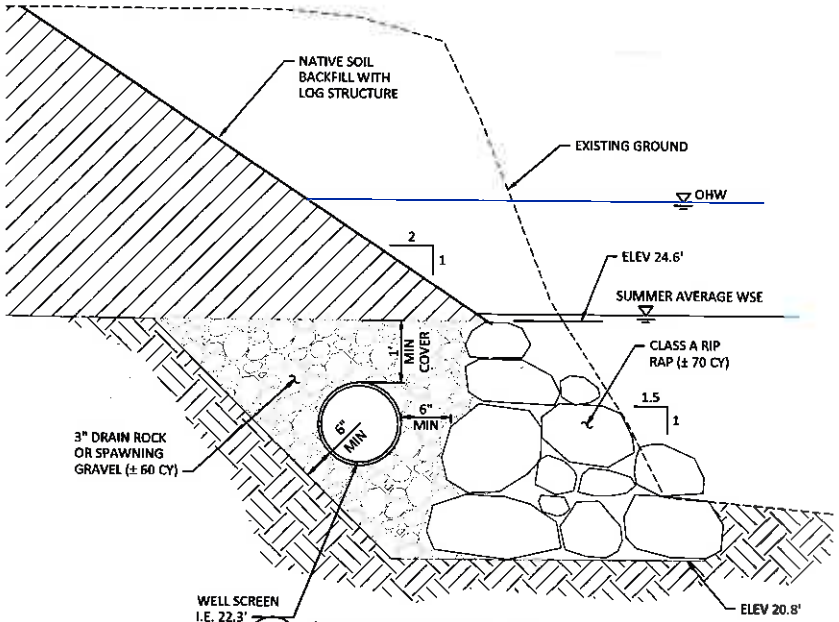


1/14 PLAN - WELL SCREEN AND LOG STRUCTURE
NOT TO SCALE

SEE FOR WELL SCREEN, PIPE, FITTINGS, AND APPURTENANCES.



2/14 SECTION - WELL SCREEN AND LOG STRUCTURE
NOT TO SCALE



3/14 INFILTRATION GALLERY
NOT TO SCALE

MICHAEL R. McALLISTER
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER

NO.	BY	DATE	REVISION DESCRIPTION

MJ,DF	MM,GJ	GJ
DRAWN	DESIGNED	CHECKED
MM	2/13/15	11-02-07
APPROVED	DATE	PROJECT

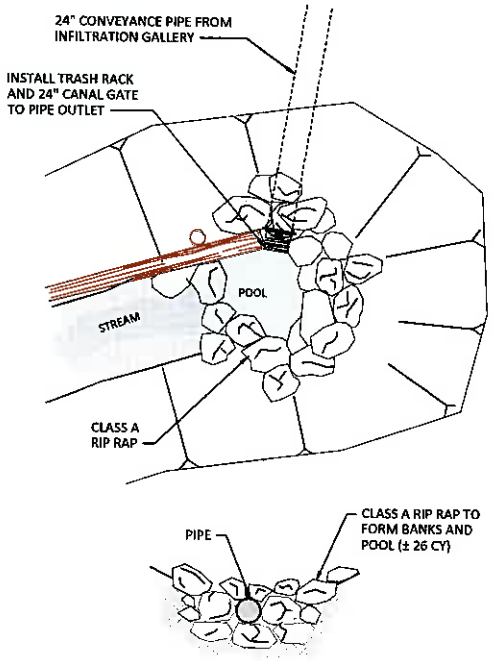
LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

inter-fluve
501 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

TYPICAL DETAILS

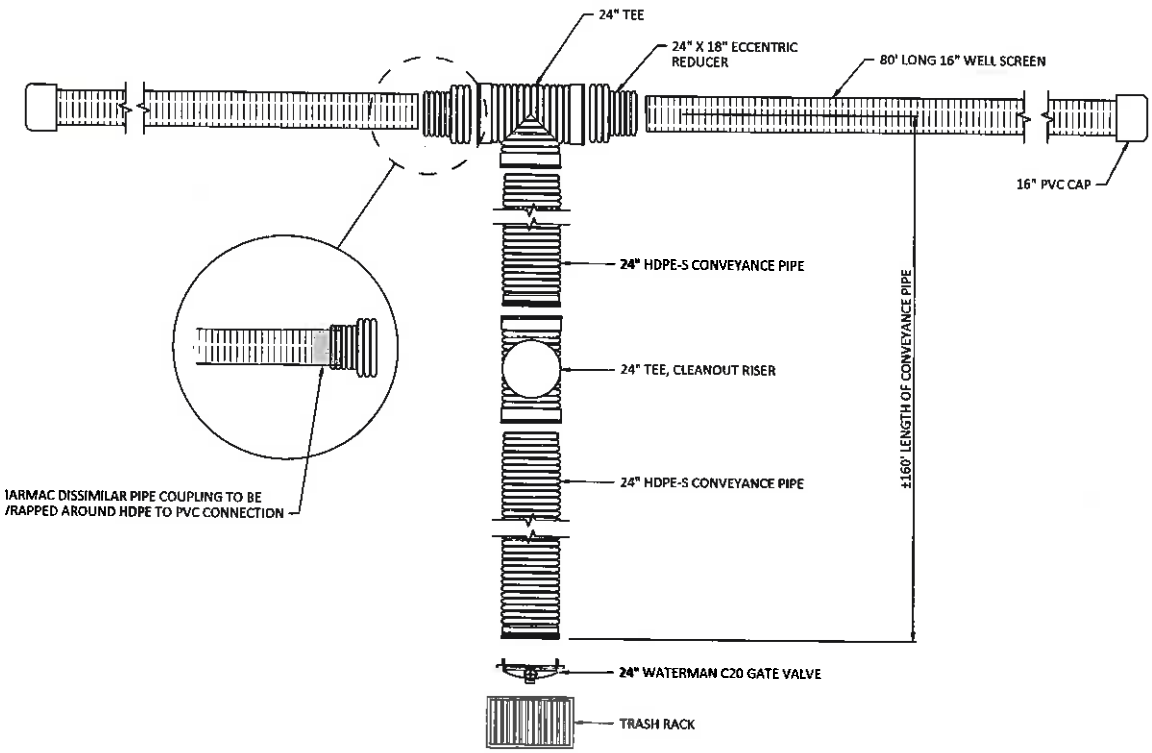
SHEET 14 OF 17

G:\U-Z\WDFW Chum Channels_110207\Drawings\IFI_WDFW_CHUM_Construction.dwg



1/15 PIPE OUTLET
NOT TO SCALE

WELLSCREEN
16" DIAMETER SCH40 OR SDR26
0.125" SLOTS, 0.25" SLOT SPACING, 10 ROWS PER FOOT
MINIMUM 133.1 SQ-IN OPEN AREA PER FOOT OF PIPE



2/15 WELL SCREEN PIPE AND FITTINGS
NOT TO SCALE

NO.	BY	DATE	REVISION DESCRIPTION

MJ,DF	MM,GJ	GJ
DRAWN	DESIGNED	CHECKED
MM	2/13/15	11-02-07
APPROVED	DATE	PROJECT

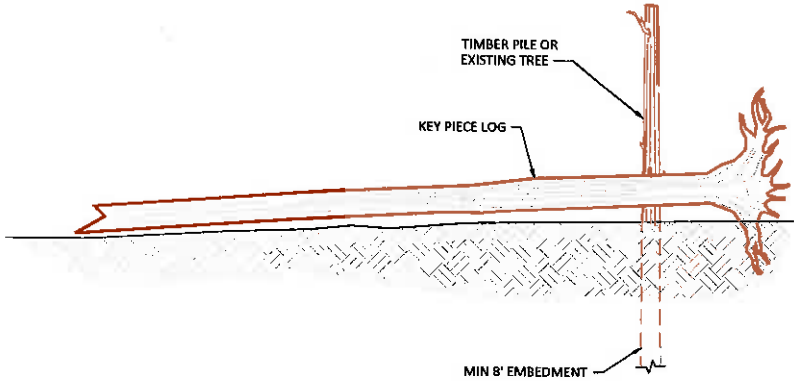
LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

inter-fluve
501 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

TYPICAL DETAILS

SHEET 15 OF 17

G:\U-Z\WDFW Chum Channels_110207\Drawings\IFI_WDFW_CHUM_Construction.dwg

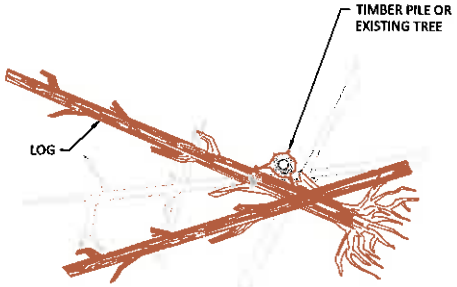


1/16 SECTION - TYPICAL FLOODPLAIN ROUGHNESS LWD
NOT TO SCALE

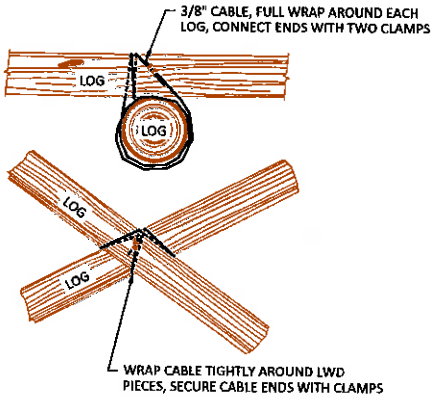
NOTES

FINAL ORIENTATION OF LOGS AND MATERIALS MAY VARY FROM TYPICAL DRAWINGS DEPENDING ON SIZE AND SHAPE OF MATERIAL DELIVERED OR SALVAGED.

BRACING TO EXISTING TREES OR INSTALLED TIMBER PILES WILL OCCUR AT LOCATIONS IDENTIFIED IN THE FIELD TO PROVIDE HORIZONTAL STABILITY. FILLER LOGS AND TREE TOPS WILL BE INSTALLED AT "RACKING" LOCATIONS TO EMULATE NATURAL DEBRIS. THESE PIECES ARE TO BE CONSIDERED MOBILE AND TRANSIENT, AND MAY BECOME LOOSE, DISPLACED, REPLACED, OR ACCUMULATED ONTO DURING FLOODING.



2/16 PLAN - TYPICAL FLOODPLAIN ROUGHNESS LWD
NOT TO SCALE



3/16 TYPICAL LOG CABLE CONNECTIONS
NOT TO SCALE

LOG CABLING

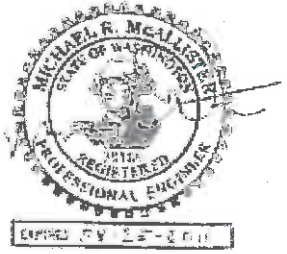
DESCRIPTION
THIS WORK CONSISTS OF ANCHORING LOGS BY CABLING TO OTHER LOGS OR LOG PILES.

MATERIALS
CABLE SHALL BE 3/8 INCH GALVANIZED STEEL CORE WIRE ROPE.

MINIMUM OF 2 CLAMPS PER CONNECTION.

CONSTRUCTION
FINAL POSITIONING OF THE ANCHORED LOG STRUCTURES SHALL BE IN THE APPROXIMATE LOCATION AS SHOWN ON THE PLANS.

LOGS SHALL BE TOUCHING. CABLE SHALL BE WRAPPED TWICE AROUND EACH LOG. PULL TIGHT AND INSTALL MINIMUM TWO CLAMPS PER CONNECTION. CLAMPS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION, SPACING AND CLAMP SIZE AND LOAD RATING OF THE CABLE BEING USED.



NO.	BY	DATE	REVISION DESCRIPTION

MJ,DF	MM,GJ	GJ
DRAWN	DESIGNED	CHECKED
MM	2/13/15	11-02-07
APPROVED	DATE	PROJECT

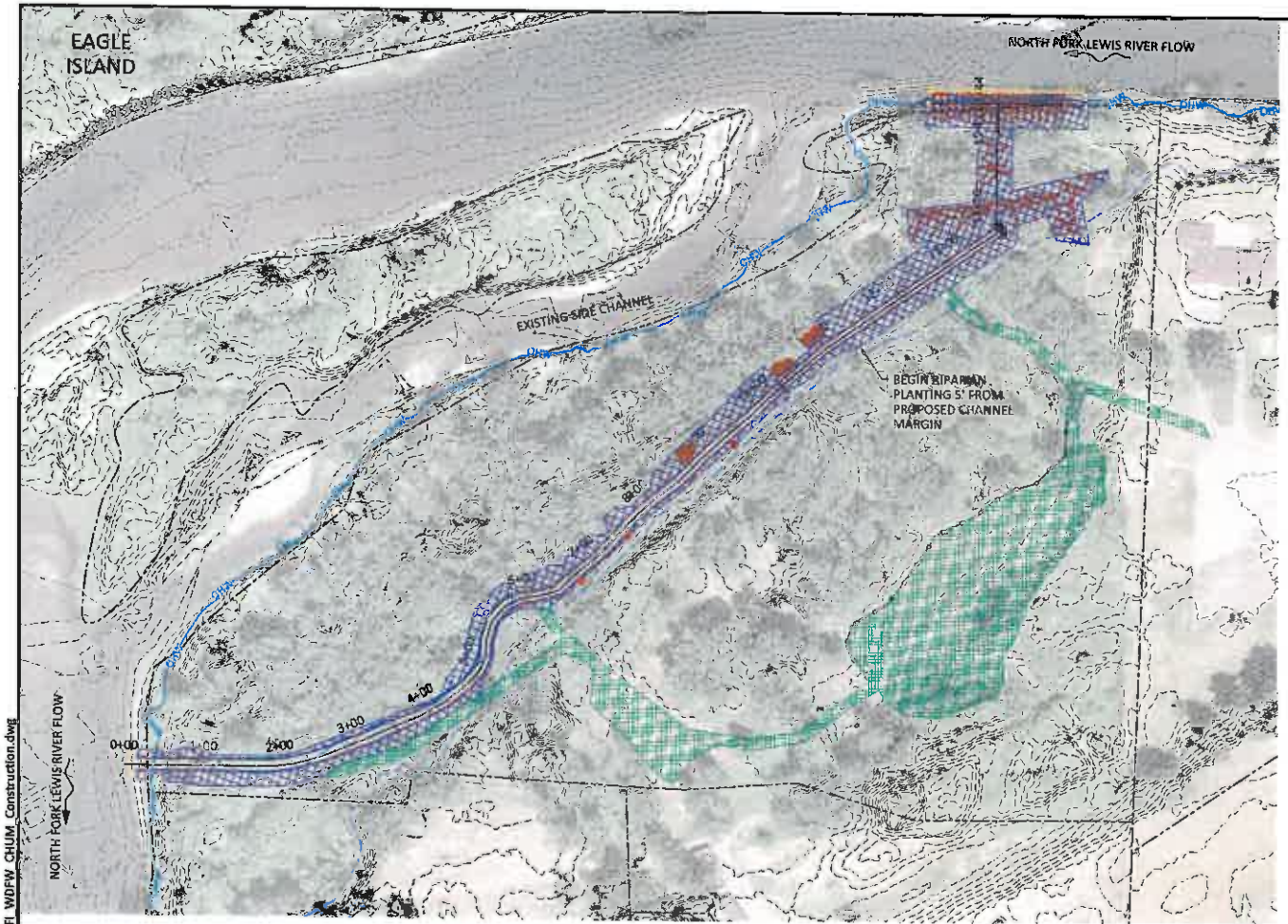
LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

inter·fluve
501 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

TYPICAL DETAILS

SHEET
16 OF 17

G:\U-Z\WDFW Chum Channels_110207\Drawings\IFI_WDFW_CHUM_Construction.dwg



PLAN

0 100 200
SCALE IN FEET

LEGEND

- PROPERTY LINES
- OHW — ORDINARY HIGH WATER
- EDGE OF FLOODPLAIN
- REVEGETATION AREA 1 - EROSION CONTROL SEED MIX
- REVEGETATION AREA 2 - SHRUB & SMALL TREE PLANTINGS

MICHAEL R. McALLISTER
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER

EXPIRES 09-25-2016

NOTES:

WEED-FREE STRAW MULCH MATERIAL SHALL BE PER SECTION 9-14.4(1) OF THE STANDARD SPECIFICATIONS AND SHALL BE APPLIED AT A RATE OF 3 TONS PER ACRE TO ALL DISTURBED AREAS FOLLOWING SEED APPLICATION.

ACCESS ROUTES AND STAGING AREAS SHALL BE DECOMPACTED PRIOR TO APPLICATION OF SEED AND MULCH.

SITE ACCESS ROADS AND OTHER DISTURBED AREAS TO BE SEEDED WITH 30-LBS. PER ACRE OF NATIVE EROSION CONTROL SEED MIX.

REVEGETATION AREA 1 SHALL HAVE SEED AND STRAW MULCH APPLIED WITHIN 7 DAYS AFTER PROJECT COMPLETION.

Table 1. Revegetation Area #1 - Erosion Control Seeding 1.83 acres

Common Name	Scientific Name	Percentage of Mix
Blue Wildrye	*Elymus glaucus*	40%
Native Red Fescue	*Festuca rubra rubra*	40%
Tufted Hairgrass	*Deschampsia caspitosa*	10%
Sheep Fescue	*Festuca ovina*	5%
Quackgrass	*Agropyron repens*	5%

Table 2. Revegetation Area #2 -- Riparian Plantings 1.45 acres

Common Name	Scientific Name	Plant Form	Min. Size	Qty
Trees - Approximate 10 foot spacing on center				
Oregon Ash	*Fraxinus latifolia*	Bare root	24"	210
Cascara	*Rhamnus pusiliana*	Bare root	24"	210
Black Cottonwood	*Populus balsamifer ssp. Trichocarpa*	Bare root	24"	210
Shrubs - Approximate 4 foot spacing on center				
Red-Osier Dogwood	*Cornus Sericea*	Bare root	36"	400
Western Serviceberry	*Amelanchier alnifolia*	Bare root	36"	400
Black hawthorn	*Crataegus douglasa var. suksdorfii*	Bare root	36"	400
Pacific Ninebark	*Physocarpus capitatus*	Bare root	36"	400
Indian plum	*Oemleria cerasiformis*	Bare root	36"	400
Thimbleberry	*Rubus parviflorus var. parviflorus*	Bare root	36"	400
Pacific willow	*Salix lucida*	Bare root	36"	400
Swamp Rose	*Rosa pisocarpa*	Bare root	36"	400

NO.	BY	DATE	REVISION DESCRIPTION

MJ,DF	MM,GJ	GJ
DRAWN	DESIGNED	CHECKED
MM	2/13/15	11-02-07
APPROVED	DATE	PROJECT

LEWIS RIVER - EAGLE ISLAND
CHUM SPAWNING CHANNEL
WOODLAND, WASHINGTON

inter·fluve
501 Portway Ave, Suite 101
Hood River, OR 97031
541.386.9003
www.interfluve.com

REVEGETATION PLAN

SHEET 17 OF 17

G:\U-Z\WDFW Chum Channels_110207\Drawings\IFI_WDFW_CHUM_Construction.dwg