EXISTING DATA
GENERAL TOPOGRAPHIC INFORMATION IS PROVIDED FROM LIDAR FROM CLARK COUNTY AND SPECIFIC PROJECT AREA SURVEY PERFORMED BY INTER-FLOUE, INC.

SOILS
LEWIS RIVER GRAVEL BAR.

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.

CONSTRUCTION ACCESS
THE CONTRACTOR SHALL ENTER THE SITE FROM NW 15TH AVE., NEAR ITS INTERSECTION WITH NW HAYES ROAD.
THE CONTRACTOR IS SOLELY RESPONSIBLE FOR OBTAINING ANY REQUIRED TRAFFIC CONTROL, OR ACCESS PERMITS.
THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING ANY REQUIRED TRAFFIC CONTROL, INCLUDING, BUT NOT LIMITED TO, SIGNAGE AND FLAGGERS.
ALL SAPLING AND TREES TO BE TRANSPLANTED OR REMOVED SHALL BE APPROVED BY THE ENGINEER AND CLEARLY MARKED.
ALL EQUIPMENT, MATERIALS AND PERSONNEL SHALL REMAIN WITHIN THE LIMITS OF DISTURBANCE.
THE CONTRACTOR SHALL KEEP THE WORK AREAS IN A NEAT AND SIGHTLY CONDITION FREE OF DEBRIS AND LITTER FOR THE DURATION OF THE PROJECT.
THE CONTRACTOR SHALL ESTABLISH ACCESS INCLUDING TEMPORARY REMOVAL AND REPLACEMENT OF GATES, TRIMMING AND REMOVAL OF TREES, AND REMOVAL AND DISPOSAL OF CONCRETE IN ACCORDANCE WITH LANDOWNER ACCESS AGREEMENTS.

COFFERDAM
WORK AREA(S) SHALL BE ISOLATED BY COFFERDAMS INSTALLED UPSTREAM AND DOWNSTREAM OF ENHANCEMENT AREA. COFFERDAM MAY BE CONSTRUCTED WITH SAND FILLED BULK BAGS AND LINED WITH VISQUEEN ADJACENT TO ACTIVE FLOW IN THE CHANNEL.
DEWATERING OF WORK AREA(S) SHALL OCCUR CONCURRENT W/ FISH RESCUE. THE SHEETWALL WILL BE RESPONSIBLE FOR CONDUCTING AND COORDINATING THE FISH RESCUE. THE CONTRACTOR SHALL COORDINATE Dewatering WITH SHEETWALL ACTIVITIES.
PUMPING SHALL BE PERFORMED TO KEEP WORK AREA DEWATERED. PUMPED DISCHARGE SHALL BE RELEASED IN WATERSHED—LADEN WATER IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OR INCREASE TURBIDITY OF SURFACE WATERS. (SEE CONTROL Dewatering).

FISH RESCUE
COFFER DAM SHALL BE INSTALLED TO ISOLATE WORK.
INITIAL Dewatering SHALL OCCUR SLOWLY BY INCREASINGLY REDUCING COFFER DAMMED AREAS OVER A PERIOD OF 30 MINUTES TO ALLOW TIME FOR FISH TO FIND RESIDUAL POOLS WITHOUT RISK OF SUDDEN STRANGULATION.
RESIDUAL POOLS WITHIN THE Dewatered CONSTRUCTION SITE SHALL BE Dewatered DURING SCREENED PUMP INTAKES. TRAPPED FISH SHALL BE RESCUED.
FISH BARRIERS AND PUMP INTAKES SHALL ADHERE TO NTMF SCREENING CRITERIA. NATIONAL MARINE FISHERIES SERVICE JUVENILE FISH SCREEN CRITERIA (REVISED FEBRUARY 16, 1995) AND ADDENDUM: JUVENILE FISH SCREEN CRITERIA FOR PUMP INTAKES (MAY 9, 1996)
ALL FISH RESCUE EFFORTS SHALL BE SUPERVISED BY A QUALIFIED FISHERIES/AQUATIC BIOLoGIST EXPERIENCED WITH THE COLLECTION AND HANDLING OF SALMONID FISHES FROM CONSTRUCTION SITES.
ALL FISH TRAPPED IN RESIDUAL POOLS WITHIN THE PROJECT AREA WILL BE CAREFULLY COLLECTED BY SHEETWALL AND/OR DP NFIS AND PLACED IN CLEAN TRANSFER CONTAINERS WITH ADEQUATE VOLUME OF WATER AND HELD WITHIN 10 MINUTES.
CAPTURED FISHES SHALL BE IMMEDIATELY RELEASED TO DOWNSRTEAM OR UPHILL ON THE CONSTRUCTION SITE, DEPENDING ON SPECIES AND LIFESTAGE.

TREE SALVAGE
ANY REMOVED VEGETATION GREATER THAN 6 INCHES DIAMETER AND 15 FEET LONG SHOULD BE INCORPORATED INTO LOG JAM STRUCTURES. CONTRACTOR IS RESPONSIBLE FOR REMOVING SMALLER CLEARING AND GRUBBING DEBRIS FROM THE SITE AT THE END OF THE PROJECT UNLESS DIRECTED BY THE ENGINEER.

LIVE TREES
ALL TREES NOT MARKED FOR REMOVAL SHALL BE LEFT STANDING UNDISTURBED. LOGGING ACTIVITY SHALL NOT DEBARK OR DAMAGE LIVE TREES.

EROSION CONTROL
THE CONTRACTOR IS ADVISED THAT THE PROJECT AREA DRAINS TO A SALMON BEARING STREAM AND/OR STATE WATERS AND THAT THE CONTRACTOR IS RESPONSIBLE TO PROTECT THE RECEIVING WATERS FROM DELTIALER EFFECTS OF CONSTRUCTION.
THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE EROSION 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 AS NEEDED TO CONTROL EROSION AND SEDIMENT AT THE CONSTRUCTION SITE AND TO PREVENT VIOLATION OF SURFACE WATER QUALITY, GROUND WATER QUALITY, OR SEDIMENT MANAGEMENT STANDARDS. EROSION CONTROL MEASURES SHALL BE MAINTAINED THROUGHOUT THE COURSE OF CONSTRUCTION AND UNTIL ALL DISTURBED EARTH IS STABILIZED IN FINISH GRADES.
THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING ALL NECESSARY EROSION CONTROL FACILITIES TO COMPLY WITH APPLICABLE EROSION CONTROL REGULATIONS.
AN APPROVED EROSION AND SEDIMENT CONTROL (ESC) PLAN IS PROVIDED IN THESE DRAWINGS. THE BID AND CONSTRUCTION CONTRACT ARE BASED UPON IT. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR PROVIDING EROSION CONTROL MEASURES TO COMPLY WITH APPLICABLE REGULATIONS AND PERMITS.
THE FOLLOWING RECOMMENDATIONS FOR AN ESC PLAN WILL PROVIDE A GUIDELINE FOR THE CONTRACTOR TO DEVELOP AND IMPLEMENT AN ESC PLAN.
A. THE IMPLEMENTATION OF THESE RECOMMENDATIONS FOR AN ESC PLAN AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADE OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED, AND VEGETATION IS ESTABLISHED.
B. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
C. ESC FACILITIES AS APPROXIMATELY SHOWN ON THIS PLAN ARE TO BE CONSTRUCTED IN CONJUNCTION WITH ALL 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.
D. THE ESC FACILITIES SHOWN ON THE ESC PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICTION SITE CONDITIONS DURING THE CONSTRUCTION PERIOD. THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT LEAVE THE SITE.
E. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
F. FROM OCTOBER 1 – APRIL 30, NO SUBSTANTIALLY UNWORKED SOILS SHALL REMAIN EXPOSED FOR MORE THAN TWO DAYS AT A TIME; FROM MAY 1 – SEPT 30 NO SUBSTANTIALLY UNWORKED SOILS SHALL REMAIN EXPOSED FOR MORE THAN SEVEN DAYS AT A TIME.
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 12 inch overlap, and both ends securely fastened to the post, or overlap 2 x 2 x 2' posts and attach as approved by the Engineer.

2. The Silt Fence is to be installed at locations shown on the plan along the downhill perimeter of disturbed areas. The fence posts shall be spaced a maximum of 4 feet apart and driven securely into the ground a minimum of 12 inches.

3. The Silt Fence shall have a minimum vertical burial of 6 inches. All excavated material from filter fabric fence installation shall be backfilled and compacted, along the entire disturbed area.

4. Standard or heavy duty Silt Fence shall have manufactured stitched loops for 2' x 2' 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.

6. Silt Fences shall be inspected by the contractor immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately.

7. On project completion, the contractor shall remove all Silt Fences and temporary erosion control measures from the project site.

INSPECTION AND MAINTENANCE

All best management practices (BMPs) shall be inspected, maintained, and repaired as needed to assure continued performance of their intended function. All on-site erosion and sediment control measures shall be inspected at least once every seven days and within 24 hours after any storm greater than 0.5 inches of rain per 24 hour period.

SEDIMENT MUST BE REMOVED FROM SILT FENCES BEFORE IT REACHES APPROXIMATELY ONE THIRD THE HEIGHT OF THE FENCE, ESPECIALLY IF HEAVY RAINS ARE EXPECTED.

STABILIZE SOILS AND PROTECT SLOPES

From May 1 through September 30, all exposed soils shall be protected from erosion by mulching, plastic sheeting, hydroseed covering, 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 until stabilized.

DESIGN, CONSTRUCT AND PHASE CUT AND FILL SLOPES IN A MANNER THAT WILL MINIMIZE EROSION. REDUCE SLOPE VELOCITIES ON DISTURBED SLOPES BY PROVIDING TEMPORARY BARRIERS. STORMWATER FROM OFF SITE SHOULD BE HANDLED SEPARATELY FROM STORMWATER GENERATED ON SITE.

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.

CONSTRUCTION ACCESS

Public rights-of-way shall be kept in a clean and serviceable condition at all times. The event materials are inadvertently deposited on roads, the material shall be promptly removed. Materials are to be swept and removed to an approved location.

SILT FENCE shall be placed along access routes, stockpile area, and downstream of outlet Coffen dam.

CONTROL POLLUTANTS

Contractor must prepare a spill prevention control and counter measure (SPCC) plan and implement required measures to control pollutants. See the special provisions.

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.

SEDIMENT CONTROLS

The duff layer, native top soil, and natural vegetation shall be retained in an undisturbed state to the maximum extent practicable. The contractor shall mark all areas which are not to be disturbed, including setbacks, sensitive/critical areas and their buffers, trees and drainage courses not to be disturbed shall be marked and flagged before construction activities are initiated. These areas shall be protected by the contractor with barrier fencing as shown on the drawing and as directed by the engineer when construction activities are initiated.

The contractor may elect to construct temporary sedimentation ponds, tanks, or other facilities as necessary to control runoff and/or to filter sediment discharges.

CONTROL DEWATERING

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.

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.

Joints in filter fabric shall be spliced at posts. Use staples, wire rings or equivalent to attach fabric to posts.

POST SPACING MAY BE INCREASED TO 8" IF WIRE BACKING IS USED.

NOTES:

1. FENCE SHALL NOT BE INSTALLED ON SLOPES STEEPER THAN 2:1.

2. JOINTS IN FILTER FABRIC SHALL BE OVERLAPPED 12 INCHES AT POST.

3. USE STAPLES, WIRE RINGS, OR EQUIVALENT TO ATTACH FABRIC.

4. REMOVE SEDIMENT WHEN IT REACHES 1/3 FENCE HEIGHT.

LEWIS RIVER - EAGLE ISLAND HABITAT RESTORATION - SITE A WOODLAND, WASHINGTON

EROSION CONTROL NOTES AND DETAILS

SILIT FENCE DETAIL

1

3
LEGEND
- TEMPORARY COFFER DAM
- ACCESS ROUTE
- STAGING/STOCKPILE
- LIMITS OF DISTURBANCE
- SILT FENCE

PLAN VIEW

SECTION A-A'

NOTES:
1. PLACE COFFER DAMS PRIOR TO PERFORMING IN-WATER WORK.
2. REMOVE COFFER DAMS AFTER IN-WATER WORK IS COMPLETE.
NOTES

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

BRACING TO EXISTING TREES OR INSTALLED VERTICAL LOG PILES WILL OCCUR AT LOCATIONS IDENTIFIED IN THE FIELD TO PROVIDE HORIZONTAL STABILITY. FILLER LOGS AND SLASH TREES WILL BE INSTALLED AT "RACKING" LOCATIONS TO EMULATE NATURAL DEBRIS ACCUMULATIONS AND TO OPTIMIZE FISH HABITAT. THESE PIECES ARE TO BE CONSIDERED MOBILE AND TRANSIENT, AND MAY BECOME LOOSE, DISPLACED, REPLACED, OR ACCUMULATED DURING FLOODING.
NOTES

SPECIFIC ORIENTATION OF LOGS AND BALLAST MATERIALS MAY VARY FROM TYPICAL ARRANGEMENTS DEPENDING ON SIZE AND SHAPE OF MATERIAL DELIVERED OR SALVAGED.

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

LEWIS RIVER - EAGLE ISLAND
HABITAT RESTORATION - SITE A
WOODLAND, WASHINGTON

TYPICAL DETAILS II

9 OF 12
**Typical Logs Secured with Pile**

Log Wood Buoyancy Force in Pounds

Assumes Wood Specific Gravity = 0.5

<table>
<thead>
<tr>
<th>DBH x Log Length (feet)</th>
<th>Factor 1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x 30</td>
<td>1,104</td>
</tr>
<tr>
<td>2 x 30</td>
<td>4,416</td>
</tr>
<tr>
<td>3 x 30</td>
<td>9,930</td>
</tr>
<tr>
<td>1 x 40</td>
<td>1,472</td>
</tr>
<tr>
<td>2 x 40</td>
<td>5,887</td>
</tr>
</tbody>
</table>

Additional Root Wad Buoyancy Force in Pounds

Estimate Based on 35% Void Space

Adjust as needed based on void space in each root wad.

- 2 x 2 Foot Diameter RW: 64
- 3 x 3 Foot Diameter RW: 215
- 4 x 4 Foot Diameter RW: 510
- 5 x 5 Foot Diameter RW: 997
- 8 x 8 Foot Diameter RW: 1,722

**Submerged Boulder Ballast in Pounds**

Assumes Rock Density of 2.65 and lift @ 5 fps

<table>
<thead>
<tr>
<th>Boulder Diameter</th>
<th>Ballast</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Foot</td>
<td>1455</td>
</tr>
<tr>
<td>4 Foot</td>
<td>2910</td>
</tr>
<tr>
<td>5 Foot</td>
<td>5816</td>
</tr>
<tr>
<td>6 Foot</td>
<td>2310</td>
</tr>
<tr>
<td>7 Foot</td>
<td>4520</td>
</tr>
<tr>
<td>8 Foot</td>
<td>9241</td>
</tr>
<tr>
<td>9 Foot</td>
<td>3448</td>
</tr>
<tr>
<td>10 Foot</td>
<td>6697</td>
</tr>
<tr>
<td>11 Foot</td>
<td>13794</td>
</tr>
</tbody>
</table>

Each verification test pile shall be tension load tested to 20,000 pounds, or pull out, whichever is less.

Testing of piles shall be performed in the presence of the engineer.

It should be anticipated that up to 25% of the production piles shall be proof tested.

Tension scale shall be intercomp TLC 6000 Tension Link scale, model 1500D5, 25,000 pound capacity, or approved equal.

Submit tension scale make and model to engineer for appraisal.

Rigging shall conform the tension scale manufacturer’s recommendations and the following:

1/2-inch cable shall be galvanized, steel core, 1/2-inch diameter and shall have a minimum nominal tensile capacity of 12 tons.

Cable clamps shall be galvanized steel and shall meet the performance requirements of federal specification FT-C-450 Type I Class 1. Cable clamps shall be Crosby clips, "G-450" or approved equal.

Top and bottom shackles shall be manufactured by Crosby for use with 1/2-inch diameter steel cable.

Testing

The proof load tests shall be made by incrementally loading the pile in accordance with the following schedule:

<table>
<thead>
<tr>
<th>Load (Alignment Load)</th>
<th>Hold Time</th>
<th>Vertical Deflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,000 Pounds</td>
<td>1 Min.</td>
<td>6 Inches</td>
</tr>
<tr>
<td>10,000 Pounds</td>
<td>1 Min.</td>
<td>6 Inches</td>
</tr>
<tr>
<td>15,000 Pounds</td>
<td>2 Min.</td>
<td>6 Inches</td>
</tr>
<tr>
<td>20,000 Pounds</td>
<td>2 Min.</td>
<td>6 Inches</td>
</tr>
</tbody>
</table>

**Pile Testing Section**

LEWIS RIVER - EAGLE ISLAND
HABITAT RESTORATION - SITE A
WOODLAND, WASHINGTON

TYPICAL DETAILS III

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N.T.S.
CABLING NOTES

DESCRIPTION
This work consists of installing logs with root wads into anchored log structures as shown on the plans and as directed by the engineer.

MATERIALS
Anchors for this work will consist of cabled boulders. Boulders shall be non-fractured basalt with a minimum specific gravity of 2.65.

CABLE SHALL BE GALVANIZED, STEEL CORE, AND SHALL HAVE A MINIMUM DIAMETER OF 1/2 INCH.

CLAMPS SHALL BE CROSBY CLIPS, G-450, OR APPROVED EQUAL. MINIMUM OF 3 CLAMPS PER CONNECTION.

EPOXY FOR ANCHORING SHALL BE HILTI HIT RE 500 ADHESIVE OR APPROVED EQUAL.

CONSTRUCTION
Final positioning of the anchored log structures shall be in the approximate location as shown on the plans and as approved in the field by the engineer.

LEWIS RIVER - EAGLE ISLAND HABITAT RESTORATION - SITE A WOODLAND, WASHINGTON

TYPICAL DETAILS IV SHEET 11 OF 12