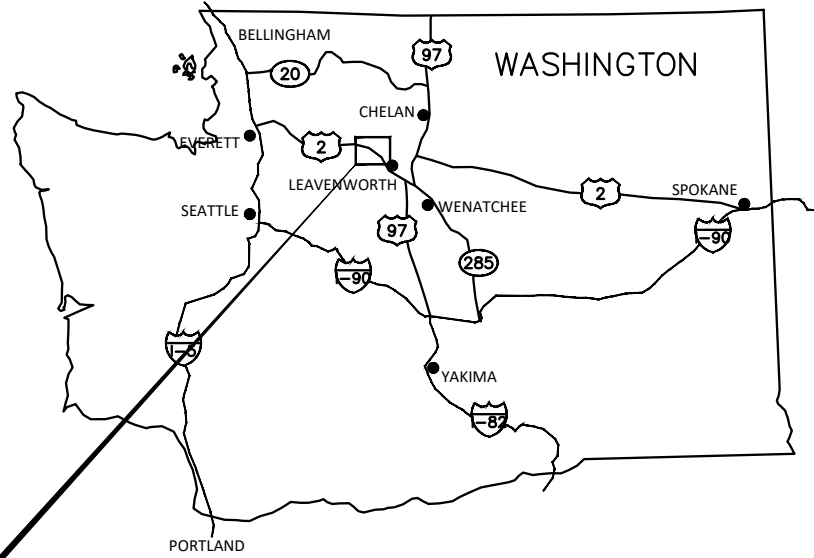


NASON CREEK, KAHLER

STREAM AND FLOODPLAIN ENHANCEMENT

Final Design

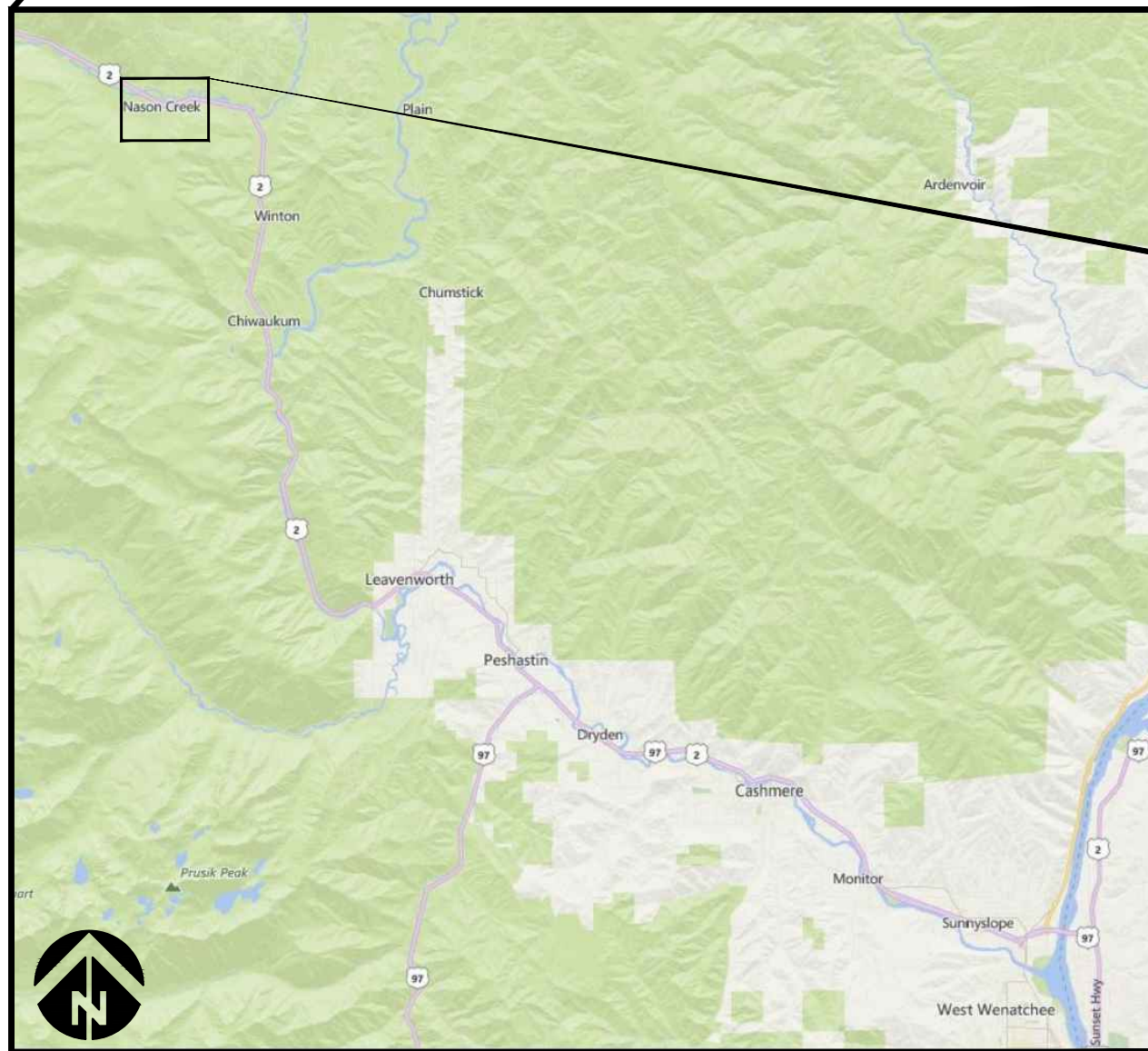


YAKAMA NATION FISHERIES
2 JOHNSON LANE
WINTHROP WA, 98862

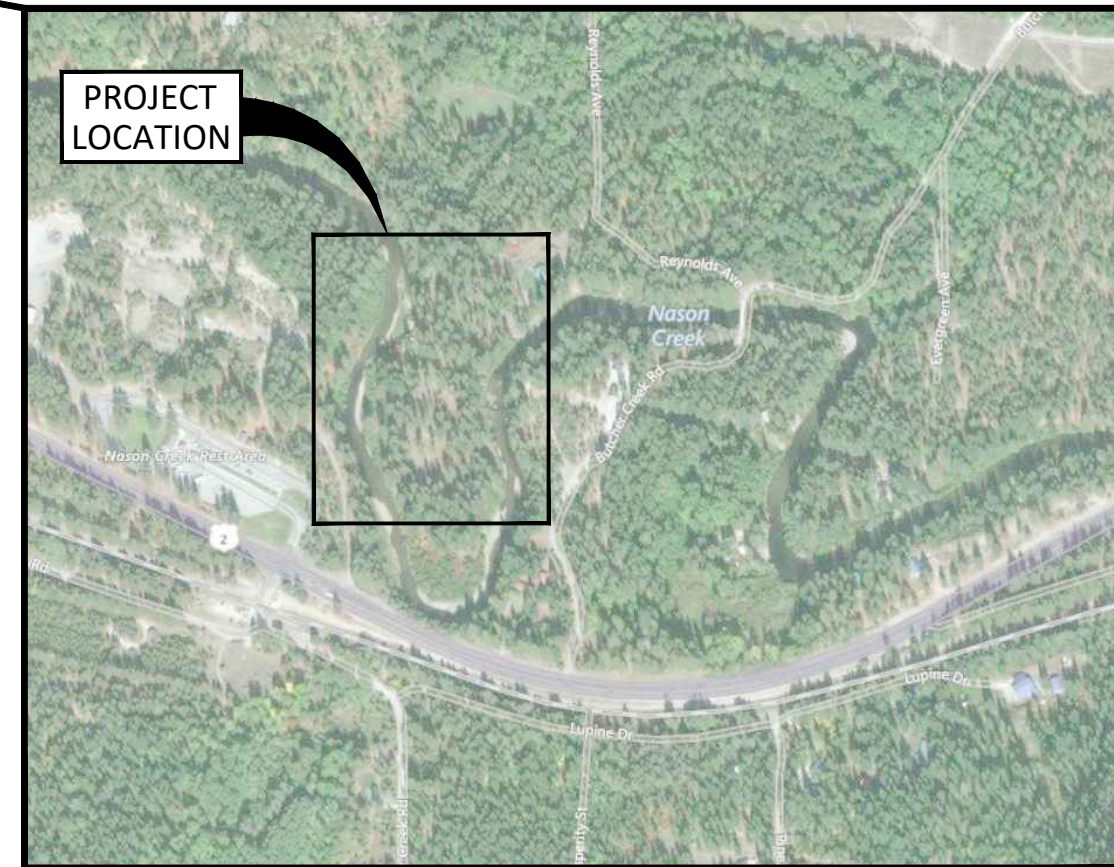
COORDINATES:
LATITUDE 47.768359
LONGITUDE -120.783107

SECTION X, TOWNSHIP XN, RANGE XE

WATERBODY: NASON CREEK
TRIBUTARY OF: WENNATCHE RIVER



VICINITY MAP
NOT TO SCALE



SITE MAP
NOT TO SCALE

Sheet Number	Sheet Title
1	Cover, Location Maps, Sheet Index
2	Notes
3	Erosion Control Notes
4	Existing Conditions, Site Access
5	Proposed Conditions, Site Overview
6	Site 1
7	Site 2 Plan & Profile
8	Site 2 Cross Sections
9	Site 3
10	Site 4
11	Pile Testing & Threaded Rod Connections
12	Specifications
13	Specifications
14	Specifications



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Hood River, OR 97031
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www.interfluve.com

COVER, LOCATION MAPS,
SHEET INDEX

SHEET
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IT IS STRONGLY SUGGESTED THAT THE CONTRACTOR ATTEND A PRE-BID SITE MEETING (SPRING 2018).

THE CONTRACTOR SHALL ATTEND A PRE-CONSTRUCTION MEETING WITH THE OWNER AND OWNER'S REPRESENTATIVE PRIOR TO BEGINNING CONSTRUCTION.

ALL WORK SHALL CONFORM TO THE CURRENT EDITIONS OF STANDARD PLANS AND SPECIFICATIONS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT), AND LOCAL STANDARDS UNLESS INDICATED OTHERWISE BY THE CONTRACT DOCUMENTS. IN CASE OF A CONFLICT BETWEEN THE REGULATORY STANDARDS OR SPECIFICATIONS, THE MORE STRINGENT SHALL PREVAIL.

IN CASE OF DISCREPANCY, BETWEEN NOTES, LOCAL REGULATIONS, OR OTHER CONTRACT DOCUMENTATION, CONTRACTOR SHALL OBTAIN CLARIFICATION/DIRECTION FROM OWNER.

EXISTING DATA

TOPOGRAPHIC SURVEY COLLECTED BY TETRATECH (2016) AND INTER-FLUVE, INC. (2017) BY RTK GPS AND TOTAL STATION. DATA IS REFERENCED TO NAD83 WASHINGTON STATE PLANE, NORTH ZONE US FEET NAVD 88.

PROPERTY BOUNDARIES PROVIDED BY CHELAN COUNTY, 2015.

WETLAND BOUNDARIES DISPLAYED IN THIS SET ARE THE RESULT OF A WETLAND ASSESSMENT PERFORMED BY INTER-FLUVE, INC. IN 2017.

THE ORDINARY HIGH WATER (OHW) AND APPROXIMATE LOW WATER LINES DISPLAYED IN THE DESIGN PACKAGE WERE DELINEATED BY INTER-FLUVE STAFF, AND ARE BASED UPON ANALYSIS, MODELING AND BEST PROFESSIONAL JUDGEMENT.

HYDRAULIC MODELING BY INTER-FLUVE USING USACE HEC-RAS (5.0.3). MODEL CALIBRATED USING SURVEYED WATER SURFACE ELEVATIONS AND EXISTING HIGH WATER MARKS.

SOILS

NASON CREEK GRAVEL AND FLOODPLAIN SOILS.

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.

WDFW IN-WATER WORK PERIODS

WORK SHALL OCCUR DURING THE PERMITTED IN-WATER WORK PERIOD AS STATED IN THE HYDRAULIC PROJECT APPROVAL.

FISH RESCUE

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 SHALL BE CAREFULLY COLLECTED BY SEINE AND/OR DIP NETS AND PLACED IN CLEAN TRANSFER CONTAINERS WITH ADEQUATE VOLUME OF WATER AND HELD WITHIN NO LONGER THAN 10 MINUTES.

CAPTURED FISHES SHALL BE IMMEDIATELY RELEASED INTO THE RIVER.

CULTURAL RESOURCES

IF ANY ARCHAEOLOGICAL RESOURCES AND/OR ARTIFACTS ARE ENCOUNTERED DURING CONSTRUCTION ALL CONSTRUCTION ACTIVITY SHALL IMMEDIATELY CEASE AND THE OWNER SHALL BE CONTACTED.

TREE SALVAGE

ALL SAPLING AND TREES TO BE REMOVED SHALL BE APPROVED AND CLEARLY MARKED BY THE OWNER'S REPRESENTATIVE.

ALL REMOVED VEGETATION SHALL BE INCORPORATED INTO LOG JAM STRUCTURES AS DIRECTED BY THE OWNER'S REPRESENTATIVE. IF EXCESS MATERIAL NEEDS DISPOSAL OUTSIDE OF CHANNEL WORK, IT SHALL BE DISTRIBUTED ON THE FLOODPLAIN AS DIRECTED BY THE OWNER'S REPRESENTATIVE.

ALL TREES REMOVED WITHIN CLEARING LIMITS SHALL BE REMOVED WHOLE WITH ROOTS INTACT AND UTILIZED IN THE SIDE CHANNEL CONSTRUCTION OR IN MAINSTEM WORK AS DIRECTED BY OWNER'S REPRESENTATIVE.

REMOVE SOIL FROM ROOTS OF SALVAGED TREES BEFORE PLACEMENT IN THE WATERWAY.

LIVE TREES

ALL TREES NOT MARKED FOR REMOVAL SHALL BE PRESERVED AND UNDISTURBED. CONSTRUCTION ACTIVITY SHALL NOT DEBARK OR DAMAGE LIVE TREES.

KEEP OUT OF DRIP LINE OF ALL PRESERVED EXISTING TREES.

IMPORTED LOGS

WOOD SHALL BE PROVIDED BY THE OWNER.

PLANTINGS

OWNER SUPPLIED PLANTS WILL BE DELIVERED ON THE DAY OF INSTALLATION. CONTRACTOR SHALL STORE PLANTS IN SHADE AND WATER THREE TIMES DAILY UNTIL INSTALLED. PLANTS SHALL BE INSTALLED DURING CONSTRUCTION AS DIRECTED BY THE OWNER.

CONSTRUCTION ACCESS

THE CONTRACTOR IS ADVISED THAT ACCESS TO THE SITE WILL BE BY RURAL ROADS OF LIMITED WIDTH.

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

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADHERING TO THE CONSERVATION MEASURES DETAILED IN THE FOREST SERVICE ROAD USE PERMIT.

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

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

TEMPORARY ACCESS ROUTES IN AREAS PRONE TO INUNDATION DURING THE IN-WATER WORK WINDOW SHALL BE DECOMMISSIONED BEFORE THE END OF THE IN-WATER WORK WINDOW.

ALL WOODY DEBRIS AND ALL SHRUBS AND TREES REMOVED FROM ACCESS SHALL BE SALVAGED FOR USE IN LOG STRUCTURES.

CONSTRUCTION STAKING

THE OWNER OR DESIGNATED REPRESENTATIVE WILL INSTALL STAKES AND OR FLAGGING TO DELINEATE EQUIPMENT ENTRY AND EXIT POINTS, STAGING AND STOCKPILE AREAS, AND PROJECT LIMITS. THE OWNER WILL INSTALL GRADE STAKES, AND ELEVATION CONTROL POINTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING DAMAGED OR MISSING STAKES.

CONTRACTOR SHALL MEET WITH THE OWNER AND OWNER'S REPRESENTATIVE TO DEFINE AND MARK LIMITS OF DISTURBANCE PRIOR TO MOBILIZATION OF EQUIPMENT OR MATERIALS ONTO THE SITE.

SOME FIELD ADJUSTMENTS TO THE LINES AND GRADES ARE TO BE EXPECTED. LOCATION, ALIGNMENT, AND ELEVATION OF LOGS AND LOGS WITH ROOTWADS ARE SUBJECT TO ADJUSTMENT BASED ON FIELD CONDITIONS, AND MATERIAL SIZE.

STAGING, STORAGE, AND STOCKPILE AREAS

STAGING AREAS (USED FOR CONSTRUCTION EQUIPMENT STORAGE, VEHICLE STORAGE, FUELING, SERVICING, AND HAZARDOUS MATERIAL STORAGE) SHALL BE 150 FEET OR MORE FROM ANY NATURAL WATER BODY OR WETLAND, OR ON AN ADJACENT, ESTABLISHED ROAD AREA IN A LOCATION AND MANNER THAT WILL PRECLUDE EROSION INTO OR CONTAMINATION OF THE STREAM OR FLOODPLAIN.

EXCAVATED MATERIALS SHALL BE STOCKPILED NEATLY IN AN APPROVED LOCATION WITHIN THE STOCKPILE AND STAGING AREA. AT COMPLETION OF WORK, THE MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR OBTAINING ANY PERMITS AND FEES REQUIRED FOR LEGAL DISPOSAL.

NATURAL MATERIALS USED FOR IMPLEMENTATION OF AQUATIC RESTORATION, SUCH AS LARGE WOOD, SLASH, GRAVEL, AND TOPSOIL, MAY BE STAGED WITHIN THE 100-YEAR FLOODPLAIN.

ANY LARGE WOOD, TOPSOIL, AND NATIVE CHANNEL MATERIAL DISPLACED BY CONSTRUCTION SHALL BE STOCKPILED FOR USE DURING SITE RESTORATION AT A SPECIFICALLY IDENTIFIED AND FLAGGED AREA.

ANY MATERIAL NOT USED IN RESTORATION, AND NOT NATIVE TO THE FLOODPLAIN, SHALL BE REMOVED TO A LOCATION OUTSIDE OF THE 100-YEAR FLOODPLAIN FOR DISPOSAL.

EQUIPMENT

MECHANIZED EQUIPMENT AND VEHICLES SHALL 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 SHALL BE:

- 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
- 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 (THIS MEASURE APPLIES ONLY TO GAS-POWERED EQUIPMENT WITH TANKS LARGER THAN 5 GALLONS)
- BIODEGRADABLE LUBRICANTS AND FLUIDS SHALL BE USED IN EQUIPMENT OPERATING IN AND ADJACENT TO THE STREAM CHANNEL AND LIVE WATER.
- INSPECTED DAILY FOR FLUID LEAKS BEFORE LEAVING THE VEHICLE STAGING AREA FOR OPERATION WITHIN 150 FEET OF ANY NATURAL WATER BODY OR WETLAND
- THOROUGHLY CLEANED BEFORE OPERATION BELOW ORDINARY HIGH WATER, AND AS OFTEN AS NECESSARY DURING OPERATION, TO REMAIN GREASE FREE.

ABBREVIATIONS

APPROX	APPROXIMATE
CY	CUBIC YARDS
°	DEGREES
DIA or ø	DIAMETER
DBH	DIAMETER AT BREAST HEIGHT
EA	EACH
EL or ELEV	ELEVATION
ESC	EROSION AND SEDIMENT CONTROL
EXIST	EXISTING
FT or '	FEET
FTR	FULLY THREADED ROD
HORIZ	HORIZONTAL
IN or "	INCH
INV	INVERT
LWM	LARGE WOODY MATERIAL
MAX	MAXIMUM
MIN	MINIMUM
OHW	ORDINARY HIGH WATER
%	PERCENT
RMx	RIVER MILE x
STA	STATION
TBD	TO BE DETERMINED
TYP	TYPICAL
VERT	VERTICAL
WSE	WATER SURFACE ELEVATION
YR	YEAR

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NOTES

SHEET
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EROSION CONTROL

CONTRACTOR SHALL BE SOLELY RESPONSIBLE AT OWN EXPENSE FOR PROVIDING AND MAINTAINING ALL NECESSARY EROSION CONTROL FACILITIES TO COMPLY WITH APPLICABLE EROSION CONTROL REGULATIONS AND TO MAINTAIN CLEAN ACCESS ROUTES.

EROSION/SEDIMENTATION CONTROL (ESC) PLAN

THE EROSION AND SEDIMENT CONTROL (ESC) PLAN PROVIDED IS FOR INFORMATIONAL PURPOSES ONLY, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR PROVIDING EROSION CONTROL MEASURES TO COMPLY WITH APPLICABLE REGULATIONS.

THE RECOMMENDATIONS FOR AN ESC PLAN INCLUDED HEREIN WILL PROVIDE GUIDELINES FOR THE CONTRACTOR TO DEVELOP AND IMPLEMENT AN ESC PLAN. THE CONTRACTOR'S ESC PLAN SHALL BE SUBMITTED TO THE OWNER PRIOR TO MOBILIZATION.

- THE IMPLEMENTATION OF AN ESC PLAN 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 / LANDSCAPING IS ESTABLISHED.
- 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.

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

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 THREE DAYS 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. MULCH AS SOON AS PRACTICAL ALL DISTURBED AREAS NOT INDICATED IN THE CONTRACT DOCUMENTS FOR OTHER PERMANENT STABILIZATION MEASURES. HAY, STRAW, AND MULCH USED ON SITE MUST BE 99.9% WEED-FREE.

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.

DUST CONTROL

THE CONTRACTOR SHALL CONTROL DUST FOR THE DURATION OF THE PROJECT. CONTROL MEASURES SHALL BE IN ACCORDANCE WITH APPLICABLE REGULATIONS.

INVASIVE SPECIES CONTROL

THE FOLLOWING MEASURES WILL BE FOLLOWED TO AVOID INTRODUCTION OF INVASIVE PLANTS AND NOXIOUS WEEDS INTO PROJECT AREAS:

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.

WATERCRAFT, WADERS, BOOTS, AND ANY OTHER GEAR TO BE USED IN OR NEAR WATER WILL BE INSPECTED FOR AQUATIC INVASIVE SPECIES.

WADING BOOTS WITH FELT SOLES ARE NOT TO BE USED DUE TO THEIR PROPENSITY FOR AIDING IN THE TRANSFER OF INVASIVE SPECIES.

CONSTRUCTION DEWATERING

CONTRACTOR SHALL PERFORM CONSTRUCTION DEWATERING IN SUCH A MANNER AS TO AVOID THE RELEASE OF TURBID OR SEDIMENT-LADEN WATER IN ORDER TO PREVENT CONTAMINATION OR INCREASE TURBIDITY OF SURFACE WATERS. EXCAVATION OF DEWATERING SUMPS BEYOND LIMITS SHOWN SHALL BE AT NO ADDITIONAL COST. SEDIMENT LADEN WATER MAY BE PUMPED TO AN UPLAND DISCHARGE LOCATION AND ALLOWED TO SHEET FLOW THROUGH EXISTING VEGETATION BEFORE INFILTRATING INTO THE GROUND. IF THIS METHOD IS NOT SUFFICIENT TO PREVENT RETURN OF TURBID WATER TO SURFACE WATERS OR SENSITIVE FLOODPLAIN AREAS, A 'DIRT-BAG' OR SEDIMENT RETENTION STRUCTURE MAY BE REQUIRED AS NECESSARY TO COMPLY WITH LAWS AND PERMIT REQUIREMENTS AT NO ADDITIONAL COST.

CONTRACTOR SHALL PROVIDE, OPERATE, AND MAINTAIN NUMBER AND SIZE OF PUMPS AS NECESSARY TO ACHIEVE DEWATERING NEEDS. AT A MINIMUM, CONTRACTOR SHALL PROVIDE A 6" DRI-PRIME DIESEL POWERED PUMP AND A PORTABLE 2" PUMP. ADDITIONAL PUMPS AND OF DIFFERENT CAPACITIES MAY BE REQUIRED AT CONTRACTOR'S EXPENSE.

OWNER OR OWNER'S REPRESENTATIVE SHALL APPROVE DEWATERING DISCHARGE LOCATION PRIOR TO IMPLEMENTATION.

- THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED AT NO ADDITIONAL COST FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
- THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
- THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 24 HOURS FOLLOWING A STORM EVENT.
- STABILIZED CONSTRUCTION ENTRANCES AND ADDITIONAL MEASURES MAY BE REQUIRED AND SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT.

SPILL PREVENTION, CONTROL, AND COUNTER MEASURES

THE USE OF MECHANIZED MACHINERY INCREASES THE RISK FOR ACCIDENTAL SPILLS OF FUEL, LUBRICANTS, HYDRAULIC FLUID, OR OTHER CONTAMINANTS INTO THE RIPARIAN ZONE OR DIRECTLY INTO THE WATER. THE PROJECT SPONSOR WILL ADHERE TO THE FOLLOWING MEASURES:

A DESCRIPTION OF HAZARDOUS MATERIALS THAT WILL BE USED, INCLUDING INVENTORY, STORAGE, AND HANDLING PROCEDURES WILL BE AVAILABLE ON-SITE.

WRITTEN PROCEDURES FOR NOTIFYING ENVIRONMENTAL RESPONSE AGENCIES WILL BE POSTED AT THE WORK SITE.

SPILL CONTAINMENT KITS (INCLUDING INSTRUCTIONS FOR CLEANUP AND DISPOSAL) ADEQUATE FOR THE TYPES AND QUANTITY OF HAZARDOUS MATERIALS USED AT THE SITE WILL BE AVAILABLE AT THE WORK SITE.

WORKERS WILL BE TRAINED IN SPILL CONTAINMENT PROCEDURES AND WILL BE INFORMED OF THE LOCATION OF SPILL CONTAINMENT KITS.

ANY WASTE LIQUIDS GENERATED AT THE STAGING AREAS WILL BE TEMPORARILY STORED UNDER AN IMPERVIOUS COVER, SUCH AS A TARPULIN, UNTIL THEY CAN BE PROPERLY TRANSPORTED TO AND DISPOSED OF AT A FACILITY THAT IS APPROVED FOR RECEIPT OF HAZARDOUS MATERIALS.

VEGETABLE BASED HYDRAULIC FLUIDS (BIODEGRADABLE OIL) WILL BE USED IN ANY VEHICLE THAT WILL BE OPERATED NEAR THE WATER.

INSPECTION AND MAINTENANCE

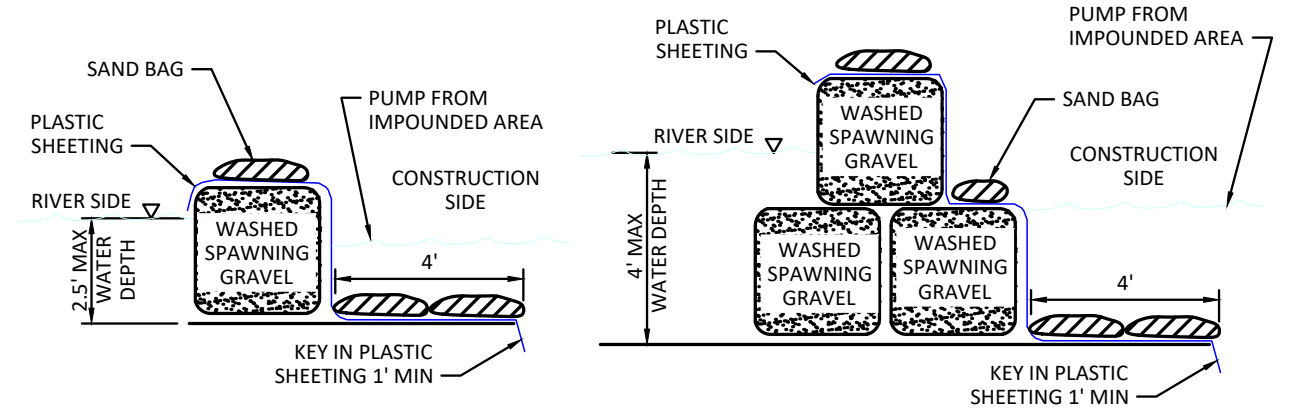
ALL ESC FACILITIES SHALL BE INSPECTED, MAINTAINED, AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. ALL ESC FACILITIES SHALL BE INSPECTED DAILY AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF RAIN PER 24 HOUR PERIOD AND AFTER EVENTS EXCEEDING 2 HOURS DURATION.

CONTRACTOR'S ESC RECORD

WEEKLY REPORTS SUMMARIZING THE SCOPE OF INSPECTIONS, THE PERSONNEL CONDUCTING THE INSPECTION, THE DATE(S) OF THE INSPECTION, MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE CONTRACTOR'S EROSION AND SEDIMENT CONTROL PLAN, AND ACTIONS TAKEN AS A RESULT OF THESE INSPECTIONS SHALL BE PREPARED AND RETAINED ON SITE BY THE CONTRACTOR. IN ADDITION, A RECORD OF THE FOLLOWING DATES SHALL BE INCLUDED IN THE REPORTS:

- WHEN MAJOR GRADING ACTIVITIES OCCUR,
- DATES OF RAINFALL EVENTS EITHER EXCEEDING 2 HOURS DURATION OR MORE THAN 0.5 INCHES/24 HOURS,
- WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON SITE, OR ON A PORTION OF THE SITE,
- WHEN STABILIZATION MEASURES ARE INITIATED FOR PORTIONS OF THE SITE.

ESC RECORDS SHALL BE MADE AVAILABLE TO THE OWNER AND OWNER'S REPRESENTATIVE ON REQUEST AND SHALL BE PROVIDED FOR REVIEW AND APPROVAL PRIOR TO APPLICATION FOR PAYMENT.



SINGLE LAYER COFFERDAM

(WATER DEPTH LESS THAN 2.5')

STACKED BULK BAG COFFERDAM

(WATER DEPTH GREATER THAN 2.5')

TEMPORARY COFFERDAM DETAILS

NOT TO SCALE

BULK BAG NOTES:

- BULK BAG COFFERDAM SHALL BE CONSTRUCTED OF SEVERAL UNITS OF BULK BAGS FILLED WITH WASHED SPAWNING GRAVEL, AND ABUTTED SIDE BY SIDE TO CREATE A ROW THAT ISOLATES THE CONSTRUCTION SITE FROM THE RIVER.
- 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. THE PLASTIC SHEETING SHALL BE DRAPED ALONG THE CHANNEL BOTTOM ON THE WORK AREA SIDE 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.
- THE OUTWARD EDGE OF PLASTIC SHEETING ON WORK AREA SIDE 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.
- IF POSSIBLE, THE COFFERDAM SHALL BE EXTENDED ONTO A GRAVEL BAR AND OUT OF THE WATER. IF THE END MUST BE TERMINATED AT THE RIVERBANK, THE COFFERDAM SHALL BE TIGHTLY SEALED TO THE GROUND BY PLASTIC SHEETING AND STANDARD SANDBAGS. MULTIPLE LAYERS OF SHEETING AND SANDBAGS MAY BE REQUIRED TO FORM A WATERTIGHT SEAL.
- BULK BAGS SHALL BE WATERPROOF CUBE-SHAPED POLYPROPYLENE WOVEN FABRIC BAGS WITH FULLY OPEN TOP, FLAT BOTTOM, FOUR LOOPS, MINIMUM 2-TON WEIGHT CAPACITY, MINIMUM 5:1 SAFETY FACTOR.
- 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.
- CONTRACTOR SHALL PROVIDE PUMPING SUFFICIENT FOR A NET INFLOW TO THE WORK AREA, AND DISCHARGE TURBID WATER TO UPLAND FLOODPLAIN.
- BULK BAG COFFERDAM SHALL BE COMPLETELY REMOVED AFTER CONSTRUCTION IS COMPLETED AND TURBIDITY HAS BEEN REMOVED. UPON OWNER'S REQUEST, SOME BULK BAGS WILL BE OPENED AND ENCLOSED SPAWNING GRAVEL APPLIED TO THE RIVER.
- ALTERNATE COFFERDAM MATERIALS AND CONFIGURATIONS MAY BE ALLOWED BUT SHALL NOT BE IMPLEMENTED WITHOUT REVIEW AND APPROVAL BY THE OWNER OR OWNER'S REPRESENTATIVE. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS AND/OR VENDOR CUT SHEETS FOR SUBSTITUTIONS.
- IF NECESSARY, GAPS BETWEEN BULK BAGS SHALL BE FILLED WITH WASHED GRAVEL TO SEAL AND IMPROVE COFFER DAM SEAL. DISPOSAL OF ROCK WASH SHALL BE DETERMINED BY OWNER.

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NASON CREEK - KAHLER SITE STREAM & FLOODPLAIN ENHANCEMENT FINAL DESIGN

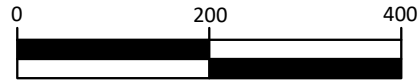


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EROSION CONTROL NOTES

SHEET

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SCALE IN FEET

AERIAL VIEW



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**EXISTING CONDITIONNS, SITE
ACCESS**

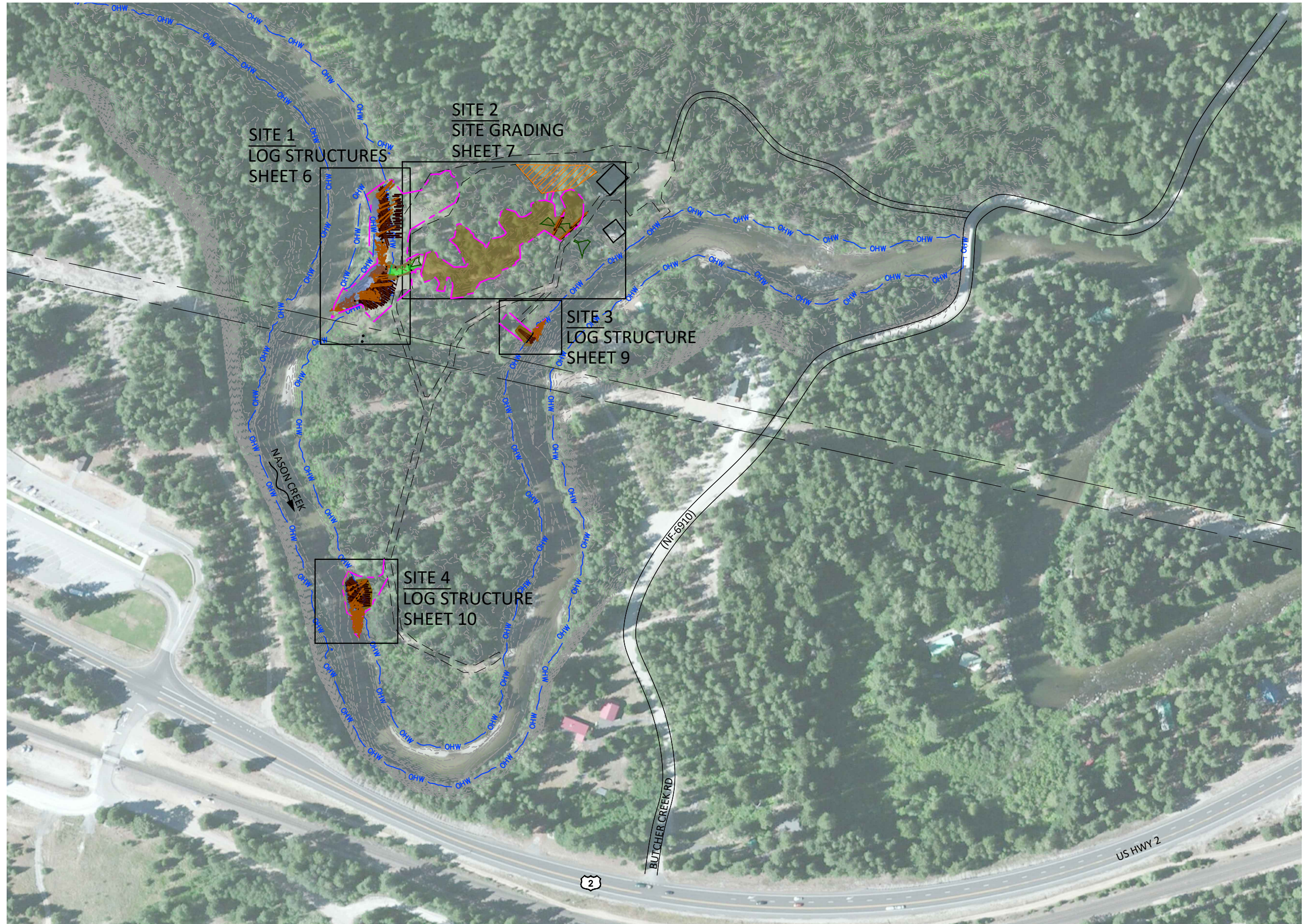


SCALE IN FEET

AERIAL VIEW

LEGEND

- ORDINARY HIGH WATER
- EXISTING TRAILS
- LIMITS OF DISTURBANCE
- TEMPORARY STAGING/STOCKPILE
- FILL AREA
- LOGS



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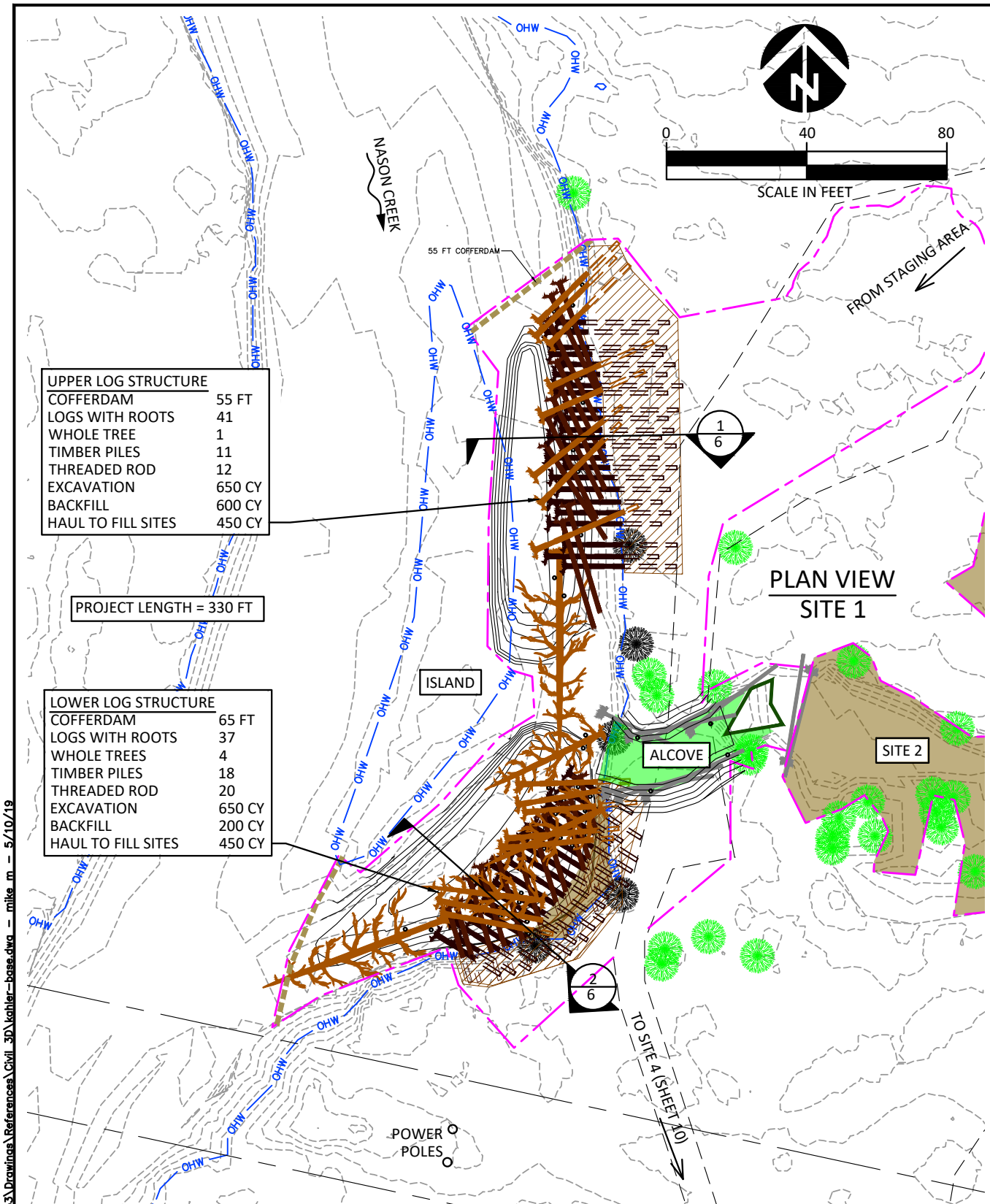
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**NASON CREEK - KAHLER SITE
STREAM & FLOODPLAIN ENHANCEMENT
FINAL DESIGN**

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NOTES



UPPER LOG STRUCTURE

COFFERDAM	55 FT
LOGS WITH ROOTS	41
WHOLE TREE	1
TIMBER PILES	11
THREADED ROD	12
EXCAVATION	650 CY
BACKFILL	600 CY
HAUL TO FILL SITES	450 CY

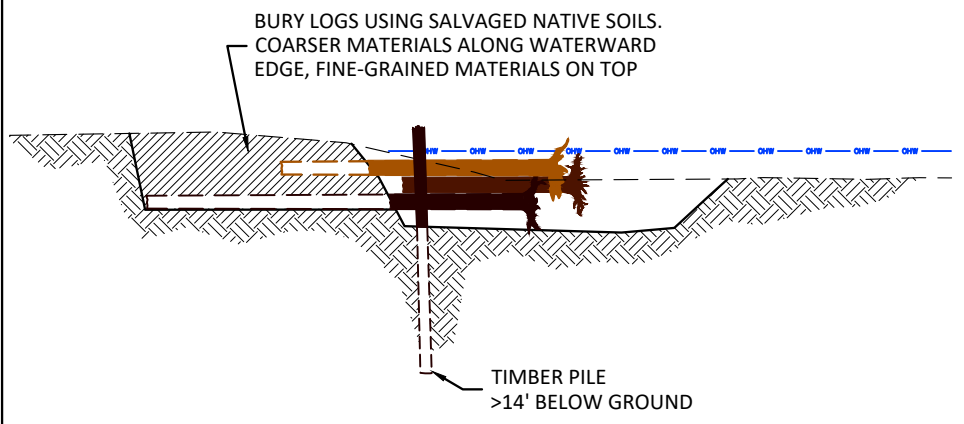
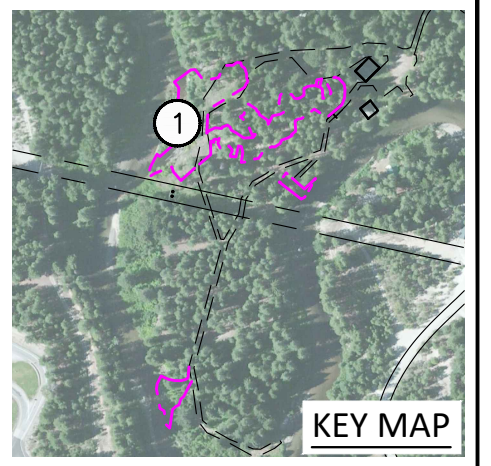
LOWER LOG STRUCTURE

COFFERDAM	65 FT
LOGS WITH ROOTS	37
WHOLE TREES	4
TIMBER PILES	18
THREADED ROD	20
EXCAVATION	650 CY
BACKFILL	200 CY
HAUL TO FILL SITES	450 CY

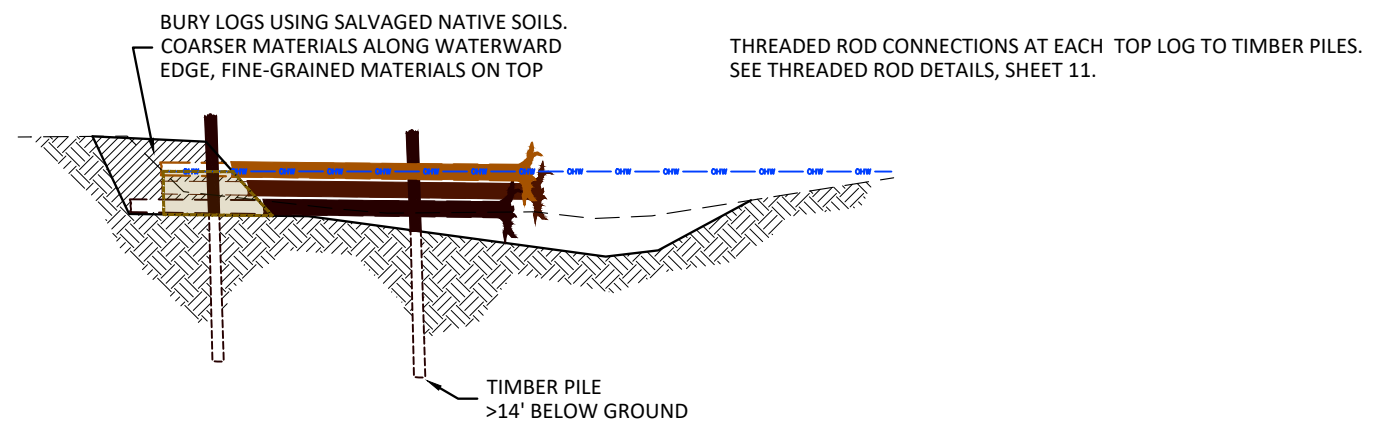
- SITE 1 RECOMMENDED CONSTRUCTION SEQUENCE:**
1. INSTALL TEMPORARY COFFERDAM.
 2. CLEAR AND GRUB LOG BURIAL AREA. SALVAGE REMOVED SHRUBS AND TREES FOR USE IN LOG STRUCTURE.
 3. EXCAVATE POOL. EXCAVATE LOG BURIAL AREA.
 4. INSTALL LOGS AND TIMBER PILES. INSTALL THREADED ROD.
 5. REMOVE COFFERDAM.
 6. APPLY STRAW MULCH TO DISTURBED GROUND WITH SLOPES GREATER THAN 10%

LEGEND

- OHW — OHW — OHW — OHW — ORDINARY HIGH WATER
- LIMITS OF DISTURBANCE
- TEMPORARY COFFERDAM
- EXISTING CONTOUR (1 FT)
- PROPOSED CONTOUR (1 FT)
- PRESERVE EXISTING TREE
- REMOVE/SALVAGE EXISTING TREE OR SNAG
- LOGS
- BACKFILL (LOG BURIAL)



1 SITE 1 UPPER LOG STRUCTURE



2 SITE 1 LOWER LOG STRUCTURE

SECTION VIEWS LOOKING DOWNSTREAM

- LOG NOTES:**
1. LOG LOCATIONS, SIZES, AND ALIGNMENTS ARE TYPICAL. SOME ADJUSTMENTS IN THE FIELD MAY OCCUR.
 2. SHRUBS AND SLASH GENERATED FROM SITE CLEARING SHALL BE INCORPORATED INTO THE STRUCTURE AS SLASH. INSTALL SLASH LOOSELY BETWEEN LOGS NEAR THE WATERWARD EDGE OF THE STRUCTURE. DO NOT BURY SLASH.
 3. VARY THE APPEARANCE OF TIMBER PILES BY INSTALLING THEM AT ANGLES AND WITH DIFFERENT TOP HEIGHTS. BREAK OR ROUGHEN THE TOP OF PILES FOR A NATURAL APPEARANCE. PILES SHALL BE INSTALLED BY VIBRATORY DRIVER. PILE DEPTH SHALL BE MINIMUM 14'. FINAL DEPTH TO BE DETERMINED BY PULLOUT TEST RESULTS



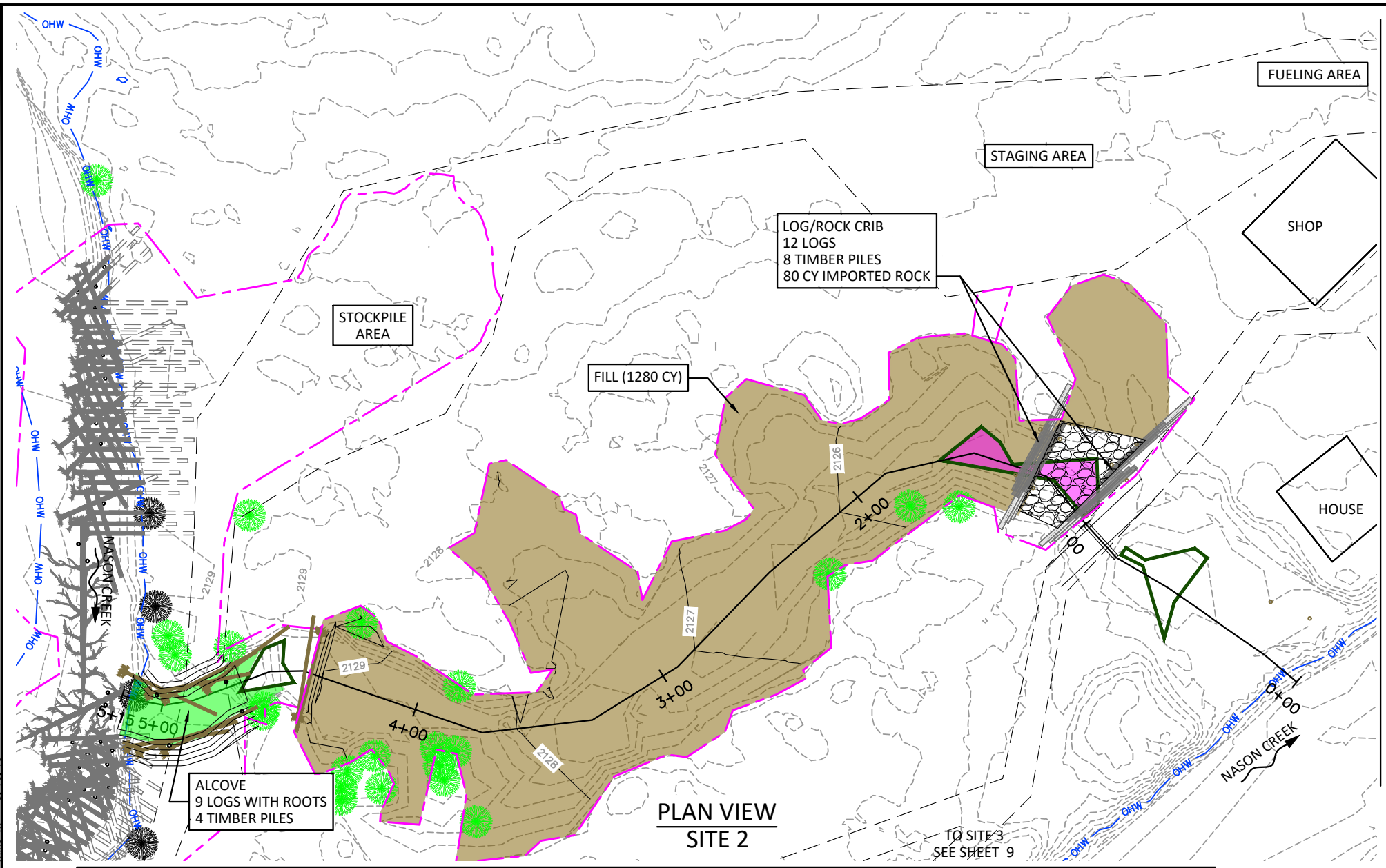
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90% DESIGN**

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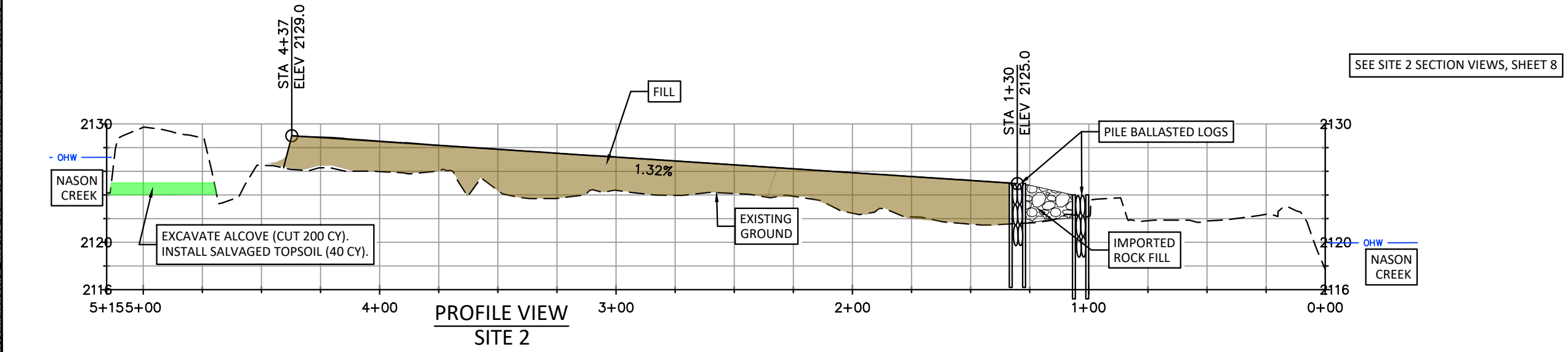
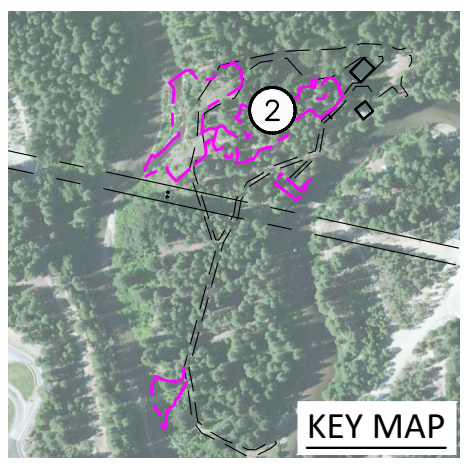
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LEGEND

- ORDINARY HIGH WATER
- EXISTING WETLAND
- LIMITS OF DISTURBANCE
- EXISTING CONTOUR (1 FT)
- PRESERVE EXISTING TREE
- REMOVE/SALVAGE EXISTING TREE OR SNAG
- FILL (SALVAGED FROM POOL EXCAVATION)
- BOULDERS
- WETLAND IMPACT (587 SF)
- WETLAND REPLACEMENT (990 SF)
- FLOODPLAIN ROUGHNESS LOG

0 40 80
SCALE IN FEET



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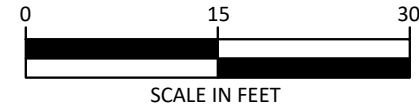
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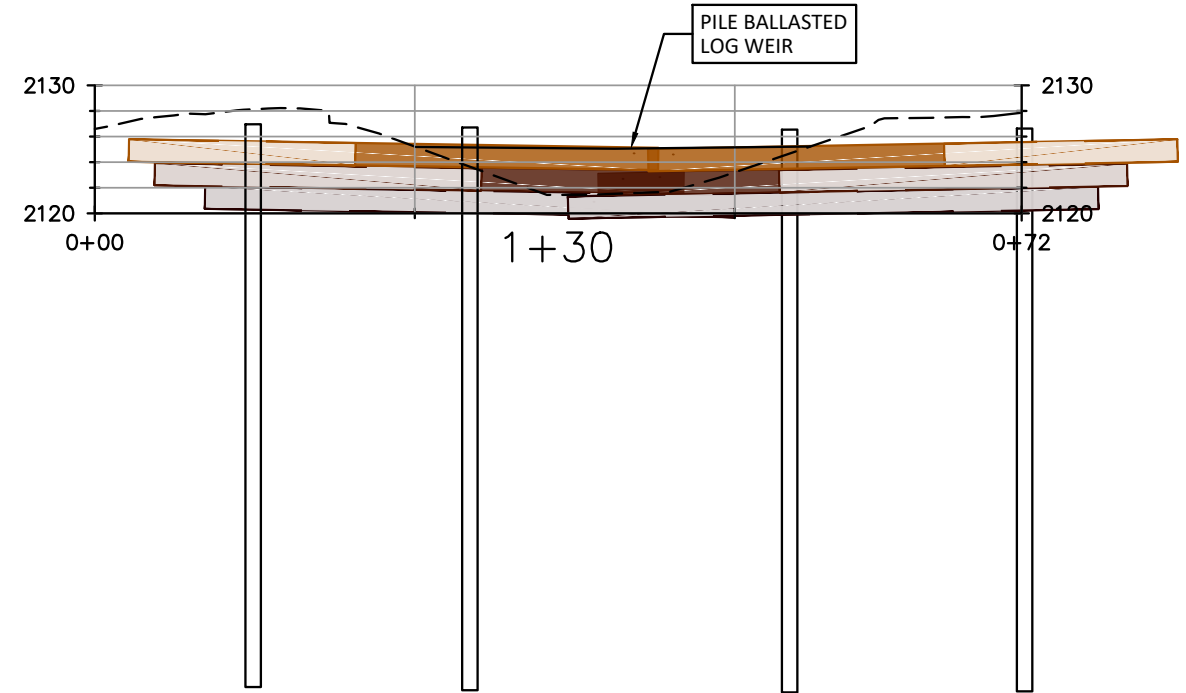
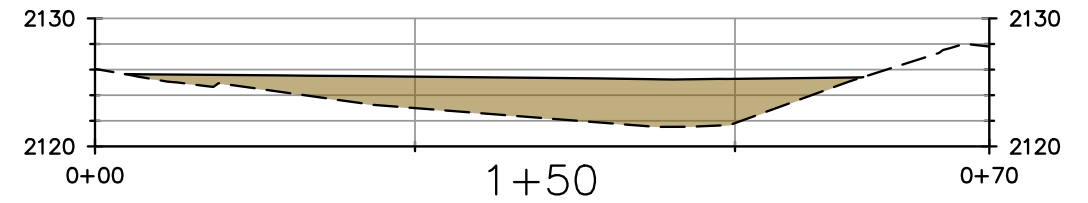
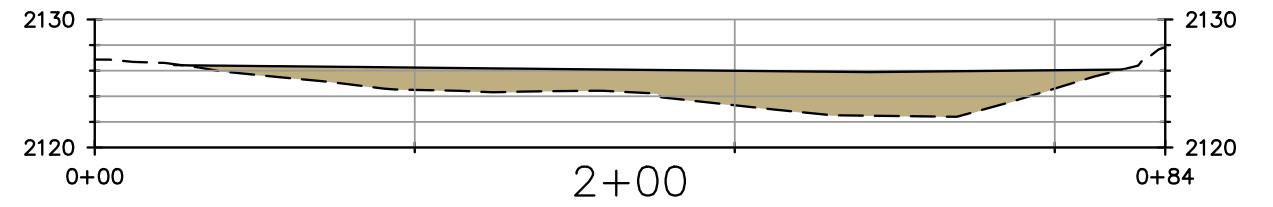
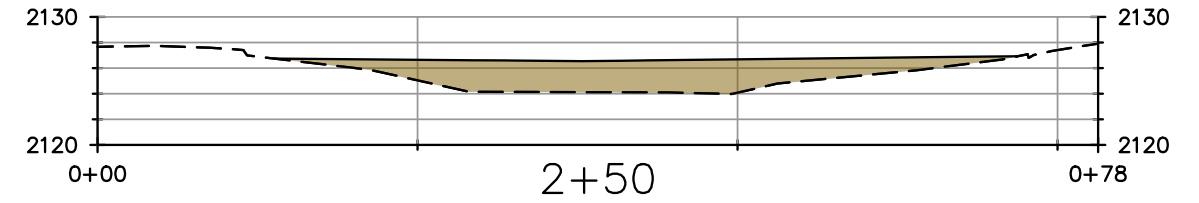
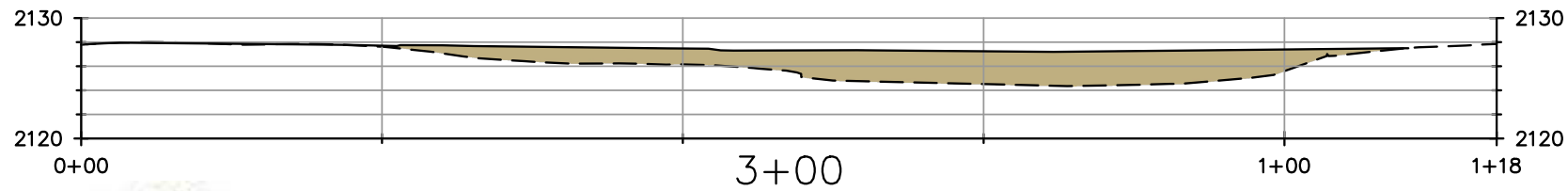
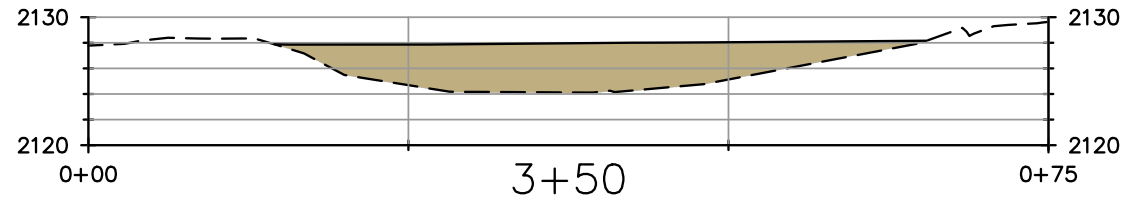
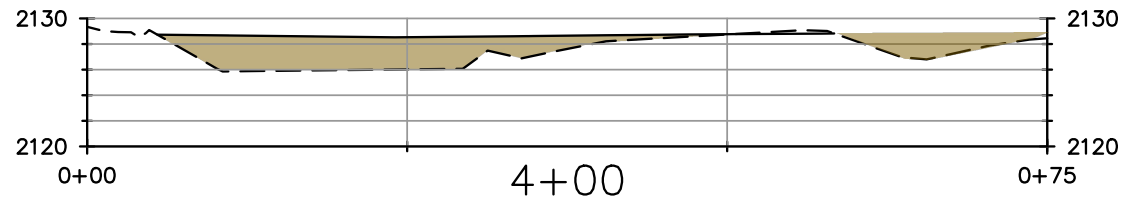
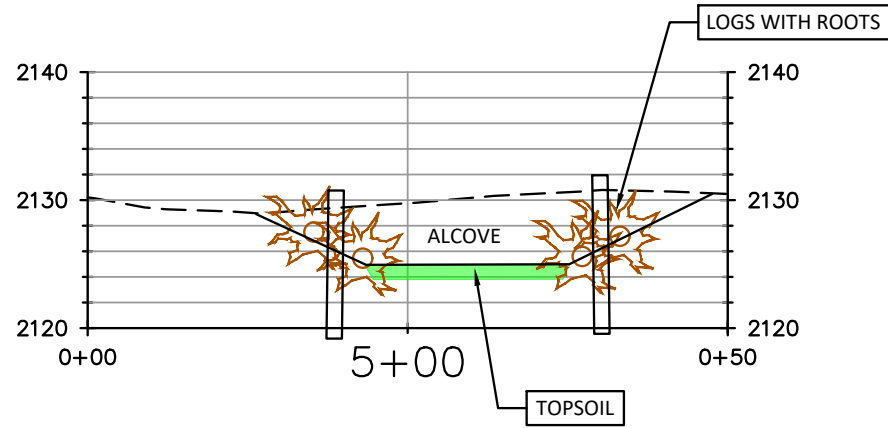
SITE 2 PLAN & PROFILE

LEGEND

- EXISTING GROUND
- PROPOSED GROUND
- FILL



1. SECTION VIEWS LOOKING DOWNSTREAM
2. SECTION ID ASSOCIATED WITH CENTERLINE ALIGNMENT STATIONING, SHEET 7



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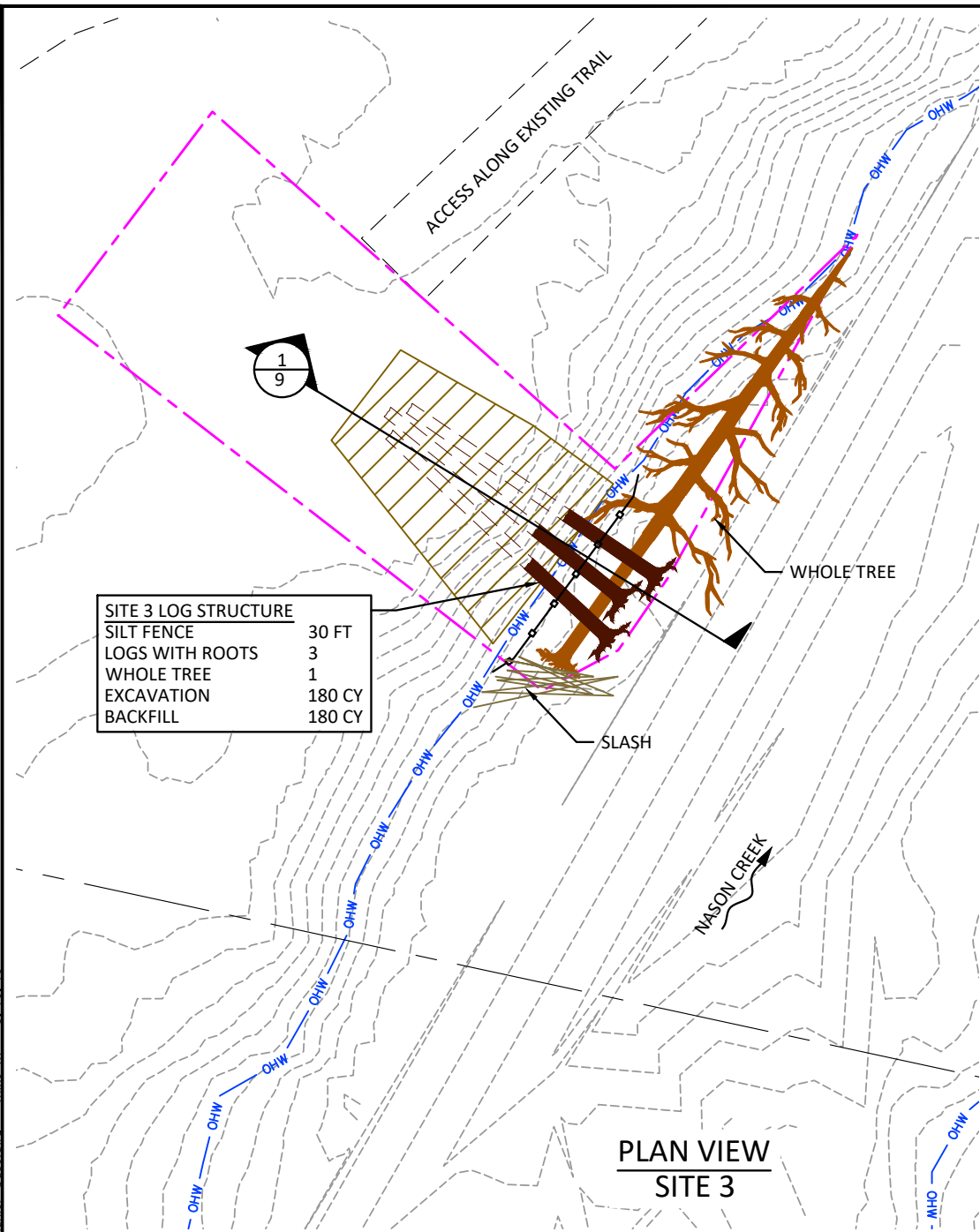
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MB	05/09/19	PROJECT
APPROVED	DATE	

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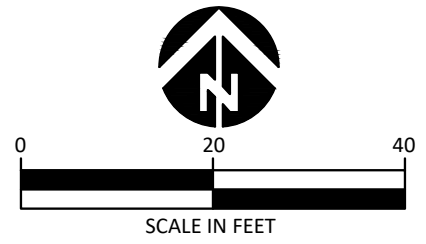
SITE 2 CROSS SECTIONS

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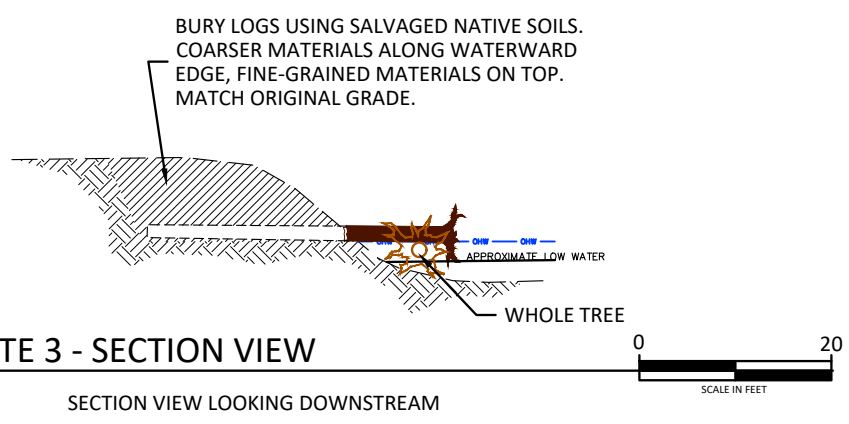


SITE 3 LOG STRUCTURE	
SILT FENCE	30 FT
LOGS WITH ROOTS	3
WHOLE TREE	1
EXCAVATION	180 CY
BACKFILL	180 CY

LEGEND	
	ORDINARY HIGH WATER
	LIMITS OF DISTURBANCE
	EXISTING CONTOUR (1 FT)
	PROPOSED CONTOUR (1 FT)
	SILT FENCE
	LOGS
	BACKFILL (LOG BURIAL)

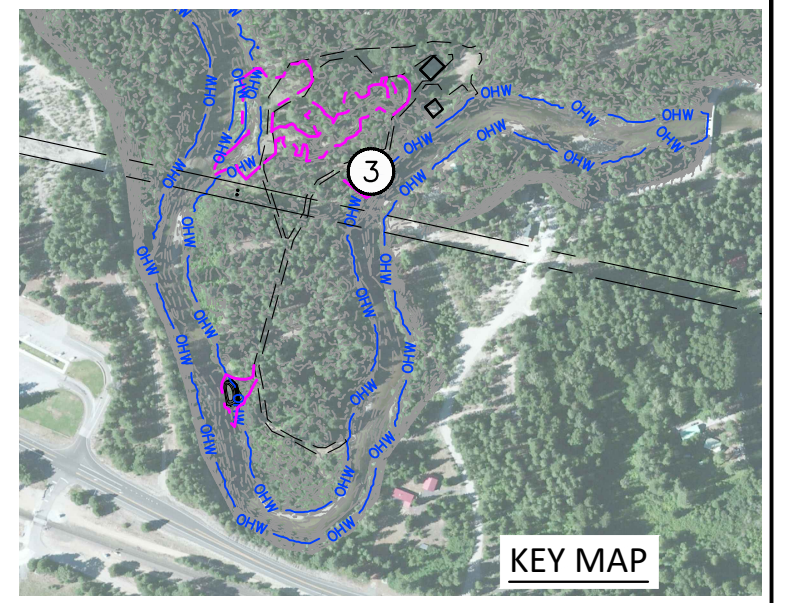


- LOG NOTES:**
- LOG LOCATIONS, SIZES, AND ALIGNMENTS ARE TYPICAL. SOME ADJUSTMENTS IN THE FIELD MAY OCCUR.
 - SHRUBS AND SLASH GENERATED FROM SITE CLEARING SHALL BE INCORPORATED INTO THE STRUCTURE AS SLASH. INSTALL SLASH LOOSELY ALONG UPSTREAM SIDE OF TREE ROOTWAD.



1 **9** **SITE 3 - SECTION VIEW**
SECTION VIEW LOOKING DOWNSTREAM

- SITE 3 RECOMMENDED CONSTRUCTION SEQUENCE:**
- INSTALL SILT FENCE.
 - CLEAR AND GRUB LOG BURIAL AREA. SALVAGE REMOVED SHRUBS AND TREES FOR USE IN LOG STRUCTURE.
 - EXCAVATE LOG BURIAL AREA TO ELEVATION 2121'.
 - REMOVE SILT FENCE.
 - INSTALL WHOLE TREE.
 - INSTALL THREE LOGS WITH ROOTS TO HOLD DOWN WHOLE TREE.
 - BACKFILL LOG BURIAL AREA.
 - APPLY STRAW MULCH TO SURFACES STEEPER THAN 10%.



KEY MAP



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DRAWN	DESIGNED	CHECKED
MB	05/09/19	
APPROVED	DATE	PROJECT

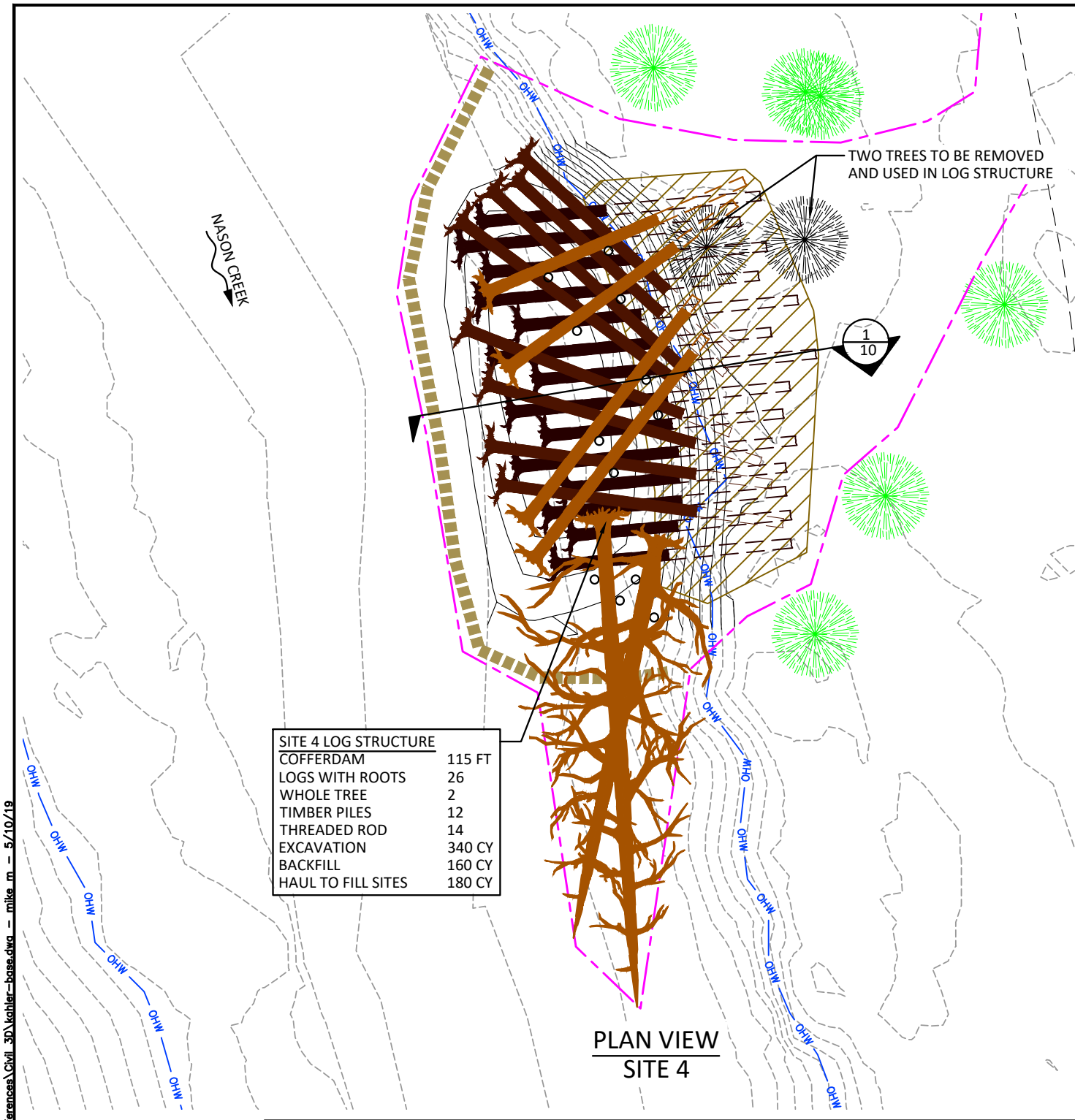
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STREAM & FLOODPLAIN ENHANCEMENT
FINAL DESIGN**



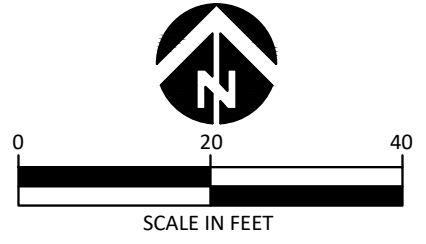
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SITE 3

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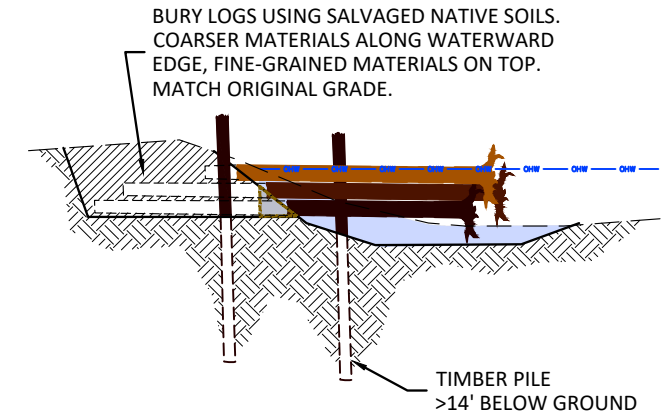


- LEGEND**
- ORDINARY HIGH WATER
 - LIMITS OF DISTURBANCE
 - EXISTING CONTOUR (1 FT)
 - PROPOSED CONTOUR (1 FT)
 - TEMPORARY COFFERDAM
 - LOGS
 - BACKFILL (LOG BURIAL)



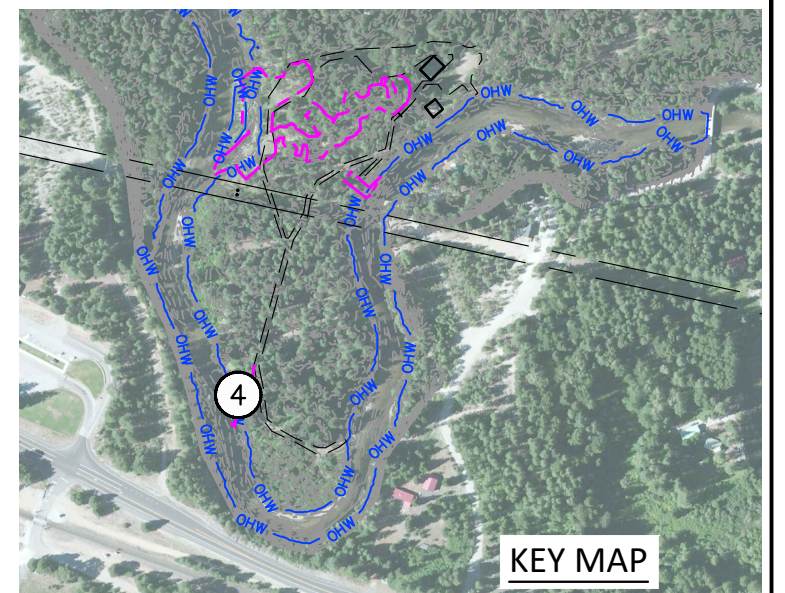
- LOG NOTES:**
- LOG LOCATIONS, SIZES, AND ALIGNMENTS ARE TYPICAL. SOME ADJUSTMENTS IN THE FIELD MAY OCCUR.
 - SHRUBS AND SLASH GENERATED FROM SITE CLEARING SHALL BE INCORPORATED INTO THE STRUCTURE AS SLASH. INSTALL SLASH LOOSELY BETWEEN LOGS NEAR THE WATERWARD EDGE OF THE STRUCTURE. DO NOT BURY SLASH.
 - VARY THE APPEARANCE OF TIMBER PILES BY INSTALLING THEM AT ANGLES AND WITH DIFFERENT TOP HEIGHTS. BREAK OR ROUGHEN THE TOP OF PILES FOR A NATURAL APPEARANCE. PILES SHALL BE INSTALLED BY VIBRATORY DRIVER. PILE DEPTH SHALL BE MINIMUM 14'. FINAL DEPTH TO BE DETERMINED BY PULLOUT TEST RESULTS

THREADED ROD CONNECTIONS AT EACH TOP LOG TO TIMBER PILES. SEE THREADED ROD DETAILS, SHEET 11.



1/10 SITE 4 - SECTION VIEW
SECTION VIEW LOOKING DOWNSTREAM

- SITE 4 RECOMMENDED CONSTRUCTION SEQUENCE:**
- INSTALL TEMPORARY COFFERDAM.
 - CLEAR AND GRUB LOG BURIAL AREA. SALVAGE REMOVED SHRUBS AND TREES FOR USE IN LOG STRUCTURE.
 - EXCAVATE POOL. EXCAVATE LOG BURIAL AREA.
 - INSTALL LOGS AND TIMBER PILES. INSTALL THREADED ROD.
 - REMOVE COFFERDAM.
 - INSTALL WHOLE TREES AND ASSOCIATED TIMBER PILES.
 - APPLY STRAW MULCH TO DISTURBED GROUND WITH SLOPES GREATER THAN 10%



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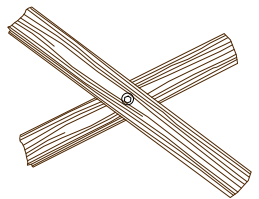
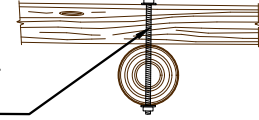
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SQUARE WASHER AND HEAVY HEX NUT

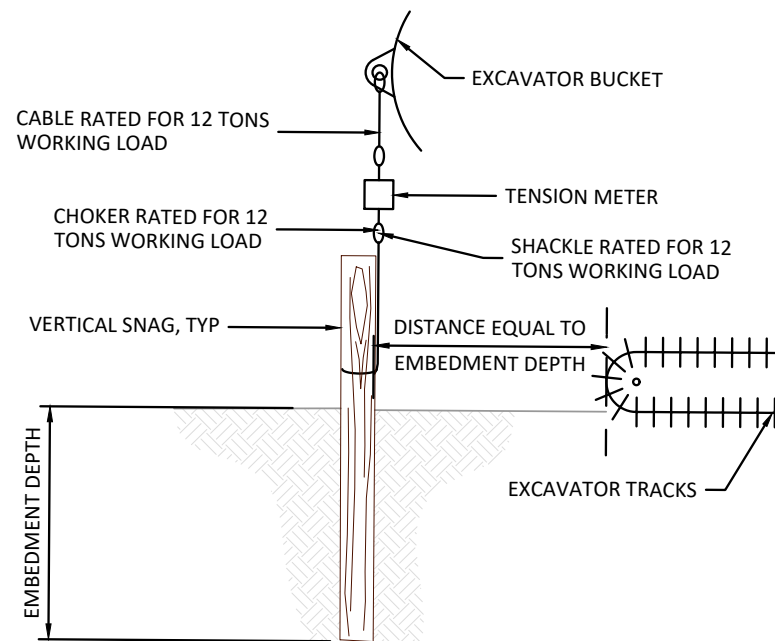
PRE-DRILL 1" HOLE.
7/8" MIN DIA. A36
THREADED ROD



NOTES:

1. BOLTS SHALL BE MINIMUM 7/8" DIAMETER THREADED ROD. BOLTS SHALL BE GRADE A36 STEEL AND MEET THE REQUIREMENTS OF ASTM F1554. WASHERS SHALL BE 4" OUTER DIAMETER. NUTS SHALL BE HEAVY HEX. ALL HARDWARE SHALL BE HOT-DIP GALVANIZED.
2. DRILL 1" HOLE THROUGH LOGS.
3. INSERT 7/8" DIA ALL-THREAD REBAR.
4. INSTALL STEEL PLATES AND HEAVY HEX NUTS. SECURE NUTS BY CHISELING THREADS.
5. EXCESS THREADED ROD SHALL BE CUT WITH A MAXIMUM OF 2 INCHES EXTENDING FROM THE TOP OF THE NUT TO THE CUT LOCATION.
6. FILE OR GRIND OFF SHARP EDGES.

1 FULLY THREADED ROD (FTR) CONNECTION
11 NOT TO SCALE



2 VERTICAL SNAG PULLOUT TESTING
11 NOT TO SCALE

VERTICAL SNAGS

ALL VERTICAL SNAGS SHALL BE INSTALLED USING VIBRATORY PILE DRIVING EQUIPMENT. INSTALLATION BY EXCAVATION OR HAMMERING WILL NOT BE ALLOWED.

RIGGING

RIGGING FOR VERTICAL SNAG TESTING SHALL CONFORM TO THE TENSION SCALE MANUFACTURER'S RECOMMENDATIONS.

CHOKERS, CABLES AND SHACKLES SHALL HAVE MINIMUM WORKING LOAD RATING OF 12 TONS. FITTINGS SHALL BE SIZED ACCORDINGLY

TESTING

TESTING OF VERTICAL SNAGS SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER OR OTHER QUALIFIED PERSONNEL.

EACH VERTICAL SNAG TEST SHALL HAVE UPWARD LOAD GRADUALLY INCREASED AND AS CLOSELY ALIGNED TO AXIS OF VERTICAL SNAG AS POSSIBLE. RECORD THE VERTICAL SNAG DIAMETER, EMBEDMENT DEPTH AND MAXIMUM FORCE REQUIRED TO MOVE THE VERTICAL SNAG. UP TO A TOTAL OF THREE LOADINGS MAY BE REQUIRED AT EACH EMBEDMENT DEPTH.

PROOF TESTS SHALL BE MADE AT UP TO FOUR EMBEDMENT DEPTHS TO BE DETERMINED IN THE FIELD. AS A GUIDELINE TEST EMBEDMENT DEPTHS MAY INCLUDE 6', 8', 10', AND 12'.

EXCAVATOR CONDUCTING PULL OUT LOADING SHALL BE POSITIONED NO CLOSER THAN EMBEDMENT DEPTH OF VERTICAL SNAG IF POSSIBLE. IF A CLOSER POSITIONING IS REQUIRED, EXCAVATOR SHALL BE NO CLOSER THAN THAT REQUIRED TO GENERATE DESIRED LOADING WITH DISTANCE FROM VERTICAL SNAG NOTED IN THE TEST RECORD. LOAD MAY BE SPREAD IN THIS SITUATION BY POSITIONING THE EXCAVATOR ACROSS HORIZONTAL LOGS, WITH DISTANCE FROM VERTICAL LOG, LOG NUMBERS AND LENGTH NOTED IN THE TEST RECORD.

PULL OUT RESISTANCE READING SHALL BE COMPARED AGAINST EXCAVATOR MAX LIFT OFFSET TABLE.

10% OF PRODUCTION VERTICAL SNAGS SHALL BE PROOF TESTED. IF RESULTS VARY MORE THAN 50% THEN IT SHOULD BE ANTICIPATED THAT UP TO 25% OF THE PRODUCTION VERTICAL SNAGS SHALL BE PROOF TESTED. IF THE VERTICAL SNAG EMBEDMENT DEPTH DOES NOT MEET MINIMUM, OWNER'S REPRESENTATIVE MAY REQUEST ADDITIONAL PULLOUT TESTING.

CONSTRUCTED DRIVEN VERTICAL SNAG EMBEDMENT DEPTH SPECIFIED IN THE DRAWINGS MAY BE REDUCED OR INCREASED, PENDING PULL OUT TEST RESULTS, AT THE CONTRACTOR'S EXPENSE.

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PILE TESTING & THREADED
ROD CONNECTIONS

SHEET
11 OF 14

Provisions

INTRODUCTION

The Washington State Department of Transportation's Standard Specifications for Road, Bridge and Municipal Construction 2014 (WSDOT Standard Specifications) shall apply unless otherwise noted in the following Special Provisions. The "Contracting Agency" or "Owner" shall be the Confederated Tribes and Bands of the Yakama Nation. Additional specifications in the following contract sections are included for items not covered by the WSDOT Standard Specifications.

Sections 1-02, 1-03, and 1-08 (except 1-08.6, 1-08.7, 1-08.8) of the Standard Specifications do not apply.

ITEM 001 - TESC, SPCC PLAN AND IMPLEMENTATION

Description

This work shall provide for preparation, implementation, and removal of a Temporary Erosion Sediment Control (TESC) plan and for the preparation and implementation of a Spill Prevention Control and Countermeasure (SPCC) plan in accordance with Section 1-07.15 of the Standard Specifications, and as amended by these Special Provisions.

1. The Contractor shall submit a TESC for the project to the Owner for approval. The TESC must satisfy the requirements of the Washington Department of Ecology NPDES Stormwater General Permit for Construction Activity and all other applicable permits. The TESC included in the Drawings and described herein is intended to provide a baseline for sediment and erosion control and does not ensure that the standards established by any applicable permits will be met. The Contractor may use these measures or alternative measures of his own design to ensure satisfactory performance and that the erosion control requirements of all applicable permits are met. The contractor shall be named as the permit holder. The contractor shall be responsible for implementing, inspecting and filing reports, maintaining, replacing, and removing TESC and SPCC measures. The plan shall include the name, address and 24-hour contact number of the person responsible for erosion prevention and sediment control measures.
2. A spill Containment Kit shall be on site and crews shall be trained in its use.
3. Biodegradable Hydraulic Fluid shall be installed into each piece of heavy machinery working within 50 feet of the river.

Measurement

"TESC, SPCC Plan and Implementation," including the above amendments to the item will be measured by lump sum.

Payment

Payment shall be considered full compensation for all equipment, labor, tools, materials, and incidentals necessary to complete this work as specified. Payment will be made in accordance with Section 1-04.1 for the following bid items: "TESC, SPCC Plan and Implementation" per lump sum.

ITEM 002 - MOBILIZATION

This item shall consist of preparation work and operations performed by the Contractor in accordance with the provisions of Section 1-09.7 of the Washington Department of Transportation Standard Specifications (Standard Specifications), and as amended by these Special Provisions.

1. Portions of access to the project site are on forest road, over a bridge, and along a dirt driveway that is narrow and winding. Alternative access routes may be explored. The Contractor is advised that access for heavy equipment and log delivery may be challenging.
2. Temporary site access within the project site shall be along alignments shown in the plans. Minor deviations to the alignments may occur as directed by the Owner to preserve sensitive areas or trees, or to avoid damage to other features identified in the field. Deviations from the alignments shown in the plans shall be approved by Owner prior to use.

Measurement and Payment

Payment for Mobilization shall be by the lump sum contract price for 'Mobilization', partial payments will be made as in accordance with Section 1-09.9 of the Standard Specifications. Payment shall be considered full compensation for all equipment, labor, tools, materials, and incidentals necessary to complete this work as specified.

ITEM 003 - ROAD REPAIR

This work consists of constructing one or more top courses of crushed surfacing top course upon a prepared subgrade in accordance with Section 4.04 of the Standard Specifications and the following supplements:

This work shall be conducted after completion of other project sites that utilize this access route.

Materials

Materials shall meet the requirements of Crushed Surfacing 9-03.9(3).

Construction Requirements

Resurfacing shall consist of application of a crushed surfacing top course to a compacted depth of 3 inches.

The Contractor shall apply water and compact top course materials to ensure quality road surface construction.

This item shall include "Blading" and "Water Supply and Watering".

Blading- This work consists of surface blading the traveled way to a condition to facilitate traffic and provide proper drainage. Blading includes shaping the crown or slope of the traveled way, and drainage dips, in accordance with this specification. Watering shall be incidental to this item.

A. General

1. Blade and shape the existing traveled way to produce a surface which is uniform, consistent to grade, and crowned or cross sloped as indicated by the character of the existing surface, unless otherwise specified. Thoroughly loosen surfacing material to no less than 2 inches depth or the depth of pothole or corrugations.
2. Apply water during blading when sufficient moisture is not present to prevent surface material segregation. Water supply, hauling, and application shall be in accordance with Water Supply and Watering (see below).
3. Shape existing native rock or aggregate surfaced drainage dips to divert surface runoff to existing outlet devices, ditches, and discharge locations.
4. Establish a blading pattern which provides a uniform driving surface, retains the surfacing on the roadbed, and provides a thorough mixing of material within the completed surface width. Upon final blading, no disturbed rock shall protrude more than 2 inches above the adjacent surface unless otherwise specified.

B. Routine Blading

Shape roadbed width in excess of the dimensions shown only as needed to provide drainage away from the travelled way. Do not remove established grasses and other vegetation from the excess width except as incidental to providing drainage or unless otherwise directed.

- C. Signage - Place suitable temporary traffic control warning signs at each end of the work area. Such signing shall conform to the Federal Highway Administration's publication "Manual for Uniform Traffic Control Devices", or MUTDC.

Water Supply and Watering- This work consists of providing facilities to furnish an adequate water supply, hauling and applying water. It shall be the contractors' sole responsibility to obtain all rights to use the water source. Equipment shall meet environmental permit or municipality requirements for controlling dispersal rates, backflow, NMFS fish screening protocol, or other pertinent requirements to conduct the work safely and efficiently.

Measurement

Road Repair will be measured as linear feet of installed material.

Payment

Payment will be made in accordance with Section 1-04.1, for "Road Repair" per cubic yard. Subsurface preparation, "Blading", and "Water Supply and Watering" shall be incidental to this item.



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MB APPROVED	05/09/19 DATE	PROJECT

**NASON CREEK - KAHLER SITE
STREAM & FLOODPLAIN ENHANCEMENT
FINAL DESIGN**



501 Portway Avenue, Suite 101
Hood River, OR 97031
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SPECIFICATIONS

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ITEM 004 - CLEARING AND GRUBBING

This item consists of clearing and grubbing for construction as shown on the plans in accordance with Section 2-01 of the Standard Specifications, and as amended by these Special Provisions.

1. Areas for Clearing and Grubbing are shown in the Plans. Adjustments to alignments and extents may be adjusted by the Owner to reduce damage to the environment. The final areas will be flagged in the field by the Owner prior to Clearing and Grubbing work. Clearing and Grubbing shall not occur outside of the designated limits.
2. Included in this item are the removal and salvage of approximately 7 trees, varying in size from 12" to 24" diameter at breast height (dbh). Salvaged Trees shall be installed as large woody debris during construction. To the maximum practicable extent, the Contractor shall excavate to loosen soil around each rootwad and then push over the trees in order to salvage logs with intact attached roots. Salvaged Trees may be temporarily stockpiled outside of the clearing limits but within reach of the excavator during construction.
3. Trees and shrubs smaller than 12" dbh that are removed during clearing and grubbing shall be left on site, placed outside of limits of disturbance, to be used as slash during construction. Unused excess slash may remain on site.
4. Vegetation protection and restoration per Section 1-07.16(2) shall be incidental to Clearing and Grubbing.

Measurement

Removal and Salvage of trees and shrubs shall be considered incidental to Clearing and Grubbing.

Measurement and compensation for the installation of the salvaged trees is described under "Logs" and paid under that item. No additional compensation will be allowed.

"Clearing and Grubbing," including the above amendments to the item will be measured by lump sum.

Payment

Payment will be made in accordance with Section 1-09.9 for the following bid items: "Clearing and Grubbing" per lump sum.

ITEMS 005, 006, 007 - LOG STRUCTURE

Description

This item is applicable to sites in the Plans labeled:

1. Site 1
2. Site 3
3. Site 4

"Log Structure" includes all work associated with onsite movement and installation of, logs, logs with roots, timber piles, whole trees, salvaged trees, slash, bumpers, and securing with threaded rod. This item includes movement from stockpiles to installation areas, excavation and backfill to partially bury "Log Structure", hauling and on-site disposal of excess fill. Cofferdam and Pumping shall be included with "Log Structure".

Materials

Material quantities for each site are shown in the Plans.

1. **Logs:** Logs and Logs with roots will be supplied by the Owner to the site staging areas. Quantities for each site are shown in the Plans. Owner supplied Logs will have the following characteristics:

Logs with Roots: 40' long and 18-24" dbh.

Logs: 40' long and 12-24" diameter at scaled end.

2. **Timber Piles:** Timber Piles will be supplied by the Owner to the site staging areas. Quantities for each site are shown in the Plans. Timber Piles will have the following characteristics: 20' long and 16" dia in middle of log.

3. **Salvaged Trees:** Salvaged Trees are individual standing trees identified by the Owner along access routes or in excavation areas. Salvaged Trees will have the following characteristics 12-24" dbh, 40-100' tall.

4. **Slash:** Slash includes shrubs and small trees removed within the clearing limits, or provided by the Owner at stockpiles near the sites.

6. **Threaded Rod:** Install threaded rod as specified in the Plans

Construction Requirements

Logs: Construction of Logs shall include delivery from stockpile areas, on site movement, and installation of Logs where shown in the Plans. Locations of Logs and Logs with Roots shall generally be as indicated on the Plans. However, final location will depend upon the size, shape and quantity of material delivered or salvaged. Installation of Logs shall be understood to require a "fit in the field" approach as directed by the Owner. Logs shall be stabilized by partial burial and/or bracing provided by Timber Piles. Some Logs shall be secured to Timber Piles or other Logs via Fully Threaded Rod.

Timber Piles: Construction of Timber Piles shall include delivery from stockpile areas, on site movement, and installation of timber piles to designated sites shown in the Plans. Timber Piles shall be per the approximate numbers and quantities indicated on the plans. Specific locations shall be determined in the field and directed by the Owner. The required embedment depth is indicated on the plans. Installed Timber Piles shall also have the following field-directed characteristics:

- c. Timber Piles shall be installed at various angles and with varying heights above ground to break up a uniform appearance.

- d. Each Timber Pile log shall have a broken top unless directed otherwise by the Owner's Representative. The preferred method shall be to break off the top 4-8 feet before installing the pile. Grinding or making multiple plunge cuts with chain saw to provide a roughened top are other acceptable methods.

Timber Piles shall be installed by vibratory hammer. Vibratory hammer shall have the following characteristics:

- a. Minimum of 800 kN (80 tons) of centrifugal force.
- b. Side grip with minimum 16" space between ends of jaws so that 16" diameter log will fit into the jaws.

At each pile installation site, one pile shall be tested for pullout resistance. Each test will require up to four individual pulls, each at a deeper depth.

Salvaged Trees: Salvaged trees shall be installed in log structures as shown in the Plans or as directed by the Owner. Care shall be taken when moving and installing salvaged trees so that branches and roots remain attached to the tree. Salvaged Trees shall be stabilized by partial burial, bracing to Timber Piles or standing trees, or held down by other partially buried logs.

Slash: Slash cleared from within the clearing shall be incorporated into log structures as directed by the Owner.

Intermingle, stack, and rack slash material to the installed logs and piles to emulate natural accumulations of wood material.

Earthwork: Excavate pools as shown in the Plans. Where partial burial of logs is required, excavate to subgrade. Stockpile the fill within the designated disturbance area. Backfill the logs as each layer is installed. Load and haul excess fill to approved disposal site.

Install threaded rod where shown in the Plans or as directed by Owner.

Measurement

Measurement will be based on the portion of work completed, measured as each completed site.

"Log Structure" will be measured by lump sum per Site.

Payment

Payment will be made in accordance with Section 1-09.9 for the following bid items: "Log Structure" as lump sum per site.

The contract price for "Log Structure" shall be full compensation for all costs incurred for equipment, materials and labor for installing and securing logs, timber piles, and salvaged trees as outlined in the plans. Earthwork, installing slash and threaded rod, Cofferdam, and Pumping shall be incidental to Log Structures.

ITEMS 008 & 009 - CHANNEL EXCAVATION INCL. HAUL

This item is applicable to excavation at the following sites:

1. Pool excavation at Sites 1, 3, & 4
2. Alcove

This item consists of excavating, loading, hauling, & placing in accordance with Section 2-03 of the Standard Specifications, and as amended by these Special Provisions.

1. Portions of work will be in water.
2. This item includes "Cofferdam" and "Pumping".
3. This item includes hauling of excavated material to a temporary stockpile area provided by the Owner. The unit contract price per cubic yard shall include "Haul".
4. Sort and stockpile materials based on characterization by visual inspection. Separate stockpiles shall be made for boulders and cobbles, and gravel and sand.

Measurement

"Channel Excavation Incl. Haul" will be measured by cubic yard. All excavated material will be measured in the position it occupied before the excavation was performed. An original ground measurement was taken using digital terrain modeling survey techniques. The original ground will be compared with the planned finished section shown in the Plans. Slope/ground intercept points defining the limits of the measurement will be as staked by the Owner. No additional compensation will be made for excavated material that is stockpiled, re-excavated, and moved again. Cofferdams and Pumping associated with preventing turbidity from entering the river shall be incidental to Channel Excavation Incl. Haul. Silt Fence shall be incidental to Item 009.

Payment

Payment shall be considered full compensation for all equipment, labor, tools, materials, and incidentals necessary to complete this work as specified. Payment will be made in accordance with Section 1-04.1 for the following bid items: "Channel Excavation Incl. Haul" per cubic yard.



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ITEM 010 - EARTH EMBANKMENT CONSTRUCTION

This item consists of placing earth embankment and compacting in accordance with Section 2-03 of the Standard Specifications, and as amended by these Special Provisions.

- a. This item includes earth embankment construction at the fill area designated in the Plans. Embankment compaction shall be per Section 2-03.3(14)C Method A. All costs for embankment compaction shall be included in this item.
- b. Material source will be the temporary stockpile of fill generated from Channel Excavation Incl. Haul.
- c. Fill materials shall be placed in designated areas and taken from separate stockpiles of boulders and cobbles, and gravel and sand.

Materials

Material placement areas for each sorted material are shown in the Plans.

Construction Requirements

Fill areas are shown in the plans as Site 2. Place the material to the required lines, grades, and cross-sections shown in the plans and staked in the field.

Measurement

“Earth Embankment Construction” will be measured by the cubic yard. All placed material will be measured as the final installed position shown in the Plans. Measurement will be calculated from the difference in volume between surveyed original ground and the lines and grades shown in the Plans as fill at Site 2.

Slope/ground intercept points defining the limits of the measurement will be as staked. No additional measurement will be made. No additional compensation will be made for stockpiled material that is moved to a position other than where shown in the plans.

Payment

Payment will be made in accordance with Section 1-04.1.

“Earth Embankment Construction”, per cubic yard.

The Contract unit price per cubic yard for “Earth Embankment Construction” shall be full compensation for all costs occurred for moving materials taken from on-site sorted stockpiles, and placing and compacting these materials at designated areas shown in the Plans.

ITEM 011 - LOG/ROCK CRIB & ALCOVE LOGS

This item applies to the installation of logs and rock where indicated in the plans as Alcove at the upstream end of Site 2, and Log/Rock Crib at the downstream side of Site 2.

Materials

- 1. Logs and Logs with roots will be supplied by the Owner, staged at the Winton Mill, approximately 10 miles from the project site. Quantities are shown in the Plans. Owner supplied Logs will have the following characteristics:
Logs with Roots: 40' long and 18-24" dbh.
Logs: 40' long and 12-24" diameter at scaled end.
- 2. Timber Piles will be supplied by the Owner, staged at the Winton Mill, approximately 10 miles from the project site. Quantity is shown in the Plans. Timber Piles will have the following characteristics:
20' long and 16" dia in middle of log.
- 3. Imported rock shall be provided by the Contractor, and meet the requirements of Rock for Erosion and Scour Protection Class B, described in 9-13.4. Quantity is shown in the Plans.

Construction Requirements

Excavate to subgrade.

Place Logs in horizontal layers. Additional excavation shall be required to bury ends of Logs.

Backfill each Log layer with Rock before placing next Log layer.

Install Salvaged Tree and Logs where indicated as Habitat Logs. Stabilize by driving two Timber Piles and Threaded Rod. If Timber Piles cannot be driven, Logs shall be partially buried to arranged to brace Salvaged Tree.

ITEM 012 - TOPSOIL TYPE B

This item shall meet the requirements of Section 8-02 of the Standard Specifications, but with the following modifications:

- 1. Topsoil Type B shall be stripped from areas identified in the field. Topsoil stripping shall refer to material salvaged to an average depth of 18-inches below ground surface following Clearing and Grubbing.
- 2. Salvaged topsoil shall be reused by placing salvaged topsoil to a depth of 12-inches over subgrade achieved by “Channel Excavation Incl. Haul”. Top surface of topsoil shall be at final ground elevations as shown in the Plans.
- 3. Temporary stockpiling of topsoil shall not occur outside of the limits of disturbance shown in the Plans unless authorized by the Owner.

Measurement

Onsite movement, stockpiling placement and mixing of topsoil are included in this item.

“Topsoil Type B” will be measured by the cubic yard of installed material.

Payment

Payment will be made in accordance with Section 1-09.9 for the following bid items: “Topsoil Type B” per cubic yard.

COFFERDAM {Incidental}

Description

This item consists of providing and installing, maintaining, and removing measures to bypass the surface waters of the stream around in-channel work areas, and to prevent turbidity from entering the river.

Cofferdam shown in the Plans is one acceptable method. The Contractor may use this method or propose a different method that provides equal or better isolation of the work area from the flow. If a different method is proposed, Contractor shall submit drawings showing details of proposed methods for providing temporary isolation of surface water during construction activities. Review and approval of the Cofferdam Plan shall not relieve the Contractor from full responsibility for the adequacy of cofferdam work if the proposed plan is not successful at properly isolating the work area.

Cofferdams shall be suitably offset from work area so as to not interfere with log placement or limit pool excavation.

The work includes coordinating with the Owner for fish salvage relocation activities.

Materials

The Contractor shall provide all required materials for the project. If Bulk Bag Cofferdam is the method to be used, see details for Bulk Bag Cofferdams on the Plans.

Sandbags filled with pea gravel or stream gravel. Using sand will not be allowed.

Construction Requirements

The contractor shall isolate the work area from the river by installing cofferdam per the plans. No turbidity from construction activities shall enter the river. Cofferdams shown on the plans are a suggested method. If Contractor elects to use alternate method(s) for temporary cofferdams, Contractor shall provide to the Owner a cofferdam/diversion plan for review prior to implementation.

1. Cofferdam

a. Construction methods for Bulk Bag Cofferdams are described in the project plans.

2. Coordination with Fish Rescue

a. The Contractor shall provide minimum 2 days advance notice to the Owner before each cofferdam installation date. The Contractor shall understand that cofferdam installation requires coordination with the Owner and only after the Owner has completed fish rescue can the cofferdams be completed. The Contractor is advised that fish rescue may take up to 2 days per cofferdam.

3. Cofferdam shall be in conjunction with Pumping.

Measurement and Payment

Cofferdam shall be incidental to “Log Structure”.

PUMPING {Incidental}

This item includes dewatering and controlling turbidity within construction areas isolated from the river by Cofferdams.

Description

The work consists of furnishing, monitoring, operating, maintaining, and removing pumps, coordinating with the Owner for fish salvage relocation activities, and installation of control of water BMPs.

Materials

- 1. One 6” or Two 4” trash pumps, with total pumping capacity greater than 600 gpm, assuming 12 feet of vertical lift and 300 feet of discharge hose.
- 2. Each water intake shall have a fish screen installed, operated and maintained according to NMFS' fish screen criteria (NMFS 1997; NMFS 2008).
- 3. Environmental Protection Measures such as straw bales, perforated pipe for discharge flow distributors, geotextiles, filter bags, or other means of controlling water and turbidity. No turbidity shall be allowed to enter the river or wetlands.

Construction Requirements

1. Pumps

a. To help prevent turbidity from leaking through cofferdams, the contractor shall provide and operate trash pump(s) to lower the water surface within the isolated area and discharge to areas to be infiltrated into the ground and without entering the river.

2. Environmental Protection Measures

a. If infiltration becomes an ineffective means to control turbidity, additional and alternative methods, such as pumping into stilling basins or filtration geotextile fabric shall be required at the Contractor's expense.

Measurement and Payment

Measurement will be based on the item from the bid list installed and the work for that portion completed. The unit contract prices for “Pumping” shall be full compensation for all costs incurred for equipment, materials and labor for furnishing, installing, securing, maintaining and removal of pumping equipment as outlined in the plans. If additional environmental protection measures are required to control turbidity, they shall be considered incidental to pumping and no additional compensation will be made.

Pumping shall be incidental to “Log Structure”.



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