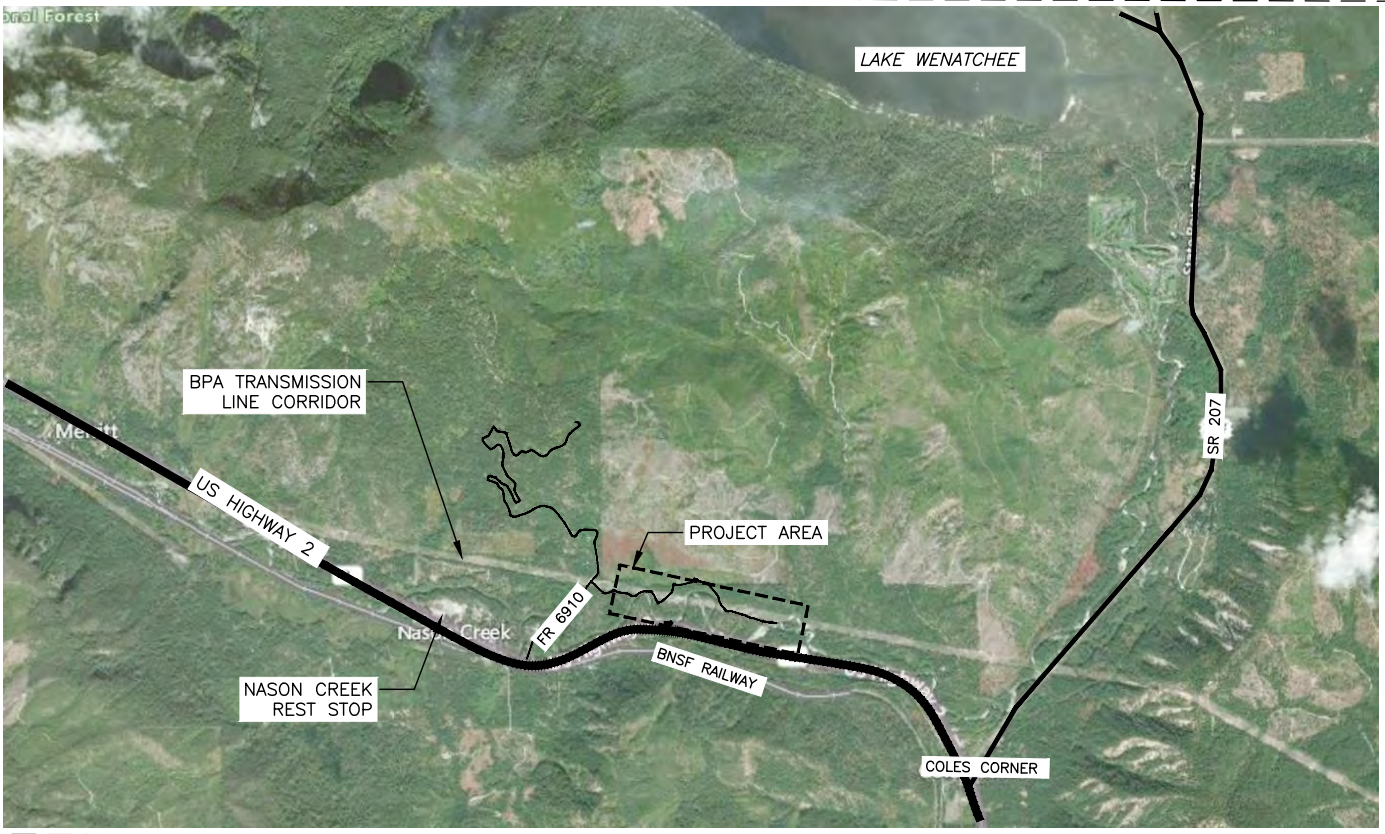


# NASON CREEK KAHLER REACH HABITAT IMPROVEMENT PROJECT

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT



WASHINGTON STATE  
SCALE: 1"=50 MILES



VICINITY MAP  
SCALE: 1"=0.5 mile



DRAWING LIST	
SHEET NUMBER	SHEET TITLE
1	COVER SHEET
2	GENERAL NOTES
3	LEGEND
4	EXISTING CONDITIONS PLAN
5	PROPOSED CONDITIONS OVERVIEW PLAN
6	ACCESS AND STAGING PLAN
7	PROPOSED CONDITIONS – SITE 1
8	CONSTRUCTION SEQUENCING – SITE 1
9	SEEDING PLAN – SITE 1
10	PROPOSED CONDITIONS – SITE 2
11	CONSTRUCTION SEQUENCING – SITE 2
12	SEEDING PLAN – SITE 2
13	TYPE 1 ELJ DETAILS
14	TYPE 1 ELJ LAYERING PLANS – 1
15	TYPE 1 ELJ LAYERING PLANS – 2
16	TYPE 2 ELJ DETAILS
17	TYPE 2 ELJ LAYERING PLANS – 1
18	TYPE 2 ELJ POST DIMENSIONING PLAN
19	SIDE CHANNEL CONNECTION GRADING
20	ROAD IMPROVEMENTS
21	RESTORATION DETAILS
22	TESC DETAILS
23	SEED SCHEDULES

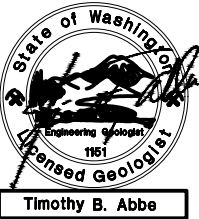
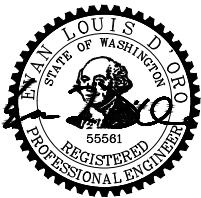
### CONTACT INFORMATION

OWNER: CHELAN COUNTY NATURAL RESOURCE DEPARTMENT

411 WASHINGTON STREET, SUITE 201  
WENATCHEE, WA 98801  
PHONE: (509) 667-6533

ENGINEER: NATURAL SYSTEMS DESIGN, INC

1900 N NORTHLAKE WAY, SUITE 211  
SEATTLE, WA 98103  
(206) 834-0175



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MEASURE 1" THEN  
DRAWING IS NOT PLOTTED  
TO ORIGINAL SCALE.



NAME OR INITIALS AND DATE		GEOGRAPHIC INFORMATION	
DESIGNED	JMS, ELD	LATITUDE	N047° 46' 7.64"
CHECKED	TBA	LONGITUDE	W120° 46' 7.76"
DRAWN	JGJ	TN/SC/RG	T26N/S7/R17E
CHECKED	JWS, GM	DATE	

NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT

COVER SHEET

1  
SHEET 1 OF 23

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Dec 20, 2021 100% PLANS – FOR CONSTRUCTION



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GENERAL NOTES

1. THESE PLANS HAVE BEEN PREPARED FOR THE EXCLUSIVE USE OF CHELAN COUNTY NATURAL RESOURCE DEPARTMENT, HEREAFTER REFERRED TO AS "OWNER" AND THEIR AUTHORIZED AGENTS. THE OWNER WILL DESIGNATE A REPRESENTATIVE, HEREAFTER REFERRED TO AS "CONTRACTING OFFICER", TO REPRESENT THE OWNER AND INTERACT WITH THE CONTRACTOR ON THEIR BEHALF. THE CONTRACTING OFFICER WILL BE ON-SITE DURING CONSTRUCTION AND WILL BE RESPONSIBLE FOR FACILITATING ADMINISTRATION OF THE CONSTRUCTION CONTRACT BETWEEN THE OWNER AND THE CONTRACTOR.
2. NATURAL SYSTEMS DESIGN, HEREAFTER REFERRED TO AS "ENGINEER", IS RESPONSIBLE FOR THE PREPARATION OF THESE ORIGINAL PLANS AND ASSOCIATED SPECIFICATIONS; AND WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGE, OR USE, OF THESE PLANS WHICH INCLUDES ALTERATION, DELETION, OR EDITING OF THIS DOCUMENT WITHOUT EXPLICIT WRITTEN PERMISSION FROM THE ENGINEER. ANY OTHER UNAUTHORIZED USE OF THIS DOCUMENT IS PROHIBITED.
3. MINOR MODIFICATIONS ARE EXPECTED TO SUIT JOB SITE DIMENSIONS OR CONDITIONS. SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK. THE OWNER, ENGINEER AND APPROPRIATE REGULATORY AGENCIES SHALL BE NOTIFIED OF ANY OWNER-AUTHORIZED CHANGE RESULTING IN MORE THAN A 10% DESIGN CHANGE OF PROPOSED FOOTPRINT OR THAT SIGNIFICANTLY AFFECTS THE INTENDED BENEFIT OR FUNCTION OF A PROJECT ELEMENT.
4. THE LOCATION OF ALL FEATURES SHOWN IS APPROXIMATE.
5. THE CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; AND FURTHER AGREES THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS IN ACCORDANCE WITH THE PROVISIONS OUTLINED BY THE PROJECT CONTRACT AND SPECIFICATIONS.
6. ALL IMPROVEMENTS SHALL BE ACCOMPLISHED UNDER THE APPROVAL, INSPECTION, AND TO THE SATISFACTION OF THE OWNER. IMPROVEMENT CONSTRUCTION SHALL COMPLY WITH THESE PLANS AND THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STANDARD PLANS FOR CONSTRUCTION OF ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION, CURRENT EDITION UNLESS NOTED OTHERWISE. ALL REFERENCES TO THE "STANDARD SPECIFICATIONS" SHALL MEAN THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION OF LOCAL STREETS AND ROADS, CURRENT EDITION. CONSTRUCTION NOT SPECIFIED ON THESE PLANS SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS. THE CONTRACTOR IS OBLIGATED TO BE FAMILIAR WITH APPLICABLE SECTIONS OF THE STANDARD SPECIFICATIONS NOT DISCUSSED IN THE GENERAL NOTES. THE CONTRACT SPECIAL PROVISIONS SHALL SUPERSEDE THOSE OF THE STANDARD SPECIFICATIONS WHERE DISCREPANCIES OCCUR.
7. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND SUBCONTRACTOR(S) TO EXAMINE THE PROJECT SITE PRIOR TO THE OPENING OF BID PROPOSALS. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED, SUCH AS THE NATURE AND LOCATION OF THE WORK; AND THE GENERAL AND LOCAL CONDITIONS, PARTICULARLY THOSE AFFECTING THE AVAILABILITY OF TRANSPORTATION, THE DISPOSAL, HANDLING, AND STORAGE OF MATERIALS, AVAILABILITY OF LABOR, WATER, ELECTRICITY, ROADS, THE UNCERTAINTIES OF WEATHER, THE CONDITIONS OF THE GROUND, SURFACE AND SUBSURFACE MATERIALS, GROUNDWATER, THE EQUIPMENT AND FACILITIES NEEDED FOR AND DURING THE PERFORMANCE OF THE WORK, AND THE COSTS THEREOF. ANY FAILURE BY THE CONTRACTOR AND SUBCONTRACTOR(S) TO ACQUAINT THEMSELVES WITH ALL THE AVAILABLE INFORMATION WILL NOT RELIEVE THE CONTRACTOR AND SUBCONTRACTOR(S) FROM RESPONSIBILITY FOR PROPERLY ESTIMATING THE DIFFICULTY AND COST OF SUCCESSFULLY PERFORMING THE WORK.
8. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE CONTRACT DOCUMENTS AND FOR ALL SUBMITTALS REQUIRED TO THE OWNER FOR REVIEW AND ACCEPTANCE.

PERMIT NOTES

1. EVERY REASONABLE EFFORT SHALL BE MADE TO CONDUCT THE ACTIVITIES SHOWN IN THESE PLANS, IN A MANNER THAT MINIMIZES THE ADVERSE IMPACT ON WATER QUALITY, FISH AND WILDLIFE, AND THE NATURAL ENVIRONMENT.
2. ALL WORK WILL BE IN COMPLIANCE WITH PERMIT CONDITIONS ISSUED BY PERTINENT REGULATORY AGENCIES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE COPIES OF ALL PERMITS ON THE JOB SITE, UNDERSTAND AND COMPLY WITH ALL PERMIT CONDITIONS.
3. ALL WORK THAT DISTURBS THE SUBSTRATE, BANK, OR SHORE OF A WATERS OF THE STATE THAT CONTAINS FISH LIFE SHALL BE CONDUCTED ONLY DURING THE WORK PERIOD FOR THAT WATERBODY AS ALLOWED BY RELEVANT HYDRAULIC WORK PERMITS. THOSE PORTIONS OF THE PROJECT WORK THAT OCCUR OUTSIDE OR ABOVE THE ORDINARY HIGH WATER MARK (ABOVE THE USACE JURISDICTIONAL LINE) ARE NOT SUBJECT TO THE WORK PERIODS DESCRIBED ABOVE UNLESS SPECIFIED IN THE RELEVANT PERMITS.
4. ALL ACTIVITIES THAT INVOLVE WORK ADJACENT TO, OR WITHIN THE WETTED CHANNEL SHALL, AT ALL TIMES, REMAIN CONSISTENT WITH ALL APPLICABLE WATER QUALITY STANDARDS; EFFLUENT LIMITATION; AND STANDARDS OF PERFORMANCE, PROHIBITIONS, PRETREATMENT STANDARDS, AND MANAGEMENT PRACTICES ESTABLISHED PURSUANT TO THE CLEAN WATER ACT OR PURSUANT TO APPLICABLE STATE AND LOCAL LAW.

5. IF AT ANY TIME, AS A RESULT OF PROJECT ACTIVITIES, FISH ARE OBSERVED IN DISTRESS, A FISH KILL OCCURS, OR WATER QUALITY PROBLEMS DEVELOP (INCLUDING EQUIPMENT LEAKS OR SPILLS), OPERATIONS SHALL CEASE AND THE OWNER SHALL BE NOTIFIED IMMEDIATELY.
6. IF, DURING CONSTRUCTION, ARCHAEOLOGICAL REMAINS ARE ENCOUNTERED, CONSTRUCTION IN THE VICINITY SHALL BE HALTED, AND THE STATE OFFICE OF HISTORIC PRESERVATION AND THE OWNER SHALL BE NOTIFIED IMMEDIATELY.

SURVEY NOTES

1. UNLESS NOTED OTHERWISE ON THE PLANS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING SURVEY MONUMENTS AND OTHER SURVEY MARKERS DURING CONSTRUCTION.
2. THE CONTRACTOR SHALL MAINTAIN A SET OF PLANS ON THE JOB SHOWING "AS-CONSTRUCTED" CHANGES MADE TO DATE. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUPPLY TO OWNER A SET OF PLANS, MARKED UP TO THE SATISFACTION OF THE OWNER, REFLECTING THE AS-CONSTRUCTED MODIFICATIONS.
3. ELEVATIONS SHOWN ON THE PLANS FOR PIPE INVERTS, TOPS OF BANKS, THALWEG, GRADE CONTROLS, ETC., ARE BASED UPON THE TOPOGRAPHIC INFORMATION SHOWN ON THE PLANS. THE CONTRACTOR SHALL VERIFY ALL NECESSARY SURFACE ELEVATIONS IN THE FIELD AND NOTIFY THE OWNER OF ANY DISCREPANCIES, WHICH MIGHT AFFECT PROPER OPERATION OF THE NEW FACILITIES BEFORE BREAKING GROUND AND PRIOR TO FACILITY INSTALLATION. THE OWNER SHALL BE CONTACTED IN THE EVENT ELEVATIONS ARE INCORRECT SO THAT THE PROPER ADJUSTMENTS CAN BE MADE BY ENGINEER PRIOR TO THE INSTALLATION OF THE FACILITIES, AS SET FORTH IN THE SPECIAL PROVISIONS.
4. LIDAR FOR THIS PROJECT WAS PROVIDED BY PSLC AND IS REPRESENTATIVE OF 2015 CONDITIONS. ADDITIONAL TOPOGRAPHIC DATA WAS COLLECTED BY NSD IN 2015. THE VERTICAL DATUM IS NAVD88 (FT). THE HORIZONTAL DATUM IS NAD83 WASHINGTON STATE PLANE NORTH (US SURVEY FT).

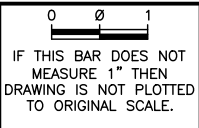
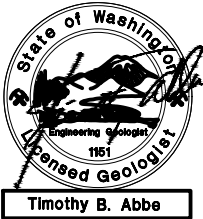
EROSION, SEDIMENT CONTROL AND WATER MANAGEMENT NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL TEMPORARY EROSION CONTROL MEASURES. THE EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND PERFORMANCE OF THE TEMPORARY EROSION CONTROL MEASURES THROUGHOUT THE DURATION OF THE PROJECT.
2. A SEDIMENT AND EROSION CONTROL PLAN WILL BE DEVELOPED BY THE CONTRACTOR AND SUBMITTED FOR APPROVAL BY OWNER AND/OR THE ENGINEER BEFORE ANY CONSTRUCTION MAY BEGIN. THE SEDIMENT AND EROSION CONTROL PLAN WILL IDENTIFY BEST MANAGEMENT PRACTICES TO ENSURE THAT THE TRANSPORT OF SEDIMENT TO SURFACE WATERS, DRAINAGE SYSTEMS, AND ADJACENT PROPERTIES IS MINIMIZED.
3. ACTIVITIES SHALL BE DESIGNED AND CONSTRUCTED TO AVOID AND MINIMIZE ADVERSE IMPACTS TO WATERS OF THE UNITED STATES TO THE MAXIMUM EXTENT PRACTICAL THROUGH THE USE OF PRACTICAL ALTERNATIVES. ALTERNATIVES THAT SHALL BE CONSIDERED INCLUDE THOSE THAT MINIMIZE THE NUMBER AND EXTENT OF IN-WATER WORK AND EQUIPMENT CROSSINGS OF WETTED CHANNELS.
4. AT NO TIME SHALL SEDIMENT-LADEN WATER BE DISCHARGED OR PUMPED DIRECTLY INTO THE SUBJECT RIVER, STREAM, OR WETLAND. WATER SHALL BE DISCHARGED IN ACCORDANCE WITH REQUIREMENTS SET FORTH IN THE PROJECT PERMITS AND / OR SPECIFICATIONS.
5. IF HIGH WATER LEVEL CONDITIONS THAT CAUSE SILTATION OR EROSION ARE ENCOUNTERED DURING CONSTRUCTION, WORK SHALL STOP UNTIL THE WATER LEVEL SUBSIDES.
6. PERMIT CONDITIONS CONTAIN SPECIFIC REQUIREMENTS FOR THE CONTROL OF EROSION AND TURBIDITY FROM PROJECT OPERATIONS. TURBIDITY WILL BE MONITORED ON A FREQUENT BASIS BY THE PROJECT MANAGEMENT AND INSPECTION STAFF ON-SITE. TURBIDITY AMOUNTS IN EXCESS OF THE PERMITTED CONCENTRATIONS AND/OR DURATIONS WILL CAUSE WORK TO BE STOPPED UNTIL IMPROVED PRACTICES ARE IN EFFECT AND THE PROBLEMS CONTROLLED. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR ANY PROJECT DELAYS THAT OCCUR BY NATURE OF THIS FAILURE TO ADEQUATELY CONTAIN SEDIMENT ON-SITE.
7. CONTRACTOR SHALL LIMIT MACHINERY MOVEMENT TO CONSTRUCTION AREAS DEFINED ON SITE PLAN OR IDENTIFIED AS ACCEPTABLE BY THE ENGINEER OR OWNER.
8. ALL EXTERNAL GREASE AND OIL SHALL BE PRESSURE-WASHED OFF THE EQUIPMENT PRIOR TO TRANSPORT TO THE SITE.
9. ALL EQUIPMENT OPERATING BELOW OHWM SHALL UTILIZE READILY BIODEGRADABLE VEGETABLE-BASED HYDRAULIC FLUIDS.
10. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT NO PETROLEUM PRODUCTS, HYDRAULIC FLUID, SEDIMENTS, SEDIMENT-LADEN WATER, CHEMICALS, OR ANY OTHER TOXIC OR DELETERIOUS MATERIALS ARE ALLOWED TO ENTER OR LEACH INTO THE SUBJECT RIVER, STREAM, OR WETLAND.
11. THE CONTRACTOR SHALL HAVE AN EMERGENCY SPILL KIT ONSITE AT ALL TIMES.

12. NO TREES OR WETLAND VEGETATION SHALL BE REMOVED UNLESS THEY ARE SHOWN AND NOTED TO BE REMOVED ON THE PLANS OR AS DIRECTLY SPECIFIED ON-SITE BY THE OWNER OR ENGINEER. ALL TREES CONFLICTING WITH GRADING SHALL BE REMOVED. NO GRADING SHALL TAKE PLACE WITHIN THE DRIP LINE OF TREES NOT TO BE REMOVED UNLESS OTHERWISE APPROVED.
13. FOLLOWING CONSTRUCTION, SITE RESTORATION WILL INCLUDE ESTABLISHING LONG-TERM EROSION PROTECTION MEASURES. THESE MEASURES WILL INCLUDE PLANTINGS, EROSION CONTROL FABRIC, SEED, AND MULCH. EQUIPMENT AND EXCESS SUPPLIES WILL BE REMOVED AND THE WORK AREA WILL BE CLEANED. MAINTENANCE ACTIVITIES FOR THE NEWLY CONSTRUCTED RESTORATION PROJECTS ARE ANTICIPATED TO OCCUR PERIODICALLY.

CONSTRUCTION NOTES

1. CONTRACT DOCUMENTS REFER TO THESE PLANS.
2. CONTRACTOR SHALL FURNISH ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY TO COMPLETE ALL WORK AS INDICATED IN THE CONTRACT DOCUMENTS.
3. CONSTRUCTION HOURS SHALL BE WEEKDAYS BETWEEN 7:00 A.M. AND 6:30 P.M. UNLESS PRIOR APPROVAL IS RECEIVED FROM THE OWNER.
4. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE OWNER PRIOR TO PROCEEDING WITH THE WORK.
5. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE BY THE OWNER OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
6. ALL WORK PERFORMED AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
7. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST SKILLS AND ATTENTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THIS CONTRACT.
8. THE CONTRACTOR SHALL MAKE ALL NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, ROADWAY, DRAINAGE WAYS, PRIVATE BRIDGE, CULVERTS, AND VEGETATION UNTIL SUCH ITEMS ARE TO BE DISTURBED OR REMOVED AS INDICATED ON THE CONTRACT DOCUMENTS.
9. THE CONTRACTOR SHALL KEEP THE JOB SITE CLEAN AND HAZARD FREE. CONTRACTOR SHALL DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH FOR THE DURATION OF THE WORK. UPON COMPLETION OF WORK, CONTRACTOR SHALL REMOVE ALL MATERIAL AND EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY.
10. NOTES AND DETAILS ON THE PLANS SHALL TAKE PRECEDENCE OVER GENERAL NOTES HEREIN.
11. DIMENSIONS CALLOUTS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON THE PLANS.
12. THE PLANS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF ALL CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURES, WORKS, AND THE PUBLIC DURING CONSTRUCTION.
13. MATERIAL SHALL NOT BE STORED OUTSIDE OF IDENTIFIED STAGING AREAS. THE CONTRACTOR SHALL USE ONLY DESIGNATED SPECIFIC SITES FOR STORAGE OF EQUIPMENT AND MATERIALS AS SHOWN ON THESE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SECURITY OF ALL EQUIPMENT AND MATERIALS.



NAME OR INITIALS AND DATE	
DESIGNED	JMS, ELD
CHECKED	TBA
DRAWN	JGJ
CHECKED	JMS, GM

GEOGRAPHIC INFORMATION	
LATITUDE	N047° 46' 7.64"
LONGITUDE	W120° 46' 7.76"
TN/SC/RG	T26N/S77/R17E
DATE	—

NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT

GENERAL NOTES



GENERAL LEGEND

- PROPERTY LINE
- CHANNEL CENTERLINE
- RIGHT OF WAY LINE
- EXISTING ROAD
- CL

CL

CLEARING LIMIT
- GL

GL

GRADING LIMIT
- 5

EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 5

PROPOSED MAJOR CONTOUR
- 5

PROPOSED MINOR CONTOUR
- 1

LOW FLOW CHANNEL
- OHWM

EXISTING ORDINARY HIGH WATER MARK
- OH

OH

OVERHEAD POWER
- 62/3

BPA TRANSMISSION LINE TOWER BASE AND CORRESPONDING NUMBER
- 261707110050

PARCEL NUMBER
- 6.6

RIVER MILE
- ESTIMATED WETLAND
- DELINEATED WETLAND
- EXISTING RIPRAP

RESTORATION LEGEND

- 01-T1

TYPE 1 ELJ AND STRUCTURE ID # 

1

13
- 02-T2

TYPE 2 ELJ AND STRUCTURE ID # 

1

16
- ROAD DECOMMISSIONING
- FLOODPLAIN SEEDING AREA
- UPLAND SEEDING AREA
- M

M

N

N

BARK OR WOODCHIP MULCH

TEMPORARY EROSION CONTROL LEGEND

- TEMPORARY STAGING AREA
- BULK BAG COFFERDAM
- TEMPORARY ACCESS ROAD
- TEMPORARY BRIDGE CROSSING

DETAIL AND SECTION REFERENCING

1

4

6

NOTE REFERENCING NUMBER

4

2

DETAIL REFERENCE NUMBER SHEET ON WHICH DETAIL APPEARS

(TITLE)

(SCALE)

DETAIL REFERENCE NUMBER SHEET FROM WHICH DETAIL WAS TAKEN

(TYP)

SPECIFIES THAT DETAIL IS UNIFORMLY TYPICAL THROUGHOUT PROJECT EXCEPT WHERE OTHERWISE NOTED

(VAR)

SPECIFIES THAT DETAIL WAS TAKEN FROM SEVERAL SHEETS

A

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SECTION A-A IS SHOWN ON SHEET 32

A

32

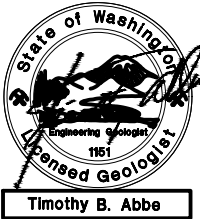
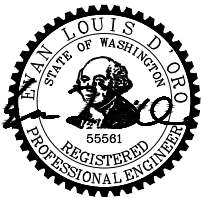
SECTION A-A IS SHOWN ON SHEET 32

SECTION A-A

32

SCALE: NTS

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CHECKED JWS, GM	DATE

NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT

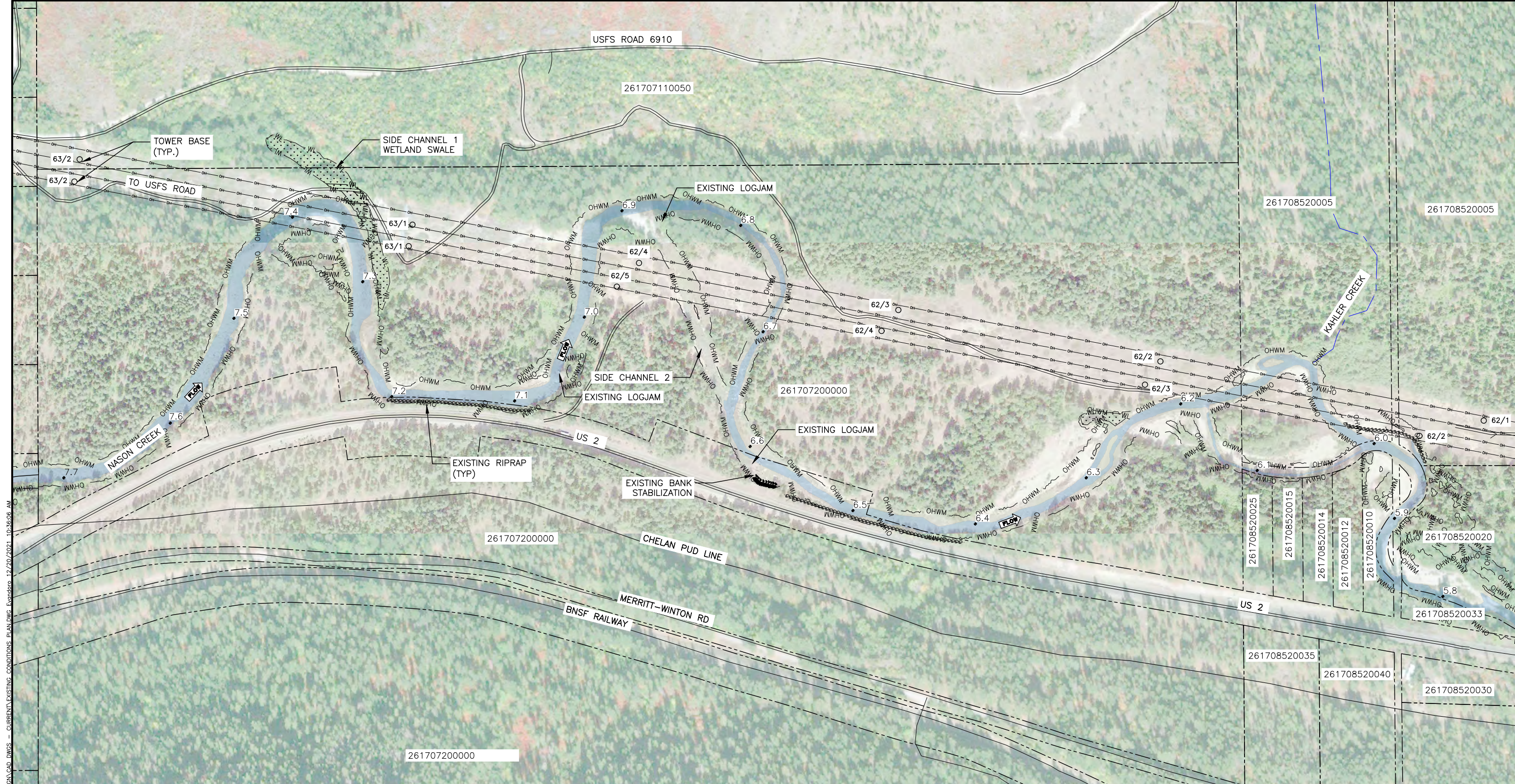
LEGEND

3

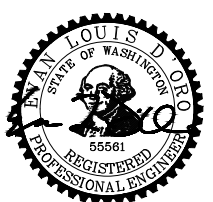
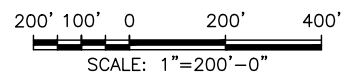
SHEET 3 OF 23

Dec 20, 2021 100% PLANS - FOR CONSTRUCTION





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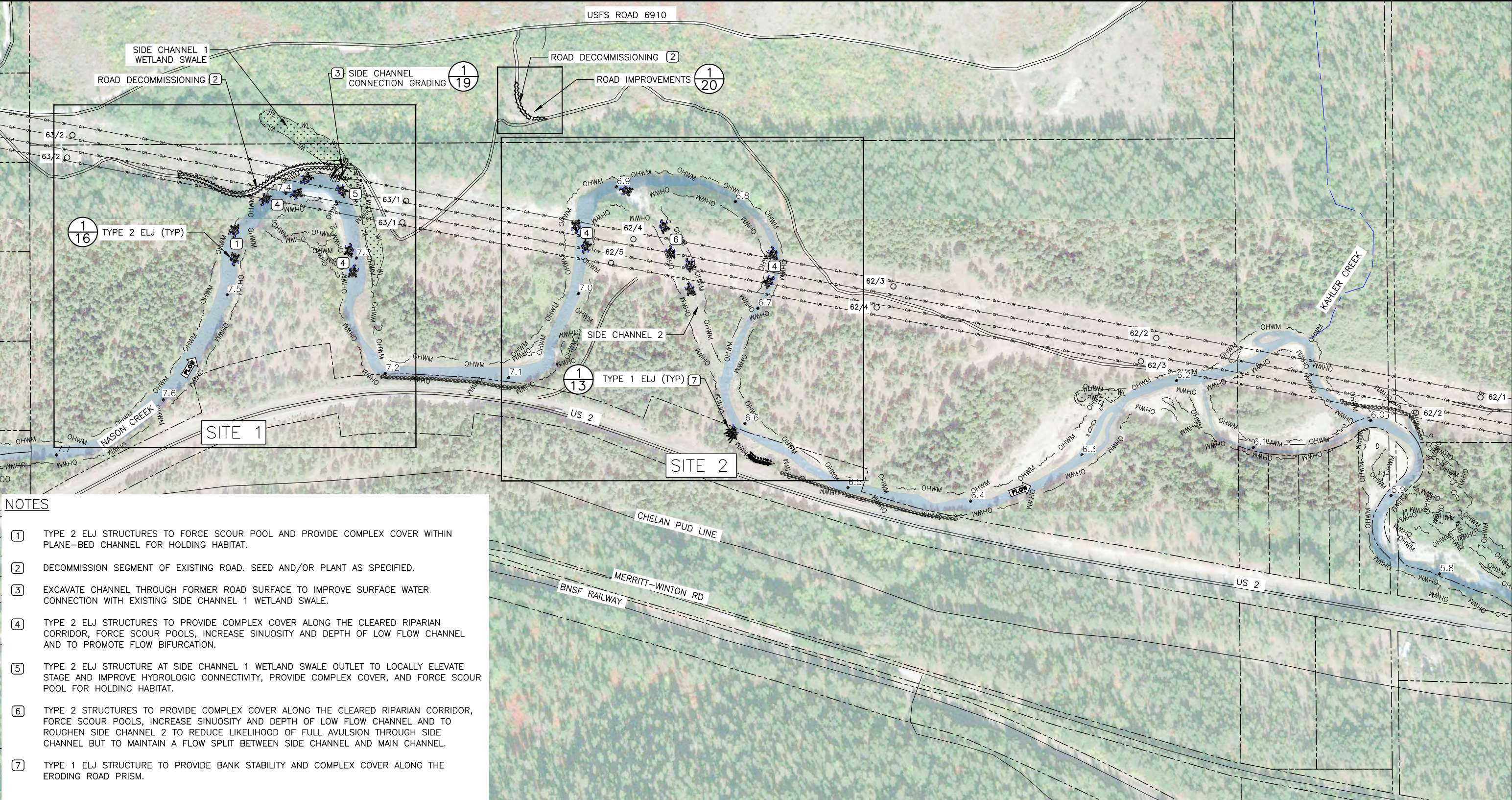
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DATE

## NASON CREEK KÄHLER REACH HABITAT IMPROVEMENT PROJECT

## EXISTING CONDITIONS PLAN

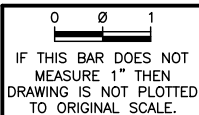
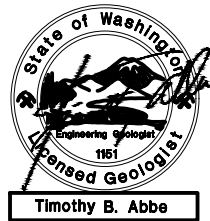
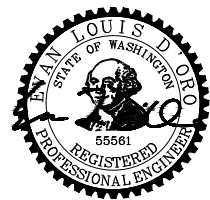
Dec 20, 2021 100% PLANS - FOR CONSTRUCTION





NOTES

- 1 TYPE 2 ELJ STRUCTURES TO FORCE SCOUR POOL AND PROVIDE COMPLEX COVER WITHIN PLANE-BED CHANNEL FOR HOLDING HABITAT.
- 2 DECOMMISSION SEGMENT OF EXISTING ROAD. SEED AND/OR PLANT AS SPECIFIED.
- 3 EXCAVATE CHANNEL THROUGH FORMER ROAD SURFACE TO IMPROVE SURFACE WATER CONNECTION WITH EXISTING SIDE CHANNEL 1 WETLAND SWALE.
- 4 TYPE 2 ELJ STRUCTURES TO PROVIDE COMPLEX COVER ALONG THE CLEARED RIPARIAN CORRIDOR, FORCE SCOUR POOLS, INCREASE SINUOSITY AND DEPTH OF LOW FLOW CHANNEL AND TO PROMOTE FLOW BIFURCATION.
- 5 TYPE 2 ELJ STRUCTURE AT SIDE CHANNEL 1 WETLAND SWALE OUTLET TO LOCALLY ELEVATE STAGE AND IMPROVE HYDROLOGIC CONNECTIVITY, PROVIDE COMPLEX COVER, AND FORCE SCOUR POOL FOR HOLDING HABITAT.
- 6 TYPE 2 STRUCTURES TO PROVIDE COMPLEX COVER ALONG THE CLEARED RIPARIAN CORRIDOR, FORCE SCOUR POOLS, INCREASE SINUOSITY AND DEPTH OF LOW FLOW CHANNEL AND TO ROUGHEN SIDE CHANNEL 2 TO REDUCE LIKELIHOOD OF FULL AVULSION THROUGH SIDE CHANNEL BUT TO MAINTAIN A FLOW SPLIT BETWEEN SIDE CHANNEL AND MAIN CHANNEL.
- 7 TYPE 1 ELJ STRUCTURE TO PROVIDE BANK STABILITY AND COMPLEX COVER ALONG THE ERODING ROAD PRISM.



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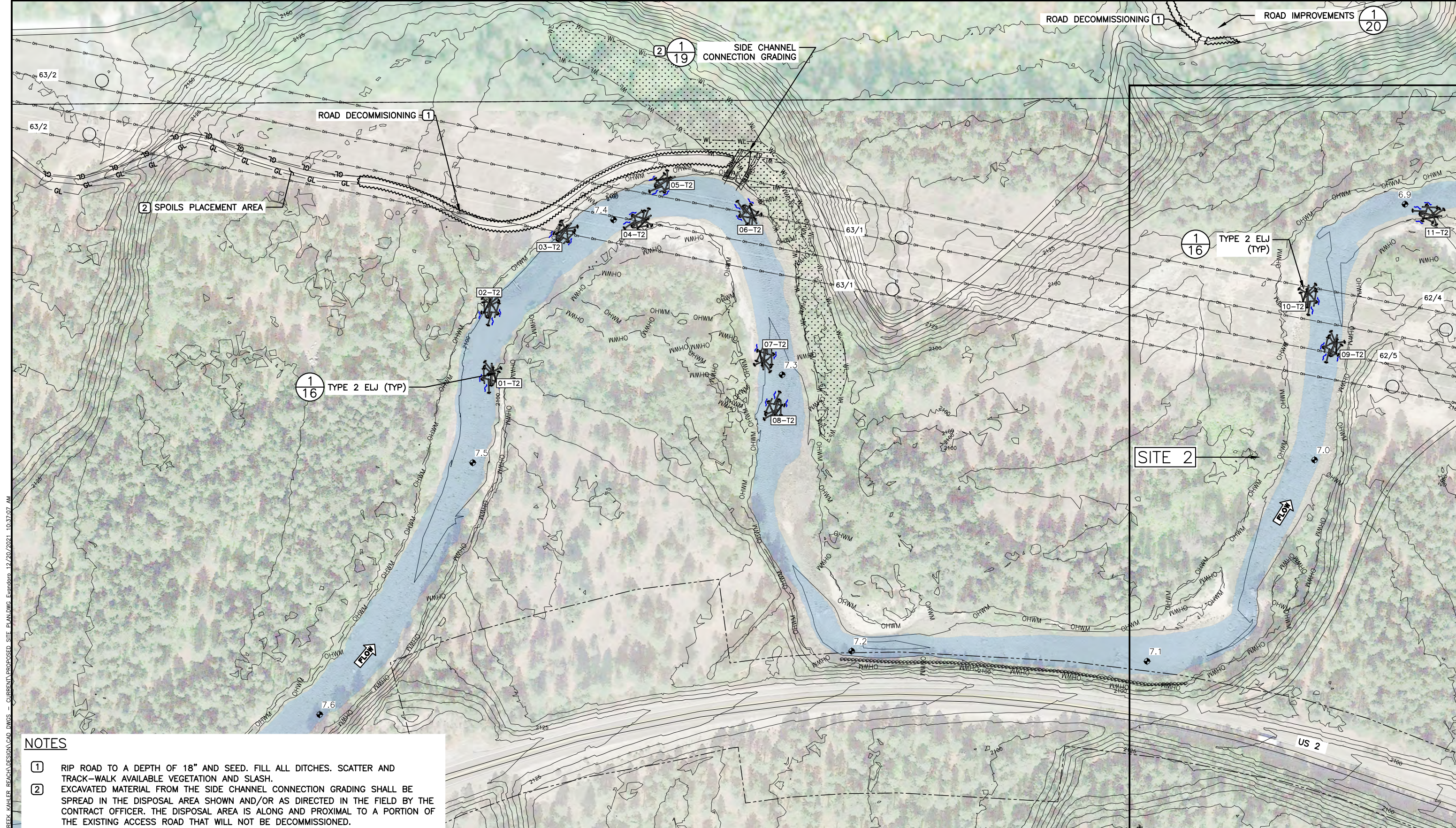
NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT

PROPOSED CONDITIONS OVERVIEW PLAN	5
	SHEET 5 OF 23



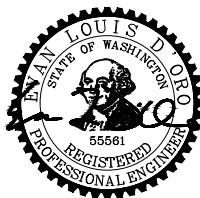






NOTES

- 1 RIP ROAD TO A DEPTH OF 18" AND SEED. FILL ALL DITCHES. SCATTER AND TRACK-WALK AVAILABLE VEGETATION AND SLASH.
- 2 EXCAVATED MATERIAL FROM THE SIDE CHANNEL CONNECTION GRADING SHALL BE SPREAD IN THE DISPOSAL AREA SHOWN AND/OR AS DIRECTED IN THE FIELD BY THE CONTRACT OFFICER. THE DISPOSAL AREA IS ALONG AND PROXIMAL TO A PORTION OF THE EXISTING ACCESS ROAD THAT WILL NOT BE DECOMMISSIONED.



0 0 1  
IF THIS BAR DOES NOT  
MEASURE 1" THEN  
DRAWING IS NOT PLOTTED  
TO ORIGINAL SCALE.



NAME OR INITIALS AND DATE  
DESIGNED JMS, ELD  
CHECKED TBA  
DRAWN JGJ  
CHECKED JWS, GM

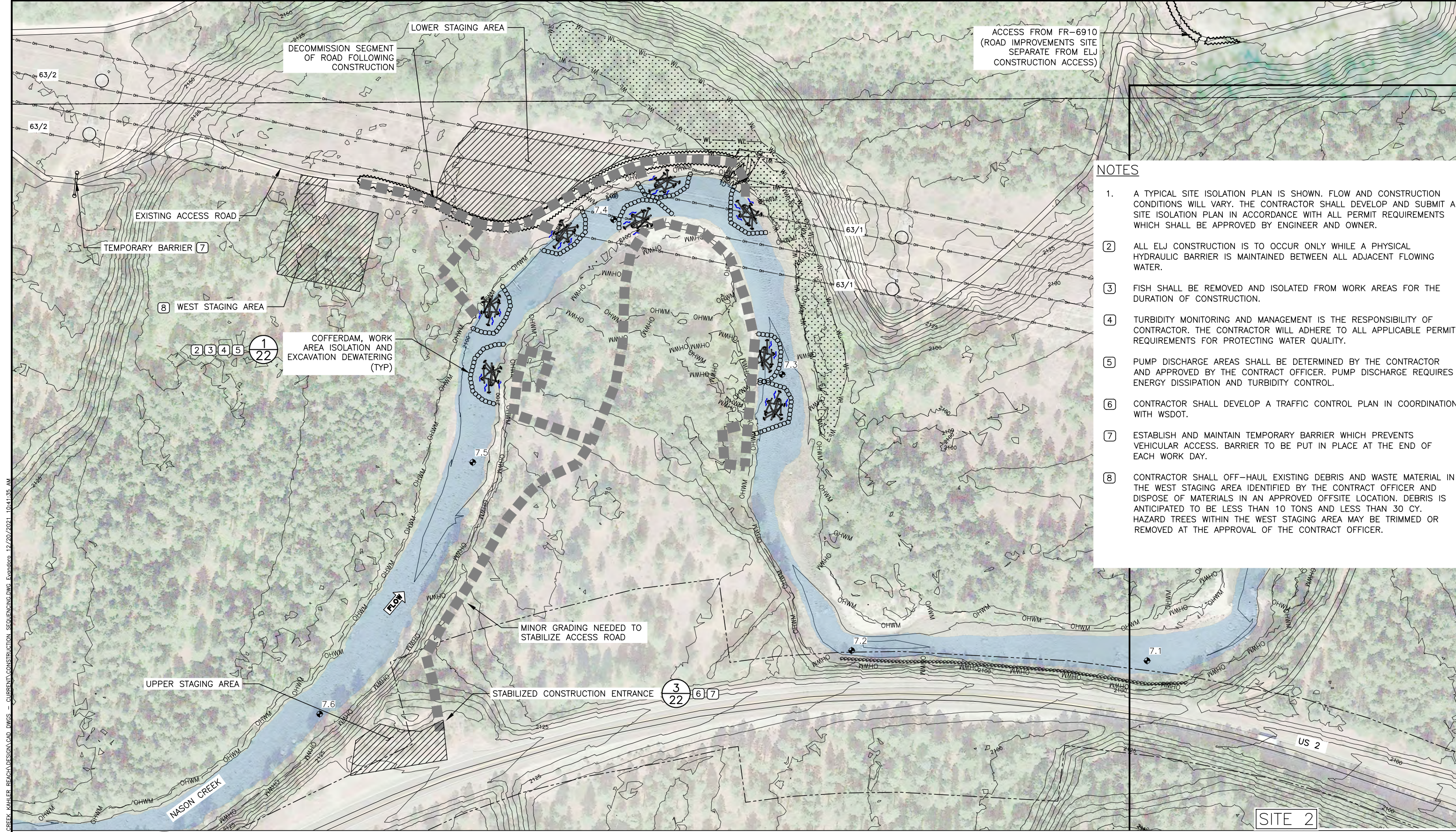
GEOGRAPHIC INFORMATION  
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LONGITUDE W120° 46' 7.76"  
TN/SC/RG T26N/S7/R17E  
DATE

NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT

PROPOSED CONDITIONS -  
SITE 1

7  
SHEET 7 OF 23





NOTES

1. A TYPICAL SITE ISOLATION PLAN IS SHOWN. FLOW AND CONSTRUCTION CONDITIONS WILL VARY. THE CONTRACTOR SHALL DEVELOP AND SUBMIT A SITE ISOLATION PLAN IN ACCORDANCE WITH ALL PERMIT REQUIREMENTS WHICH SHALL BE APPROVED BY ENGINEER AND OWNER.
2. ALL ELJ CONSTRUCTION IS TO OCCUR ONLY WHILE A PHYSICAL HYDRAULIC BARRIER IS MAINTAINED BETWEEN ALL ADJACENT FLOWING WATER.
3. FISH SHALL BE REMOVED AND ISOLATED FROM WORK AREAS FOR THE DURATION OF CONSTRUCTION.
4. TURBIDITY MONITORING AND MANAGEMENT IS THE RESPONSIBILITY OF CONTRACTOR. THE CONTRACTOR WILL ADHERE TO ALL APPLICABLE PERMIT REQUIREMENTS FOR PROTECTING WATER QUALITY.
5. PUMP DISCHARGE AREAS SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE CONTRACT OFFICER. PUMP DISCHARGE REQUIRES ENERGY DISSIPATION AND TURBIDITY CONTROL.
6. CONTRACTOR SHALL DEVELOP A TRAFFIC CONTROL PLAN IN COORDINATION WITH WSDOT.
7. ESTABLISH AND MAINTAIN TEMPORARY BARRIER WHICH PREVENTS VEHICULAR ACCESS. BARRIER TO BE PUT IN PLACE AT THE END OF EACH WORK DAY.
8. CONTRACTOR SHALL OFF-HAUL EXISTING DEBRIS AND WASTE MATERIAL IN THE WEST STAGING AREA IDENTIFIED BY THE CONTRACT OFFICER AND DISPOSE OF MATERIALS IN AN APPROVED OFFSITE LOCATION. DEBRIS IS ANTICIPATED TO BE LESS THAN 10 TONS AND LESS THAN 30 CY. HAZARD TREES WITHIN THE WEST STAGING AREA MAY BE TRIMMED OR REMOVED AT THE APPROVAL OF THE CONTRACT OFFICER.

P:\PROJECTS\CHILAN COUNTY\NASON CREEK KÄHLER REACH DESIGN\CAD DWGS - CURRENT\CONSTRUCTION SEQUENCING.DWG Evandora 12/20/2021 10:41:35 AM

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.

NAME OR INITIALS AND DATE

DESIGNED	JMS, ELD
CHECKED	TBA
DRAWN	JGJ
CHECKED	JWS, GM

GEOGRAPHIC INFORMATION

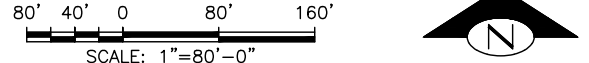
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LONGITUDE	W120° 46' 7.76"
TN/SC/RG	T26N/S7/R17E
DATE	

**NASON CREEK KÄHLER REACH HABITAT IMPROVEMENT PROJECT**

**ACCESS, STAGING, AND SITE ISOLATION – SITE 1**

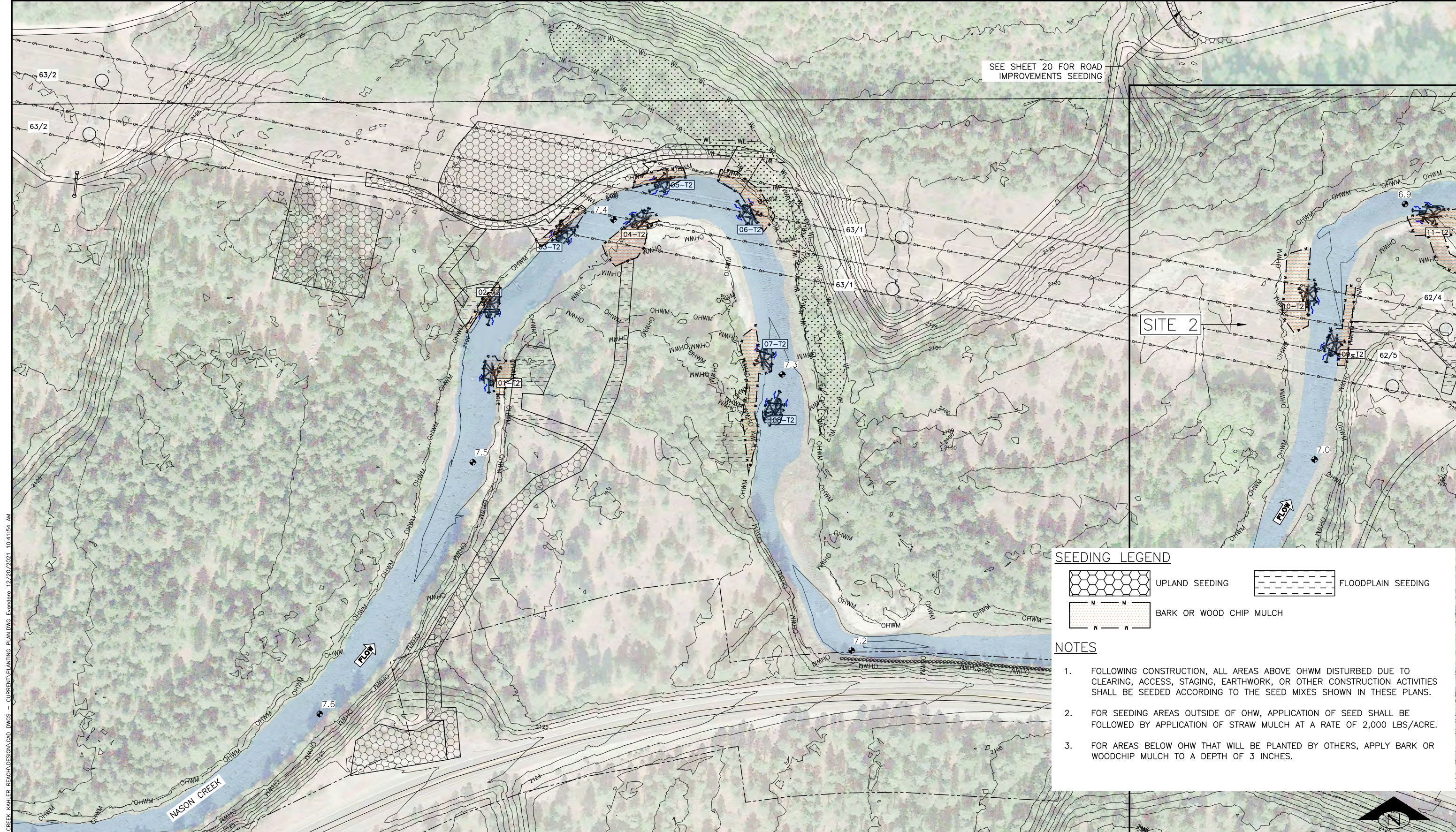
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SHEET **8** OF **23**



Dec 20, 2021 100% PLANS – FOR CONSTRUCTION

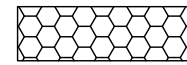




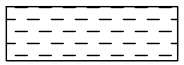
SEE SHEET 20 FOR ROAD  
IMPROVEMENTS SEEDING

SITE 2

SEEDING LEGEND



UPLAND SEEDING



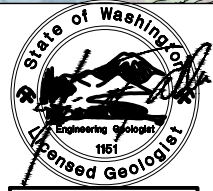
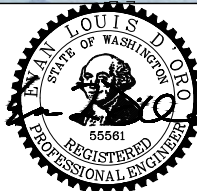
FLOODPLAIN SEEDING



BARK OR WOOD CHIP MULCH

NOTES

1. FOLLOWING CONSTRUCTION, ALL AREAS ABOVE OHWM DISTURBED DUE TO CLEARING, ACCESS, STAGING, EARTHWORK, OR OTHER CONSTRUCTION ACTIVITIES SHALL BE SEEDDED ACCORDING TO THE SEED MIXES SHOWN IN THESE PLANS.
2. FOR SEEDING AREAS OUTSIDE OF OHW, APPLICATION OF SEED SHALL BE FOLLOWED BY APPLICATION OF STRAW MULCH AT A RATE OF 2,000 LBS/ACRE.
3. FOR AREAS BELOW OHW THAT WILL BE PLANTED BY OTHERS, APPLY BARK OR WOODCHIP MULCH TO A DEPTH OF 3 INCHES.



0 0 1  
IF THIS BAR DOES NOT  
MEASURE 1" THEN  
DRAWING IS NOT PLOTTED  
TO ORIGINAL SCALE.



NAME OR INITIALS AND DATE	
DESIGNED	JMS, ELD
CHECKED	TBA
DRAWN	JGJ
CHECKED	JWS, GM

GEOGRAPHIC INFORMATION	
LATITUDE	N047° 46' 7.64"
LONGITUDE	W120° 46' 7.76"
TN/SC/RG	T26N/S7/R17E
DATE	

NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT

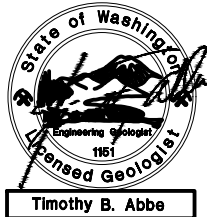
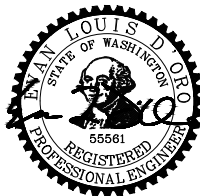
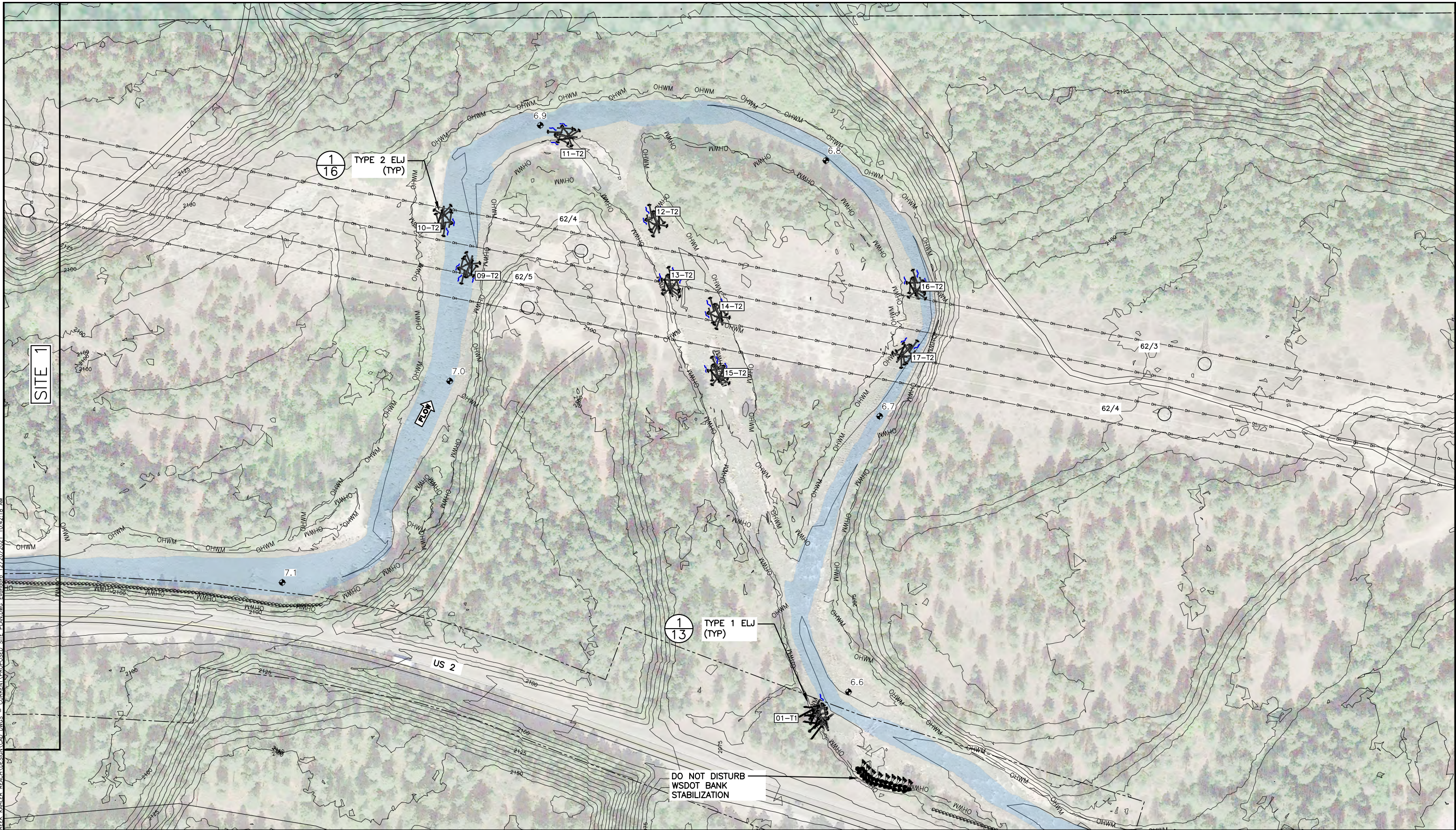
SEEDING PLAN – SITE 1

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Dec 20, 2021 100% PLANS – FOR CONSTRUCTION



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IF THIS BAR DOES NOT  
MEASURE 1" THEN  
DRAWING IS NOT PLOTTED  
TO ORIGINAL SCALE.



NAME OR INITIALS AND DATE
DESIGNED JMS, ELD
CHECKED TBA
DRAWN JGJ
CHECKED JWS, GM

GEOGRAPHIC INFORMATION
LATITUDE N047° 46' 7.64"
LONGITUDE W120° 46' 7.76"
TN/SC/RG T26N/S7/R17E
DATE

NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT

PROPOSED CONDITIONS –  
SITE 2

10
SHEET 10 OF 23

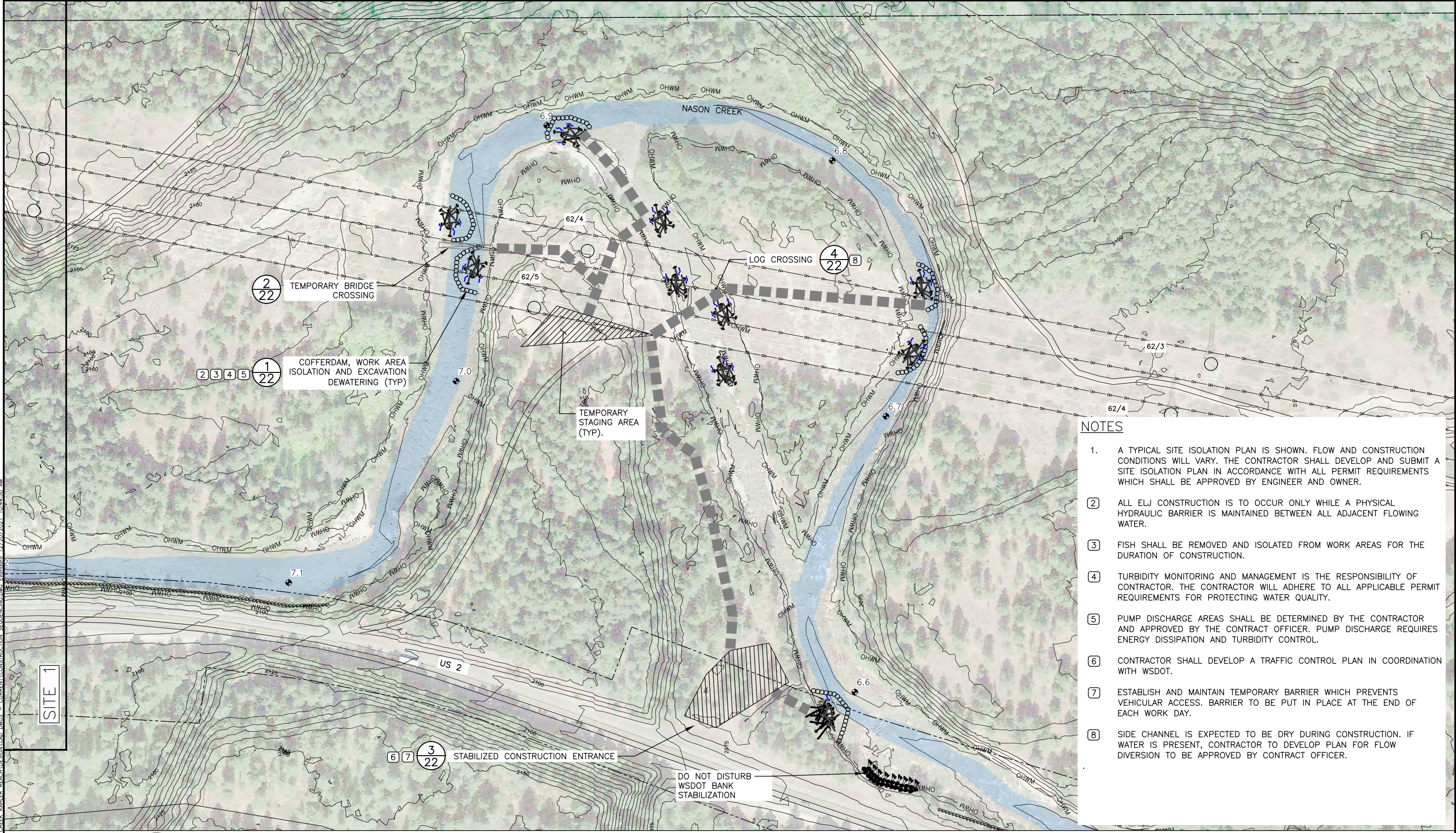
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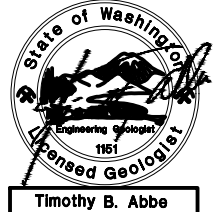
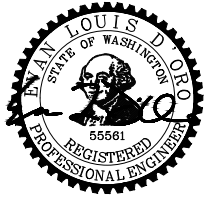
Dec 20, 2021 100% PLANS – FOR CONSTRUCTION



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- NOTES**
1. A TYPICAL SITE ISOLATION PLAN IS SHOWN. FLOW AND CONSTRUCTION CONDITIONS WILL VARY. THE CONTRACTOR SHALL DEVELOP AND SUBMIT A SITE ISOLATION PLAN IN ACCORDANCE WITH ALL PERMIT REQUIREMENTS WHICH SHALL BE APPROVED BY ENGINEER AND OWNER.
  2. ALL ELJ CONSTRUCTION IS TO OCCUR ONLY WHILE A PHYSICAL HYDRAULIC BARRIER IS MAINTAINED BETWEEN ALL ADJACENT FLOWING WATER.
  3. FISH SHALL BE REMOVED AND ISOLATED FROM WORK AREAS FOR THE DURATION OF CONSTRUCTION.
  4. TURBIDITY MONITORING AND MANAGEMENT IS THE RESPONSIBILITY OF CONTRACTOR. THE CONTRACTOR WILL ADHERE TO ALL APPLICABLE PERMIT REQUIREMENTS FOR PROTECTING WATER QUALITY.
  5. PUMP DISCHARGE AREAS SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE CONTRACT OFFICER. PUMP DISCHARGE REQUIRES ENERGY DISSIPATION AND TURBIDITY CONTROL.
  6. CONTRACTOR SHALL DEVELOP A TRAFFIC CONTROL PLAN IN COORDINATION WITH WSDOT.
  7. ESTABLISH AND MAINTAIN TEMPORARY BARRIER WHICH PREVENTS VEHICULAR ACCESS. BARRIER TO BE PUT IN PLACE AT THE END OF EACH WORK DAY.
  8. SIDE CHANNEL IS EXPECTED TO BE DRY DURING CONSTRUCTION. IF WATER IS PRESENT, CONTRACTOR TO DEVELOP PLAN FOR FLOW DIVERSION TO BE APPROVED BY CONTRACT OFFICER.



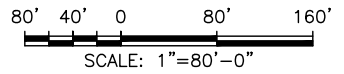
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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.



NAME OR INITIALS AND DATE		GEOGRAPHIC INFORMATION	
DESIGNED	JMS, ELD	LATITUDE	N047° 46' 7.64"
CHECKED	TBA	LONGITUDE	W120° 46' 7.76"
DRAWN	JGJ	TN/SC/RG	T26N/S7/R17E
CHECKED	JMS, GM	DATE	

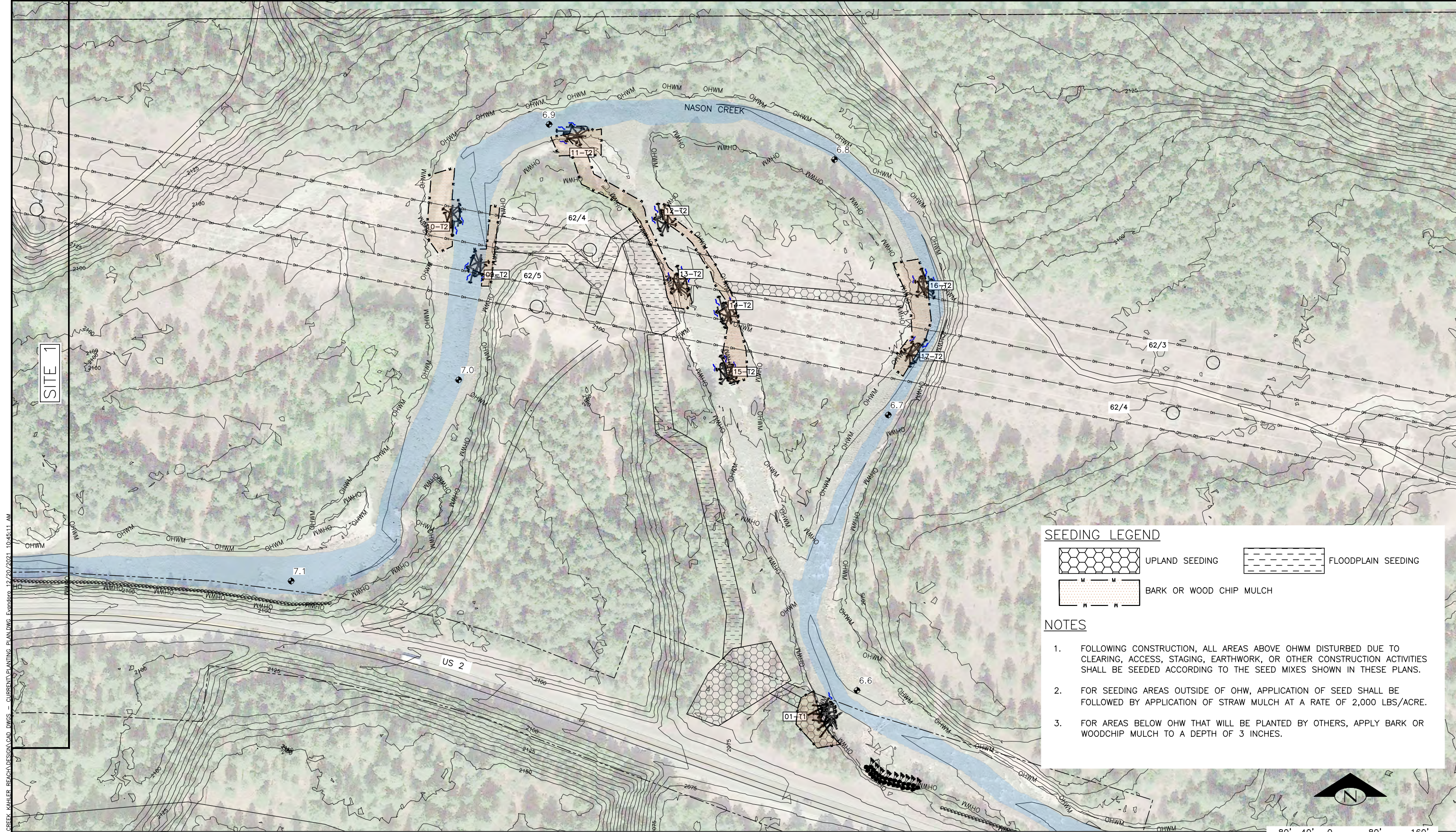
**NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT**

**ACCESS, STAGING, AND SITE  
ISOLATION – SITE 2**



Dec 20, 2021 100% PLANS – FOR CONSTRUCTION





SEEDING LEGEND

UPLAND SEEDING

FLOODPLAIN SEEDING

BARK OR WOOD CHIP MULCH

NOTES

1. FOLLOWING CONSTRUCTION, ALL AREAS ABOVE OHWM DISTURBED DUE TO CLEARING, ACCESS, STAGING, EARTHWORK, OR OTHER CONSTRUCTION ACTIVITIES SHALL BE SEEDDED ACCORDING TO THE SEED MIXES SHOWN IN THESE PLANS.

2. FOR SEEDING AREAS OUTSIDE OF OHW, APPLICATION OF SEED SHALL BE FOLLOWED BY APPLICATION OF STRAW MULCH AT A RATE OF 2,000 LBS/ACRE.

3. FOR AREAS BELOW OHW THAT WILL BE PLANTED BY OTHERS, APPLY BARK OR WOODCHIP MULCH TO A DEPTH OF 3 INCHES.

SEAL OF ANTONIO DO ROSA

REGISTERED PROFESSIONAL ENGINEER

55581

SEAL OF STATE OF WASHINGTON

REGISTERED PROFESSIONAL ENGINEER

1151

SEAL OF TIMOTHY B. ABBE

REGISTERED PROFESSIONAL ENGINEER

1151

0 0 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.

Natural Systems Design

NAME OR INITIALS AND DATE

DESIGNED JMS, ELD

CHECKED TBA

DRAWN JGJ

CHECKED JWS, GM

GEOGRAPHIC INFORMATION

LATITUDE N047° 46' 7.64"

LONGITUDE W120° 46' 7.76"

TN/SC/RG T26N/S7/R17E

DATE

NASON CREEK KAHLER REACH HABITAT IMPROVEMENT PROJECT

SEEDING PLAN – SITE 2

12

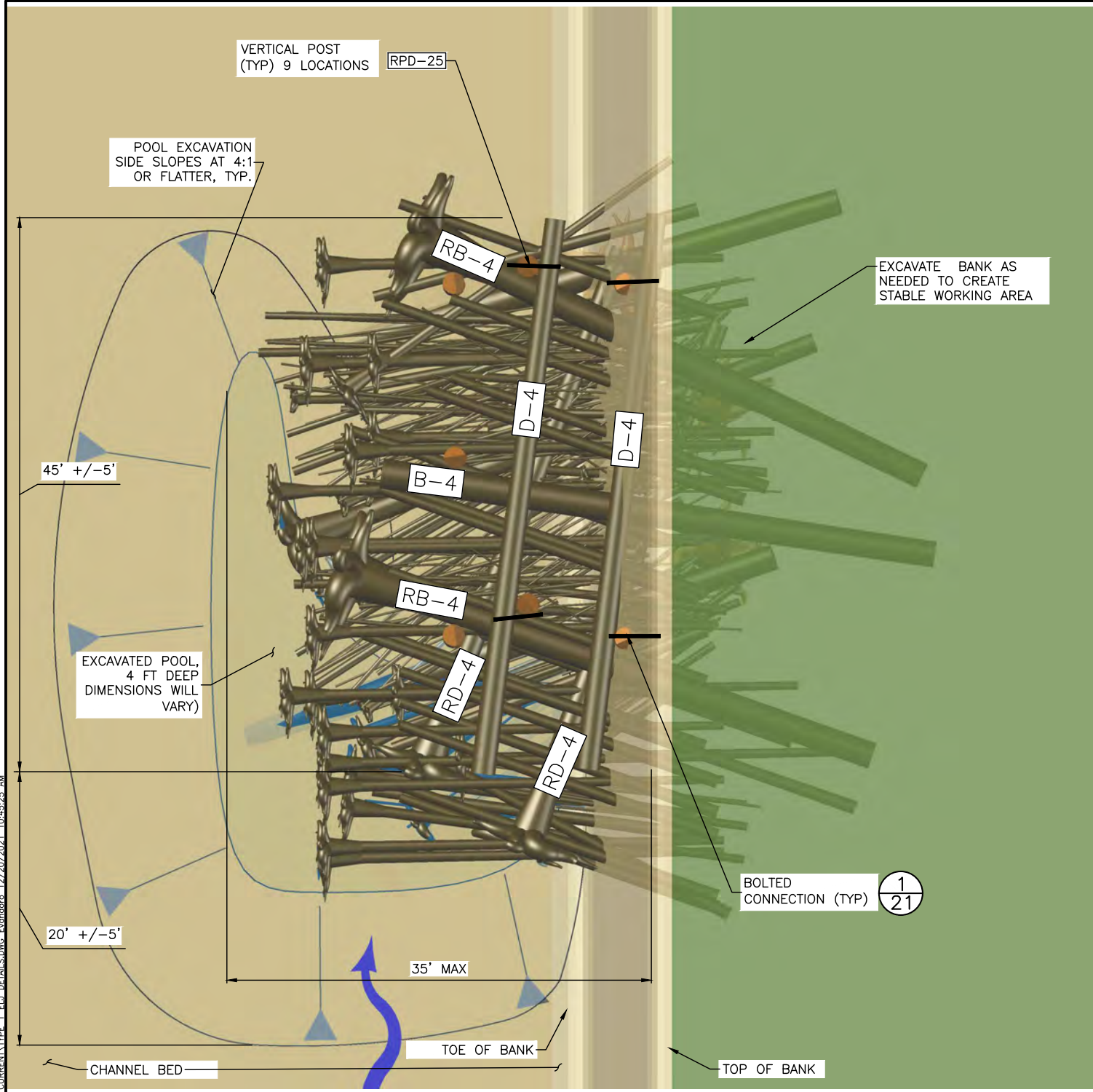
SHEET 12 OF 23

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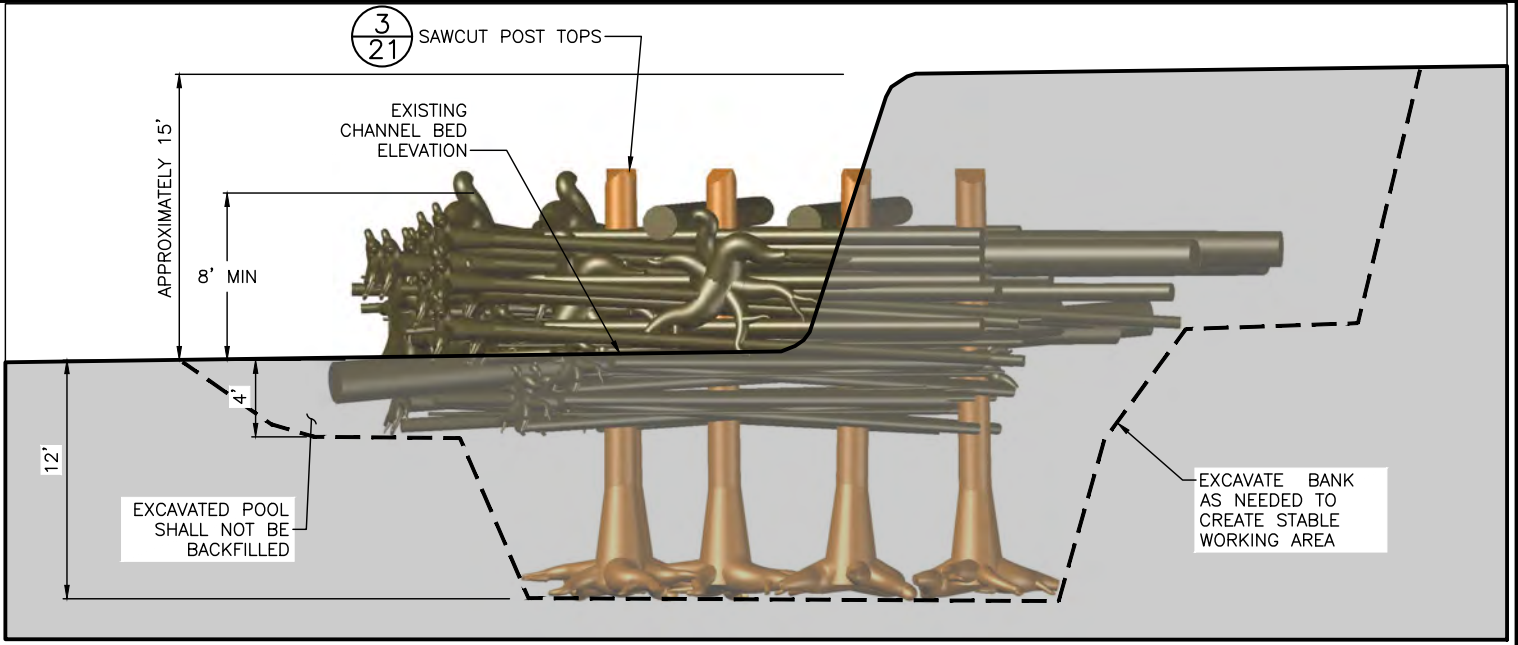
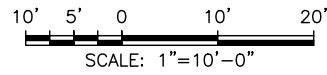
Dec 20, 2021 100% PLANS – FOR CONSTRUCTION



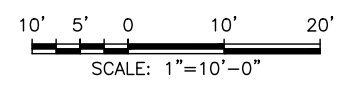
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**TYPE 1 ELJ PLAN**  
SCALE: 1"=10'

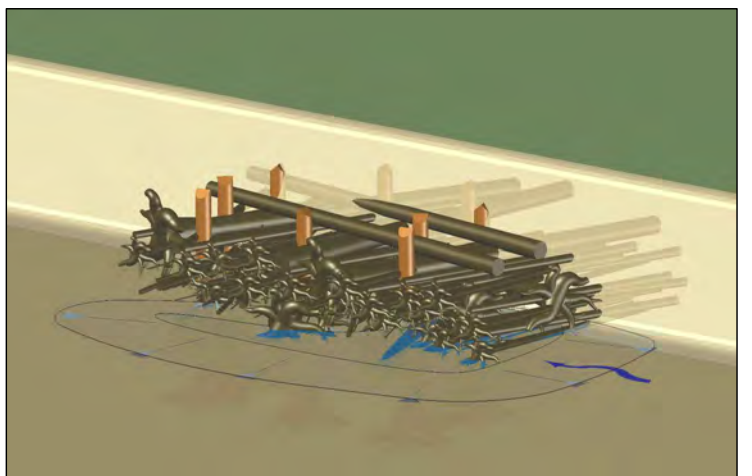


**TYPE 1 ELJ SECTION (LOOKING DOWNSTREAM)**  
SCALE: 1"=10'



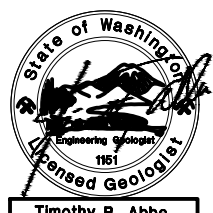
**NOTES**

1. ALL STRUCTURE LOCATIONS AND POST BOTTOM ELEVATIONS SHALL BE STAKED BY THE ENGINEER PRIOR TO EXCAVATION, ASSEMBLY AND INSTALLATION OF EACH STRUCTURE.
2. CONTRACTOR SHALL EXCAVATE TO THE STRUCTURE BOTTOM ELEVATION AND MAINTAIN A DEWATERED WORK AREA SO LAYERING AND CONNECTIONS CAN BE MADE PER LAYERING SHEETS.
3. EXCAVATION SPOILS SHALL BE STAGED ACCORDING TO THE PERMIT REQUIREMENTS.
4. THE WOOD LAYER PLACEMENT IN EACH LOGJAM LAYER SHALL BE FIELD VERIFIED BY ENGINEER OR OWNER REPRESENTATIVE PRIOR TO BACKFILLING.
5. THE FINISHED ELEVATION AND WIDTH OF ANY ELJ SHALL NOT EXCEED THE DIMENSIONS SHOWN IN THESE PLANS.
6. BACKFILL EXTENTS MAY VARY AND ARE TO BE CONSTRUCTED WITH NATIVE ALLUVIUM FROM EXCAVATION SPOILS. BACKFILL ELEVATION IS NOT TO EXCEED THE SPECIFIED GRADE.
7. THE CONTRACTOR SHALL CLEARLY MARK EACH LOG WITH A UNIQUE COLOR IDENTIFYING THE LOG TYPE FOR VERIFICATION BY THE CONTRACT OFFICER BEFORE PLACEMENT INTO STRUCTURES.
8. FOR ROOTWAD POST SIZE DIMENSION SPECIFICATIONS, SEE (4/21)
9. BOULDERS >24" EXCAVATED OUT DURING POST INSTALLATION ARE TO BE STOCKPILED SEPARATELY AND INCORPORATED INTO BACKFILL, OR PLACED IN THE STREAM CHANNEL WITHIN 10 FT OF THE ELJ, AS DIRECTED BY THE ENGINEER.



**TYPE 1 ELJ PERSPECTIVE VIEW**  
NOT TO SCALE

TYPE 1 ELJ MATERIALS SCHEDULE					
LOG ID	DIA (INCHES)	LENGTH (FEET)	ROOTWAD (Y/N)	QUANTITY PER STRUCTURE	NOTES
RPD-25	20 MIN	25	Y	9	MUST BE DOUGLAS FIR
RD-4	20	40	Y	3	
RB-4	24	40	Y	2	
B-4	24	40	N	1	
D-4	20	40	N	4	
RACKING	6-12	30-40	Y/N	100	
SLASH	<3	<4	N	100 CY	



IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.



NAME OR INITIALS AND DATE		GEOGRAPHIC INFORMATION	
DESIGNED	JMS, ELD	LATITUDE	N047° 46' 7.64"
CHECKED	TBA	LONGITUDE	W120° 46' 7.76"
DRAWN	JGJ	TN/SC/RG	T26N/S7/R17E
CHECKED	JWS, GM	DATE	

**NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT**

**TYPE 1 ELJ DETAILS**

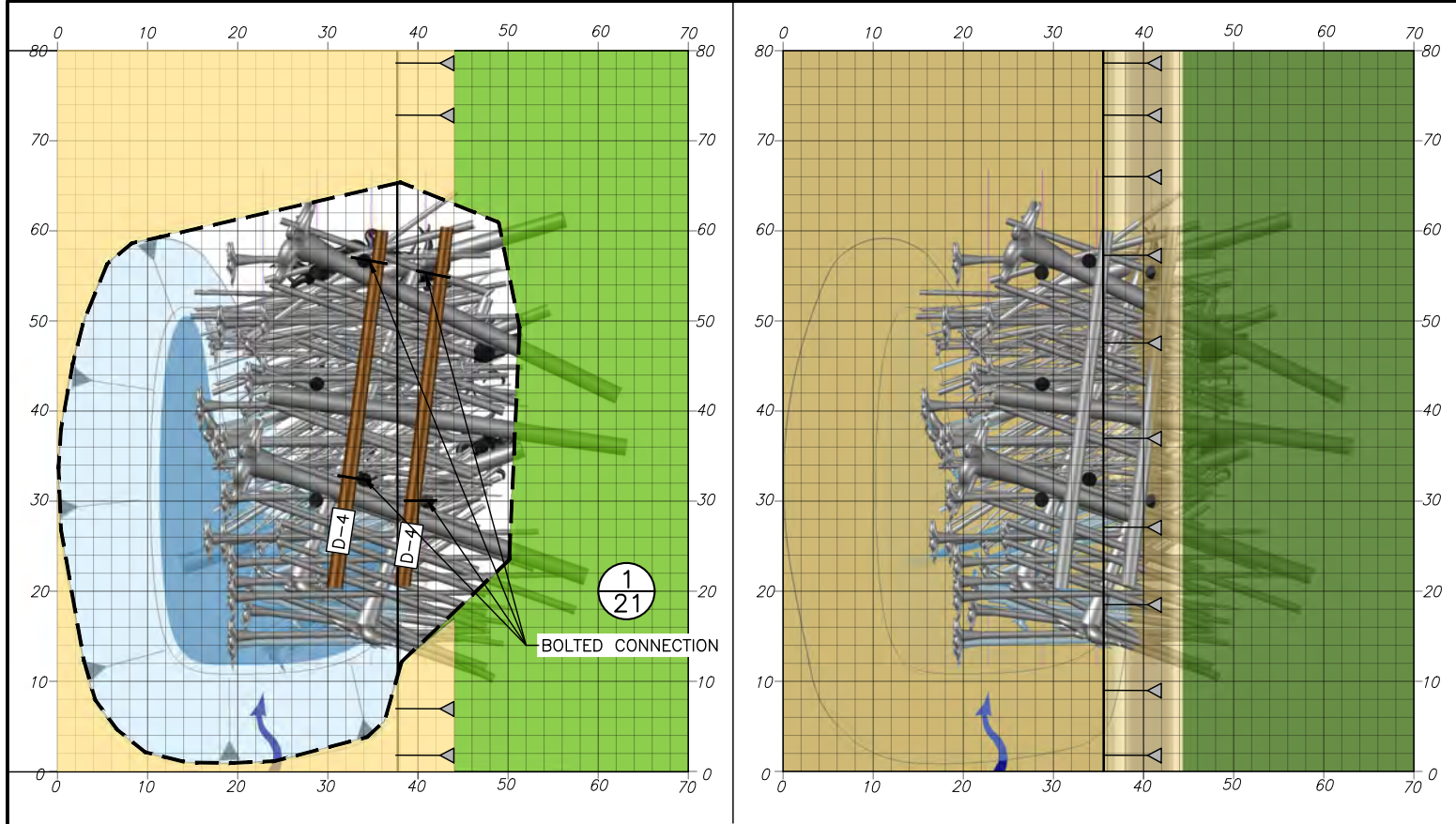
Dec 20, 2021 100% PLANS - FOR CONSTRUCTION



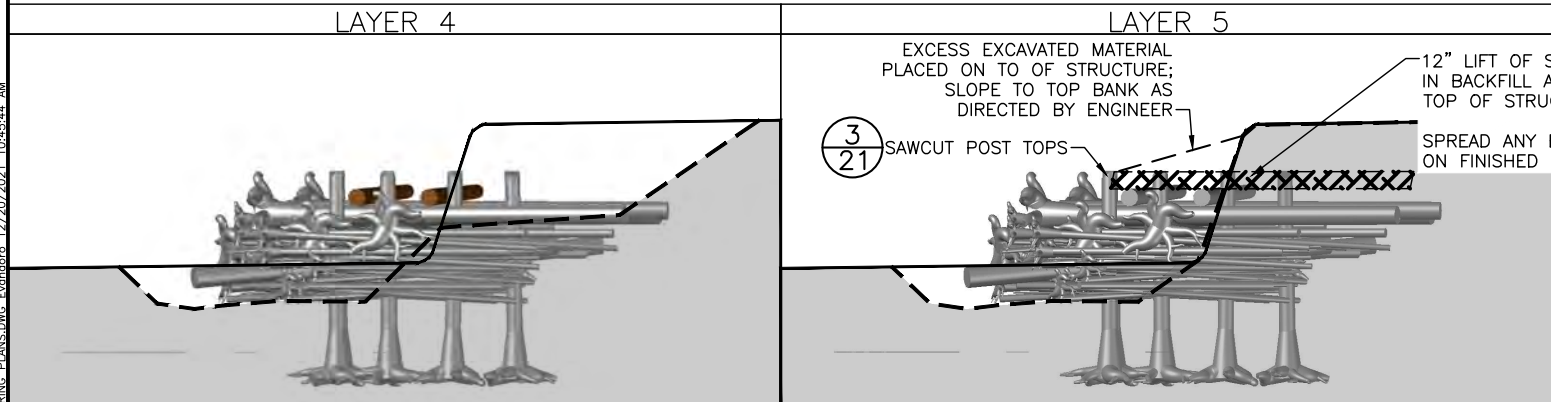




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PLAN VIEWS



SECTION VIEWS

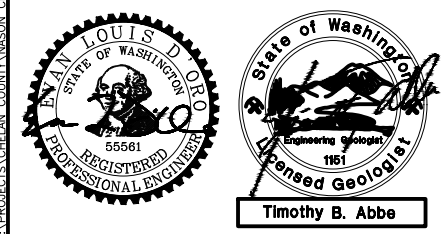
1. PLACE 2 LOGS

2. BOLT LOGS TO POSTS AT 4 LOCATIONS

**1**  
**21**
1. BACKFILL BANK TO PRE-PROJECT GRADE. INCORPORATE SLASH (~30 CY) INTO BACKFILL.

2. SAWCUT POST TOPS.

**3**  
**21**



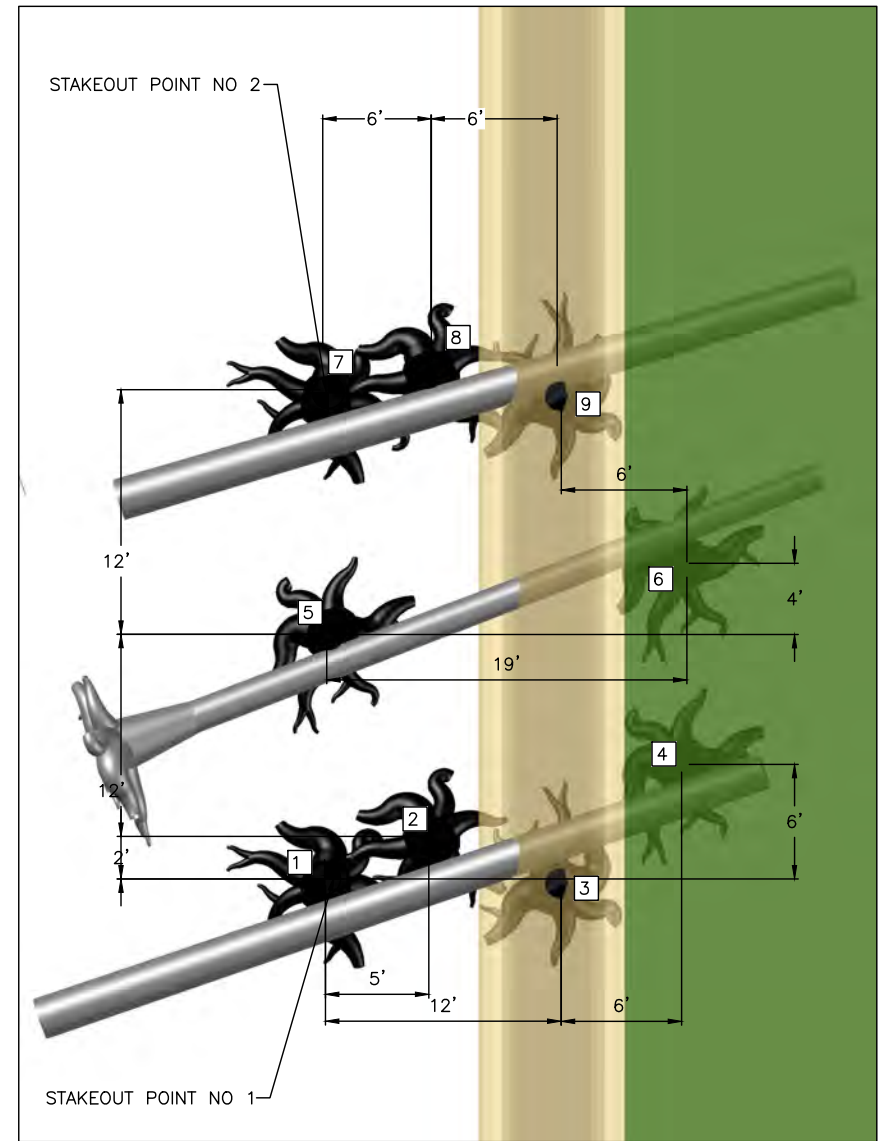
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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.



NAME OR INITIALS AND DATE	GEOGRAPHIC INFORMATION
DESIGNED JMS, ELD	LATITUDE N047° 46' 7.64"
CHECKED TBA	LONGITUDE W120° 46' 7.76"
DRAWN JGJ	TN/SC/RG T26N/S7/R17E
CHECKED JWS, GM	DATE

NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT

TYPE 1 ELJ LAYERING PLANS  
- 2

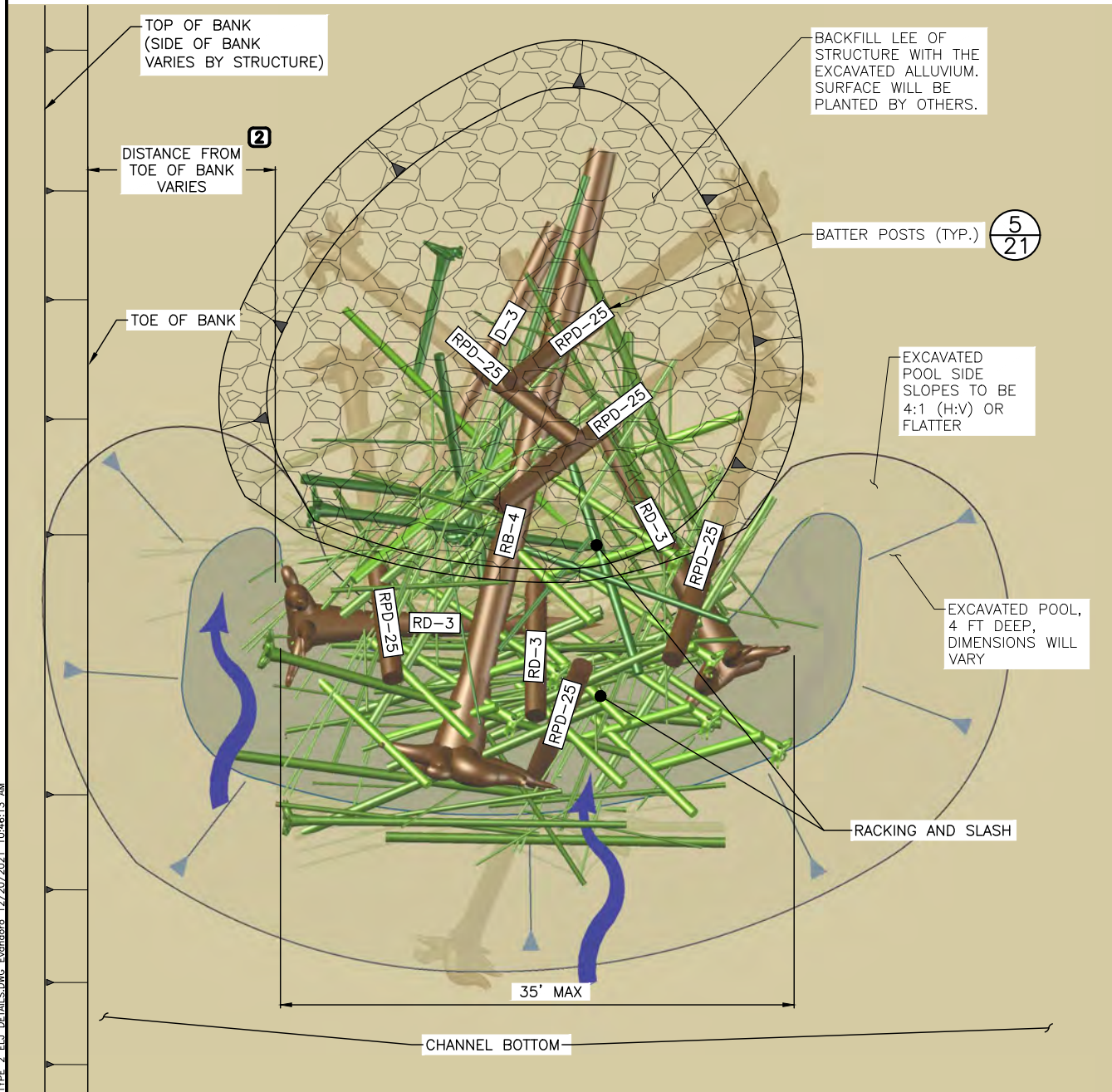


TYPE 1 POST LAYOUT PLAN  
SCALE: 1" = 5'

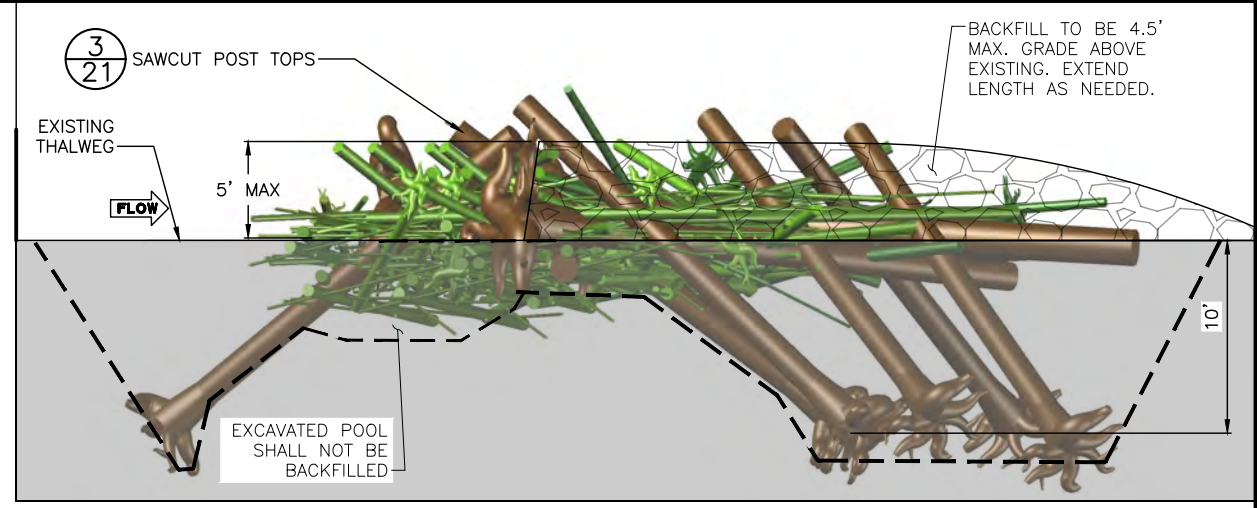
- NOTES
1. THE ENGINEER WILL STAKE THE STAKEOUT POINT LOCATIONS SHOWN. THE CONTRACTOR SHALL MAINTAIN STAKES OR REFERENCE LINE TO STAKES FOR ACCURATE POST PLACEMENT DURING CONSTRUCTION.



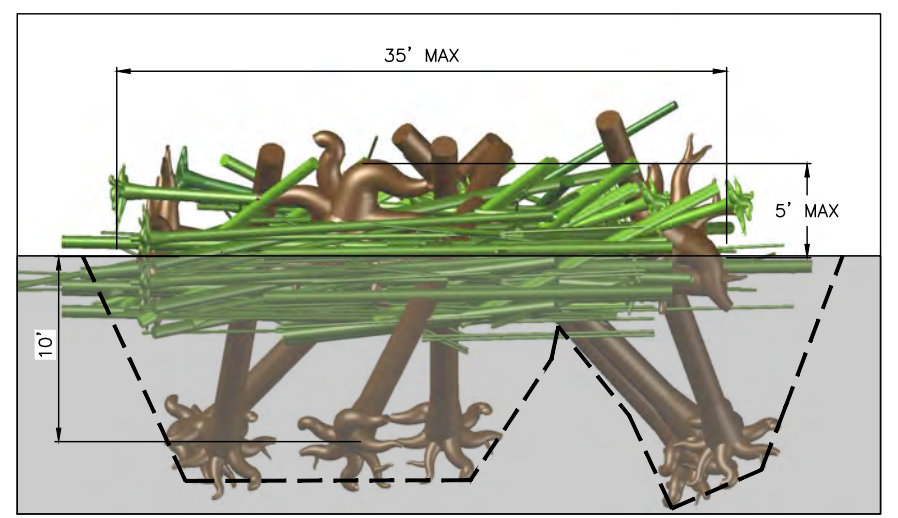
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**TYPE 2 ELJ PLAN**  
SCALE: 1"=10'



**TYPE 2 ELJ SIDE PROFILE**  
SCALE: 1"=10'



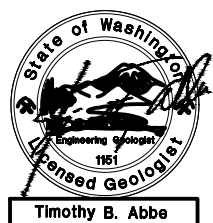
**TYPE 2 ELJ FRONT PROFILE**  
SCALE: 1"=10'

**NOTES**

1. ALL STRUCTURE LOCATIONS AND POST BOTTOM ELEVATIONS SHALL BE STAKED BY THE ENGINEER PRIOR TO EXCAVATION, ASSEMBLY AND INSTALLATION OF EACH STRUCTURE
2. WHEN STRUCTURES ABUT BANKS, EXCAVATE A PORTION OF THE BANK AS NEEDED TO INSTALL THE STRUCTURE. REGRADE THE BANK FOLLOWING COMPLETION AND PLACE EXCESS MATERIAL IN LEE OF ELJ AS DRAWN. THE SIDE OF THE STRUCTURE WHICH THE BANK IS ALIGNED WITH WILL VARY.
3. CONTRACTOR SHALL EXCAVATE TO THE STRUCTURE BOTTOM ELEVATION AND MAINTAIN A DEWATERED WORK AREA SO LAYERING AND CONNECTIONS CAN BE MADE PER LAYERING SHEETS.
4. EXCAVATION SPOILS SHALL BE STAGED ACCORDING TO THE PERMIT REQUIREMENTS.
5. THE WOOD LAYER PLACEMENT IN EACH LOGJAM LAYER SHALL BE FIELD VERIFIED BY ENGINEER OR OWNER REPRESENTATIVE PRIOR TO BACKFILLING.
6. THE FINISHED ELEVATION AND WIDTH OF ANY ELJ SHALL NOT EXCEED THE DIMENSIONS SHOWN IN THESE PLANS.
7. BACKFILL EXTENTS MAY VARY AND ARE TO BE CONSTRUCTED WITH NATIVE ALLUVIUM FROM EXCAVATION SPOILS. BACKFILL ELEVATION IS NOT TO EXCEED THE SPECIFIED GRADE.
8. THE CONTRACTOR SHALL CLEARLY MARK EACH LOG WITH A UNIQUE COLOR IDENTIFYING THE LOG TYPE FOR VERIFICATION BY THE CONTRACT OFFICER BEFORE PLACEMENT INTO STRUCTURES.
9. FOR ROOTWAD POST SIZE DIMENSION SPECIFICATIONS, SEE
10. BOULDERS >24" EXCAVATED OUT DURING POST INSTALLATION ARE TO BE STOCKPILED SEPARATELY AND INCORPORATED INTO BACKFILL, OR PLACED IN THE STREAM CHANNEL WITHIN 10 FT OF THE ELJ, AS DIRECTED BY THE ENGINEER.

TYPE 2 ELJ MATERIALS SCHEDULE					
LOG ID	DIA (INCHES)	LENGTH (FEET)	ROOTWAD (Y/N)	QUANTITY PER STRUCTURE	NOTES
RPD-25	20 MIN	25	Y	7	MUST BE DOUGLAS FIR
RB-4	24	40	Y	1	
RD-3	20	30	Y	2	
D-3	20	30	N	1	
RACKING	6-12	20-30	Y/N	50	
SLASH	<3	<4	N	30 CY	

**TYPE 2 ELJ DETAILS**  
SCALE: AS NOTED



0 0 1  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.



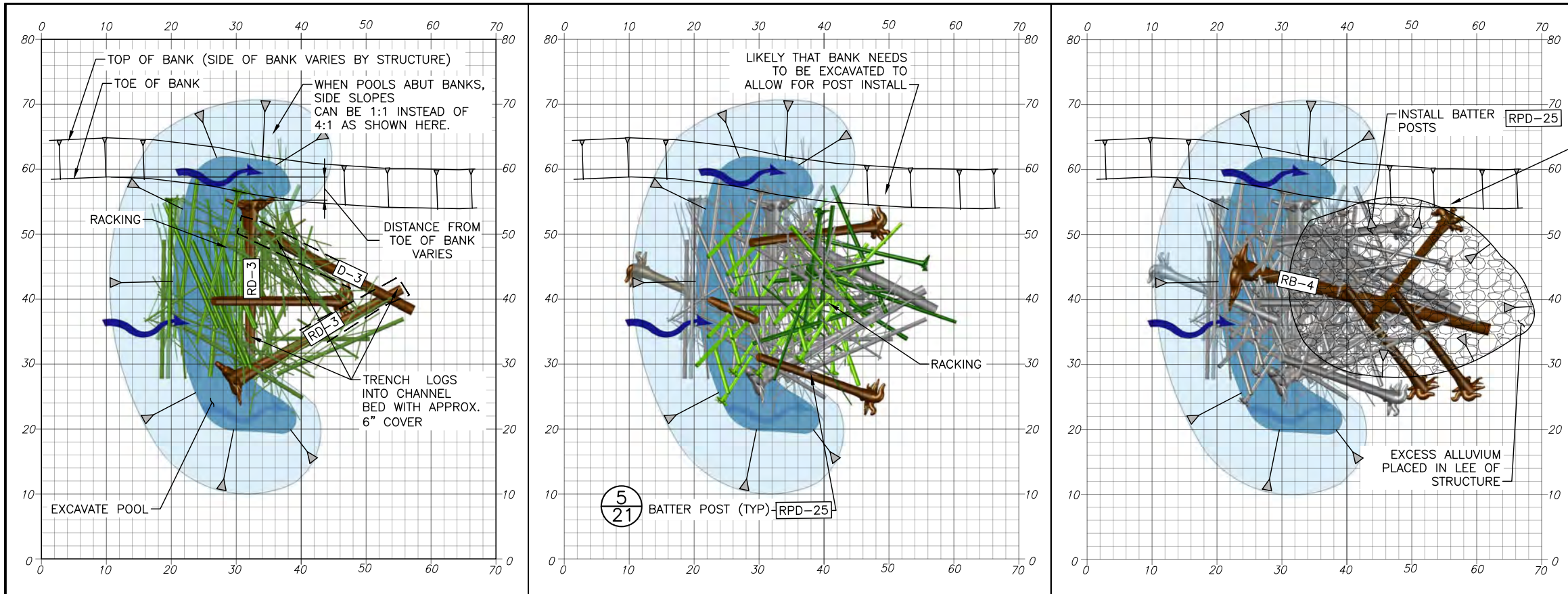
NAME OR INITIALS AND DATE	GEOGRAPHIC INFORMATION
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CHECKED TBA	LONGITUDE W120° 46' 7.76"
DRAWN JGJ	TN/SC/RG T26N/S7/R17E
CHECKED JWS, GM	DATE

**NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT**

**TYPE 2 ELJ DETAILS**

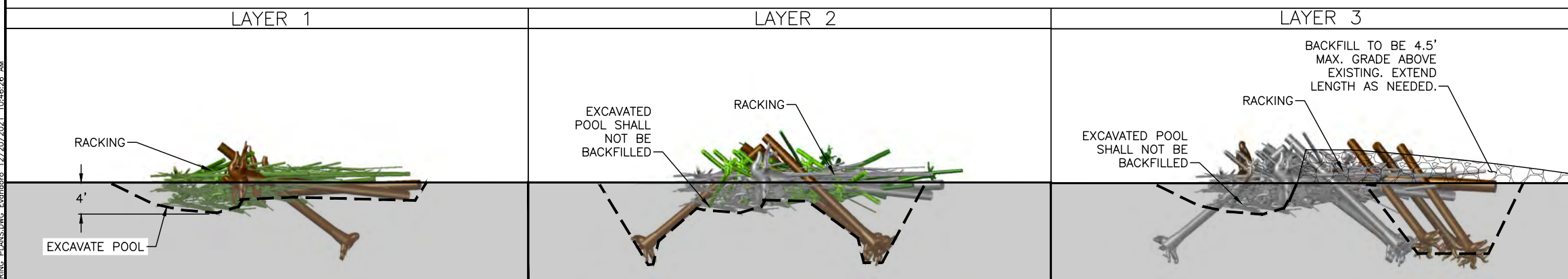


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LIKELY THAT BANK NEEDS TO BE EXCAVATED TO ALLOW FOR POST INSTALL

PLAN VIEWS



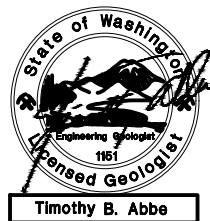
SECTION VIEWS



1. EXCAVATE POOL (~120 CY).
2. PLACE RACKING IN SCOUR HOLE.
3. PLACE 2 ROOTWADS AND 1 LOG AS SHOWN.
4. INSTALL ROOTWAD POST 4 IF NEEDED.
5. EXCAVATE FOR LAYER 2 POSTS.
6. PLACE APPROXIMATELY  $\frac{1}{2}$  THE RACKING THROUGHOUT CORE AND FACE OF STRUCTURE.

1. INSTALL BATTER POSTS 1, 2, 3, AND 4. BACKFILL POSTS. ORDER OF POST INSTALLATION MAY VARY WITH APPROVAL BY ENGINEER.
2. PLACE REMAINING RACKING IN CORE AND FACE OF STRUCTURE. ADD SLASH (~15 CY) TO CORE OF STRUCTURE.

1. PLACE 1 ROOTWAD.
2. INSTALL BATTER POSTS 5, 6, AND 7. BACKFILL POSTS.
3. PLACE EXCESS EXCAVATED ALLUVIUM IN LEE OF STRUCTURE TO CREATE PLANTING SURFACE (PLANTING DONE BY OTHERS). MAX HEIGHT IS 4.5' ABOVE EXISTING GRADE. MIX ~15 CY OF SLASH INTO BACKFILL.



0 0 1  
IF THIS BAR DOES NOT  
MEASURE 1" THEN  
DRAWING IS NOT PLOTTED  
TO ORIGINAL SCALE.



NAME OR INITIALS AND DATE  
DESIGNED JMS, ELD  
CHECKED TBA  
DRAWN JGJ  
CHECKED JWS, GM

GEOGRAPHIC INFORMATION  
LATITUDE N047° 46' 7.64"  
LONGITUDE W120° 46' 7.76"  
TN/SC/RG T26N/S7/R17E  
DATE

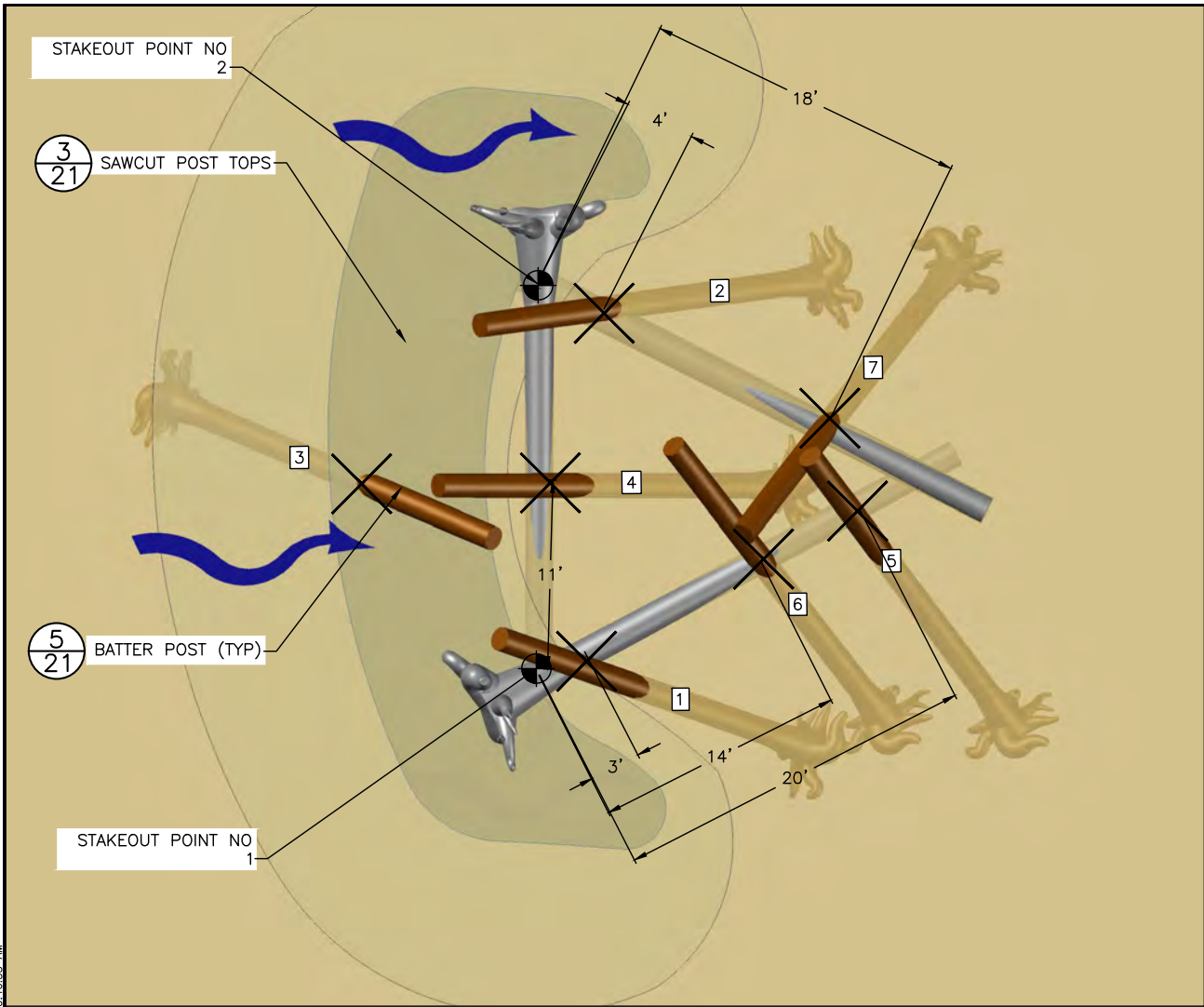
NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT

TYPE 2 ELJ LAYERING PLANS  
- 1

17  
SHEET 17 OF 23



P:\PROJECTS\CHILAN COUNTY\NASON CREEK KAHLER BEACH DESIGN\CAD DWGS - CURRENT\TYPE 2 ELJ LAYERING PLANS.DWG Exandora 12/20/2021 10:46:33 AM

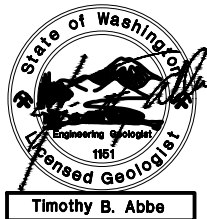
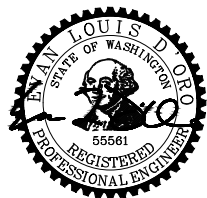


**TYPE 2 ELJ POST LAYOUT PLAN**  
SCALE: 1" = 5'

1  
18

**NOTES**

1. THE ENGINEER WILL STAKE THE STAKEOUT POINT LOCATIONS SHOWN. THE CONTRACTOR SHALL MAINTAIN STAKES OR REFERENCE LINE TO STAKES FOR ACCURATE POST PLACEMENT DURING CONSTRUCTION.
2. THE ORDER OF POST INSTALLATION SHOWN ON SHEET 17 IS APPROXIMATE. THE CONTRACTOR SHALL DETERMINE THE ORDER OF INSTALLATION SEQUENCE.



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IF THIS BAR DOES NOT  
MEASURE 1" THEN  
DRAWING IS NOT PLOTTED  
TO ORIGINAL SCALE.



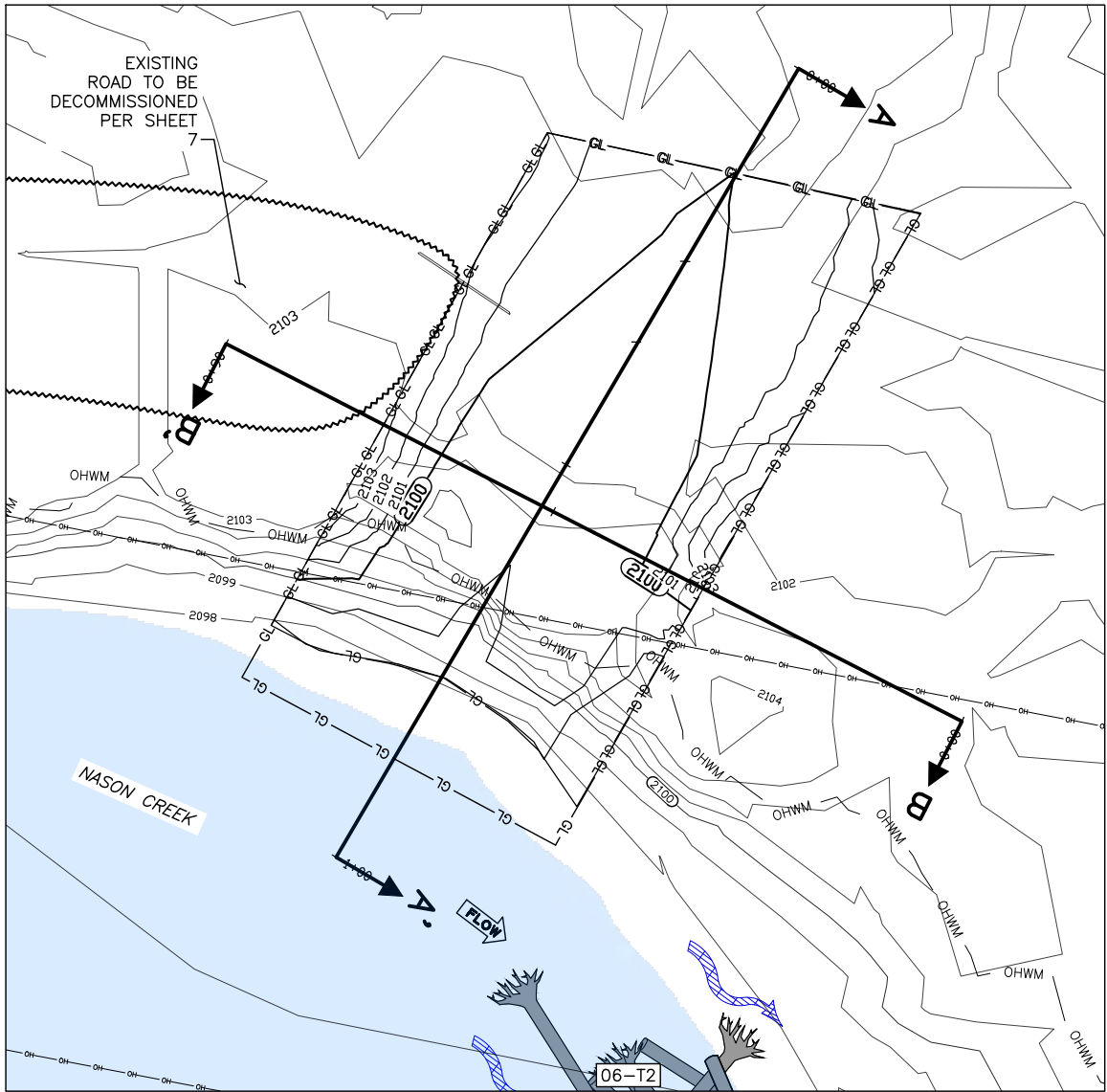
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DESIGNED JMS, ELD	LATITUDE N047° 46' 7.64"
CHECKED TBA	LONGITUDE W120° 46' 7.76"
DRAWN JGJ	TN/SC/RG T26N/S7/R17E
CHECKED JWS, GM	DATE

**NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT**

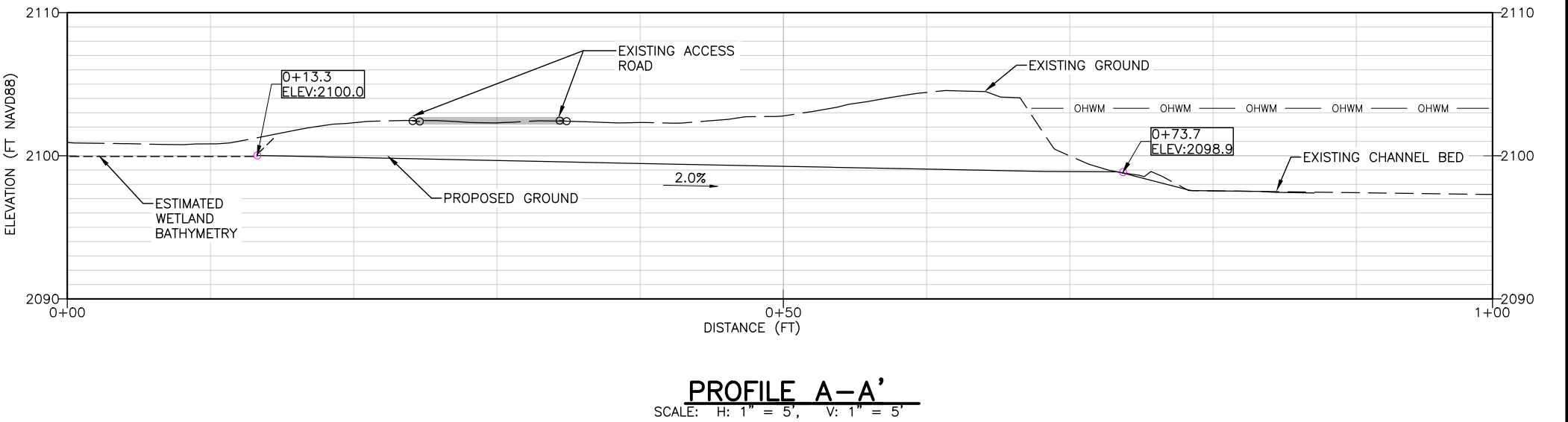
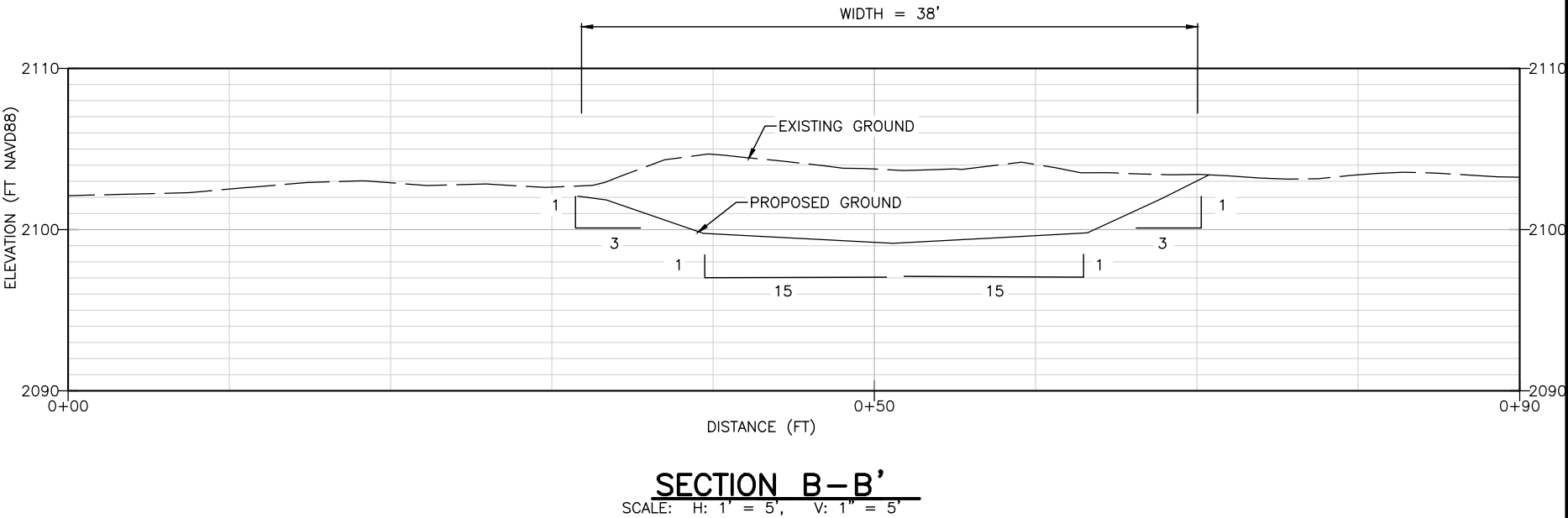
**TYPE 2 ELJ POST  
DIMENSIONING PLAN**

**18**  
SHEET **18** OF **23**

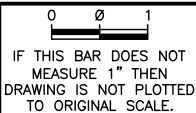
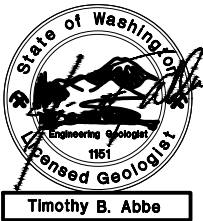




SIDE CHANNEL CONNECTION PLAN 1/7  
SCALE: 1" = 10'



- NOTES
- EXCAVATE ACCESS ROAD BETWEEN EXISTING SIDE CHANNEL 1 WETLAND SWALE AND NASON CREEK. HAUL EXCAVATED MATERIAL AND SPREAD AT THE ON-SITE DISPOSAL LOCATION SHOWN ON THE PLANS OR AS DIRECTED BY CONTRACT OFFICER.
  - MINIMIZE IMPACTS TO EXISTING TREES AND SHRUBS TO THE EXTENT POSSIBLE.
  - PLACE CLEARED TREES AND SHRUBS AS SLASH MATERIAL IN ADJACENT TYPE 2 ELJ(S) AS DIRECTED BY THE ENGINEER.
  - ISOLATE EARTHWORK FROM FLOWING WATERS. PUMP OUT SEDIMENT LADEN WATER TO UPLAND SITE PRIOR TO CONNECTION OF CHANNEL TO FLOWING WATERS.
  - ESTIMATED CUT QUANTITY IS 250 CY.



NAME OR INITIALS AND DATE	GEOGRAPHIC INFORMATION
DESIGNED JMS, ELD	LATITUDE N047° 46' 7.64"
CHECKED TBA	LONGITUDE W120° 46' 7.76"
DRAWN JGJ	TN/SC/RG T26N/S7/R17E
CHECKED JWS, GM	DATE

NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT

SIDE CHANNEL CONNECTION  
GRADING

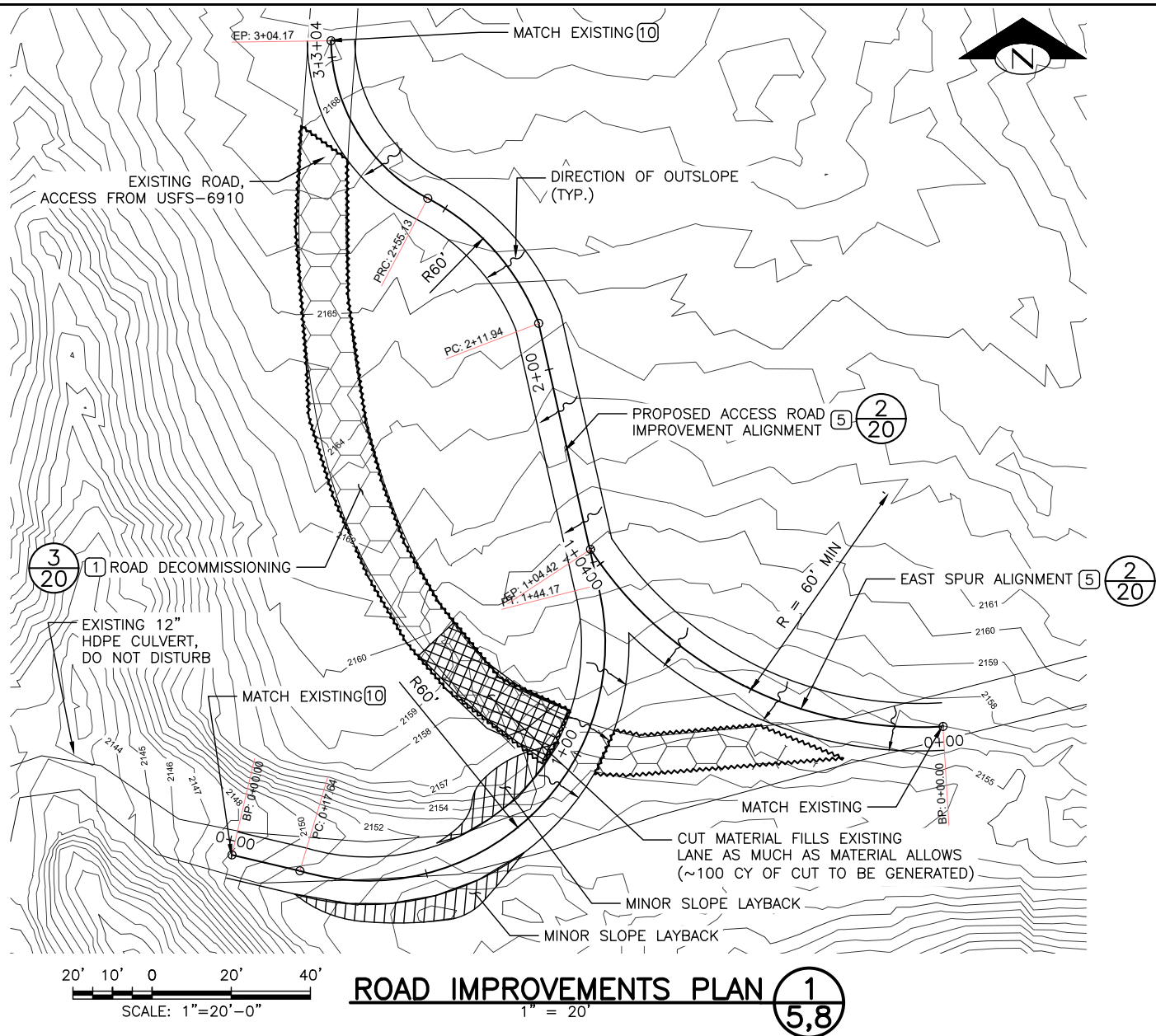
19  
SHEET 19 OF 23

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Dec 20, 2021 100% PLANS - FOR CONSTRUCTION



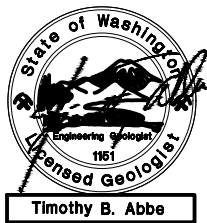
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- LEGEND**
- UPLAND SEEDING (SEE SHEET 23)
  - MINOR CUT/BANK LAYBACK (~100 CY)
  - SPOILS LOCATION FOR ANY EXCESS CUT
  - SLASH/VEGETATION DEBRIS FROM CLEARING AND GRUBBING OF NEW ROAD
  - NATIVE GROUND
  - PROPOSED OUTSLOPE DIRECTION

**NOTES**

- DECOMMISSION EXISTING SEGMENT OF ROAD. RIP ROAD TO A DEPTH OF 18" AND REGRADE SUCH THAT DRAINAGE PATHS ARE FILLED. SEED ACCORDING TO SEED MIX SHOWN IN THESE PLANS.
- CLEARED AND GRUBBED VEGETATION SHALL BE SPREAD OVER THE PORTION OF ROAD BEING DECOMMISSIONED AS DIRECTED BY THE ENGINEER. ALL SLASH AND VEGETATION PLACEMENTS SHALL BE TRACK WALKED.
- APPLICATION OF SEED SHALL BE FOLLOWED BY APPLICATION OF STRAW MULCH AT A RATE OF 2,000 LBS/ACRE. SCATTER AVAILABLE VEGETATION AND SLASH ABOVE STRAW.
- THE PROPOSED ROAD ALIGNMENTS WILL BE STAKED IN THE FIELD BY THE CONTRACTING OFFICER.
- ALL CURVES SHALL HAVE A MINIMUM TURNING RADIUS OF 60 FEET.
- EXISTING GRADE SHALL BE FOLLOWED AS MUCH AS FEASIBLE WHEN SLOPES ARE <10%. ROAD PROFILE SHALL BE 10% MAX.
- ROAD SURFACE WILL BE NATIVE GROUND. PROVIDE OUTSLOPE PER THE DETAILS TO DRAIN WATER OFF OF THE TRAVELED LANE.
- EXCESS MATERIAL ASSOCIATED WITH SLOPE LAYBACK OR PROFILE ADJUSTMENTS SHALL BE PLACED IN THE EXISTING ROAD THAT IS TO BE DECOMMISSIONED PER DIRECTION OF THE ENGINEER.
- EXISTING EXTENTS OF ROADWAY AND TOPOGRAPHY ARE APPROXIMATE. ACTUAL LOCATIONS OF MATCHING EXISTING AS WELL AS EXISTING GRADES WILL VARY. ROAD IMPROVEMENTS MAY VARY BY 50 LINEAR FEET IN EITHER DIRECTION RELATIVE TO WHAT IS SHOWN.



0 0 1  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.



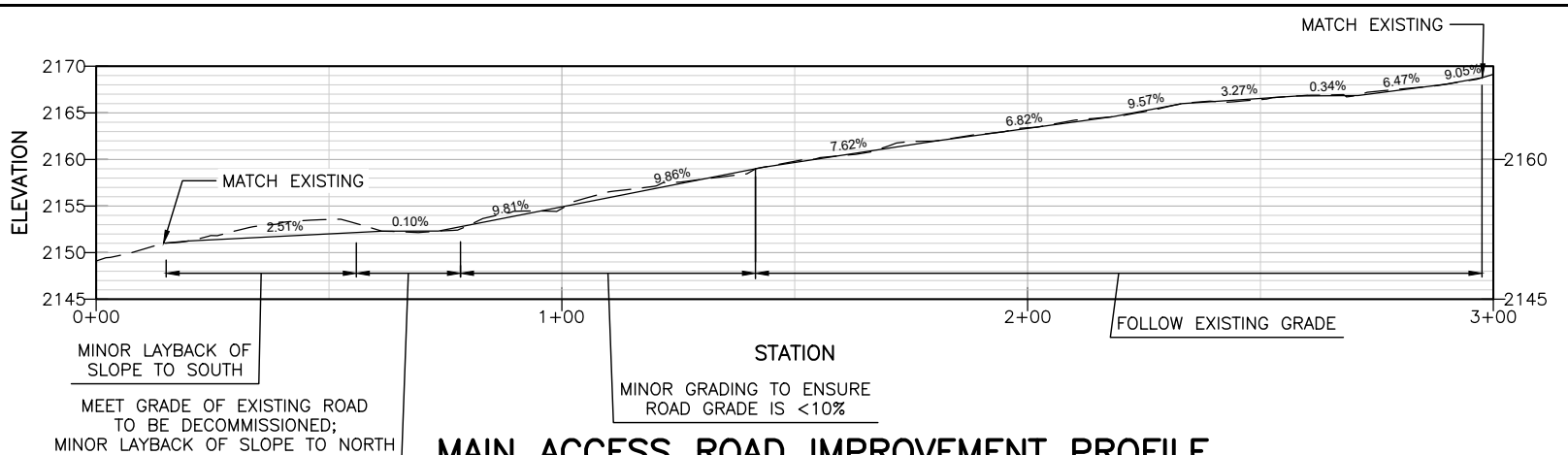
NAME OR INITIALS AND DATE  
DESIGNED JMS, ELD  
CHECKED TBA  
DRAWN JGJ  
CHECKED JWS, GM

GEOGRAPHIC INFORMATION  
LATITUDE N047° 46' 7.64"  
LONGITUDE W120° 46' 7.76"  
TN/SC/RG T26N/S7/R17E  
DATE

**NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT**

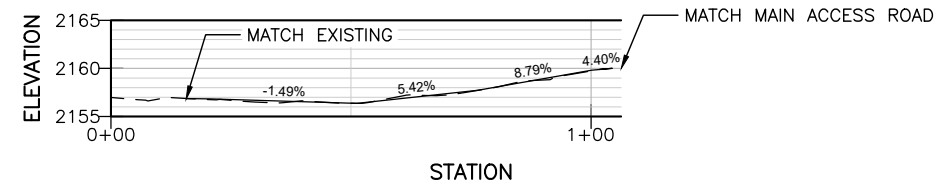
**ROAD IMPROVEMENTS**

20  
SHEET 20 OF 23



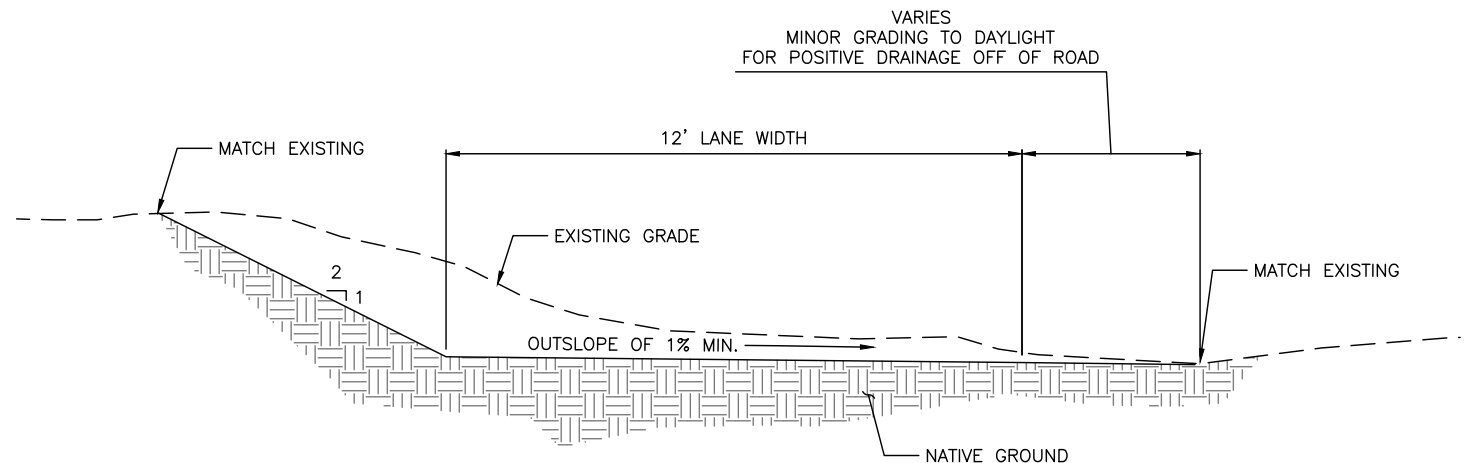
**MAIN ACCESS ROAD IMPROVEMENT PROFILE**

V: 1" = 5' H: 1" = 10'



**EAST SPUR PROFILE**

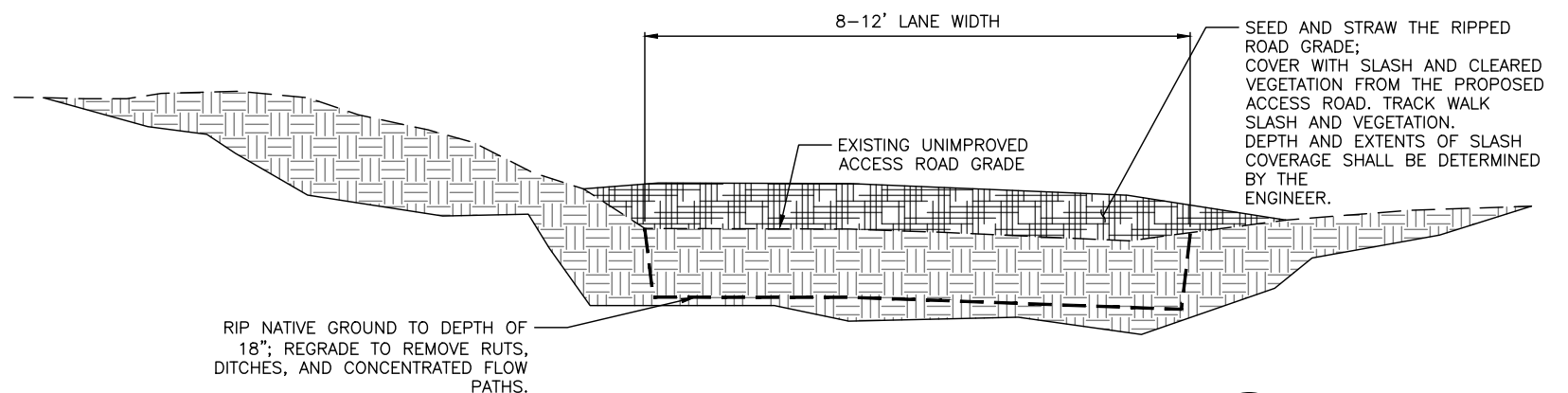
V: 1" = 10' H: 1" = 10'



**ACCESS ROAD IMPROVEMENT TYPICAL SECTION**

NOT TO SCALE

2/20



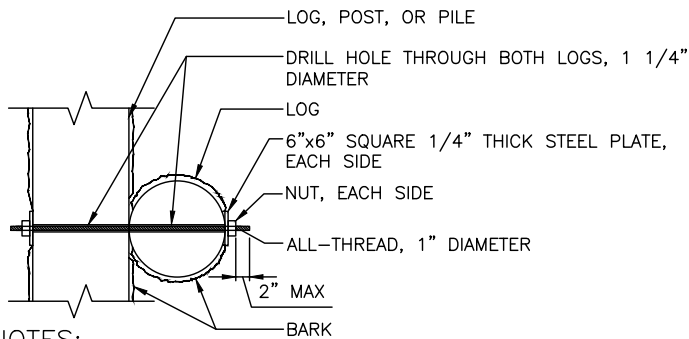
**ACCESS ROAD DECOMMISSIONING TYPICAL SECTION**

NOT TO SCALE

3/20

Dec 20, 2021 100% PLANS - FOR CONSTRUCTION



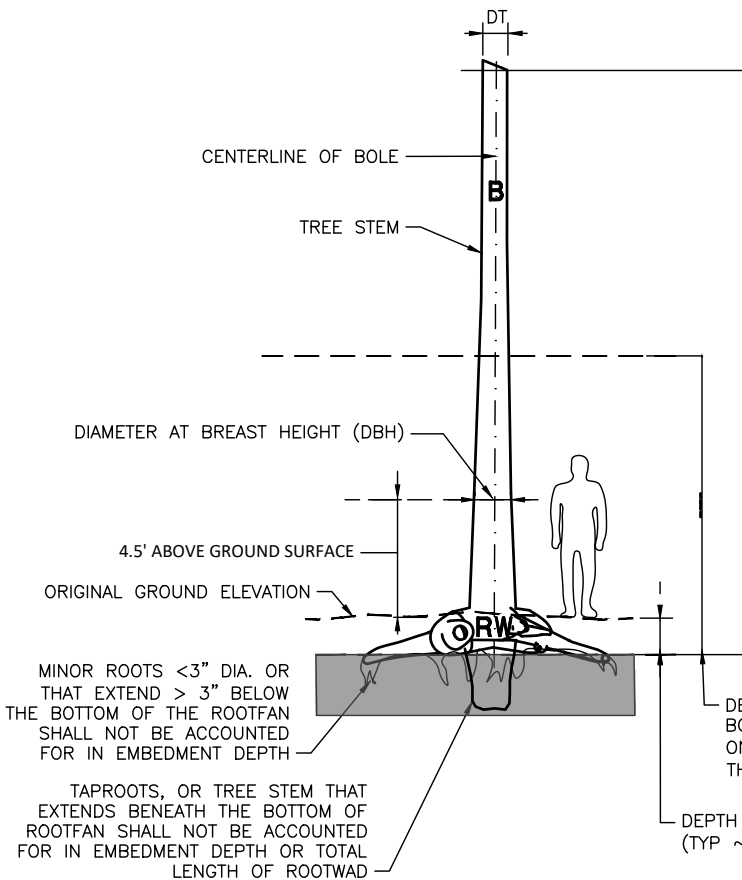


**NOTES:**

1. REMOVE BARK AT CONNECTION POINTS.
2. DRILL HOLE THROUGH CENTER OF LOGS.
3. TIGHTEN SUFFICIENTLY TO ELIMINATE GAP BETWEEN LOGS BUT NOT CRUSH BOLES. PEEN THREADS OR TACK WELD NUT TO ALL-THREAD FOLLOWING TIGHTENING.
4. ALL-THREAD TO BE ASTM TYPE A 307, GRADE A. LENGTH VARIES BY CONNECTION.
5. MULTIPLE LOG CONNECTIONS AT SAME JOINT WILL USE SINGLE PIECE OF ALL-THREAD TO MINIMIZE HOLES IN POSTS.

**BOLTED CONNECTION** 1  
NOT TO SCALE 13.14.15

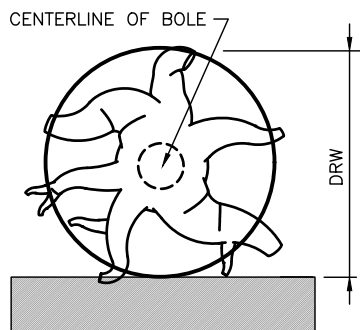
**ROOTWAD/ROOTWAD POST**



**ABBREVIATIONS:**

B = BOLE (EG., STEM, TRUNK) OF TREE  
RW = ROOTWAD  
DRW = DIAMETER OF ROOTWAD  
DBH = DIAMETER AT BREAST HEIGHT MEASURED WITH BARK OFF  
DT = DIAMETER AT TIP

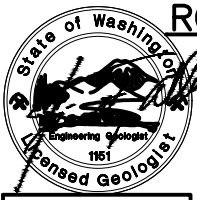
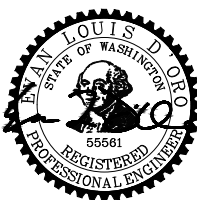
**ROOTWAD**



DESIGN EMBEDMENT DEPTH SHALL BE MEASURED FROM THE BOTTOM OF THE BOLE WHERE THE ROOTFAN ROOTS ARE SPREAD TO THEIR MAXIMUM DIAMETER, ONLY ACCOUNTING FOR MAJOR ROOTS >3" IN DIAMETER AND DO NOT VARY MORE THAN 3" IN LENGTH BELOW THE BOTTOM OF THE BOLE.

DEPTH OF ROOT FAN  
(TYP ~3-4 FT)

**ROOTWAD DIMENSIONING REQUIREMENTS** 4  
NOT TO SCALE 16.17.18



0 0 1  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.

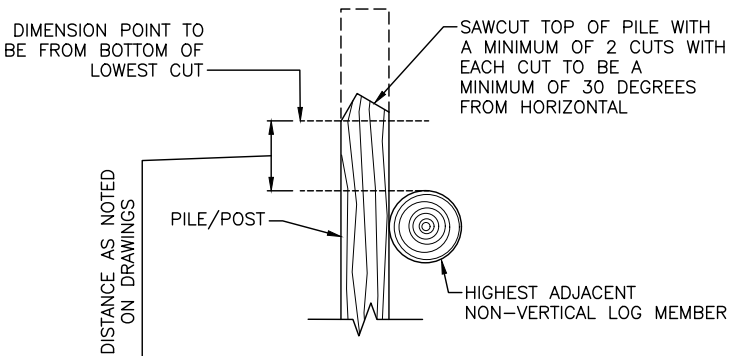


NAME OR INITIALS AND DATE	GEOGRAPHIC INFORMATION
DESIGNED JMS, ELD	LATITUDE N047° 46' 7.64"
CHECKED TBA	LONGITUDE W120° 46' 7.76"
DRAWN JGJ	TN/SC/RG T26N/S7/R17E
CHECKED JWS, GM	DATE

**NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT**

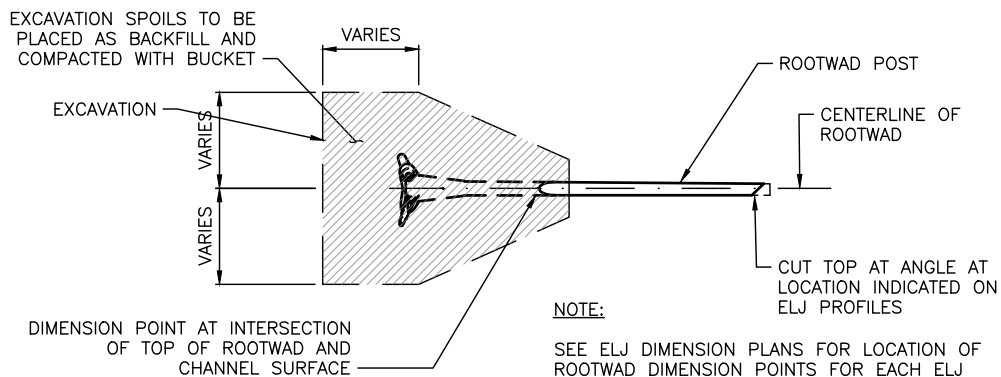
**RESTORATION DETAILS**

21  
SHEET 21 OF 23

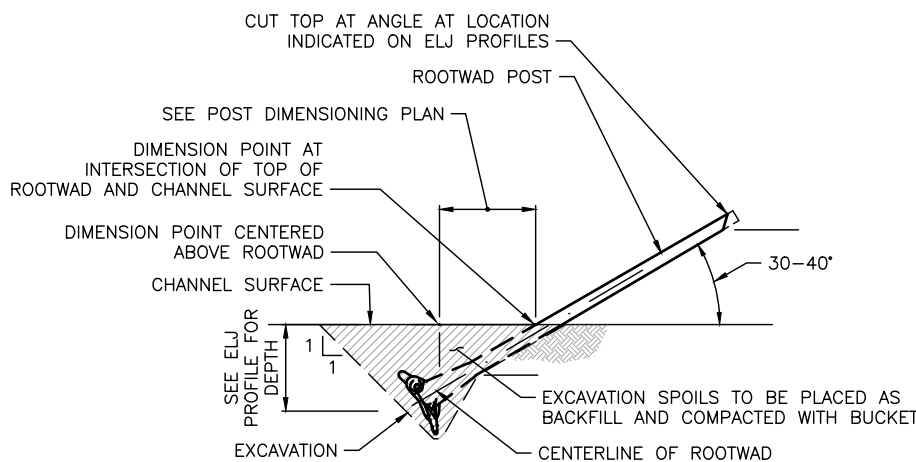


**PROFILE**

**SAWCUT POST TOP** 3  
NOT TO SCALE 21



**PLAN**

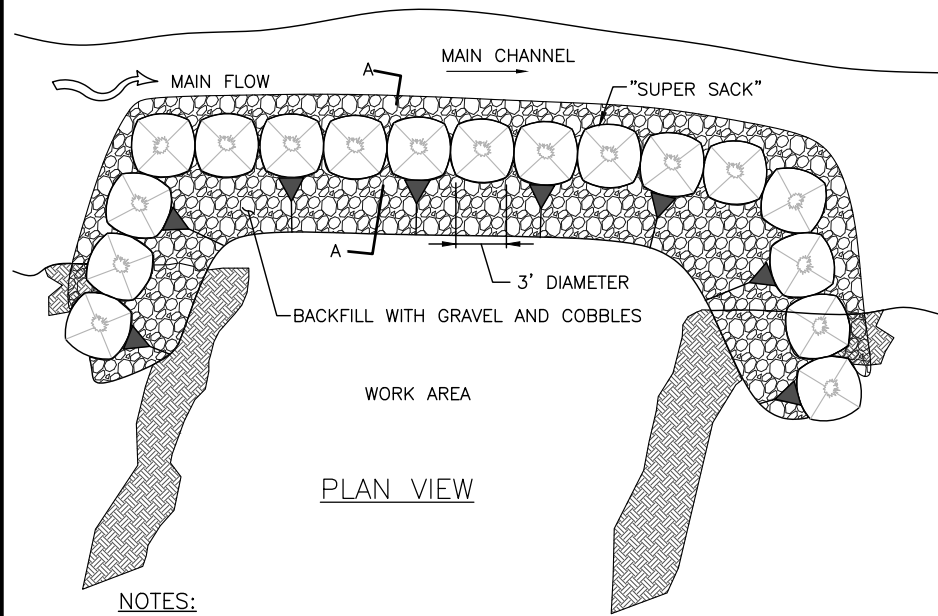


**PROFILE**

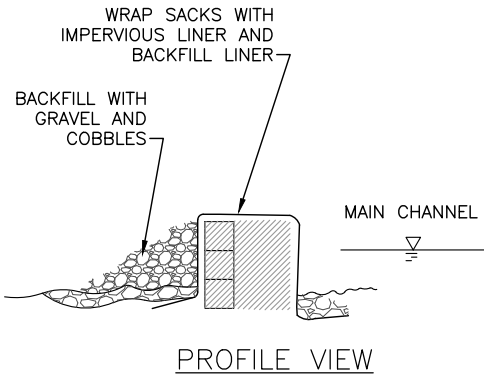
**BATTER POST INSTALLATION** 5  
NOT TO SCALE 16.17.18



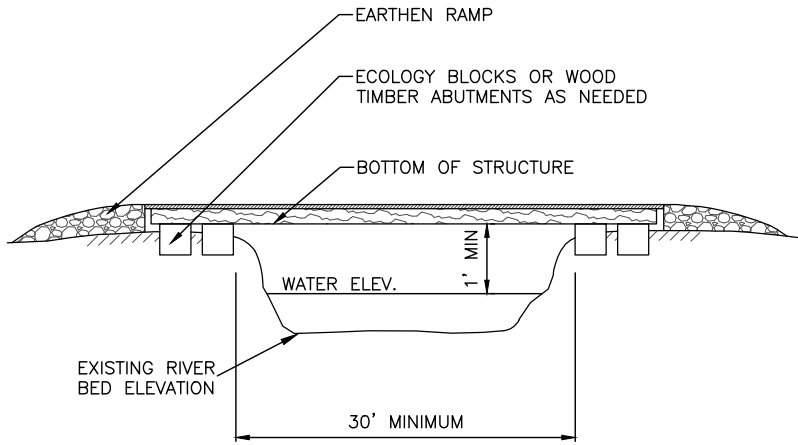
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- NOTES:
1. WRAP "SUPER SACKS" WITH IMPERVIOUS PLASTIC LINER TO PREVENT SEEPAGE.
  2. BACKFILL THE DOWNSTREAM SIDE COFFER DAM WITH NATIVE, ADJACENT ALLUVIUM.
  3. USE "SUPER SACKS" AS BUTTRESSES AS REQUIRED.
  4. ALTERNATIVE METHODS FOR COFFERDAM MUST COMPLY WITH ARBO REQUIREMENTS.



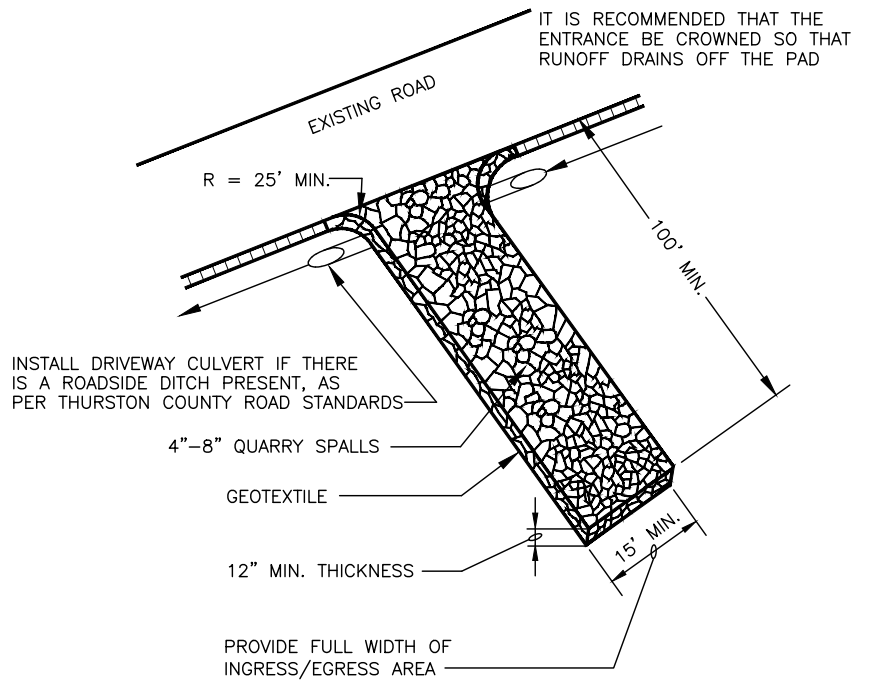
**COFFERDAM** 1  
NOT TO SCALE 8,11



- NOTES:
1. CONTRACTOR TO DESIGN TEMPORARY BRIDGE.
  2. BRIDGE SHALL BE LOCATED SUCH THAT ONLY ONE SPAN IS USED TO ELIMINATE IMPACTS TO SUBSTRATE OF CHANNEL.
  3. END OF BRIDGE SHALL BEAR ON HIGH BANKS WITH SUFFICIENT BEARING CAPACITY TO PREVENT SLOUGHING OR COLLAPSE OF SIDE CHANNEL BANKS.
  4. CONCRETE ECOLOGY BLOCKS OR WOOD ABUTMENTS MAY BE USED TO SUPPORT ENDS OF TEMPORARY BRIDGE AS NEEDED.
  5. BRIDGES MAY BE CONSTRUCTED FROM LOGS OR APPROVED EQUAL AND DECKED WITH STEEL SHEET, WOOD LAGGING OR APPROVED EQUAL.



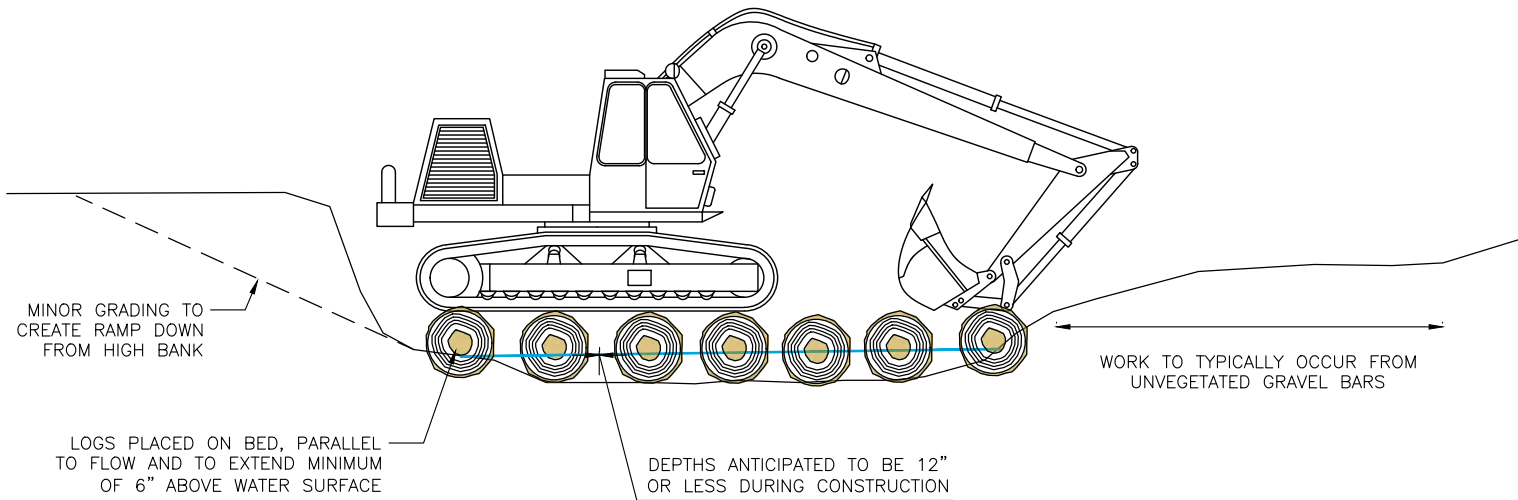
**TEMPORARY BRIDGE** 2  
NOT TO SCALE 6,11



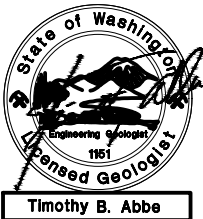
REFERENCE; WASHINGTON STATE DEPARTMENT OF ECOLOGY STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON (FIGURE 4-2)

**STABILIZED CONSTRUCTION ENTRANCE**  
NOT TO SCALE

3  
22



**TEMPORARY LOG CROSSING** 4  
NOT TO SCALE 6,11



0 0 1  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.



**Natural Systems Design**

NAME OR INITIALS AND DATE	GEOGRAPHIC INFORMATION
DESIGNED JMS, ELD	LATITUDE N047° 46' 7.64"
CHECKED TBA	LONGITUDE W120° 46' 7.76"
DRAWN JGJ	TN/SC/RG T26N/S7/R17E
CHECKED JWS, GM	DATE

**NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT**

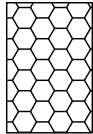
**TESC DETAILS**

22  
SHEET 22 OF 23

Dec 20, 2021 100% PLANS - FOR CONSTRUCTION

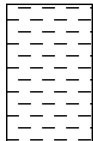


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PLANT COMMUNITY	SPECIES	COMMON NAME	LBS PLS/ACRE
UPLAND SEED MIX	<i>Achillea millefolium</i>	Western Yarrow	0.5
	<i>Achnatherum hymenoides</i>	Indian Ricegrass	6
	<i>Agropyron spicatum</i>	Bluebunch Wheatgrass	6
	<i>Bromus carinatus</i>	Mountain Brome	0.5
	<i>Elymus glaucus</i>	Wild Rye	0.5
	<i>Festuca idahoensis</i>	Idaho Fescue	3
	<i>Linum lewisii</i>	Prairie Flax	0.25
	<i>Lomatium dissectum</i>	Desert Parsley	1
	<i>Lomatium nudicaule</i>	Barestem Biscuitroot	1
	<i>Lupinus sericeus</i>	Silky Lupine	0.25
	<i>Triticum aestivum x secale cereale</i>	Sterile Triticale	20
	<i>Poa secunda</i>	Sandberg Bluegrass	6

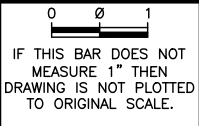
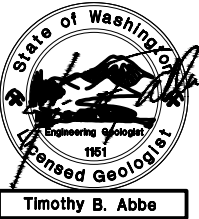
SEED MIX QUANTITIES			
MIX	SITE 1 QTY (AC)	SITE 2 QTY (AC)	ROAD IMPROVEMENTS AREA QTY (AC)
UPLAND	2.5	0.6	0.1
FLOODPLAIN	0.9	0.8	



PLANT COMMUNITY	SPECIES	COMMON NAME	LBS PLS/ACRE
FLOODPLAIN SEED MIX	<i>Agrostis scabra</i>	Hair Bentgrass	0.5
	<i>Deschampsia cespitosa</i>	Tufted Hairgrass	1
	<i>Erigeron speciosus</i>	Aspen Fleabane	0.75
	<i>Festuca rubra var. rubra</i>	Red Fescue	2
	<i>Juncus tenuis</i>	Slender Rush	0.5
	<i>Triticum aestivum x secale cereale</i>	Sterile Triticale	20

SEEDING NOTES

1. FOLLOWING CONSTRUCTION, ALL AREAS ABOVE ORDINARY HIGH WATER MARK DISTURBED DUE TO EARTHWORK, CLEARING, ACCESS, STAGING OR OTHER CONSTRUCTION ACTIVITIES SHALL BE SEEDED ACCORDING TO THE SEED MIXES AND APPLICATION RATES SHOWN ON THIS SHEET.
2. ALL SEEDING AREAS SHALL BE PREPARED IN ACCORDANCE WITH THE SPECIFICATIONS. SEEDING AREAS NEED NOT BE CULTIVATED, BUT SHALL BE RAKED OR CHAINED TO ENSURE A FRIABLE SURFACE FREE OF SOIL CLUMPS LARGER THAN 2 INCHES IN DIAMETER.
3. FOR SEEDING AREAS OUTSIDE OF OHW, APPLICATION OF SEED SHALL BE FOLLOWED BY APPLICATION OF STRAW MULCH AT A RATE OF 2,000 LBS/ACRE.
4. FOR AREAS BELOW OHW THAT WILL BE PLANTED BY OTHERS, APPLY BARK OR WOODCHIP MULCH TO A DEPTH OF 3 INCHES.



NAME OR INITIALS AND DATE		GEOGRAPHIC INFORMATION	
DESIGNED	JMS, ELD	LATITUDE	N047° 46' 7.64"
CHECKED	TBA	LONGITUDE	W120° 46' 7.76"
DRAWN	JGJ	TN/SC/RG	T26N/S7°/R17E
CHECKED	JWS, GM	DATE	

NASON CREEK KAHLER REACH  
HABITAT IMPROVEMENT  
PROJECT

SEED SCHEDULES	
SHEET 23 OF 23	