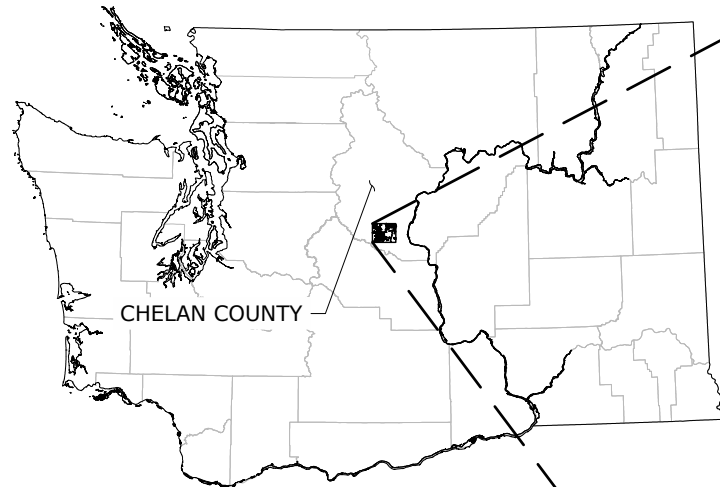
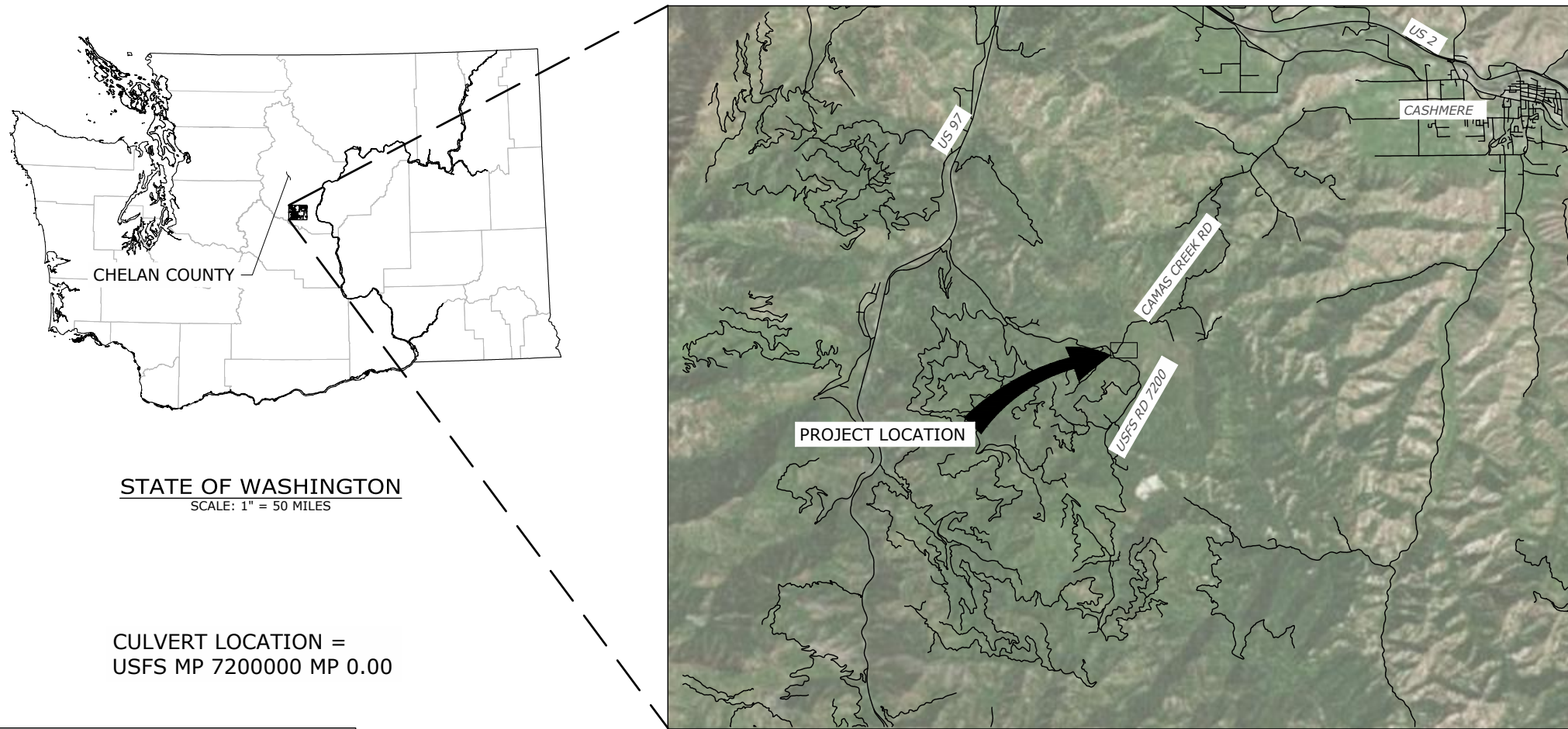


LOWER CAMAS MEADOWS RESTORATION PROJECT

FINAL DESIGN

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT



STATE OF WASHINGTON
SCALE: 1" = 50 MILES

CULVERT LOCATION =
USFS MP 7200000 MP 0.00

CONTACT INFORMATION

ENGINEER: NATURAL SYSTEMS DESIGN, INC

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

CONTRACTING AGENCY: CHELAN COUNTY NATURAL RESOURCE DEPARTMENT

411 WASHINGTON ST #201
WENATCHEE, WA 98801
(509) 667-6533

SHEET LIST	
SHEET NO.	SHEET TITLE
1	COVER
2	GENERAL NOTES AND QUANTITIES
3	LEGEND
4	EXISTING CONDITIONS
5	ACCESS AND STAGING PLAN
6	OVERALL SITE PLAN
7	SITE PLAN 1
8	SITE PLAN 2
9	SITE PLAN 3
10	CULVERT AND VALLEY GRADE CONTROL PROFILE & CROSS SECTIONS
11	CAMAS CREEK PROFILE
12	CHANNEL CROSS-SECTIONS
13	ROAD GRADING PLAN
14	DITCH PROFILE AND CROSS SECTIONS
15	ROAD PROFILE
16	CULVERT CROSS-SECTION
17	CULVERT STRUCTURE DETAILS
18	HEADWALL AND WINGWALL CONNECTION DETAILS
19	TYPE 1 LOG STRUCTURE
20	LOG STRUCTURE DETAILS
21	ACCESS AND STAGING DETAILS
22	PAVEMENT DETAILS



Susan E Dickerson-Lange
6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
LOWER CAMAS MEADOWS RESTORATION PROJECT
COVER
FINAL DESIGN

DATE: 06/25/2024
COUNTY: CHELAN
LATITUDE: 47°28'18"N
LONGITUDE: 120°35'14"W
TMS/SG/RG: T23N35E1/618E
DESIGN: JIN DRAWN: ELI,KS
CHECK: EB CHECK: MN

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

REVISED 6/18/2024

SHEET
1 OF 22

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GENERAL NOTES

1. THESE PLANS HAVE BEEN PREPARED FOR THE EXCLUSIVE USE OF CHELAN COUNTY NATURAL RESOURCES DEPARTMENT, HEREAFTER REFERRED TO AS "OWNER", AND THEIR AUTHORIZED AGENTS.
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. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE CONTRACT DOCUMENTS AND FOR ALL REQUIRED SUBMITTALS TO THE CONTRACTING AGENCY.
4. EXISTING TELEPHONE LINE EXISTS ON NORTH SIDE OF CAMAS CREEK ROAD. CONTRACTOR SHALL LOCATE ANY UTILITY LINES WITHIN PROJECT AREA PRIOR TO COMMENCING WORK. CONTRACTOR SHALL BE LIABLE FOR ANY DAMAGE OR DISRUPTION TO UTILITY SERVICE LINES.

PERMIT NOTES

1. THE CONTRACTOR SHALL 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 SHALL BE IN COMPLIANCE WITH PERMIT CONDITIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE COPIES OF ALL PERMITS ON THE JOB SITE, UNDERSTAND AND COMPLY WITH ALL PERMIT CONDITIONS.
3. IF AT ANY TIME 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.
4. AVOID AND MINIMIZE ADVERSE IMPACTS TO WATERS OF THE UNITED STATES, INCLUDING MINIMIZING THE AMOUNT, DURATION, AND EXTENT OF WORK BELOW ORDINARY HIGH WATER AND EQUIPMENT CROSSINGS OF WETTED CHANNELS.
5. 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. LIDAR FOR THIS PROJECT WAS COLLECTED IN 2018 AND IS REPRESENTATIVE OF 2018 CONDITIONS. SURVEY DATA COLLECTED BY NSD IN AUGUST AND OCTOBER 2021 WAS USED TO REPRESENT THE CHANNEL PROFILE.
2. THE VERTICAL DATUM IS NAVD88 (FT). THE HORIZONTAL DATUM IS NAD83 WASHINGTON STATE PLANE NORTH AND THE UNIT IS US SURVEY FEET.
3. GATES, FENCELINES, AND UTILITIES WERE NOT SURVEYED. CONTRACTOR TO VERIFY IN FIELD.
4. PARCEL BOUNDARIES ARE FROM CHELAN COUNTY GIS AND ARE NOT SURVEYED.

CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY.
2. CONSTRUCTION HOURS SHALL BE WEEKDAYS BETWEEN 7:00 A.M. AND 6:30 P.M. UNLESS PRIOR APPROVAL IS RECEIVED FROM THE OWNER.
3. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE OWNER PRIOR TO PROCEEDING WITH THE WORK.
4. THE CONTRACTOR SHALL PROTECT ALL EXISTING STRUCTURES, VEGETATION, AND IMPROVEMENTS NOT INDICATED FOR REMOVAL.
5. THE CONTRACTOR SHALL KEEP THE JOB SITE CLEAN AND HAZARD FREE.
6. THE CONTRACTOR SHALL DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH GENERATED BY THE WORK. UPON COMPLETION OF WORK, CONTRACTOR SHALL REMOVE ALL MATERIAL AND EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING CULVERT OFF OF NATIONAL FOREST SYSTEM LANDS
7. NO TREES OR VEGETATION SHALL BE REMOVED UNLESS NOTED ON THE PLANS OR SPECIFIED ON-SITE BY THE OWNER OR THE ENGINEER. NO GRADING SHALL TAKE PLACE WITHIN THE DRIP LINE OF TREES NOT TO BE REMOVED UNLESS OTHERWISE APPROVED.
8. 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.
9. THE CONTRACTOR SHALL DEVELOP A HAZARDOUS SPILL PLAN PRIOR TO STARTING WORK.
10. ALL EQUIPMENT SHALL BE CLEANED BEFORE ENTERING PROJECT SITE. ANY MATERIAL BROUGHT ONSITE SHALL BE FROM A CERTIFIED WEED FREE SOURCE.
11. MATERIAL AND EQUIPMENT 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.
12. THE CONTRACTOR SHALL DEVELOP AND SUBMIT A TRAFFIC CONTROL PLAN TO THE ENGINEER AND OWNER FOR REVIEW AND APPROVAL PRIOR TO COMMENCING WORK.

ELJ NOTES

1. ALL LOGS SHALL BE DOUGLAS FIR OR WESTERN RED CEDAR.
2. ALL PILES SHALL BE ROUND, UNTREATED TIMBER PILES AND SHALL BE DOUGLAS FIR. PILES SHALL BE FREE FROM DEFECTS, CRACKS, AND SPLITTING AT THE TIME OF DRIVING.
3. LOGS SHALL HAVE SPECIFIED DIAMETERS AS MEASURED AT DBH WITHOUT BARK, DEFINED AS 4.5 FEET ABOVE GROUND WHEN TREE WAS STANDING.
4. EXISTING WOODY MATERIAL AT THE STRUCTURE LOCATION SHALL BE MOVED OR PROTECTED FROM CONSTRUCTION ACTIVITIES AND THEN INCORPORATED INTO THE STRUCTURE AS DIRECTED BY THE CONTRACTING OFFICER.
5. PILE EMBEDMENT DEPTH FOR EACH ELJ SHALL BE MEASURED RELATIVE TO THE CHANNEL THALWEG. EXCAVATION DEPTHS AND QUANTITIES IN THE STRUCTURE SCHEDULE ARE BASED ON TOPOGRAPHIC DATA COLLECTED IN 2018 AND 2021, AND EXISTING GRADE ELEVATIONS AND ASSOCIATED EXCAVATION DEPTHS MAY BE OFF BY SEVERAL FEET. ACTUAL EXCAVATION DEPTHS SHALL BE PROVIDED BY THE ENGINEER WHEN THE STRUCTURE LOCATION IS STAKED PRIOR TO CONSTRUCTION.
6. KEY LOGS, FRAMING LOGS, AND PILES SHALL HAVE AN ALUMINUM TAG AFFIXED PER RCW 77.85.050(5E). ALUMINUM TAGS SHALL BE A MINIMUM OF 1 ¼ INCHES IN DIAMETER. AT CONSTRUCTION COMPLETION, A RECORD OF THE TAG NUMBERS BROKEN DOWN BY STRUCTURE ID SHALL BE PROVIDED TO THE OWNER.

DESIGN CRITERIA NOTES

1. THE CULVERT STRUCTURE HAS BEEN DESIGNED TO A RATING OF A HL-93 AASHTO VEHICLE LIVE LOAD.
2. SOIL BEARING RESISTANCE (WITH A RESISTANCE FACTOR OF 0.45) HAS A STRENGTH LIMIT STATE BEARING RESISTANCE VALUE OF 3,500 PSF.
3. LATERAL EARTH PRESSURE PARAMETERS (FROM ASPECT CONSULTING, 2023):

EARTH PRESSURE CONDITION	EARTH PRESSURE COEFFICIENT	EQUIVALENT FLUID WEIGHT ^{(2),(3)} (PCF) ⁽¹⁾	SURCHARGE PRESSURE (PSF) ⁽¹⁾
ACTIVE (K _a) ⁽⁴⁾	0.28	35 18 (SUBMERGED)	0.28S ⁽⁷⁾
AT REST (K _o)	0.44	55 28 (SUBMERGED)	0.44S ⁽⁷⁾
PASSIVE (K _p) ⁽⁵⁾	3.54	440 ⁽⁶⁾ 220 (SUBMERGED)	--

4. ROAD AND GUARDRAIL DESIGN IS BASED ON THE UNITED STATES FOREST SERVICE (USFS) LOW-VOLUME ROADS ENGINEERING BEST MANAGEMENT PRACTICE FIELD GUIDE AND WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) BRIDGE DESIGN MANUAL.
5. ROAD DESIGN SPEED IS 30MPH.

BID QUANTITIES

BID SCHEDULE				
ITEM	SPEC #	DESCRIPTION	UNIT	QUANTITY
1	1-09.7	MOBILIZATION [10%]	LS	1
2	1-05.4	SURVEY	LS	1
3	1-07.17	UTILITY RELOCATION	LS	1
4	1-10.2	PROJECT TEMPORARY TRAFFIC CONTROL	LS	1
5	2-03	REMOVAL OF PAVEMENT	SY	333
6	2-03	ROADWAY EXCAVATION	CY	420
7	2-03	NATIVE BACKFILL	CY	420
8	2-03 & 9-03.14(3)	IMPORTED FILL	CY	269
9	2-09	REMOVAL OF EXISTING CULVERT AND WEIR	LS	1
10	6-06	BEAM GUARDRAIL TYPE 31	LF	44
11	6-06	BEAM GUARDRAIL TYPE 31 - NON-FLARED TERMINAL	EA	3
12	6-06	BEAM GUARDRAIL TYPE 31 - ANCHOR TYPE 11	EA	1
13	6-10.3	PRECAST CONCRETE BARRIER (WITH SCUPPERS) - UNANCHORED	LF	37.5
14	6-20	CULVERT STRUCTURE	LS	1
15	8-05	TEMPORARY ACCESS AND STAGING	LS	1
16	8-19	TYPE 1 LOG STRUCTURE [MATERIALS AND INSTALL]	EA	8
17	8-21	PERMANENT SIGNAGE	LS	1
18	8-26	MEADOW PROTECTION MATS	LS	1
19	8-30	VALLEY GRADE CONTROL: ROOTWADS	EA	10
20	8-30	VALLEY GRADE CONTROL: LOGS	EA	9
21	8-30	VALLEY GRADE CONTROL: BOLTED CONNECTIONS	EA	18
22	8-30	VALLEY GRADE CONTROL INSTALL	LS	1
23	9-02.1	HMA CL. 3/8 IN. PG 64-28	TN	70
24	9-03.9(3)	CRUSHED SURFACING BASE COURSE - GRAVEL SURFACING	TN	193
25	9-03.9(3)	CRUSHED SURFACING BASE COURSE - ASPHALT PAVING SUBBASE	TN	236
26	9-03.11	STREAMBED SEDIMENT	TN	497
27	9-03.11	STREAMBED COBBLES - 10"	TN	514
28	9-03.11	STREAMBED BOULDERS: TYPE 1-2	TN	141
29		MINOR CHANGE	DOL	\$5,000

TOTAL WOOD QUANTITY

	DIAMETER (IN)	LENGTH (FT)	QUANTITY	STRUCTURE TYPE
LOG	18	30	9	VALLEY GRADE CONTROL
ROOTWAD	18	20	10	VALLEY GRADE CONTROL
PILE	6	8	144	TYPE 1 LOG STRUCTURE
LOG	18	7	8	TYPE 1 LOG STRUCTURE
LOG	18	10	16	TYPE 1 LOG STRUCTURE
LOG	14	30	48	TYPE 1 LOG STRUCTURE
RACKING BUNDLE (EA)	N/A	N/A	80	TYPE 1 LOG STRUCTURE
LOOSE RACKING AND SLASH (CY)	N/A	N/A	96	TYPE 1 LOG STRUCTURE



Natural Systems Design
+ Coastal Geologic Services



6/18/2024



Susan E. Dickerson-Lange

6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
LOWER CAMAS MEADOWS RESTORATION PROJECT
GENERAL NOTES AND QUANTITIES
FINAL DESIGN

DATE 06/25/2024
COUNTY CHELAN
LATITUDE 47°28'18"N
LONGITUDE 120°35'14"W
TMS/SG/RG T23M/S21/R18E
DESIGN_MN DRAWN_EJL:ES
CHECK_EB CHECK_MN

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

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GENERAL LEGEND

- PROPERTY LINE
- PL PROJECT LIMITS
- 5 EXISTING MAJOR CONTOUR
- 1 EXISTING MINOR CONTOUR
- 5 PROPOSED MAJOR CONTOUR
- 1 PROPOSED MINOR CONTOUR
- 2-YR FLOOD EVENT INUNDATION
- OHWM EXISTING OHWM
- EXISTING CULVERT
- PROPOSED CULVERT
- EXISTING WETLAND
- DEMOLITION/REMOVAL AREA
- CONTROL POINT LOCATION
- WATER SURFACE ELEVATION
- EXISTING BOULDER
- EXISTING SIGN
- EXISTING MAILBOX
- EXISTING LOG WEIR
- MATCHLINE
- WSE PROFILE
- EXISTING GRADE
- PROPOSED GRADE
- LIMITS OF EXCAVATION
- EXISTING FILL, CULVERT
- BEAM GUARDRAIL TYPE 31
NON-FLARED END TERMINAL
- BEAM GUARDRAIL TYPE 31

DESIGN LEGEND

- RACKING AND SLASH MATERIAL
- ROOTWAD
- LOG
- TYPE 1 ELJ (T1-#)
- STREAMBED BOULDER CASCADE FILL
- STREAMBED AGGREGATE FILL
- NATIVE FILL OR IMPORTED FILL
- CULVERT BEDDING MATERIAL
- GRANULAR STRUCTURAL BACKFILL
- CRUSHED SURFACING BASE COURSE
- HMA CL 3/8 IN. PG 64-28
- PRECAST CONCRETE FOOTING
- PROPOSED GRAVEL SURFACING
- PROPOSED ASPHALT PAVEMENT
- EXTENTS OF PROPOSED ROAD FILL

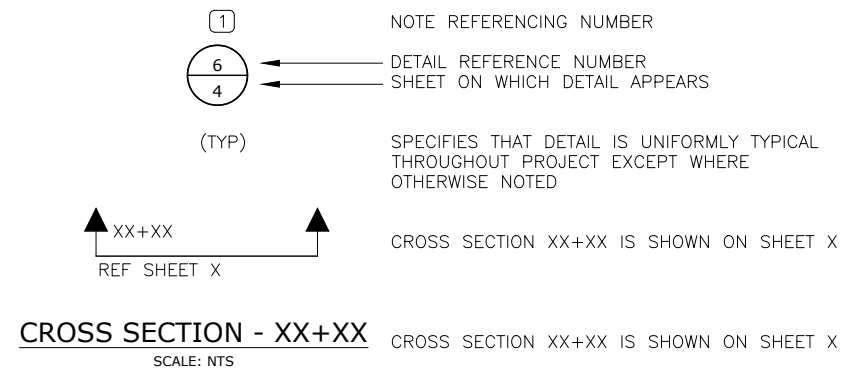
RESTORATION LEGEND

- STAGING AREAS
- UPLAND ACCESS ROUTES
- MEADOW MAT ACCESS ROUTES
- MEADOW ACCESS ROUTE - SETBACK
- TYPE 1 ELJS
- GRADE CONTROL FILL AND ACCESS

ACCESS AND STAGING LEGEND

- HIGH VISIBILITY FENCE
- TEMP ACCESS ROAD, MEADOW MAT
- TEMP ACCESS ROAD, UPLAND
- PROPOSED STAGING AREA
- SLASH CONSTRUCTION ENTRANCE
- SENSITIVE AVOIDANCE AREA

DETAIL AND SECTION REFERENCING



STAKEOUT TABLES

PROPOSED ROAD CENTERLINE				
STATION	ALIGNMENT	NORTHING	EASTING	ELEVATION
0+13.00	CAMAS CREEK ROAD	172113.18	1701347.71	2802.88
0+23.00	CAMAS CREEK ROAD	172114.07	1701337.75	2802.87
0+33.00	CAMAS CREEK ROAD	172114.96	1701327.79	2802.87
0+43.00	CAMAS CREEK ROAD	172115.84	1701317.83	2802.86
0+53.00	CAMAS CREEK ROAD	172116.73	1701307.87	2802.86
0+63.00	CAMAS CREEK ROAD	172117.61	1701297.91	2802.85
0+73.00	CAMAS CREEK ROAD	172118.50	1701287.95	2802.85
0+83.00	CAMAS CREEK ROAD	172119.56	1701278.01	2802.75
0+93.00	CAMAS CREEK ROAD	172123.05	1701268.66	2802.45
1+03.00	CAMAS CREEK ROAD	172128.64	1701260.40	2802.19
1+13.00	CAMAS CREEK ROAD	172136.02	1701253.69	2801.79
1+23.00	CAMAS CREEK ROAD	172144.78	1701248.91	2801.29
499+88.40	ROAD	171982.33	1701289.82	2803.86
499+98.40	ROAD	171991.86	1701286.78	2803.99
500+08.40	ROAD	172001.38	1701283.74	2804.12
500+18.40	ROAD	172010.91	1701280.69	2804.24
500+28.40	ROAD	172020.43	1701277.65	2804.36
500+38.40	ROAD	172029.96	1701274.60	2804.43

PROPOSED ROAD CENTERLINE				
STATION	ALIGNMENT	NORTHING	EASTING	ELEVATION
500+48.40	ROAD	172039.49	1701271.56	2804.44
500+58.40	ROAD	172049.09	1701268.78	2804.41
500+68.40	ROAD	172058.80	1701266.37	2804.32
500+78.40	ROAD	172068.59	1701264.36	2804.18
500+88.40	ROAD	172078.46	1701262.74	2803.98
500+98.40	ROAD	172088.37	1701261.39	2803.74
501+08.40	ROAD	172098.28	1701260.04	2803.44
501+18.40	ROAD	172108.15	1701258.45	2803.09
501+28.40	ROAD	172117.95	1701256.46	2802.69
501+38.40	ROAD	172127.66	1701254.09	2802.23
501+48.40	ROAD	172137.27	1701251.32	2801.72
501+58.40	ROAD	172146.76	1701248.18	2801.16
501+68.40	ROAD	172156.12	1701244.66	2800.55
501+78.40	ROAD	172165.33	1701240.76	2799.88
501+88.40	ROAD	172174.46	1701236.68	2799.17
501+98.40	ROAD	172183.59	1701232.59	2798.40
502+08.20	ROAD	172192.53	1701228.59	2797.62

STRUCTURE ID	NORTHING	EASTING	EXISTING ALIGNMENT STATION
T1-1	172073.7	1701487.8	5+38.42'
T1-2	172073.3	1701561.2	6+10.99'
T1-3	172059.5	1701676.9	7+53.59'
T1-4	172102.1	1701929.8	10+47.01'
T1-5	172226.2	1702041.1	12+56.50'
T1-6	172284.1	1702069.2	13+39.22'
T1-7	172617.3	1702540.4	21+87.93'
T1-8	172732.0	1702632.6	23+64.34'

CULVERT	NORTHING	EASTING	ELEVATION	DESIGN ALIGNMENT STATION	OFFSET
CP-1	172094.8	1701240.8	2792.5	101+05.67'	-7.875
CP-2	172110.2	1701244.1	2792.5	101+05.67'	7.875
CP-3	172102.6	1701279.3	2792.5	101+41.67'	7.875
CP-4	172087.2	1701275.9	2792.5	101+41.67'	-7.875

VALLEY GRADE CONTROL	NORTHING	EASTING	DESIGN ALIGNMENT STATION	OFFSET	EXISTING ALIGNMENT STATION	OFFSET
GC-1	172135.3	1701214.4	100+58.17'	0.00	2+31.95'	-0.468
GC-2	172088.8	1701292.3	101+57.80'	0.00	3+29.75	0.536
GC-3	172064.9	1701433.8	103+02.00'	0.00	4+80.02'	-0.178



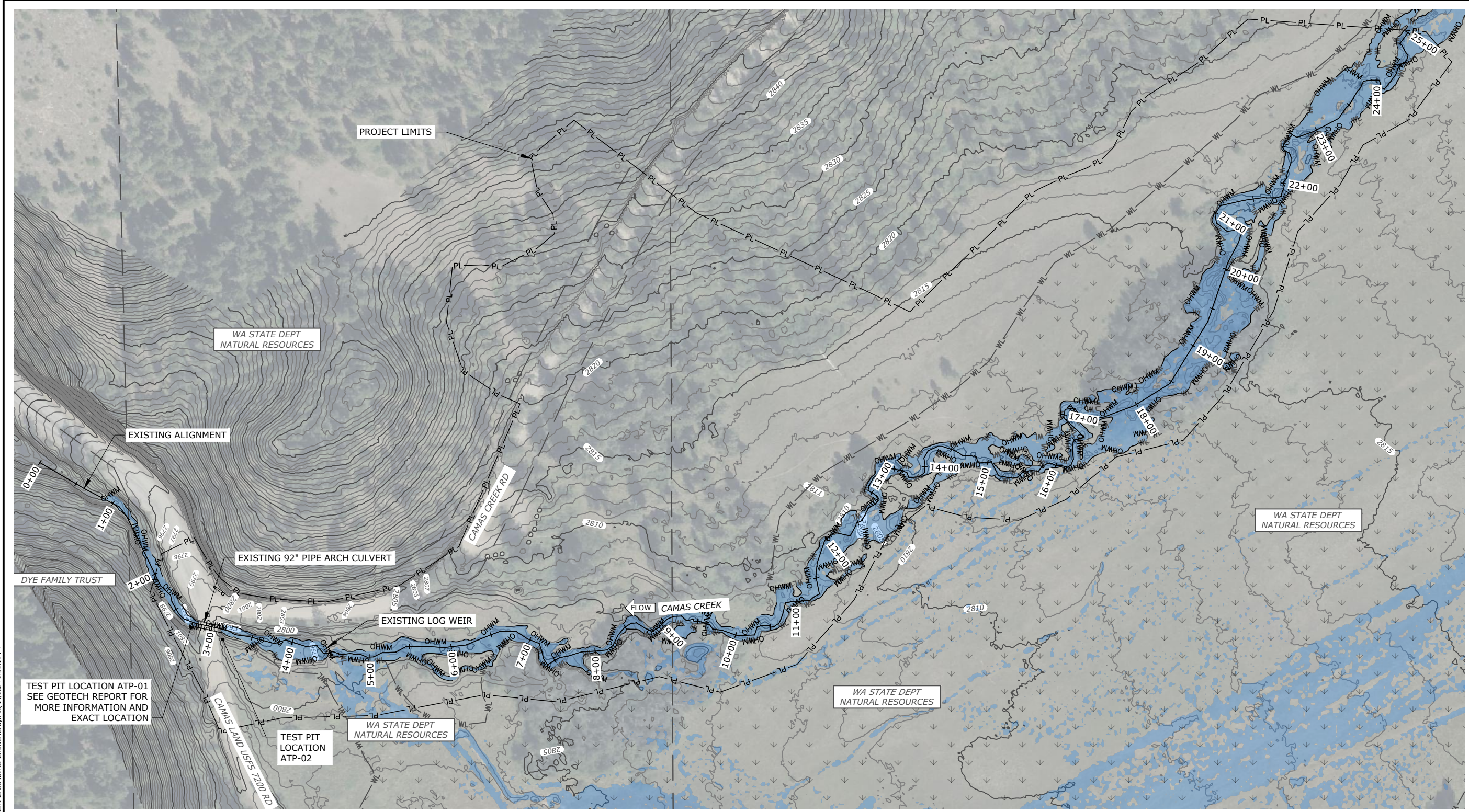
Susan E Dickerson-Lange
6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
 LOWER CAMAS MEADOWS RESTORATION PROJECT
LEGEND
 FINAL DESIGN

DATE: 06/25/2024
 COUNTY: CHELAN
 LATITUDE: 47°28'18"N
 LONGITUDE: 120°35'14"W
 TN/SC/RG: T23N/S21/R18E
 DESIGN: MN DRAWN: ELKS
 CHECK: EB CHECK: MN

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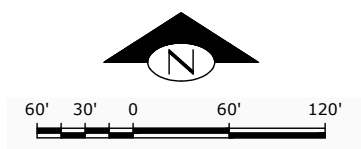


Susan E. Dickerson-Lange
6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
LOWER CAMAS MEADOWS RESTORATION PROJECT
EXISTING CONDITIONS
FINAL DESIGN

NOTES

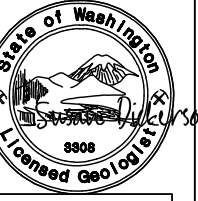
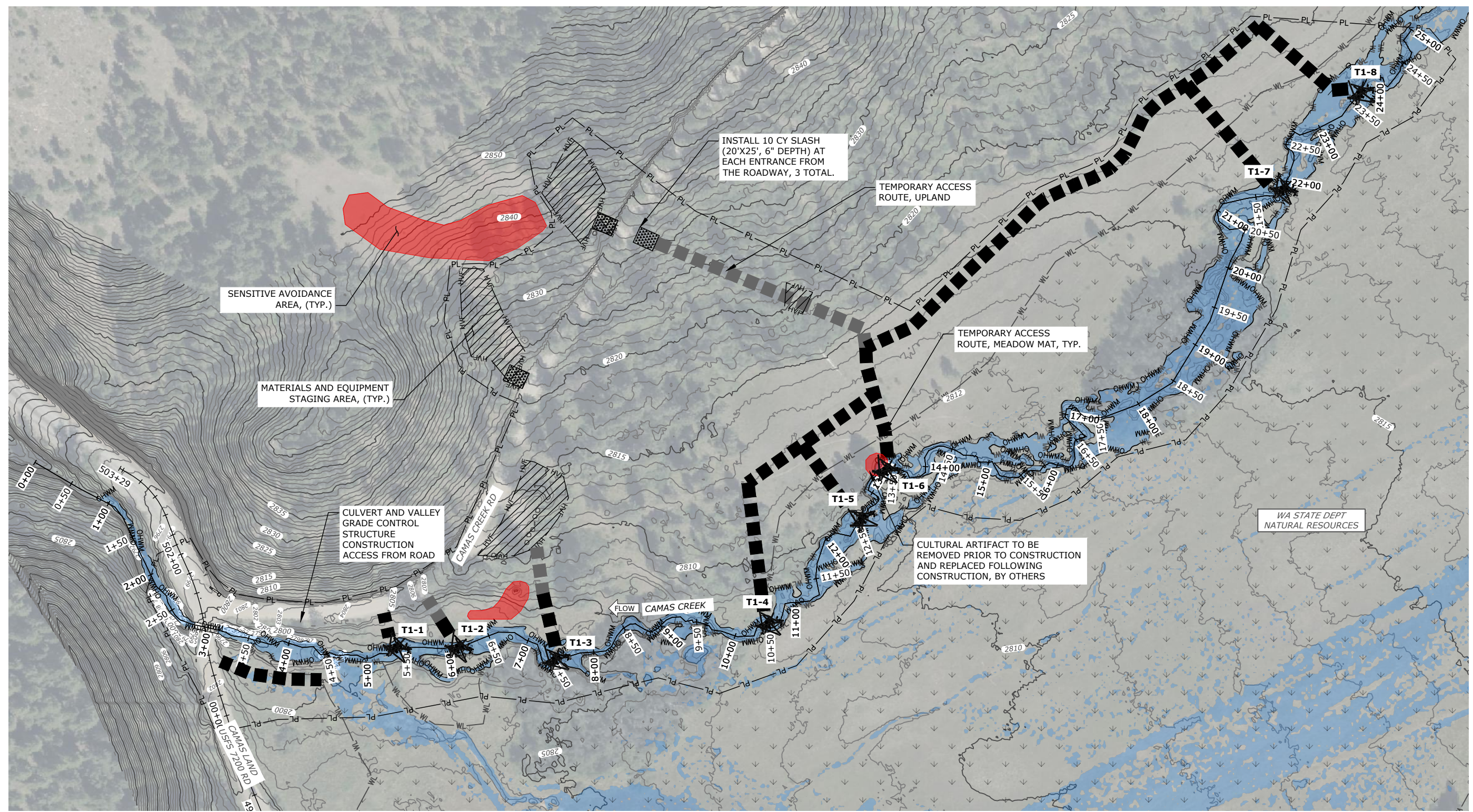
1. AERIAL IMAGE WAS CAPTURED IN 2022.
2. CHANNEL THALWEG ALIGNMENT AND ELEVATION BASED ON NSD SURVEY CONDUCTED IN AUGUST AND OCTOBER 2021. ELEVATIONS ARE BASED ON 2018 LIDAR OTHERWISE.
3. LIMITS OF INUNDATION SHOWN REFLECT MODELED EXISTING CONDITIONS AT A 2-YEAR FLOOD EVENT (22.6 CFS) (BLUE HATCH). THE ORDINARY HIGH WATER MARK (OHWM) BOUNDARY IS DEVELOPED FROM THIS MODELING OUTPUT AND INPUT FROM FIELD OBSERVATIONS. HYDRAULIC MODELING PERFORMED IN HEC-RAS VERSION 6.3.1.
4. ALL PROJECT ACTIONS ARE WITHIN WA STATE DEPARTMENT OF NATURAL RESOURCES LAND.
5. EXISTING BOULDERS EXIST IN THE VICINITY OF THE CULVERT DOWNSTREAM OF THE EXISTING LOG WEIR. APPROXIMATELY 23 LARGER BOULDERS (±3-FT DIAMETER) AND 27 SMALLER ROCKS (±1-2-FT DIAMETER) EXIST BASED ON NSD SITE VISIT IN OCTOBER 2023.



DATE 06/25/2024
COUNTY CHELAN
LATITUDE 47°28'18"N
LONGITUDE 120°35'14"W
TMS/CRG 123M/62.1/8.18E
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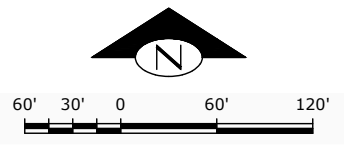


Susan E. Dickerson-Lange
6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
LOWER CAMAS MEADOWS RESTORATION PROJECT
ACCESS AND STAGING PLAN
FINAL DESIGN

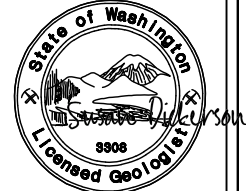
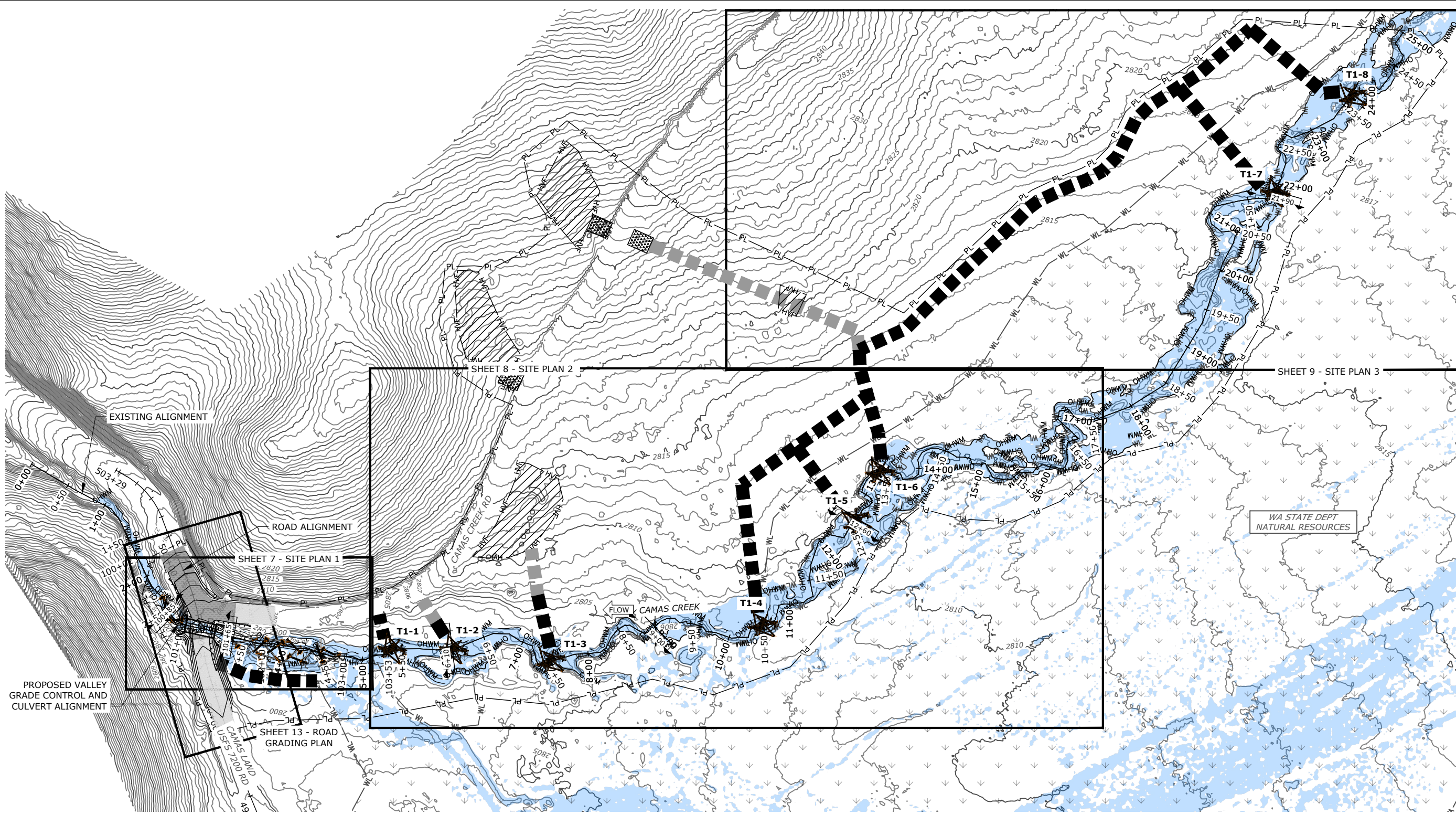
NOTES

- ACCESS ROUTE LOCATIONS ARE BASED ON WASHINGTON DEPARTMENT OF NATURAL RESOURCES (DNR) MAPPING CONDUCTED IN JUNE 2023 AND ARE SUBJECT TO CHANGE BASED ON DISCOVERY OF CULTURAL RESOURCES OR REQUEST FROM WA DNR.
- STAGING AREA LOCATIONS BASED ON NSD FIELD OBSERVATIONS CONDUCTED IN 2021 AND ARE SUBJECT TO CHANGE BASED ON DISCOVERY OF CULTURAL RESOURCES OR REQUEST FROM WA DNR.
- CONTRACTOR TO INSTALL MEADOW PROTECTION MATS ALONG ALL CONSTRUCTION ACCESS ROUTES WHERE SHOWN. CONTRACTOR TO MAINTAIN MEADOW PROTECTION THROUGHOUT CONSTRUCTION AND REMOVE MATS UPON PROJECT COMPLETION.
- SENSITIVE AVOIDANCE AREAS (IN RED) OBTAINED BY WA DNR IN OCTOBER 2023.
- MEADOW MATS ARE NOT REQUIRED FOR PROTECTION OF THE STAGING AREAS OR ON ACCESS ROUTES IN UPLAND/SHRUB AREAS.
- INSTALL TREE PROTECTION ON UP TO 5 TREES IN/ADJACENT TO THE STAGING AREAS. SEE DETAIL 2 ON SHEET 21. THE CONTRACTOR SHALL IDENTIFY TREES FOR PROTECTION, TO BE APPROVED BY THE ENGINEER OR OWNER PRIOR TO CONSTRUCTION.
- THE STAGING AREAS HAVE LARGE BOULDERS BLOCKING ACCESS (4 TO 5-MAN). REMOVE AND REPLACE FOLLOWING CONSTRUCTION.
- THE OWNER WILL FLAG THE EXTENTS OF STAGING AND ACCESS ROUTES PRIOR TO CONSTRUCTION. CONSTRUCTION FENCING MUST BE INSTALLED AROUND ALL STAGING AREAS.
- CAMAS CREEK ROAD MUST HAVE ONE LANE MINIMUM OPEN AT ALL TIMES FOR ACCESS. USE APPROPRIATE TRAFFIC CONTROL IF NECESSARY FOR TRUCK LOADING/UNLOADING IN THE STAGING AREAS.
- A FULL CLOSURE OF USFS 7200 WILL BE ALLOWED FOR THE CULVERT REPLACEMENT. CONTRACTOR WILL SUBMIT A SCHEDULE FOR THE PROPOSED CLOSURE DURATION FOR APPROVAL BY THE CCNRD PRIOR TO CONSTRUCTION.
- PLACE WOODY MATERIAL CLEARED FROM THE PROJECT AREA ALONG UPLAND/SHRUB ACCESS ROUTES.
- DECOMPACT ALL ACCESS ROUTES. BOTH STAGING AREAS AND ACCESS ROUTES WILL BE RESTORED BY CCNRD FOLLOWING PROJECT COMPLETION. SEE RESTORATION SHEET FOR IMPACT AREAS.
- SEE SHEET 21 FOR DETOUR OVERVIEW FOR USFS 7200 RD CLOSURE.



DATE: 06/25/2024
COUNTY: CHELAN
LATITUDE: 47°28'18"N
LONGITUDE: 120°35'14"W
TMS/CRG: T23N052.0R8E
DESIGN: MN DRAWN: ELLKS
CHECK: EB CHECK: MN

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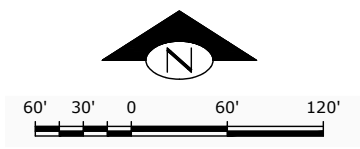


Susan E Dickerson-Lange
6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
LOWER CAMAS MEADOWS RESTORATION PROJECT
OVERALL SITE PLAN
FINAL DESIGN

NOTES

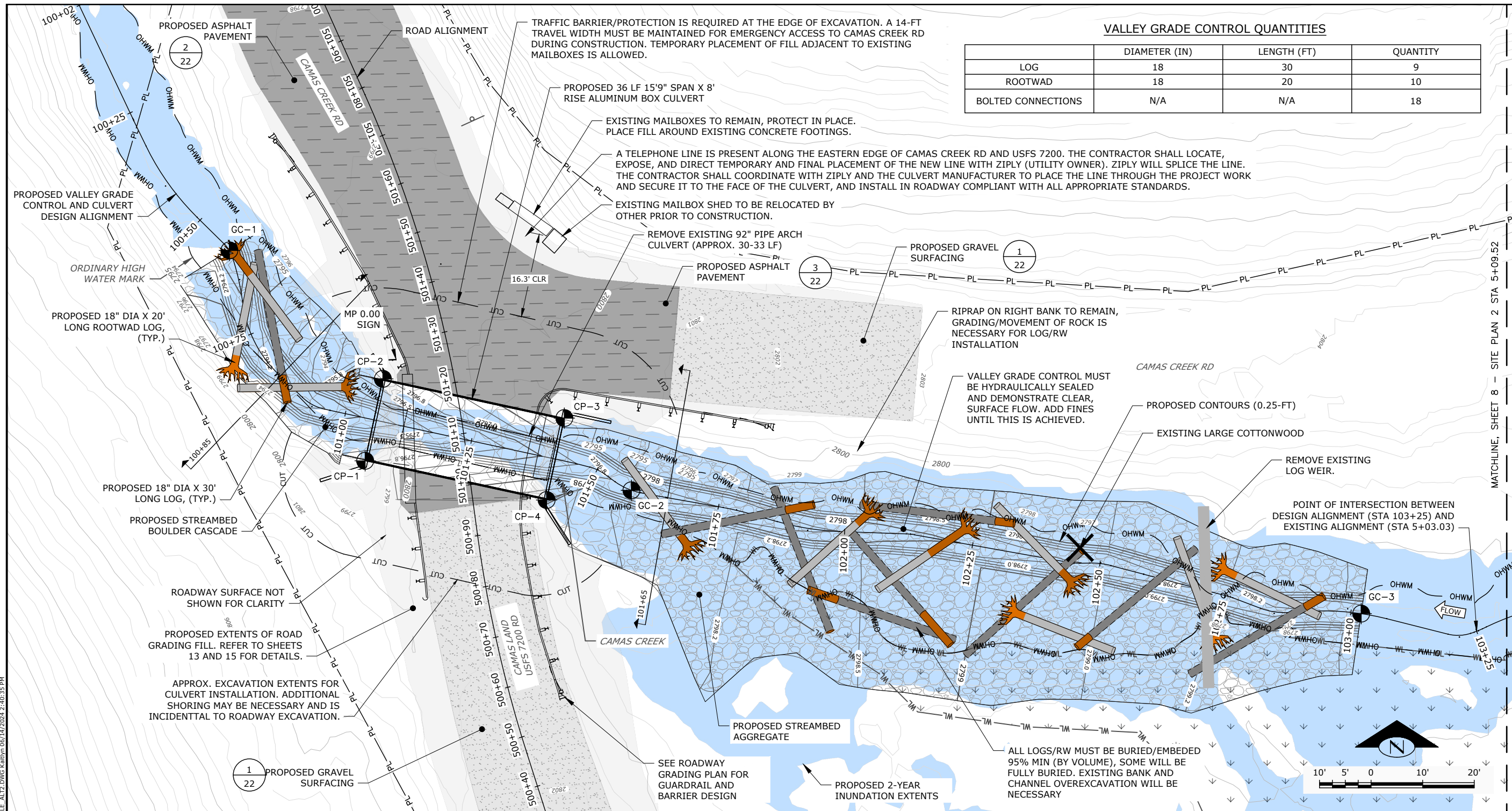
1. REFER TO SHEET 7 FOR CULVERT PLAN, SHEETS 8 AND 9 FOR TYPE 1 LOG STRUCTURE PLACEMENT, AND SHEET 13 FOR ROAD GRADING PLAN.
2. CHANNEL THALWEG ALIGNMENT AND ELEVATION BASED ON NSD SURVEY CONDUCTED IN AUGUST AND OCTOBER 2021. ELEVATIONS ARE BASED ON 2018 LIDAR OTHERWISE.
3. LIMITS OF INUNDATION SHOWN REFLECT MODELED PROPOSED CONDITIONS AT A 2-YEAR FLOOD EVENT (22.6 CFS).
4. USFS IS NOT RESPONSIBLE FOR CLEARING OF ANY LARGE WOODY MATERIAL IN THE CASE OF RACKING AT THE CULVERT INLET. USFS IS NOT RESPONSIBLE FOR PUTTING ANY DISLODGED LWM BACK IN THE CHANNEL/PREVIOUS LOCATION.



DATE 06/25/2024
COUNTY CHELAN
LATITUDE 47°28'18"N
LONGITUDE 120°35'14"W
TMS/SG 1236521/618E
DESIGN_MEN DRAWN_EJL:KS
CHECK_EB CHECK_MIN

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

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VALLEY GRADE CONTROL QUANTITIES

	DIAMETER (IN)	LENGTH (FT)	QUANTITY
LOG	18	30	9
ROOTWAD	18	20	10
BOLTED CONNECTIONS	N/A	N/A	18

TRAFFIC BARRIER/PROTECTION IS REQUIRED AT THE EDGE OF EXCAVATION. A 14-FT TRAVEL WIDTH MUST BE MAINTAINED FOR EMERGENCY ACCESS TO CAMAS CREEK RD DURING CONSTRUCTION. TEMPORARY PLACEMENT OF FILL ADJACENT TO EXISTING MAILBOXES IS ALLOWED.

PROPOSED 36 LF 15'9" SPAN X 8' RISE ALUMINUM BOX CULVERT

EXISTING MAILBOXES TO REMAIN, PROTECT IN PLACE. PLACE FILL AROUND EXISTING CONCRETE FOOTINGS.

A TELEPHONE LINE IS PRESENT ALONG THE EASTERN EDGE OF CAMAS CREEK RD AND USFS 7200. THE CONTRACTOR SHALL LOCATE, EXPOSE, AND DIRECT TEMPORARY AND FINAL PLACEMENT OF THE NEW LINE WITH ZIPLY (UTILITY OWNER). ZIPLY WILL SPLICE THE LINE. THE CONTRACTOR SHALL COORDINATE WITH ZIPLY AND THE CULVERT MANUFACTURER TO PLACE THE LINE THROUGH THE PROJECT WORK AND SECURE IT TO THE FACE OF THE CULVERT, AND INSTALL IN ROADWAY COMPLIANT WITH ALL APPROPRIATE STANDARDS.

EXISTING MAILBOX SHED TO BE RELOCATED BY OTHER PRIOR TO CONSTRUCTION.

REMOVE EXISTING 92" PIPE ARCH CULVERT (APPROX. 30-33 LF)

PROPOSED GRAVEL SURFACING

RIPRAP ON RIGHT BANK TO REMAIN, GRADING/MOVEMENT OF ROCK IS NECESSARY FOR LOG/RW INSTALLATION

VALLEY GRADE CONTROL MUST BE HYDRAULICALLY SEALED AND DEMONSTRATE CLEAR, SURFACE FLOW. ADD FINES UNTIL THIS IS ACHIEVED.

PROPOSED CONTOURS (0.25-FT)

EXISTING LARGE COTTONWOOD





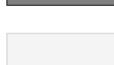
REMOVE EXISTING LOG WEIR.

POINT OF INTERSECTION BETWEEN DESIGN ALIGNMENT (STA 103+25) AND EXISTING ALIGNMENT (STA 5+03.03)

PLAN
SCALE: 1" = 10'

NOTES

- REMOVE EXISTING 92" PIPE ARCH CULVERT AND REPLACE WITH 15'9" SPAN X 8' RISE ALUMINUM BOX CULVERT. STRUCTURE WILL PROVIDE A 12-FOOT OPEN CHANNEL WIDTH AND 1.5 FT OF FREEBOARD ABOVE THE Q100.
- VALLEY GRADE CONTROL CONSISTS OF A BOULDER CASCADE, STREAMBED AGGREGATE, AND ROOTWAD LOG PLACEMENTS. VALLEY GRADE CONTROL TO EXTEND APPROXIMATELY 150 LF UPSTREAM OF EXISTING CULVERT AND APPROXIMATELY 50 LF DOWNSTREAM OF EXISTING CULVERT AS SHOWN IN PROPOSED CHANNEL PROFILE. APPROXIMATELY 160 CY OF BOULDER CASCADE FILL AND 340 CY OF STREAMBED AGGREGATE FILL IS REQUIRED.
- PROVIDE MINIMUM CULVERT OPENING OF 12' THROUGHOUT CROSSING. CREATE 8' WIDE BY 1.2' DEEP LOW FLOW CHANNEL THROUGHOUT BOULDER CASCADE GRADE CONTROL EXTENTS. BANKFULL WIDTH IS APPROXIMATELY 8'.
- REFER TO SHEET 10 FOR PROPOSED PROFILE AND CROSS SECTIONS.
- DEPTH OF FILL MUST BE GREATER THAN PROPOSED SCOUR DEPTH OF 1.8' THROUGHOUT PROPOSED CULVERT. ADDITIONAL FILL REQUIREMENTS INCLUDED ON SHEET 10.
- CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE ALONG CAMAS CREEK ROAD. REFER TO SHEETS 13 AND 15 FOR PROPOSED ROAD GRADING AND PROFILE.
- INUNDATION AREAS ARE THE 2-YR (22.6 CFS) FLOW HYDRAULIC MODELING RESULTS BASED ON PROPOSED CONDITIONS.
- WHERE LOGS CROSS, INSTALL BOLTED CONNECTION, TOTAL OF 18 THROUGHOUT VALLEY GRADE CONTROL.
- REMOVE AND REPLACE ANY ROADWAY SIGNAGE AS NECESSARY. A TRAFFIC CONTROL PLAN AND DETOUR WILL BE NECESSARY, TO BE DEVELOPED BY THE CONTRACTOR. SEE DETOUR PLAN ON SHEET 21.
- SALVAGE AND REPLANT WILLOW ON LEFT BANK UPSTREAM OF THE CULVERT.
- USE WOODY/BRUSH MATERIAL THAT IS REMOVED FROM THE VALLEY GRADE CONTROL AREA FOR UPLAND/SHRUB ACCESS ROUTES.
- SOME LARGE EXISTING BOULDERS WILL REMAIN IN PLACE WITH LWM AND COBBLED INSTALLED AROUND IT, SOME OF THE BOULDERS WILL BE REPOSITIONED DOWNSTREAM OF THE CULVERT. NO EXPORT FROM THE SITE.
- LARGE COTTONWOOD AT STA 101+48 TO BE REMOVED AND STORED ON SITE FOR PLACEMENT OVER ACCESS ROUTE FOLLOWING CONSTRUCTION.
- EXCAVATE MEADOW GRASS IN LARGE PATCHES, MIN 2FT X 2FT PATCHES MIN 6" DEPTH (OR AS LARGE AS POSSIBLE) DURING TYPE 1 LOG STRUCTURE INSTALLATION. PLACE ASIDE DURING INSTALLATION, REPLACE UPON COMPLETION. NO MATERIAL TO BE REMOVED FROM THE SITE. ALL MEADOW GRASS PATCHES SHALL BE COVERED WITH CLEAR PLASTIC AFTER REMOVAL (PRIOR TO REPLACEMENT), UNLESS OTHERWISE DIRECTED BY THE ENGINEER OR REPRESENTATIVE.

-  STREAMBED BOULDER CASCADE FILL
-  STREAMBED AGGREGATE FILL
-  PROPOSED GRAVEL SURFACING
-  PROPOSED ASPHALT PAVEMENT
-  EXTENTS OF PROPOSED ROAD FILL

NSD CGS
Natural Systems Design + Coastal Geologic Services

CHelan County Natural Resources
6/18/2024

MELAN B. NELSON
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER
53408

State of Washington
Susan E. Dickerson-Lange
LICENSED GEOLOGIST
8908

Susan E. Dickerson-Lange
6/18/2024

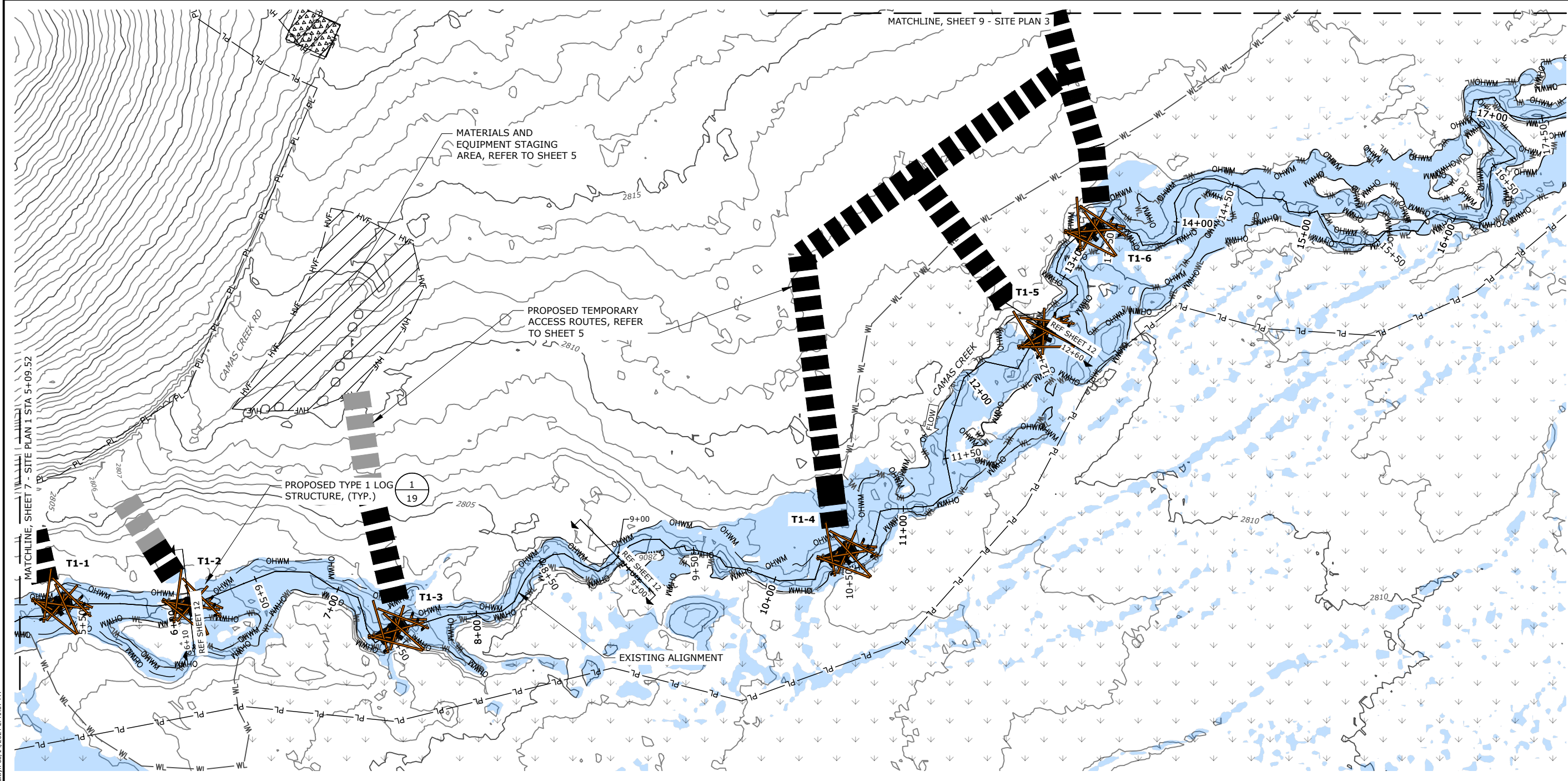
CHelan County Natural Resource Department
LOWER CAMAS MEADOWS RESTORATION PROJECT
SITE PLAN 1
FINAL DESIGN

DATE: 06/25/2024
COUNTY: CHELAN
LATITUDE: 47°28'18"N
LONGITUDE: 120°53'14"W
TWS/SG/RG: T23N/S21/E31.8E
DESIGN: JLN DRAWN: ELKES
CHECK: EB CHECK: JLN

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

SHEET
7 OF 22

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NOTES

1. STRUCTURE LOCATIONS BASED ON 2021 NSD FIELD VISIT AND ARE SUBJECT TO CHANGE BASED ON FIELD DIRECTION FROM ENGINEER AT THE TIME OF CONSTRUCTION.
2. TYPE 1 LOG STRUCTURE PLACEMENTS ARE BASED ON EXISTING CHANNEL THALWEG ALIGNMENT. CHANNEL THALWEG ALIGNMENT AND ELEVATION BASED ON NSD SURVEY CONDUCTED IN AUGUST AND OCTOBER 2021. ELEVATIONS ARE BASED ON 2018 LIDAR OTHERWISE.
3. LIMITS OF INUNDATION SHOWN REFLECT MODELED PROPOSED CONDITIONS AT A 2-YEAR FLOOD EVENT (22.6 CFS).
4. REFER TO SHEET 11 FOR CAMAS CREEK CHANNEL PROFILE AND SHEET 12 FOR TYPICAL CHANNEL CROSS SECTIONS.
5. EXCAVATE MEADOW GRASS IN LARGE PATCHES, MIN 2FT X 2FT PATCHES MIN 6" DEPTH (OR AS LARGE AS POSSIBLE) DURING TYPE 1 LOG STRUCTURE INSTALLATION. PLACE ASIDE DURING INSTALLATION, REPLACE UPON COMPLETION. NO MATERIAL TO BE REMOVED FROM THE SITE. ALL MEADOW GRASS PATCHES SHALL BE COVERED WITH CLEAR PLASTIC AFTER REMOVAL (PRIOR TO REPLACEMENT), UNLESS OTHERWISE DIRECTED BY THE ENGINEER OR REPRESENTATIVE.



Natural Systems Design
+ Coastal Geologic Services



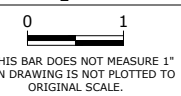
6/18/2024



Susan E. Dickerson-Lange
6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
LOWER CAMAS MEADOWS RESTORATION PROJECT
SITE PLAN 2
FINAL DESIGN

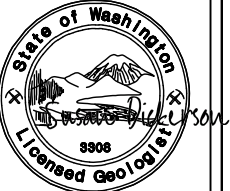
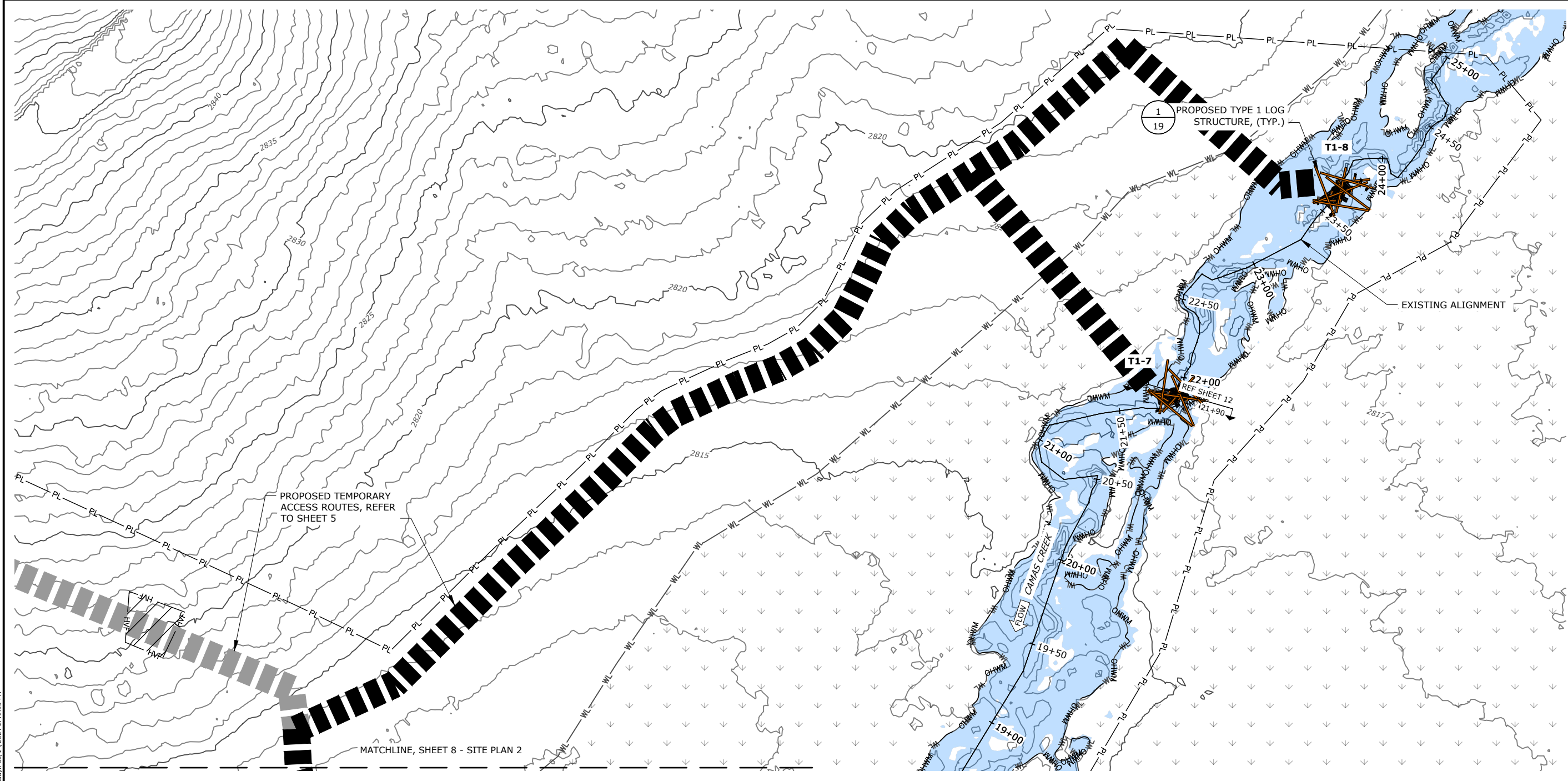
DATE	06/25/2024
COUNTY	CHELAN
LATITUDE	47°28'18"N
LONGITUDE	120°35'14"W
TNS/SG/RS	TJ23/MSJ/RS/BE
DESIGN	JMN
DRAWN	EJL/KS
CHECK	EB
CHECK	JMN



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

SHEET
8 OF 22

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Susan E Dickerson-Lange
6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
LOWER CAMAS MEADOWS RESTORATION PROJECT
SITE PLAN 3
FINAL DESIGN

DATE: 06/25/2024
COUNTY: CHELAN
LATITUDE: 47°28'18"N
LONGITUDE: 120°35'14"W
TMS/CRG: 12306231/618E
DESIGN: JIN DRAWN: ELKS
CHECK: EB CHECK: JIN

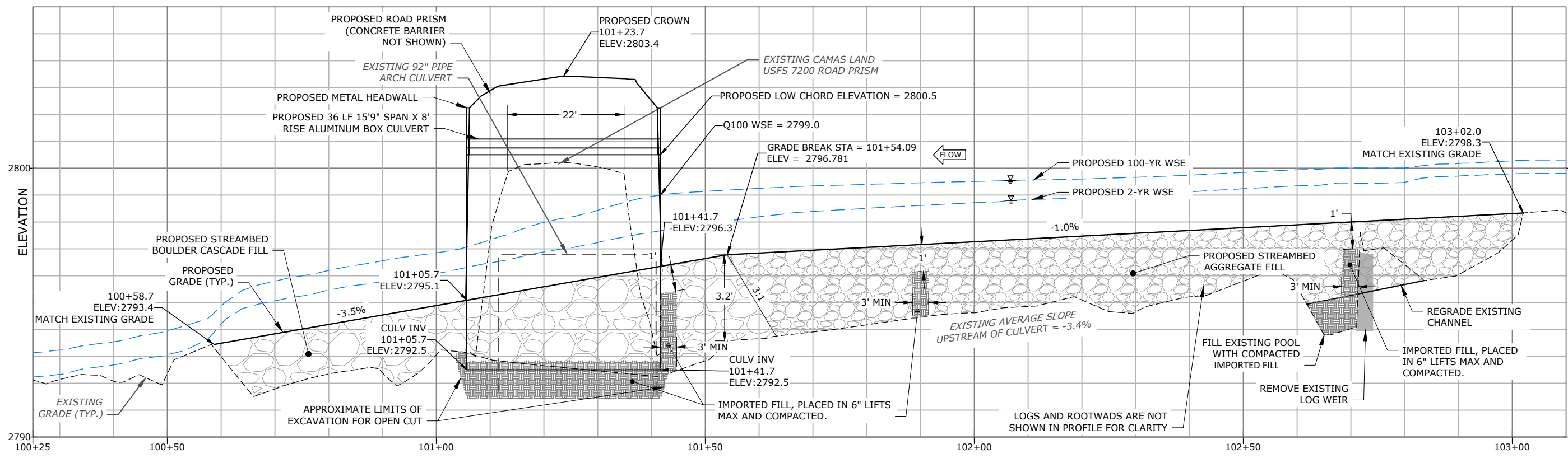
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SHEET
9 OF 22

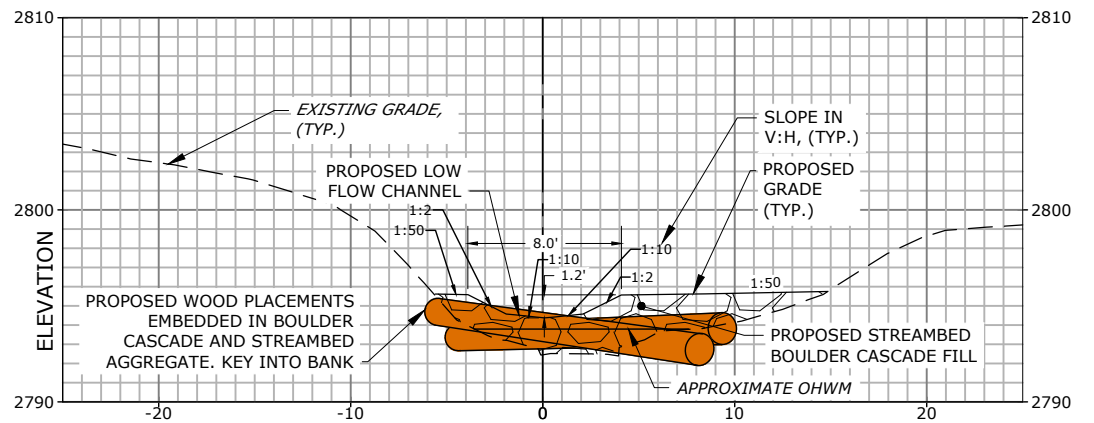
NOTES

1. STRUCTURE LOCATIONS BASED ON 2021 NSD FIELD VISIT AND ARE SUBJECT TO CHANGE BASED ON FIELD DIRECTION FROM ENGINEER AT THE TIME OF CONSTRUCTION
2. TYPE 1 LOG STRUCTURE PLACEMENTS ARE BASED ON EXISTING CHANNEL THALWEG ALIGNMENT. CHANNEL THALWEG ALIGNMENT AND ELEVATION BASED ON NSD SURVEY CONDUCTED IN AUGUST AND OCTOBER 2021. ELEVATIONS ARE BASED ON 2018 LIDAR OTHERWISE.
3. LIMITS OF INUNDATION SHOWN REFLECT MODELED PROPOSED CONDITIONS AT A 2-YEAR FLOOD EVENT (22.6 CFS).
4. REFER TO SHEET 11 FOR CAMAS CREEK CHANNEL PROFILE AND SHEET 12 FOR TYPICAL CHANNEL CROSS SECTIONS.
5. EXCAVATE MEADOW GRASS IN LARGE PATCHES, MIN 2FT X 2FT PATCHES MIN 6" DEPTH (OR AS LARGE AS POSSIBLE) DURING TYPE 1 LOG STRUCTURE INSTALLATION. PLACE ASIDE DURING INSTALLATION, REPLACE UPON COMPLETION. NO MATERIAL TO BE REMOVED FROM THE SITE. ALL MEADOW GRASS PATCHES SHALL BE COVERED WITH CLEAR PLASTIC AFTER REMOVAL (PRIOR TO REPLACEMENT), UNLESS OTHERWISE DIRECTED BY THE ENGINEER OR REPRESENTATIVE.

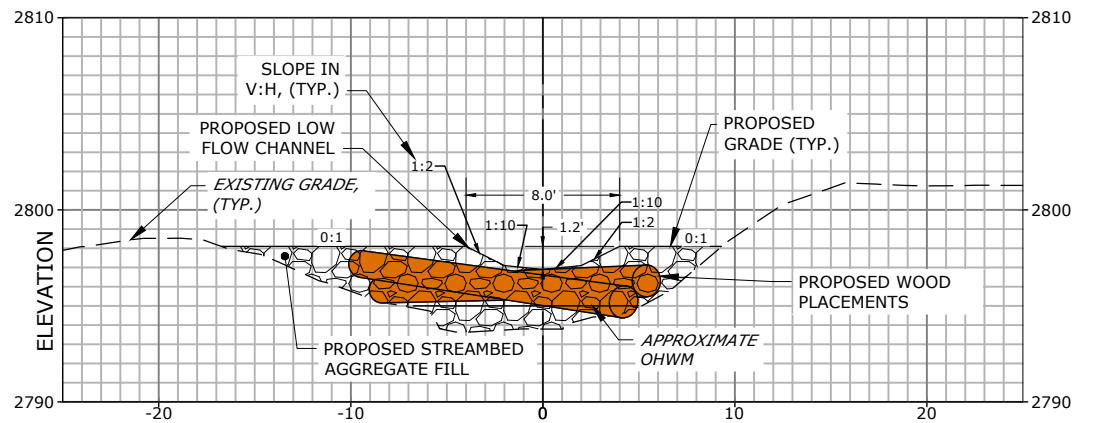
N:\PROJECTS\CCNR\DC\CONRD\98 LOWERCAMASMEADOWS\DESIGN\CAD\OVERVIEW SITE PLAN\DWG\KABRYN_06/14/2024_2:41:15 PM



VALLEY GRADE CONTROL AND CULVERT PROFILE
 HORIZONTAL SCALE: 1" = 10'; VERTICAL SCALE: 1" = 2'



CROSS SECTION - STA. 100+85 (DOWNSTREAM OF CULVERT CROSSING)
 HORIZONTAL SCALE: 1" = 5'; VERTICAL SCALE: 1" = 5'



CROSS SECTION - STA. 101+65 (UPSTREAM OF CULVERT CROSSING)
 HORIZONTAL SCALE: 1" = 5'; VERTICAL SCALE: 1" = 5'

NOTES

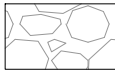
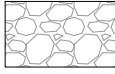
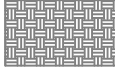
1. PROFILE AND CROSS SECTIONS ON THIS SHEET ARE BASED ON VALLEY GRADE CONTROL AND CULVERT DESIGN ALIGNMENT.
2. PROVIDE MINIMUM CULVERT OPENING OF 12' THROUGHOUT CROSSING. CREATE 8' WIDE BY 1.2' DEEP LOW FLOW CHANNEL THROUGHOUT BOULDER CASCADE GRADE CONTROL EXTENTS. BANKFULL WIDTH IS APPROXIMATELY 8'.
3. REFER TO SHEET 15 FOR PROPOSED ROAD ALIGNMENT AND SHEET 16 FOR CULVERT CROSS SECTIONS.
4. DEPTH OF FILL RANGES FROM 2.3 FT TO 3.5 FT THROUGH THE PROPOSED CULVERT, AVERAGE DEPTH IS 2.9 FT. MINIMUM CALCULATED SCOUR DEPTH REQUIRED IS 1.8 FT.
5. COMPACT NATIVE FILL AND IMPORTED FILL WHERE SHOWN, ACROSS THE FULL WIDTH OF THE CHANNEL. COST FOR FILL PLACEMENT/COMPACTION IS INCIDENTAL TO VALLEY GRADE CONTROL INSTALL OR ROADWAY EXCAVATION.
6. WATER SURFACE PROFILES ARE BASED ON PROPOSED 2-YEAR AND 100-YEAR HYDRAULIC MODELING RESULTS.
7. THE STREAMBED BOULDER CASCADE AND STREAMBED AGGREGATE SHALL BE COMPRISED OF STREAMBED MIXES MEETING THE GRADATIONS IN THE ADJACENT TABLE.
8. STREAMBED BOULDER CASCADE SHALL CONSIST OF STREAMBED SEDIMENT, 10" COBBLES, AND TYPE 1, TYPE 2, AND TYPE 3 STREAMBED BOULDERS IN ACCORDANCE WITH WSDOT 9-03.11. 50% OF THE IMPORTED STREAMBED BOULDERS SHALL BE TYPE 1 AND 50% TYPE 2.
9. STREAMBED AGGREGATE SHALL CONSIST OF STREAMBED SEDIMENT AND 10" COBBLES IN ACCORDANCE WITH WSDOT 9-03.11.
10. EXISTING LARGE BOULDERS EXIST ON SITE AND MAY BE USED TO MEET STREAMBED AGGREGATE SPECIFICATIONS.
11. REFER TO SHEETS 13 AND 22 FOR GUARDRAIL LAYOUT.

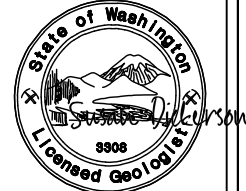
STREAMBED BOULDER CASCADE FILL

% PASSING	DIAMETER (INCHES)
100	30
84	20
65	13
50	8
40	5
30	3
16	1
10	0.3

STREAMBED AGGREGATE FILL

% PASSING	DIAMETER (INCHES)
100	10
84	7
65	5
50	3
40	2
30	1
16	0.25
10	0.11

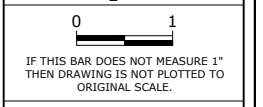
 STREAMBED BOULDER CASCADE FILL
 STREAMBED AGGREGATE FILL
 COMPACTED NATIVE MATERIAL



Susan E. Dickerson-Lange
6/18/2024

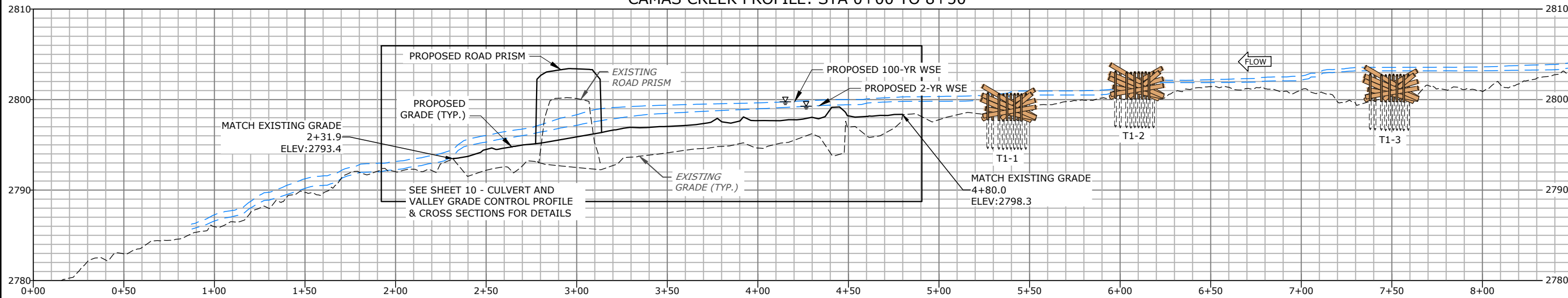
CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
 LOWER CAMAS MEADOWS RESTORATION PROJECT
 CULVERT AND VALLEY GRADE CONTROL
 PROFILE & CROSS SECTIONS
 FINAL DESIGN

DATE: 06/25/2024
 COUNTY: CHELAN
 LATITUDE: 47°28'18"N
 LONGITUDE: 120°35'14"W
 TMS/SG/RS: T23N05E14R08E
 DESIGN: JIN DRAWN: ELKS
 CHECK: EB CHECK: MIN

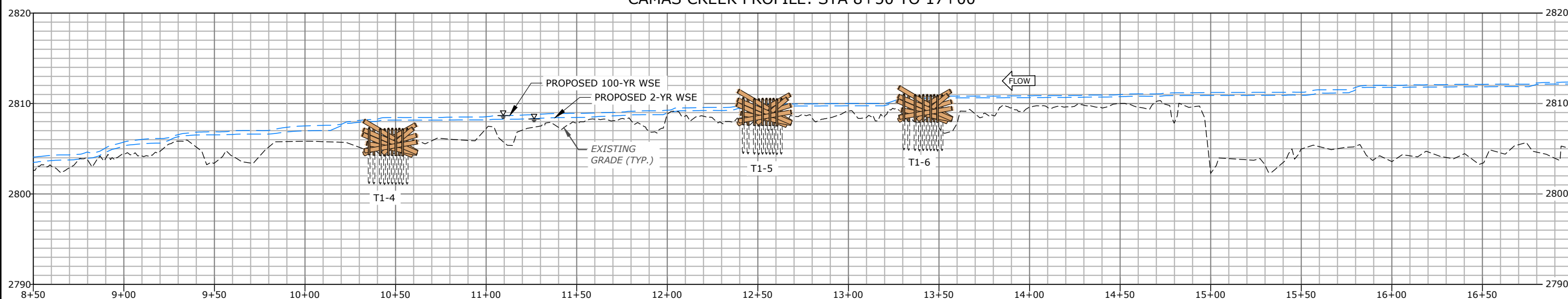


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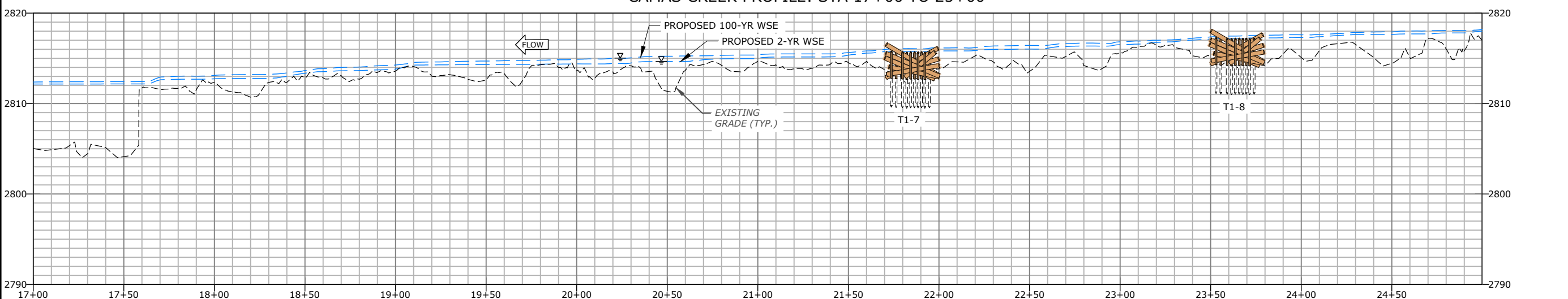
CAMAS CREEK PROFILE: STA 0+00 TO 8+50



CAMAS CREEK PROFILE: STA 8+50 TO 17+00

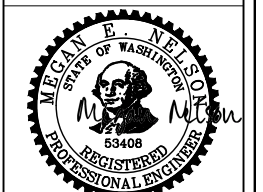
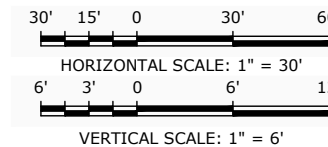


CAMAS CREEK PROFILE: STA 17+00 TO 25+00



NOTES

1. PROFILES ON THIS SHEET ARE BASED ON EXISTING ALIGNMENT. CHANNEL THALWEG ALIGNMENT AND ELEVATION BASED ON NSD SURVEY CONDUCTED IN AUGUST AND OCTOBER 2021.
2. STRUCTURE LOCATIONS ARE BASED ON 2021 NSD FIELD VISIT AND ARE SUBJECT TO CHANGE BASED ON FIELD DIRECTION FROM ENGINEER AT TIME OF CONSTRUCTION.



Susan E Dickerson-Lange
6/18/2024

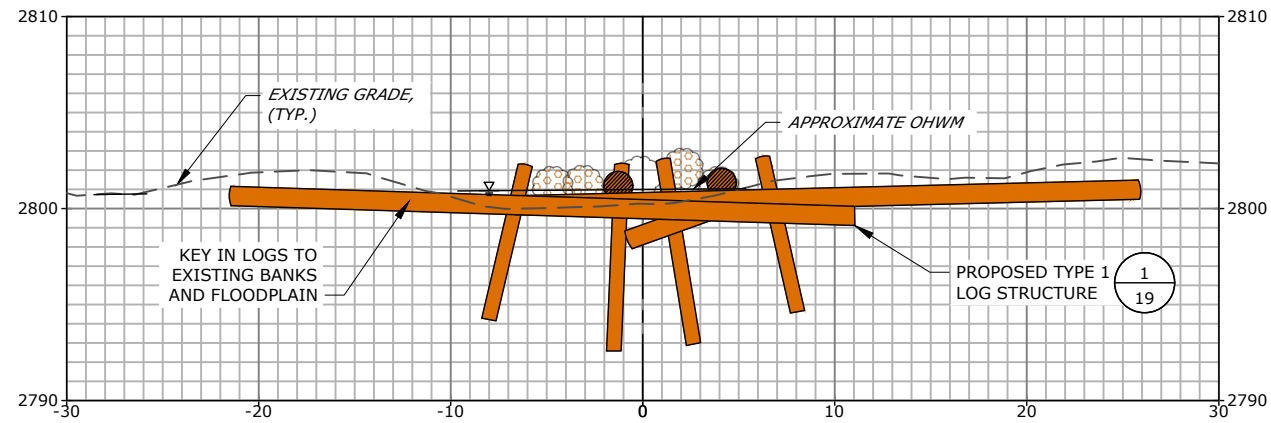
CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
LOWER CAMAS MEADOWS RESTORATION PROJECT
CAMAS CREEK PROFILE

FINAL DESIGN

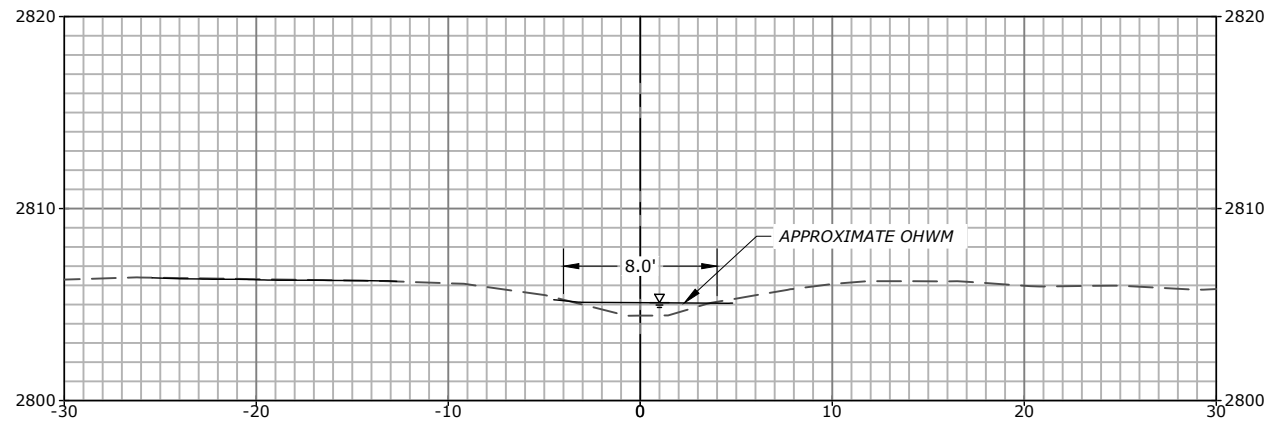
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COUNTY	CHELAN
LATITUDE	47°28'18"N
LONGITUDE	120°35'14"W
TN/SG/RG	T23N/S21/R18E
DESIGN	JEN
DRAWN	EJL/KS
CHECK	EB
CHECK	MIN

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

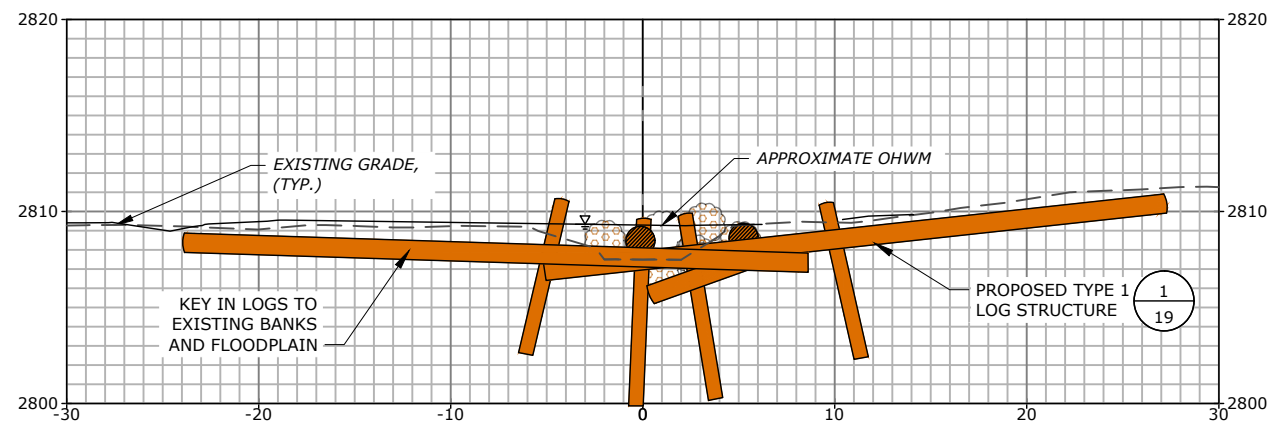
N:\PROJECTS\CCNR\DC\CONRD\98 LOWERCAMASMEADOWS\DESIGN\CAD\PLAN PROFILE ALT2.DWG KariVr 06/14/2024 2:41:53 PM



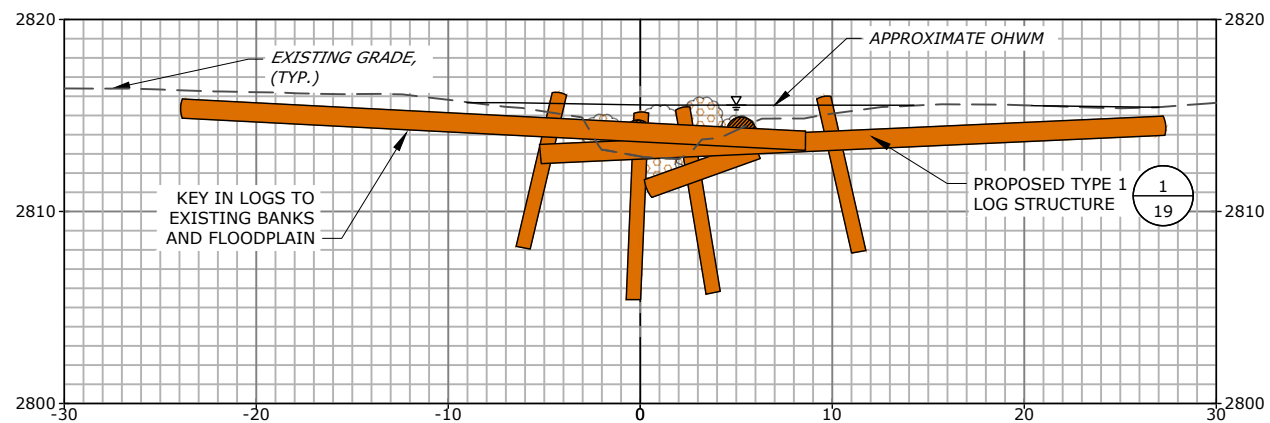
TYPE 1 LOG STRUCTURE CROSS SECTION - STA. 6+10
HORIZONTAL SCALE: 1" = 5'; VERTICAL SCALE: 1" = 5'



TYPICAL CROSS SECTION - STA. 9+00
HORIZONTAL SCALE: 1" = 5'; VERTICAL SCALE: 1" = 5'



TYPE 1 LOG STRUCTURE CROSS SECTION - STA. 12+60
HORIZONTAL SCALE: 1" = 5'; VERTICAL SCALE: 1" = 5'



TYPE 1 LOG STRUCTURE CROSS SECTION - STA. 21+90
HORIZONTAL SCALE: 1" = 5'; VERTICAL SCALE: 1" = 5'

NOTES

1. CROSS SECTIONS ON THIS SHEET ARE BASED ON EXISTING ALIGNMENT.
2. ALL CROSS SECTIONS TAKEN FACING DOWNSTREAM.
3. EXACT LOG ALIGNMENTS AND ANGLES WILL BE FIELD-FIT, DIRECTED BY THE ENGINEER OR REPRESENTATIVE.

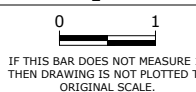
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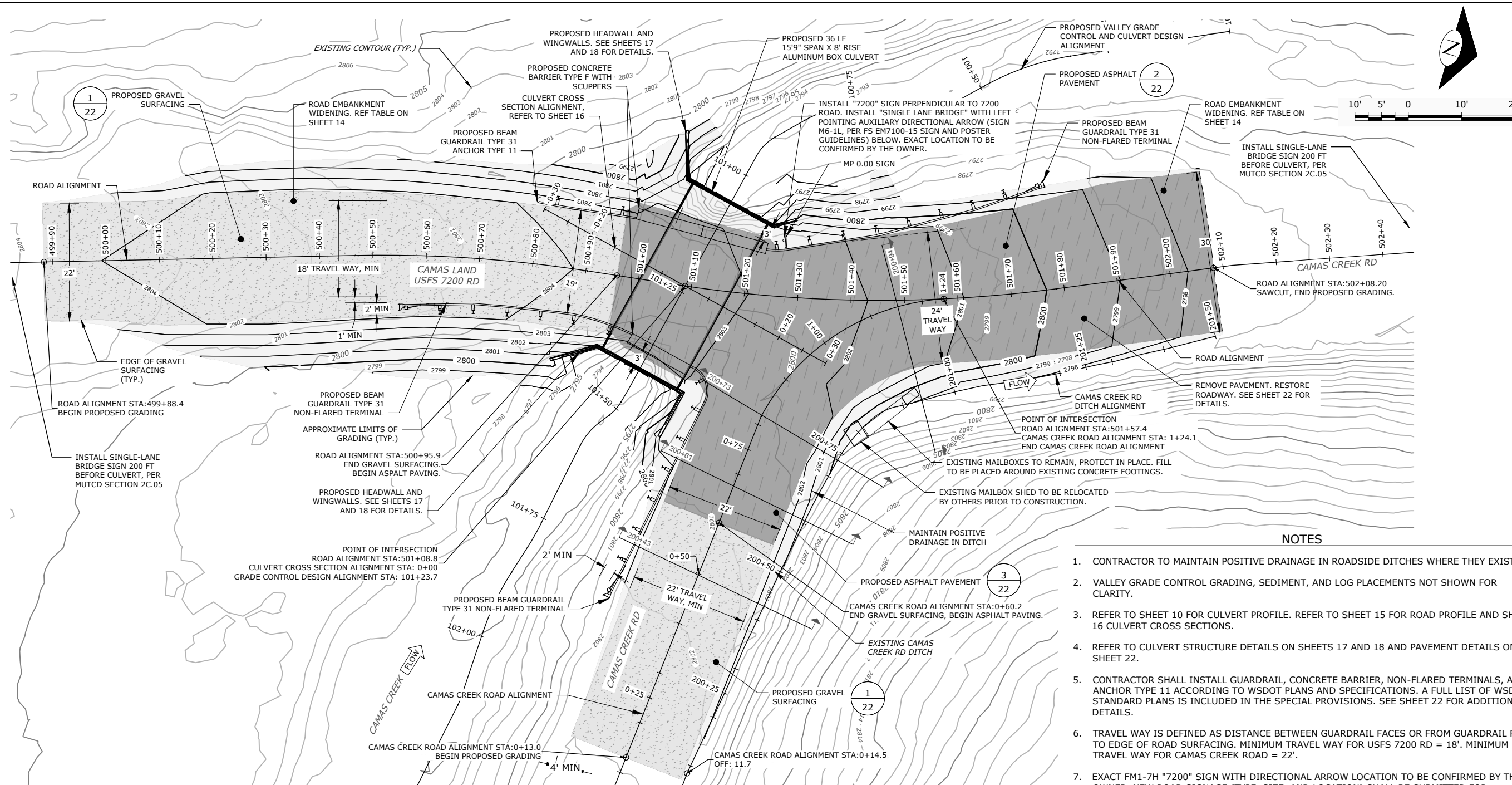


Susan E Dickerson-Lange
6/18/2024

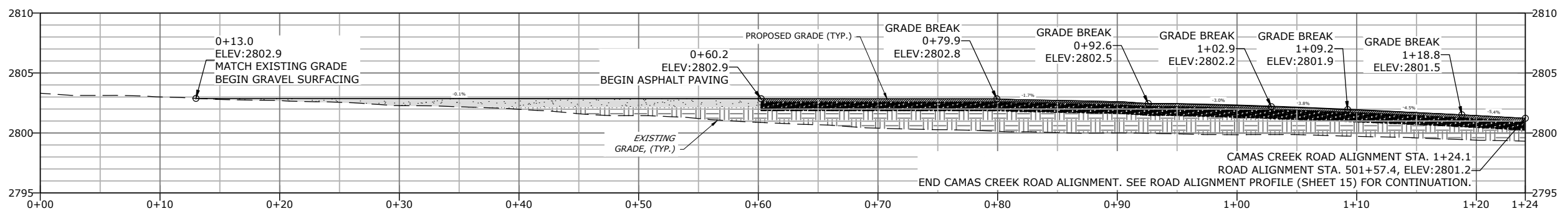
CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
LOWER CAMAS MEADOWS RESTORATION PROJECT
CHANNEL CROSS-SECTIONS
FINAL DESIGN

DATE 06/25/2024
COUNTY CHELAN
LATITUDE 47°28'18"N
LONGITUDE 120°35'14"W
TMS/SG/RG T23N/52E/16.8BE
DESIGN_MRN DRAWN_ELR/KS
CHECK_EB CHECK_MN





ROAD GRADING - PLAN VIEW
HORIZONTAL SCALE: 1" = 10'



CAMAS CREEK RD PROFILE
HORIZONTAL SCALE: 1" = 5'; VERTICAL SCALE: 1" = 5'

- NOTES**
1. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE IN ROADSIDE DITCHES WHERE THEY EXIST.
 2. VALLEY GRADE CONTROL GRADING, SEDIMENT, AND LOG PLACEMENTS NOT SHOWN FOR CLARITY.
 3. REFER TO SHEET 10 FOR CULVERT PROFILE. REFER TO SHEET 15 FOR ROAD PROFILE AND SHEET 16 CULVERT CROSS SECTIONS.
 4. REFER TO CULVERT STRUCTURE DETAILS ON SHEETS 17 AND 18 AND PAVEMENT DETAILS ON SHEET 22.
 5. CONTRACTOR SHALL INSTALL GUARDRAIL, CONCRETE BARRIER, NON-FLARED TERMINALS, AND ANCHOR TYPE 11 ACCORDING TO WSDOT PLANS AND SPECIFICATIONS. A FULL LIST OF WSDOT STANDARD PLANS IS INCLUDED IN THE SPECIAL PROVISIONS. SEE SHEET 22 FOR ADDITIONAL DETAILS.
 6. TRAVEL WAY IS DEFINED AS DISTANCE BETWEEN GUARDRAIL FACES OR FROM GUARDRAIL FACE TO EDGE OF ROAD SURFACING. MINIMUM TRAVEL WAY FOR USFS 7200 RD = 18'. MINIMUM TRAVEL WAY FOR CAMAS CREEK ROAD = 22'.
 7. EXACT FM1-7H "7200" SIGN WITH DIRECTIONAL ARROW LOCATION TO BE CONFIRMED BY THE OWNER. NEW ROAD SIGNAGE (TYPE, SIZE, AND LOCATION) SHALL BE SUBMITTED FOR APPROVAL PRIOR TO INSTALLATION.
 8. REMOVE AND REPLACE ANY ROADWAY SIGNAGE AS NECESSARY.

	CRUSHED SURFACING BASE COURSE
	HMA 1 1/2" IN. PG 64-28
	PROPOSED GRAVEL SURFACING
	PROPOSED ASPHALT PAVEMENT
	EXTENTS OF PROPOSED ROAD FILL
	NATIVE FILL OR IMPORTED FILL

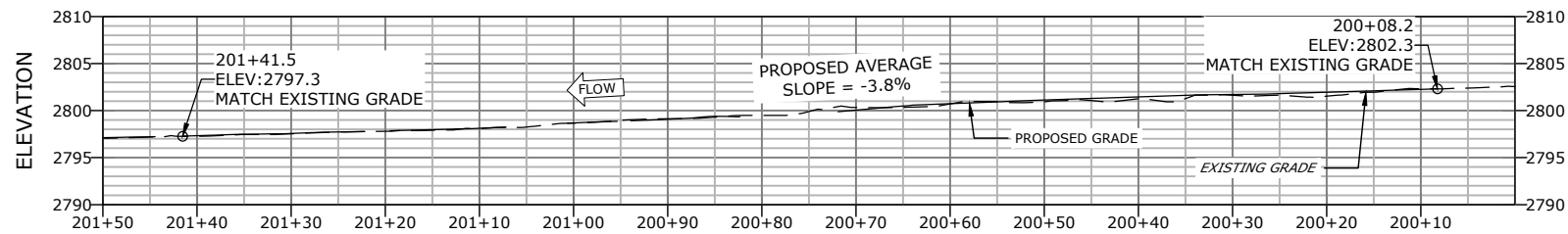


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6/18/2024

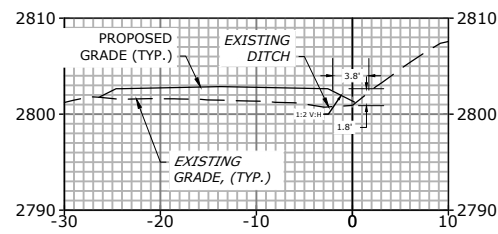
CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
LOWER CAMAS MEADOWS RESTORATION PROJECT
ROAD GRADING PLAN
FINAL DESIGN

DATE: 06/25/2024	COUNTY: CHELAN	LATITUDE: 47°28'18"N	LONGITUDE: 120°35'14"W	TNS/SG/NG: T23N/S21E/R3BE	DESIGN: MIN	DRAWN: ELKJS	CHECK: MIN
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SHEET							
13 OF 22							

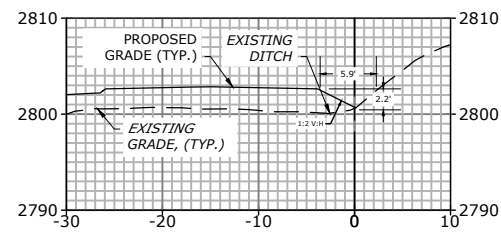
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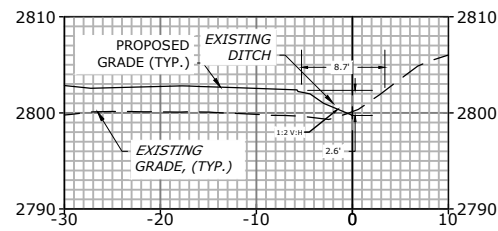
CAMAS CREEK RD DITCH PROFILE
HORIZONTAL SCALE: 1" = 10'; VERTICAL SCALE: 1" = 10'



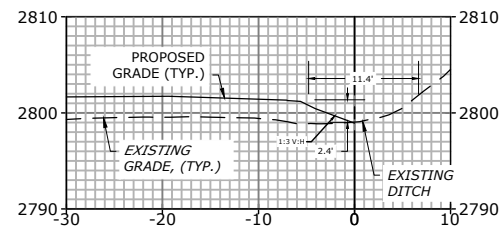
DITCH CROSS SECTION - STA. 200+43
HORIZONTAL SCALE: 1" = 10'; VERTICAL SCALE: 1" = 10'



DITCH CROSS SECTION - STA. 200+61
HORIZONTAL SCALE: 1" = 10'; VERTICAL SCALE: 1" = 10'



DITCH CROSS SECTION - STA. 200+73
HORIZONTAL SCALE: 1" = 10'; VERTICAL SCALE: 1" = 10'



DITCH CROSS SECTION - STA. 200+94
HORIZONTAL SCALE: 1" = 10'; VERTICAL SCALE: 1" = 10'

ROAD EMBANKMENT WIDENING TABLE

ALIGNMENT	STATION	OFFSET (EDGE OF ROAD SURFACING)	OFFSET (GUARDRAIL FACE)	NOTE
ROAD ALIGNMENT	499+98.9	11' R	N/A	BEGIN EMBANKMENT WIDENING
ROAD ALIGNMENT	500+10.9	12.25' R	7' R	END EMBANKMENT WIDENING
ROAD ALIGNMENT	500+29.9	12.25' R	7' R	BEGIN EMBANKMENT TAPER
ROAD ALIGNMENT	500+59.9	11' R	7' R	END EMBANKMENT TAPER, MATCH TYPICAL SECTION
ROAD ALIGNMENT	500+07.6	11' L	7' L	BEGIN EMBANKMENT WIDENING
ROAD ALIGNMENT	500+19.6	12.25' L	7' L	END EMBANKMENT WIDENING
ROAD ALIGNMENT	500+38.6	12.25' L	7' L	BEGIN EMBANKMENT TAPER
ROAD ALIGNMENT	500+68.6	11' L	7' L	END EMBANKMENT TAPER, MATCH TYPICAL SECTION
ROAD ALIGNMENT	501+45.0	12' L	8' L	BEGIN EMBANKMENT WIDENING, BEGIN GUARDRAIL OFFSET
ROAD ALIGNMENT	501+89.4	18.25' L	12.33' L	END EMBANKMENT WIDENING, END GUARDRAIL OFFSET
ROAD ALIGNMENT	502+08.0	18.25' L	N/A	END ROAD IMPROVEMENTS

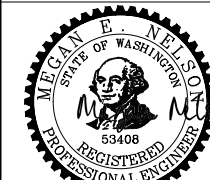
1. REFER TO WSDOT STANDARD PLAN C22.45-06 FOR DETAILS.

NOTES

1. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE IN ROADSIDE DITCHES WHERE THEY EXIST.
2. VALLEY GRADE CONTROL GRADING, SEDIMENT, AND LOG PLACEMENTS NOT SHOWN FOR CLARITY.
3. REFER TO SHEET 10 FOR CULVERT PROFILE. REFER TO SHEET 15 FOR ROAD PROFILE AND CULVERT CROSS SECTION.
4. REFER TO CULVERT STRUCTURE DETAILS ON SHEETS 17 AND 18 AND PAVEMENT DETAILS ON SHEET 22.



6/18/2024



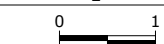
Susan E. Dickerson-Lange

6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
LOWER CAMAS MEADOWS RESTORATION PROJECT
DITCH PROFILE AND CROSS SECTIONS

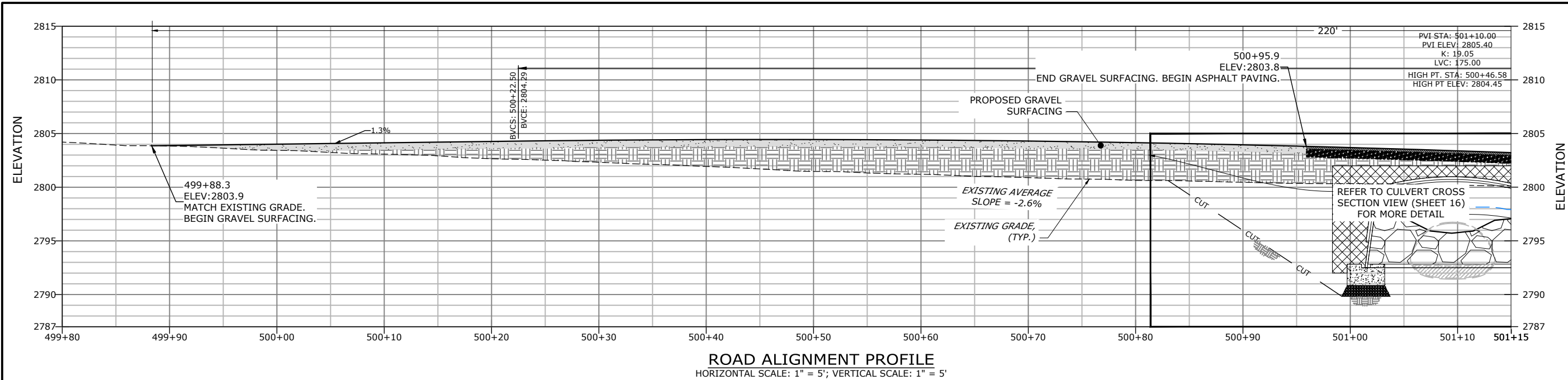
FINAL DESIGN

DATE: 06/25/2024
COUNTY: CHELAN
LATITUDE: 47°28'18"N
LONGITUDE: 120°35'14"W
TIN/SG/RG: T23N/S21/R18E
DESIGN: MN DRAWN: ELKS
CHECK: EB CHECK: MN

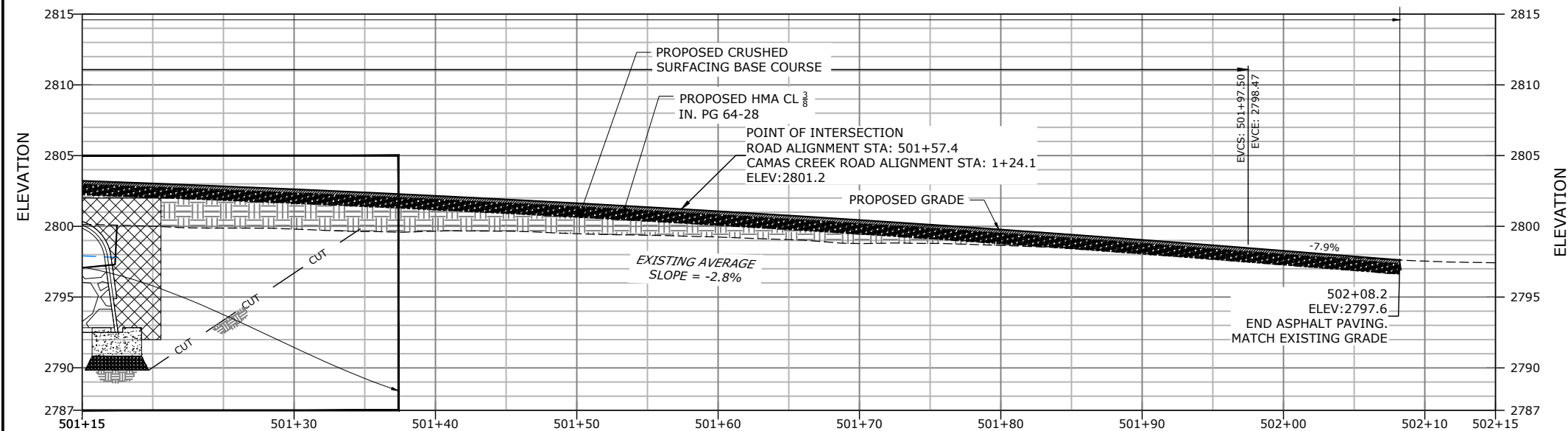


IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.

SHEET
14 OF 22



ROAD ALIGNMENT PROFILE
HORIZONTAL SCALE: 1" = 5'; VERTICAL SCALE: 1" = 5'

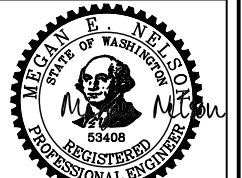


ROAD ALIGNMENT PROFILE - CONTINUED
HORIZONTAL SCALE: 1" = 5'; VERTICAL SCALE: 1" = 5'

NOTES

1. PROFILES SHOWN ON THIS SHEET ARE BASED OFF OF THE PROPOSED ROAD ALIGNMENT. PROPOSED ROAD ALIGNMENT IS PLACED AT THE MIDPOINT OF THE PROPOSED CULVERT AND CROSSES THE GRADE CONTROL DESIGN ALIGNMENT AT STA. 101+23.7. REFER TO SHEET 13 FOR PROPOSED CAMAS CREEK ROAD PROFILE. CAMAS CREEK ROAD ALIGNMENT STA. 1+24.1 = ROAD ALIGNMENT STA. 501+57.4.
2. INSTALL CULVERT PER CULVERT STRUCTURE SHEET. STRUCTURE PROVIDE S MINIMUM CULVERT OPENING OF 12' THROUGHOUT CROSSING. CREATE 8' WIDE BY 1.2' DEEP LOW FLOW CHANNEL THROUGHOUT BOULDER CASCADE GRADE CONTROL EXTENTS. BANKFULL WIDTH IS APPROXIMATELY 8'.
3. REFER TO PROPOSED GRADING ON SHEETS 10 AND 13.
4. PROPOSED DESIGN INCLUDES 1.5-FT CLEARANCE BETWEEN THE 100-YR WSE AND THE LOW CHORD OF THE CULVERT.
5. REFER TO CULVERT CROSS SECTION ON SHEET 16, CULVERT STRUCTURE DETAILS ON SHEET 17, AND PAVEMENT DETAILS ON SHEET 22.

	STREAMBED BOULDER CASCADE FILL		PRECAST CONCRETE FOOTING		CRUSHED SURFACING BASE COURSE
	STREAMBED AGGREGATE FILL		CULVERT BEDDING MATERIAL		HMA CL 3/4 IN. PG 64-28
	GRAVEL SURFACING		UNDISTURBED NATIVE SOIL		NATIVE FILL OR IMPORTED FILL
	GRANULAR STRUCTURAL BACKFILL				



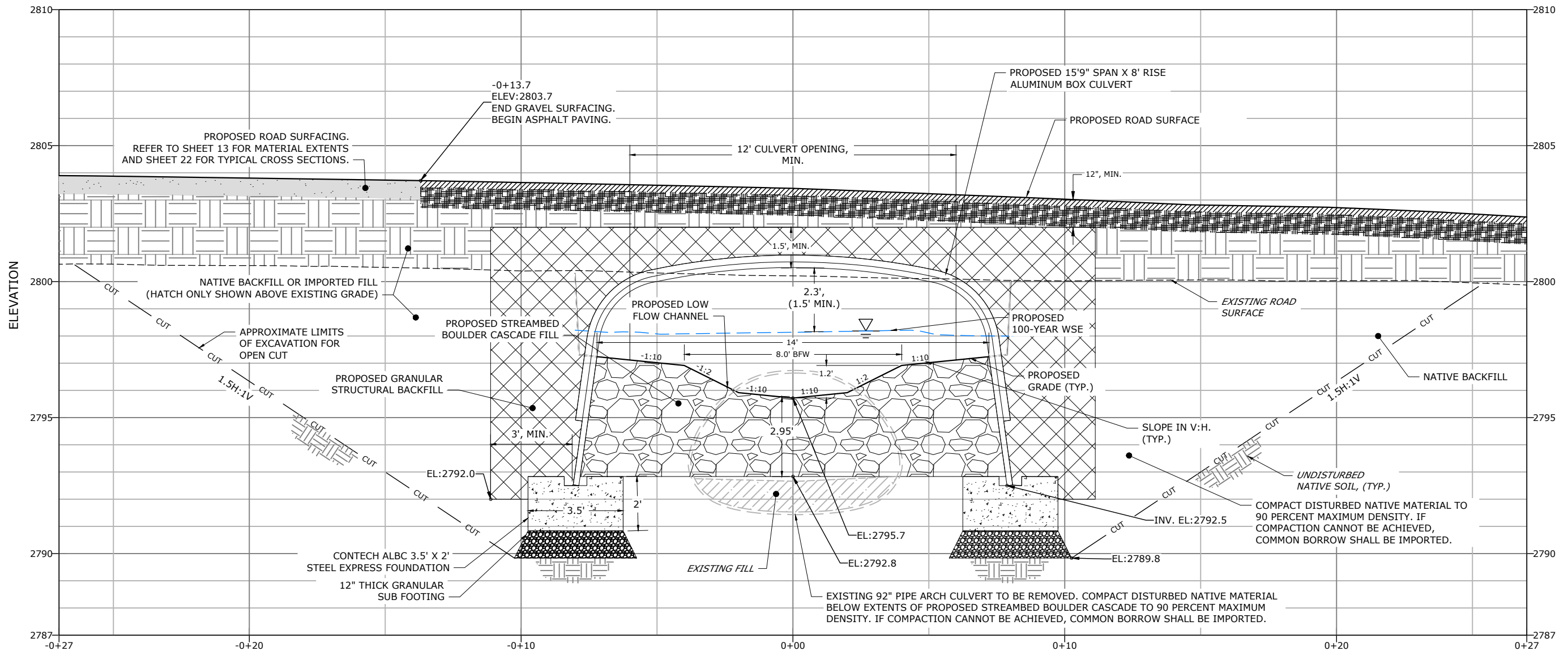
Susan E. Dickerson-Lange
6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
LOWER CAMAS MEADOWS RESTORATION PROJECT
ROAD PROFILE
FINAL DESIGN

DATE: 06/25/2024
COUNTY: CHELAN
LATITUDE: 47°28'18"N
LONGITUDE: 120°35'14"W
TNS/SG/RG: T23N/35E/1/8/18E
DESIGN: MN DRAWN: ELKS
CHECK: EB CHECK: MN

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

SHEET
15 OF 22

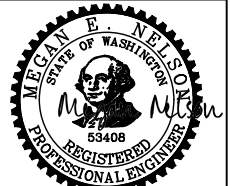


CULVERT CROSS SECTION VIEW
 HORIZONTAL SCALE: 1" = 2'; VERTICAL SCALE: 1" = 2'

NOTES

- CROSS SECTION SHOWN ON THIS SHEET IS BASED OFF OF CULVERT CROSS SECTION ALIGNMENT. CULVERT CROSS SECTION IS PLACED AT THE MIDPOINT OF THE PROPOSED CULVERT AND CROSSES THE ROAD ALIGNMENT AT STA. 501+08.8 AND GRADE CONTROL DESIGN ALIGNMENT AT STA. 101+23.7. REFER TO SHEET 13.
- PROVIDE MINIMUM CULVERT OPENING OF 12' THROUGHOUT CROSSING. CREATE 8' WIDE BY 1.2' DEEP LOW FLOW CHANNEL THROUGHOUT BOULDER CASCADE GRADE CONTROL EXTENTS. BANKFULL WIDTH IS APPROXIMATELY 8'.
- REFER TO PROPOSED GRADING ON SHEETS 10 AND 13 AND PROPOSED ROAD PROFILE ON SHEET 15.
- PROPOSED DESIGN INCLUDES 1.5-FT CLEARANCE BETWEEN THE 100-YR WSE AND THE LOW CHORD OF THE CULVERT.
- REFER TO CULVERT STRUCTURE DETAILS ON SHEET 17 AND 18 AND PAVEMENT DETAILS ON SHEET 22.

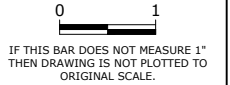
	STREAMBED BOULDER CASCADE FILL		PRECAST CONCRETE FOOTING		CRUSHED SURFACING BASE COURSE
	STREAMBED AGGREGATE FILL (NOT PRESENT IN XS)		CULVERT BEDDING MATERIAL		UNDISTURBED NATIVE SOIL
	GRAVEL SURFACING		NATIVE FILL OR IMPORTED FILL		
	GRANULAR STRUCTURAL BACKFILL				



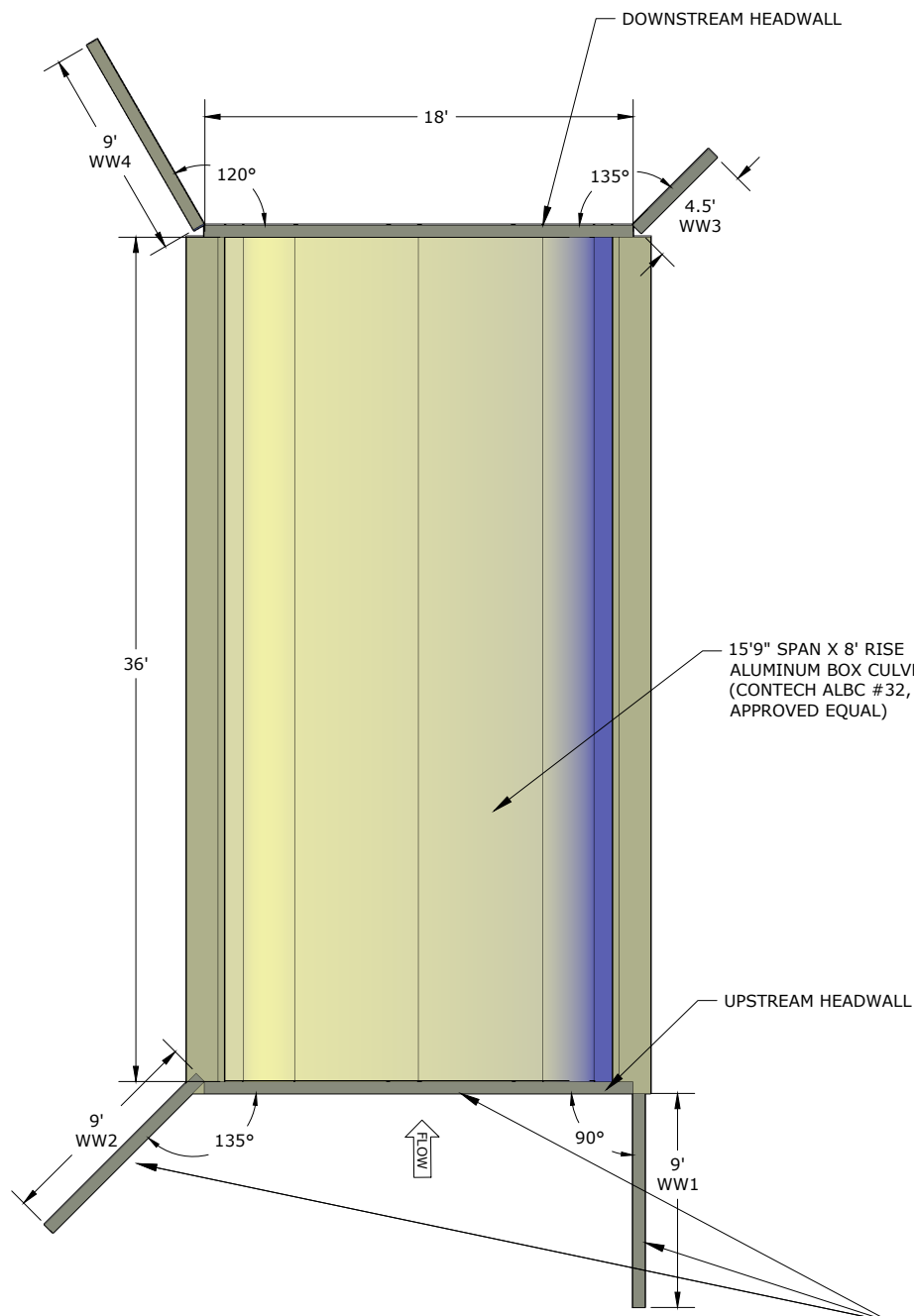
Susan E. Dickerson-Lange
6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
 LOWER CAMAS MEADOWS RESTORATION PROJECT
CULVERT CROSS-SECTION
 FINAL DESIGN

DATE: 06/25/2024
 COUNTY: CHELAN
 LATITUDE: 47°28'18"N
 LONGITUDE: 120°35'14"W
 TMS/SG/RG: T23N/62W/R18E
 DESIGN: MN DRAWN: EL,KS
 CHECK: EB CHECK: MN



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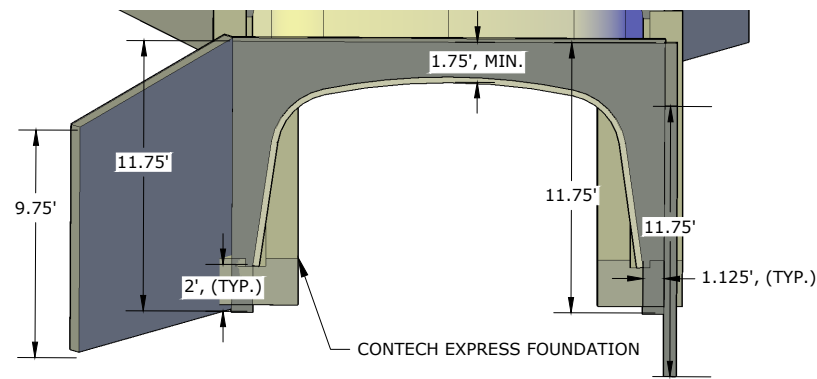
CULVERT, HEADWALL, & WINGWALL PLAN VIEW

SCALE: 1"=4'

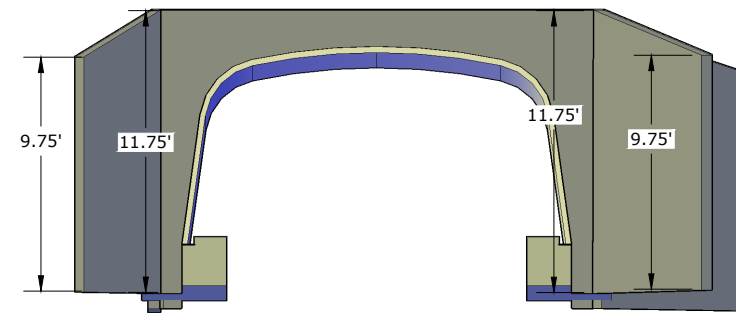


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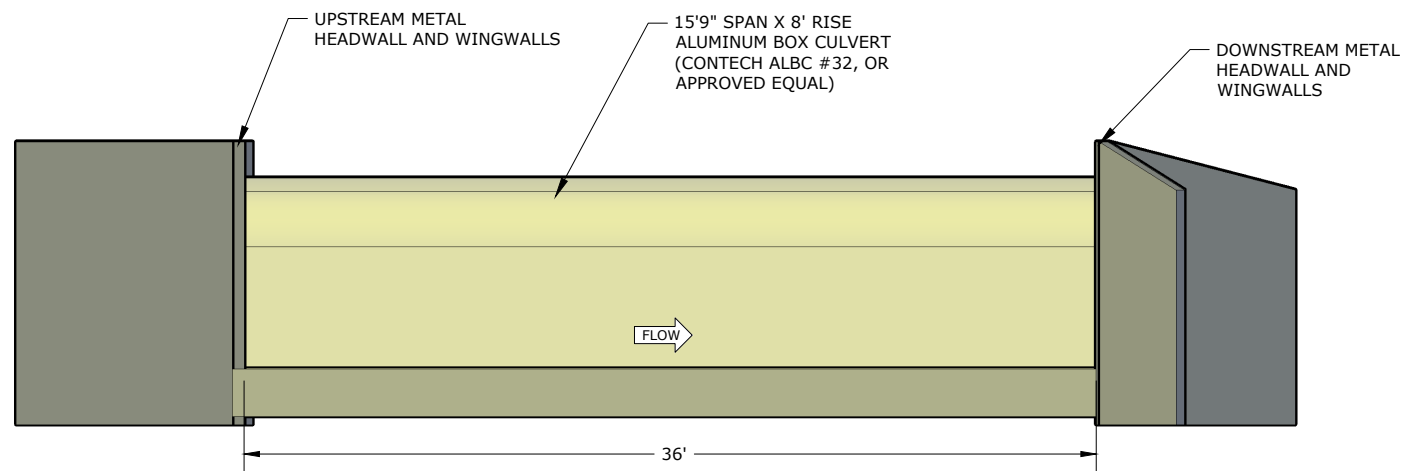
1. DIMENSIONS SHOWN ARE BASED ON CONTECH 15'9" SPAN X 8' RISE ALUMINUM BOX CULVERT (ALBC #32) WITH METAL HEADWALL AND WINGWALLS. CULVERT FOOTING SHALL BE CONTECH EXPRESS FOUNDATION OR APPROVED EQUAL.
2. CONTRACTOR TO SUBMIT WORKING DRAWINGS FOR CULVERT, HEADWALL, WINGWALLS. AND FOUNDATION TO OWNER FOR REVIEW AND APPROVAL.
3. REFER TO DETAILS ON SHEET 18 FOR HEADWALL AND WINGWALL CONNECTION DETAILS.
4. ALL DETAILS PROVIDED BY CONTECH (NOT DESIGNED BY NSD). PROVIDED FOR STRUCTURAL DETAIL REFERENCE. CULVERT SHALL MEET THE DESIGN CRITERIA AND SIZING PRESENTED IN THESE PLANS. ALL MATERIALS RELATED TO TEH CULVERT SHALL MEET MANUFACTURER'S REQUIREMENTS.



UPSTREAM HEADWALL, & WINGWALL ISOMETRIC VIEW
NTS



DOWNSTREAM HEADWALL, & WINGWALL ISOMETRIC VIEW
NTS



CULVERT, HEADWALL, & WINGWALL PROFILE VIEW

SCALE: 1"=4'



Natural Systems Design
+ Coastal Geologic Services



6/18/2024



Susan E. Dickerson-Lange

6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT

LOWER CAMAS MEADOWS RESTORATION PROJECT

CULVERT STRUCTURE DETAILS

FINAL DESIGN

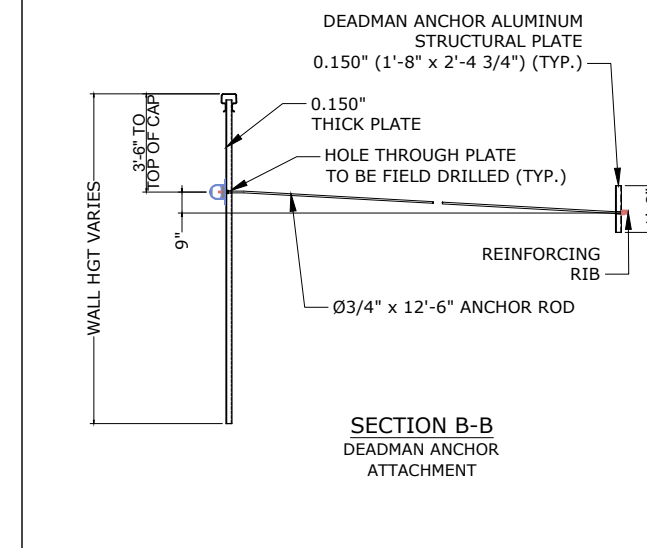
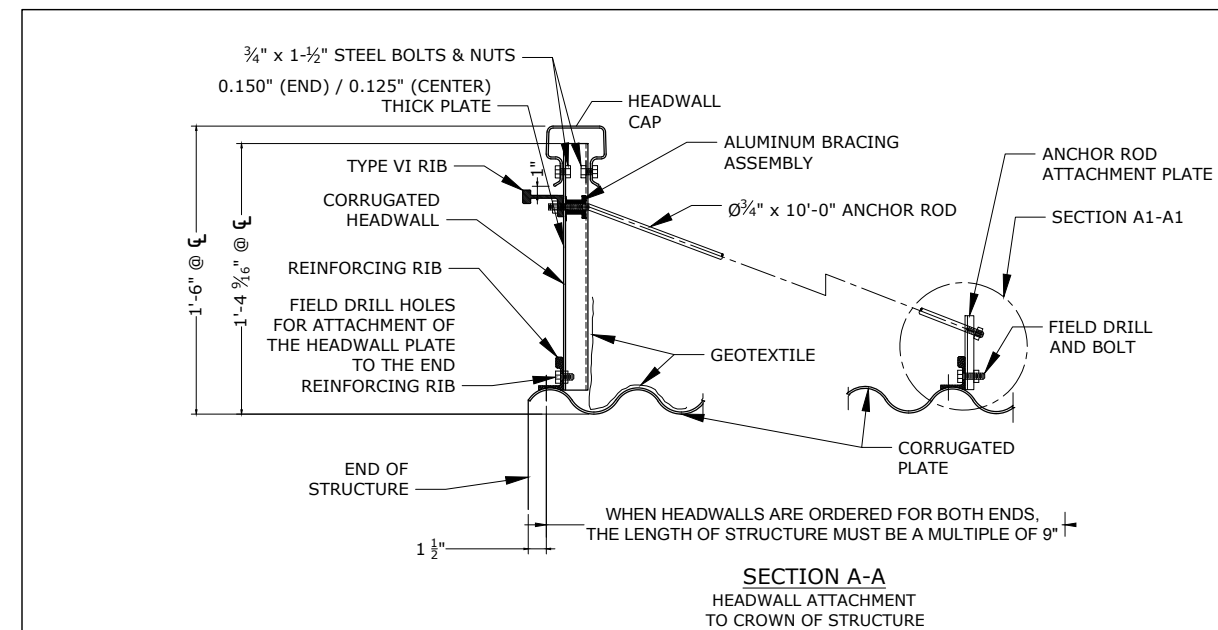
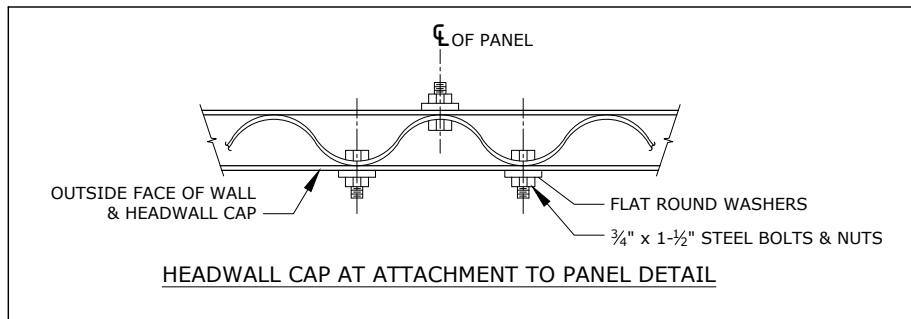
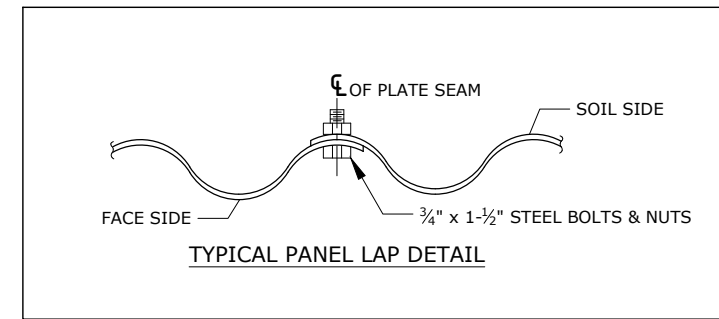
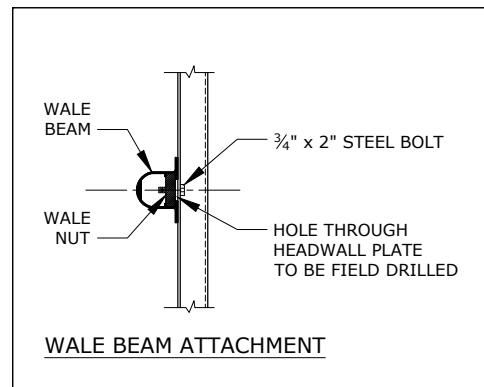
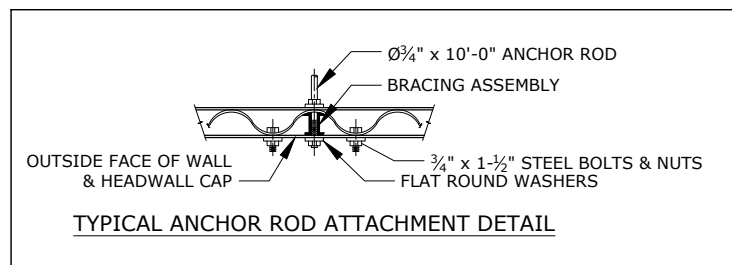
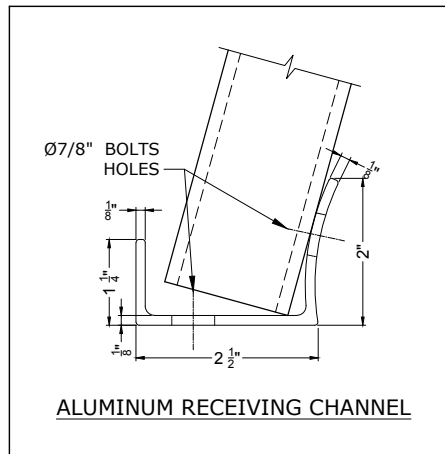
DATE	06/25/2024
COUNTY	CHELAN
LATITUDE	47°28'18"N
LONGITUDE	120°35'14"W
TMS/CRG	T23N62W/618E
DESIGN	MIN. DRAWN_EJL:KS
CHECK	EB. CHECK_MIN.



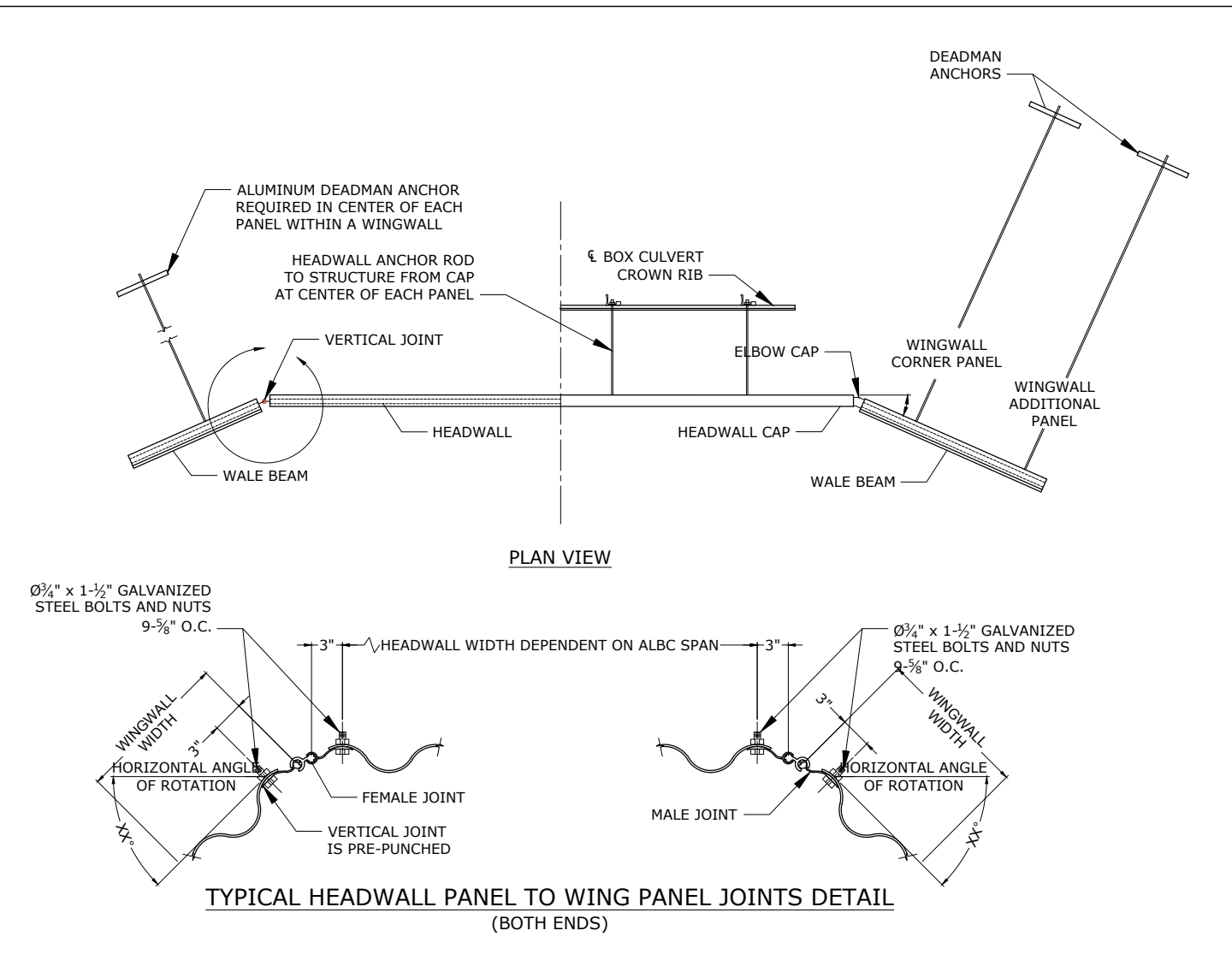
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT PLOTTED TO ORIGINAL SCALE.

SHEET

17 OF 22



- NOTES:**
- 1) REVERSE CROWN RIB FOR PROPER ANCHOR ROD ATTACHMENT PLATE ORIENTATION.
 - 2) NO SPLICE PLATES ARE USED FOR THE TYPE IV REINFORCING RIBS ATTACHED TO THE CORRUGATED HEADWALL.
 - 3) REINFORCING RIB AT EACH END OF STRUCTURE MUST BE ORIENTED SUCH THAT THE HEADWALL CAN BE PLACE BEHIND THEM AS SHOWN.
 - 4) MINIMUM TOE DEPTH OF HEADWALL IS 24 INCHES.
 - 5) IF HEADWALL HEIGHT > 24 INCHES, A SPECIAL HEADWALL DETAIL IS REQUIRED.



HEADWALL AND WINGWALL CONNECTION DETAILS

NTS



Susan E Dickerson-Lange

6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
 LOWER CAMAS MEADOWS RESTORATION PROJECT
HEADWALL AND WINGWALL CONNECTION DETAILS
 FINAL DESIGN

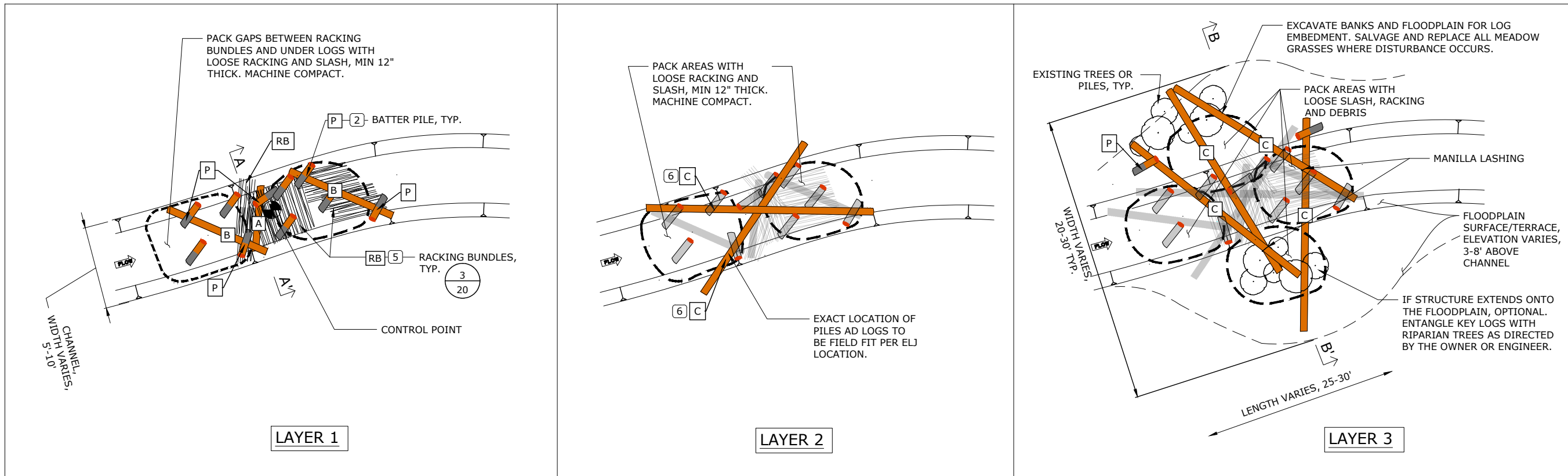
DATE 06/25/2024
 COUNTY CHELAN
 LATITUDE 47°28'18"N
 LONGITUDE 120°35'14"W
 TMS/SG/RG T28N/52W/R18E
 DESIGN_MN DRAWN_EJL:KS
 CHECK_EB CHECK_MN

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

SHEET
 18 OF 22

1. THESE HEADWALL AND WINGWALL CONNECTION DETAILS, IN ADDITION TO THE CULVERT STRUCTURE DETAILS, HAVE BEEN PROVIDED BY CONTECH AND ARE FOR REFERENCE ONLY.
2. THE NEW CULVERT STRUCTURE (INCLUDING WINGWALLS, ANCHORING, HEADWALLS) AND FOUNDATION/FOOTING DESIGN AND COMPONENTS SHALL MEET THE SPECIFICATIONS OUTLINED IN THE EXAMPLE REFERENCE DRAWINGS (APPENDIX E IN THE SPECIAL PROVISIONS/BID PACKAGE) FROM CONTECH OR EQUIVALENT/APPROVED CULVERT MANUFACTURER.
3. THE CONTRACTOR IS REQUIRED TO PROVIDE SHOP DRAWINGS/DETAILS ON CULVERT AND MANUFACTURER OF THEIR CHOICE. THE CULVERT STRUCTURE DESIGN MUST MEET THE DESIGN CRITERIA LISTED IN THE GEOTECHNICAL REPORT AND THIS PLAN SET.

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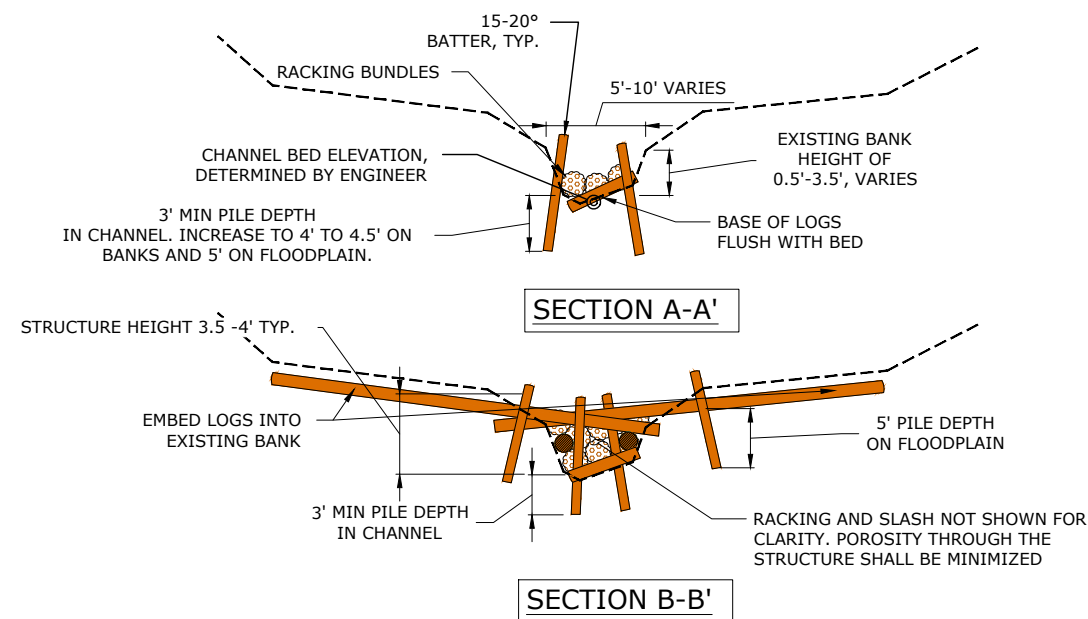
NOTES

- ACTUAL LAYERING WILL VARY TO SUIT FIELD CONDITIONS. THE ENGINEER OR OWNER SHALL DIRECT THE LAYERING. SEQUENCE 1 AND 2 ARE CRITICAL.
- PILES SHALL BE DRIVEN IN PLACE (NO EXCAVATION). PILES SHALL BATTER 15-20 DEG FROM VERTICAL AND "TRAP" SURROUNDING LOGS. ENTANGLEMENT WITH RIPARIAN TREES IS PREFERRED TO BATTER PILE INSTALLATION. THE OWNER OR ENGINEER SHALL SPECIFY HOW TO ENTANGLE LOGS WITH RIPARIAN TREES. ADDITIONAL LOGS AND PILES OR ENTANGLEMENT MAY BE DIRECTED BY THE ENGINEER OR OWNER FOR STRUCTURE STABILITY.
- LOG LENGTHS WILL VARY AND BE CUT IN PLACE TO FIT STRUCTURE DIMENSIONS PER OWNER OR ENGINEER. CUT ENDS SHALL BE INCORPORATED INTO STRUCTURE OR USED AS DIRECTED BY OWNER OR ENGINEER.
- CUT SEQUENCE 1 LOGS TO PLACE SNUG TO CHANNEL TOES AND PRESS FIRMLY INTO THE CHANNEL BED.
- RACKING BUNDLES SHALL SURROUND PILES TO PROTECT FROM SCOUR. GAPS SHALL BE PACKED WITH LOOSE RACKING AND SLASH.
- KEY IN CROSS-LOGS INTO THE BANK. ADDITIONAL EXCAVATION WILL BE REQUIRED. KEY LOGS MAY BE POSITIONED AT VARYING ANGLES (IN PLAN VIEW) TO ACCOMMODATE DIFFERENT CHANNEL WIDTHS DEPENDING ON LOCATION, LOG LENGTH MAY BE TRIMMED IF DIRECTED BY THE ENGINEER TO FIT THE SITE.
- MANILLA LASHING SHALL BE USED TO SECURE LOGS TO PILES AND ADJACENT LOGS AS DIRECTED BY ENGINEER. ONLY 2 MANILLA LASHINGS ARE SHOWN. INSTALL ADDITIONAL LASHINGS IN LAYERS 2 OR 3.

TYPE 1 LOG STRUCTURE QUANTITIES					
LOG TYPE	DESCRIPTION	QUANTITY PER LAYER			TOTAL PER STRUCTURE
		1	2	3	
P	PILE, 8' L X 6" DIA	10		8	18
A	LOG, 7' L x 18" DBH	1			1
B	LOG, 10' L x 18" DBH	2			2
C	LOG, 30' L x 14" DBH		2	4	6
RB	RACKING BUNDLE	6-8	1-2		7-10
R/S	LOOSE RACKING AND SLASH	4 CY	4 CY	4 CY	12 CY
	MANILLA LASHING				4

NOTE: ALL STRUCTURES ARE FIELD FIT AND QUANTITIES WILL VARY.

NOTE: STRUCTURE HEIGHTS AND WIDTHS MAY VARY. A TYPICAL SECTION IS SHOWN BELOW. THE STRUCTURE DOES NOT NEED TO BE LEVEL WITH TOP OF BANK OR SPAN INTO THE FLOODPLAIN.



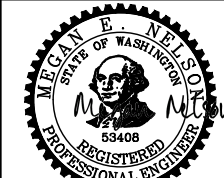
TYPE 1 LOG STRUCTURE
NTS



Natural Systems Design
+ Coastal Geologic Services



6/18/2024



Susan E. Dickerson-Lange

6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
LOWER CAMAS MEADOWS RESTORATION PROJECT
TYPE 1 LOG STRUCTURE
FINAL DESIGN

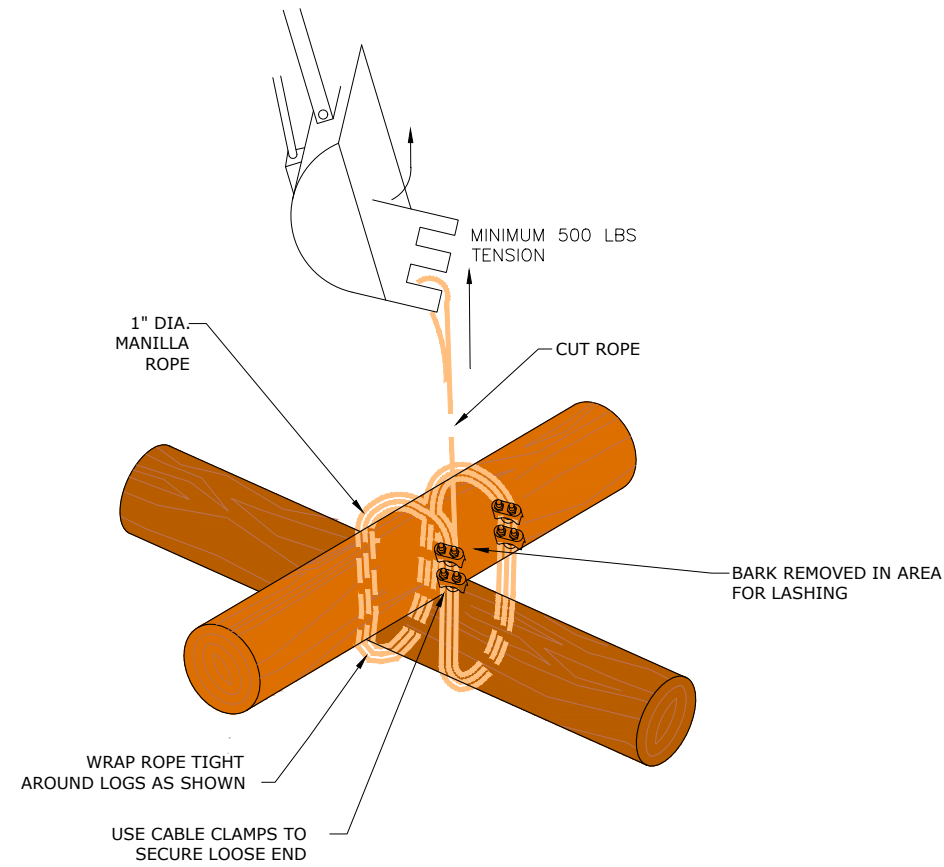
DATE: 06/25/2024
COUNTY: CHELAN
LATITUDE: 47°28'18"N
LONGITUDE: 120°35'14"W
TMS/CRG: T28N52E16R8E
DESIGN: JIN DRAWN: EJKS
CHECK: EB CHECK: MIN



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

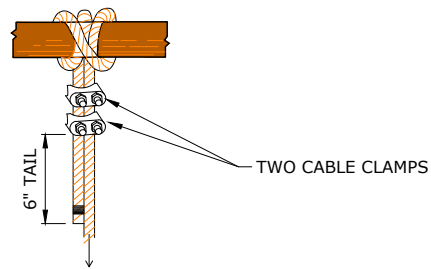
SHEET

19 OF 22



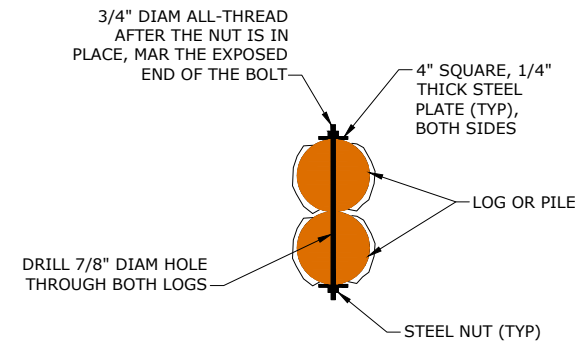
NOTES

1. ALL LASHING TO HAVE A MINIMUM OF 2 WRAPS PER LASHING.
2. START WITH A CLOVE HITCH AROUND LOG AND CABLE CLAMP TWICE ON ROPE END.
3. BARK TO BE REMOVED IN AREA OF LASHING TO ENSURE ABILITY TO TENSION ROPE.
4. ROPE ENDS TO BE CLAMPED TWICE PER ROPE END. CLAMP TO HAVE AN INNER DIAMETER OF 1".



MANILLA ROPE LASHING
NTS

1
20



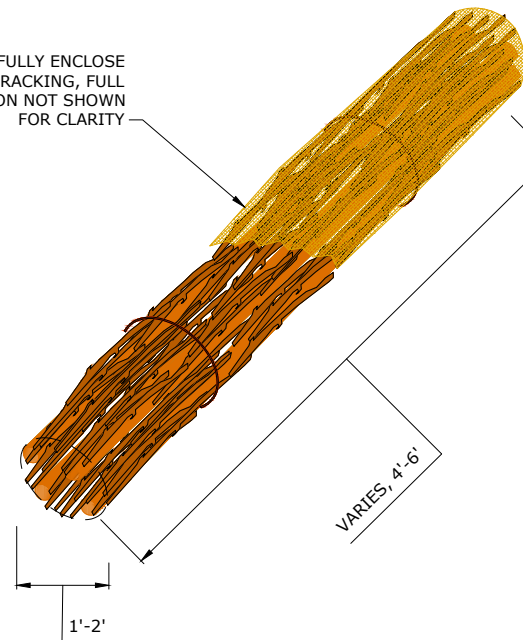
NOTES

1. ALL BARK SHALL BE REMOVED FROM BOTH LOGS AT THE CONNECTION POINT PRIOR TO INSTALLATION.
2. END OF THREADED ROD TO EXTEND 2" MAXIMUM BEYOND NUTS.
3. TIGHTEN SUFFICIENTLY TO ELIMINATE GAP BETWEEN LOGS BUT NOT CRUSH BOLES.

BOLTED CONNECTION
NTS

2
20

COIR TO FULLY ENCLOSE ALL SLASH/RACKING, FULL EXTENSION NOT SHOWN FOR CLARITY



NOTES

1. SECURE BUNDLES ON BOTH ENDS WITH 3 WRAPS WITH 1" DIAMETER MANILLA ROPE SECURED WITH A SQUARE KNOT WITH 6" TAILS.
2. BUNDLES SHALL CONSIST OF YOUNG TREES AND BRANCHES HAVING VARYING DIAMETERS OF 0.5-3 INCHES AND A LENGTH OF 3-6 FEET, APPROXIMATELY 6 TO 10 PIECES PER BUNDLE.
3. WRAP 6 FT BY 6.5 FT COIR MATTING AROUND SLASH AND RACKING. TIE ALL MATERIALS WITH MANILLA LASHINGS

RACKING BUNDLE
NTS

3
20



Susan E. Dickerson-Lange
6/18/2024

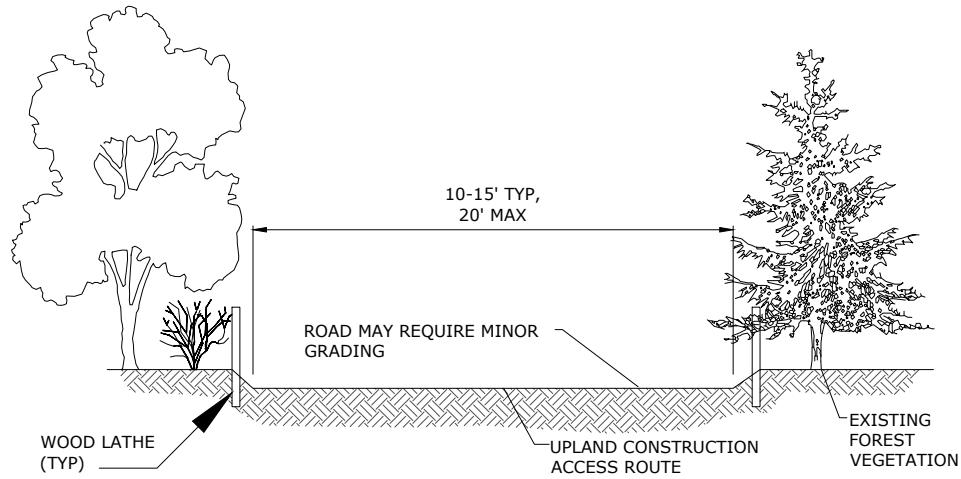
CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
LOWER CAMAS MEADOWS RESTORATION PROJECT
LOG STRUCTURE DETAILS

FINAL DESIGN

DATE	04/25/2024
COUNTY	CHELAN
LATITUDE	47°28'18"N
LONGITUDE	120°35'14"W
TN/SC/RG	T23N/S21/R18E
DESIGN	JIN
DRAWN	EJL/KS
CHECK	EB
CHECK	JIN

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

SHEET
20 OF 22



NOTES FOR TEMPORARY CLEARED ACCESS

1. CLEARED ACCESS TO BE ROUTED TO MINIMIZE VEGETATION DISTURBANCE AND FOREST CLEARING.
2. CONTRACTOR SHALL MARK CLEARING LIMITS WITH FLAGGING. CLEARING LIMITS TO BE APPROVED BY ENGINEER PRIOR TO ANY CLEARING ACTIVITIES.
3. TREES AND SHRUBS WITH A DIAMETER GREATER THAN 6" SHALL BE STOCKPILED FOR USE AS RACKING MATERIAL IN THE ELJS OR AS GROUND PROTECTION FOR THE STAGING AREAS AND/OR UPLAND CONSTRUCTION ACCESS ROUTES.
4. ANY TREE GREATER THAN 12" DBH THAT IS IDENTIFIED FOR REMOVAL MUST BE APPROVED PRIOR TO CLEARING
5. ACCESS SHALL BE MAINTAINED BY MINOR GRADING.
6. ANY LARGE RUTS THAT DEVELOP SHALL BE GRADED AND DECONSTRUCTED AT THE TERMINATION OF WORK. ACCESS ROUTES SHALL BE RESTORED TO PRE-PROJECT CONDITION.

TEMPORARY ACCESS ROUTE, UPLAND
NTS

1
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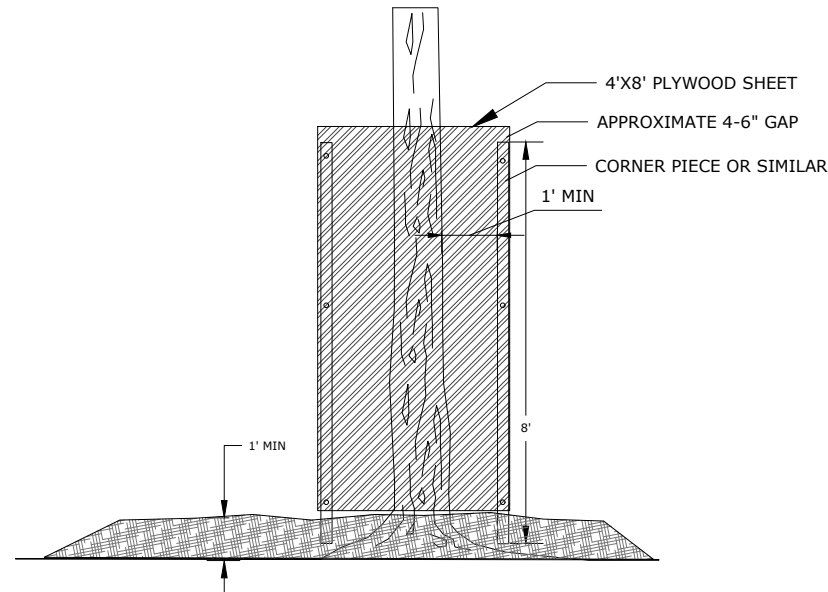


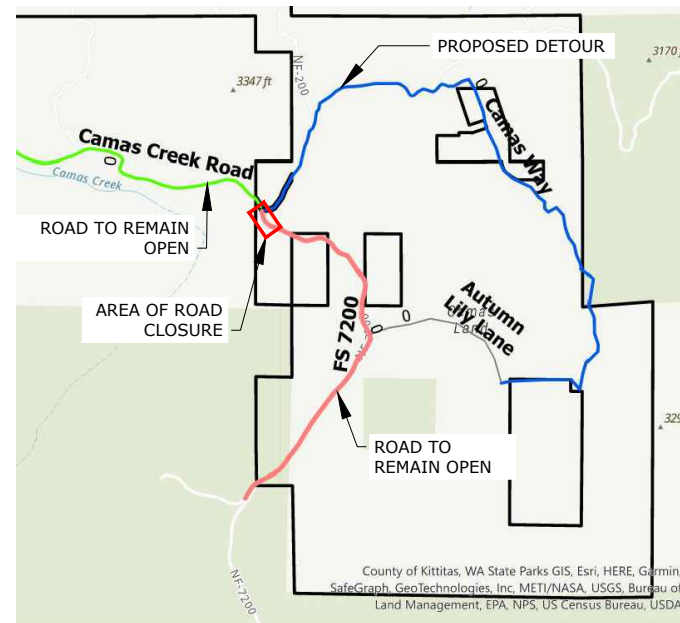
PHOTO EXAMPLE OF SIMILAR TREE PROTECTION DESIGN

NOTES

1. TREE PROTECTION WILL ONLY BE NECESSARY FOR TREES AT THE ENTRANCES TO THE STAGING AREAS AND WHERE IDENTIFIED BY THE ENGINEER OR REPRESENTATIVE, MAX 6 TOTAL.
2. PLACE 1' OF SLASH, OR CLEARED NATIVE BRUSH, OVER SOILS WITHIN DRIP LINE TO PROTECT ROOTS.
3. SECURE 4 OR MORE PLYWOOD SHEETS AROUND BASE OF TREE TO CREATE A BOX BY SECURING WITH CORNER PIECES. CORNER PIECES SHALL EXTEND BELOW BASE OF PLYWOOD TO CREATE "FEET" THAT CAN BE TRIMMED AS NECESSARY TO KEEP BOX LEVEL.
4. FOR LARGER TRUNKS OR MULTI-STEMMED TREES, >4 SHEETS OF PLYWOOD MAY BE REQUIRED.
5. ALTERNATIVE TYPES OF FENCING FOR TREE PROTECTION MAY BE PROPOSED FOR APPROVAL BY THE ENGINEER.

TREE PROTECTION DETAIL

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NOTES

1. CONTRACTOR SHALL DEVELOP AND SUBMIT A TRAFFIC CONTROL PLAN TO THE ENGINEER AND OWNER FOR REVIEW AND APPROVAL PRIOR TO COMMENCING WORK.

DETOUR PLAN
NTS

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21



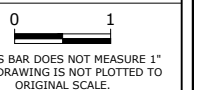
6/18/2024



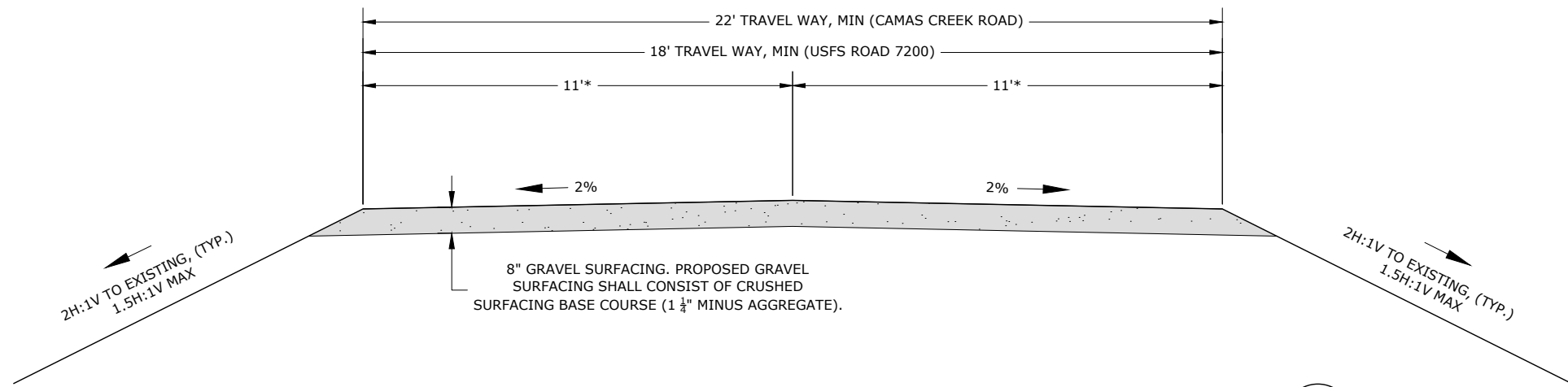
Susan E Dickerson-Lange
6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
LOWER CAMAS MEADOWS RESTORATION PROJECT
ACCESS AND STAGING DETAILS
FINAL DESIGN

DATE	06/25/2024
COUNTY	CHELAN
LATITUDE	47°28'18"N
LONGITUDE	120°35'14"W
TN/SG/RG	T23N/S21/R18E
DESIGN	MIN
DRAWN	ELI.KS
CHECK	EB
CHECK	MIN

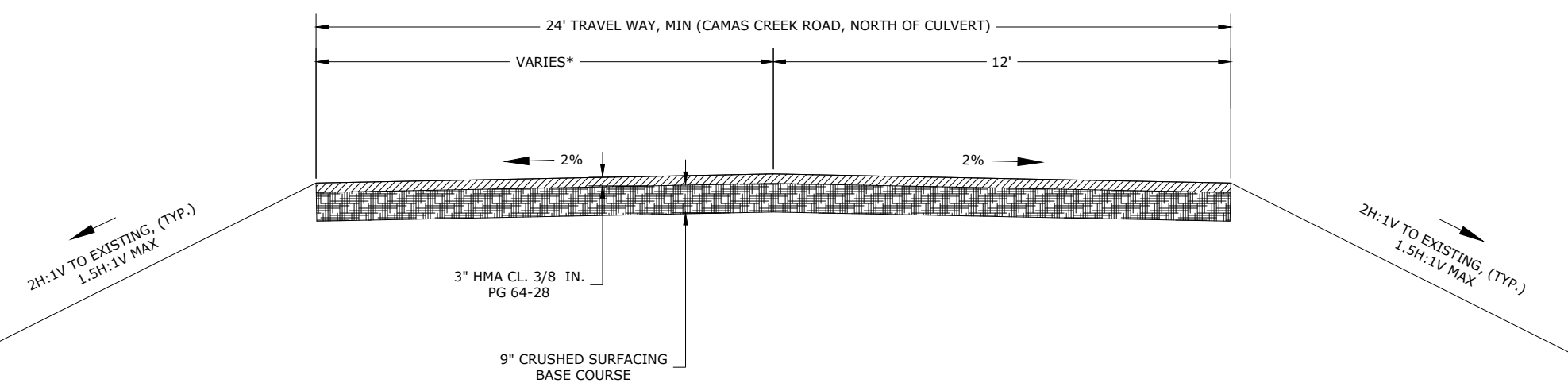


SHEET
21 OF 22



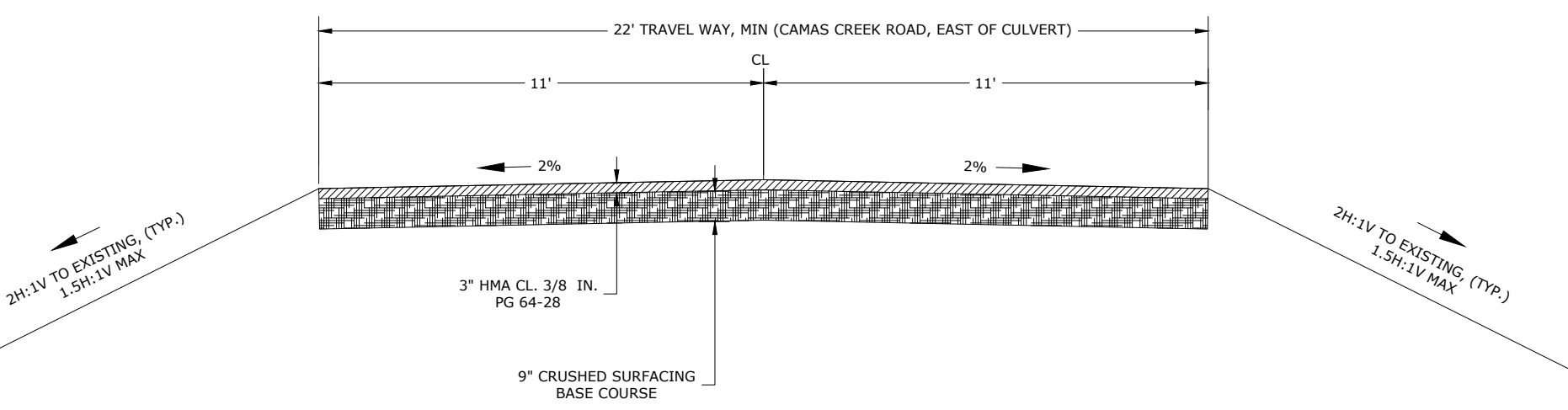
22' GRAVEL ROAD SURFACING (USFS ROAD 7200 & CAMAS CREEK ROAD)
 SCALE: 1" = 2'
 *LANE WIDTH VARIES FROM ON USFS ROAD 7200 TO ACCOMMODATE NON-FLARED TERMINAL. REFER TO PLANS ON SHEET 13.

1
22



24' ASPHALT PAVEMENT (CAMAS CREEK ROAD)
 SCALE: 1" = 2'
 *LANE WIDTH VARIES TO ACCOMMODATE NON-FLARED TERMINAL. REFER TO PLANS ON SHEET 13.

2
22



22' ASPHALT PAVEMENT (CAMAS CREEK ROAD)
 SCALE: 1" = 2'

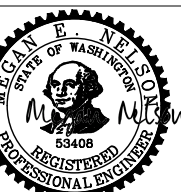
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22

NOTES

- REFER TO SHEET 13 FOR ROAD GRADING EXTENTS, GUARDRAIL AND CONCRETE BARRIER LAYOUT, AND SHEET 15 FOR PROPOSED ROAD PROFILE.
- CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE IN ROADSIDE DITCHES WHERE THEY EXIST.
- CONTRACTORS SHALL INSTALL GUARDRAIL, PRECAST CONCRETE BARRIER (WITH SCUPPERS), NON-FLARED TERMINALS, AND ANCHOR TYPE 11 END ACCORDING TO WSDOT SPECIFICATIONS.
- GUARDRAIL AND CONCRETE BARRIERS ARE NOT SHOWN IN PAVEMENT CROSS SECTIONS. REFER TO ROADWAY GRADING PLAN FOR LAYOUT AND WSDOT STANDARD PLANS FOR SECTION/OFFSET REQUIREMENTS.
- REFER TO WSDOT STANDARD PLANS FOR SLOPE BREAK OFFSET AND STANDARD PLACEMENT:
 C-7
 C-20.10-09
 C-20.14-05
 C-20.15-03
 C-20.42-06
 C-22.45-06
 C-23.70-01
 C-24.10-04
- GUARDRAIL SHALL UTILIZE SNOW LOAD WASHERS OUTSIDE OF NON-FLARED TERMINAL LIMITS.
- BEAM GUARDRAIL TYPE 31 NON-FLARED TERMINAL SECTIONS SHALL INCLUDE OBJECT MARKERS PER WSDOT STANDARD PLAN C-22.45-06.



Natural Systems Design
 + Coastal Geologic Services



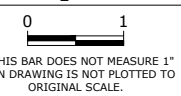
Susan E. Dickerson-Lange
 6/18/2024

CHELAN COUNTY NATURAL RESOURCE DEPARTMENT
 LOWER CAMAS MEADOWS RESTORATION PROJECT

PAVEMENT DETAILS

FINAL DESIGN

DATE	04/25/2024
COUNTY	CHELAN
LATITUDE	47°28'18"N
LONGITUDE	120°35'14"W
TN/SC/RG	T23N/S21/R18E
DESIGN	MIN DRAWN_EI_KS
CHECK	EB CHECK_MIN



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

SHEET
 22 OF 22

N:\PROJECTS\CCNRD\CCNRD\948_LOWERCAMASMEADOWS\DESIGN\CAD\STRUCTURE DETAILS.DWG Kahlvin 06/14/2024 2:43:20 PM