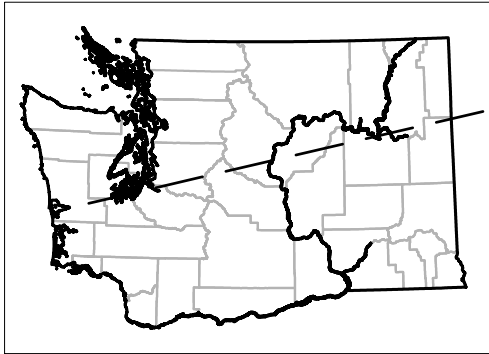


KEYS ROAD FLOOD PROTECTION

JARPA FIGURES

GRAYS HARBOR COUNTY



WASHINGTON STATE

SCALE: 1" = 50 MILES

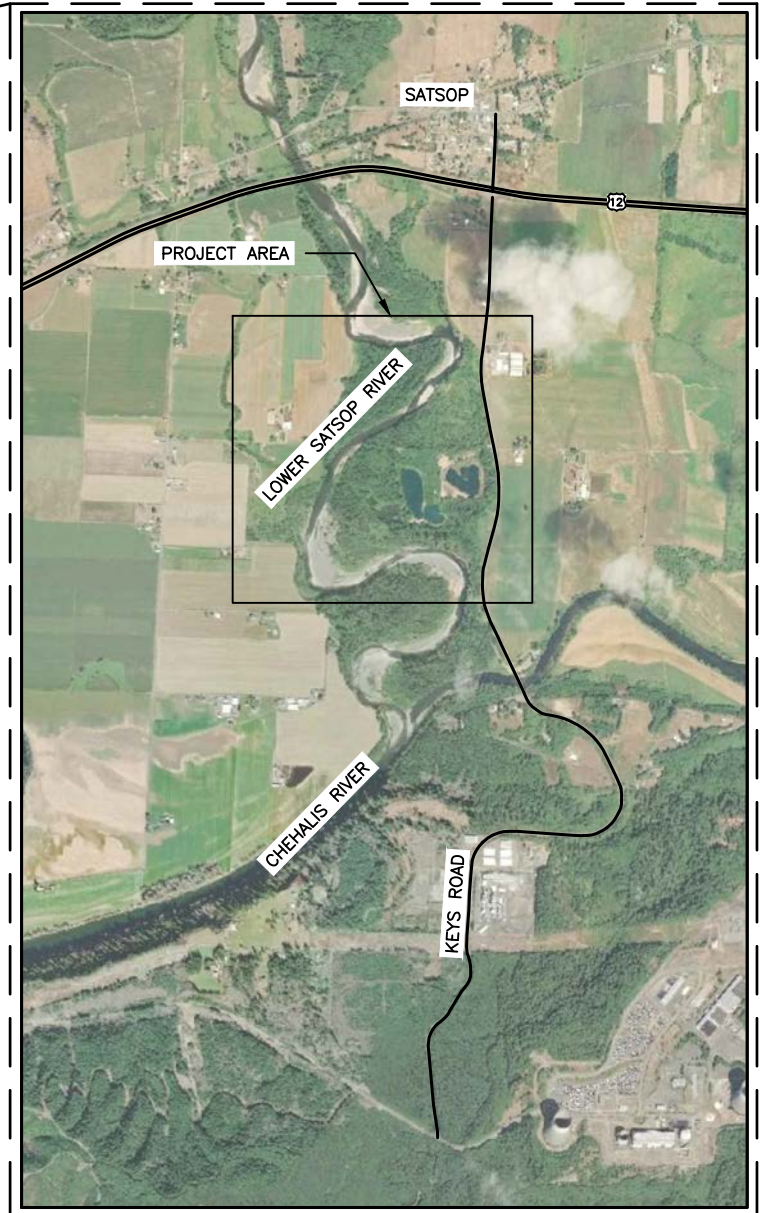
SHEET LIST TABLE

SHEET NO.	SHEET TITLE
01	COVER SHEET
02	EXISTING CONDITIONS, SITE ACCESS, & STAGING
03	PROPOSED CONDITIONS & IMPACTS
04	PROPOSED CONDITIONS & IMPACTS
05	PROJECT ELEMENT QUANTITIES
06	PROJECT ELEMENT QUANTITIES
07	REVEGETATION & ALLUVIUM PLACEMENT PLAN
08	PLANT SCHEDULES & DETAILS
09	TYPE 1 APEX ELJ DETAILS
10	TYPE 2 APEX ELJ DETAILS
11	TYPE 1 DEFLECTOR ELJ DETAILS
12	FLOODPLAIN ROUGHNESS ELJ DETAILS
13	TIMBER COMPLEX ELJ DETAILS
14	TYPE 1 SETBACK REVETMENT ELJ DETAILS
15	TYPE 2 SETBACK REVETMENT ELJ DETAILS

CONTACT INFORMATION

GRAYS HARBOR COUNTY

DEPARTMENT OF PUBLIC WORKS
110 WEST BROADWAY, SUITE 31
MONTESANO, WA 98563
(360) 249-4222



PROJECT LOCATION MAP

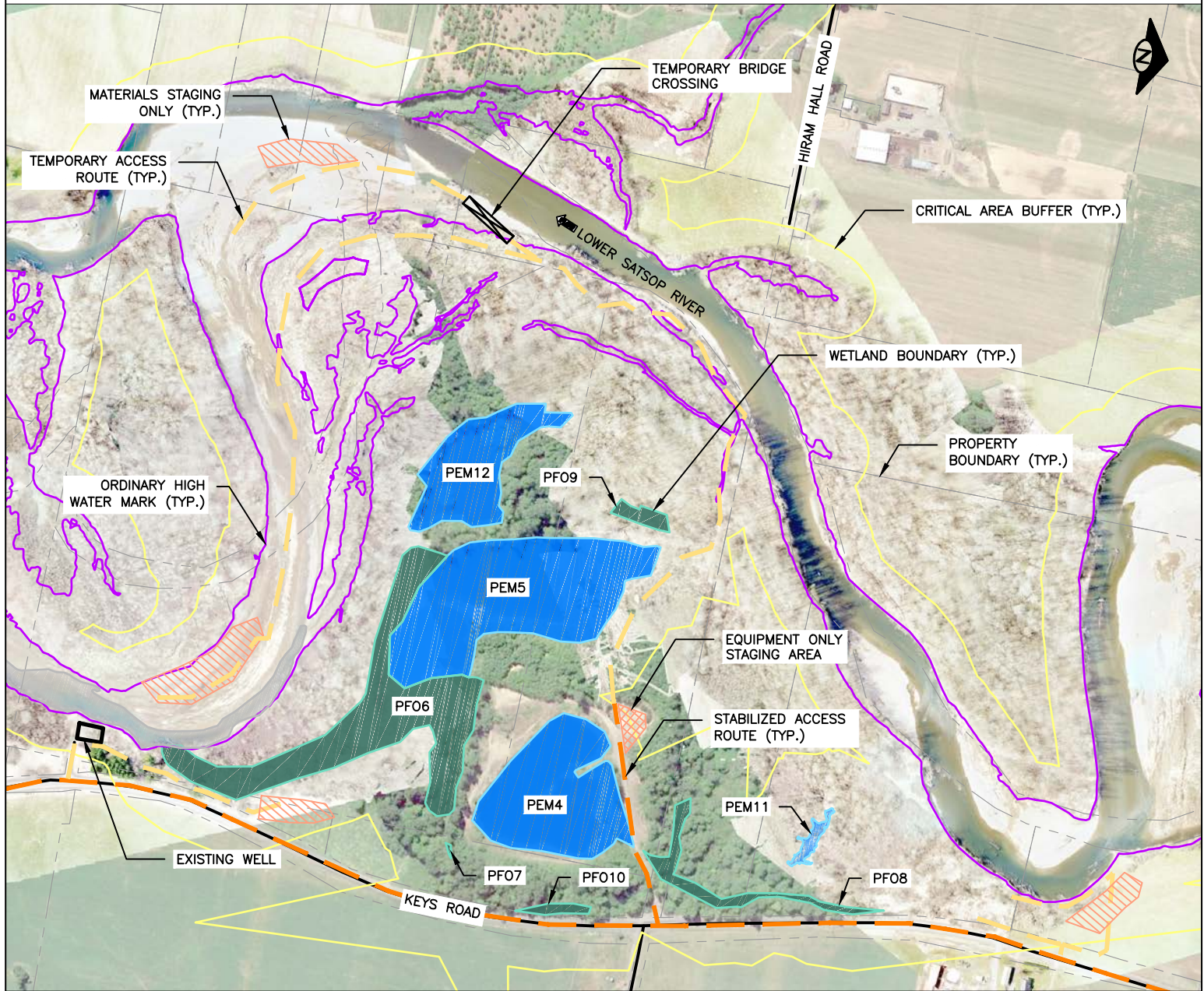
SCALE: 1" = 3,000'



REFERENCE NUMBER: NWS-2020-0322 APPLICANT: GRAYS HARBOR COUNTY		PROJECT LOCATION: SEE SHEET 01	PROPOSED PROJECT: KEYS ROAD FLOOD PROTECTION	
LATITUDE: 47° 03' 49" N LONGITUDE: 123° 29' 29" W		VERTICAL DATUM - NAVD 88 HORIZONTAL DATUM - NAD 83/91		
SHEET 01 - COVER SHEET	DATE: 4/22/2020	IN: LOWER SATSOP RIVER NEAR/AT: SATSOP	COUNTY: GRAYS HARBOR STATE: WA	FILE: JARPA_COVER SHEET.DWG

NOTES:

1. AERIAL IMAGERY SOURCE: COMPOSITE DRONE IMAGERY 2019. DUE TO EROSION OF STREAMBANKS AND DEPOSITION OF STREAMBED MATERIAL SINCE IMAGERY WAS CAPTURED, THE GEOMETRY OF THE STREAMBANKS AT THE TIME OF CONSTRUCTION COULD BE DIFFERENT THAN SHOWN IN THESE FIGURES.
2. MATERIALS STAGING AREAS ARE LOCATED ON UNVEGETATED GRAVEL BARS. NO CLEARING WILL OCCUR.
3. EQUIPMENT STAGING AREA IS LOCATED IN AN UNVEGETATED UPLAND AREA. NO CLEARING WILL OCCUR.
4. ALL TEMPORARY ACCESS AND STAGING AREAS WILL BE SEEDED FOLLOWING PROJECT COMPLETION WITH AN APPROPRIATE NATIVE UPLAND SEED MIX.



EXISTING CONDITIONS, SITE ACCESS, & STAGING

SCALE: 1" = 600'

REFERENCE NUMBER: NWS-2020-0322
APPLICANT: GRAYS HARBOR COUNTY

PROJECT LOCATION:
SEE SHEET 01

PROPOSED PROJECT:
KEYS ROAD FLOOD PROTECTION

LATITUDE: 47° 03' 49" N
LONGITUDE: 123° 29' 29" W

VERTICAL DATUM - NAVD 88
HORIZONTAL DATUM - NAD 83/91

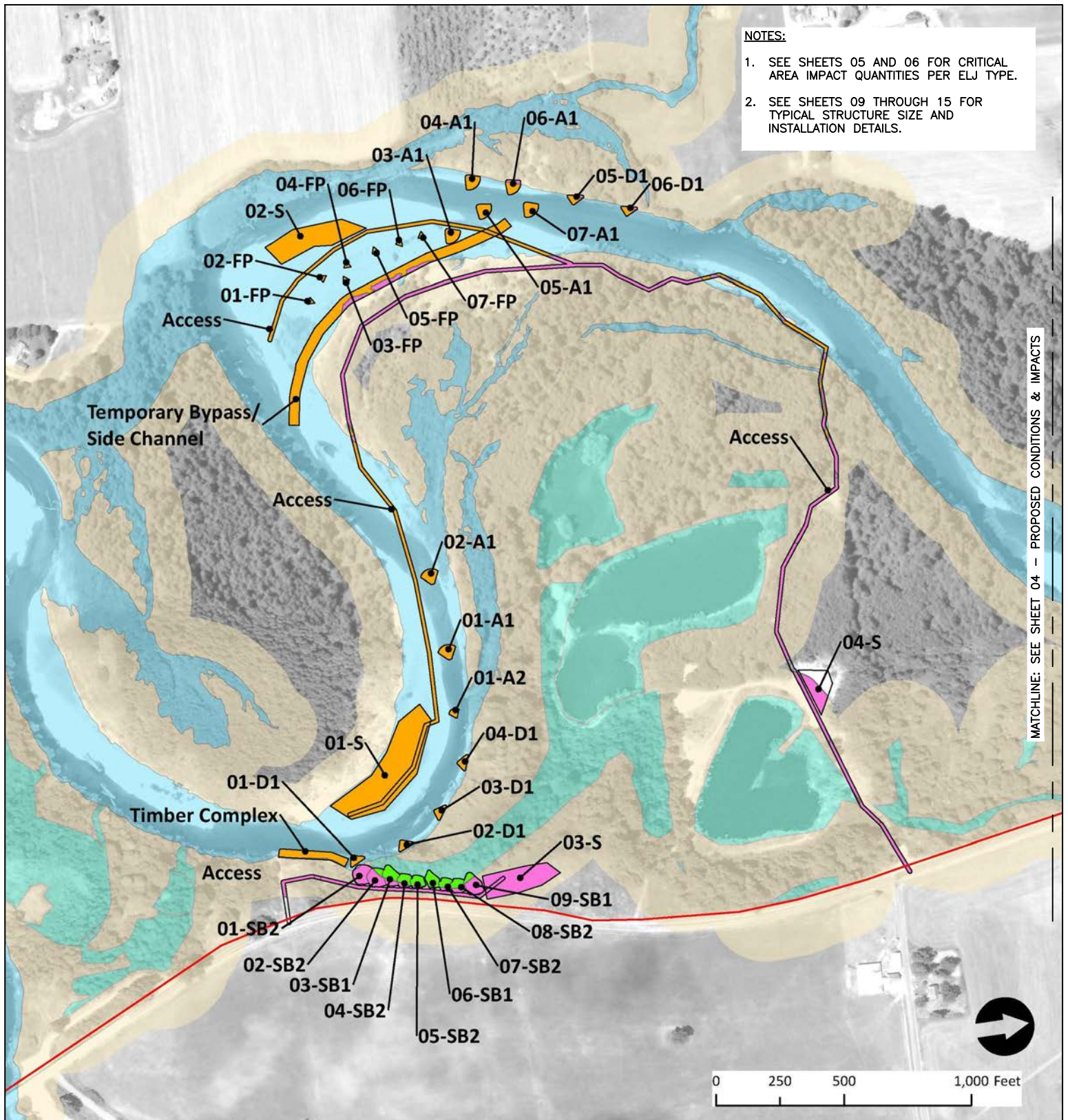
SHEET 02 - EXISTING
CONDITIONS, SITE
ACCESS, & STAGING

DATE: 4/22/2020

IN: LOWER SATSOP RIVER
NEAR/AT: SATSOP

COUNTY: GRAYS HARBOR
STATE: WA

FILE: JARPA_EXISTING
CONDITIONS.DWG



- NOTES:**
1. SEE SHEETS 05 AND 06 FOR CRITICAL AREA IMPACT QUANTITIES PER ELJ TYPE.
 2. SEE SHEETS 09 THROUGH 15 FOR TYPICAL STRUCTURE SIZE AND INSTALLATION DETAILS.

**PROPOSED CONDITIONS
& IMPACTS**

- ELJ Structure Types**
- Large Apex
 - Small Apex
 - Large Deflector
 - Floodplain Roughness Element
 - Setback Revetment
 - Timber Complex

- Wetlands
- Ordinary High Water
- Wetlands and Waters Buffers
- Project Element Footprint

- Temporary Impacts to Wetlands
- Temporary Impacts to Waterbodies
- Temporary Impacts to Critical Areas Buffers
- Cascade Natural Gas Line

REFERENCE NUMBER: NWS-2020-0322
APPLICANT: GRAYS HARBOR COUNTY

PROJECT LOCATION:
SEE SHEET 01

PROPOSED PROJECT:
KEYS ROAD FLOOD PROTECTION

LATITUDE: 47° 03' 49" N
LONGITUDE: 123° 29' 29" W

VERTICAL DATUM - NAVD 88
HORIZONTAL DATUM - NAD 83/91

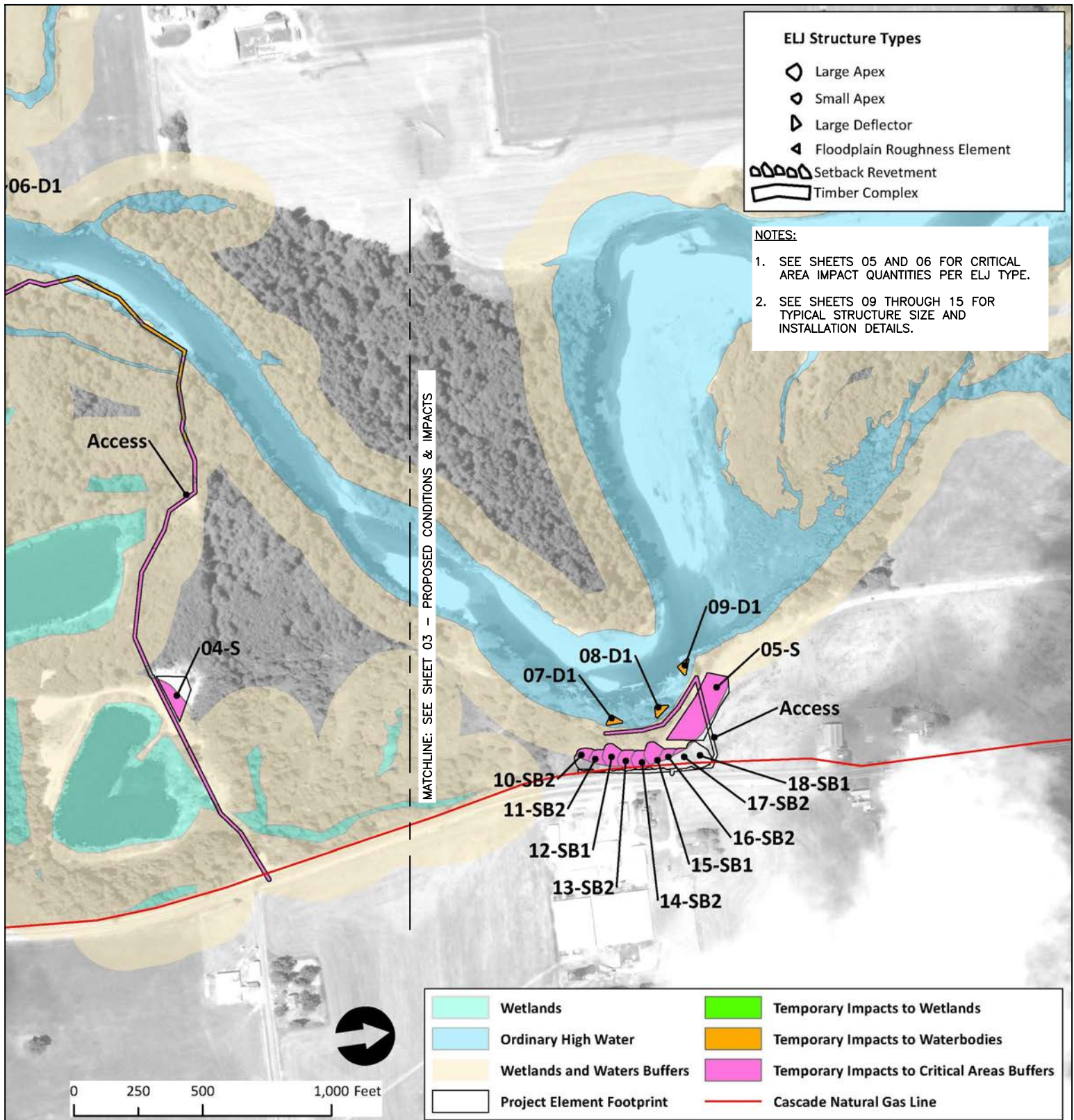
SHEET 03 - PROPOSED
CONDITIONS & IMPACTS

DATE: 4/22/2020

IN: LOWER SATSOP RIVER
NEAR/AT: SATSOP

COUNTY: GRAYS HARBOR
STATE: WA

FILE: JARPA_PROPOSED
CONDITIONS.DWG



PROPOSED CONDITIONS & IMPACTS

REFERENCE NUMBER: NWS-2020-0322
APPLICANT: GRAYS HARBOR COUNTY

PROJECT LOCATION:
SEE SHEET 01

PROPOSED PROJECT:
KEYS ROAD FLOOD PROTECTION

LATITUDE: 47° 03' 49" N
LONGITUDE: 123° 29' 29" W

VERTICAL DATUM - NAVD 88
HORIZONTAL DATUM - NAD 83/91

SHEET 04 - PROPOSED
CONDITIONS & IMPACTS

DATE: 4/22/2020

IN: LOWER SATSOP RIVER
NEAR/AT: SATSOP

COUNTY: GRAYS HARBOR
STATE: WA

FILE: JARPA_PROPOSED
CONDITIONS.DWG

KEYS ROAD FLOOD PROTECTION PROJECT ELEMENTS

		TOTAL IMPACTS		CRITICAL AREAS BUFFER IMPACTS		TEMPORARY WETLAND IMPACTS		WATERBODY IMPACTS	
PROJECT ELEMENT	IMPACTED RESOURCE	EXCAVATION (CY)	AREA (AC)	EXCAVATION (CY)	AREA (AC)	EXCAVATION (CY)	AREA (AC)	EXCAVATION (CY)	AREA (AC)
TYPE 1 APEX ELJ									
01-A1	SATSOP RIVER	0	0.063	–	–	–	–	0	0.063
02-A1	SATSOP RIVER	0	0.063	–	–	–	–	0	0.063
03-A1	SATSOP RIVER	0	0.063	–	–	–	–	0	0.063
04-A1	SATSOP RIVER	0	0.063	–	–	–	–	0	0.063
05-A1	SATSOP RIVER	0	0.063	–	–	–	–	0	0.063
06-A1	SATSOP RIVER AND BUFFER	0	0.063	0	0.013	–	–	0	0.050
07-A1	SATSOP RIVER	0	0.063	–	–	–	–	0	0.063
TYPE 2 APEX ELJ									
01-A2	SATSOP RIVER	0	0.020	–	–	–	–	0	0.020
TYPE 1 DEFLECTOR ELJ									
01-D1	SATSOP RIVER	170	0.035	–	–	–	–	170	0.035
02-D1	SATSOP RIVER	170	0.035	–	–	–	–	170	0.035
03-D1	SATSOP RIVER	170	0.035	–	–	–	–	170	0.035
04-D1	SATSOP RIVER	170	0.035	–	–	–	–	170	0.035
05-D1	SATSOP RIVER	170	0.035	–	–	–	–	170	0.035
06-D1	SATSOP RIVER	170	0.035	–	–	–	–	170	0.035
07-D1	SATSOP RIVER	170	0.035	–	–	–	–	170	0.035
08-D1	SATSOP RIVER	170	0.035	–	–	–	–	170	0.035
09-D1	SATSOP RIVER	170	0.035	–	–	–	–	170	0.035
FLOODPLAIN ROUGHNESS ELJ									
01-FP	SATSOP RIVER	0	0.009	–	–	–	–	0	0.009
02-FP	SATSOP RIVER	0	0.009	–	–	–	–	0	0.009
03-FP	SATSOP RIVER	0	0.009	–	–	–	–	0	0.009
04-FP	SATSOP RIVER	0	0.009	–	–	–	–	0	0.009
05-FP	SATSOP RIVER	0	0.009	–	–	–	–	0	0.009
06-FP	SATSOP RIVER	0	0.009	–	–	–	–	0	0.009
07-FP	SATSOP RIVER	0	0.009	–	–	–	–	0	0.009
TIMBER COMPLEX ELJ									
	SATSOP RIVER	1,500	0.180	–	–	–	–	1,500	0.180
TYPE 1 SB REVETMENT ELJ									
03-SB1	WETLAND PF06	1,214	0.089	254	0.026	960	0.063	–	–
06-SB1	WETLAND PF06	538	0.063	14	0.003	524	0.060	–	–
09-SB1	WETLAND PF06	1,308	0.106	1,027	0.084	281	0.023	–	–
12-SB1	WETLAND PF06 BUFFER	2,318	0.111	2,318	0.111	–	–	–	–
15-SB1	WETLAND PF06 BUFFER	2,278	0.107	2,278	0.107	–	–	–	–
18-SB1	WETLAND PF06 BUFFER	98	0.006	98	0.006	–	–	–	–

REFERENCE NUMBER: NWS-2020-0322
APPLICANT: GRAYS HARBOR COUNTY

PROJECT LOCATION:
SEE SHEET 01

PROPOSED PROJECT:
KEYS ROAD FLOOD PROTECTION

LATITUDE: 47° 03' 49" N
LONGITUDE: 123° 29' 29" W

VERTICAL DATUM – NAVD 88
HORIZONTAL DATUM – NAD 83/91

SHEET 05 – PROJECT
ELEMENT QUANTITIES

DATE: 4/22/2020

IN: LOWER SATSOP RIVER
NEAR/AT: SATSOP

COUNTY: GRAYS HARBOR
STATE: WA

FILE:
JARPA_STAGE1.DWG

KEYS ROAD FLOOD PROTECTION PROJECT ELEMENTS CONTINUED

		TOTAL IMPACTS		CRITICAL AREAS BUFFER IMPACTS		TEMPORARY WETLAND IMPACTS		WATERBODY IMPACTS	
PROJECT ELEMENT	IMPACTED RESOURCE	EXCAVATION (CY)	AREA (AC)	EXCAVATION (CY)	AREA (AC)	EXCAVATION (CY)	AREA (AC)	EXCAVATION (CY)	AREA (AC)
TYPE 2 SB REVETMENT ELJ									
01-SB2	WETLAND PF06 BUFFER	1,726	0.093	1,726	0.093	—	—	—	—
02-SB2	WETLAND PF06	1,706	0.099	1,383	0.080	323	0.018	—	—
04-SB2	WETLAND PF06	714	0.058	111	0.014	603	0.044	—	—
05-SB2	WETLAND PF06	587	0.057	49	0.008	538	0.049	—	—
07-SB2	WETLAND PF06	537	0.049	79	0.011	458	0.038	—	—
08-SB2	WETLAND PF06	799	0.063	243	0.024	556	0.039	—	—
10-SB2	WETLAND PF06 BUFFER	1,221	0.051	1,221	0.051	—	—	—	—
11-SB2	WETLAND PF06 BUFFER	1,454	0.063	1,454	0.063	—	—	—	—
13-SB2	WETLAND PF06 BUFFER	1,506	0.079	1,506	0.079	—	—	—	—
14-SB2	WETLAND PF06 BUFFER	1,251	0.104	1,251	0.104	—	—	—	—
16-SB2	WETLAND PF06 BUFFER	721	0.046	721	0.046	—	—	—	—
17-SB2	WETLAND PF06 BUFFER	250	0.015	250	0.015	—	—	—	—
BYPASS/ SIDE CHANNEL									
	SATSOP RIVER AND BUFFER	10,000	1.140	1,228	0.140	—	—	8,772	1.000
TEMPORARY ACCESS ROUTES									
	SATSOP RIVER AND BUFFER	0	3.300	0	2.300	—	—	0	1.000
STAGING AREAS									
01-S	SATSOP RIVER	0	1.503	—	—	—	—	0	1.503
02-S	SATSOP RIVER	0	0.691	—	—	—	—	0	0.691
03-S	WETLAND PF06 BUFFER	0	0.569	0	0.569	—	—	—	—
04-S	WETLAND PEM4 BUFFER	0	0.286	0	0.286	—	—	—	—
05-S	SATSOP RIVER BUFFER	0	0.713	0	0.713	—	—	—	—
PROJECT TOTALS		33,256	10.480	17,211	4.946	4,243	0.334	11,802	5.200

REFERENCE NUMBER: NWS-2020-0322
APPLICANT: GRAYS HARBOR COUNTY

PROJECT LOCATION:
SEE SHEET 01

PROPOSED PROJECT:
KEYS ROAD FLOOD PROTECTION

LATITUDE: 47° 03' 49" N
LONGITUDE: 123° 29' 29" W

VERTICAL DATUM — NAVD 88
HORIZONTAL DATUM — NAD 83/91

SHEET 06 — PROJECT
ELEMENT QUANTITIES

DATE: 4/22/2020

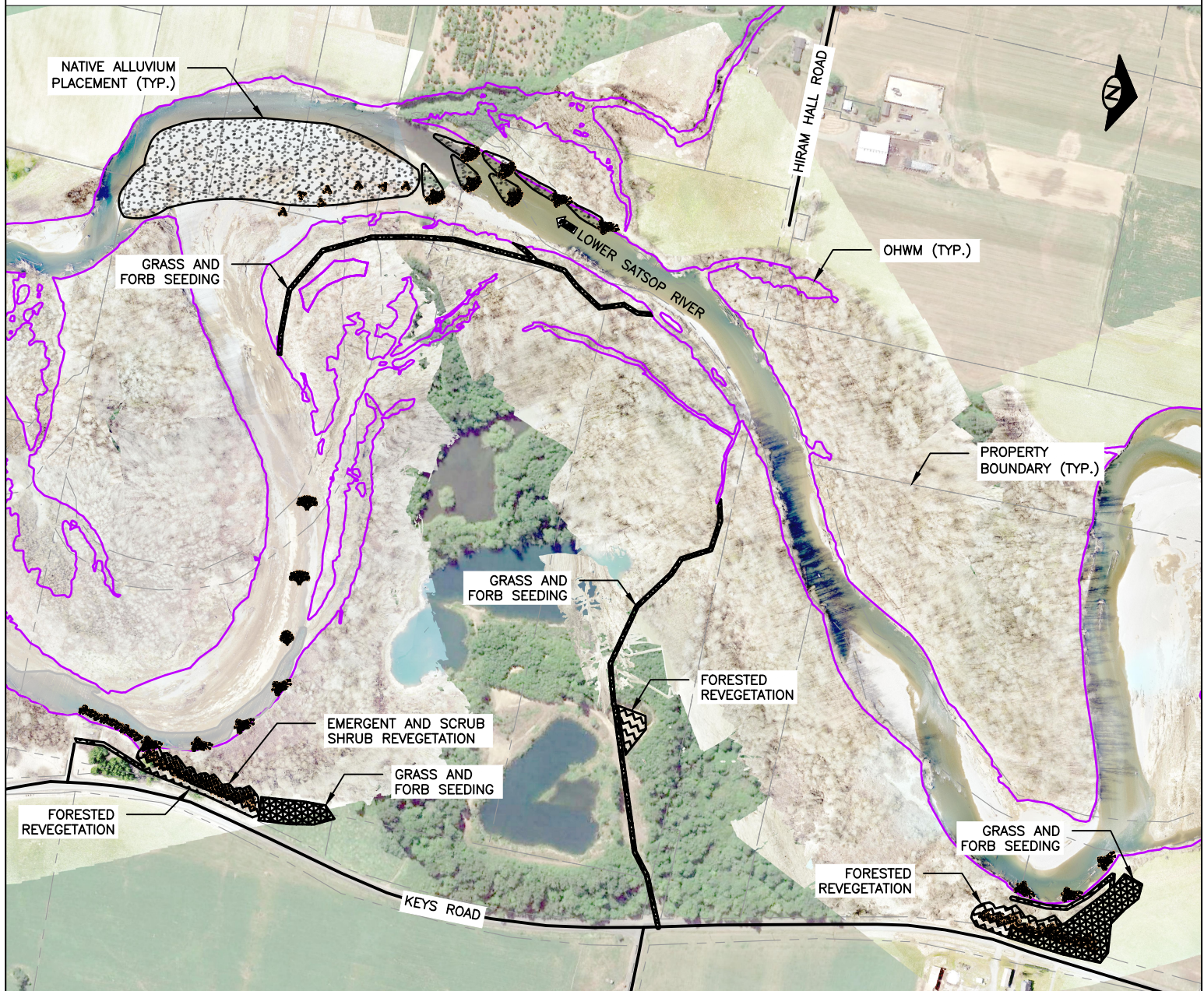
IN: LOWER SATSOP RIVER
NEAR/AT: SATSOP

COUNTY: GRAYS HARBOR
STATE: WA

FILE:
JARPA_STAGE1.DWG

NOTES:

1. UPON COMPLETION OF CONSTRUCTION, ACCESS ROUTES ABOVE OHWM WILL BE HYDROSEEDING USING A GRASS AND FORB SEED MIX. ACCESS ROUTES BELOW OHWM WILL BE DECOMPACTED AND NOT SEEDED.
2. EMERGENT AND SCRUB SHRUB REVEGETATION WILL OCCUR IN DISTURBED WETLAND AREAS.
3. FORESTED REVEGETATION WILL OCCUR IN DISTURBED UPLAND AREAS.
4. SEE SHEET 08 FOR NATIVE PLANT SCHEDULES AND NATIVE SEED MIX.



REVEGETATION & ALLUVIUM PLACEMENT PLAN

SCALE: 1" = 600'

REFERENCE NUMBER: NWS-2020-0322 APPLICANT: GRAYS HARBOR COUNTY		PROJECT LOCATION: SEE SHEET 01	PROPOSED PROJECT: KEYS ROAD FLOOD PROTECTION	
LATITUDE: 47° 03' 49" N LONGITUDE: 123° 29' 29" W		VERTICAL DATUM - NAVD 88 HORIZONTAL DATUM - NAD 83/91		
07 - REVEGETATION & SHEET ALLUVIUM PLACEMENT PLAN	DATE: 4/22/2020	IN: LOWER SATSOP RIVER NEAR/AT: SATSOP	COUNTY: GRAYS HARBOR STATE: WA	FILE: JARPA_EXISTING CONDITIONS.DWG

EMERGENT AND SCRUB SHRUB REVEGETATION PLANT SCHEDULE					
PLANTING AREA: 0.33 ACRE					
COMMON NAME	SPECIES	PLANT MATERIAL	TYP. SPACING	PERCENT OF PLANTING AREA	# OF PLANTS
TREES					
RED ALDER	ALNUS RUBRA	Bareroot	15'	50%	32
TOTAL TREES					32
SHRUBS AND SMALL TREES					
PACIFIC WILLOW	SALIX LASIANDRA	Bareroot	6'	15%	61
RED—OSIER DOGWOOD	CORNUS ALBA	Bareroot	6'	15%	61
SNOWBERRY	SYMPHORICARPOS ALBUS	Bareroot	6'	15%	61
SALMONBERRY	RUBUS SPECTABILIS	Bareroot	6'	15%	61
TOTAL SHRUBS AND SMALL TREES					244
GROUND					
SLOUGH SEDGE	CAREX OBNUPTA	Bareroot	2'	10%	364
TOTAL GROUND					364



TYPE 1 AND 2 REVETMENT STRUCTURE EXAMPLES

NOTES:

1. TYPE 1 AND 2 SETBACK REVETMENT STRUCTURES TO BE BACKFILLED TO ORIGINAL GRADE AND REVEGETATED WITH NATIVE FORESTED AND SCRUB SHRUB PLANT SPECIES.
2. SEE REVEGETATION PLANT SCHEDULE THIS SHEET.
3. SEE SHEETS 14 AND 15 FOR REVETMENT STRUCTURE CONSTRUCTION DETAILS.

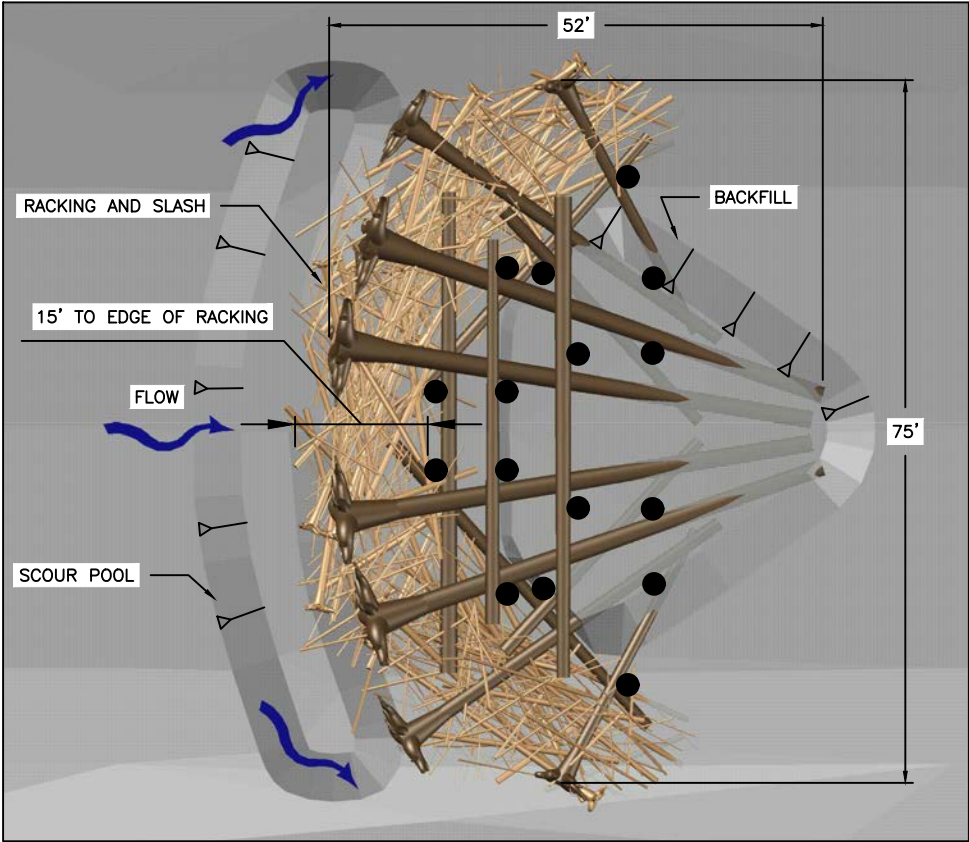
FORESTED REVEGETATION PLANT SCHEDULE					
PLANTING AREA: 1.60 ACRE					
COMMON NAME	SPECIES	PLANT MATERIAL	TYP. SPACING	PERCENT OF PLANTING AREA	# OF PLANTS
TREES					
RED ALDER	ALNUS RUBRA	Bareroot	15	16%	50
DOUGLAS FIR	PSEUDOTSUGA MENZIESII	Bareroot	15	17%	53
TOTAL TREES					103
SHRUBS AND SMALL TREES					
BEAKED HAZELNUT	CORYLUS CORNUTA	Bareroot	6	8%	156
THIMBLEBERRY	RUBUS PARVIFLORUS	Bareroot	6	8%	156
SNOWBERRY	SYMPHORICARPOS ALBUS	Bareroot	6	8%	156
TOTAL SHRUBS AND SMALL TREES					468

GRASS AND FORB HYDROSEED MIX				
SEEDING AREA: 3.40 ACRE				
COMMON NAME	SPECIES	PERCENT OF MIX BY WEIGHT	BULK PLANTING RATE LBS/ACRE	TOTAL BULK SEED (LBS)
BLUE WILD RYE	ELYMUS GLAUCUS	30	4.46	14.93
NATIVE RED FESCUE	FESTUCA RUBRA	30	1.49	4.98
CALIFORNIA BROME	BROMUS CARINATUS	20	1.98	6.64
TUFTED HAIRGRASS	DESCHAMPSIA CESPITOSA	10	0.20	0.66
STREAMBANK WHEATGRASS	ELYMUS LANCEOLATUS SSP. PSAMMOPHILUS	10	1.05	3.50
TOTAL				30.71

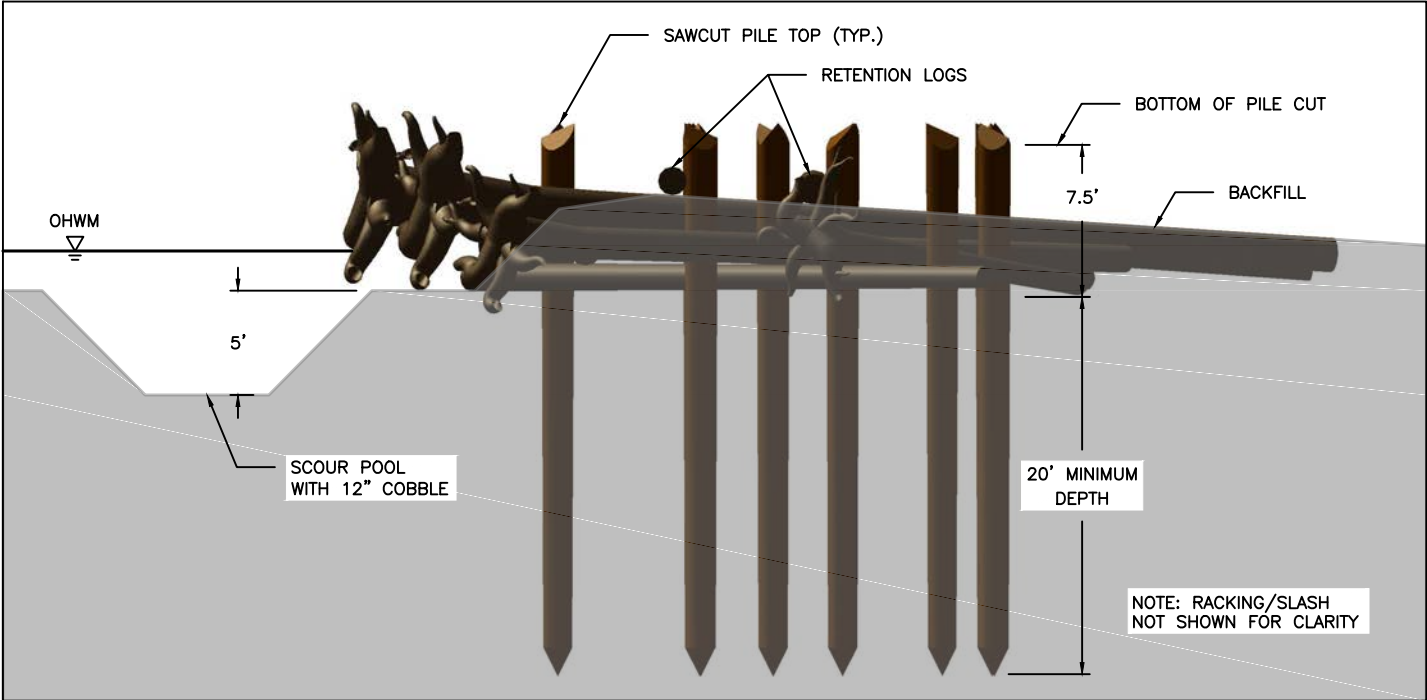
REFERENCE NUMBER: NWS-2020-0322 APPLICANT: GRAYS HARBOR COUNTY		PROJECT LOCATION: SEE SHEET 01	PROPOSED PROJECT: KEYS ROAD FLOOD PROTECTION	
LATITUDE: 47° 03' 49" N LONGITUDE: 123° 29' 29" W		VERTICAL DATUM - NAVD 88 HORIZONTAL DATUM - NAD 83/91		
SHEET 08 - PLANT SCHEDULES & DETAILS	DATE: 4/22/2020	IN: LOWER SATSOP RIVER NEAR/AT: SATSOP	COUNTY: GRAYS HARBOR STATE: WA	FILE: JARPA_STAGE1.DWG

TYPE 1 APEX STRUCTURE DIMENSIONS	
TOTAL STRUCTURE LENGTH	52'
STRUCTURE WIDTH	75'
STRUCTURE HEIGHT	VARIES
EXCAVATION QUANTITY	106 CY

- NOTES:
- ALL LOGS ARE DOUGLAS FIR, OR WESTERN RED CEDAR.
 - SOIL EXCAVATED DURING CONSTRUCTION SHALL BE REPLACED TO ORIGINAL GROUND FOLLOWING PLACEMENT OF ALL LOGS.
 - THE LOCATIONS SHOWN IN THE PLANS ARE APPROXIMATE AND MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER.
 - EXTENTS AND LOCATION OF THE SCOUR POOL IS APPROXIMATE AND TO BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER.
 - EXISTING WOODY MATERIAL AT THE STRUCTURE CONSTRUCTION SITE SHALL BE MOVED OR PROTECTED FROM CONSTRUCTION ACTIVITIES AND THEN INCORPORATED INTO THE STRUCTURE AS DIRECTED BY THE CONTRACTING OFFICER.



TYPE 1 APEX ELJ PERSPECTIVE
1" = 20'

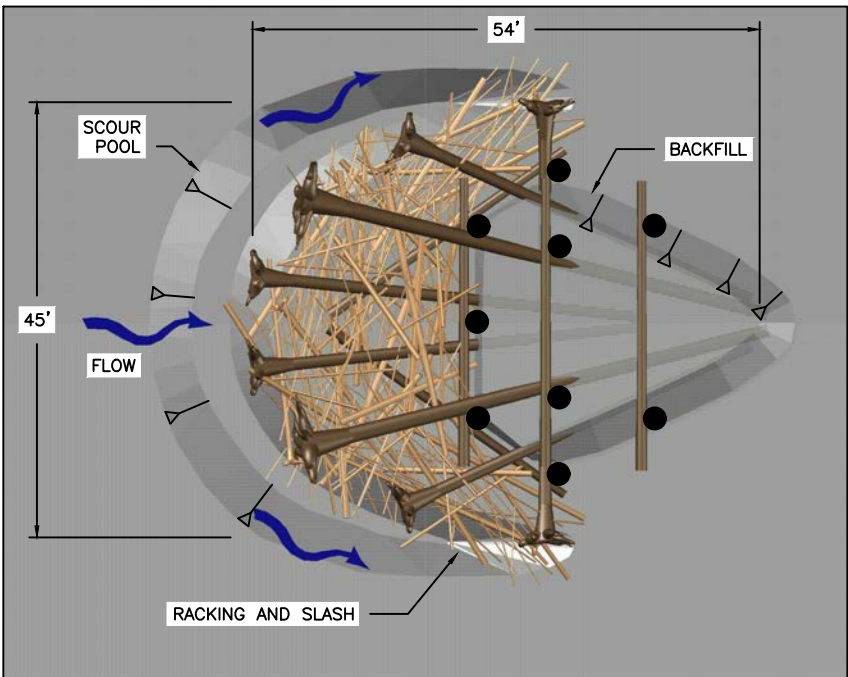


TYPE 1 APEX ELJ PROFILE
1" = 10'

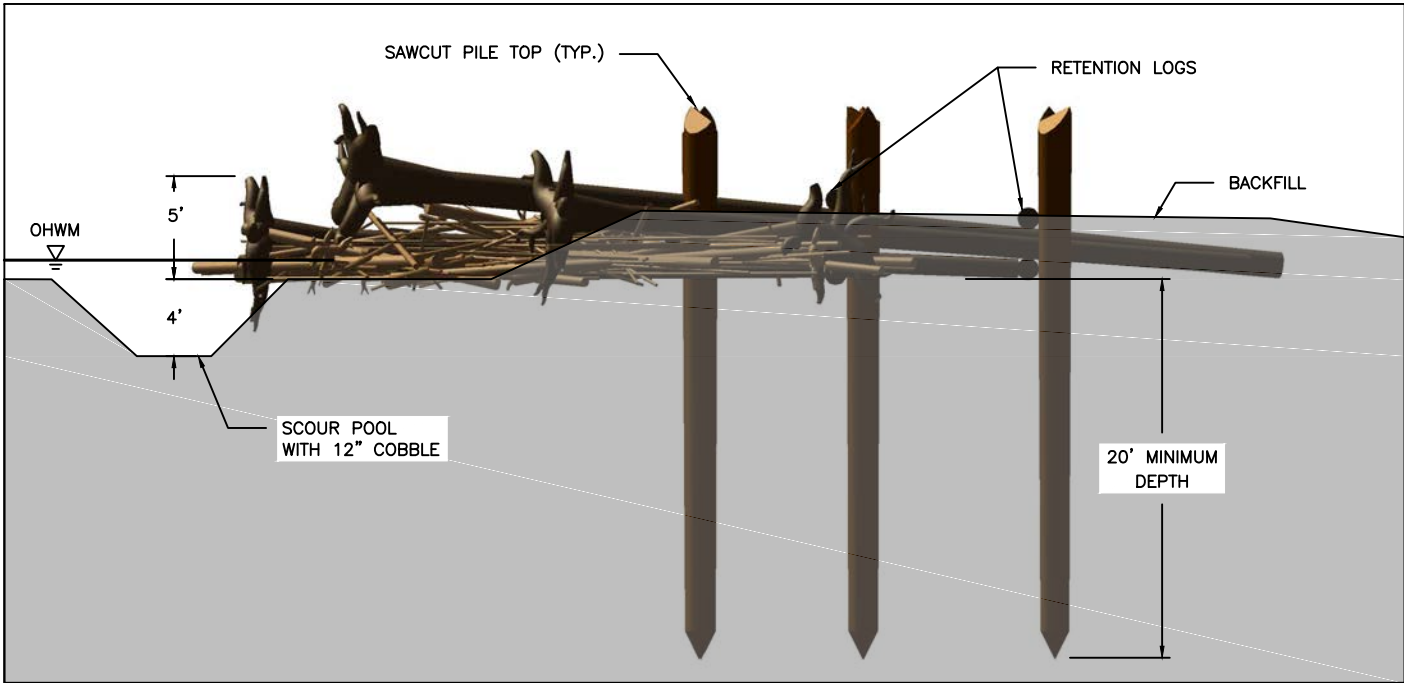
REFERENCE NUMBER: NWS-2020-0322 APPLICANT: GRAYS HARBOR COUNTY		PROJECT LOCATION: SEE SHEET 01	PROPOSED PROJECT: KEYS ROAD FLOOD PROTECTION	
LATITUDE: 47° 03' 49" N LONGITUDE: 123° 29' 29" W		VERTICAL DATUM - NAVD 88 HORIZONTAL DATUM - NAD 83/91		
SHEET 09 - TYPE 1 APEX ELJ DETAILS	DATE: 4/22/2020	IN: LOWER SATSOP RIVER NEAR/AT: SATSOP	COUNTY: GRAYS HARBOR STATE: WA	FILE: JARPA TYPE 1 APEX LARGE.DWG

TYPE 2 APEX STRUCTURE DIMENSIONS	
TOTAL STRUCTURE LENGTH	54'
STRUCTURE WIDTH	45'
STRUCTURE HEIGHT	VARIES
EXCAVATION QUANTITY	45 CY

- NOTES:
1. ALL LOGS ARE DOUGLAS FIR, OR WESTERN RED CEDAR.
 2. SOIL EXCAVATED DURING CONSTRUCTION SHALL BE REPLACED TO ORIGINAL GROUND FOLLOWING PLACEMENT OF ALL LOGS.
 3. THE LOCATIONS SHOWN IN THE PLANS ARE APPROXIMATE AND MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER.
 4. EXTENTS AND LOCATION OF THE SCOUR POOL ARE APPROXIMATE AND TO BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER.
 5. EXISTING WOODY MATERIAL AT THE STRUCTURE CONSTRUCTION SITE SHALL BE MOVED OR PROTECTED FROM CONSTRUCTION ACTIVITIES AND THEN INCORPORATED INTO THE STRUCTURE AS DIRECTED BY THE CONTRACTING OFFICER.



TYPE 2 APEX ELJ PLAN
1" = 20'



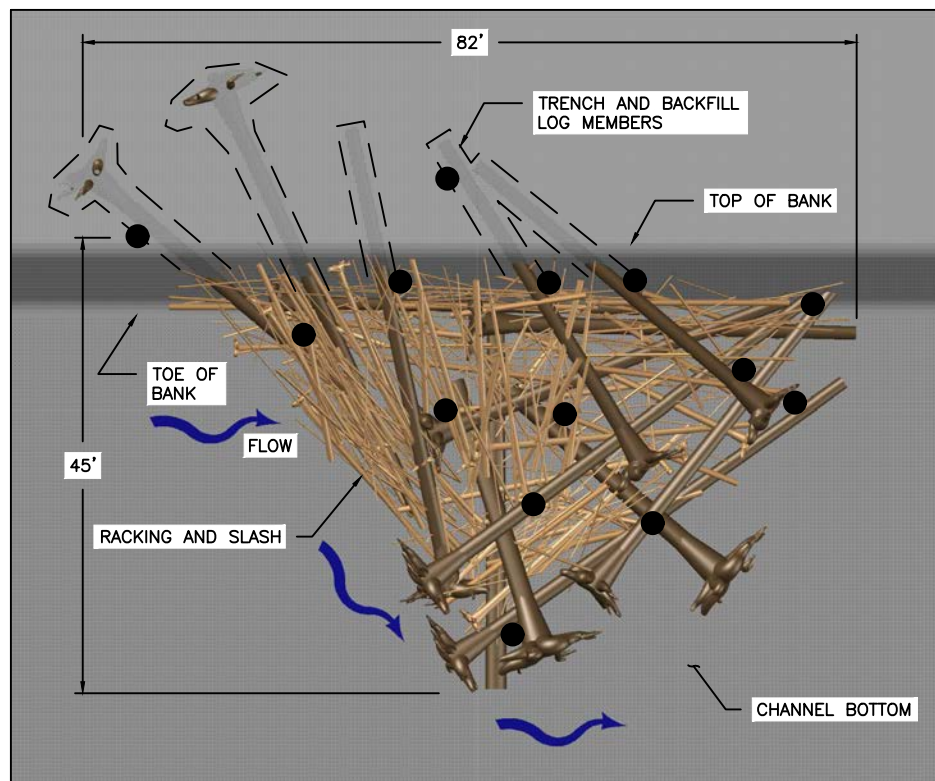
TYPE 2 APEX ELJ PROFILE
1" = 10'

REFERENCE NUMBER: NWS-2020-0322 APPLICANT: GRAYS HARBOR COUNTY		PROJECT LOCATION: SEE SHEET 01	PROPOSED PROJECT: KEYS ROAD FLOOD PROTECTION	
LATITUDE: 47° 03' 49" N LONGITUDE: 123° 29' 29" W		VERTICAL DATUM – NAVD 88 HORIZONTAL DATUM – NAD 83/91		
SHEET 10 – TYPE 2 APEX ELJ DETAILS	DATE: 4/22/2020	IN: LOWER SATSOP RIVER NEAR/AT: SATSOP	COUNTY: GRAYS HARBOR STATE: WA	FILE: JARPA TYPE 2 APEX SMALL.DWG

TYPE 1 DEFLECTOR STRUCTURE DIMENSIONS	
TOTAL STRUCTURE LENGTH	82'
STRUCTURE WIDTH	45'
STRUCTURE HEIGHT	VARIES
EXCAVATION QUANTITY	170 CY

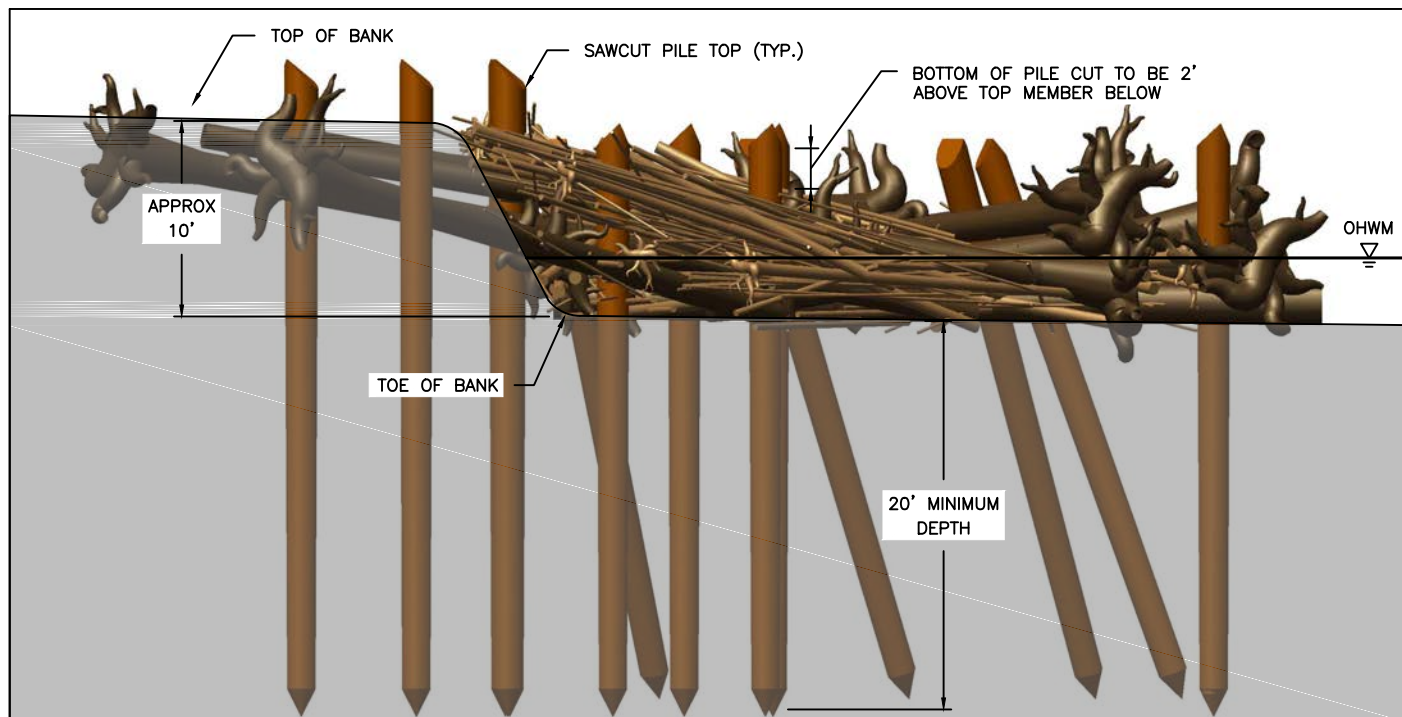
NOTES:

1. ALL LOGS ARE DOUGLAS FIR, OR WESTERN RED CEDAR.
2. SOIL EXCAVATED DURING CONSTRUCTION SHALL BE REPLACED TO ORIGINAL GROUND FOLLOWING PLACEMENT OF ALL LOGS.
3. THE LOCATIONS SHOWN IN THE PLANS ARE APPROXIMATE AND MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER.
4. EXTENTS AND LOCATION OF THE SCOUR POOL ARE APPROXIMATE AND TO BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER.
5. EXISTING WOODY MATERIAL AT THE STRUCTURE CONSTRUCTION SITE SHALL BE MOVED OR PROTECTED FROM CONSTRUCTION ACTIVITIES AND THEN INCORPORATED INTO THE STRUCTURE AS DIRECTED BY THE CONTRACTING OFFICER.



TYPE 1 DEFLECTOR ELJ PLAN

1" = 20'



TYPE 1 DEFLECTOR ELJ PROFILE

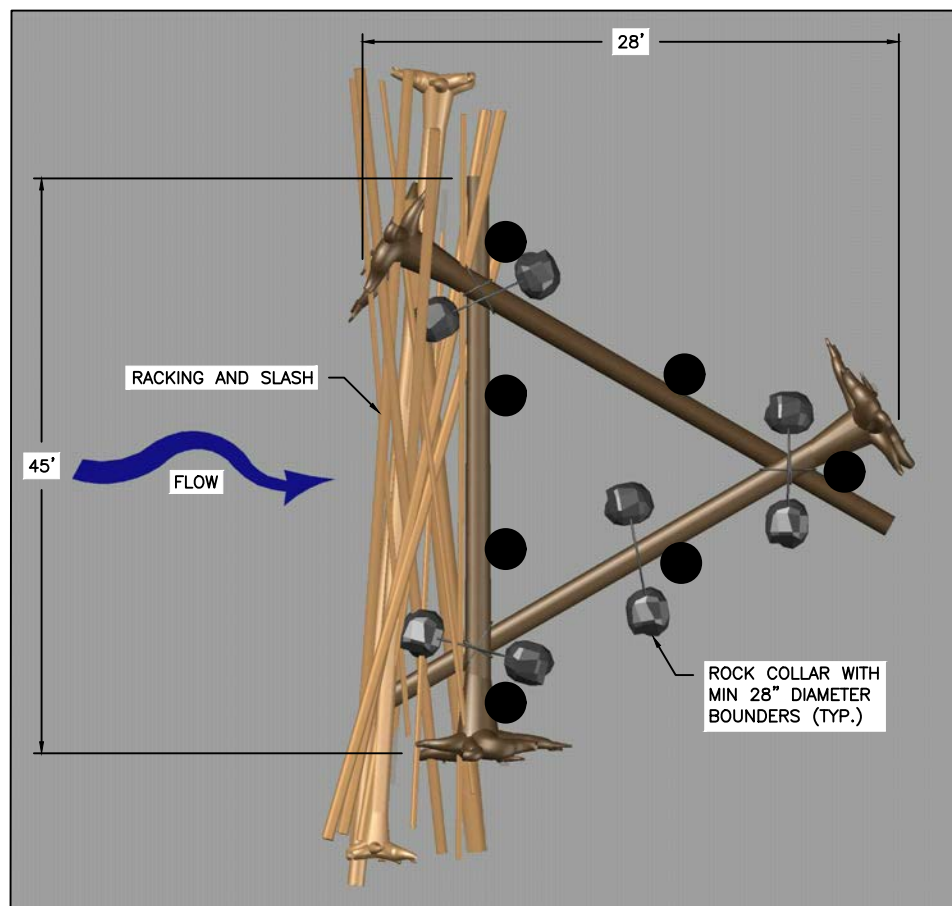
1" = 10'

REFERENCE NUMBER: NWS-2020-0322 APPLICANT: GRAYS HARBOR COUNTY		PROJECT LOCATION: SEE SHEET 01	PROPOSED PROJECT: KEYS ROAD FLOOD PROTECTION	
LATITUDE: 47° 03' 49" N LONGITUDE: 123° 29' 29" W		VERTICAL DATUM - NAVD 88 HORIZONTAL DATUM - NAD 83/91		
SHEET 11 - TYPE 1 DEFLECTOR ELJ DETAILS	DATE: 4/22/2020	IN: LOWER SATSOP RIVER NEAR/AT: SATSOP	COUNTY: GRAYS HARBOR STATE: WA	FILE: JARPA TYPE 1 DEFLECTOR-LARGE.DWG

TYPE 1 DEFLECTOR STRUCTURE DIMENSIONS	
TOTAL STRUCTURE LENGTH	28'
STRUCTURE WIDTH	45'
STRUCTURE HEIGHT	VARIABLE
EXCAVATION QUANTITY	N/A

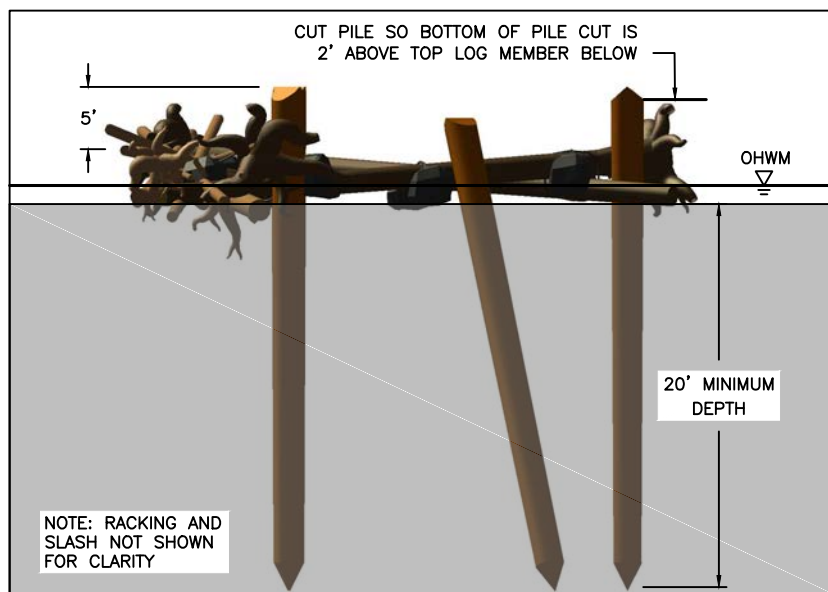
NOTES:

1. ALL LOGS ARE DOUGLAS FIR, OR WESTERN RED CEDAR.
2. SOIL EXCAVATED DURING CONSTRUCTION SHALL BE REPLACED TO ORIGINAL GROUND FOLLOWING PLACEMENT OF ALL LOGS.
3. THE LOCATIONS SHOWN IN THE PLANS ARE APPROXIMATE AND MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER.
4. EXISTING WOODY MATERIAL AT THE STRUCTURE CONSTRUCTION SITE SHALL BE MOVED OR PROTECTED FROM CONSTRUCTION ACTIVITIES AND THEN INCORPORATED INTO THE STRUCTURE AS DIRECTED BY THE CONTRACTING OFFICER.
5. TRIANGLE FRAME UNITS SHALL BE PRE-ASSEMBLED IN THE DRY AND LIFTED INTO PLACE TO REDUCE IN-WATER WORK DURATION. FRAME UNITS SHALL BE PINNED AT LOG INTERSECTIONS.



FLOODPLAIN ROUGHNESS ELJ PLAN

1" = 10'



FLOODPLAIN ROUGHNESS ELJ PROFILE

1" = 10'

REFERENCE NUMBER: NWS-2020-0322
APPLICANT: GRAYS HARBOR COUNTY

PROJECT LOCATION:
SEE SHEET 01

PROPOSED PROJECT:
KEYS ROAD FLOOD PROTECTION

LATITUDE: 47° 03' 49" N
LONGITUDE: 123° 29' 29" W

VERTICAL DATUM - NAVD 88
HORIZONTAL DATUM - NAD 83/91

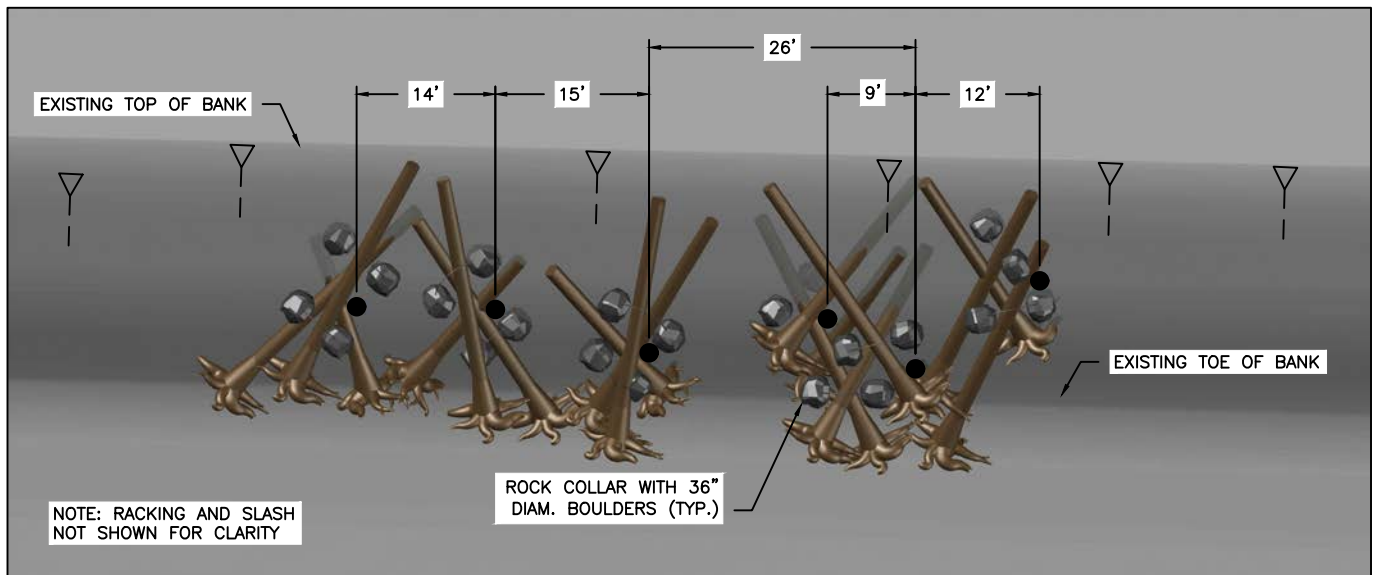
SHEET 12 - FLOODPLAIN
ROUGHNESS ELJ DETAILS

DATE: 4/22/2020

IN: LOWER SATSOP RIVER
NEAR/AT: SATSOP

COUNTY: GRAYS HARBOR
STATE: WA

FILE: JARPA FLOODPLAIN
ROUGHNESS ELJ.DWG

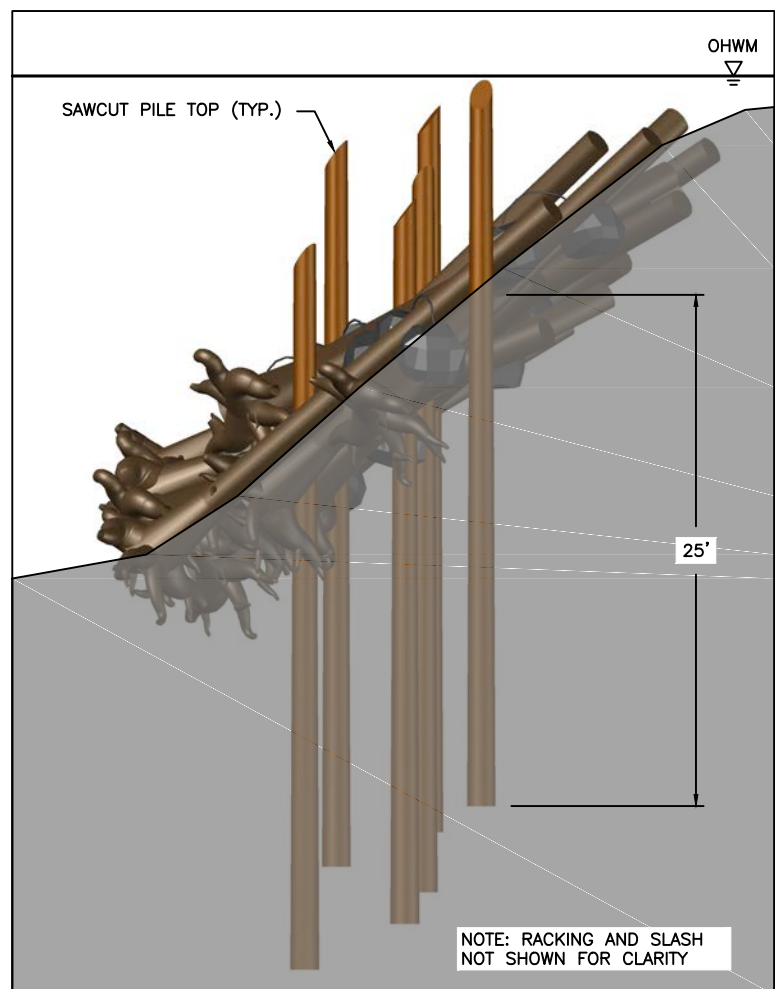


TIMBER COMPLEX ELJ PLAN
1" = 20'

TIMBER COMPLEX STRUCTURE DIMENSIONS	
TOTAL STRUCTURE LENGTH	70'
STRUCTURE WIDTH	28'
STRUCTURE HEIGHT	VARIES
EXCAVATION QUANTITY	300 CY PER 70' INSTALLED LENGTH

NOTES:

1. ALL LOGS ARE DOUGLAS FIR, OR WESTERN RED CEDAR.
2. SOIL EXCAVATED DURING CONSTRUCTION SHALL BE REPLACED TO ORIGINAL GROUND FOLLOWING PLACEMENT OF ALL LOGS.
3. THE LOCATIONS SHOWN IN THE PLANS ARE APPROXIMATE AND MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER.
4. EXTENTS AND LOCATION OF THE SCOUR POOL IS APPROXIMATE AND TO BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER.
5. EXISTING WOODY MATERIAL AT THE STRUCTURE CONSTRUCTION SITE SHALL BE MOVED OR PROTECTED FROM CONSTRUCTION ACTIVITIES AND THEN INCORPORATED INTO THE STRUCTURE AS DIRECTED BY THE CONTRACTING OFFICER.
6. TRIANGLE FRAME UNITS SHALL BE PRE-ASSEMBLED IN THE DRY AND LIFTED INTO PLACE TO REDUCE IN-WATER WORK DURATION. FRAME UNITS SHALL BE PINNED AT LOG INTERSECTIONS.



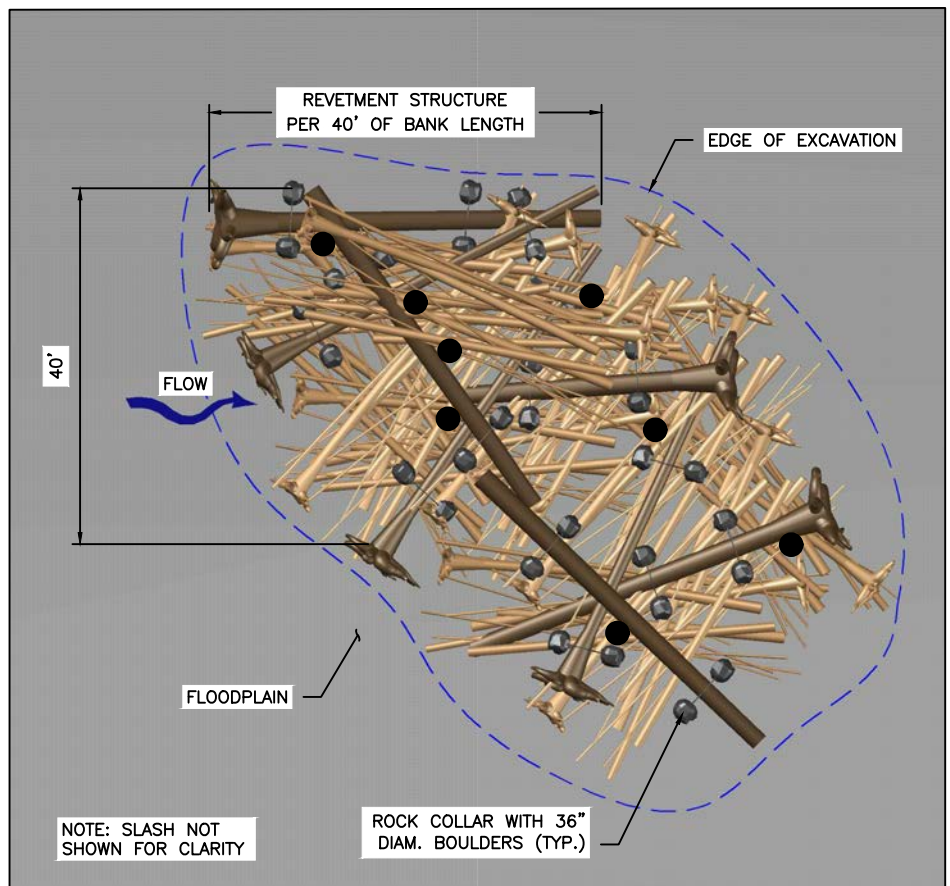
TIMBER COMPLEX ELJ PROFILE
1" = 10'

REFERENCE NUMBER: NWS-2020-0322 APPLICANT: GRAYS HARBOR COUNTY		PROJECT LOCATION: SEE SHEET 01	PROPOSED PROJECT: KEYS ROAD FLOOD PROTECTION	
LATITUDE: 47° 03' 49" N LONGITUDE: 123° 29' 29" W		VERTICAL DATUM - NAVD 88 HORIZONTAL DATUM - NAD 83/91		
SHEET 13 - TIMBER COMPLEX ELJ DETAILS	DATE: 4/22/2020	IN: LOWER SATSOP RIVER NEAR/AT: SATSOP	COUNTY: GRAYS HARBOR STATE: WA	FILE: JARPA TIMBER COMPLEX.DWG

TYPE 1 SETBACK REVETMENT STRUCTURE DIMENSIONS	
TOTAL STRUCTURE LENGTH	40'
STRUCTURE WIDTH	40'
STRUCTURE HEIGHT	VARIES
EXCAVATION QUANTITY	733 CY

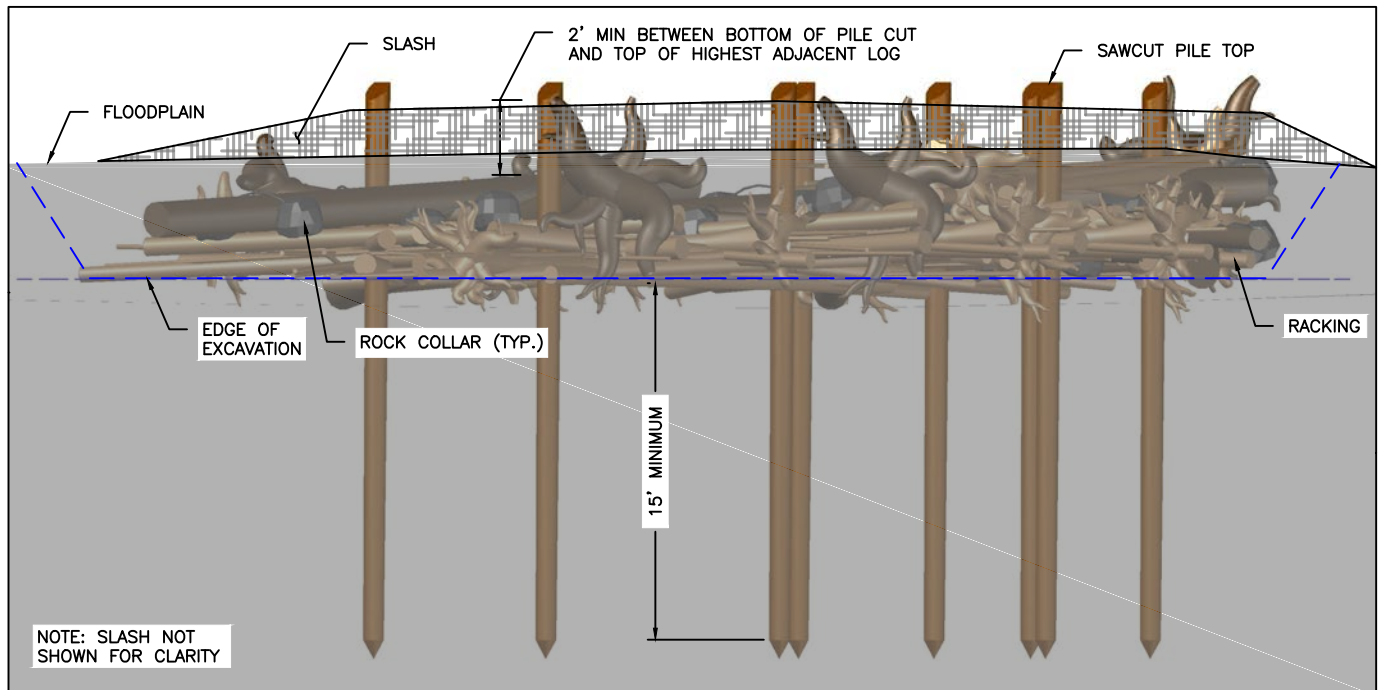
NOTES:

1. ALL SETBACK REVETMENT STRUCTURES ARE LOCATED ABOVE THE OHWM.
2. THE LOCATIONS SHOWN IN THE PLANS ARE APPROXIMATE AND MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER.
3. EXCAVATION SPOILS SHALL BE STAGED WITHIN THE WORK AREA AND OUTSIDE FLOWING WATER. SPOILS SHALL BE STOCKPILED TO ALLOW LOG LAYER PLACEMENT AND CONSTRUCTION ACCESS.
4. BACKFILL EXTENTS VARY AND TO BE CONSTRUCTED WITH NATIVE ALLUVIUM FROM EXCAVATION SPOILS.
5. COVER TOP OF BACKFILL AREA AND BASE OF STRUCTURES WITH LOOSE WOOD DEBRIS AND CHIPS. MIX 6 INCHES OF LOOSE WOOD INTO UPPER 2 FT ON BACKFILL.
6. FINAL REVETMENT HEIGHT TO BE ACHIEVED AS SPECIFIED REGARDLESS OF ACTUAL LOG DIAMETERS USED OR STACKING ARRANGEMENT.
7. AREA OF DISTURBANCE WILL BE REVEGETATED USING NATIVE WETLAND AND UPLAND SPECIES FOLLOWING CONSTRUCTION ACTIVITIES. SEE SHEET 05 FOR PLANT SCHEDULE.



TYPE 1 SETBACK REVETMENT PLAN

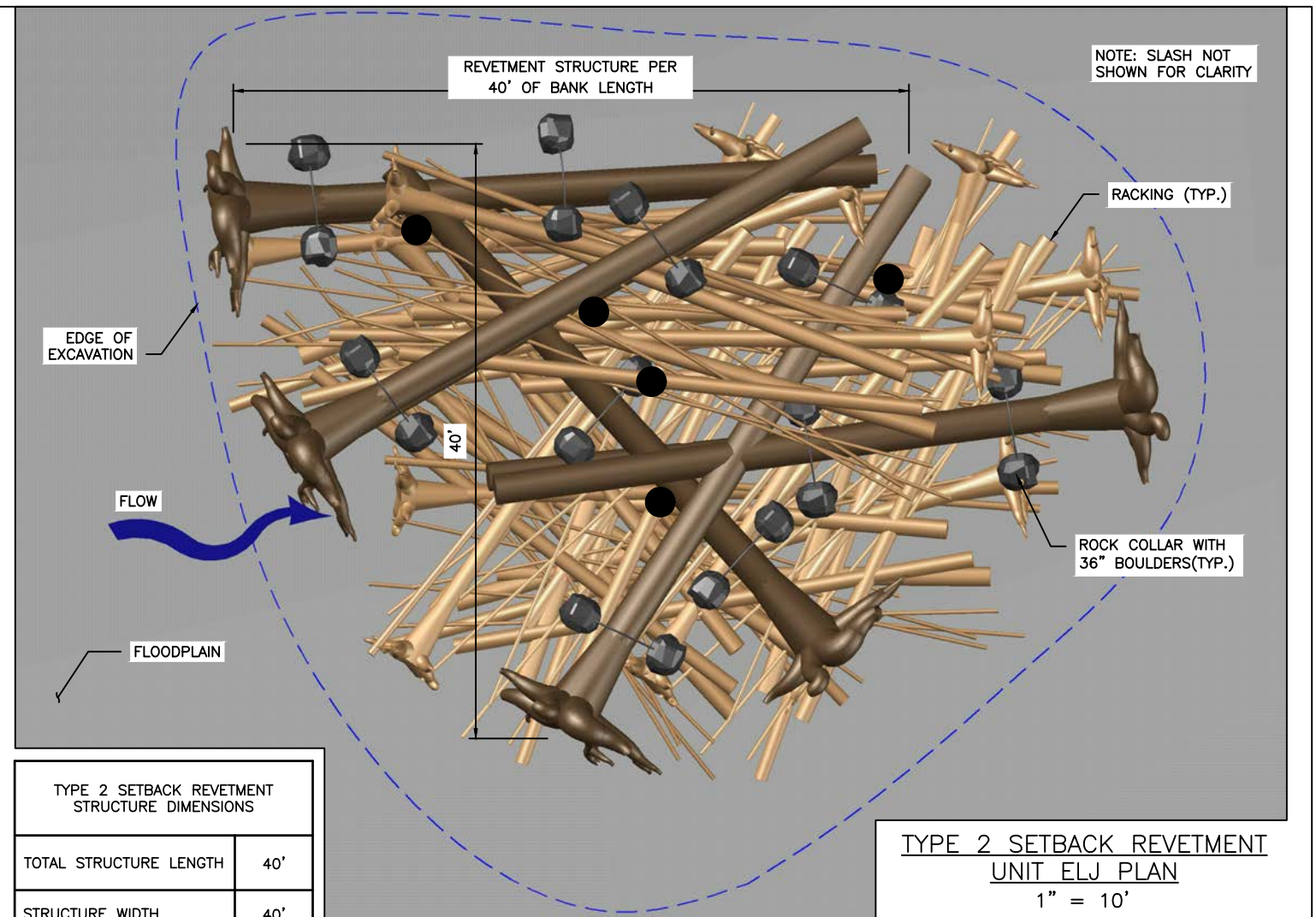
1" = 20'



TYPE 1 SETBACK REVETMENT PROFILE

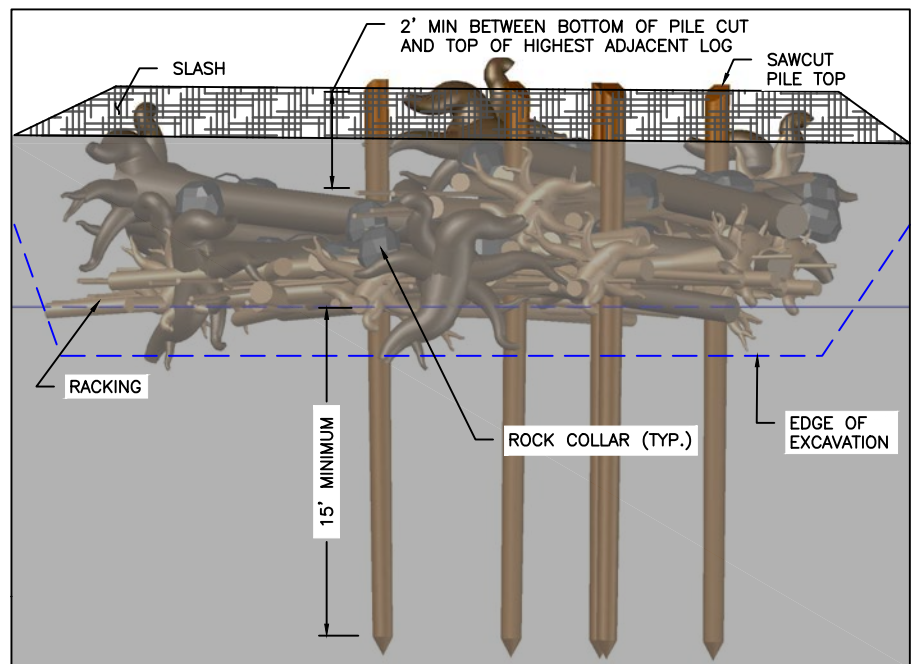
1" = 10'

REFERENCE NUMBER: NWS-2020-0322 APPLICANT: GRAYS HARBOR COUNTY		PROJECT LOCATION: SEE SHEET 01	PROPOSED PROJECT: KEYS ROAD FLOOD PROTECTION
LATITUDE: 47° 03' 49" N LONGITUDE: 123° 29' 29" W		VERTICAL DATUM - NAVD 88 HORIZONTAL DATUM - NAD 83/91	
SHEET 14 - TYPE 1 SETBACK REVETMENT ELJ DETAILS	DATE: 4/22/2020	IN: LOWER SATSOP RIVER NEAR/AT: SATSOP	COUNTY: GRAYS HARBOR STATE: WA FILE: JARPA TYPE 1 SETBACK REVTMENT.DWG



NOTES:

1. ALL SETBACK REVETMENT STRUCTURES ARE LOCATED ABOVE THE OHWM.
2. THE LOCATIONS SHOWN IN THE PLANS ARE APPROXIMATE AND MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTING OFFICER.
3. EXCAVATION SPOILS SHALL BE STAGED WITHIN THE WORK AREA AND OUTSIDE FLOWING WATER. SPOILS SHALL BE STOCKPILED TO ALLOW LOG LAYER PLACEMENT AND CONSTRUCTION ACCESS.
4. BACKFILL EXTENTS VARY AND TO BE CONSTRUCTED WITH NATIVE ALLUVIUM FROM EXCAVATION SPOILS.
5. COVER TOP OF BACKFILL AREA AND BASE OF STRUCTURES WITH LOOSE WOOD DEBRIS AND CHIPS. MIX 6 INCHES OF LOOSE WOOD INTO UPPER 2 FT ON BACKFILL.
6. FINAL REVETMENT HEIGHT TO BE ACHIEVED AS SPECIFIED REGARDLESS OF ACTUAL LOG DIAMETERS USED OR STACKING ARRANGEMENT.
7. AREA OF DISTURBANCE WILL BE REVEGETATED USING NATIVE WETLAND AND UPLAND SPECIES FOLLOWING CONSTRUCTION ACTIVITIES. SEE SHEET 05 FOR PLANT SCHEDULE.



REFERENCE NUMBER: NWS-2020-0322 APPLICANT: GRAYS HARBOR COUNTY		PROJECT LOCATION: SEE SHEET 01	PROPOSED PROJECT: KEYS ROAD FLOOD PROTECTION	
LATITUDE: 47° 03' 49" N LONGITUDE: 123° 29' 29" W		VERTICAL DATUM - NAVD 88 HORIZONTAL DATUM - NAD 83/91		
15 - TYPE 2 SHEET SETBACK REVETMENT ELJ DETAILS	DATE: 4/22/2020	IN: LOWER SATSOP RIVER NEAR/AT: SATSOP	COUNTY: GRAYS HARBOR STATE: WA	FILE: JARPA_TYPE II REVTMENT.DWG