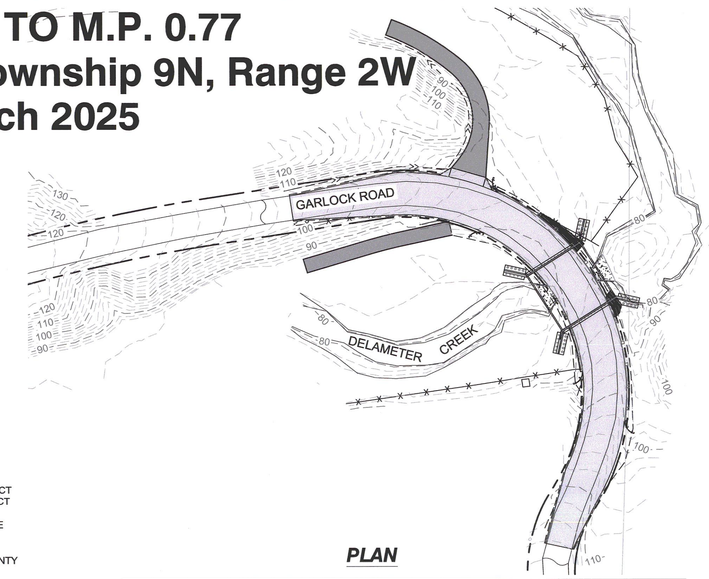
GARLOCK ROAD DELAMETER CREEK FISH PASSAGE PROJECT

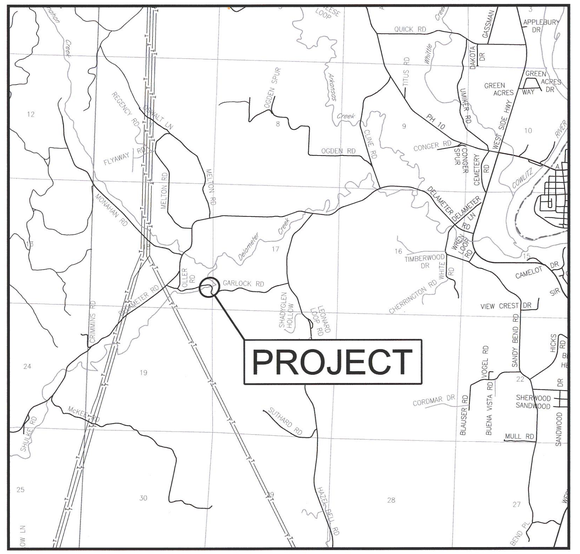
M.P. 0.67 TO M.P. 0.77

Section 17 & 18, Township 9N, Range 2W

March 2025



PLAN



VICINITY MAP

SCALE: 1" = 3000'

CALL 48 HOURS BEFORE YOU DIG

1-800-424-5555

"It's the Law"

GRAPHIC SCALE

60 0 30 60 120

(IN FEET)

1 inch = 60 ft.

SYMBOL LEGEND

SYMBOL	DESCRIPTION
	MANHOLE - EXISTING
	MANHOLE - NEW
	SANITARY SEWER CLEANOUT - EXISTING
	SANITARY SEWER CLEANOUT - NEW
	GRATE INLET - TYPE 1L - NEW
	CURB INLET - TYPE 1L - NEW
	CURB INLET - TYPE 2 - NEW
	FENCE GATE POST - EXISTING
	FENCE GATE POST - NEW
	MAIL BOX
	SHRUB
	CONIFER TREE
	DECIDUOUS TREE
W	WATER WELL
	ROAD SIGN
	BORE HOLE
	INCLINOMETER
	MONITOR WELL
	PIEZEOMETER
	MARKER
	CABLE TV PEDESTAL
	NATURAL GAS METER
	NATURAL GAS VENT
	NATURAL GAS VALVE
	PETROLEUM VENT
	GUY ANCHOR
	GUY POLE
	LIGHT STANDARD
	LIGHT POLE
	ELECTRICAL POWER METER
	UTILITY / POWER / TELEPHONE POLE
	SERVICE POLE
	TELEPHONE PEDESTAL
	FIRE HYDRANT
	WATER METER
	WATER VALVE

LINETYPE LEGEND

LINETYPE	DESCRIPTION
	EXISTING DRAINAGE CULVERT
	EXISTING DRAINAGE / ROAD DITCH
	EXISTING DRAINAGE BANK
OHW	ORDINARY HIGH WATER
X X X X X X	EXISTING FENCE
OTV	CABLE TV OVERHEAD LINE
UTV	CABLE TV UNDERGROUND LINE
GAS	NATURAL GAS LINE
PET	PETROLEUM LINE
OP	ELECTRICAL POWER OVERHEAD LINE
UP	ELECTRICAL POWER UNDERGROUND LINE
SS	EXISTING SANITARY SEWER LINE
OT	TELEPHONE OVERHEAD LINE
UT	TELEPHONE UNDERGROUND LINE
WTR	EXISTING WATER LINE
WET	WETLANDS DELINEATION
	EXISTING ROAD / DRIVEWAY GRAVEL
	EXISTING ROAD / DRIVEWAY PAVEMENT
	EXISTING GUARD RAIL
	DESIGN ALIGNMENT CENTERLINE
	DESIGN EDGE OF PAVEMENT
	DESIGN SHOULDER
	DESIGN ROAD / DRAINAGE DITCH
X X X X X X	DESIGN FENCE
	SILT FENCE
	DESIGN GUARD RAIL
	DESIGN STORM SEWER / ROAD CULVERT PIPE
	DESIGN PERF / UNDERDRAIN LINE
CUT	DESIGN DAYLIGHT - CUT
FILL	DESIGN DAYLIGHT - FILL
	EXISTING GROUND CENTERLINE PROFILE
	DESIGN CENTERLINE PROFILE
	RIGHT OF WAY LINE
	CONTOUR - EXISTING - INDEX
	CONTOUR - EXISTING - NORMAL
	CONTOUR - DESIGN - INDEX
	CONTOUR - DESIGN - NORMAL

BASIS OF BEARINGS:

ASSUMED, BASED ON PREVIOUS COWLITZ COUNTY PROJECT #1802 DELAMETER ROAD RECONSTRUCTION. SAID PROJECT HAVING CONTROL POINTS 1 AND 13 BEING S80°43'41"W, 8278.79'. THE LOCATION OF CONTROL POINTS 1 AND 13 ARE DEPICTED IN THE SURVEY CONTROL TABLE. FOR MORE INFORMATION, SEE RECORD OF SURVEY BY PAUL GALLI RECORDED IN VOLUME 36 PAGE 115 AT THE COWLITZ COUNTY AUDITORS OFFICE.

BASIS OF ELEVATIONS:

ELEVATION DATUM: NAVD 88
BENCHMARK: SURVEY CONTROL #309
LOCATION: AS SHOWN ON RECORD OF SURVEY PROJECT ID: 1779
ELEVATION: 92.76'

STANDARD DRAWINGS

DRAWING	DESCRIPTION
WSDOT:	
B-55.20	PIPE ZONE BEDDING AND BACKFILL
C-1B	BEAM GUARDRAIL POSTS AND BLOCKS
C-20.10	BEAM GUARDRAIL TYPE 31
C-20.14	BEAM GUARDRAIL TYPE 3 PLACEMENT (CASES 1-31, 2-31, & 3-31)
C-22.45	BEAM GUARDRAIL TYPE 31 NON-FLARED TERMINAL (POSTED SPEED 45 MPH AND BELOW)
C-23.70	BEAM GUARDRAIL (TYPE 31) ANCHOR TYPE 11
I-30.15	SILT FENCE
COUNTY:	
CC-1317	APPROACH - ASPHALT OR CONCRETE APRON
CC-1318	APPROACH - TYPICAL SECTIONS

ABBREVIATIONS

ABBREV	DESCRIPTION
Δ	DELTA
BK	BOOK
BOC	BACK OF CURB
BVCS	POINT OF VERTICAL CURVATURE - STATION
BVCE	POINT OF VERTICAL CURVATURE - ELEVATION
CDF	CONTROLLED DENSITY FILL
CONC	CONCRETE
CPE	CORRUGATED POLYETHYLENE PIPE
CRP	COUNTY ROAD PROJECT
DIA	DIAMETER
EG	EXISTING GROUND
EL	ELEVATION
ELEV	ELEVATION
EOP	EDGE OF PAVEMENT
EVCS	POINT OF VERTICAL TANGENCY - STATION
EVCE	POINT OF VERTICAL TANGENCY - ELEVATION
EXIST	EXISTING
FD	FOUND
FG	FINISH GRADE
FL	FLOW LINE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HMA	ASPHALT CONCRETE
HORIZ	HORIZONTAL
HP	HIGH POINT
I.E.	INVERT ELEVATION
INV	INVERT
IP	IRON PIPE
IR	IRON ROD
JT	JOINT
L	LENGTH
LF	LINEAR FEET
LT	LEFT
M.P.	MILE POST
MAX	MAXIMUM
MIN	MINIMUM
N	NORTH
NTS	NOT TO SCALE
PC	POINT OF HORIZONTAL CURVATURE
PG	PERFORMANCE GRADE
PI	POINT OF HORIZONTAL INTERSECTION
PSI	POUNDS PER SQUARE INCH
PT	POINT OF HORIZONTAL TANGENCY
PVI	POINT OF VERTICAL INTERSECTION
R	RANGE, RADIUS
R/W	RIGHT OF WAY
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
REINF	REINFORCING
RT	RIGHT
S	SOUTH
SEC	SECTION
SHT	SHEET
SPEC	SPECIFICATION
SR	STATE ROUTE
STA	STATION
STD	STANDARD
T	TOWNSHIP, TANGENT
TYP	TYPICAL
VC	VERTICAL CURVE
VERT	VERTICAL
W	WEST
WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
W/	WITH

INDEX OF DRAWINGS

R.E.M. PROJECT MANAGER — 3/20/2025 DATE

D.J.B. DRAWN BY — 3/20/2025 DATE

S.E.E. CHECKED BY — 3/20/2025 DATE

HORIZ. SCALE: AS NOTED
VERT. SCALE: -

PROJECT ID: 1779
ROAD NO. : 23200

COMPUTER FILE: 1779 Garlock Cover.dwg

COWLITZ COUNTY WASHINGTON

DEPARTMENT OF PUBLIC WORKS

1600-13th AVENUE SOUTH
KELSO, WASHINGTON 98626

APPROVED BY: Susan Eugenis — 3/24/25
COUNTY ENGINEER

DATE: March 24, 2025

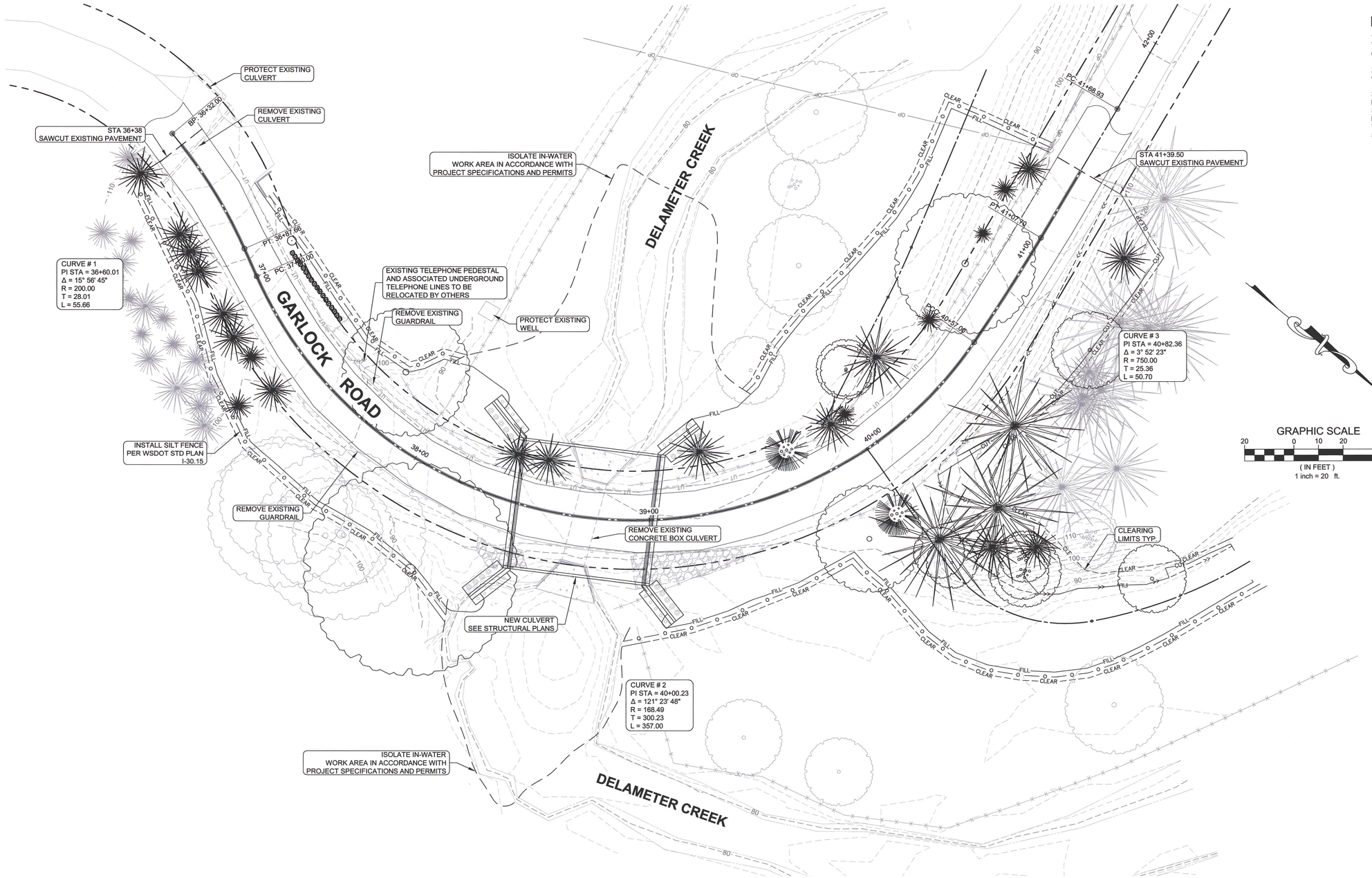
ROGER EVAN MAUK — STATE OF WASHINGTON — 24839 — REGISTERED PROFESSIONAL ENGINEER

CRP Number 764

GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT

COVER SHEET

SHEET 1 OF 25



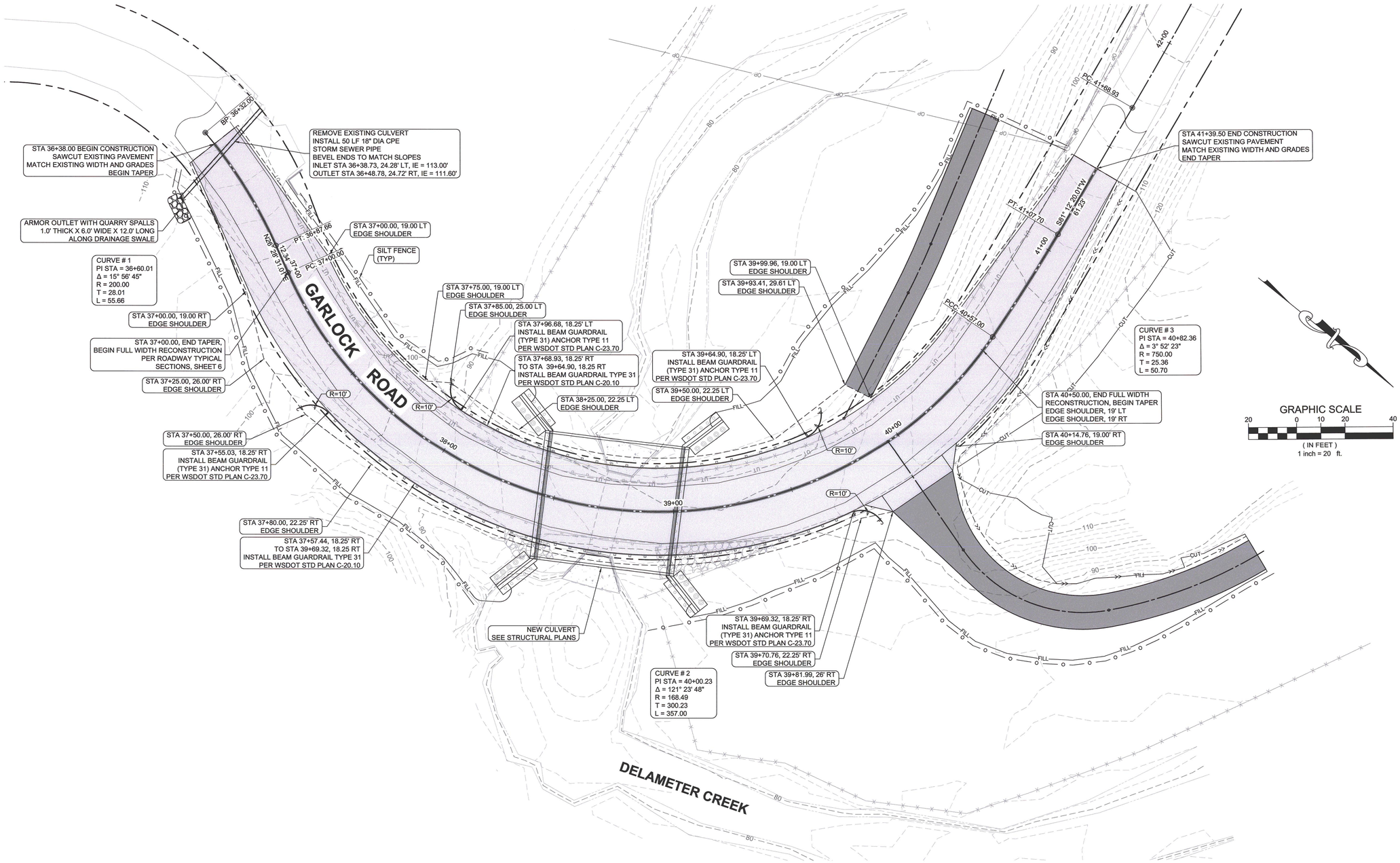
NOTES:

1. REMOVE ALL PAVEMENT WITHIN PROJECT AREA (BETWEEN SAWCUTS).
2. CLEAR AND GRUB TO CLEARING LIMITS SHOWN.
3. REMOVE ALL TREES DESIGNATED FOR REMOVAL WITH DARK TREE SYMBOL. STORE TREES WITH INTACT ROOTWADS FOR USE IN STREAMBED. TREES WITH FADED TREE SYMBOL SHALL BE PROTECTED.

PLAN

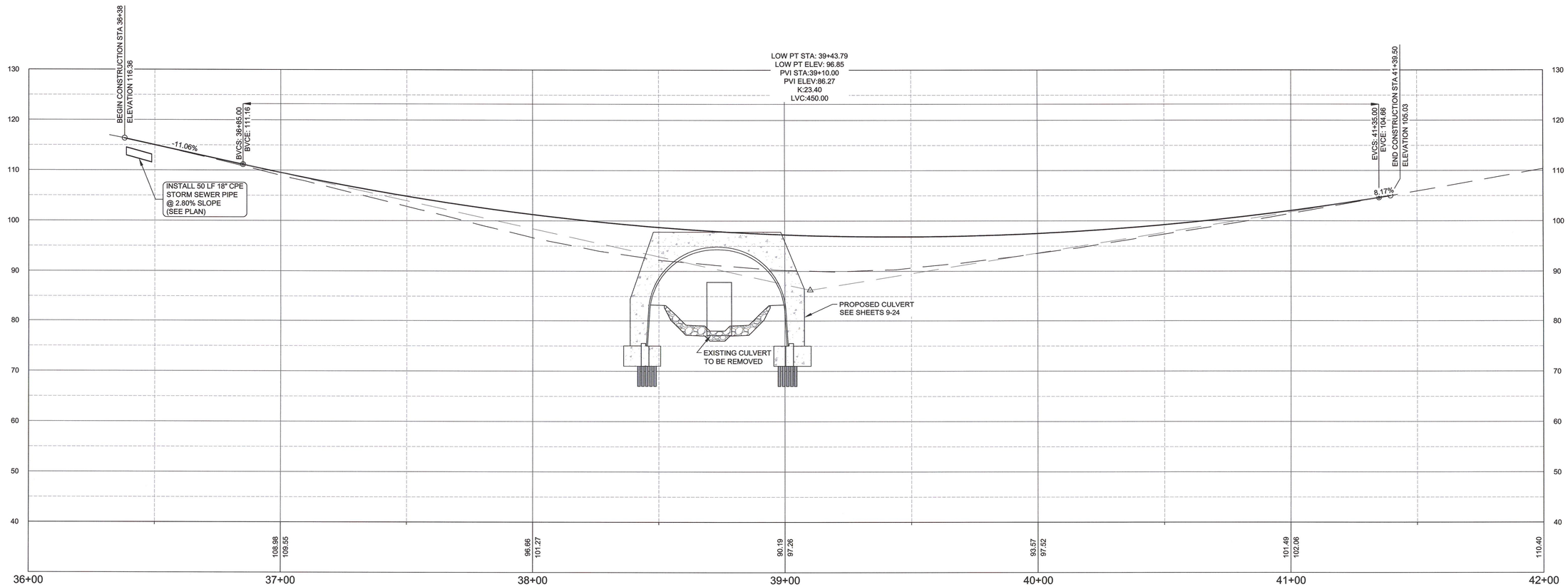
3/24/25

R.E.M. PROJECT MANAGER 3/20/2025 DATE D.J.B. DRAWN BY 3/20/2025 DATE S.E.E. CHECKED BY 3/20/2025 DATE	HORIZ. SCALE: 1" = 20' VERT. SCALE: PROJECT ID: 1779 ROAD NO. : 23200 COMPUTER FILE: 1779 Garlock Design.dwg	COWLITZ COUNTY WASHINGTON	DEPARTMENT OF PUBLIC WORKS 1600 13TH AVENUE SOUTH KELSO, WASHINGTON 98626	NOTE: SCALES SHOWN ARE FOR FULL SIZE (24"x36") PLAN SHEETS ONLY. SCALES FOR HALF SIZE PLAN SHEETS ARE APPROXIMATELY ONE HALF SCALE.	ROGER EVAN MAIRE STATE OF WASHINGTON 34939 REGISTERED PROFESSIONAL ENGINEER	Sec. 17 & 18, T 9N, R 2W	**GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT** **REMOVAL PLAN AND TESC PLAN**	SHEET 2 OF 25

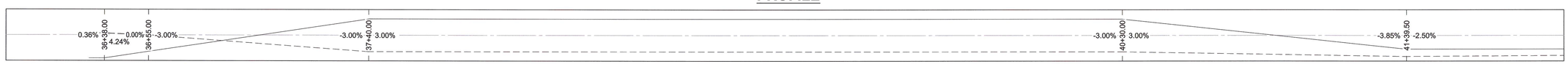


PLAN

R.E.M. PROJECT MANAGER 3/20/2025 DATE D.J.B. DRAWN BY 3/20/2025 DATE S.E.E. CHECKED BY 3/20/2025 DATE	HORIZ. SCALE: 1" = 20' VERT. SCALE: PROJECT ID: 1779 ROAD NO. : 23200 COMPUTER FILE: 1779 Garlock Design.dwg	COWLITZ COUNTY WASHINGTON DEPARTMENT OF PUBLIC WORKS 1600 13TH AVENUE SOUTH KELSO, WASHINGTON 98626	NOTE: SCALES SHOWN ARE FOR FULL SIZE (24"x36") PLAN SHEETS ONLY. SCALES FOR HALF SIZE PLAN SHEETS ARE APPROXIMATELY ONE HALF SCALE.	ROGER EVAN MAURER STATE OF WASHINGTON 34939 REGISTERED PROFESSIONAL ENGINEER 3/24/25	Sec. 17 & 18, T 9N, R 2W	**GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT** **ROADWAY PLAN**	SHEET 3 OF 25

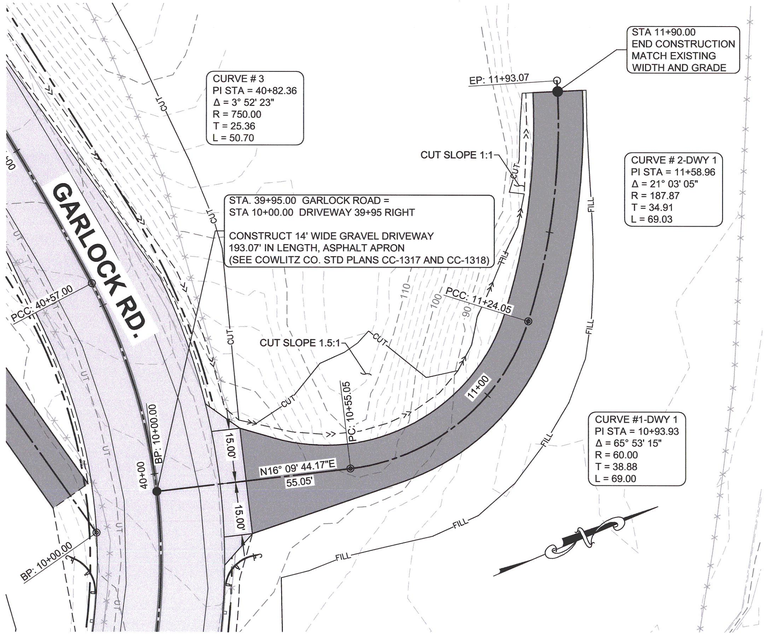


PROFILE



SUPERELEVATION

R.E.M. PROJECT MANAGER 3/20/2025 DATE D.J.B. DRAWN BY 3/20/2025 DATE S.E.E. CHECKED BY 3/20/2025 DATE	HORIZ. SCALE: 1" = 20' VERT. SCALE: 1" = 10' PROJECT ID: 1779 ROAD NO. : 23200 COMPUTER FILE: 1779 Garlock Design.dwg	COWLITZ COUNTY WASHINGTON	DEPARTMENT OF PUBLIC WORKS 1600 13TH AVENUE SOUTH KELSO, WASHINGTON 98626	NOTE: SCALES SHOWN ARE FOR FULL SIZE (24"x36") PLAN SHEETS ONLY. SCALES FOR HALF SIZE PLAN SHEETS ARE APPROXIMATELY ONE HALF SCALE.	3/24/25 ROGER EVAN MAIRS STATE OF WASHINGTON 34939 REGISTERED PROFESSIONAL ENGINEER	Sec. 17 & 18, T 9N, R 2W	**GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT** **ROADWAY PROFILE AND SUPERELEVATION PLAN STA 36+32 TO STA 40+25**	SHEET 4 OF 25



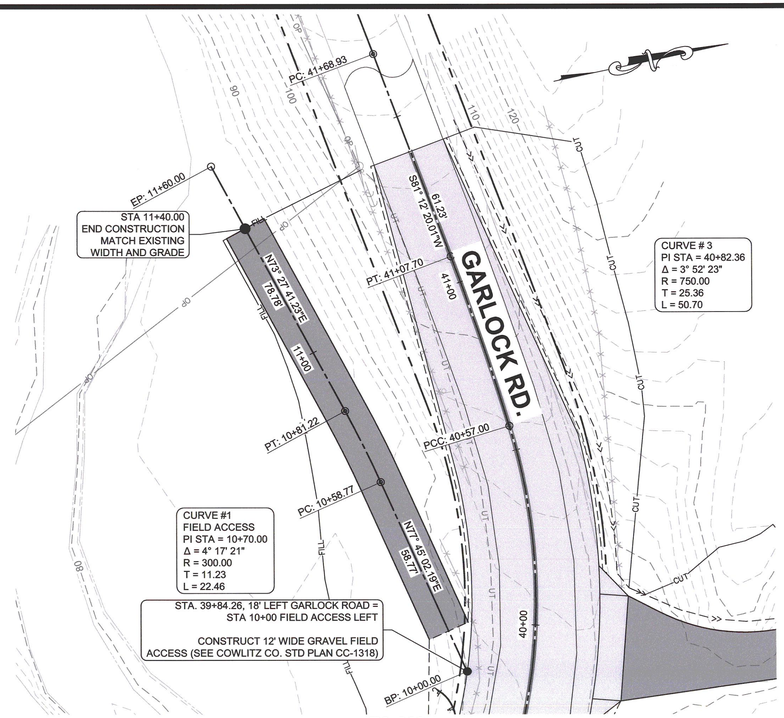
PLAN

GRAPHIC SCALE

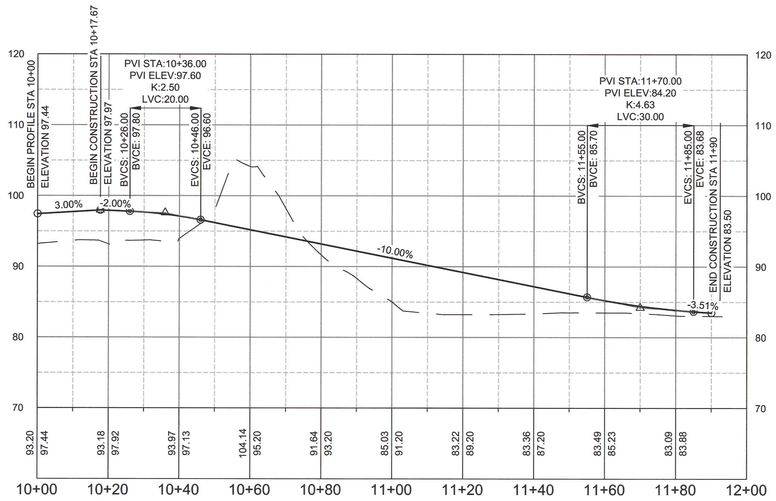
20 0 10 20 40

(IN FEET)

1 inch = 20 ft.

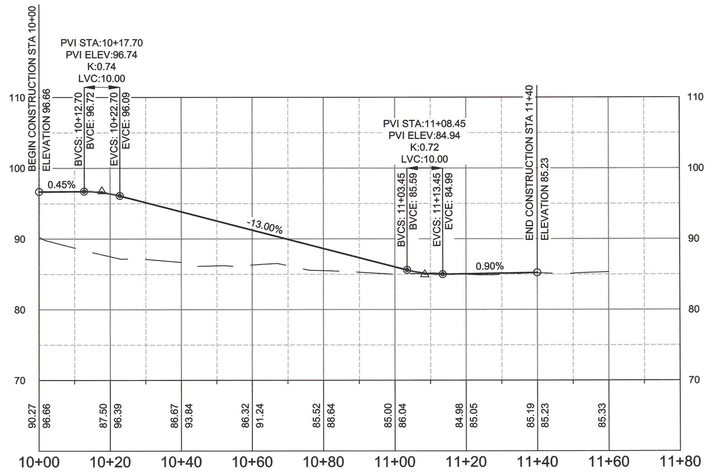


PLAN



PROFILE

DRIVEWAY 39+95, RIGHT



PROFILE

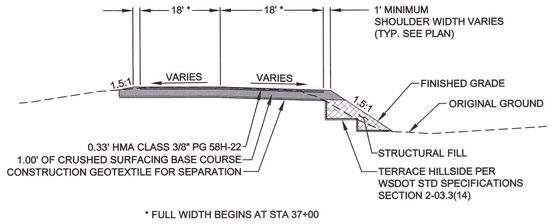
FIELD ACCESS 39+84.26, LEFT

R.E.M. PROJECT MANAGER	3/20/2025 DATE	HORIZ. SCALE: 1" = 20' VERT. SCALE: 1" = 10'	COWLITZ COUNTY WASHINGTON	DEPARTMENT OF PUBLIC WORKS	NOTE: SCALES SHOWN ARE FOR FULL SIZE (24"x36") PLAN SHEETS ONLY. SCALES FOR HALF SIZE PLAN SHEETS ARE APPROXIMATELY ONE HALF SCALE.	3/21/25 ROGER EVAN MAUBER STATE OF WASHINGTON 24539 REGISTERED PROFESSIONAL ENGINEER	Sec. 17 & 18, T 9N, R 2W
D.J.B. DRAWN BY	3/20/2025 DATE	PROJECT ID: 1779 ROAD NO. : 23200		1600 13TH AVENUE SOUTH KELSO, WASHINGTON 98626			
S.E.E. CHECKED BY	3/20/2025 DATE	COMPUTER FILE: 1779 Garlock Design.dwg					

GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT

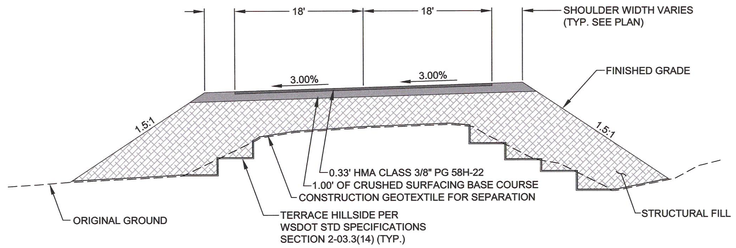
DRIVEWAY & FIELD ACCESS PLAN AND PROFILE

SHEET 5 OF 25

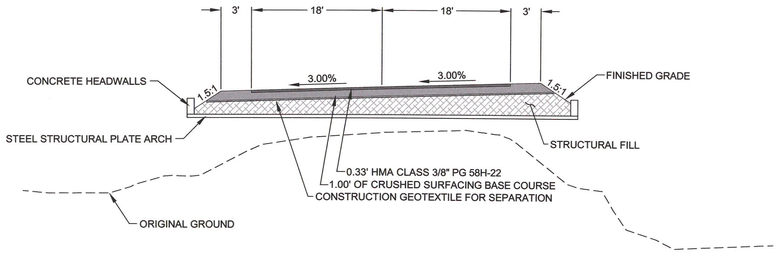


* FULL WIDTH BEGINS AT STA 37+00

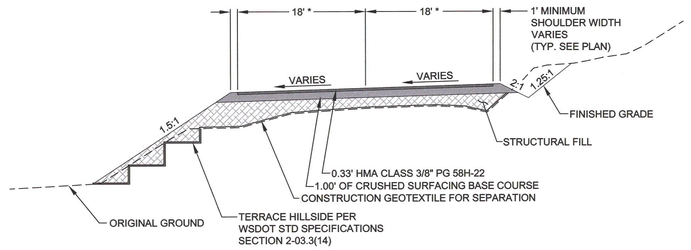
GARLOCK ROAD-TYPICAL ROADWAY SECTION
STA 36+38 TO STA 37+50



GARLOCK ROAD-TYPICAL ROADWAY SECTION
STA 37+50 TO STA 38+31.07
STA 39+00.95 TO STA 40+19.76



GARLOCK ROAD-TYPICAL ROADWAY SECTION
STA 38+31.07 TO STA 39+00.95

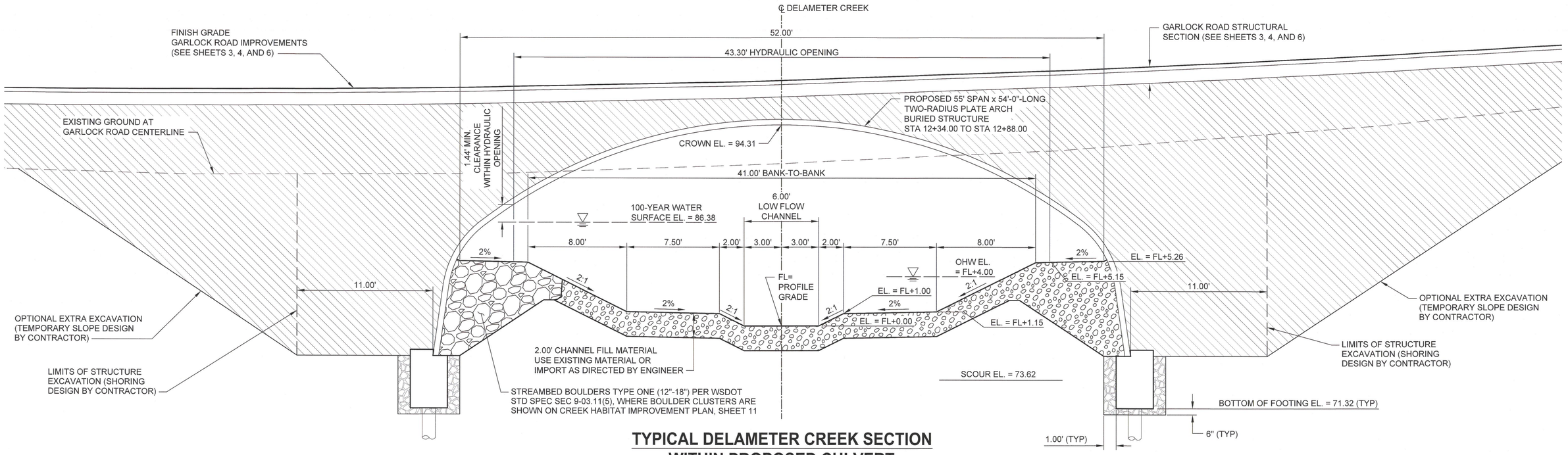


* FULL WIDTH ENDS AT STA 40+50

GARLOCK ROAD-TYPICAL ROADWAY SECTION
STA 40+14.76 TO STA 41+39.50

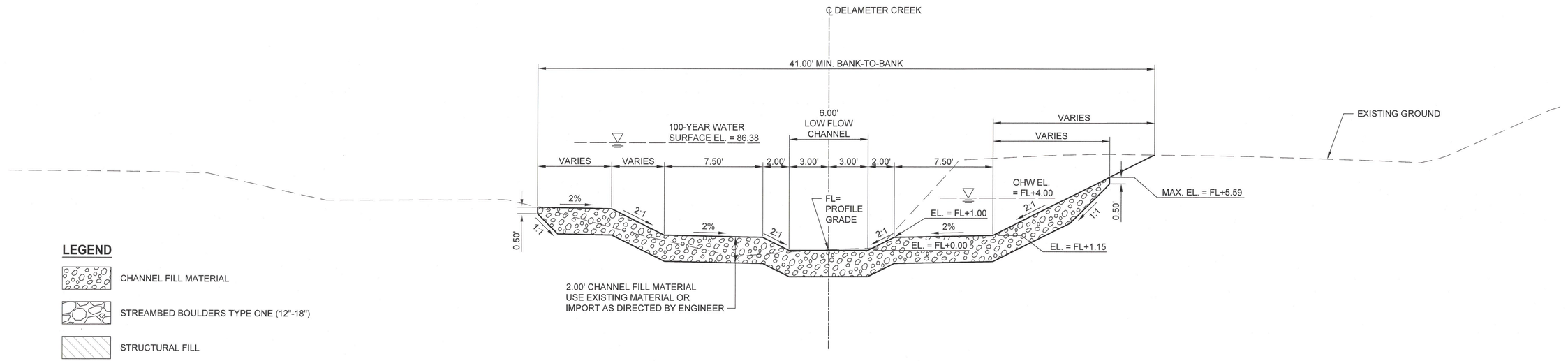
3/21/25

R.E.M. PROJECT MANAGER 3/20/2025 DATE D.J.B. DRAWN BY 3/20/2025 DATE S.E.E. CHECKED BY 3/20/2025 DATE	HORIZ. SCALE: 1" = 10' VERT. SCALE: PROJECT ID: 1779 ROAD NO. : 23200 COMPUTER FILE: 1779 Garlock Design.dwg	COWLITZ COUNTY WASHINGTON	DEPARTMENT OF PUBLIC WORKS 1600 13TH AVENUE SOUTH KELSO, WASHINGTON 98626	NOTE: SCALES SHOWN ARE FOR FULL SIZE (24"x36") PLAN SHEETS ONLY. SCALES FOR HALF SIZE PLAN SHEETS ARE APPROXIMATELY ONE HALF SCALE.	ROGER EVAN MAUER STATE OF WASHINGTON 34959 REGISTERED PROFESSIONAL ENGINEER	Sec. 17 & 18, T 9N, R 2W	**GARLOCK ROAD - DELAMETER CREEK** **FISH PASSAGE PROJECT** **TYPICAL ROADWAY SECTIONS**	SHEET 6 OF 25



TYPICAL DELAMETER CREEK SECTION WITHIN PROPOSED CULVERT

STA 12+22.87 TO STA 12+88.00



LEGEND

- CHANNEL FILL MATERIAL
- STREAMBED BOULDERS TYPE ONE (12"-18")
- STRUCTURAL FILL
- GRAVEL BACKFILL FOR FOUNDATIONS OR CRUSHED SURFACING BASE COURSE

TYPICAL DELAMETER CREEK SECTION UPSTREAM OF PROPOSED CULVERT

STA 11+20.00 TO STA 12+22.87

BRIAN BIERWAGEN	3/21/2025
PROJECT MANAGER	DATE
NILS HOVLAND	3/21/2025
DRAWN BY	DATE
SHAWN ELLIS	3/21/2025
CHECKED BY	DATE

HORIZ. SCALE: NO SCALE
VERT. SCALE: NO SCALE

PROJECT ID: 1779
ROAD NO. : 23200

COMPUTER FILE:
PO2415014H01_Creek
Typical and Gen.dwg

COWLITZ COUNTY WASHINGTON

DEPARTMENT
OF
PUBLIC WORKS

1600 13TH AVENUE SOUTH
KELSO, WASHINGTON 98626

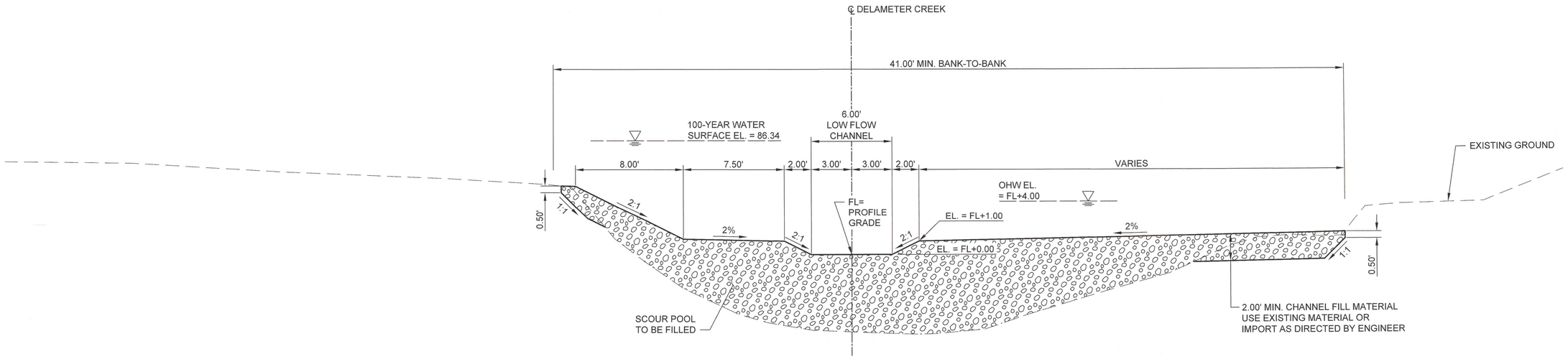
Parametrix
5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214
Ph: 503.233.2400

BRIAN BIERWAGEN STATE OF WASHINGTON 28900 REGISTERED PROFESSIONAL ENGINEER
3/24/25

SECTIONS 17 & 18, T9N, R2W

GARLOCK ROAD - DELAMETER CREEK
FISH PASSAGE PROJECT
DELAMETER CREEK
TYPICAL SECTIONS (1 OF 2)

SHEET 7 OF 25



TYPICAL DELAMETER CREEK SECTION
DOWNSTREAM OF PROPOSED CULVERT

STA 12+88.00 TO STA 13+70.00

LEGEND

CHANNEL FILL MATERIAL

BRIAN BIERWAGEN — PROJECT MANAGER — 3/21/2025 DATE	HORIZ. SCALE: NO SCALE VERT. SCALE: NO SCALE PROJECT ID: 1779 ROAD NO. : 23200 COMPUTER FILE: PO2415014H01_Creek Typical and Gen.dwg
NILS HOVLAND — DRAWN BY — 3/21/2025 DATE	
SHAWN ELLIS — CHECKED BY — 3/21/2025 DATE	

COWLITZ COUNTY WASHINGTON

DEPARTMENT
OF
PUBLIC WORKS

1600 13TH AVENUE SOUTH
KELSO, WASHINGTON 98626

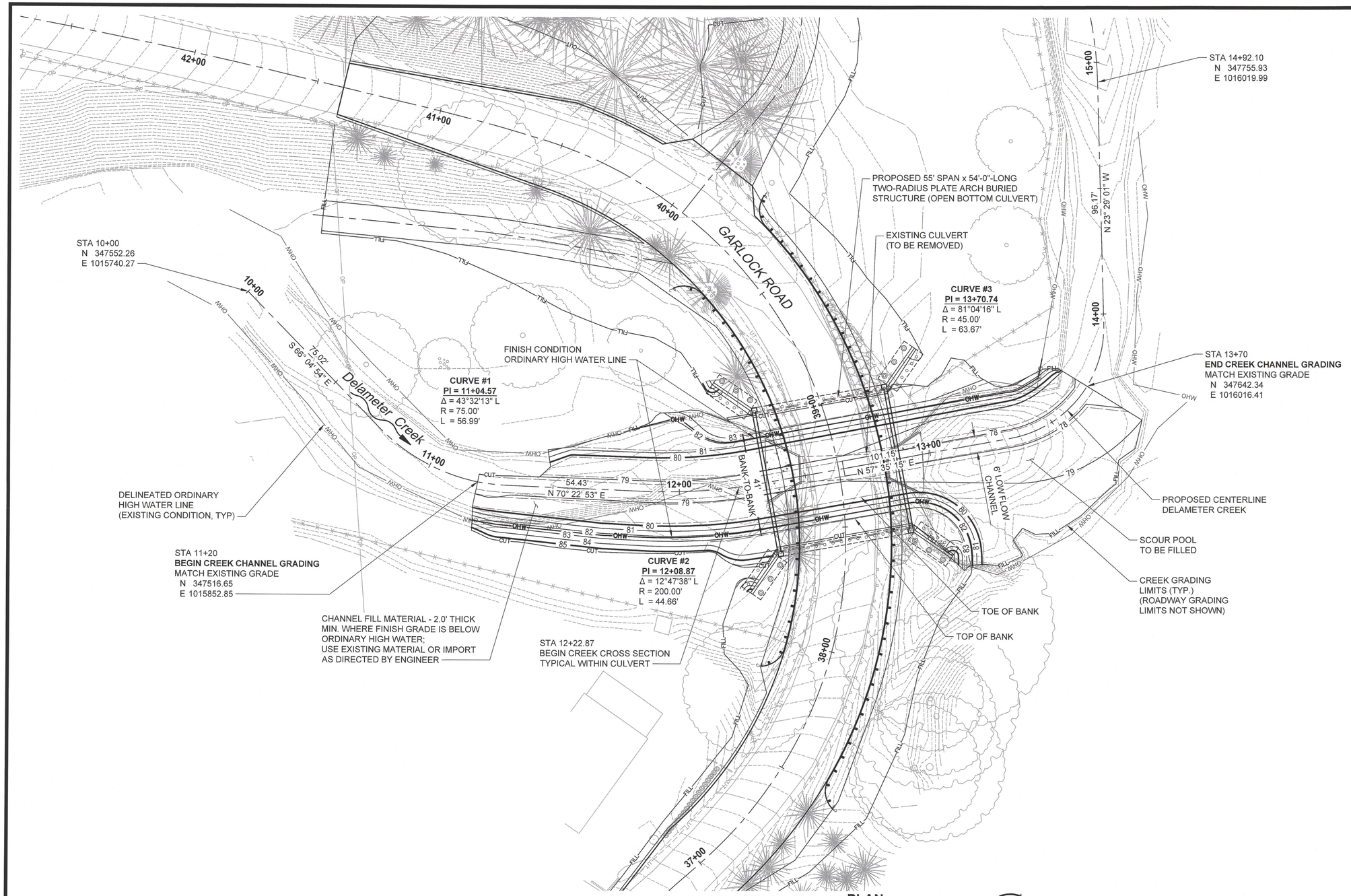
Parametrix
5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214
Ph: 503.233.2400

BRIAN N BIERWAGEN — STATE OF WASHINGTON — 28900 — REGISTERED PROFESSIONAL ENGINEER — 3/24/25

SECTIONS 17 & 18, T9N, R2W

GARLOCK ROAD - DELAMETER CREEK
FISH PASSAGE PROJECT
DELAMETER CREEK
TYPICAL SECTIONS (2 OF 2)

SHEET 8 OF 25

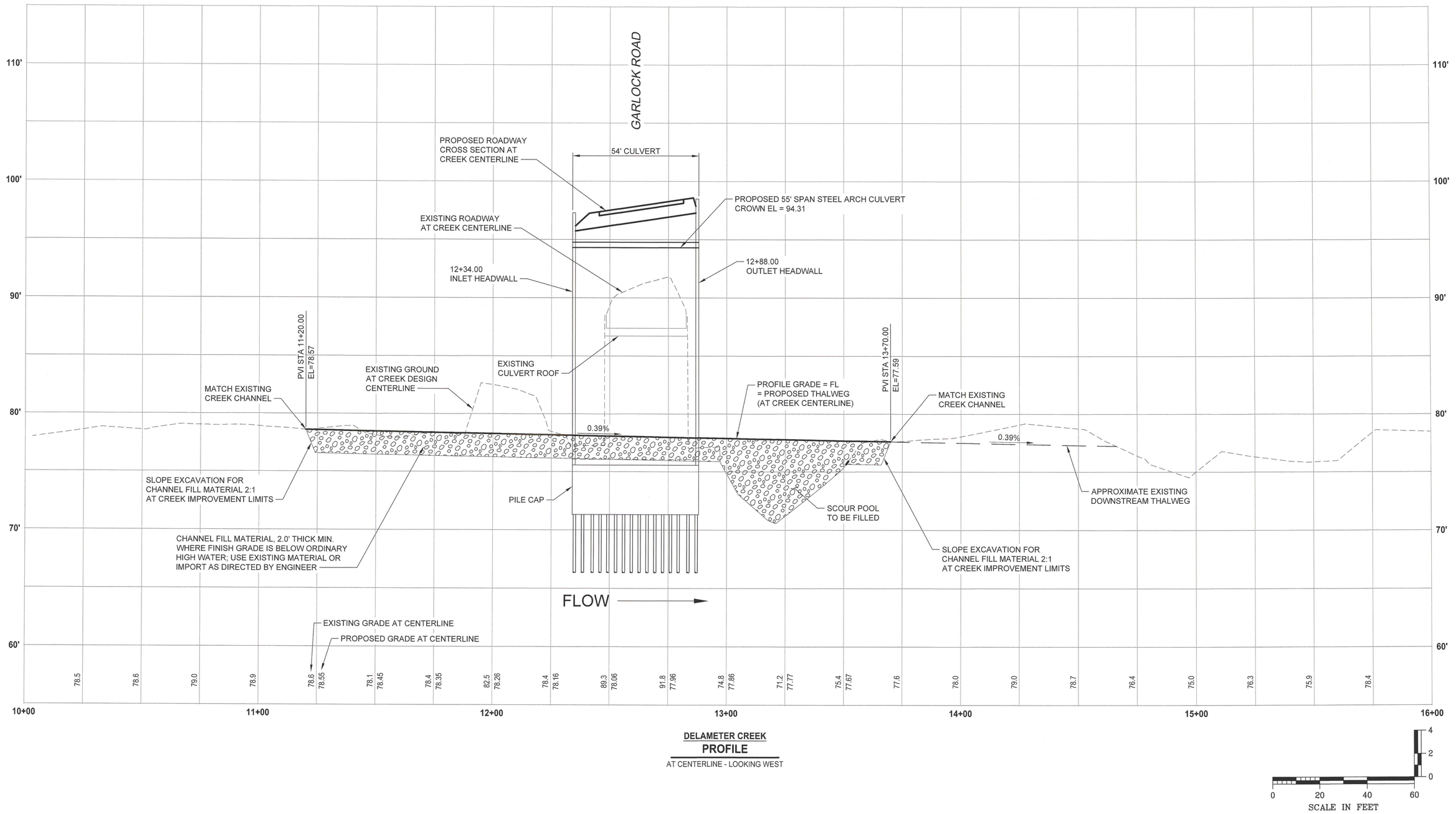


PLAN

0 20 40 60

SCALE IN FEET

BRIAN BIERWAGEN PROJECT MANAGER 3/21/2025 DATE NILS HOVLAND DRAWN BY 3/21/2025 DATE SHAWN ELLIS CHECKED BY 3/21/2025 DATE	HORIZ. SCALE: 1" = 20' VERT. SCALE: PROJECT ID: 1779 ROAD NO. : 23200 COMPUTER FILE: PO2415014H02_Creek Plan.dwg	COWLITZ COUNTY WASHINGTON DEPARTMENT OF PUBLIC WORKS 1600 13TH AVENUE SOUTH KELSO, WASHINGTON 98626	Parametrix 5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214 Ph: 503.233.2400	BRIAN N BIERWAGEN STATE OF WASHINGTON 28900 REGISTERED PROFESSIONAL ENGINEER 3/24/25	SECTIONS 17 & 18, T9N, R2W	GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT CREEK PLAN	SHEET 9 OF 25



DELAMETER CREEK

PROFILE

AT CENTERLINE - LOOKING WEST

BRIAN BIERWAGEN	3/21/2025	
PROJECT MANAGER	DATE	
NILS HOVLAND	3/21/2025	
DRAWN BY	DATE	
SHAWN ELLIS	3/21/2025	
CHECKED BY	DATE	

HORIZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 4'

PROJECT ID: 1779
ROAD NO. : 23200

COMPUTER FILE:
PO2415014H03_Creek Long Profile.dwg

COWLITZ COUNTY WASHINGTON

DEPARTMENT OF PUBLIC WORKS

1600 13TH AVENUE SOUTH
KELSO, WASHINGTON 98626

Parametrix
5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214
Ph: 503.233.2400

BRIAN N BIERWAGEN STATE OF WASHINGTON 28500 REGISTERED PROFESSIONAL ENGINEER 3/24/25

SECTIONS 17 & 18, T9N, R2W

GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT

DELAMETER CREEK LONG PROFILE

SHEET 10 OF 25

LEGEND

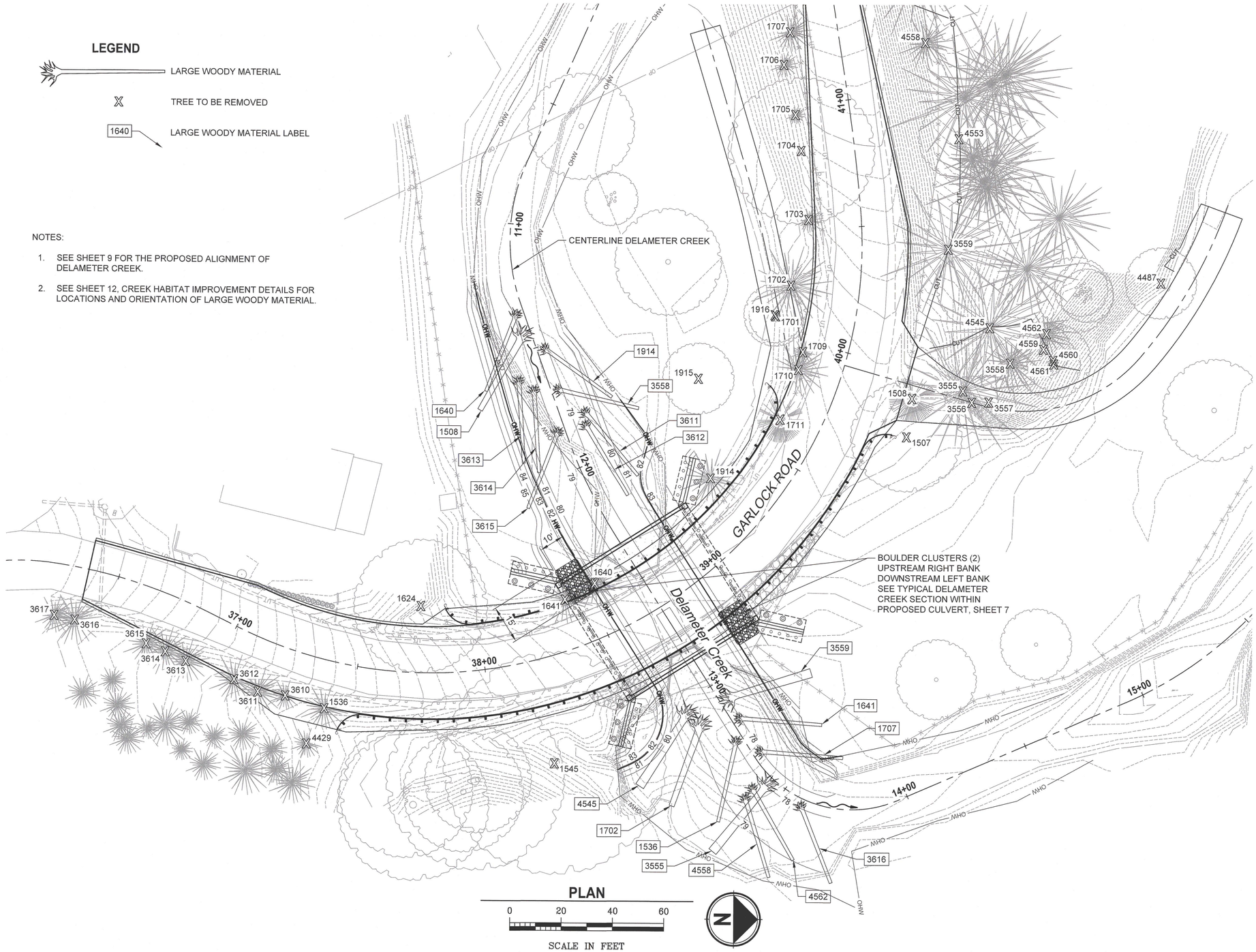
LARGE WOODY MATERIAL

TREE TO BE REMOVED

1640 — LARGE WOODY MATERIAL LABEL

NOTES:

1. SEE SHEET 9 FOR THE PROPOSED ALIGNMENT OF DELAMETER CREEK.
2. SEE SHEET 12, CREEK HABITAT IMPROVEMENT DETAILS FOR LOCATIONS AND ORIENTATION OF LARGE WOODY MATERIAL.



PLAN

0 20 40 60

SCALE IN FEET

TREE REMOVALS

TREE ID #	NORTHING	EASTING	SIZE (BHD) (In.)	SPECIES	NOTES
1507	347,670.556	1,015,915.751	12	ALDER	
1508	347,672.705	1,015,900.695	12-25	FIR	FORKED
1536	347,443.909	1,016,023.350	12	FIR	
1545	347,533.877	1,016,044.296	50	MAPLE	
1624	347,481.288	1,015,983.117	30	MAPLE	
1640	347,549.175	1,015,973.858	14	FIR	
1641	347,537.589	1,015,980.301	14	FIR	
1701	347,619.431	1,015,868.567	12	MAPLE	
1702	347,625.395	1,015,856.543	21	FIR	
1703	347,632.195	1,015,830.837	7	FIR	
1704	347,629.202	1,015,803.788	33	MAPLE	
1705	347,626.941	1,015,789.706	5	FIR	
1706	347,622.343	1,015,769.990	7	CEDAR	
1707	347,624.729	1,015,757.196	11	FIR	
1709	347,630.116	1,015,882.555	6-8	CEDAR	FORKED
1710	347,628.409	1,015,889.523	15	CEDAR	
1711	347,621.268	1,015,909.002	8-10	CEDAR	FORKED
1914	347,594.118	1,015,932.333	16	FIR	
1915	347,589.285	1,015,893.114	16	ALDER	
1916	347,619.112	1,015,868.094	14	MAPLE	
3555	347,692.642	1,015,897.672	38	FIR	
3556	347,696.049	1,015,902.108	12	MAPLE	
3557	347,702.642	1,015,901.955	12	ALDER	
3558	347,711.050	1,015,886.677	16	FIR	
3559	347,686.834	1,015,842.244	36	FIR	
3610	347,428.610	1,016,018.435	8	FIR	
3611	347,417.888	1,016,017.039	13	FIR	
3612	347,408.605	1,016,012.246	13	FIR	
3613	347,389.710	1,016,005.254	12	FIR	
3614	347,381.666	1,016,001.549	13	FIR	
3615	347,374.180	1,015,998.474	12	FIR	
3616	347,346.194	1,015,989.368	14	FIR	
3617	347,338.214	1,015,987.622	10	FIR	
4429	347,437.031	1,016,037.178	8	FIR	
4487	347,769.712	1,015,855.190	16	ALDER	
4545	347,703.095	1,015,872.895	40	FIR	
4553	347,690.812	1,015,798.911	18	ALDER	
4558	347,677.691	1,015,761.187	14	FIR	
4559	347,723.991	1,015,881.206	12-18-19-19	MAPLE	CLUSTER
4560	347,727.732	1,015,885.842	17	MAPLE	
4561	347,728.022	1,015,886.959	14-22-24-25	MAPLE	STUMP
4562	347,725.205	1,015,875.075	14	FIR	

BRIAN BIERWAGEN — PROJECT MANAGER — 3/21/2025 DATE

SHAWN ELLIS — DRAWN BY — 3/21/2025 DATE

BRIAN BIERWAGEN — CHECKED BY — 3/21/2025 DATE

HORIZ. SCALE: 1" = 20'
VERT. SCALE:

PROJECT ID: 1779
ROAD NO. : 23200

COMPUTER FILE:
PO2415014H04_Habitat Improvement.dwg

COWLITZ COUNTY WASHINGTON

DEPARTMENT OF PUBLIC WORKS
1600 13TH AVENUE SOUTH
KELSO, WASHINGTON 98626

Parametrix
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Ph: 503.233.2400

BRIAN N BIERWAGEN — STATE OF WASHINGTON — 28900 — REGISTERED PROFESSIONAL ENGINEER — 3/24/25

SECTIONS 17 & 18, T9N, R2W

GARLOCK ROAD - DELAMETER CREEK
FISH PASSAGE PROJECT

CREEK HABITAT IMPROVEMENT PLAN

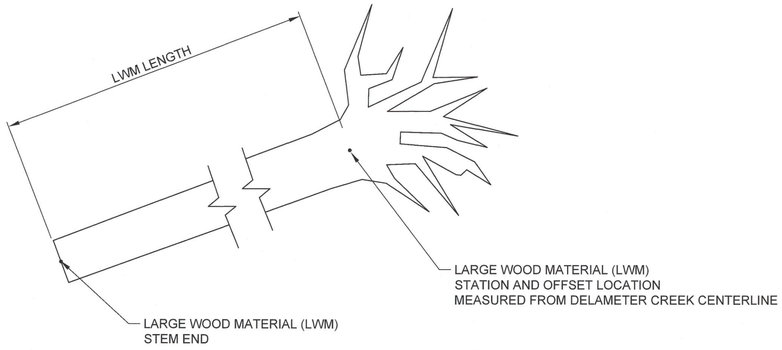
SHEET 11 OF 25

LARGE WOODY MATERIAL (LWM) LOCATION TABLE

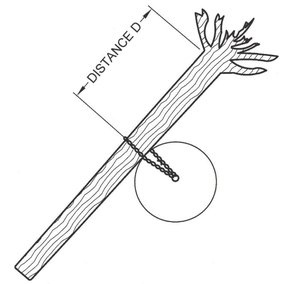
TREE ID #	LENGTH (FT)	STATION / OFFSET	ANGLE A (DEG)	ANGLE B (DEG)	DISTANCE C (FT)	ANCHOR TYPE	DISTANCE D (FT)
1508	30	11+45 / 5' RT	50	-8	-1.5		
1536	40	13+25 / 4' RT	45	-4.5	0.0		
1640	30	11+36 / 4' RT	41	-2	0.0		
1641	30	13+17 / 4' LT	54	-2	0.0		
1702	30	13+12 / 13' RT	52	-4	1.0		
1707	30	13+33 / 4' LT	54	-1	0.0		
1914	30	11+53 / 4' LT	35	-5	0.0		
3555	40	13+44 / 5' RT	87	-12	-2.0		
3558	30	11+69 / 4' LT	58	-2	0.0		
3559	40	13+08 / 6' LT	74	-11	0.5		
3611	30	11+82 / 10' LT	21	-7	1.5		
3612	30	11+87 / 9' LT	12	-8	1.5		
3613	30	11+62 / 11' RT	16	-7	1.5		
3614	30	11+67 / 7' RT	16	-8	1.0		
3615	30	11+85 / 4' RT	41	-2	0.0		
3616	30	13+59 / 4' RT	48	-3	0.0		
4545	35	13+06 / 6' RT	64	-10	1.0		
4558	30	13+43 / 14' RT	41	-2	1.75		
4562	30	13+42 / 9' RT	29	-6	1.0		

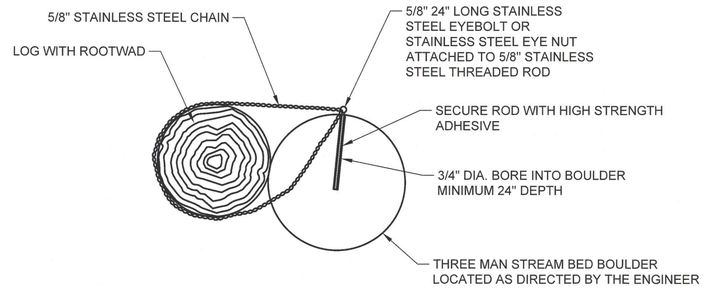
NOTES:

1. LARGE WOODY MATERIAL LENGTH IS MEASURED FROM THE COLLAR OF THE ROOT WAD TO THE STEM END. LENGTH SHOWN IS THE MINIMUM LENGTH REQUIRED.
2. THE STATION AND OFFSET INDICATE THE LOCATION OF THE ROOTWAD RELATIVE TO THE CREEK THALWEG CENTERLINE.
3. ANGLE "A" IS MEASURED FROM THE STREAM CENTERLINE TO THE LOG CENTERLINE AS SHOWN ON THE DETAIL FOR LEFT BANK (LB) OR RIGHT BANK (RB) LOG PLACEMENT.
4. ANGLE "B" IS MEASURED FROM HORIZONTAL AS SHOWN ON THE DETAIL. POSITIVE ANGLE "B" VALUE INDICATES THAT THE ELEVATION OF THE LOG END FURTHEST FROM THE MAIN CHANNEL IS HIGHER THAN THE LOG END NEAREST THE MAIN CHANNEL. NEGATIVE ANGLE "B" VALUE INDICATES THAT THE ELEVATION OF THE LOG END FURTHEST FROM THE MAIN CHANNEL IS LOWER THAN THE LOG END NEAREST THE MAIN CHANNEL.
5. DISTANCE "C" IS THE DEPTH BENEATH THE THALWEG MEASURED TO THE BOTTOM OF THE ROOTWAD. A POSITVE "C" VALUE" INDICATES AN ELEVATION ABOVE THE THALWEG. A NEGATIVE "C" VALUE INDICATES AN ELEVATION BELOW THE THALWEG.
6. DISTANCE "D" IS THE LOCATION FOR THE ANCHOR, IF REQUIRED, AS MEASURED FROM THE ROOTWAD COLLAR.



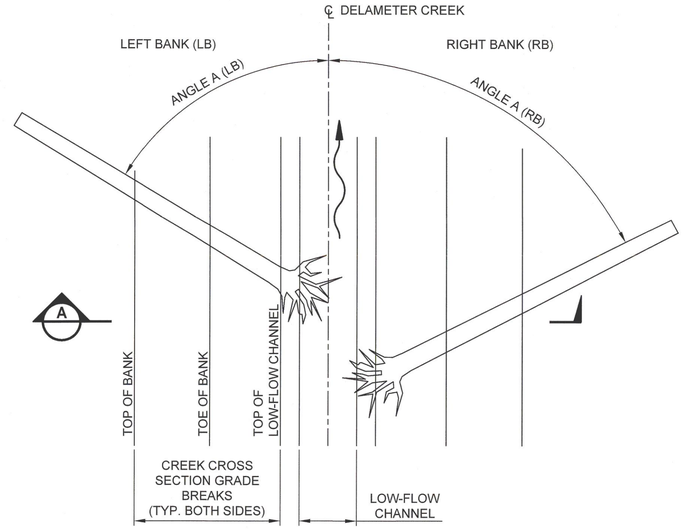
LWM STATION / OFFSET LOCATION DETAIL



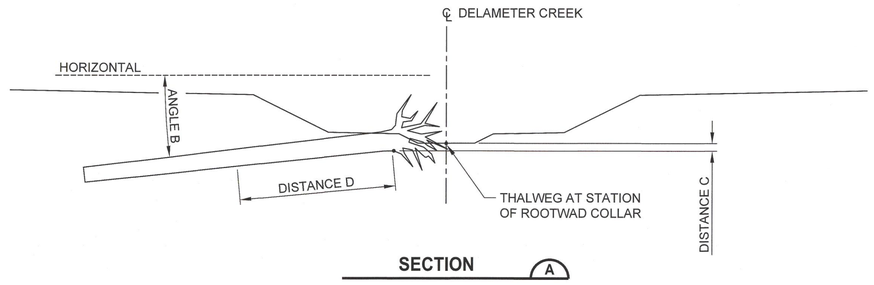


NOTE: DEADMAN ANCHORS ARE REQUIRED AS INDICATED ON LWM LOCATION TABLE OR AS DIRECTED BY ENGINEER.

DEADMAN ANCHOR DETAIL



LWM HORIZONTAL ANGLE (A) DETAIL



SECTION A

BRIAN BIERWAGEN 3/21/2025 PROJECT MANAGER DATE
SHAWN ELLIS 3/21/2025 DRAWN BY DATE
BRIAN BIERWAGEN 3/21/2025 CHECKED BY DATE

HORIZ. SCALE: NO SCALE
VERT. SCALE: NO SCALE
PROJECT ID: 1779
ROAD NO. : 23200
COMPUTER FILE: PO2415014H04_Habitat Improvement.dwg

COWLITZ COUNTY WASHINGTON

DEPARTMENT OF PUBLIC WORKS
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KELSO, WASHINGTON 98626

Parametrix
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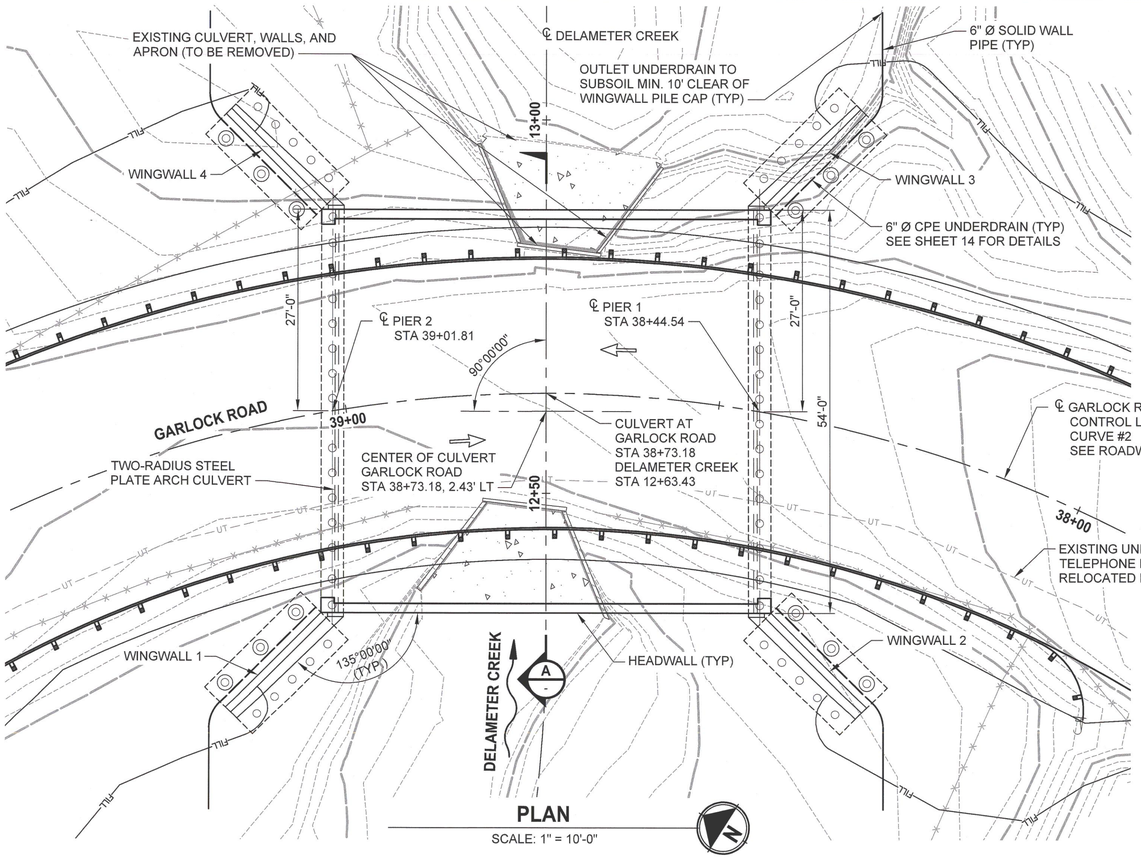
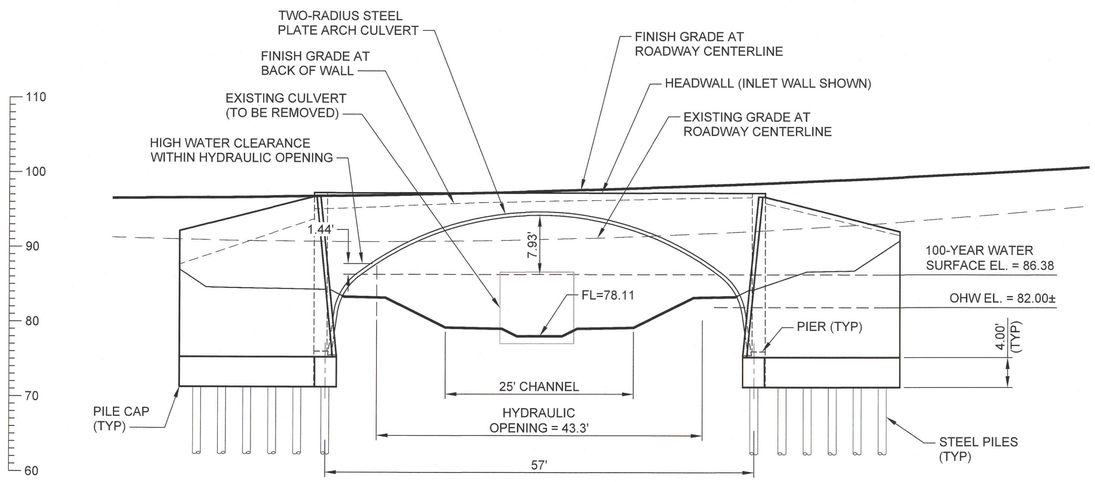
BRIAN N BIERWAGEN STATE OF WASHINGTON 28900 REGISTERED PROFESSIONAL ENGINEER 3/24/25

SECTIONS 17 & 18, T9N, R2W

GARLOCK ROAD - DELAMETER CREEK
FISH PASSAGE PROJECT
CREEK HABITAT IMPROVEMENT DETAILS

SHEET 12 OF 25

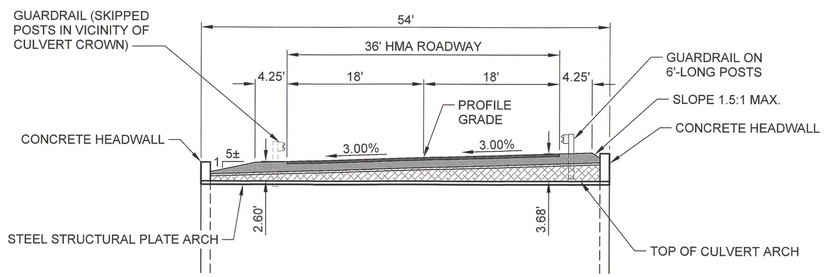




(INLET SHOWN)

DEVELOPED ELEVATION

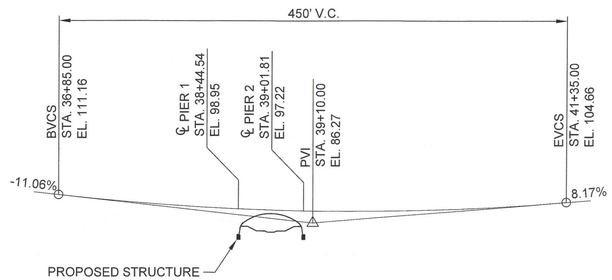
SCALE: 1" = 10'-0"



ROADWAY SECTION AT CULVERT CROWN

SECTION A

SCALE: 1" = 10'-0"



GRADELINE PROFILE (GARLOCK ROAD)

NO SCALE

BRIAN BIERWAGEN PROJECT MANAGER	3/21/2025 DATE	HORIZ. SCALE: 1" = 10' VERT. SCALE: 1" = 10'	COWLITZ COUNTY WASHINGTON	DEPARTMENT OF PUBLIC WORKS 1600 13TH AVENUE SOUTH KELSO, WASHINGTON 98626	Parametrix 5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214 Ph: 503.233.2400	BENJAMIN JAMES SCHLEICHER STATE OF WASHINGTON 55844 STRUCTURAL ENGINEER PROFESSIONAL ENGINEER 3/24/25	SECTIONS 17 & 18, T9N, R2W	GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT CULVERT PLAN AND ELEVATION	SHEET 13 OF 25
NILS HOVLAND DRAWN BY	3/21/2025 DATE	PROJECT ID: 1779 ROAD NO. : 23200							
NATHAN BINGHAM CHECKED BY	3/21/2025 DATE	COMPUTER FILE: PO2415014S01_Bridge S&L.dwg							

GENERAL NOTES:

SPECIFICATION & DESCRIPTION:

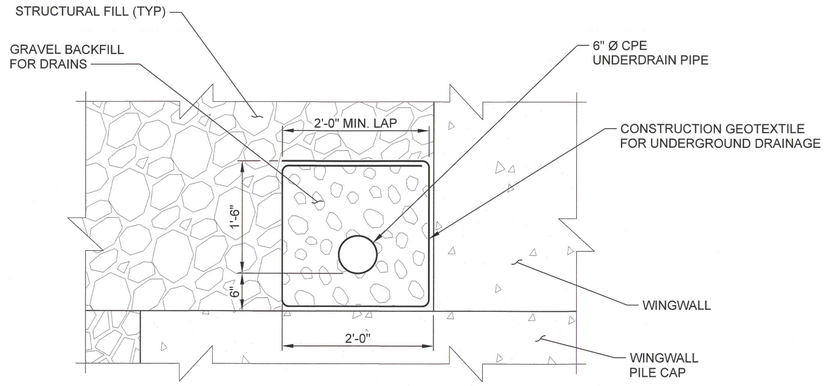
1. ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, DATED 2025, AND SPECIAL PROVISIONS.
2. THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION, WITH INTERIM REVISIONS AND THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION BRIDGE DESIGN MANUAL.

LOADING / MISCELLANEOUS:

1. SEISMIC DESIGN OF THE STRUCTURE IS IN ACCORDANCE WITH THE SPECIFICATIONS IN NOTE 2 ABOVE, USING AN ACCELERATION COEFFICIENT OF 0.38G, SITE CLASS D, AND SEISMIC PERFORMANCE ZONE 4.
2. THE BRIDGE HAS BEEN DESIGNED FOR HL-93 LOADING ACCORDING TO THE SPECIFICATIONS IN NOTE 2 ABOVE.
3. CONCRETE SHALL BE CLASS 5000
4. THE NUMBER AND LENGTH OF REINFORCING BARS SHALL BE DETERMINED BY THE CONTRACTOR FROM THE PLANS. ALL REINFORCING BARS SHALL BE ASTM A706 UNLESS OTHERWISE SHOWN. FOR HOOKS AND BENDS ON THE REINFORCING BARS, USE STIRRUP/TIE HOOK AND BEND DIMENSIONS IF REINFORCEMENT SPECIFIES A STIRRUP OR TIE, OTHERWISE USE STANDARD HOOK AND BEND DIMENSIONS, UNLESS NOTED OTHERWISE. ALL REINFORCING STEEL TO BE EPOXY COATED IS DESIGNATED BY AN "E" AFTER THE BAR MARK.
5. SPLICE REINFORCING BARS AT ALTERNATE BARS, STAGGERED AT LEAST ONE SPLICE LENGTH OR AS FAR AS POSSIBLE, UNLESS OTHERWISE SHOWN. THE FOLLOWING LAP SPLICE LENGTHS SHALL BE USED UNLESS OTHERWISE SHOWN.

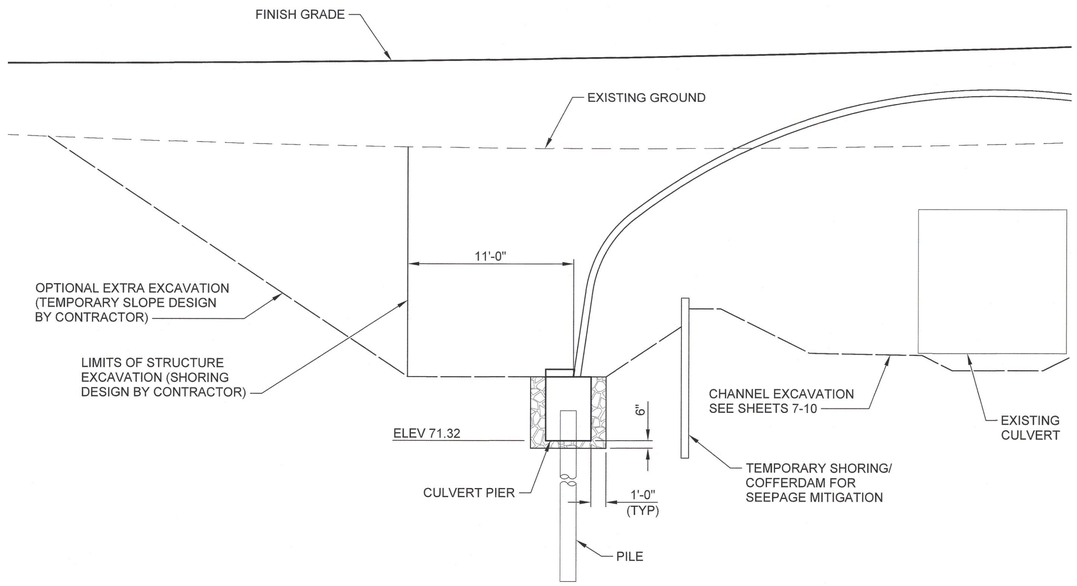
BAR SIZE	UNCOATED	12" CONC. BELOW BAR
#4	2'-4"	3'-1"
#5	3'-0"	3'-10"
#6	3'-7"	4'-7"
#7	4'-2"	5'-4"
#8	4'-9"	6'-1"
#9	5'-4"	6'-11"

6. UNLESS OTHERWISE SHOWN IN THE PLANS, THE MINIMUM CONCRETE COVER MEASURED FROM THE FACE OF THE CONCRETE TO THE FACE OF ANY REINFORCING STEEL SHALL BE 3 INCHES. EDGES OF CONCRETE THAT WILL BE EXPOSED UPON COMPLETION OF THE STRUCTURE SHALL BE CHAMFERED ¾ INCH UNLESS OTHERWISE NOTED.
7. CLASS 1 FINISH FOR EXPOSED CONCRETE SURFACES. CLASS 2 FINISH FOR ALL OTHER CONCRETE SURFACES.
8. LOCATION OF CONSTRUCTION JOINTS, AS SHOWN ON THE PLANS, SHALL BE TAKEN TO MEAN A CONSTRUCTION JOINT WITH A ROUGHENED SURFACE TO 1/4 INCH AMPLITUDE.
9. ALL PLAN DIMENSIONS ARE MEASURED HORIZONTALLY, UNLESS NOTED OTHERWISE, AND REFLECT THE GEOMETRIC SHAPE AND LOCATION OF ALL ELEMENTS AT A MEAN TEMPERATURE OF 64 DEGREES FAHRENHEIT.
10. ALL DIMENSIONS AND ELEVATIONS SHALL BE VERIFIED IN FIELD BY THE CONTRACTOR.
11. SEE FOUNDATION PLAN, SHEET 15, FOR FOUNDATION NOTES AND DETAILS.
12. CONTRACTOR TO PROVIDE DESIGNS FOR SHORING IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATIONS SECTION 2-09.3(3)D.
13. CONTRACTOR TO PROVIDE DESIGNS FOR OPEN PIT EXCAVATIONS IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATIONS SECTION 2-09.3(3)B.
14. CONTRACTOR TO PROVIDE DEWATERING SYSTEM IN ACCORDANCE WITH SPECIAL PROVISIONS.



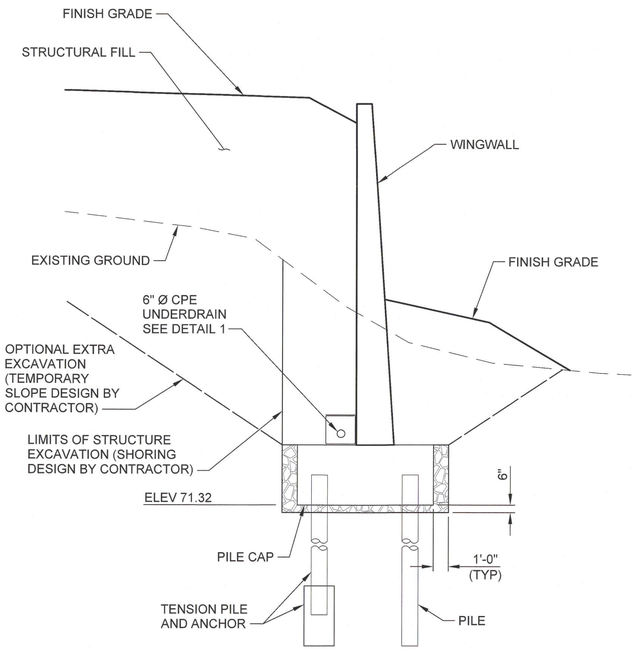
UNDERDRAIN DETAIL 1

NO SCALE



CULVERT PIER EXCAVATION AND BACKFILL PAY LIMITS DIAGRAM

NO SCALE



WINGWALL EXCAVATION AND BACKFILL PAY LIMITS DIAGRAM

NO SCALE

LEGEND

GRAVEL BACKFILL FOR FOUNDATIONS OR CRUSHED SURFACING BASE COURSE

BRIAN BIERWAGEN PROJECT MANAGER	3/21/2025 DATE
NILS HOVLAND DRAWN BY	3/21/2025 DATE
NATHAN BINGHAM CHECKED BY	3/21/2025 DATE

HORIZ. SCALE: NO SCALE
VERT. SCALE: NO SCALE

PROJECT ID: 1779
ROAD NO. : 23200

COMPUTER FILE:
PO2415014S02_Gen Notes.dwg

COWLITZ COUNTY WASHINGTON

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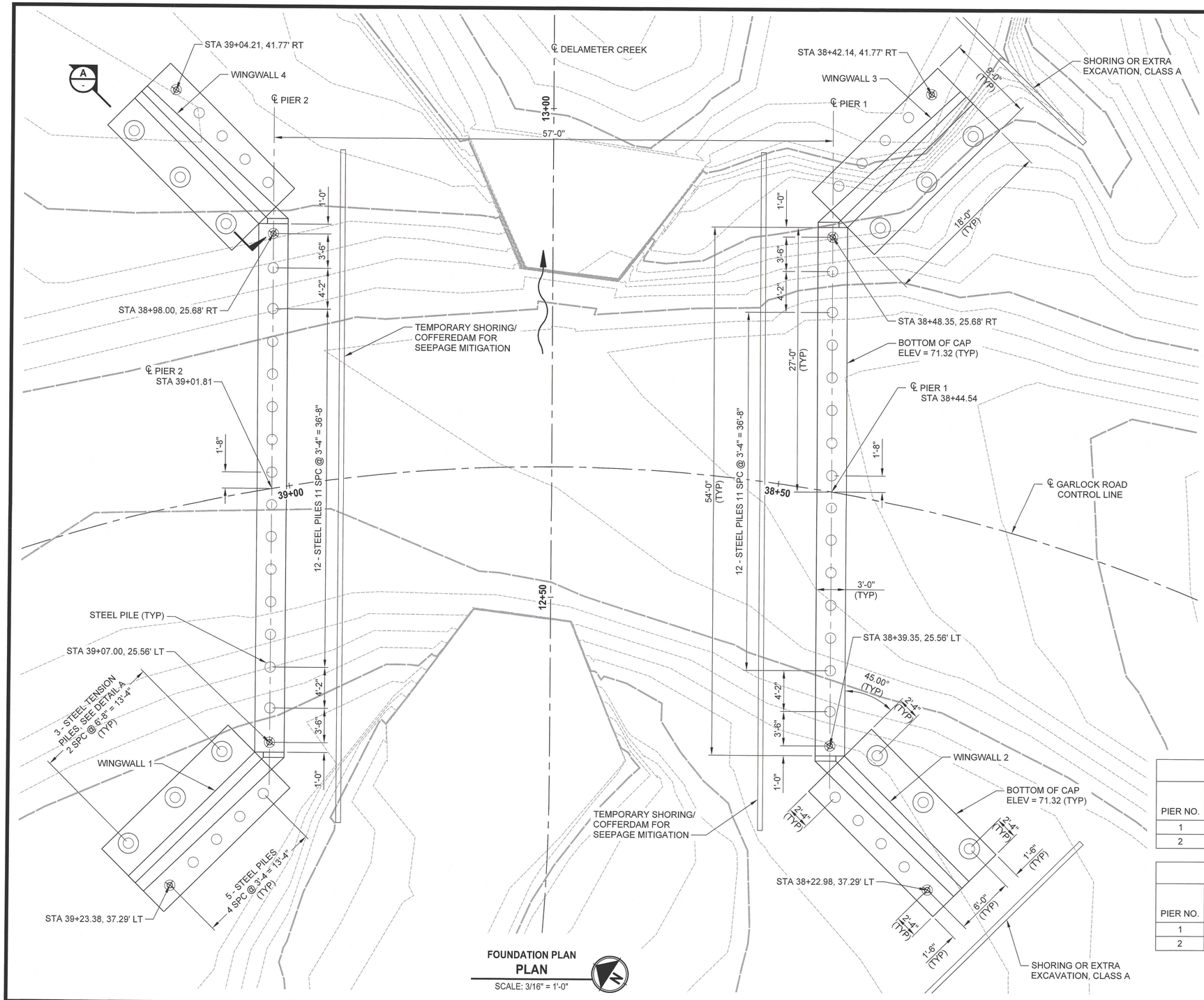
BENJAMIN JAMES SCHLAEFLI — STATE OF WASHINGTON — 55844 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — 3/24/25

SECTIONS 17 & 18, T9N, R2W

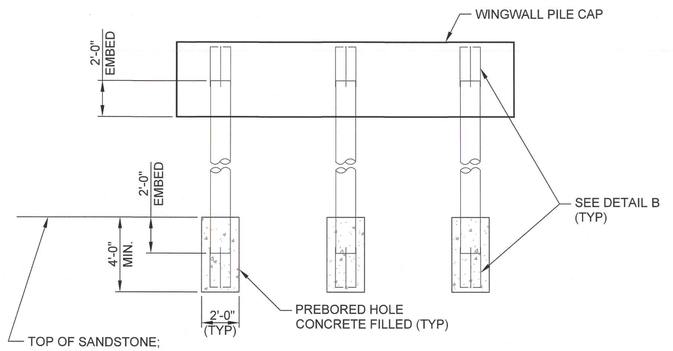
GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT

GENERAL NOTES AND DETAILS

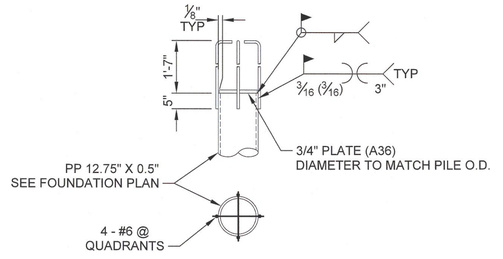
SHEET 14 OF 25



FOUNDATION PLAN
PLAN
SCALE: 3/16" = 1'-0"



TENSION PILES
DETAIL (A)
SCALE: 1/4" = 1'-0"



STEEL PIPE

PROVIDE ASTM A706, EXCEPT ASTM A615 GRADE 60 OR ASTM A496 MAY BE USED IF COPIES OF THE CHEMICAL COMPOSITION ANALYSIS ARE SUBMITTED AND APPROVED AS WELDABLE BY THE ENGINEER.

ANCHOR PILE
DETAIL (B)
SCALE: NTS

FOUNDATION NOTES:

1. LAYOUT DIMENSIONS ARE MEASURED AT CL OF FOUNDATIONS.
2. ELEVATIONS AND DIMENSIONS AND SUBSTRUCTURE DETAILS ARE SUBJECT TO CHANGE DEPENDING UPON FOUNDATION MATERIAL ENCOUNTERED AND FINAL LOCATION OF PILES. REINFORCING STEEL FOR FOOTINGS AND WALLS SHALL NOT BE FABRICATED UNTIL SHOP DRAWINGS HAVE BEEN ACCEPTED BY THE ENGINEER.
3. GEOTECHNICAL REPORT WAS COMPLETED BY FOUNDATION ENGINEERING, INC., PROJECT 2191131, DATED APRIL, 3, 2020. CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT FOR THE LOCATION OF THE SOIL BORINGS.
4. PROVIDE PP12.75x0.500 ASTM A252 GRADE 3, STEEL PIPE PILES.
5. STEEL PILE SHALL EMBED 2'-0" INTO PILE CAP AND GROUTED DRILLED HOLES. WELD TENSION ANCHORS (A706 DEFORMED BAR) PER THE DETAIL.

PILE FOUNDATION DATA

PIER NO.	WINGWALL NOS.	PILE QTY.	NOMINAL AXIAL RESISTANCE (KIPS)	FACTORED AXIAL RESISTANCE (KIPS)	NOMINAL PILE UPLIFT RESISTANCE (KIPS)	ESTIMATED TIP ELEV.	PILE LENGTH (FT)
1	2 & 3	26	440	176	11	64.0	10
2	1 & 4	26	440	176	32	50.0	24

WINGWALL PREBORED PILE FOUNDATION DATA

PIER NO.	WINGWALL NOS.	PILE QTY.	NOMINAL AXIAL RESISTANCE (KIPS)	FACTORED AXIAL RESISTANCE (KIPS)	NOMINAL PILE UPLIFT RESISTANCE (KIPS)	ESTIMATED TIP ELEV.	PILE LENGTH (FT)
1	2 & 3	6	440	176	100	55.0	18
2	1 & 4	6	440	176	100	49.0	24

BRIAN BIERWAGEN, PROJECT MANAGER — 3/21/2025 DATE
NILS HOVLAND, DRAWN BY — 3/21/2025 DATE
NATHAN BINGHAM, CHECKED BY — 3/21/2025 DATE

HORIZ. SCALE: AS NOTED
VERT. SCALE: AS NOTED
PROJECT ID: 1779
ROAD NO. : 23200
COMPUTER FILE: PO2415014S03_Foundation.dwg

COWLITZ COUNTY WASHINGTON
DEPARTMENT OF PUBLIC WORKS
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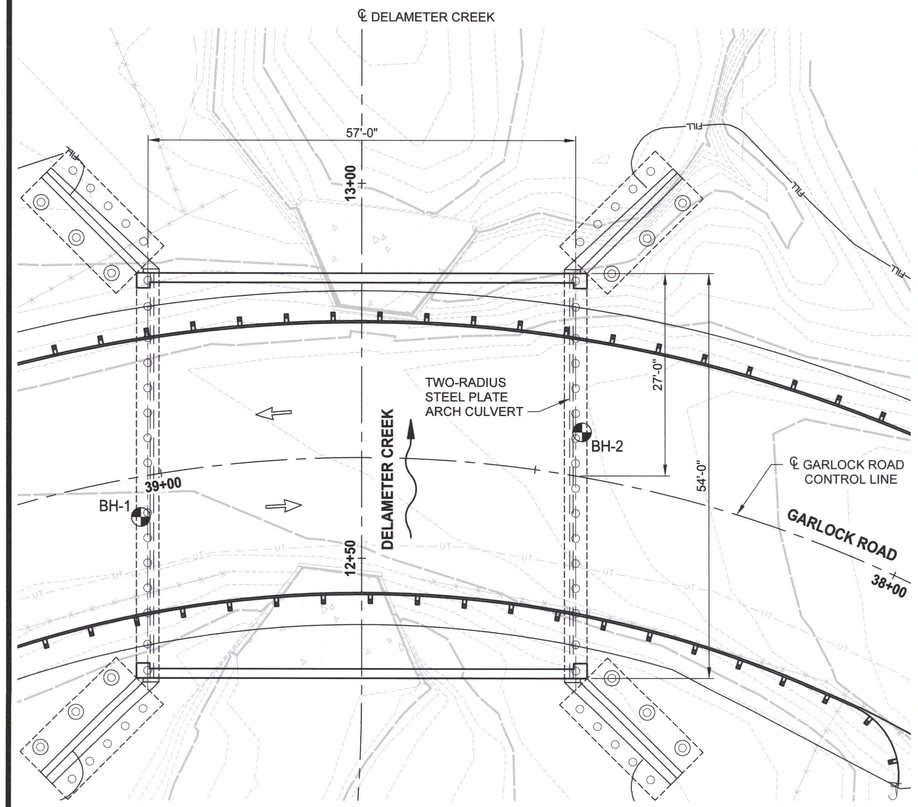
BENJAMIN JAMES SCHLACHTER — STATE OF WASHINGTON — 55844 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — 3/24/25

SECTIONS 17 & 18, T9N, R2W

GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT

FOUNDATION PLAN

SHEET 15 OF 25



PLAN

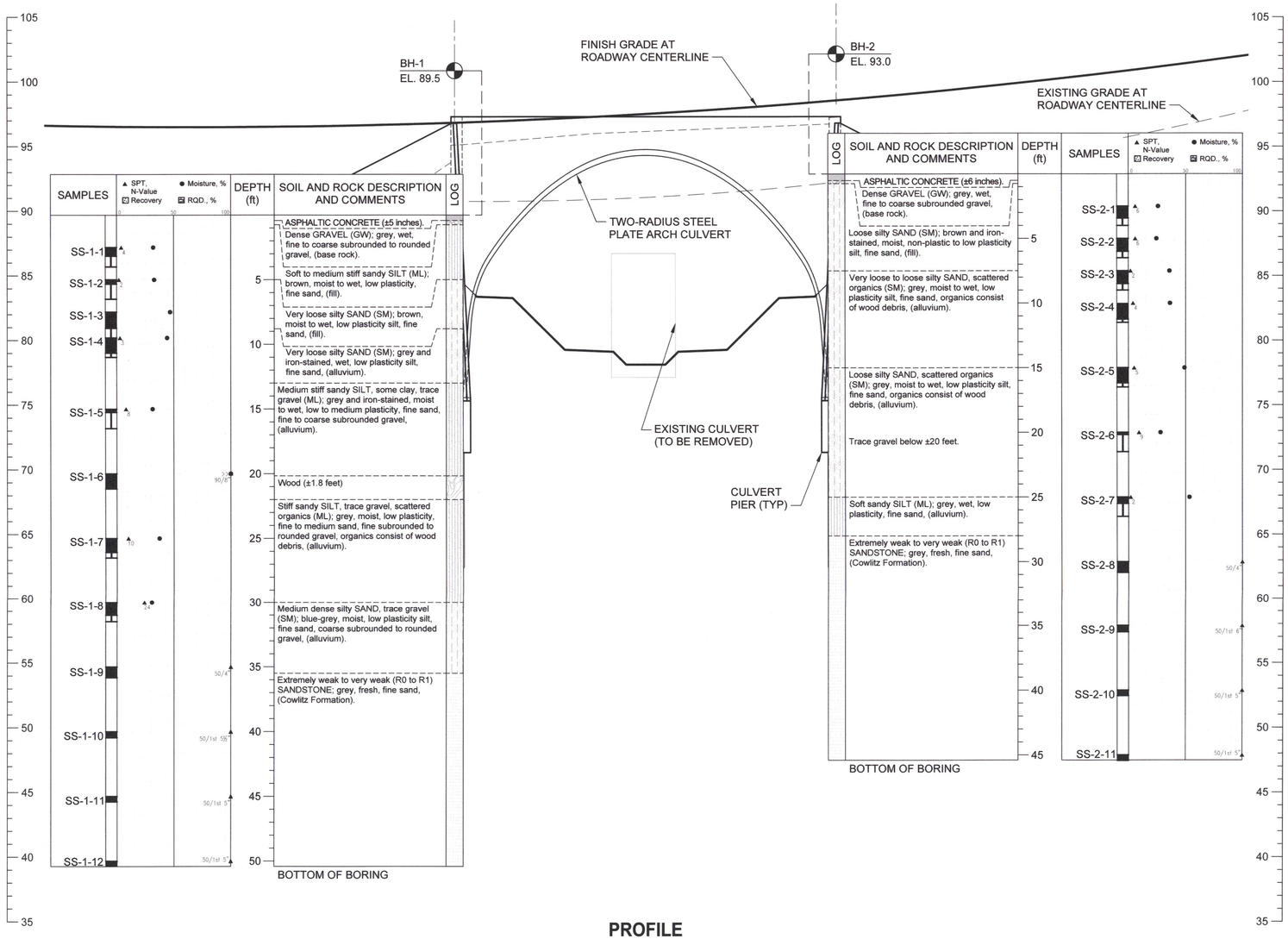
SCALE: 1" = 10'-0"

LEGEND

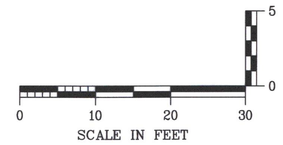
⊕	GEOTECHNICAL BORING (BH)
	STANDARD PENETRATION TEST (SPT) N-VALUE
SS	SPLIT SPOON SAMPLE
50/4" OR 50/1st 4"	SPT REFUSAL LENGTH

GENERAL NOTES

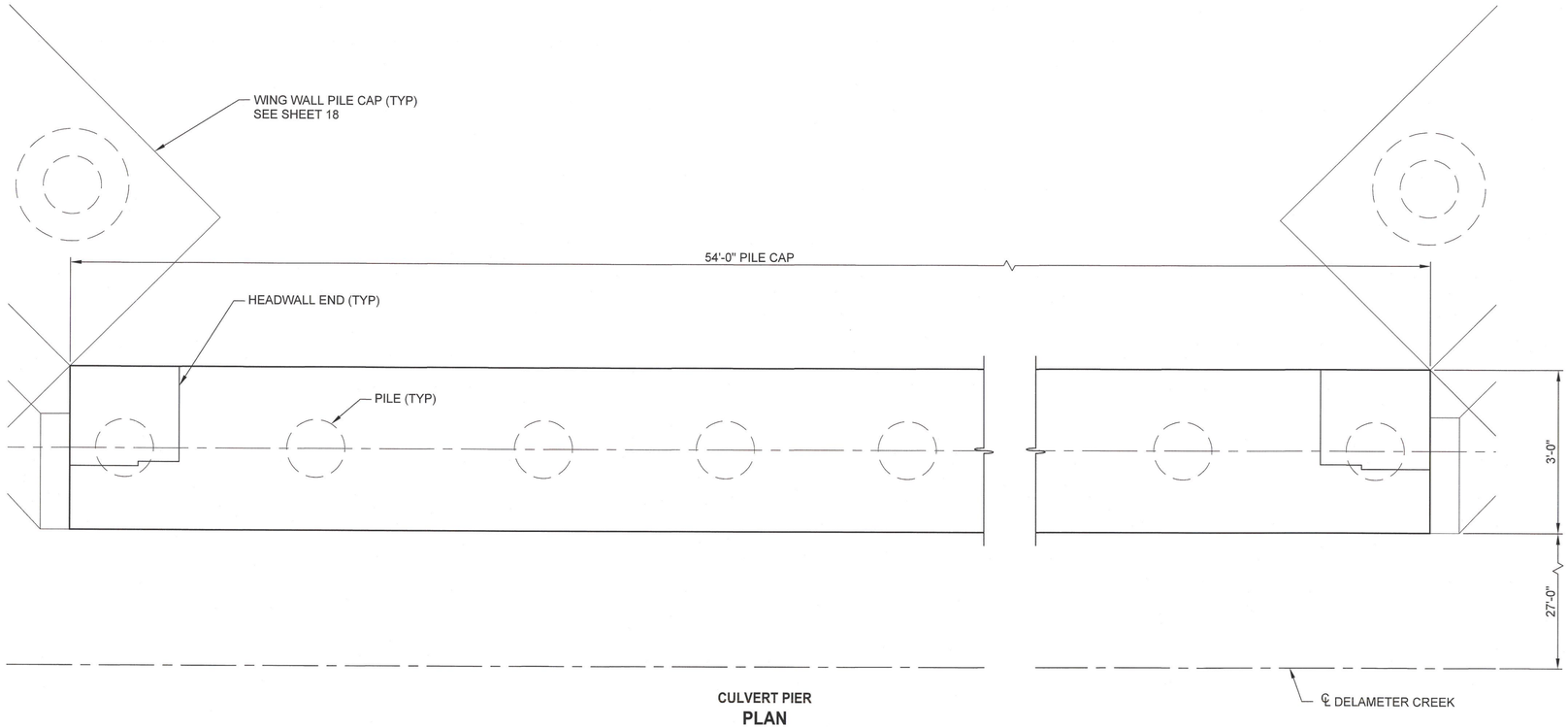
1. ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88, M.S.L.=0.00).
2. BORING ELEVATIONS WERE NOT SURVEYED. BORING LOCATIONS AND ELEVATIONS ARE APPROXIMATE.
3. GEOTECHNICAL DATA SHOWN ON THIS DRAWING ARE A CONSOLIDATION OF INFORMATION FROM THE GEOTECHNICAL BORING LOGS. MORE DETAILED SUBSURFACE DATA IS AVAILABLE ON THE BORING LOGS IN THE GEOTECHNICAL REPORT. THE BORING LOGS AND GEOTECHNICAL REPORT ARE AVAILABLE UPON REQUEST FOR REVIEW AT THE OFFICE OF COWLITZ COUNTY DEPARTMENT OF PUBLIC WORKS. CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT, BORING LOGS, AND INFORMATION THEREIN.
4. IN ACCORDANCE WITH ASTM D1586, N-VALUES ARE REPORTED FOR AN INTERVAL OF 1-FOOT, EXCEPT AS NOTED.



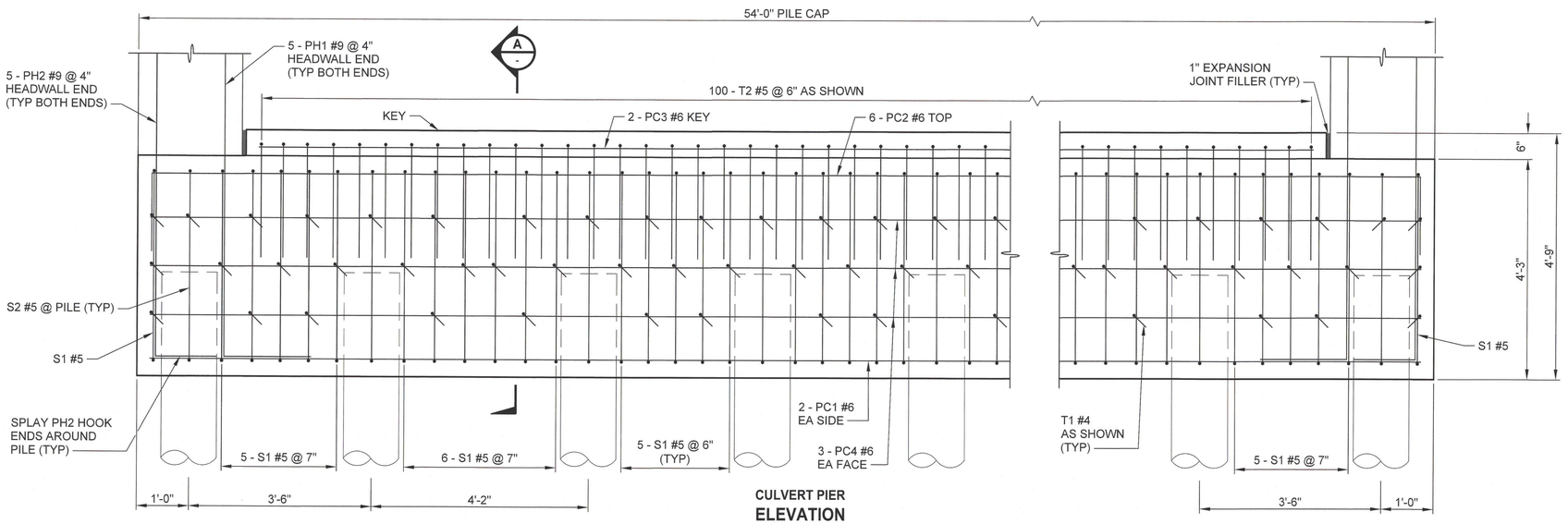
PROFILE



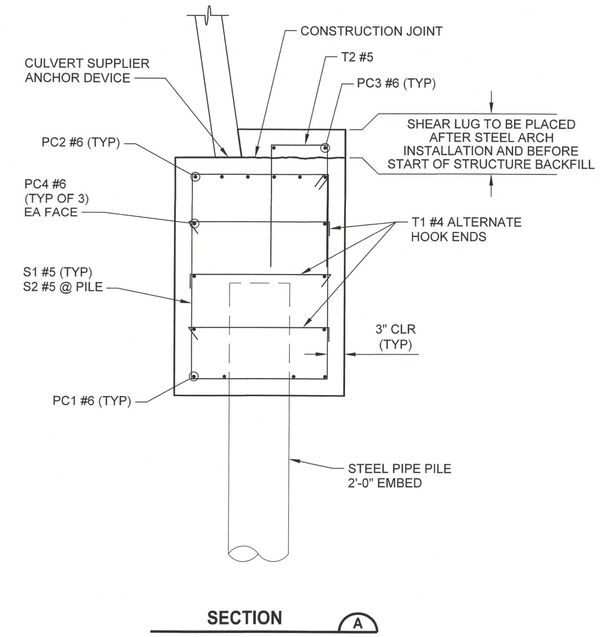
WILLIAM NICKELS, JR. DESIGNED BY	3/19/2025 DATE	HORIZ. SCALE: 1" = 10' VERT. SCALE: 1" = 5' PROJECT ID: 1779 ROAD NO. : 23200 COMPUTER FILE: PO2415014S04_Bridge_Geo.dwg	COWLITZ COUNTY WASHINGTON	DEPARTMENT OF PUBLIC WORKS 1600 13TH AVENUE SOUTH KELSO, WASHINGTON 98626	Foundation Engineering, Inc. Professional Geotechnical Services	M. LEON NICKELS REGISTERED PROFESSIONAL ENGINEER Exp. 9-16-25	SECTIONS 17 & 18, T9N, R2W	GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT FOUNDATION DATA SHEET	SHEET 16 OF 25
MEL McCRACKEN REVIEWED BY	3/19/2025 DATE								
JEFF TUCKER CHECKED BY	3/19/2025 DATE								



CULVERT PIER
PLAN
SCALE: 3/4" = 1'-0"

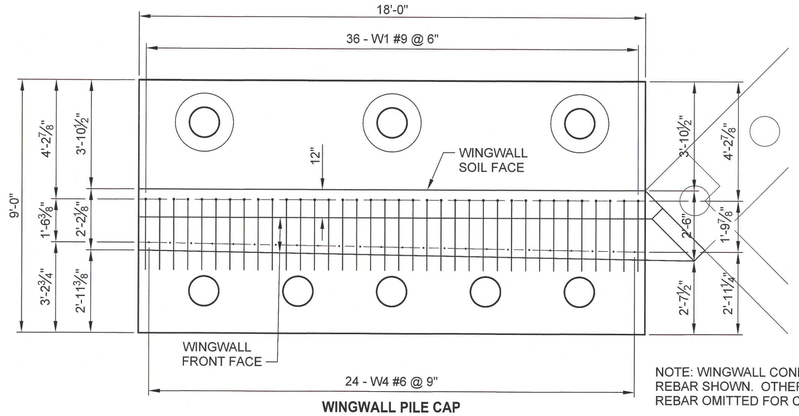


CULVERT PIER
ELEVATION
SCALE: 3/4" = 1'-0"



SECTION A
3/4" = 1'-0"

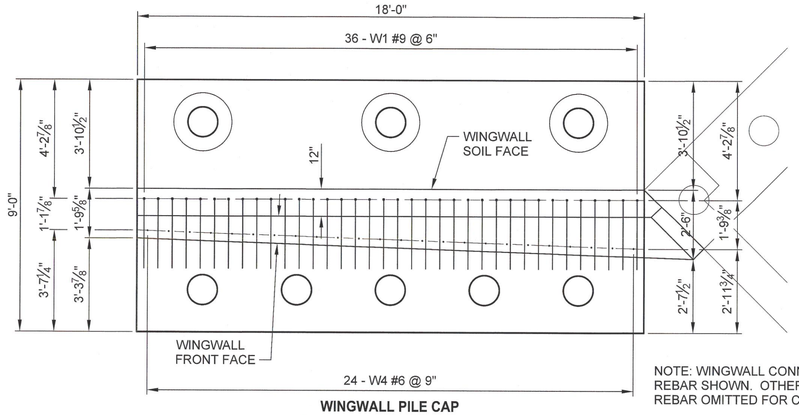
BRIAN BIERWAGEN PROJECT MANAGER	3/21/2025 DATE	HORIZ. SCALE: 3/4" = 1'-0" VERT. SCALE: 3/4" = 1'-0"	COWLITZ COUNTY WASHINGTON	DEPARTMENT OF PUBLIC WORKS 1600 13TH AVENUE SOUTH KELSO, WASHINGTON 98626	Parametrix 5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214 Ph: 503.233.2400	BENJAMIN JAMES SCHLICHER STATE OF WASHINGTON 55244 STRUCTURAL ENGINEER PROFESSIONAL ENGINEER 3/24/25	SECTIONS 17 & 18, T9N, R2W	GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT PIER DETAILS	SHEET 17 OF 25
NILS HOVLAND DRAWN BY	3/21/2025 DATE	PROJECT ID: 1779 ROAD NO. : 23200							
NATHAN BINGHAM CHECKED BY	3/21/2025 DATE	COMPUTER FILE: PO2415014S05_Pier.dwg							



NOTE: WINGWALL CONNECTION REBAR SHOWN. OTHER FOOTING REBAR OMITTED FOR CLARITY.

WINGWALL PILE CAP
WINGWALLS 1 & 2 (INLET)
PLAN

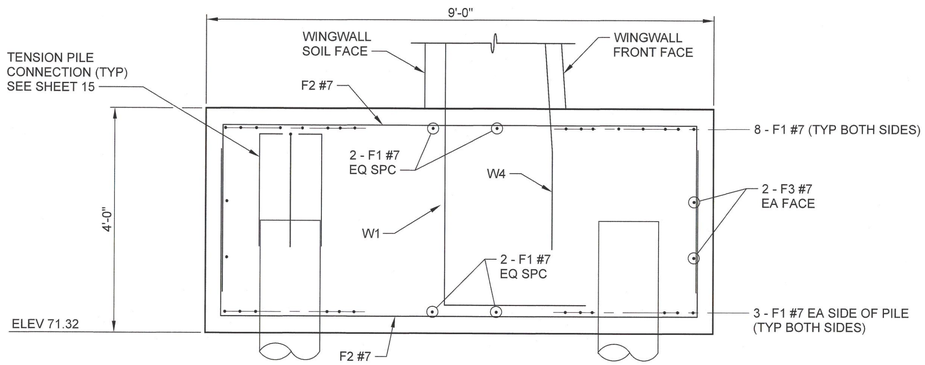
SCALE: 3/8" = 1'-0"



NOTE: WINGWALL CONNECTION REBAR SHOWN. OTHER FOOTING REBAR OMITTED FOR CLARITY.

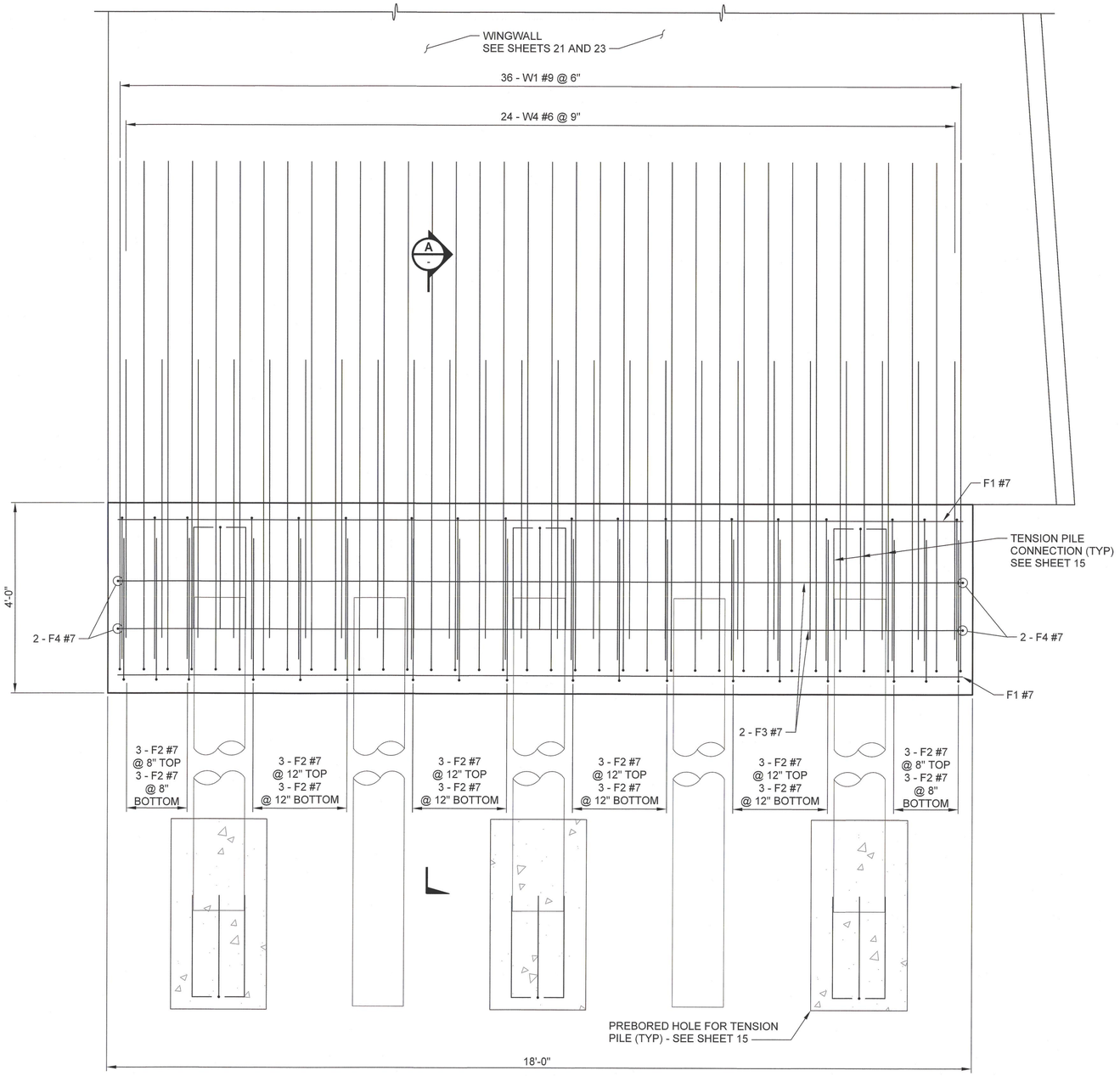
WINGWALL PILE CAP
WINGWALLS 3 & 4 (OUTLET)
PLAN

SCALE: 3/8" = 1'-0"



SECTION A -

SCALE: 3/4" = 1'-0"



TYPICAL WINGWALL PILE CAP
ELEVATION

SCALE: 3/4" = 1'-0"

BRIAN BIERWAGEN PROJECT MANAGER	3/21/2025 DATE	HORIZ. SCALE: AS NOTED VERT. SCALE: AS NOTED PROJECT ID: 1779 ROAD NO. : 23200 COMPUTER FILE: PO2415014S06_WW Pile Cap.dwg
NILS HOVLAND DRAWN BY	3/21/2025 DATE	
NATHAN BINGHAM CHECKED BY	3/21/2025 DATE	

COWLITZ COUNTY WASHINGTON

DEPARTMENT OF PUBLIC WORKS
1600 13TH AVENUE SOUTH
KELSO, WASHINGTON 98626

Parametrix
5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214
Ph: 503.233.2400

BENJAMIN JAMES SCHLACHTER — STATE OF WASHINGTON — 55244 — PROFESSIONAL ENGINEER — 3/24/25

SECTIONS 17 & 18, T9N, R2W

GARLOCK ROAD - DELAMETER CREEK
FISH PASSAGE PROJECT

WINGWALL PILE CAP DETAILS

SHEET 18 OF 25

GALVANIZED STEEL STRUCTURAL PLATE CULVERT WITH DEEP CORRUGATIONS:

1. MANUFACTURER SHALL DESIGN AND FABRICATE THE CLASS 2 TWO-RADIUS ARCH AS SHOWN ON THE PLANS. FABRICATION SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-761 AND SHALL CONSIST OF PLATES, FASTENERS, AND APPURTENANT ITEMS IN ACCORDANCE WITH SPECIFICATION SECTION 6-20.3.

2. PLATE THICKNESS, END TREATMENT AND TYPE OF INVERT AND FOUNDATION SHALL BE AS INDICATED ON THE PLANS. ALL MANUFACTURING PROCESSES INCLUDING CORRUGATING, PUNCHING, CURVING AND REQUIRED GALVANIZING SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.

3. THE CONTRACTOR SHALL VERIFY ALL FIELD DIMENSIONS AND CONDITIONS PRIOR TO ORDERING MATERIALS.

4. THE PROPOSED STRUCTURE SHALL BE A GALVANIZED STEEL DEEP CORRUGATION (5½") BOLTED PLATES WITH THE FOLLOWING DIMENSIONS:

   SPAN: 55'-5" (INSIDE) RISE: 18'-8⅞" (INSIDE) GAGE: 3 ga. MIN.

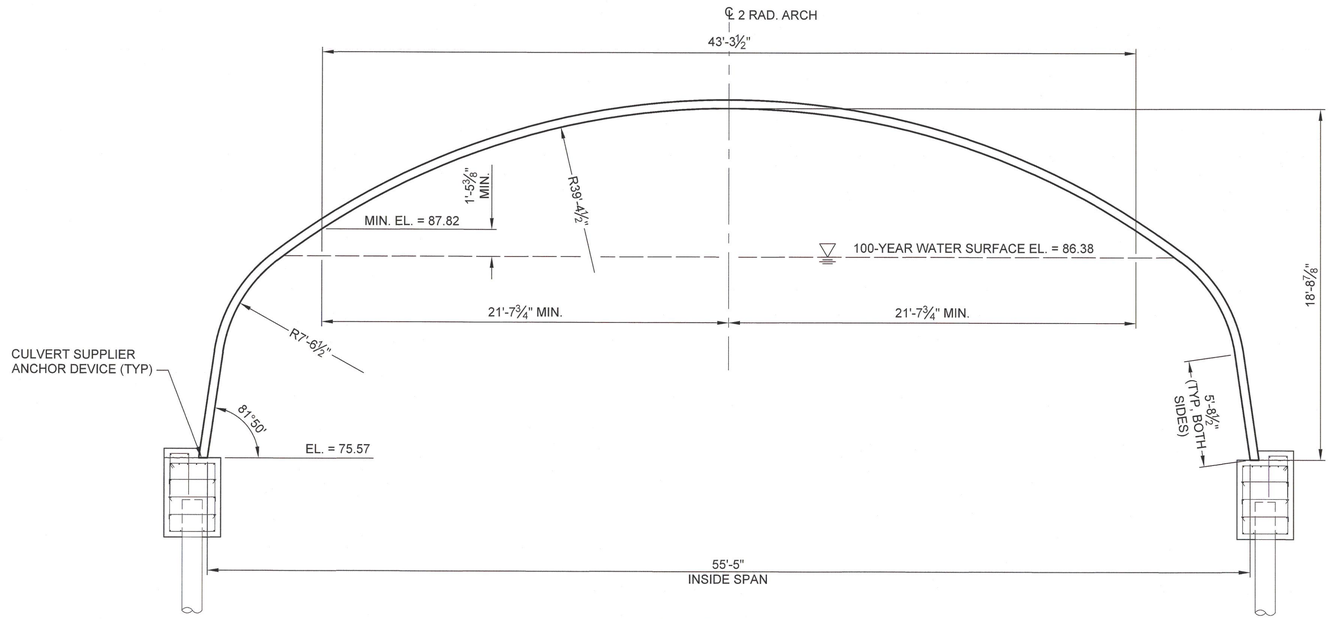
5. ALL PLAN DIMENSIONS ON THE CONTRACT DRAWINGS ARE MEASURED IN A TRUE HORIZONTAL PLAN UNLESS OTHERWISE NOTED.

6. BOLTS AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-449. BOLTS SHALL BE TIGHTENED USING AN APPLIED TORQUE OF BETWEEN 100 AND 300 FT.-LBS.

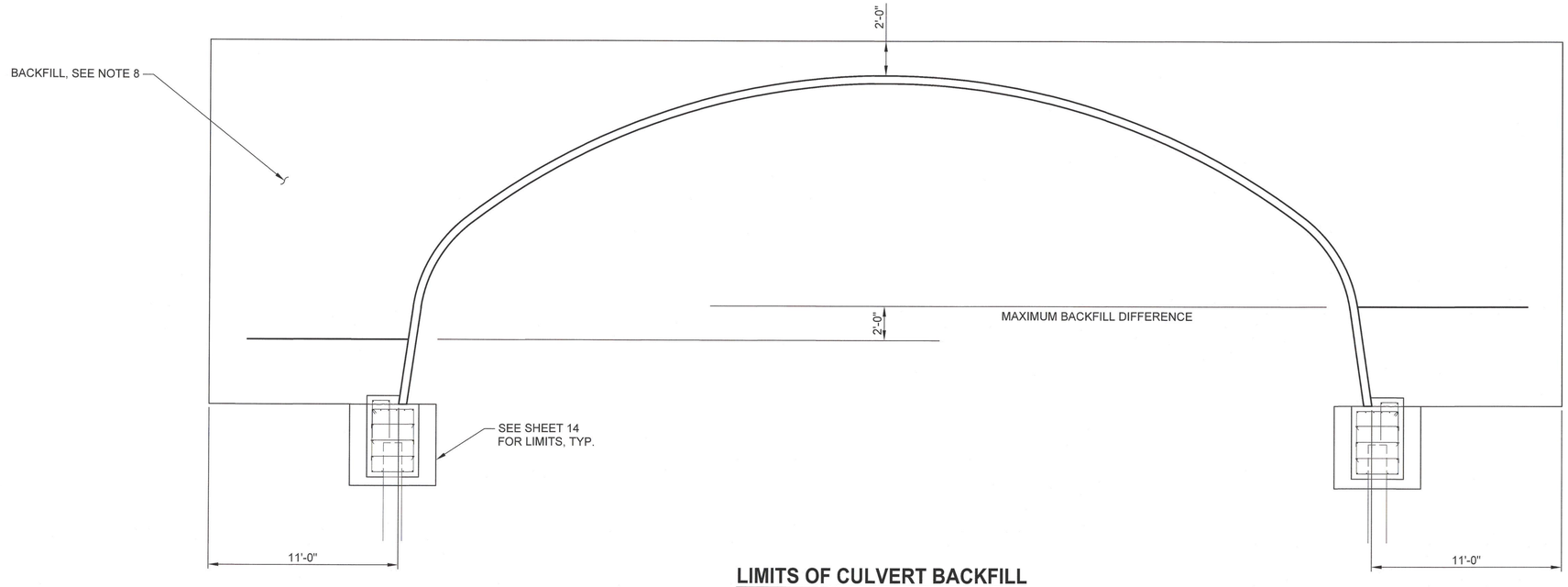
7. THE STRUCTURE SHALL BE ASSEMBLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

8. THE STRUCTURE SHALL BE BACKFILLED IN ACCORDANCE WITH WSDOT SPECIFICATION, 6-20.3(9) BACKFILLING. SEE LIMITS OF CULVERT BACKFILL, THIS SHEET, AND DIAGRAM: CULVERT PIER EXCAVATION AND BACKFILL PAY LIMITS ON SHEET 14. THE FURNISHING, PLACING AND COMPACTING OF BACKFILL IS INCLUDED IN THE LUMP SUM BID ITEM FOR "CONTRACTOR DESIGNED BURIED STRUCTURE NO. 1".

9. CONSTRUCTION LOADS THAT EXCEED HIGHWAY LOAD LIMITS ARE NOT ALLOWED TO CROSS THE STRUCTURE WITHOUT APPROVAL FROM THE ENGINEER AND MANUFACTURER/ CONTRACTOR'S ENGINEER. NORMAL HIGHWAY TRAFFIC IS NOT ALLOWED TO CROSS THE STRUCTURE UNTIL THE STRUCTURE HAS BEEN BACKFILLED AND PAVED. IF THE ROAD IS UNPAVED, COVER ALLOWANCE TO ACCOMMODATE RUTTING SHALL BE AS DIRECTED BY THE ENGINEER.

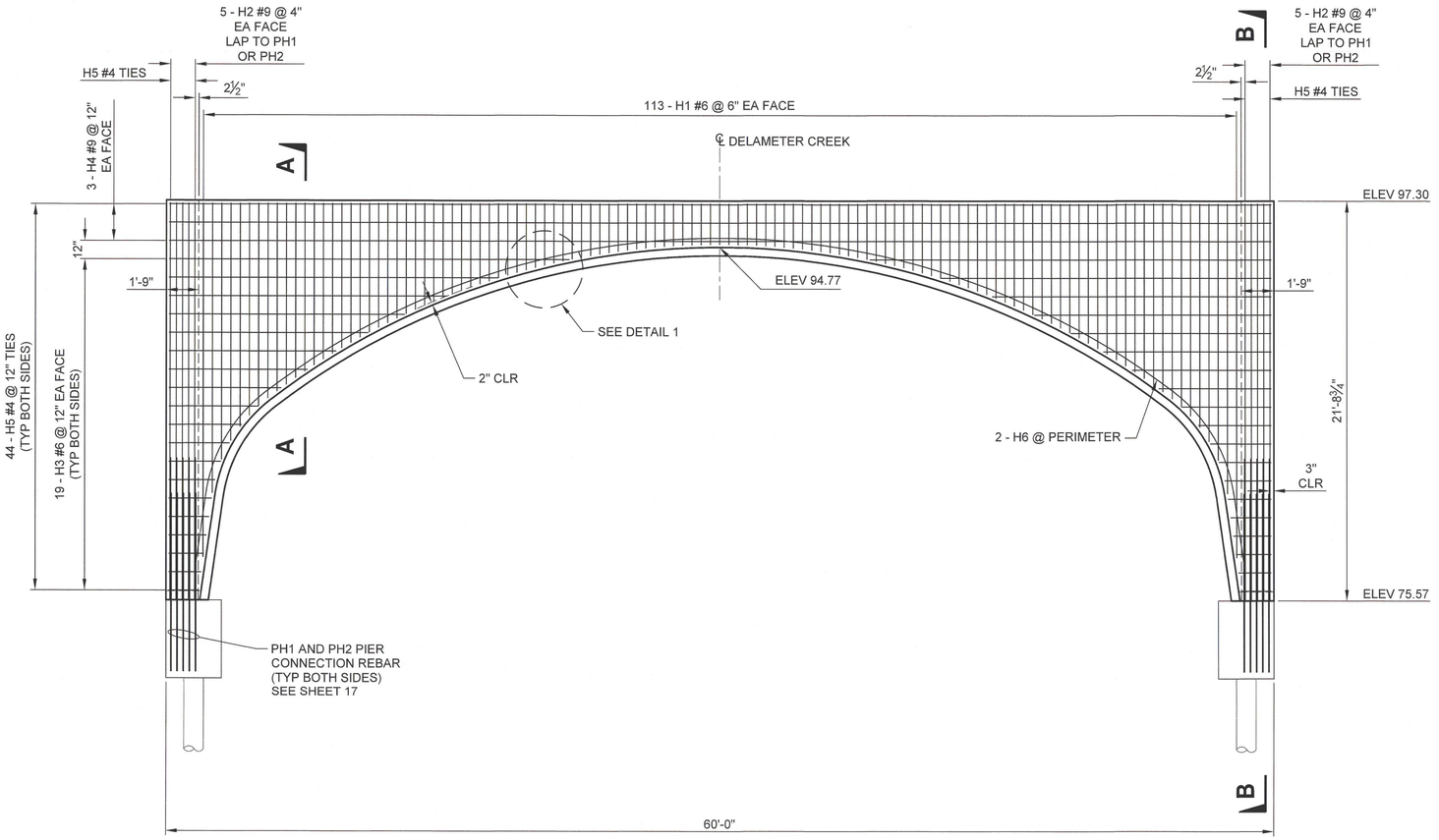


CULVERT GEOMETRY



LIMITS OF CULVERT BACKFILL

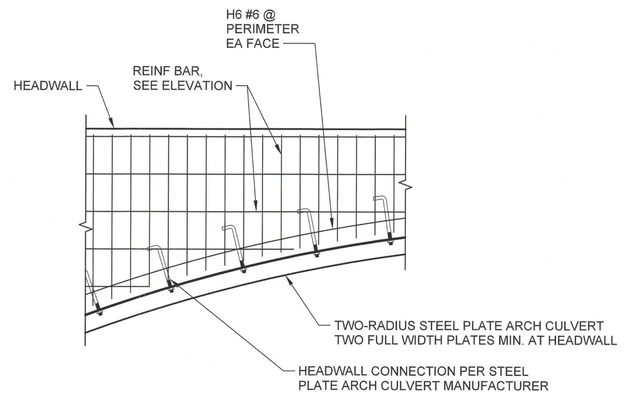
BRIAN BIERWAGEN PROJECT MANAGER 3/21/2025 DATE NILS HOVLAND DRAWN BY 3/21/2025 DATE NATHAN BINGHAM CHECKED BY 3/21/2025 DATE	HORIZ. SCALE: 1/4" = 1'-0" VERT. SCALE: 1/4" = 1'-0" PROJECT ID: 1779 ROAD NO. : 23200 COMPUTER FILE: PO2415014S07_Arch.dwg	COWLITZ COUNTY WASHINGTON	DEPARTMENT OF PUBLIC WORKS 1600 13TH AVENUE SOUTH KELSO, WASHINGTON 98626	Parametrix 5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214 Ph: 503.233.2400	BENJAMIN JAMES SCHLAUTER STATE OF WASHINGTON 55244 PROFESSIONAL ENGINEER 3/24/25	SECTIONS 17 & 18, T9N, R2W	GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT ARCH DETAIL	SHEET 19 OF 25



HEADWALL ELEVATION

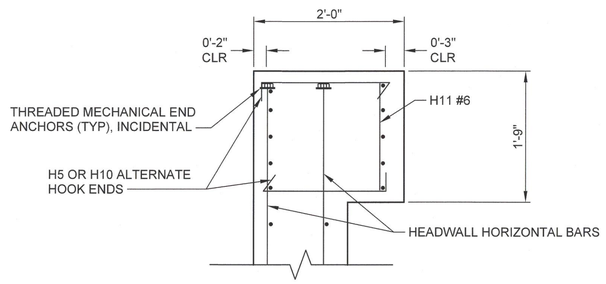
SCALE: 1/4" = 1'-0"

NOTE: FIELD TRIM H1 AND H3 BARS TO FIT AROUND STEEL PLATE ARCH CULVERT.



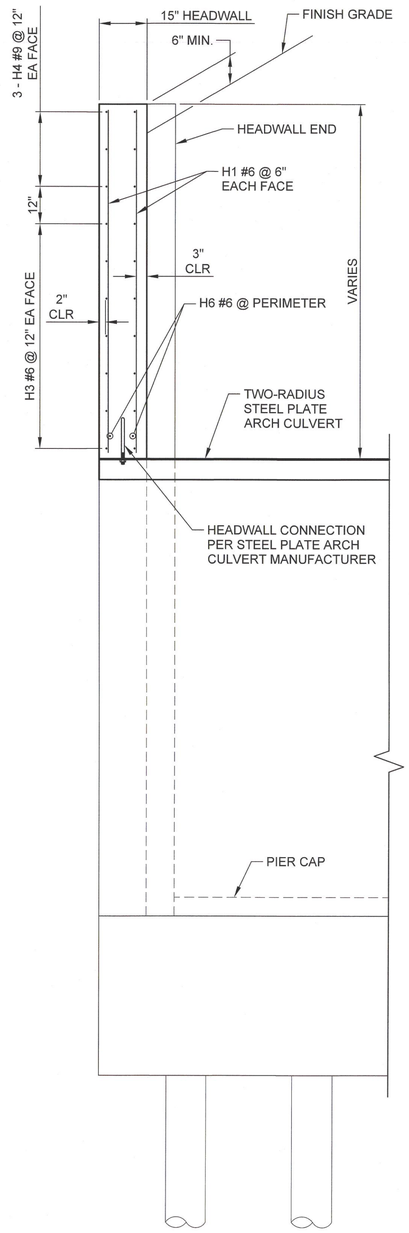
ARCH-TO-HEADWALL CONNECTION DETAIL 1

SCALE: 1/2" = 1'-0"



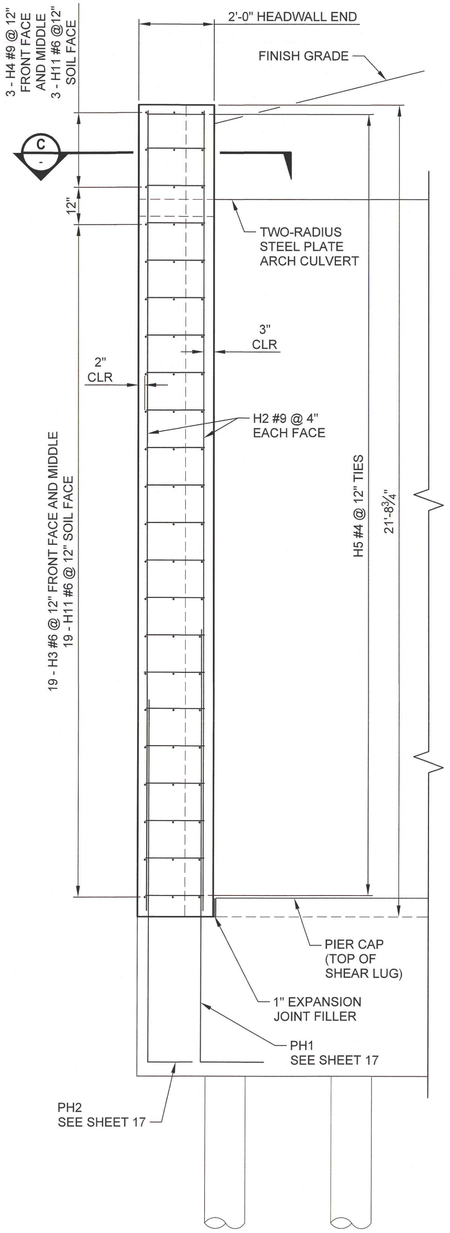
HEADWALL END SECTION C

SCALE: 1" = 1'-0"



HEADWALL SECTION A

SCALE: 1/2" = 1'-0"



HEADWALL END SECTION B

SCALE: 1/2" = 1'-0"

BRIAN BIERWAGEN	3/21/2025	HORIZ. SCALE: AS NOTED	DEPARTMENT OF PUBLIC WORKS
PROJECT MANAGER	DATE	VERT. SCALE: AS NOTED	1600 13TH AVENUE SOUTH
NILS HOVLAND	3/21/2025	PROJECT ID: 1779	KELSO, WASHINGTON 98626
DRAWN BY	DATE	ROAD NO. : 23200	
NATHAN BINGHAM	3/21/2025	COMPUTER FILE: PO2415014S08_Headwalls.dwg	Parametrix
CHECKED BY	DATE		5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214 Ph: 503.233.2400

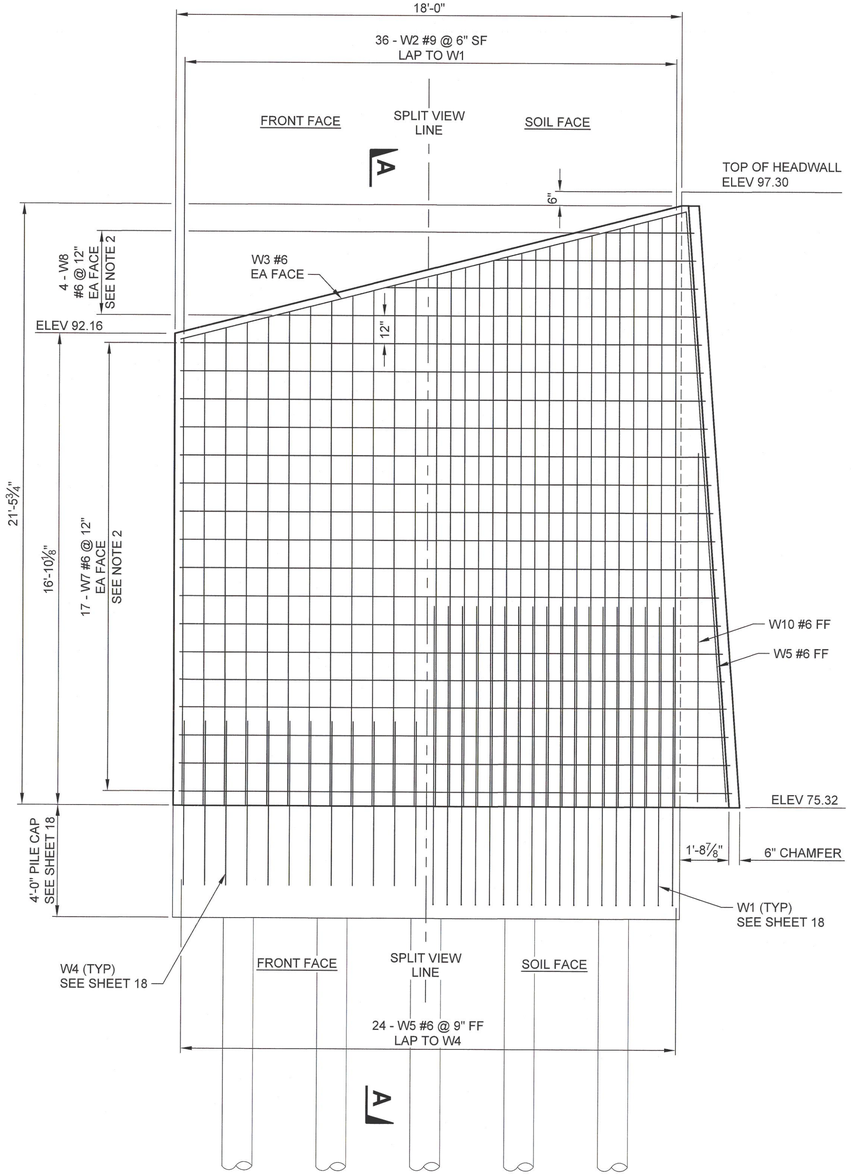
BENJAMIN JAMES SCHLICHTER — STATE OF WASHINGTON — 55244 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — 3/24/25

SECTIONS 17 & 18, T9N, R2W

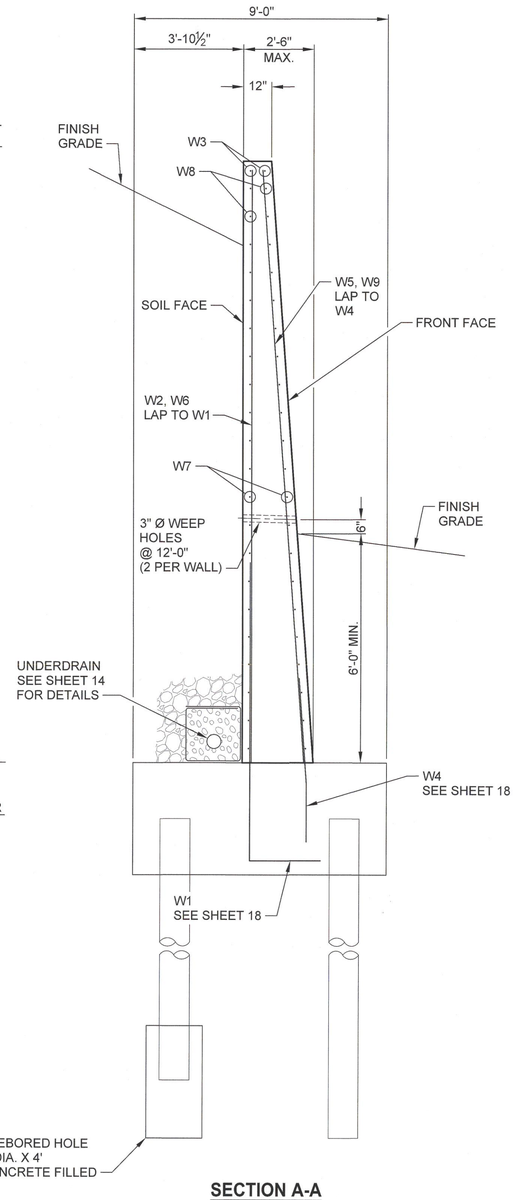
GARLOCK ROAD - DELAMETER CREEK
FISH PASSAGE PROJECT

INLET HEADWALL

SHEET 20 OF 25



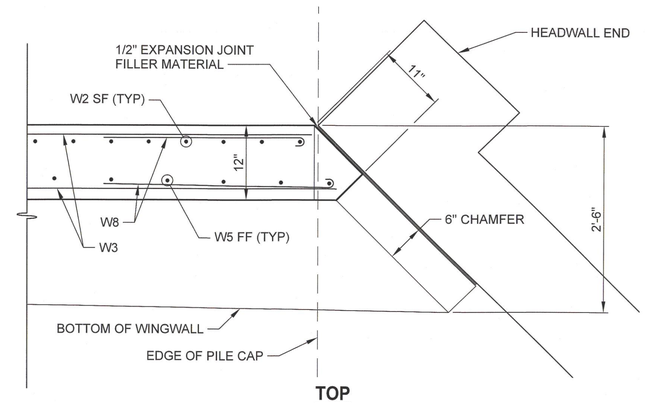
SPLIT ELEVATION VIEW
(SHOWING SEPARATE REBAR LAYERS)



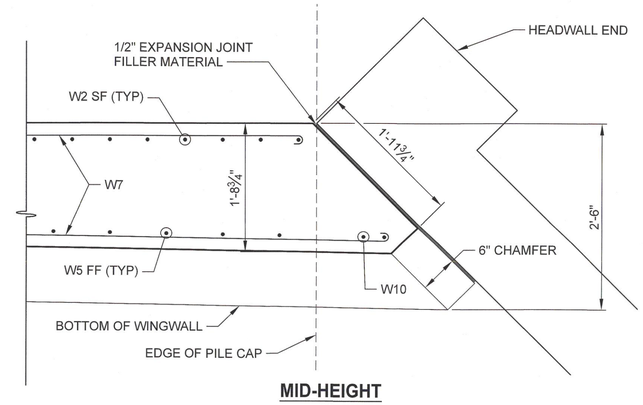
SECTION A-A

NOTES:
1. WINGWALL 1 SHOWN. WINGWALL 2 OPPOSITE HAND.
2. FIELD TRIM W7 AD W8 BARS TO FIT WALL TAPER.
3. WEEP HOLES NOT SHOWN ON ELEVATION FOR CLARITY.

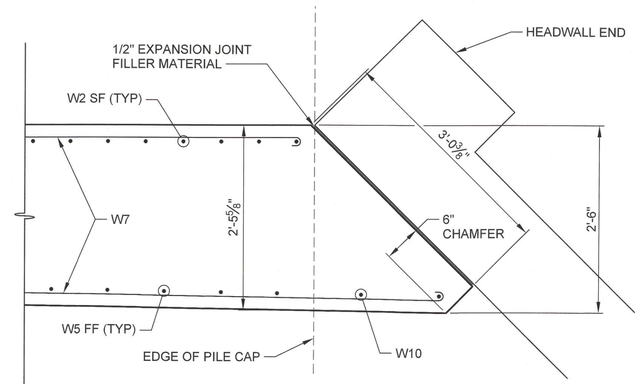
WINGWALLS 1 AND 2 (INLET)
SCALE: 3/8" = 1'-0"



TOP



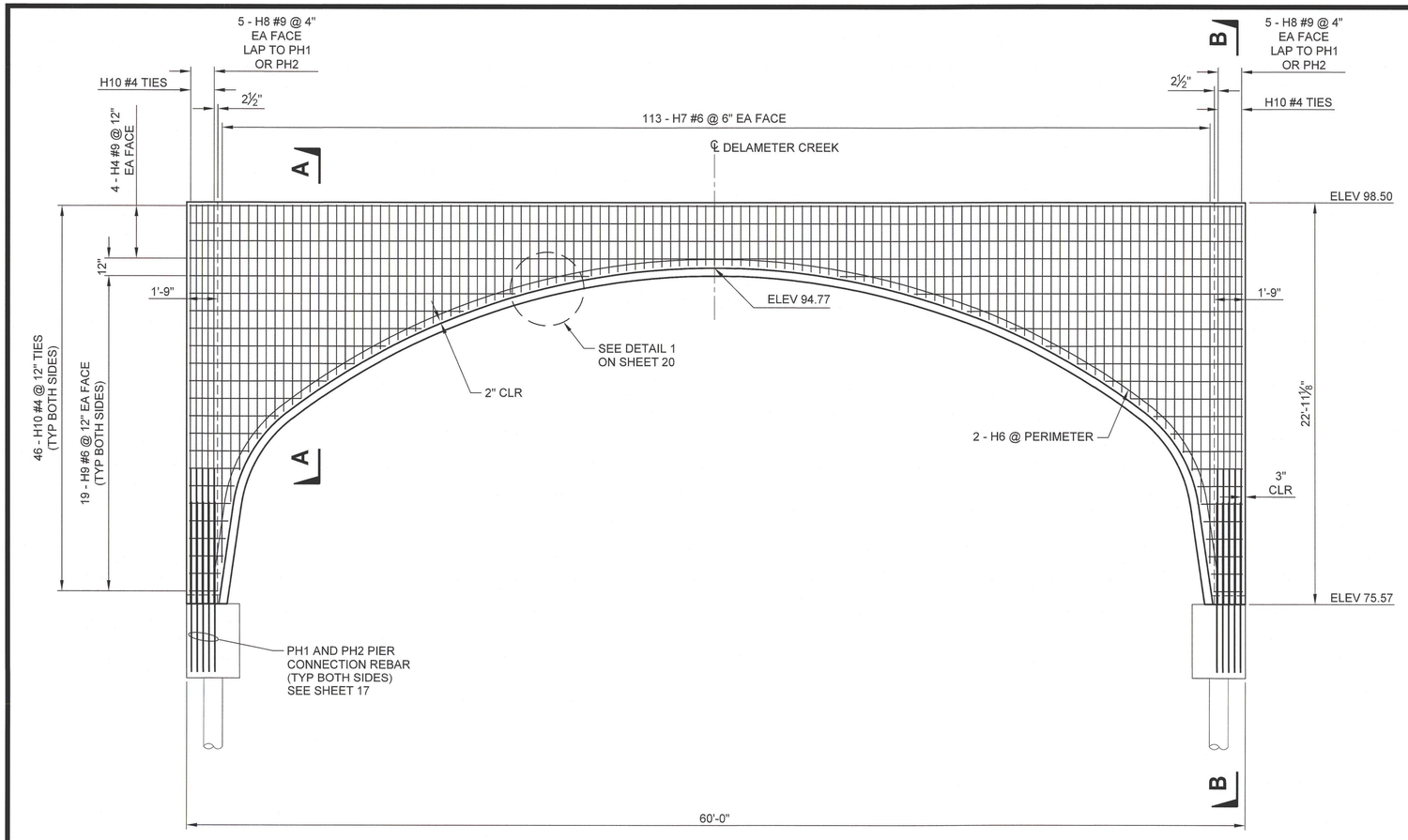
MID-HEIGHT



BOTTOM

WINGWALL CHAMFER
SCALE: 1" = 1'-0"

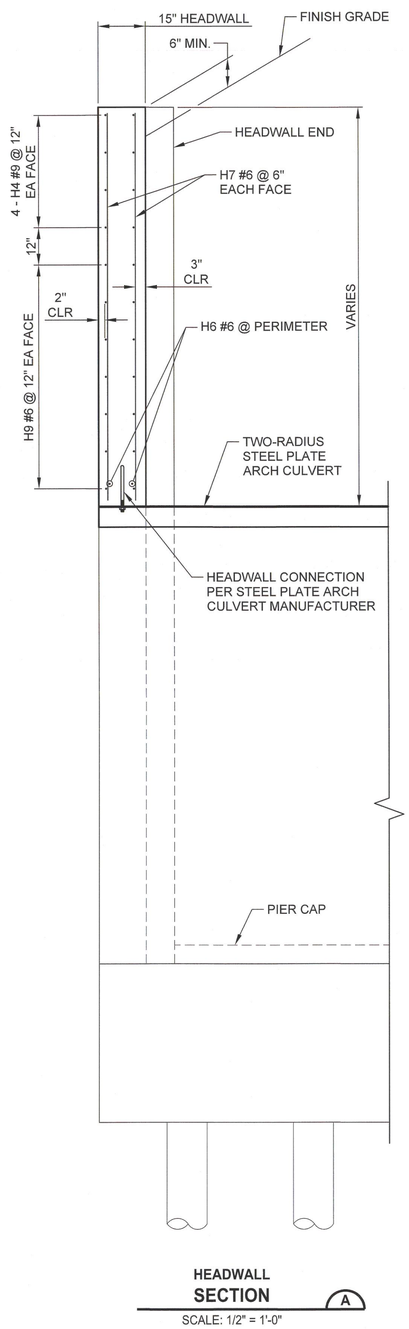
BRIAN BIERWAGEN PROJECT MANAGER	3/21/2025 DATE	HORIZ. SCALE: AS NOTED VERT. SCALE: AS NOTED PROJECT ID: 1779 ROAD NO. : 23200 COMPUTER FILE: PO2415014S09_WingWalls_1 & 2.dwg	COWLITZ COUNTY WASHINGTON	DEPARTMENT OF PUBLIC WORKS 1600 13TH AVENUE SOUTH KELSO, WASHINGTON 98626	Parametrix 5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214 Ph: 503.233.2400	BENJAMIN JAMES SCHLACHTER STATE OF WASHINGTON 55244 PROFESSIONAL ENGINEER 3/24/25	SECTIONS 17 & 18, T9N, R2W	GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT WINGWALLS 1 AND 2	SHEET 21 OF 25
NILS HOVLAND DRAWN BY	3/21/2025 DATE								
NATHAN BINGHAM CHECKED BY	3/21/2025 DATE								



HEADWALL ELEVATION

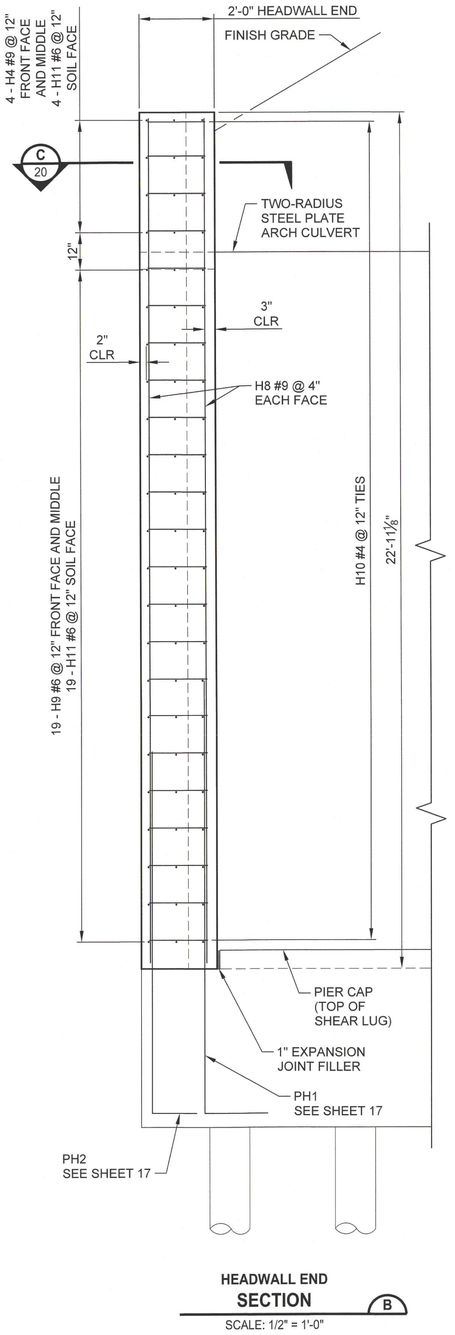
SCALE: 1/4" = 1'-0"

NOTE: FIELD TRIM H7 AND H9 BARS TO FIT AROUND STEEL PLATE ARCH CULVERT.



HEADWALL SECTION A

SCALE: 1/2" = 1'-0"



HEADWALL END SECTION B

SCALE: 1/2" = 1'-0"

BRIAN BIERWAGEN	3/21/2025	PROJECT MANAGER / DATE
NILS HOVLAND	3/21/2025	DRAWN BY / DATE
NATHAN BINGHAM	3/21/2025	CHECKED BY / DATE

HORIZ. SCALE: AS NOTED
VERT. SCALE: AS NOTED

PROJECT ID: 1779
ROAD NO. : 23200

COMPUTER FILE:
PO2415014S08_Headwalls.dwg

COWLITZ COUNTY WASHINGTON

DEPARTMENT OF PUBLIC WORKS

1600 13TH AVENUE SOUTH
KELSO, WASHINGTON 98626

Parametrix
5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214
Ph: 503.233.2400

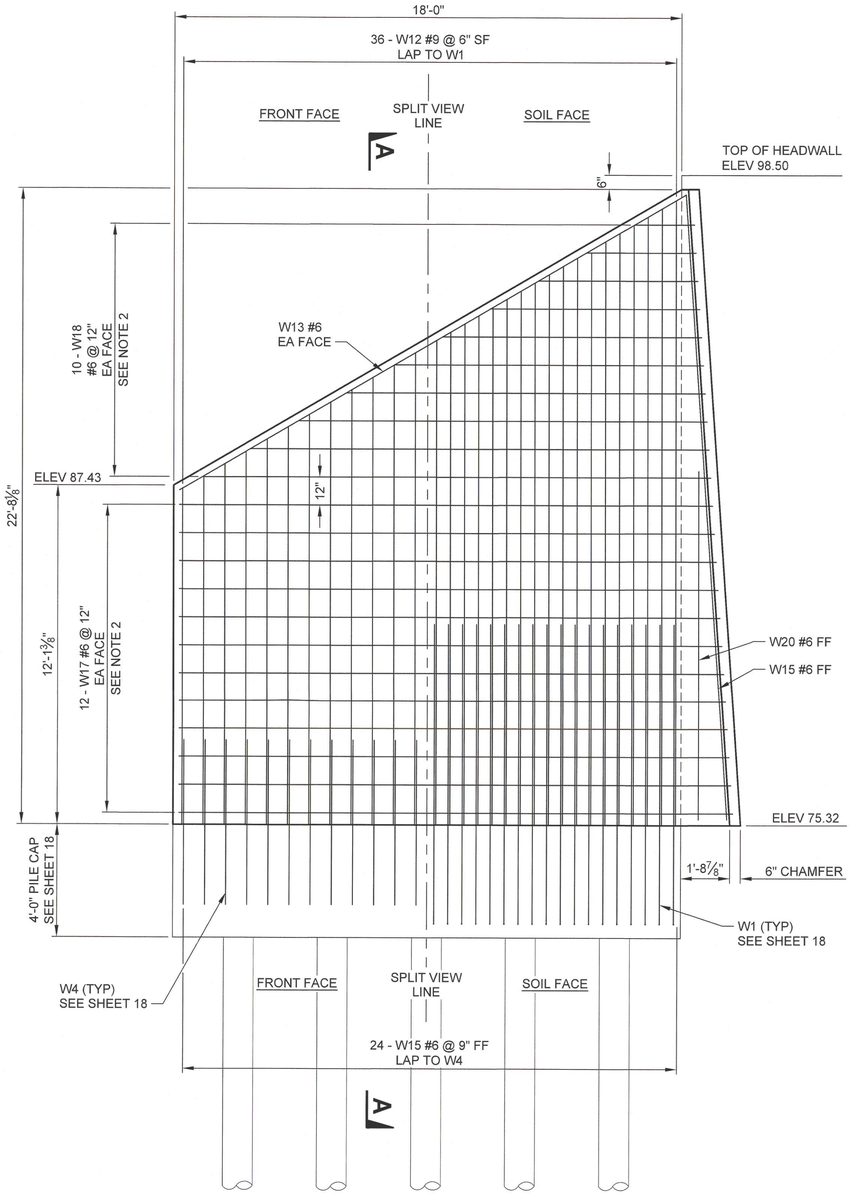
BENJAMIN JAMES SCHLACHTER — STATE OF WASHINGTON — 25244 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — 3/24/25

SECTIONS 17 & 18, T9N, R2W

GARLOCK ROAD - DELAMETER CREEK
FISH PASSAGE PROJECT

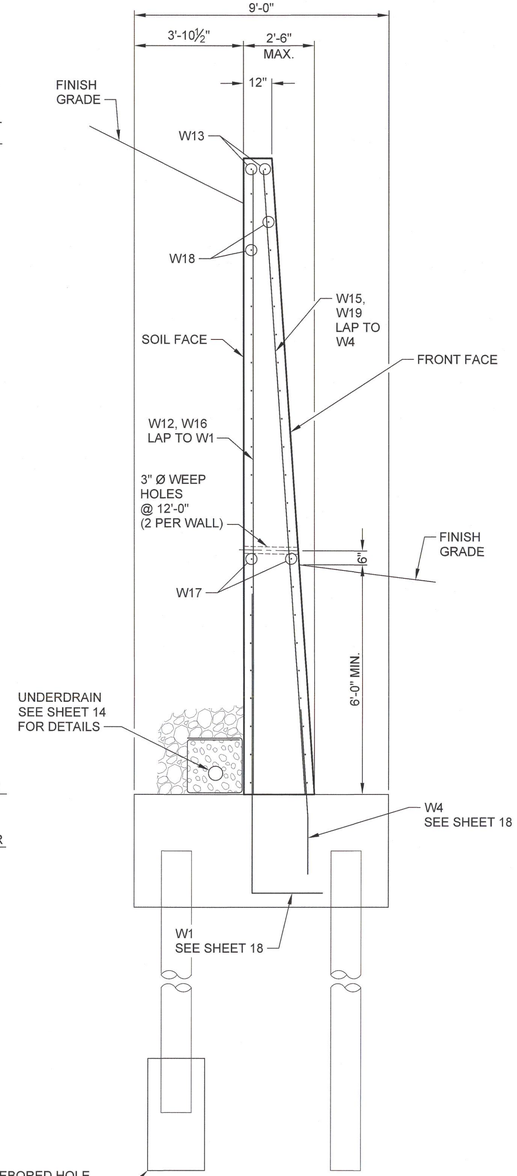
OUTLET HEADWALL

SHEET 22 OF 25

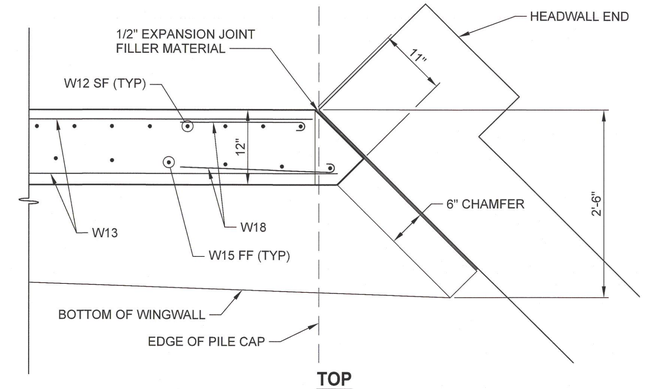


SPLIT ELEVATION VIEW

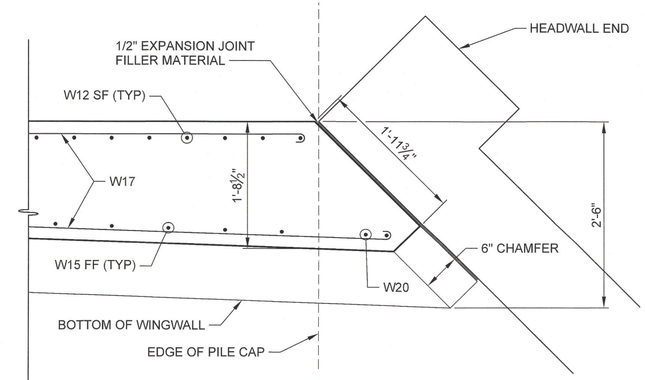
(SHOWING SEPARATE REBAR LAYERS)



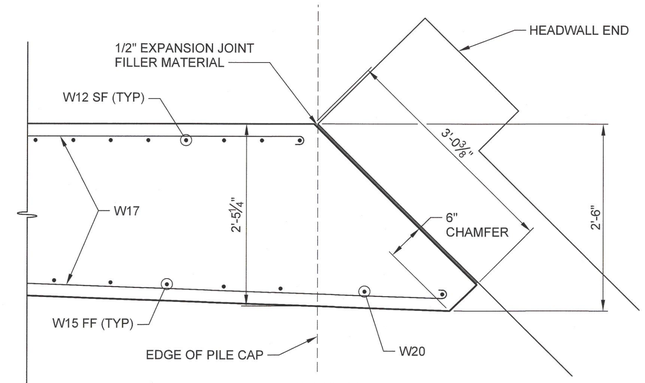
SECTION A-A



TOP



MID-HEIGHT



BOTTOM

WINGWALL CHAMFER

SCALE: 1" = 1'-0"

WINGWALLS 3 AND 4 (OUTLET)

SCALE: 3/8" = 1'-0"

NOTES:
1. WINGWALL 3 SHOWN. WINGWALL 4 OPPOSITE HAND.
2. FIELD TRIM W17 AD W18 BARS TO FIT WALL TAPER.
3. WEEP HOLES NOT SHOWN ON ELEVATION FOR CLARITY.

BRIAN BIERWAGEN PROJECT MANAGER	3/21/2025 DATE
NILS HOVLAND DRAWN BY	3/21/2025 DATE
NATHAN BINGHAM CHECKED BY	3/21/2025 DATE

HORIZ. SCALE: AS NOTED
VERT. SCALE: AS NOTED

PROJECT ID: 1779
ROAD NO. : 23200

COMPUTER FILE:
PO2415014S10_WingWalls_3 & 4.dwg

COWLITZ COUNTY WASHINGTON

DEPARTMENT OF PUBLIC WORKS

1600 13TH AVENUE SOUTH
KELSO, WASHINGTON 98626

Parametrix
5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214
Ph: 503.233.2400

BENJAMIN JAMES SCHLACHTER — STATE OF WASHINGTON — 55244 — PROFESSIONAL ENGINEER — STRUCTURAL — 3/24/25

SECTIONS 17 & 18, T9N, R2W

GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT

WINGWALLS 3 AND 4

SHEET 23 OF 25

S = BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES

L = LUMP SUM QUANTITY

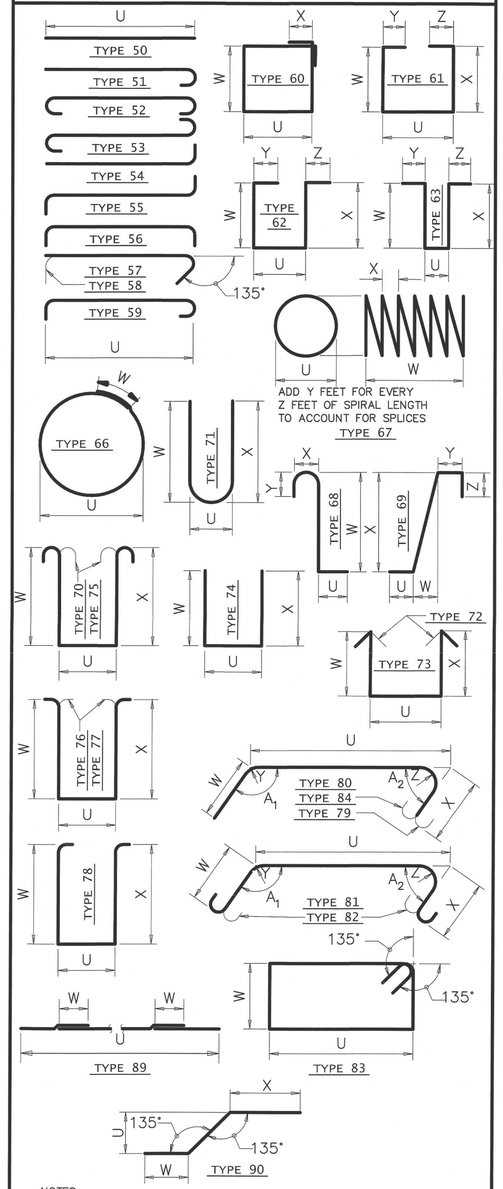
T = TRANSVERSE OR S = SEISMIC

E = BAR IS TO BE EPOXY COATED

X = BAR DIMENSIONS VARY BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE

MARK NO.	LOCATION	SIZE	NO. REQ'D	BEND TYPE	TIE OR STIR.	LUMP SUM	SUBSTR.	EPOXY COAT	VARIES	NO. EACH	DIMENSIONS (Out to Out) U Ft	U In	W Ft	W In	X Ft	X In	Y Ft	Y In	Z Ft	Z In	A1 Deg	A2 Deg	Length Ft	Length In	Wt Lbs
PIER CAPS																									
PC1	Long Bottom	6	8	50							53	6											428	0	642.85
PC2	Long Top	6	12	56							53	6											642	0	964.28
PC3	Top Key	6	4	50							53	6											214	0	321.4
PC4	Long Side	6	12	50							53	6											642	0	964.3
S1	Stirrup	5	158	83	S						2	6	3	9									2133	0	2224.7
S2	Stirrup	5	32	61	S						2	6	3	9	3	9	0	6	0	6			352	0	367.1
T1	Tie	4	258	58	T						2	6											860	0	574.5
T2	Top Key	5	200	74	T						1	0	2	0	2	0							1000	0	1043.0
PH1	Headwall End	9	20	54							11	5											260	0	884.0
PH2	Headwall End	9	20	54							9	8											216	8	736.6
HEADWALL INLET																									
H1	Vertical Each Face	6	226	50					X		19	0											4294	0	6449.6
				50					X		2	0													
				50							19	0													
H2	Vertical End Each Face	9	20	50							21	2											428	4	1456.3
H3	Horizontal Each Face	6	19	50					X	4	21	6											893	0	1341.3
				50							1	10													
H4	Horizontal Each Face	9	6	50							59	6											357	0	1213.8
H5	End Ties	4	88	58	T						1	6											205	4	137.2
H6	Perimeter	6	2	89							75	0	3	7									157	2	236.1
H11	Headwall End Horizontal	6	44	50							1	3											62	6	93.8
HEADWALL OUTLET																									
H7	Vertical Each Face	6	226	50					X		20	2											4557	8	6845.6
				50					X		3	2													
				50							20	2													
H8	Vertical End Each Face	9	20	50							22	5											448	4	1524.3
H9	Horizontal Each Face	6	19	50					X	4	21	7											893	0	1341.3
				50							1	10													
H4	Horizontal Each Face	9	8	50							59	6											476	0	1618.4
H10	End Ties	4	92	58	T						1	6											214	7	143.4
H11	Headwall End Horizontal	6	46	50							1	3											10	10	71.3
H6	Perimeter	6	2	89							75	0	3	7									157	2	236.1
WINGWALL 1 & 2 INLET																									
W2	Soil Face Vertical	9	72	50					X		18	10											426	0	1448.4
				50							16	8													
W3	Top of Wall	6	4	50							18	6											74	0	111.1
W5	Front Face Vertical	6	50	50					X		18	10											426	0	639.9
				50							16	8													
W10	Front Face Vertical	6	2	50							12	5											24	10	37.3
W7	Each Face Horizontal	6	17	51					X	4	19	6											1334	6	2004.4
											18	5													
W8	Each Face Horizontal	6	4	51					X	4	15	11											169	4	254.3
											3	11													
WINGWALL 3 & 4 OUTLET																									
W12	Soil Face Vertical	9	72	50					X		16	10											346	0	1176.4
				50							12	0													
W13	Top of Wall	6	4	50							20	6											82	0	123.2
W15	Front Face Vertical	6	50	50					X		16	10											346	0	519.7
				50							12	0													
W20	Front Face Vertical	6	2	50							12	5											24	10	37.3
W17	Each Face Horizontal	6	12	51					X	4	19	6											952	0	1429.9
											18	10													
W18	Each Face Horizontal	6	10	51					X	4	18	3											438	4	658.4
											2	4													
WINGWALL FOOTINGS																									
W1	Soil Face Vertical	9	144	54							10	9											1548		5263.2
W4	Front Face Vertical	6	96	80							3	0	3	0							176		576	0	865.2
F1	Longitudinal T&B	7	128	74							17	6	3	0	3	0							3008	0	6148.4
F2	Transverse T&B	7	144	74							8	6	3	0	3	0							2088	0	4267.9
F3	Perimeter	7	16	74							17	4	1	2	1	2							314	8	643.2
F4	Perimeter	7	16	74							8	4	1	2	1	2							170	8	348.8

BENDING DIAGRAMS



NOTES:

1. ALL REINFORCING BARS ON THIS SHEET SHALL BE ASTM A 706 UNLESS SHOWN OTHERWISE.

BRIAN BIERWAGEN — PROJECT MANAGER — 3/21/2025 DATE

NILS HOVLAND — DRAWN BY — 3/21/2025 DATE

NATHAN BINGHAM — CHECKED BY — 3/21/2025 DATE

HORIZ. SCALE: NO SCALE
VERT. SCALE: NO SCALE

PROJECT ID: 1779
ROAD NO. : 23200

COMPUTER FILE:
PO2415014S11_Bar List.dwg

COWLITZ COUNTY WASHINGTON

DEPARTMENT OF PUBLIC WORKS

1600 13TH AVENUE SOUTH
KELSO, WASHINGTON 98626

Parametrix
5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214
Ph: 503.233.2400

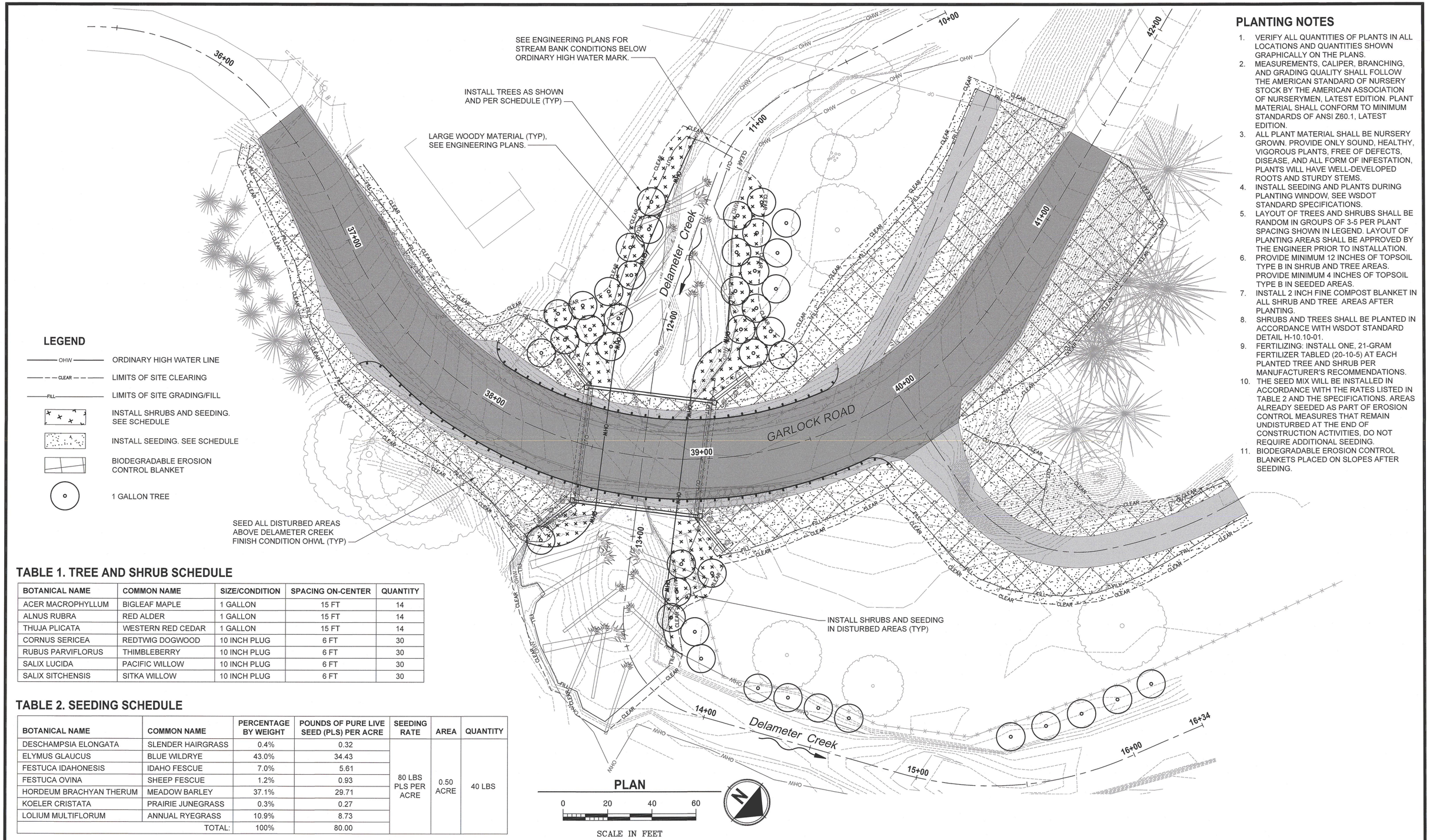
BENJAMIN JAMES SCHLACHER — STATE OF WASHINGTON — 55244 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — 5/29/25

SECTIONS 17 & 18, T9N, R2W

GARLOCK ROAD - DELAMETER CREEK
FISH PASSAGE PROJECT

BAR LIST

SHEET 24 OF 25



LEGEND

- OHW — ORDINARY HIGH WATER LINE
- CLEAR — LIMITS OF SITE CLEARING
- FILL — LIMITS OF SITE GRADING/FILL
- INSTALL SHRUBS AND SEEDING. SEE SCHEDULE
- INSTALL SEEDING. SEE SCHEDULE
- BIODEGRADABLE EROSION CONTROL BLANKET
- 1 GALLON TREE

PLANTING NOTES

1. VERIFY ALL QUANTITIES OF PLANTS IN ALL LOCATIONS AND QUANTITIES SHOWN GRAPHICALLY ON THE PLANS.
2. MEASUREMENTS, CALIPER, BRANCHING, AND GRADING QUALITY SHALL FOLLOW THE AMERICAN STANDARD OF NURSERY STOCK BY THE AMERICAN ASSOCIATION OF NURSERYMEN, LATEST EDITION. PLANT MATERIAL SHALL CONFORM TO MINIMUM STANDARDS OF ANSI Z60.1, LATEST EDITION.
3. ALL PLANT MATERIAL SHALL BE NURSERY GROWN. PROVIDE ONLY SOUND, HEALTHY, VIGOROUS PLANTS, FREE OF DEFECTS, DISEASE, AND ALL FORM OF INFESTATION, PLANTS WILL HAVE WELL-DEVELOPED ROOTS AND STURDY STEMS.
4. INSTALL SEEDING AND PLANTS DURING PLANTING WINDOW, SEE WSDOT STANDARD SPECIFICATIONS.
5. LAYOUT OF TREES AND SHRUBS SHALL BE RANDOM IN GROUPS OF 3-5 PER PLANT SPACING SHOWN IN LEGEND. LAYOUT OF PLANTING AREAS SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
6. PROVIDE MINIMUM 12 INCHES OF TOPSOIL TYPE B IN SHRUB AND TREE AREAS. PROVIDE MINIMUM 4 INCHES OF TOPSOIL TYPE B IN SEEDED AREAS.
7. INSTALL 2 INCH FINE COMPOST BLANKET IN ALL SHRUB AND TREE AREAS AFTER PLANTING.
8. SHRUBS AND TREES SHALL BE PLANTED IN ACCORDANCE WITH WSDOT STANDARD DETAIL H-10.10-01.
9. FERTILIZING: INSTALL ONE, 21-GRAM FERTILIZER TABLED (20-10-5) AT EACH PLANTED TREE AND SHRUB PER MANUFACTURER'S RECOMMENDATIONS.
10. THE SEED MIX WILL BE INSTALLED IN ACCORDANCE WITH THE RATES LISTED IN TABLE 2 AND THE SPECIFICATIONS. AREAS ALREADY SEEDED AS PART OF EROSION CONTROL MEASURES THAT REMAIN UNDISTURBED AT THE END OF CONSTRUCTION ACTIVITIES. DO NOT REQUIRE ADDITIONAL SEEDING.
11. BIODEGRADABLE EROSION CONTROL BLANKETS PLACED ON SLOPES AFTER SEEDING.

TABLE 1. TREE AND SHRUB SCHEDULE

BOTANICAL NAME	COMMON NAME	SIZE/CONDITION	SPACING ON-CENTER	QUANTITY
ACER MACROPHYLLUM	BIGLEAF MAPLE	1 GALLON	15 FT	14
ALNUS RUBRA	RED ALDER	1 GALLON	15 FT	14
THUJA PLICATA	WESTERN RED CEDAR	1 GALLON	15 FT	14
CORNUS SERICEA	REDTWIG DOGWOOD	10 INCH PLUG	6 FT	30
RUBUS PARVIFLORUS	THIMBLEBERRY	10 INCH PLUG	6 FT	30
SALIX LUCIDA	PACIFIC WILLOW	10 INCH PLUG	6 FT	30
SALIX SITCHENSIS	SITKA WILLOW	10 INCH PLUG	6 FT	30

TABLE 2. SEEDING SCHEDULE

BOTANICAL NAME	COMMON NAME	PERCENTAGE BY WEIGHT	POUNDS OF PURE LIVE SEED (PLS) PER ACRE	SEEDING RATE	AREA	QUANTITY
DESCHAMPSIA ELONGATA	SLENDER HAIRGRASS	0.4%	0.32	80 LBS PLS PER ACRE	0.50 ACRE	40 LBS
ELYMUS GLAUCUS	BLUE WILDRYE	43.0%	34.43			
FESTUCA IDAHONESIS	IDAHO FESCUE	7.0%	5.61			
FESTUCA OVINA	SHEEP FESCUE	1.2%	0.93			
HORDEUM BRACHYAN THERUM	MEADOW BARLEY	37.1%	29.71			
KOELER CRISTATA	PRAIRIE JUNEGRASS	0.3%	0.27			
LOLIUM MULTIFLORUM	ANNUAL RYEGRASS	10.9%	8.73			
	TOTAL:	100%	80.00			

BRIAN BIERWAGEN — PROJECT MANAGER — 3/21/2025 DATE
NILS HOVLAND — DRAWN BY — 3/21/2025 DATE
BRIAN BIERWAGEN — CHECKED BY — 3/21/2025 DATE

HORIZ. SCALE: 1" = 20'
VERT. SCALE:
PROJECT ID: 1779
ROAD NO. : 23200
COMPUTER FILE: PO2415014V01_Planting and Landscaping.dwg

COWLITZ COUNTY WASHINGTON

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KELSO, WASHINGTON 98626

Parametrix
5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214
Ph: 503.233.2400

BRIAN N BIERWAGEN — STATE OF WASHINGTON — 28900 — REGISTERED PROFESSIONAL ENGINEER
3/24/25

SECTIONS 17 & 18, T9N, R2W

GARLOCK ROAD - DELAMETER CREEK FISH PASSAGE PROJECT

PLANTING PLAN

SHEET 25 OF 25