



RACE LAGOON RACE ROAD
FISH PASSAGE - CULVERTS
#1893 & 1894 REPLACEMENT
RCO 22-1089



PREPARED FOR:



**SKAGIT FISHERIES
ENHANCEMENT
GROUP**

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CHINOOK ENGINEERING

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Race Road Culvert Replacements 1893, 1894

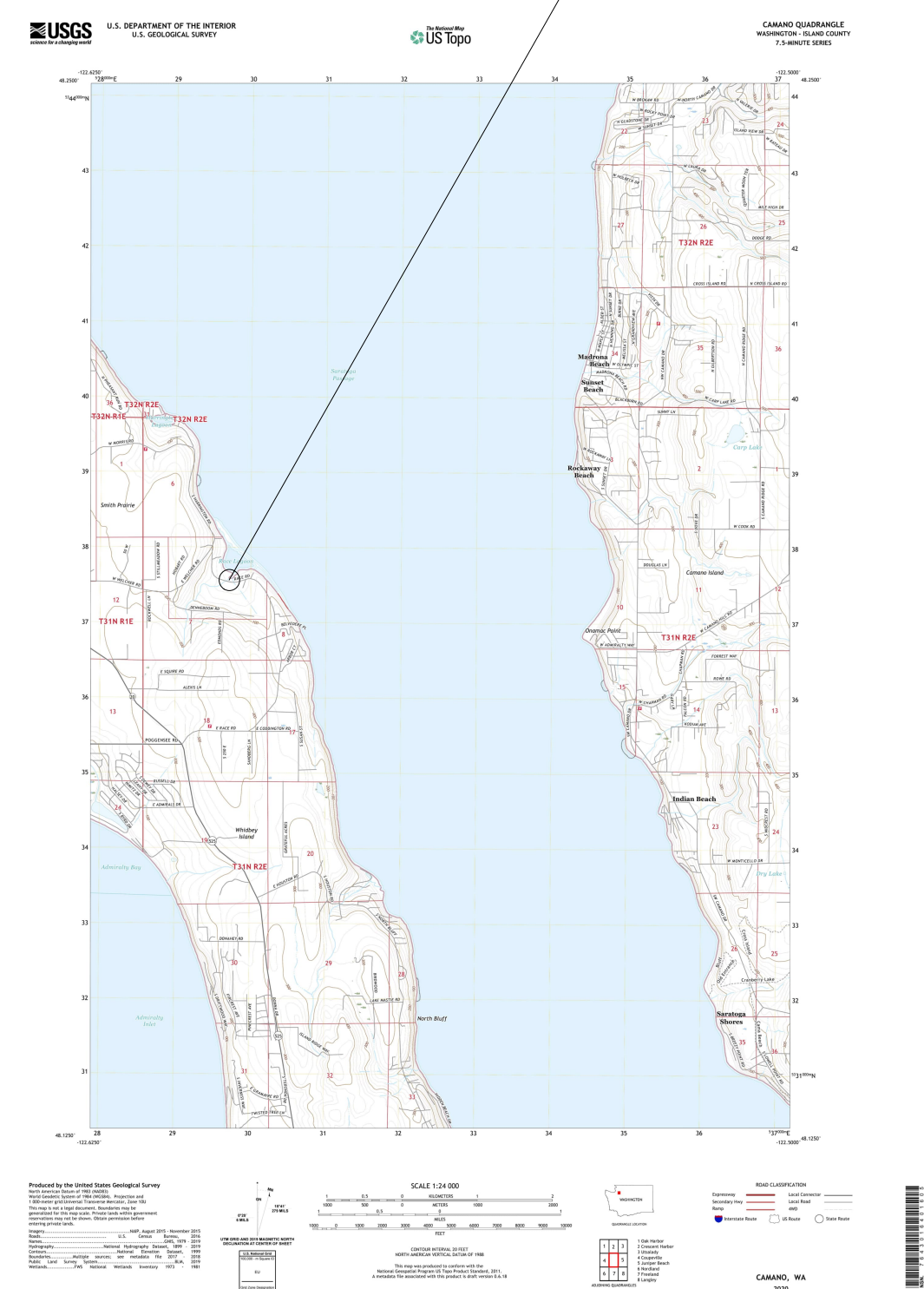
SHEET TITLE:
Cover Sheet

FILE NO:	22457
SCALE:	AS INDICATED
DATE:	03/28/2024
DRAWN BY:	ER
CHECKED BY:	JSK

SHEET NUMBER:
CVR
1 OF 23

1" Bar at Original Scale

Project Location



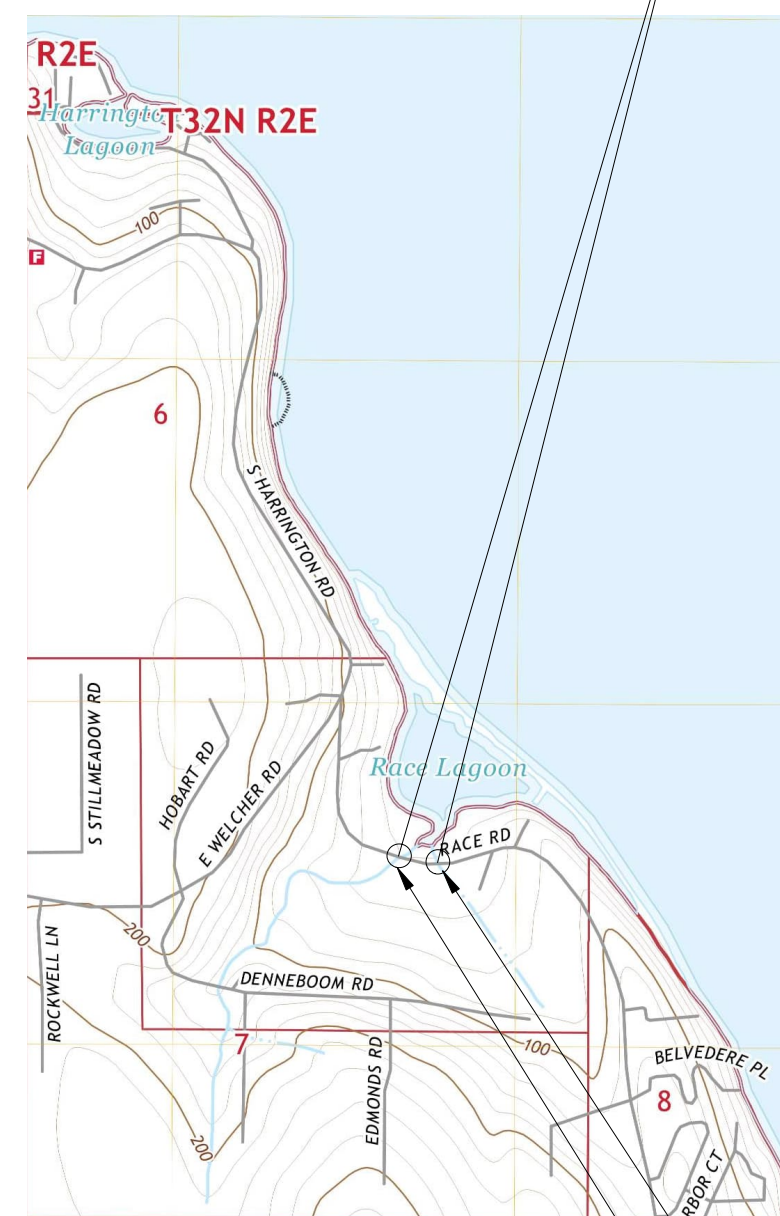
- Project Locations:

Section 7, T32N R2E

West Culvert 1893: LAT: 48.190518, LON: -122.600902

East Culvert 1894: LAT: 48.190339, LON: -122.599497

Island County



— 1894 East

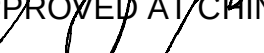
— 1893 West

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VICINITY MAPS

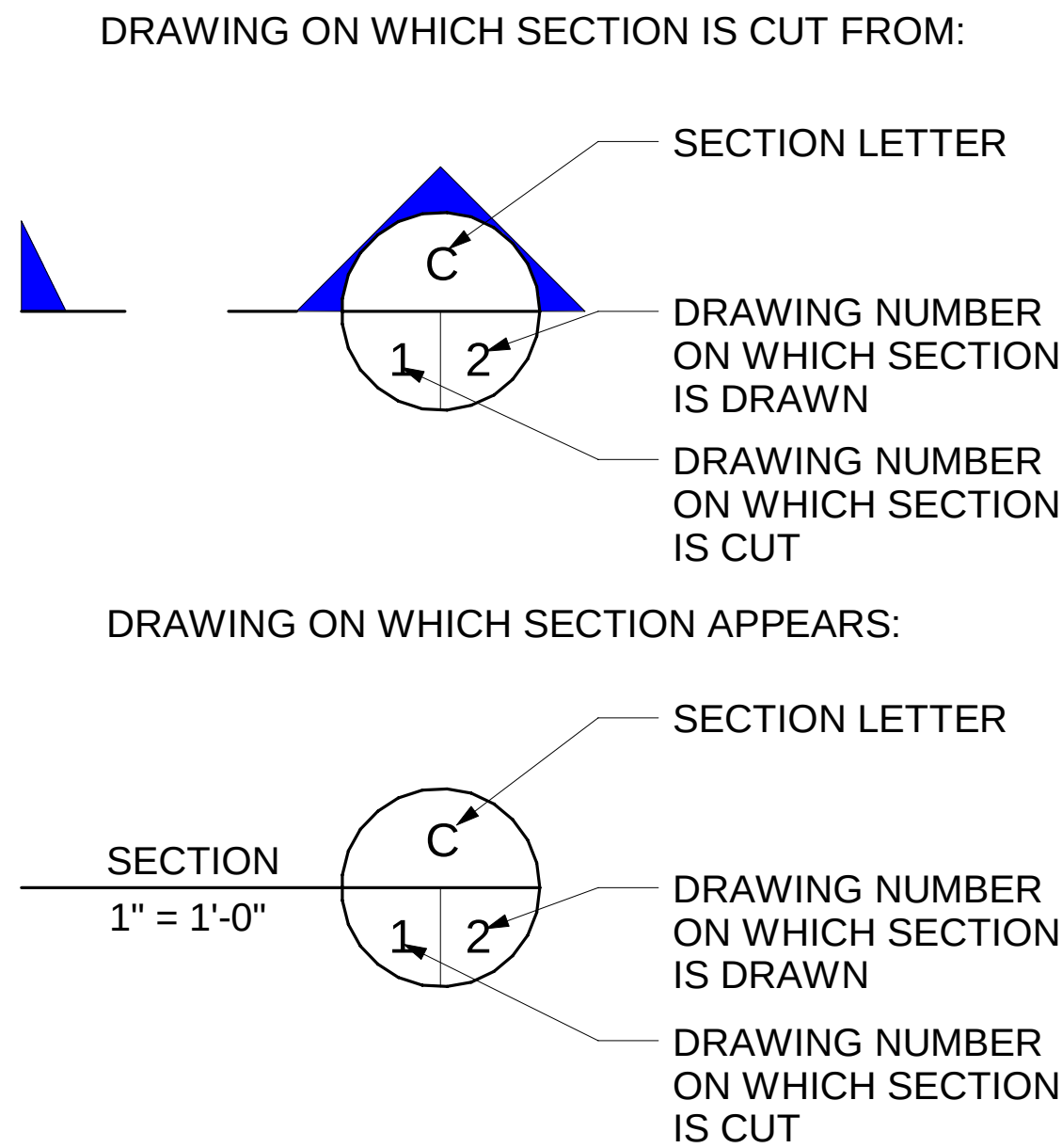


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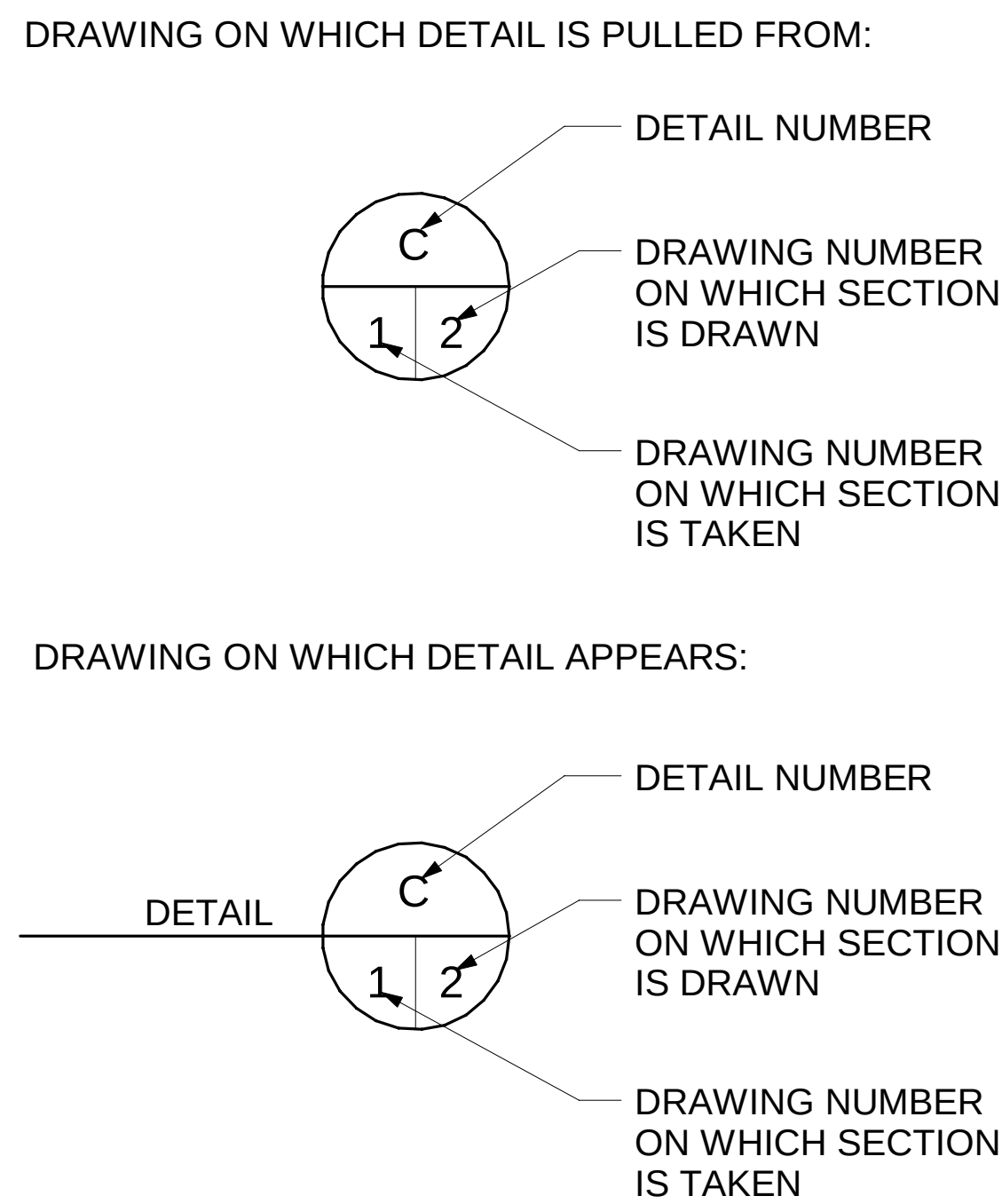

APPROVED AT CHINOOK ENGINEERING: DATE 03/28/2024

%	PERCENT	LG	LONG
&	AND	LOC	LOCATION
@	AT	LOD	LARGE ORGANIC DEBRIS
AB	ANCHOR BOLT	LWD	LARGE WOODY DEBRIS
ABV	ABOVE	LP	LOW PRESSURE
AL	ALUMINUM	LP	LOW POINT
ALG	ALONG	MANUF	MANUFACTURER
ALT	ALTERNATE	MAX	MAXIMUM
ALUM	ALUMINUM	MEZZ	MEZZANINE
APPROX or ~	APPROXIMATELY	MH	MANHOLE
ASPH	ASPHALT	MIN	MINIMUM
ASSOC	ASSOCIATION		MANUAL ON UNIFORM TRAFFIC
AVG	AVERAGE	MUTCD	CONTROL DEVICES FOR
BOT	BOTTOM		STREETS AND HIGHWAYS
B.O.F.	BOTTOM OF FOOTING	N	NORTH or NORTHING
B.O.P.	BEGINNING OF PROJECT	NAF	NEAR AND FAR
BF	BUTTERFLY	NEC	NECESSARY
BFW	BANK FULL WIDTH	NIC	NOT IN CONTRACT
BLDG	BUILDING	NML	NORMAL or NOMINAL
BVC	BEGIN OF VERTICAL CURVE	NO or #	NUMBER
C	CHANNEL	NTS	NOT TO SCALE
CBW	CHANNEL BANK WIDTH	OHWL	ORDINARY HIGH WATER LEVEL
CIP	CAST-IN-PLACE	O.C.	ON CENTER
CL	CENTER LINE	PC	POINT OF CURVATURE
CLR	CLEAR	PE	POLYETHYLENE
CMP	CORRUGATED METAL PIPE	PERF	PERFORATED
CONC	CLEAN OUT	PI	POINT OF INTERSECTION
CONC	CONCRETE	PL	PLATE
CY	CUBIC YARD	PLCS	PLACES
DEF	DEFINITION	PROP	PROPOSED
DESC	DESCRIPTION	PS	PUMP STATIONPT
DET	DETAIL	PT	POINT OF TANGENCY
DF	DOUGLASS FIR	PVC	POINT OF VERTICAL CURVE
DI	DUCTILE IRON	RAD	RADIUS
DIA or Ø	DIAMETER	RD	ROAD
DIST	DISTRIBUTION OR DISTRIBUTOR	RED	REDUCER
DS	DOWNSTREAM	REF	REFERENCE
DWG	DRAWING	REINF	REINFORCEMENT
E	EAST or EASTING	REQ'D	REQUIRED
E.O.P.	END OF PROJECT	ROW	RIGHT OF WAY
EA	EACH	RW	RACEWAY
EF	EACH FACE	S	SOUTH
EL or ELEV	ELEVATION	SC	SQUARE CORNER
ELL	ELBOW	SCH	SCHEDULE
EQ or EQUIV	EQUIVALENT	SCHED	SCHEDULE
EVC	END VERTICAL CURVE	SPA or SPCS	SPACE OR SPACES
EW /	EACH WAY	SPEC	SPECIFICATIONS
EXIST or EX	EXISTING	SS	SANITARY SEWER
FAB	FABRICATOR, ED, TION	SSTL	STAINLESS STEEL
FB	FLAT BAR	STA	STATION
FCA	FLANGE COUPLING ADAPTER	STD	STANDARD
FF or FIN FLR	FINISH FLOOR	STL	STEEL
FL	FLOW LINE	T	FOR REBAR TRANSVERSE
FOC	FACE OF CURVE	TEMP	TEMPERATURE
FT or '	FEET	TOC	TOP OF CONCRETE
GALV	GALVANIZED	TOF	TOP OF FOOTING
GB	GRADE BREAK	TOS	TOP OF SLAB
GS	GROUND SURFACE	TOW	TOP OF WALL
HDBOX	HEADBOX	TS	TUBE STEEL
HDPE	HIGH DENSITY POLYETHYLENE	TYP	TYPICAL
HEX	HEXAGONAL	UON	UNLESS OTHERWISE NOTED
HORIZ	HORIZONTAL	US	UPSTREAM
HP	HIGH PRESSURE	VAP	VERTICAL ADJUSTED POTENTIAL
ID	INSIDE DIAMETER	VERT	VERTICAL
IE	INVERT ELEVATION	VIC	VICTAULIC
IN or"	INCHES	VPC	VERTICAL POINT OF CURVATURE
INT	INTERSECTION	VPI	VERTICAL POINT OF INTERSECTION
L	for rebar LONGITUDINAL	VPT	VERTICAL POINT OF TANGENCY
L	LENGTH OF CURVE	W/	WITH
L	ANGLE IRON	WF	WIDE FLANGE
LF	LINEAR FOOT	WT	WIDE TEE STEEL SECTION
		WWF	WELDED WIRE FABRIC
			DEFLECTION ANGLE

SECTION INDICATOR:



DETAIL INDICATOR:



LEGEND:

	FNC	EXISTING FENCE
	2200	EXISTING CONTOUR
		EXISTING GRAVEL ROAD
	W	EXISTING WATER
	P	EXISTING POWER
	T	EXISTING TELEPHONE
	M	EXISTING WATER MANHOLE W/ METER
		EXISTING POWER POLE
		EXISTING MONITORING WELL
	FNC	FENCE
		ASPHALT PAVED ROAD
	2(H) (V)1 2:1	SLOPE DESIGNATION
		FLOW DIRECTION
		BUILDING
		CATCH BASIN
		TELEPHONE/POWER RISER
	P	POWER
	W	WATER (POTABLE)
	PW	PROCESS WATER
	T	TELEPHONE
	THW	THALWEG
	SS	SANITARY SEWER
		TRANSVERSE DRAINAGE STRUCTURE
	8%	GRADE
		RETAINING WALL

BY	
ISSUE	Preliminary Submittal
DATE	02.08.2024
REV	1



Section 7,132N R2E
**Race Road Culvert Replacements
1893,1894**

FILE NO:	22457	SHEET TITLE:	Abbreviations
SCALE:	AS INDICATED		
DATE:	03/28/2024		
DRAWN BY:	ER		
CHECKED BY:	JSK		

SPECIFICATIONS

All work performed under these contract documents shall be in accordance with the State of Washington Standard Specifications for Road, Bridge, and Municipal Construction, M41-10, most recent version. In the event of a conflict between the following attached specifications and the State of Washington Standard Specifications for Road, Bridge, and Municipal Construction, M41-10, the attached specifications on this sheet for this contract shall prevail. Special Provisions shall follow and then the WSDOT M41-10. The following most current provisions, codes and specific material and workmanship specifications are attached to this contract and shall be adhered to;

AAWA	Architectural Aluminum Manufactures' Association
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
APA	American Plywood Association
APWA	American Public Works Association
AREA	American Railway Engineering Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society For Testing of Materials
AWPA	American Wood Preservers Association
AWS	American Welding Society
AWWA	American Water Works Association
WSDOT	Washington Standard Specifications for Road, Bridge, and Municipal Construction, M41-10

Items in Specifications
Certain items described in the specification may not be utilized in this project but are listed as general items and may or may not apply specifically to this project.

Alternates
Alternative materials and construction methods are acceptable. The overall size and concept of the project shall be unchanged. Alternate methods of construction and any dimensional alternates shall be provided in writing for approval by the engineer, prior to installation. Changes in cost associated with alternates shall be at the risk of the contractor. Any alternates installed without prior written approval may be removed and replaced at the discretion of the engineer at no cost to the owner.

Submittals
Submittals for appurtenances installed under this contract shall be provided to the engineer prior to installation for approval. The following notes apply unless indicated otherwise:

Special inspection, as noted shall be provided by the owner's representative.

Code:
International Building Code, current edition and AASHTO Standard Specifications for Highway Bridges 17th ed with errata.

Design soil pressure:
Surface 2ksf max dead + live load allowable as per AASHTO
Cast footings and slab on grade over 12" thick compacted granular fill over compacted subgrade 95% min. compaction. Special inspection required.

Design loads:
Snow 100 psf
Snow drift ANSI 58.1
Seismic Design Category D
Site Classification D

Fa= 1.00
Fv= 1.50
Sms= 1.626
Sm1= 1.023
Sds= 1.084
Sd1= 0.682

Equivalent lateral Fluid pressure
Cantilevered walls 35 pcf
Restrained 50 pcf
Wind 50 psf on exposure

Culverts
Culverts shall be as specified on the drawing and shall be supplied by Pacific Corrugated, contact Bill Sullivan, 541-461-0990, BigR contact Doug Meyers, (253) 797-8293 or Contech Michael Blank 253.952.1154 or equal. Culvert shall be fabricated from a minimum of 8 gage, 0.1644" steel thickness and shall be galvanized as per AASHTO M274 and ASTM A 929 UNO on the drawings. Culvert backfill soil compaction shall be constructed in multiple 8" loose soil thickness layers subsequently compacted to 95% maximum density at optimum moisture content. Care shall be taken to compact the haunches of the culvert to the same 95% maximum soil density. Shop drawing submittals shall be submitted for bevels and skews.

Bridges
UNO Bridge shall be fabricated in accordance with AASHTO Standard Specifications for Highway Bridges, 17th Edition with errata or AASHTO LRFD Bridge Design Specifications, 5th or 6th Edition. Furnish a prefabricated concrete or steel superstructure. Prefabricated steel superstructures shall be fabricated with corrosion resistant steel meeting the requirements of ASTM A588 for the primary structural elements; steel decking may be galvanized. Fabrication of the steel bridge shall be performed in a plant certified by AISC for Simple Bridge Fabrication. Concrete super structures shall be constructed in accordance with the ACI 318. Special inspection is required for reinforcement by engineer of record. Bridge rail elements to be timber and/or weathering steel with galvanized hardware; incorporate railing bolts or attachments into the prefabricated superstructure as required by the design. The bridge superstructure shall be designed and sealed by a professional engineer licensed in the State of Washington, in accordance with the required design specifications. Concrete bridges may be substituted as a three sided concrete structure placed on footings UNO. Submit shop drawings and calculations that have been stamped and

sealed by a professional engineer licensed in the State of Washington. All bridges shall meet minimum specifications as set by AASHTO and shall be capable of resisting HL93 U80/L90 intermittent overload loads unless noted otherwise. Rail loading shall be half AASHTO (5 kip) and steel or approved equal.

Crushed gravel surfacing
Crushed gravel surfacing shall meet WSDOT spec. 9-03.9(3) for crushed surfacing rock and shall meet WSDOT spec. 9-03.9(3) for base course or top coarse as indicated on the drawings.

Culvert Demolition
Culverts shall be removed and disposed of offsite in a location as approved by the landowner or engineer.

Structural fill
Structural fill material shall be composed of crushed gravel, or quarry spalls as specified herein or approved by the project engineer and shall be compacted to 95% maximum density at optimum moisture content and shall be placed in 8" maximum loose lifts prior to compaction and in accordance with WSDOT 2-03.3(14)C compacting earth embankment Method C.

Riprap
WSDOT spec. 9-13.1(2) light loose rip rap. Riprap may exist on site and shall be salvaged and reused as shown in the drawings.

Quarry spalls
Quarry spalls shall be WSDOT 9-13.6

Fish mix
Fish mix gravel shall consist of washed round river gravel consisting by volume, 50% of the volume to be, sand - 2" rock, as per WSDOT 9-03.11(1) Streambed Sediment 30% of the volume to be, 2" - 4" rock, per WSDOT 9-03.11(2) Streambed Cobbles, 20% of the volume to be, 4" - 10" rock as WSDOT 9-03.11(2) Streambed Cobbles. Fish mix shall be supplemented as necessary with native bed material and/or imported pit run in order to match existing bed material gradation and prevent subsurface flow. All fish mix gravel shall be approved in writing by the engineer at the gravel pit prior to delivery of site.

Stream Dewatering
If stream dewatering is anticipated to be necessary during construction, a pump and diversion or gravity system will be required. The pump intake shall be screened and water discharged downstream of the project site. Discharge pipeline shall be placed and/or protected so as to prevent erosion in the channel. Upon completion of diversion, sponsor, contractor and/or project biologist will remove stranded fish, if present. Pumped diversions shall run continuously for the duration of the diversion UNO. Turbidity curtains may be employed in lieu of full stream diversion.

Pump intakes shall be affixed with a fish screen with mesh openings of 1/16" and shall be maintained clean. Through screen velocities shall not exceed 0.33 feet per second.

Exact locations of all in-stream habitat structures are to be approved by written submittal prior to construction by project manager or project engineer prior to installation.

Reinforced Concrete:
All concrete - f'c = 4000 psi at 28 days minmum, maximum w/c = 0.45, 6 sacks of cement minimum per cubic yard. Submit mix design. Special inspection required steel bars per ASTM A615, grade 60. Submit reinforcing steel shop drawings with details per ACI 315 manual of standard practice. Lap bars with a class B splice. Field bending bars not permitted w/o written approval. Welded wire fabric (WWF) per ASTM A185. Furnish WWF in flat sheets, not rolls. Lap edges 1 1/2 mesh minimum.

Concrete cover:
Footings 3". Pile caps 3". Walls 1", except 1 ½" where Exposed to weather and 2" against earth. Beams and Columns 1½" to stirrups or ties. Slabs and joists 1". Slabs on grade 1½". Cover to be not less than
Footings:
Provide 2-#5 longitudinal bottom bars in wall footings. Provide corner bars of same size and number at corners and inter-sections, 40 diameters each leg. Provide vertical dowels of same size, number and spacing as vertical bars with a 90 degree standard hook at bottom of footing.

Beams and slabs
Rigidly support bars with concrete blocks or approved accessories. Provide #5 support bars all slabs. Where main slab bars are parallel to a support, provide #4 @ 12 top bars extending 2'-0" beyond each face of support into slab. Where slab is on one side only, provide a 90 degree standard hook at discontinuous face. At slab openings over 12" square, provide two additional bottom main slab bars or 2-#5 minimum on all four sides of the opening extfrending 40 diameters past opening. Slabs on grade shall have contraction joints and construction joints as indicated on the plans. Contraction joints shall be saw cut to a depth of 1" by concrete sawing.

Provide 1-#5x4'-0" diagonal bottom bar all four corners. All slabs
Provide slab temperature bars as follows:
4" slabs, #3 @ 15 bottom,
5" slabs, #4 @ 18 bottom,
6" slabs, #4 @ 18 bottom,
7" slabs, #4 @ 15 bottom,
8" slabs, #3 @ 18 top, #4 @ 18 bottom,
9" slabs, #3 @ 18 top, #4 @ 18 bottom,
10" slabs, #3 @ 16 top, #4 @ 18 bottom,
11" slabs, #4 @ 18 top, #4 @ 18 bottom,
12" slabs, #4 @ 18 top, #4 @ 18 bottom.

Walls
Reinforce as follows:
6" walls, #4 @ 12 horizontal and vertical @ center of wall,
8" walls, #5 @ 15 horizontal and vertical @ center of wall

10" walls, #4 @ 16 horizontal and vertical each face,
12" walls, #4 @ 12 horizontal and vertical each face.

At openings over 12" square, provide 2-#5 bars @ center of wall all four sides, except 10" walls and over provide 1-#6 bar each face all four sides, extending 40 diameters past opening. Provide 1-#5 x 4'-0" diagonal bar @ center of wall all four corners. At corners, provide corner bars in outside face of same size and spacing as horizontal bars, 40 diameter each leg. At intersections, provide corner bars of same size, number and spacing as horizontal bars of intersecting wall, 40 diameter each leg. Provide 2-#5 longitudinal bars at top and bottom of walls. Provide roughened surface at construction. Provide vertical dowels of same size, number and spacing as vertical bars.

Grout
Grout shall be 6000 psi minimum 7-day cube strength per ASTM C109. Grout to be premixed, non-shrink "Masterflow" by Master Builders or "Concresive" by Adhesive Engineering or approved equal. ICBO certification required. use specific grout mix recommended by manufacturer for each grout application and follow manufacturer's instructions. Special inspection required.

Anchor Bolts
Anchor bolts shall be hot dipped galvanized ASTM A307. Special inspection required. Set all anchor bolts by template.

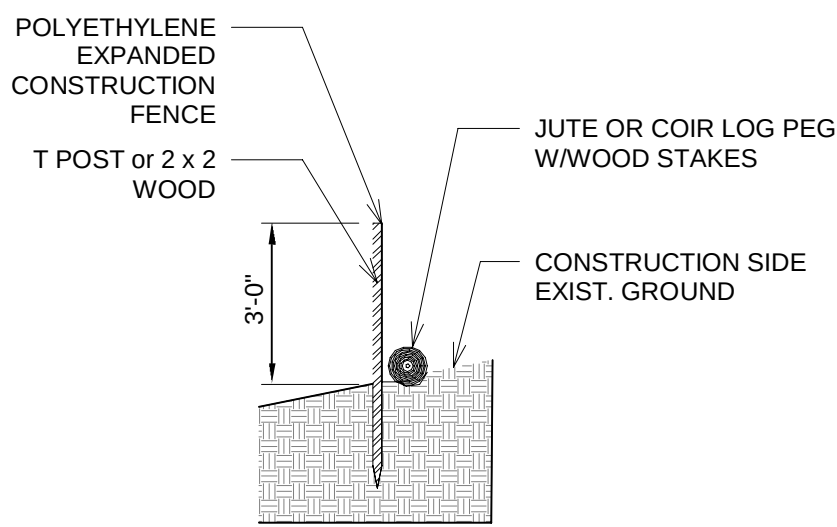
Drill In Expansion Bolts
"Kwik-Bolts" by Hilti fastening systems, "Parabolts" by USM Corp, "Red Head Wedge Anchor" by ITT Phillips or approved equal ICBO certification required. Special inspection required.

Adhesive Anchoring
"Hy-200 R" by Hilti inc., or Simpson SET-XP use A36 or A307 threaded rod. ICBO certification required for bolts and rod. May be applied to stainless steel cable. Special inspection required.

Structural Steel
All steel ASTM A36 or A588, fy = 36 ksi. Special inspection required. Fabrication and erection per AISC Specifications. Submit shop drawings. Welding per AWS D1.1. Minimum size welds 3/16" continuous fillet. Welders certified per AWS for rod and position. Use cold galvanizing spray on finished surface for field weld. High - strength bolts per ASTM A325. Typical bolted connections - friction type. Tension high-strength bolts by direct tension indicator method using load indicator washers installed per manufacturer's instructions. All steel shall be hot dip galvanized unless otherwise noted. Where ASTM A588 steel is used galvaninzing is not allowed.

Revegetation Sponsor to Complete
Revegetate all disturbed areas of construction. Replant riparian areas as follows: red osier dogwood and willow (salix spp.) shall be live staked along the waters edge at 2'-0" on center for 4 rows back from anticipated Ordinary

High Water (OHW) edge. Disturbed areas 10' from OHW edge shall be replanted as follows: western red cedar, black cottonwood and Douglas fir shall be interspersed and planted as pull ups with roots in soil through disturbed upland areas at 25' O.C.. Erosion control seed mixture appropriate for local shall be hand broadcast or hydroseeded in all upland disturbed areas.



TESC FENCE SECTION 2
3/8" = 1'-0" SPC



REV	1	DATE	02.08.2024	ISSUE	Preliminary Submittal	BY	
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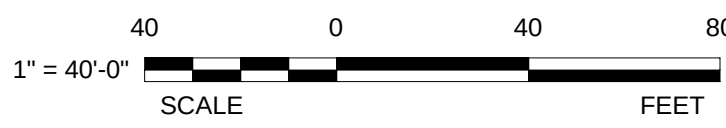
Section 7.132N R2E
**Race Road Culvert Replacements
1893,1894**

FILE NO:	22457	SHEET TITLE:	Specification
SCALE:	AS INDICATED	DATE:	03/28/2024
DRAWN BY:	ER	CHECKED BY:	JSK

SHEET NUMBER:
SPC
3 OF 23



Site - Existing 1
C-1



GENERAL NOTES

- BENCHMARKS
- ROAD/STREAM CENTERLINE
- PROPERTY LINE



Section 7.132N R2E
Race Road Culvert Replacements
1893,1894

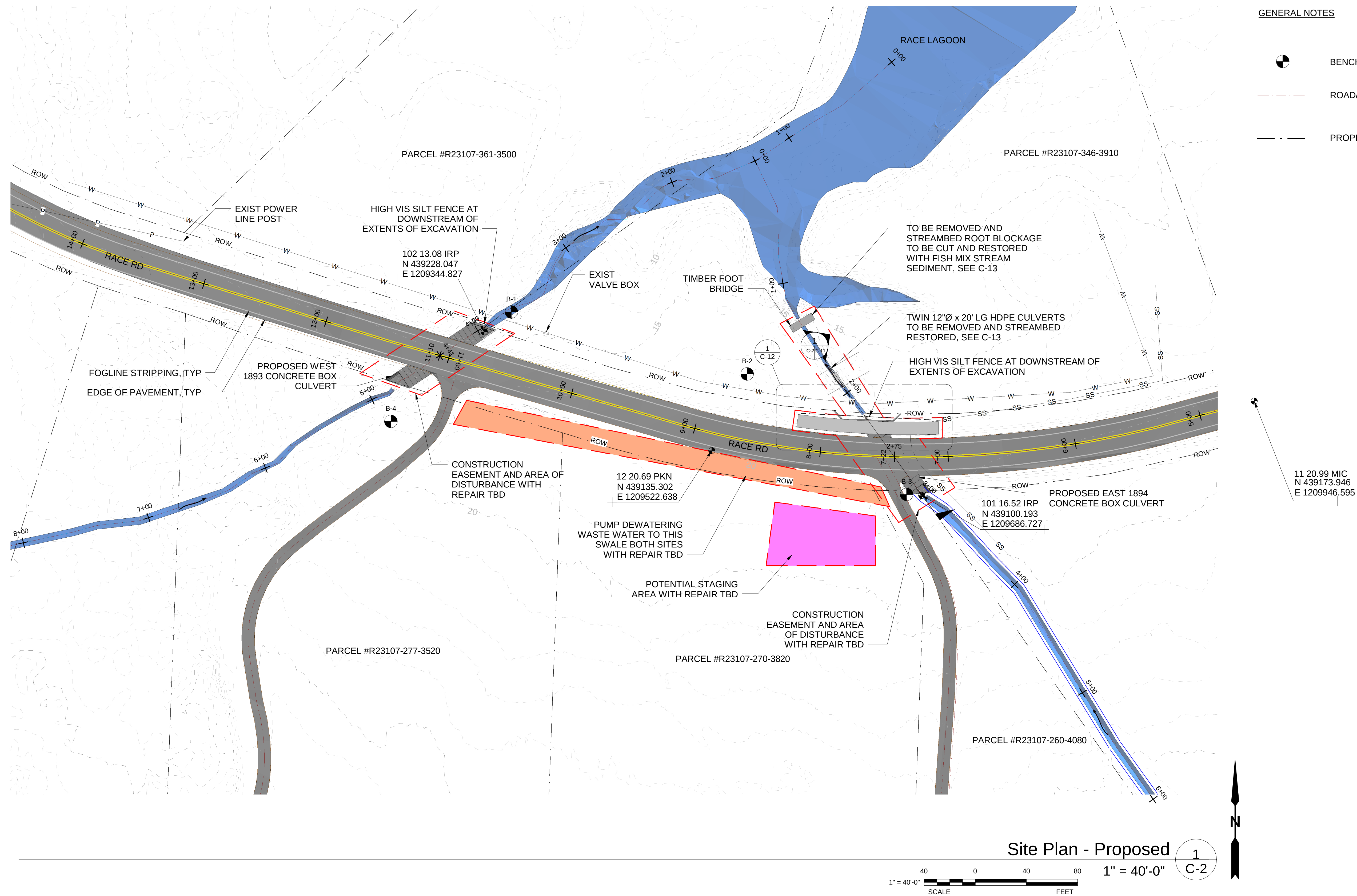
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Site Plan - Existing

FILE NO:	22457
SCALE:	AS INDICATED
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DRAWN BY:	ER
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SHEET NUMBER:
C-1
4 OF 23

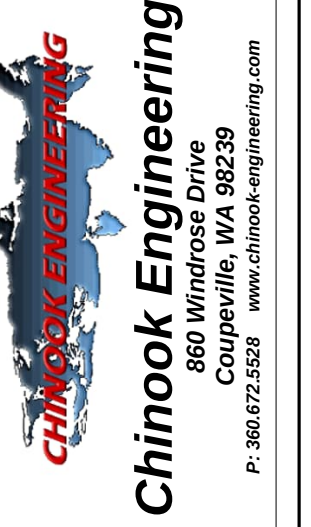
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GENERAL NOTES

- BENCHMARKS
- ROAD/STREAM CENTERLINE
- PROPERTY LINE



REV	DATE	ISSUE	BY
1	02.08.2024	Preliminary Submittal	



Race Road Culvert Replacements
1893,1894

FILE NO:	22457	SHEET TITLE:	Site Plan - Proposed
SCALE:	AS INDICATED	DATE:	03/29/2024
DRAWN BY:	ER	CHECKED BY:	JSK

SHEET NUMBER:
C-2
5 OF 23

National Oceanic And Atmospheric Administration (NOAA) Online Vertical Datum Transformation.

<https://vdatum.noaa.gov/vdatumweb/vdatumweb?a=120005520240126>



NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

ONLINE VERTICAL DATUM TRANSFORMATION

INTERPRETING AMERICA'S ELEVATION DATA

[Home](#)
[About VDatum](#)
[Download](#)
[Docs & Support](#)
[Contact Us](#)

Regional Information

* Region : West Coast

Horizontal Information

Source	Target
Reference Frame: IGS14 - use ITRF2014	NAD83(2011)
Coor. System: Geographic (Longitude, Latitude)	Geographic (Longitude, Latitude)
Unit: meter (m)	meter (m)
Zone: AL E - 0101	AL E - 0101

Vertical Information

Source	Target
Reference Frame: MHW	NAVD 88
Unit: foot (U.S. Survey) (US_ft)	foot (U.S. Survey) (US_ft)
☒ Height ☐ Sounding ☐ GEOD model: XGEOD20B	☒ Height ☐ Sounding ☐ GEOD model: GEOD18

Point Conversion

ASCII File Conversion

Input		Output
Latitude: 48.195000	Transform	Latitude: 48.1949966235
e.g. 33.7866 or 33 43 30.9600		
Longitude: -122.597598	Reset	Longitude: -122.5975789620
e.g. -118.7691 or -118 46 8.7600		
Height: 0	DMS	Height: 9.052
e.g. 3.037		
Drive to on map Reset Map		Drive to on map Reset Map
☐ to DMS		

Vertical Uncertainty: ☒ 1 sigma ☐ 95% Confidence

Spatially Varying Uncertainty (+/-): 0.313 US_ft

☐ Add Observation Vertical Uncertainty

Vertical_Area: WA\duca14_8301:4:1

[United States](#)
[United States](#)
[United States](#)

1. VERTICAL DATUM FOR ELEVATIONS SHOWN REFERENCED TO THE NOAA/TIDAL MLL = 0.00' DATUM, BASED UPON HOLDING THE PUBLISHED NAVD88 ELEVATION AT ISLAND COUNTY SURVEY POINT#MC111 ELEV=20.99. CONVERSIONS FROM THE PUBLISHED NAVD88 VALUE TO LOCAL TIDAL (MLLW = 0.00') DERIVED USING THE CURRENT (V. 3.2) VERSION OF NOAA'S TIDAL-DATUM CONVERSION SOFTWARE "VDATUM" FOR THE PUGET SOUND REGION. VERTICAL CONVERSION FROM NAVD88 TO MLLW. PER THE CURRENT MENSURATION IS +2.559. THAT IS, TO CONVERT A VALUE EXPRESSED IN NAVD88 TO ITS VALUE RELATIVE TO THE MLLW DATUM, 2.56 FEET SHOULD BE ADDED TO THE NAVD88 VALUE (A MONUMENT HAVING A NAVD88 ELEVATION OF 10.00', WOULD HAVE A MLLW ELEVATION OF 12.56 FOR EXAMPLE.)

SHEET TITLE:
Datum and NAVD
Conversions

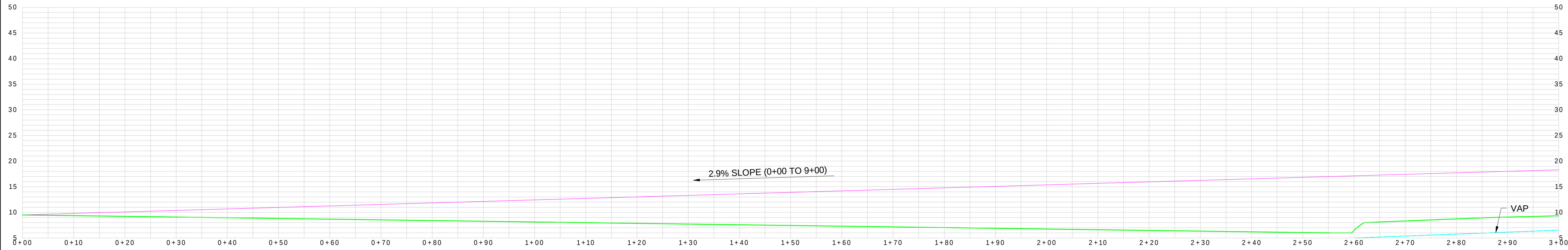
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D-1
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CHINOOK ENGINEERING

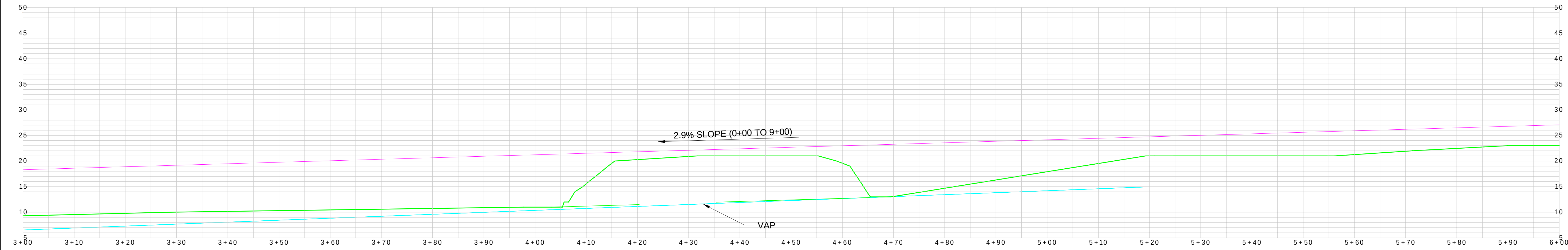
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2/28/2024 12:19:39 PM C:\PROJECTS\2024\Race Road Culvert Replacements\Drawings\1893,1894\Stream Profiles West.dwg User: JTK



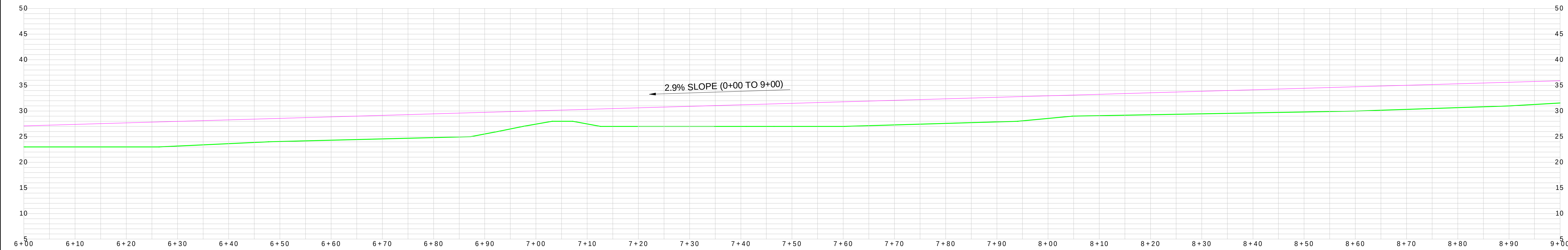
Stream Profile West (Stations 0+00 to 3+00)

1
C-4



Stream Profile West (Stations 3+00 to 6+00)

2
C-4



Stream Profile West (Stations 6+00 to 9+00)

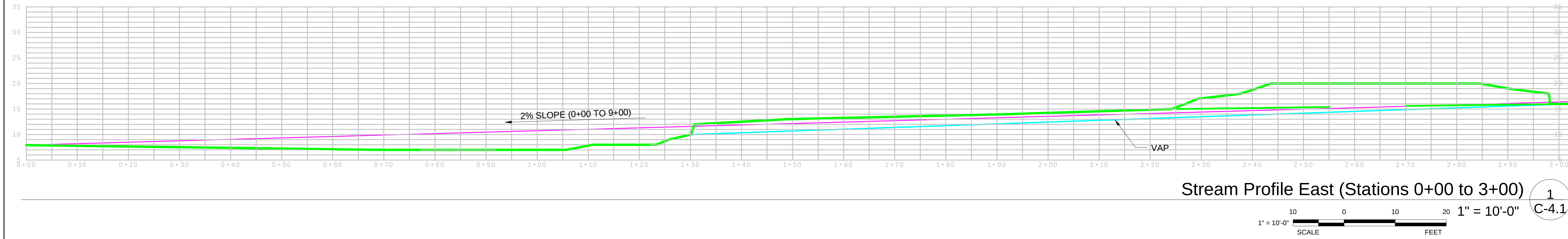
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C-4

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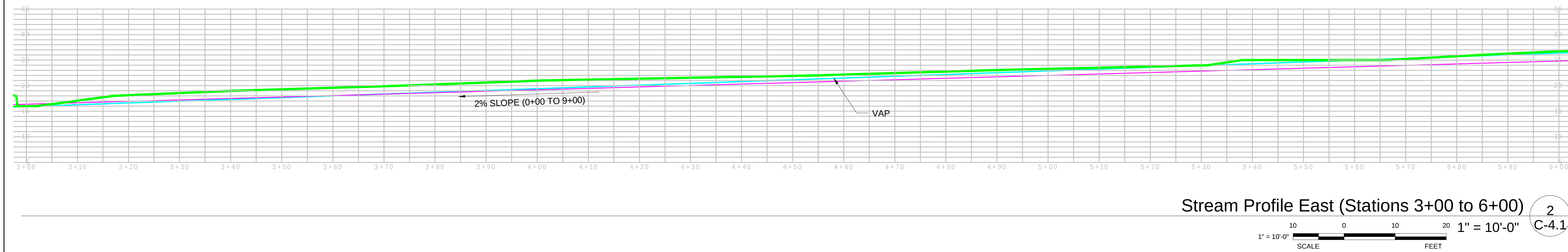


Section 7.132N R2E
**Race Road Culvert Replacements
1893,1894**

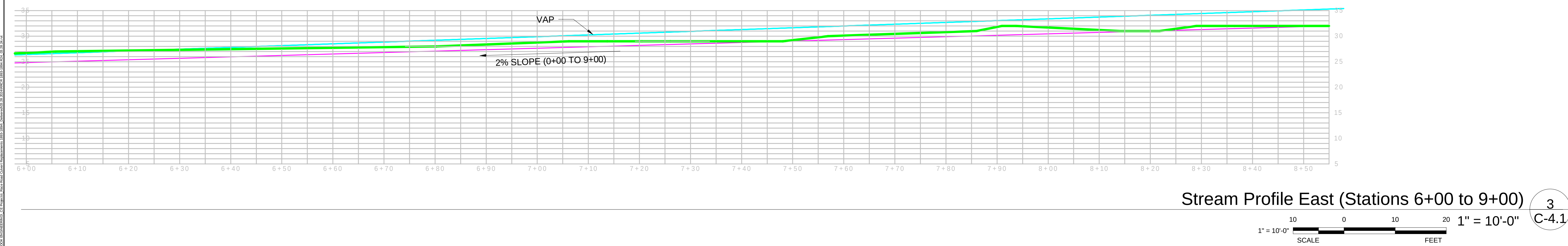
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FILE NO: 22457	SCALE: AS INDICATED	DATE: 03/28/2024	DRAWN BY: ER
			CHECKED BY: JSK



Stream Profile East (Stations 0+00 to 3+00) 1 C-4.1



Stream Profile East (Stations 3+00 to 6+00) 2 C-4.1



Stream Profile East (Stations 6+00 to 9+00) 3 C-4.1



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20000 1st Avenue
Coeur d'Alene, WA 83814
P: 360.672.5528 www.chinook-engineering.com

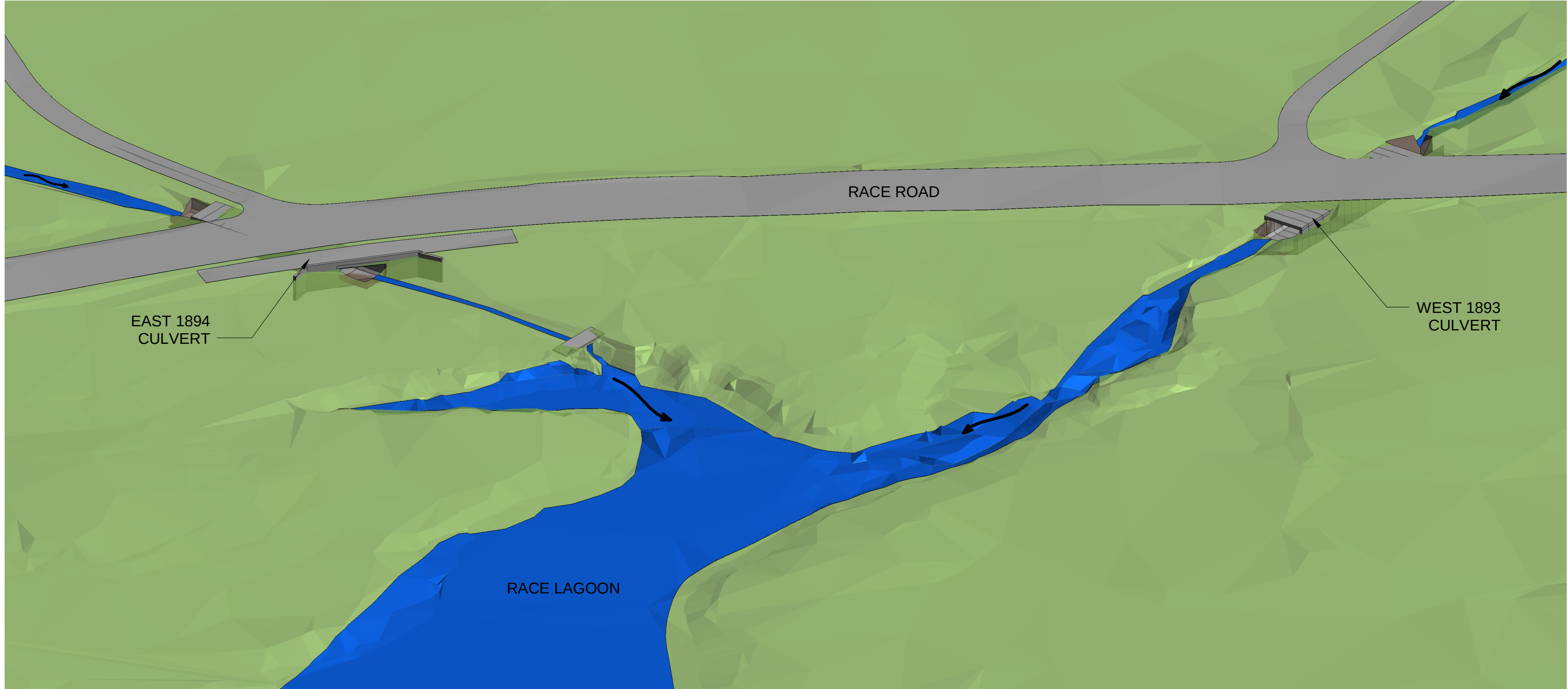
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Race Road Culvert Replacements
1893,1894

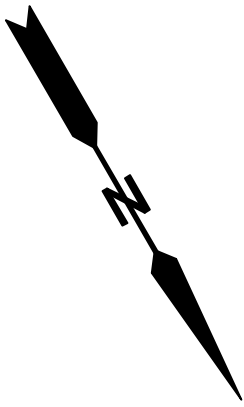
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FILE NO: 22457	SCALE: AS INDICATED	DATE: 03/29/2024	ER
DRAWN BY:		JSK	
CHECKED BY:			

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ISO View - South

2
C-5



ISO View - North

1
C-5



SHEET NUMBER:
C-5
10 OF 23

FILE NO: 22457
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SHEET TITLE:
ISO Views

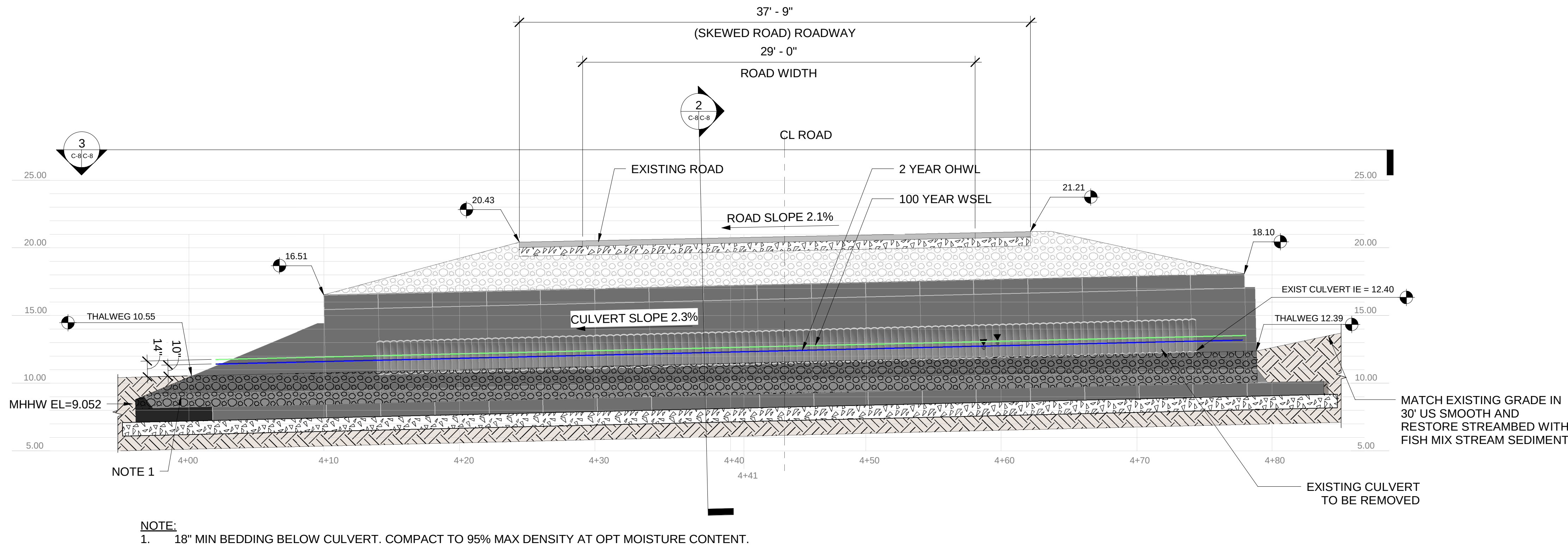
Section 7.132N R2E
**Race Road Culvert Replacements
1893,1894**



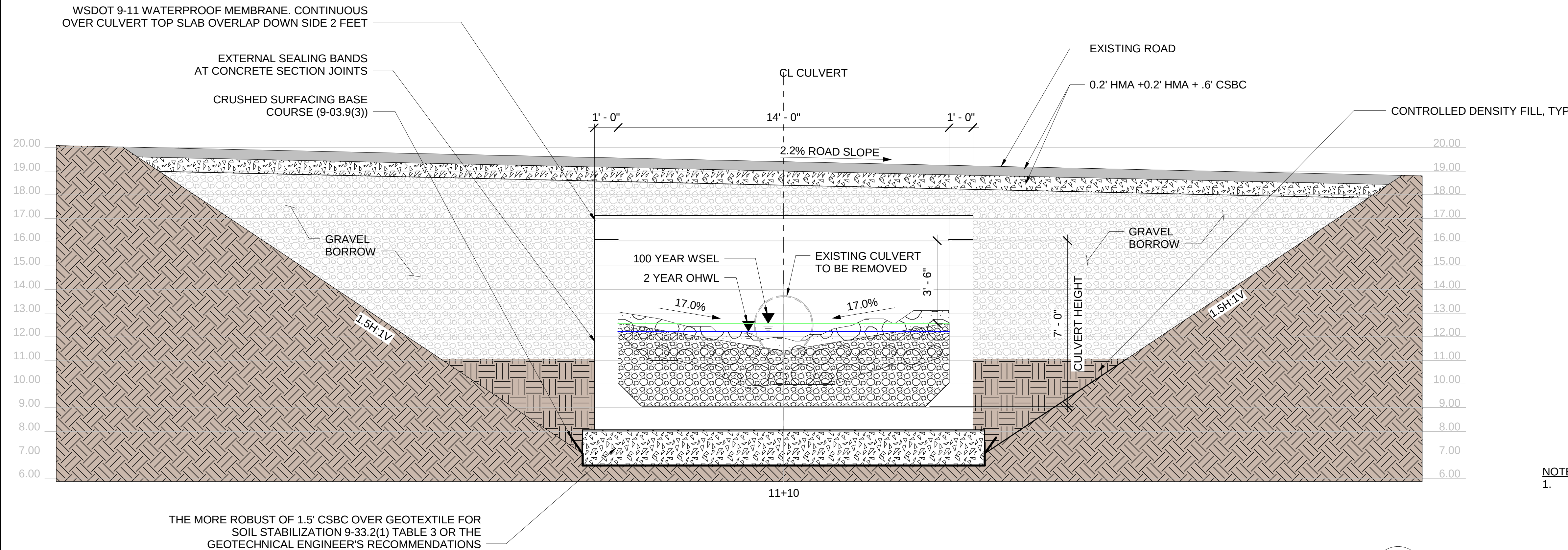
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1" Bar at Original Scale

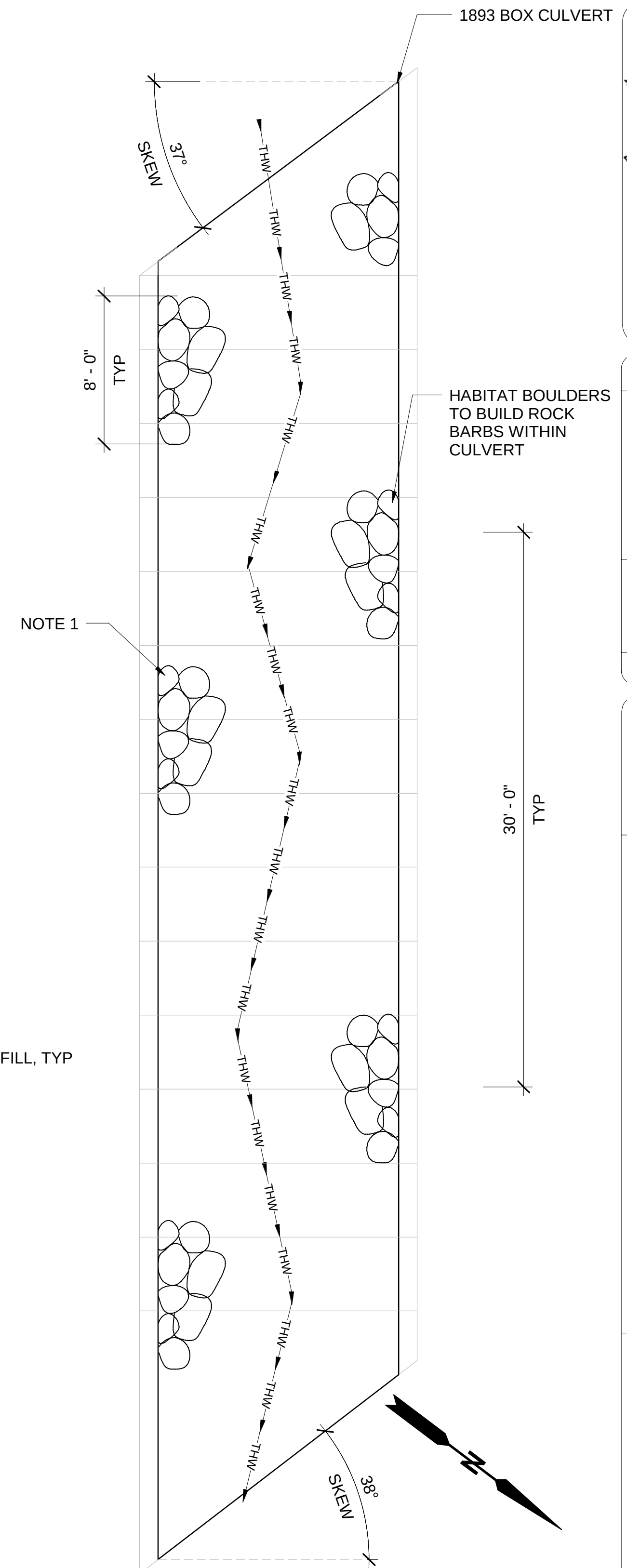
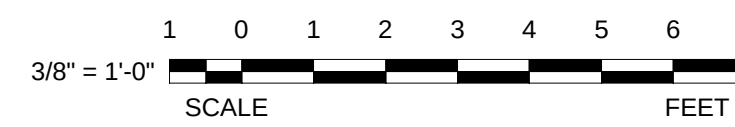
Chinook Engineering
2000 1st Ave N
Corvallis, WA 98309
P: 360.872.5528 www.chinook-engineering.com



Proposed West 1893 Box Culvert Profile - Length 1 C-8

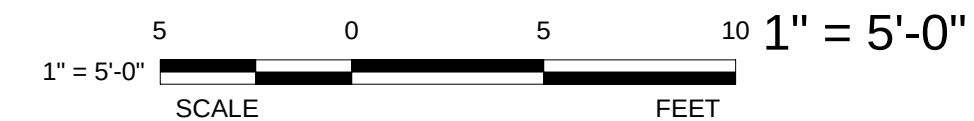


Proposed West 1893 Box Culvert Section - Width 2 C-8



- NOTE:
- STREAMBED SEDIMENT SHALL BE COARSE AND APPROXIMATELY SHOWN BELOW:
50% OF THE VOLUME TO BE, SAND - 2" ROCK, AS PER WSDOT 9-03.11(1) STREAMBED SEDIMENT 30% OF THE VOLUME TO BE, 2" - 4" ROCK, PER WSDOT 9-03.11(2) STREAMBED COBBLES 20% OF THE VOLUME TO BE, 4" - 10" ROCK AS WSDOT 9-03.11(2) STREAMBED COBBLES
 - HABITAT BOULDERS SHALL BE IN ADDITION TO THE ABOVE GRADATION.

1893 West Culvert - Top 3 C-8



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TO BE DEVELOPED

FILE NO: 22457
SCALE: AS INDICATED
DATE: 03/28/2024
DRAWN BY: ER
CHECKED BY: JMK
SHEET TITLE:
Proposed East 1893
Box Culvert - Details

Section 7,132N R2E
Race Road Culvert Replacements
1893,1894

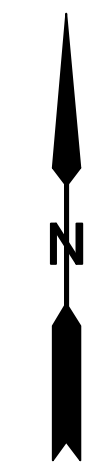


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1" Bar at Original Scale



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1" = 10'-0"

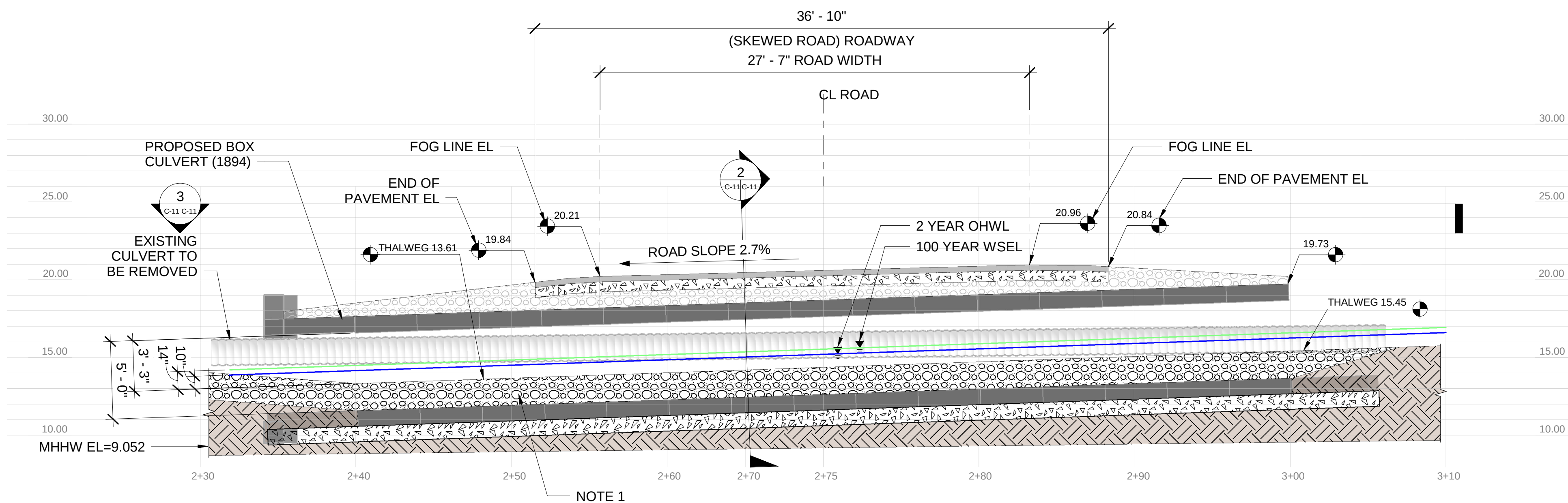
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SCALE FEET

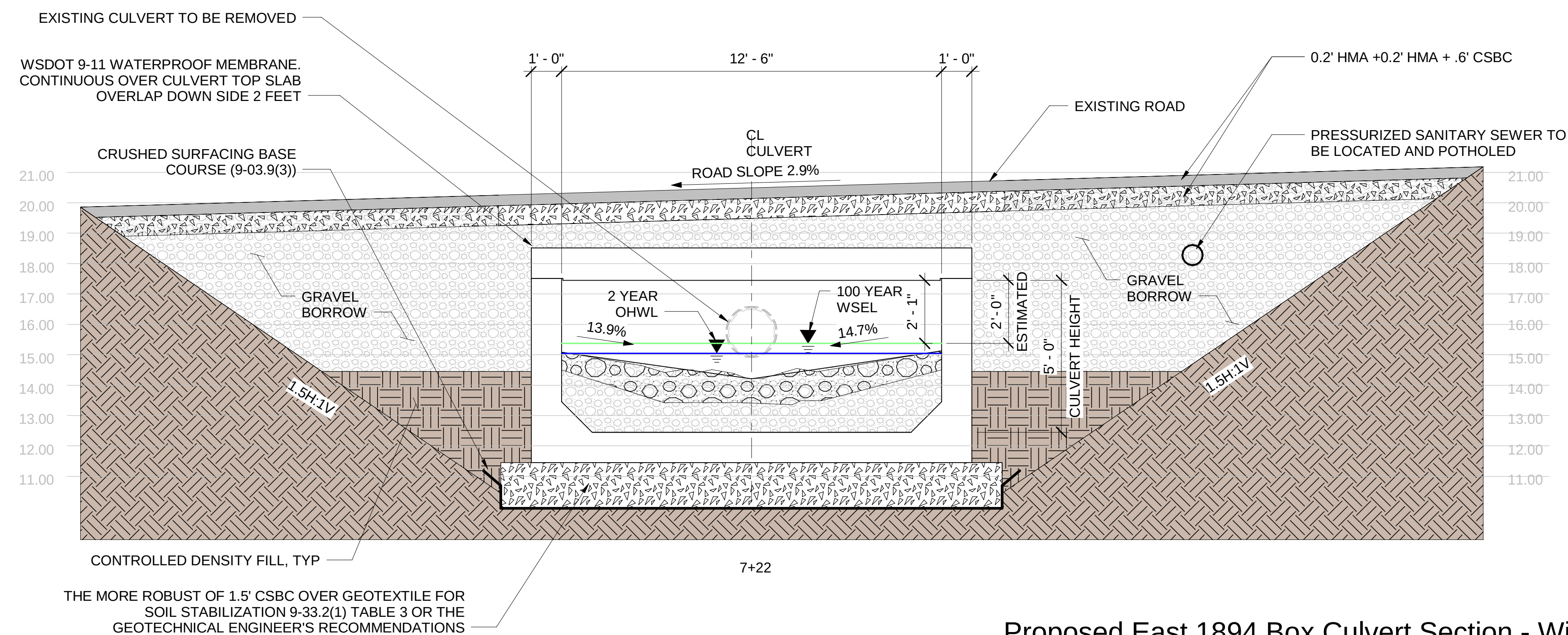
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C-10

FILE NO:	22457	SHEET TITLE:	Proposed East 1894 Box Culvert - Plan View
SCALE:	AS INDICATED		
DATE:	03/28/2024		
DRAWN BY:	ER		
CHECKED BY:	JSK		

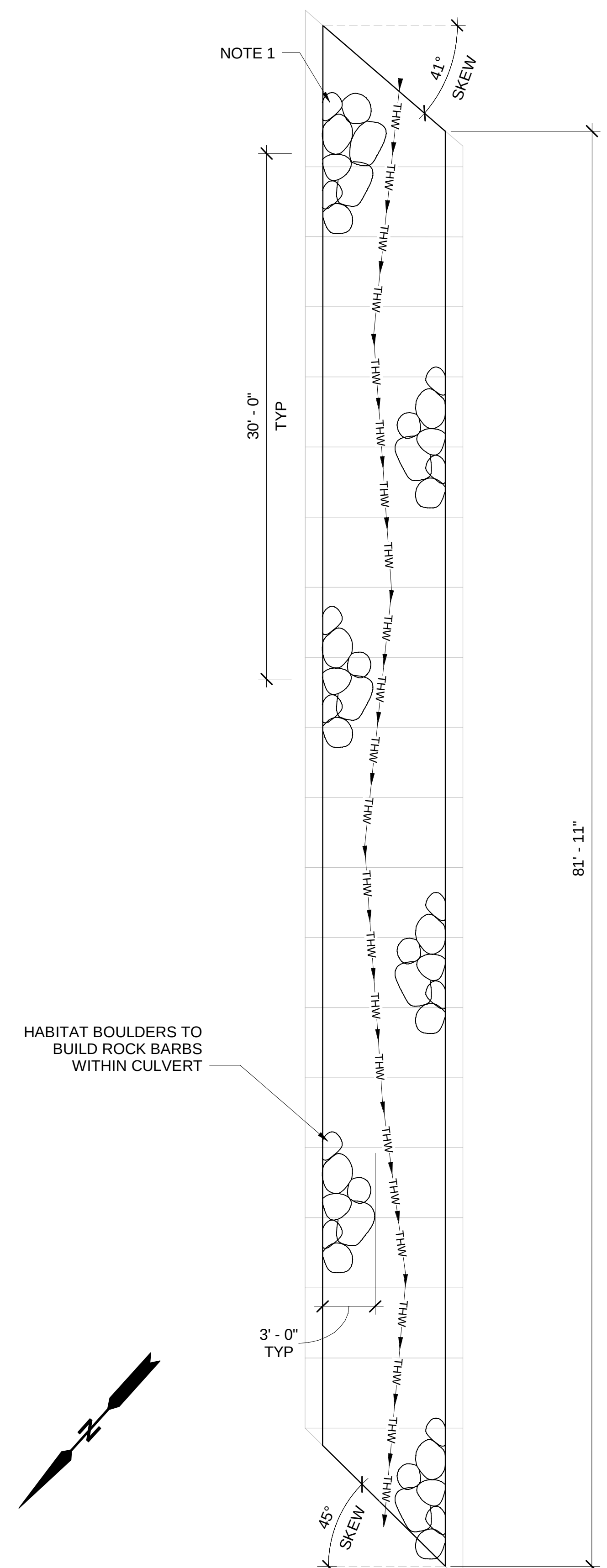
SHEET NUMBER:
C-10
15 OF 23



NOTE:
1. 18" MIN BEDDING BELOW CULVERT. COMPACT TO 95% MAX DENSITY AT OPT MOISTURE CONTENT.

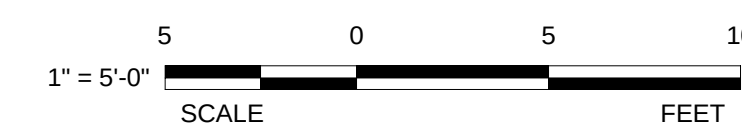


Proposed East 1894 Box Culvert Section - Width



NOTE:

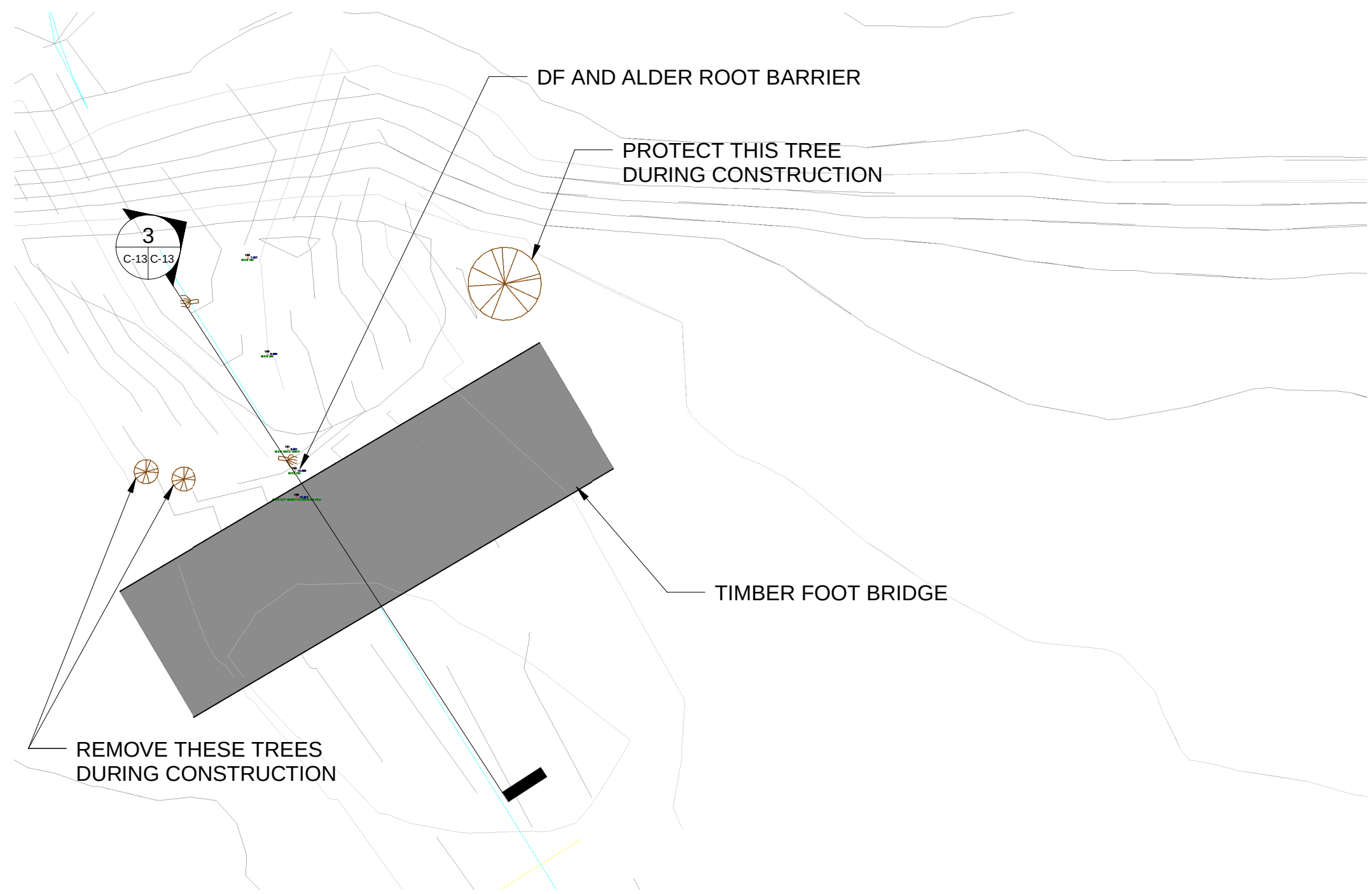
1. STREAMBED SEDIMENT SHALL BE COARSE AND APPROXIMATELY SHOWN BELOW:
50% OF THE VOLUME TO BE, SAND - 2" ROCK, AS PER WSDOT 9-03.11(1) STREAMBED SEDIMENT
30% OF THE VOLUME TO BE, 2" - 4" ROCK, PER WSDOT 9-03.11(2) STREAMBED COBBLES
20% OF THE VOLUME TO BE, 4" - 10" ROCK AS WSDOT 9-03.11(2) STREAMBED COBBLES
2. HABITAT BOULDERS SHALL BE IN ADDITION TO THE ABOVE GRADATION.

[illegible]

Race Road Culvert Replacements 1893,1894

FILE NO:	22457	SHEET TITLE:	Proposed East 1894 Box Culvert - Profile and Section
SCALE:	AS INDICATED		
DATE:	03/28/2024		
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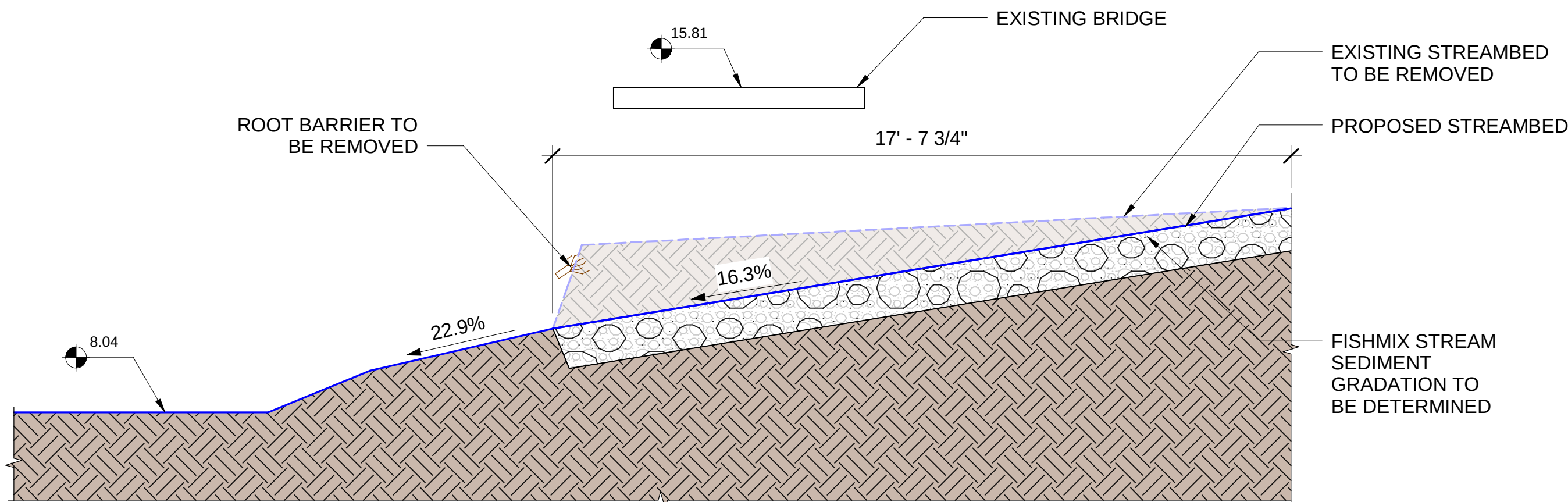
SHEET NUMBER:
C-11
16 OF 23



Bridge- Plan View

1
C-13

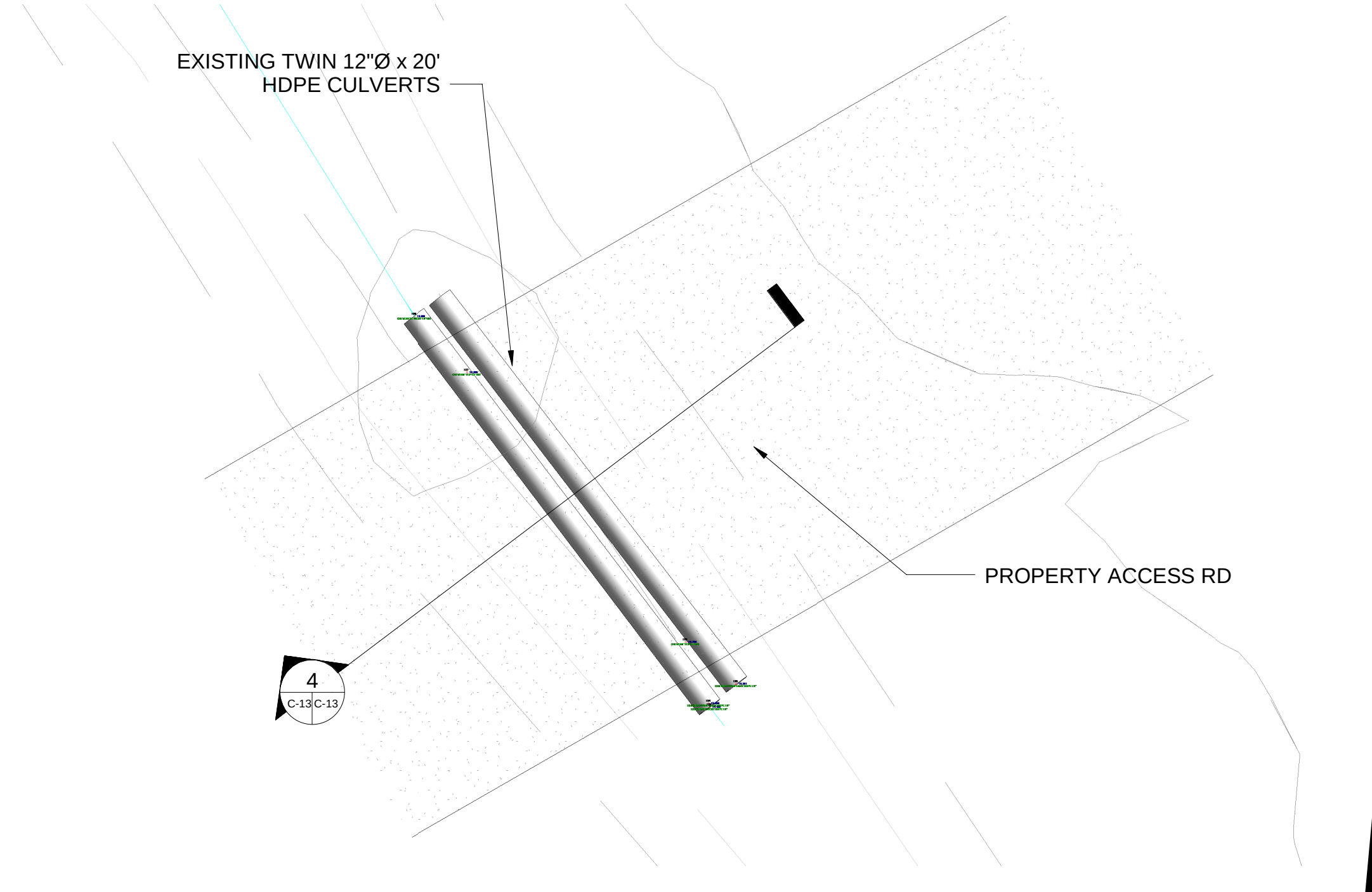
1" = 5'-0"
SCALE
FEET



Streambed Restoration (Bridge)

3
C-13

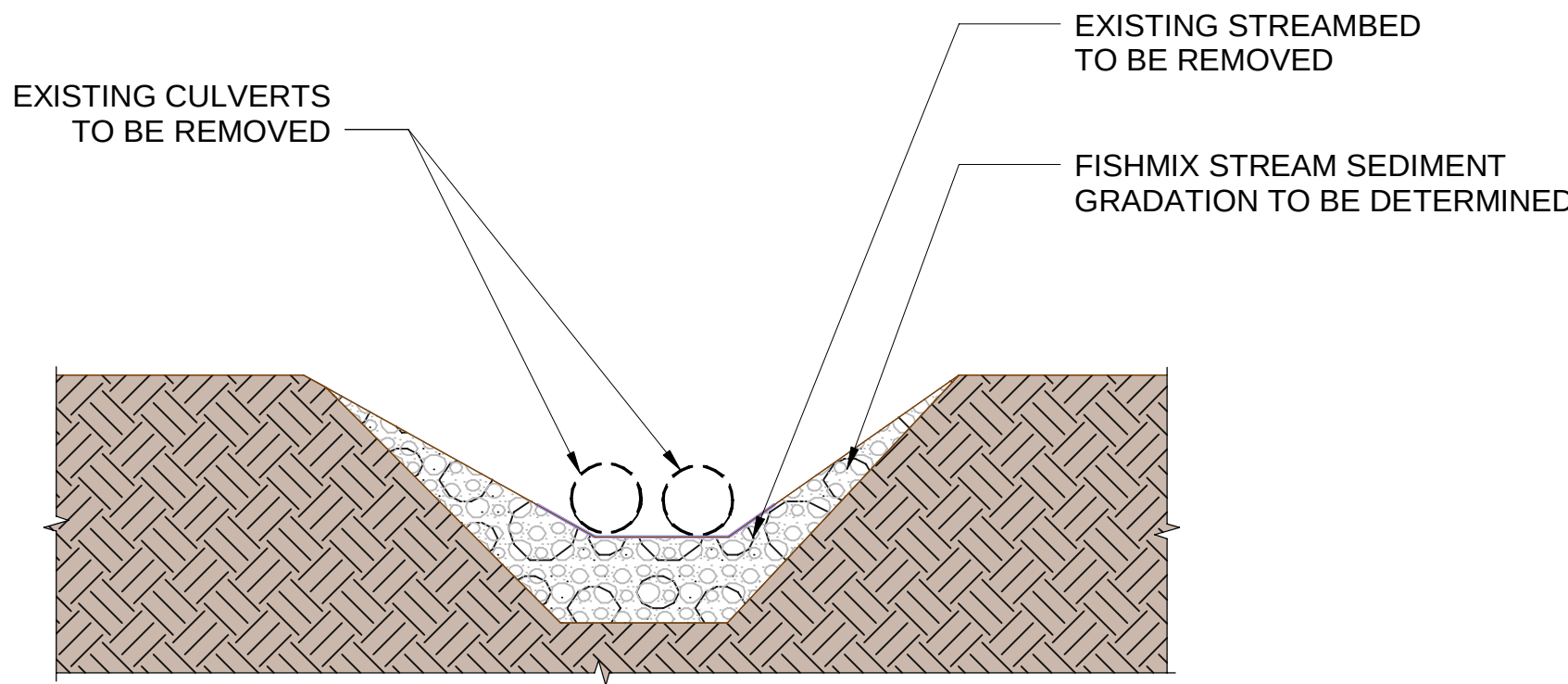
3/8" = 1'-0"
SCALE
FEET



Crossing and Culverts - Plan View

2
C-13

1" = 5'-0"
SCALE
FEET



Streambed Restoration (Culverts)

4
C-13

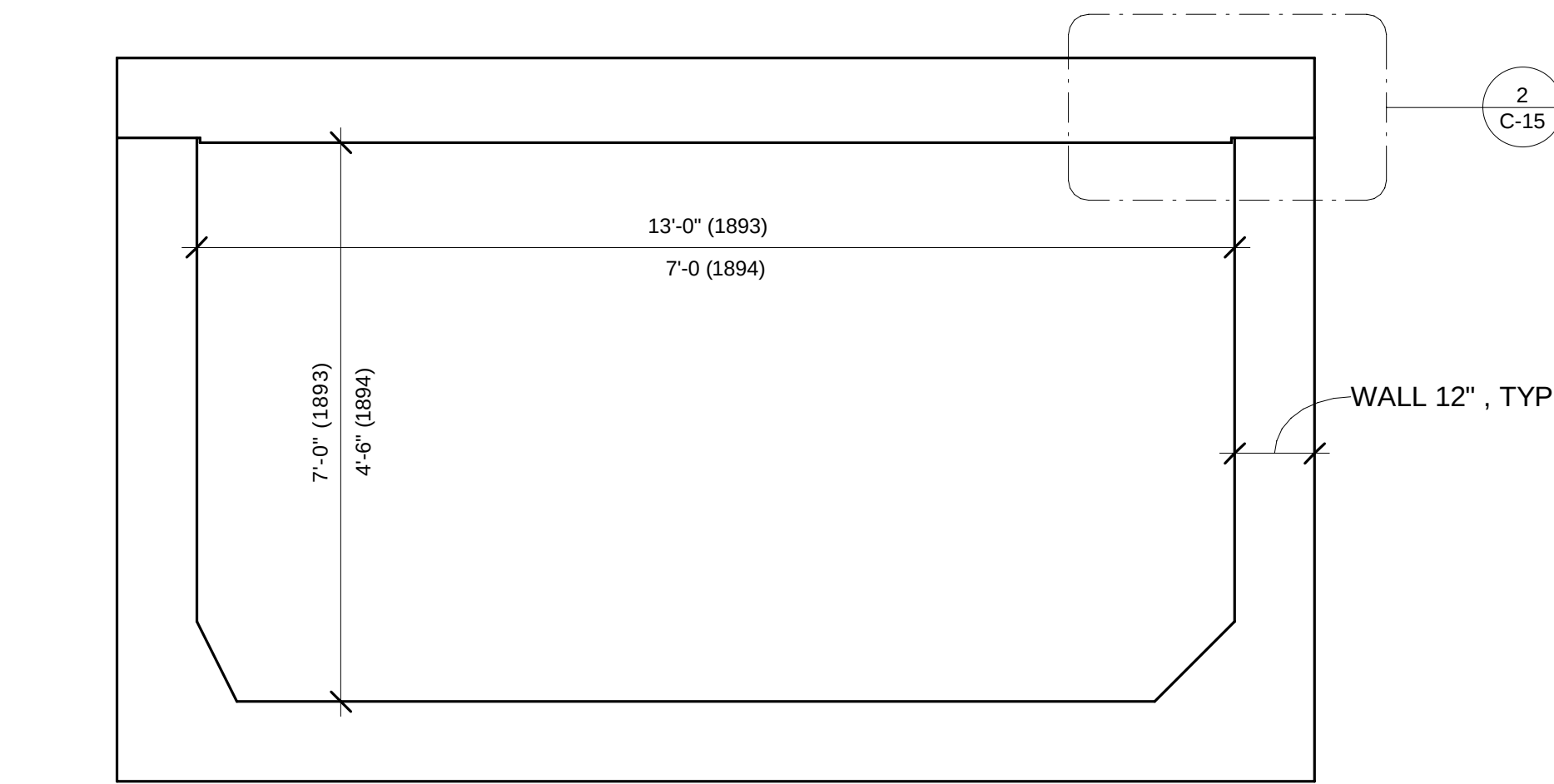
3/8" = 1'-0"
SCALE
FEET

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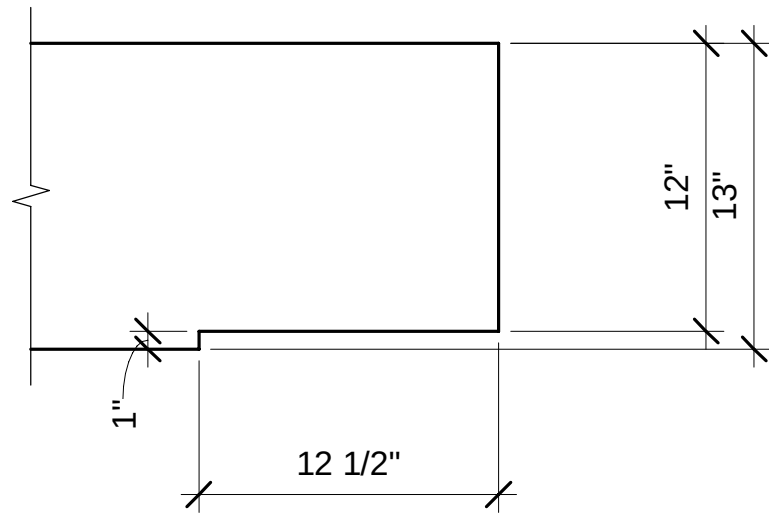


Typical Box Culvert Profile View 1 C-15

1/2" = 1'-0"

SCALE

FEET

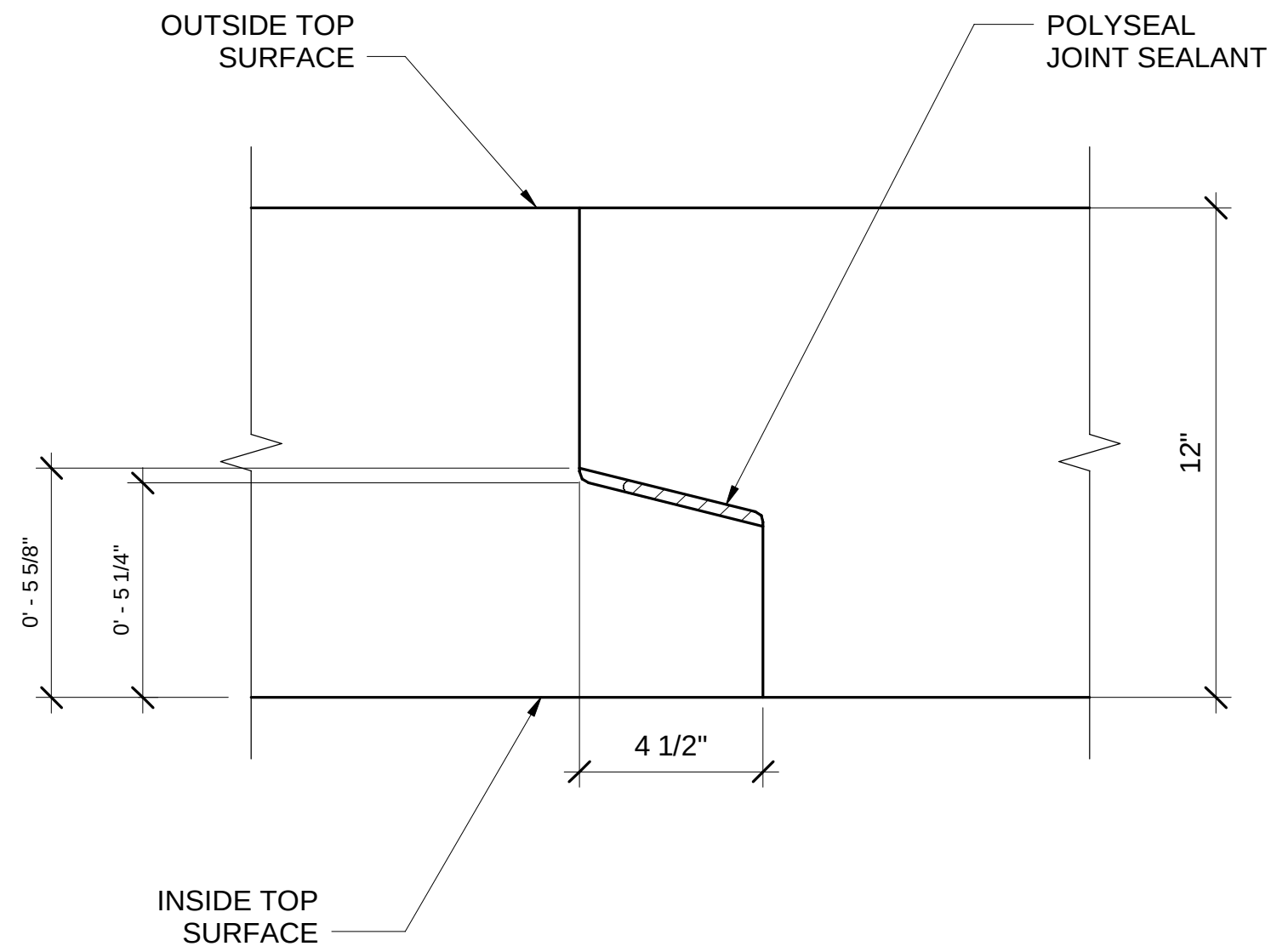


Typical Lid Joint Detail 2 C-15

1 1/2" = 1'-0"

SCALE

INCH

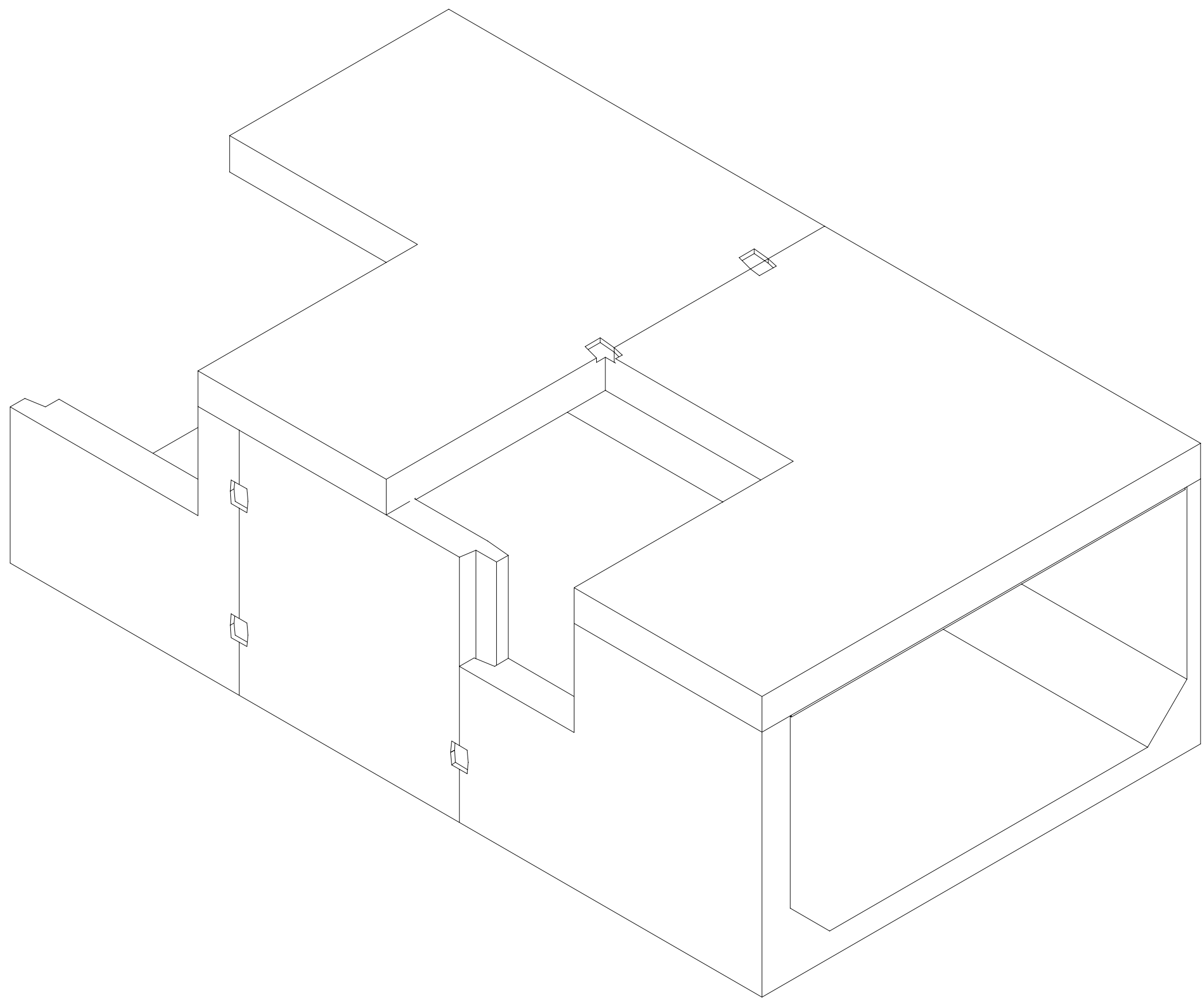


Typical Joint Detail for Walls 3 C-15

3" = 1'-0"

SCALE

INCH



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SHEET TITLE:
Proposed Box Culverts
- Typical Details

Section 7, T32N R2E
Race Road Culvert Replacements
1893, 1894



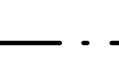
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20000 1st Avenue
Covington, WA 98230
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C-15
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GENERAL NOTES

-  BENCHMARKS
-  ROAD/STREAM CENTERLINE
-  PROPERTY LINE

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Section 7.132N R2E
Race Road Culvert Replacements
1893,1894

FILE NO:	22457	SHEET TITLE:	Soil Profile - Base points
SCALE:	AS INDICATED	DATE:	03/28/2024
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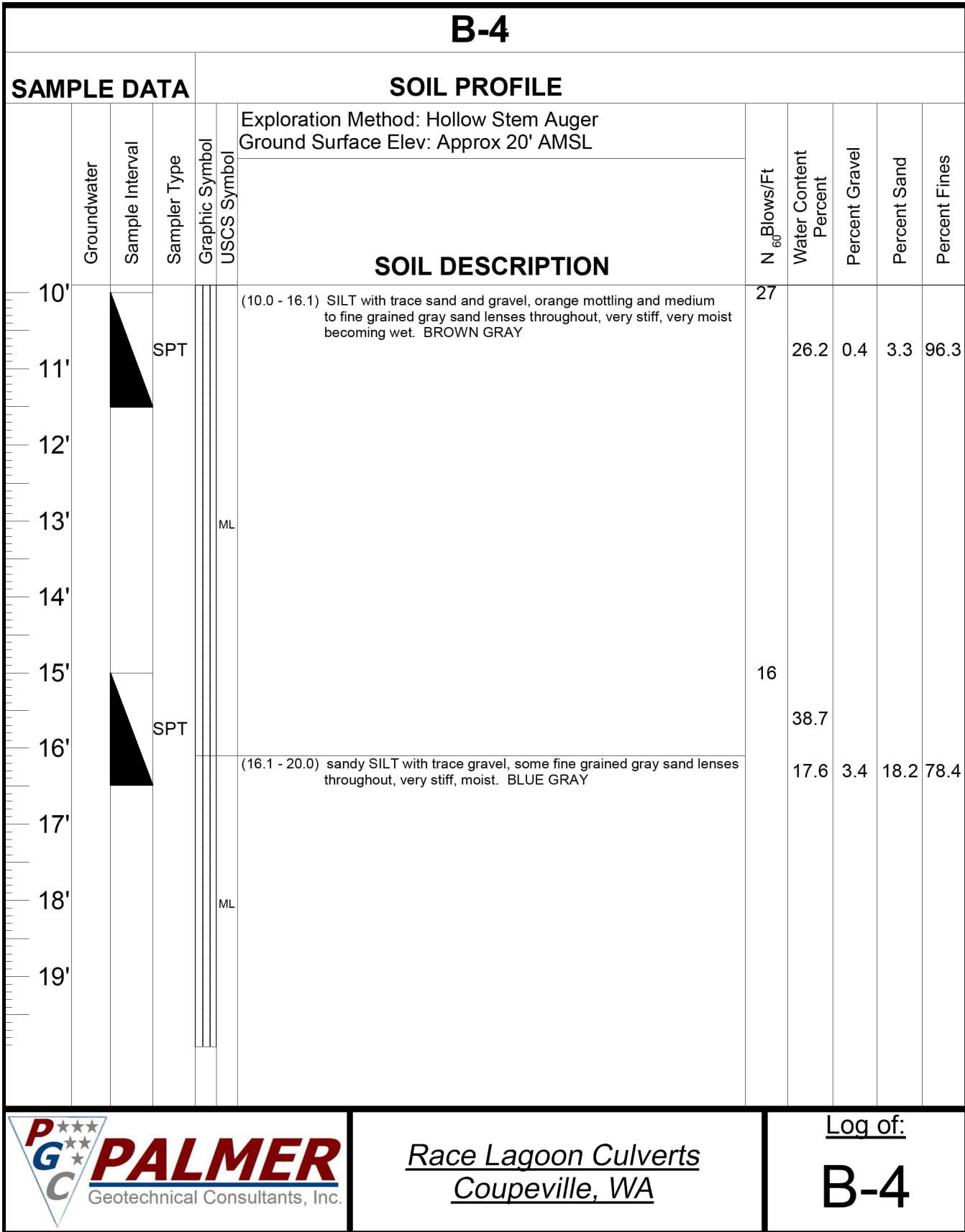
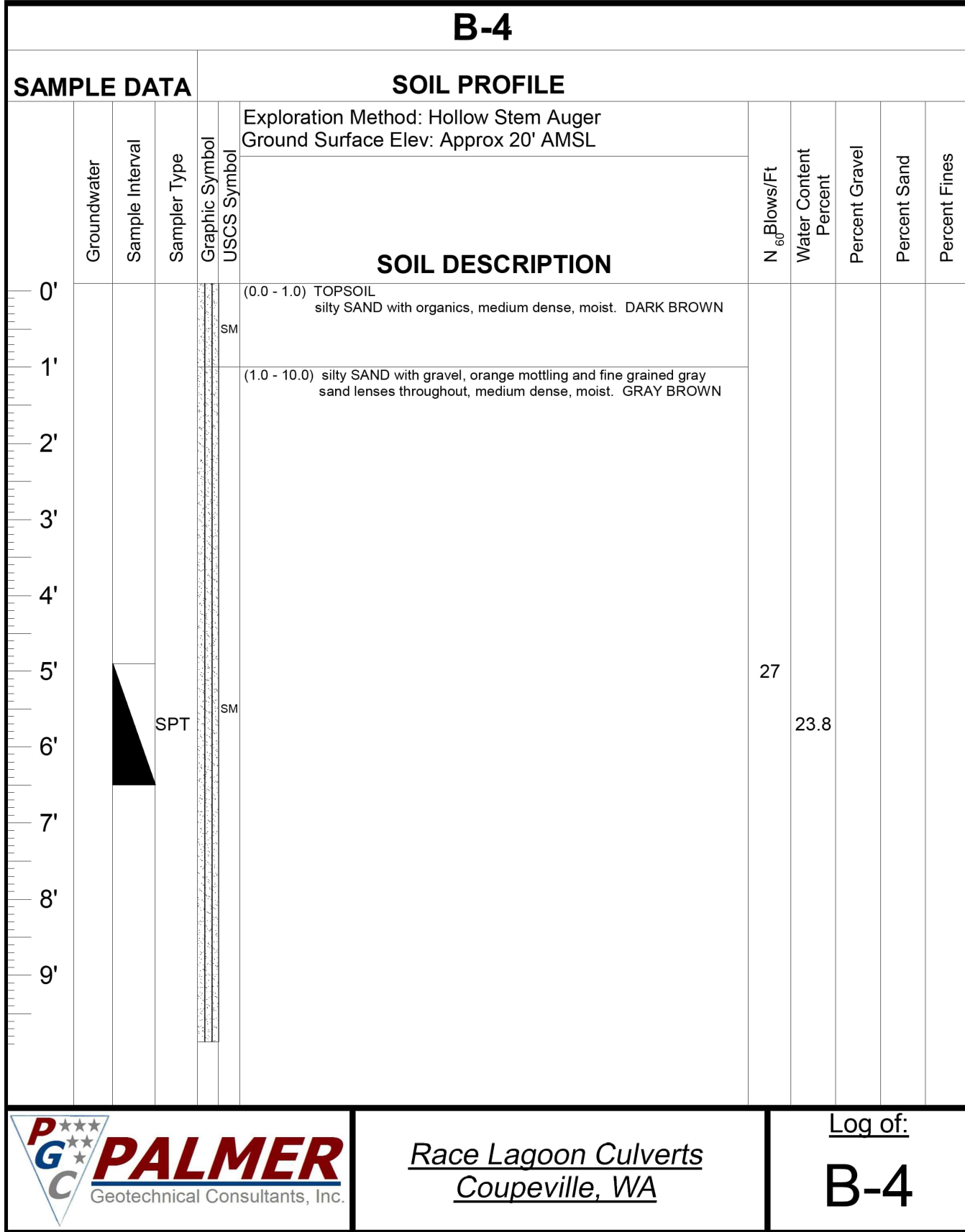
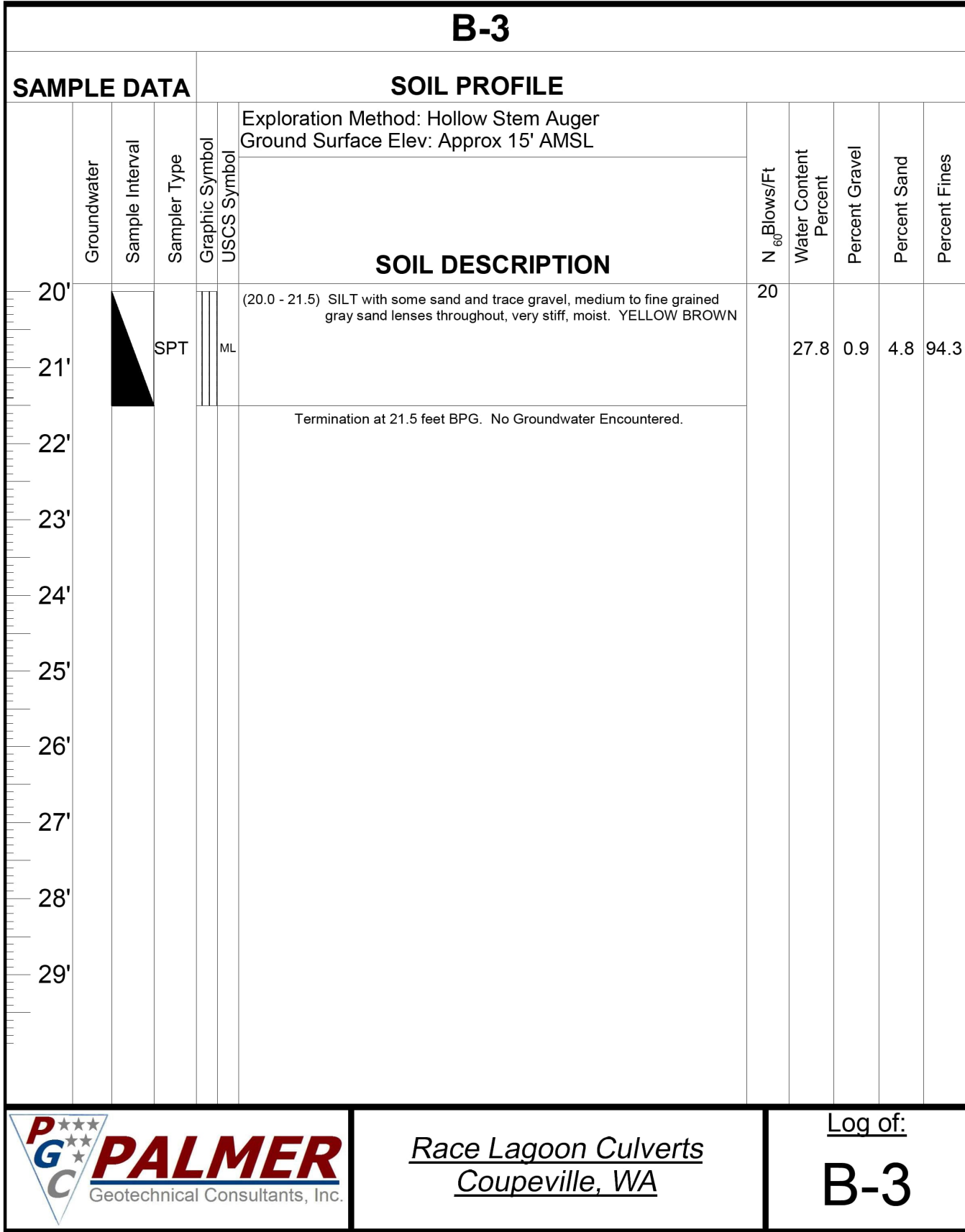
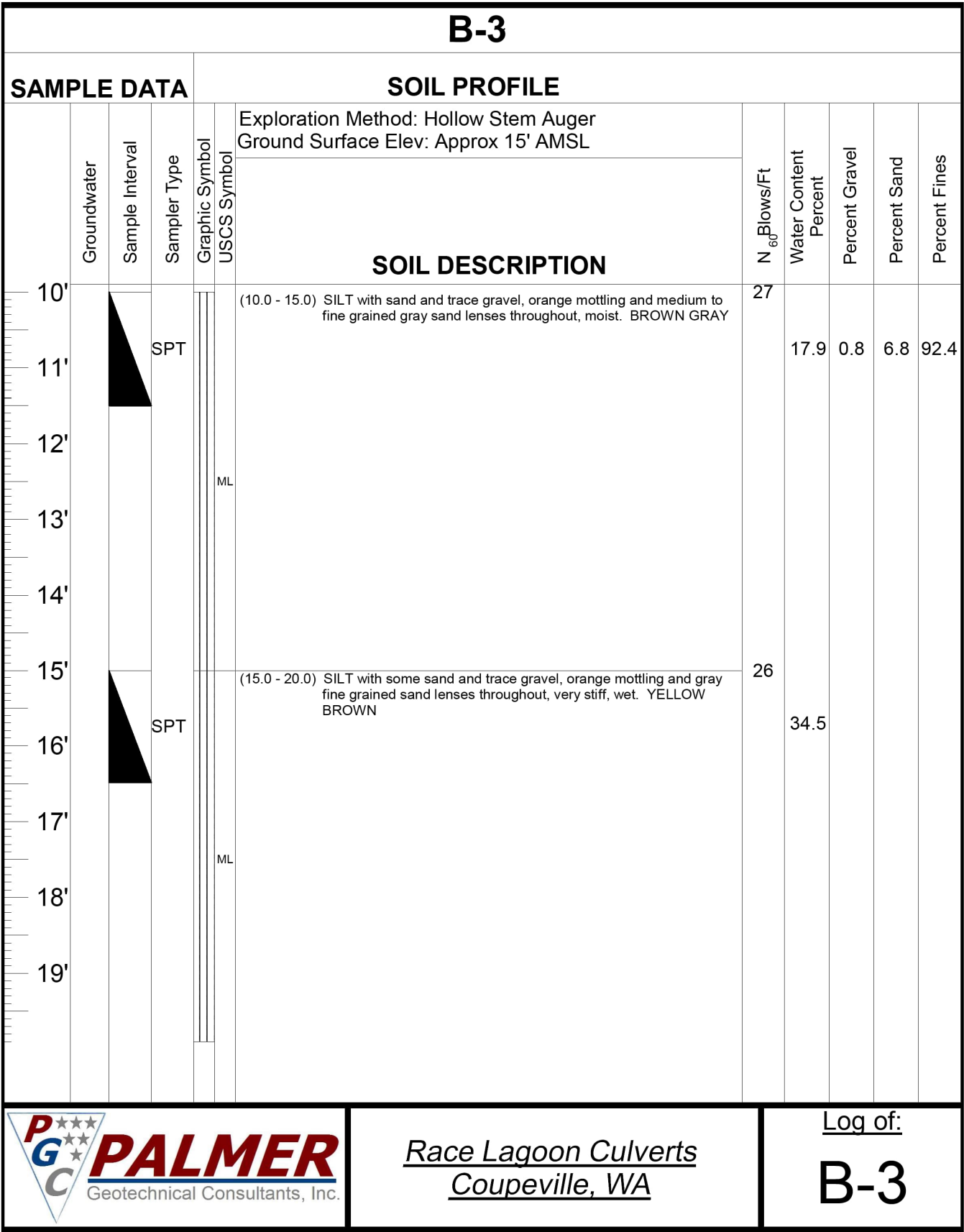


PALMER
Geotechnical Consultants, Inc.

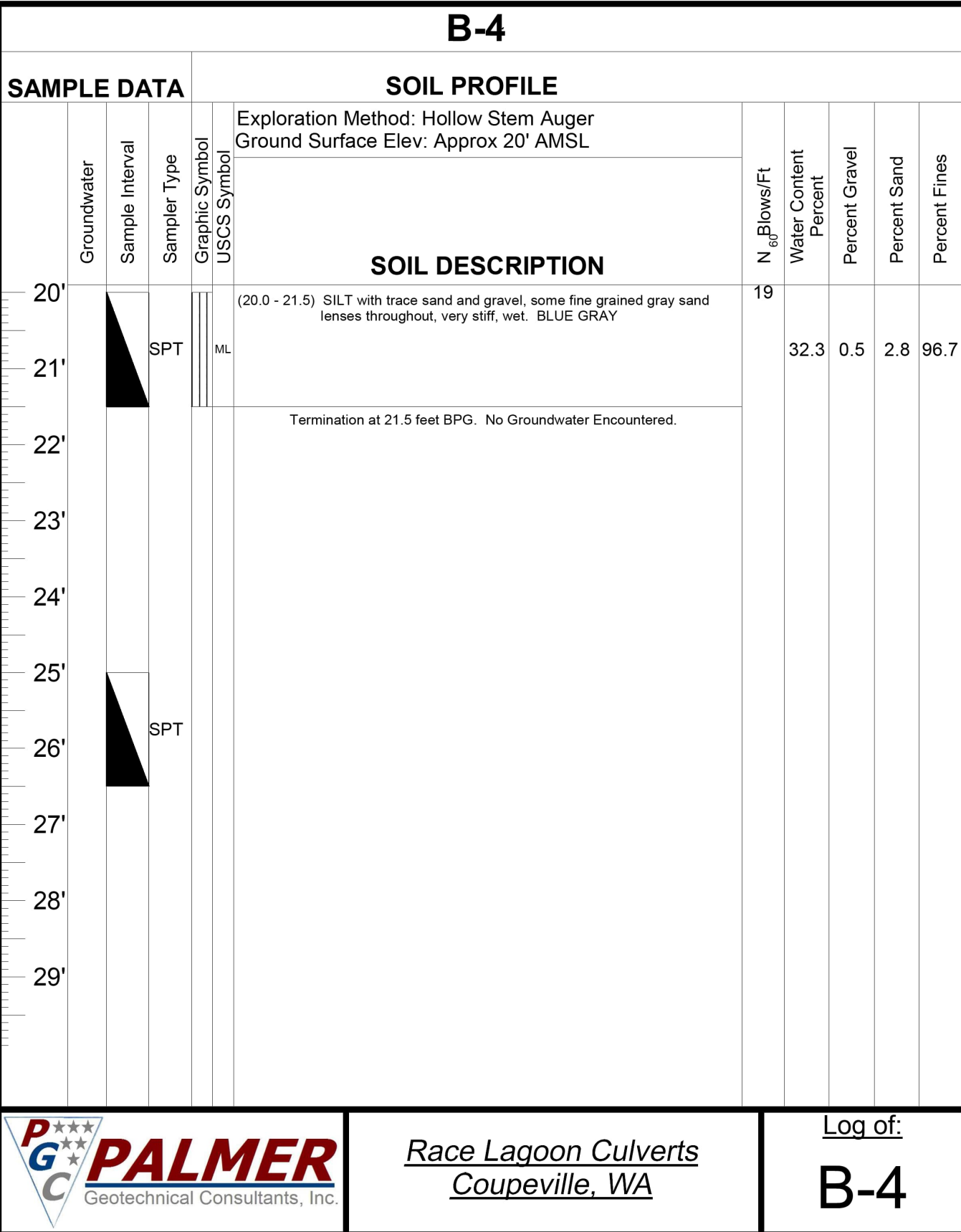
Race Lagoon Culverts
Coupeville, WA

Not to Scale
Not to be Used for Construction

Figure:
2



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Race Road Culvert Replacements
1893,1894

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SCALE:	AS INDICATED	DATE:	03/29/2024	ER
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SHEET NUMBER:
C-18
23 OF 23