July 9th, 2026

Sudden Valley Community Association
Attn: Jo Anne Jensen
4 Clubhouse Circle
Bellingham, WA 98229

RE: Project Scope Letter
Area Z Bridge Replacement, SVCA Capital Code 9924.6
Contract Award

PNW is providing this contract award recommendation letter to SVCA for the Area Z Bridge Replacement project. On March 27th, 2025, SVCA's Board approved funding for replacement of the Area Z Bridge and Culvert #4 on Polo Park Drive. After numerous permit delays, the final permit was received June 12th, 2026. Due to timing, replacement of Culvert #4 will be delayed until summer 2027 as bidding and completing all work required prior to September 30th (end of Lake Whatcom watershed construction window) isn't feasible. It is anticipated that Culvert #4 will be paired with replacement of Culvert #24 that is also scheduled for replacement in 2027. Both culverts are being replaced with pre-engineered bridges.

After the permits were received, Chinook Engineering prepared a bid package incorporating the permits. On June 28th, 2026, PNW issued a bid package to SVCA's 3 on-call contractors requesting quotes. Bid package is attached for reference. Bidders included:

- Stremler Gravel, Inc. – Quote Received
- Strider Construction – Quote Received
- Western Refinery Services, Inc. (WRS) – No Quote

2 quotes were received per the attached bid tabulations, and Stremler Gravel has the low quote at $200,802.76. PNW recommends awarding the contract to Stremler Gravel. The project will be completed in an expedited manor with the new bridge installed by the end of September.

Please let me know if you have any questions, or if you would like any further information.

Sincerely,

Tyler Andrews
President

July 9, 2026 - Bid Tabulation

Project: Area Z Bridge Replacement

				Stremler Gravel		Strider Construction	
Item #	**Description**	**Quantity**	**Unit**	**Unit Price**	**Total**	**Unit Price**	**Total**
1	Mobilization	1	LS	$ 29,175.00	$ 29,175.00	$ 30,000.00	$ 30,000.00
2	Temporary Construction Access & Staging	1	LS	$ 10,300.00	$ 10,300.00	$ 7,500.00	$ 7,500.00
3	Construction Surveying	1	LS	$ 500.00	$ 500.00	$ 4,500.00	$ 4,500.00
4	Clearing & Grubbing	1	LS	$ 950.00	$ 950.00	$ 7,500.00	$ 7,500.00
5	Tree Falling & Removal	18	EA	$ 395.00	$ 7,110.00	$ 520.00	$ 9,360.00
6	Temporary Utility Support	1	LS	$ 3,300.00	$ 3,300.00	$ 6,000.00	$ 6,000.00
7	Removal of Existing Bridge	1	LS	$ 13,250.00	$ 13,250.00	$ 10,000.00	$ 10,000.00
8	Removal of Existing Bridge Foundations	1	EST.	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00
9	Removal of Asphalt	98	SY	$ 19.00	$ 1,862.00	$ 18.00	$ 1,764.00
10	Pothole Utility Trench Prior to Abutment Excavation	2	EA	$ 3,150.00	$ 6,300.00	$ 5,000.00	$ 10,000.00
11	Common Excavation Including Haul & Disposal	126	CY	$ 48.35	$ 6,092.10	$ 35.00	$ 4,410.00
12	Common Excavation Including Placement	20	CY	$ 84.00	$ 1,680.00	$ 16.00	$ 320.00
13	Crushed Surfacing Base Course	98	TONS	$ 96.35	$ 9,442.30	$ 100.00	$ 9,800.00
14	Crushed Surfacing Top Course	49	TONS	$ 77.80	$ 3,812.20	$ 90.00	$ 4,410.00
15	Bridge	1	LS	$ 27,500.00	$ 27,500.00	$ 87,000.00	$ 87,000.00
16	Utility Hanger Installation & Utility Relocation	1	EST.	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00
17	Erosion Control & Water Pollution Control	1	LS	$ 5,000.00	$ 5,000.00	$ 2,000.00	$ 2,000.00
18	Site Restoration (Seed, Mulch, Coir)	1	LS	$ 2,100.00	$ 2,100.00	$ 2,500.00	$ 2,500.00
19	Hot Mix Asphalt, HMA, Cl 3/8IN	67	TONS	$ 266.84	$ 17,878.28	$ 300.00	$ 20,100.00
20	Coir Fabric, 9.8' x 165' Rolls	3	EA	$ 880.00	$ 2,640.00	$ 500.00	$ 1,500.00
21	Traffic & Pedestrian Control	1	LS	$ 500.00	$ 500.00	$ 4,000.00	$ 4,000.00
22	Minor Changes	1	EST.	$ 15,000.00	$ 15,000.00	$ 15,000.00	$ 15,000.00
	Subtotal				**$184,391.88**		**$257,664.00**
	WSST @ 8.9%				**$ 16,410.88**		**$ 22,932.10**
	Total w/ WSST				**$200,802.76**		**$280,596.10**

SUDDEN VALLEY FISH PASSAGE AND CULVERT IMPROVEMENTS

Schedule B — Roy Road Bridge Replacement

Owner: Sudden Valley Community Association (SVCA) | Engineer: Chinook Engineering — Jay S. Kidder, P.E. | Bid Form

Bidder Name: Stremler Gravel, Inc.
Date: 7/9/26

Addendum #1

Item	Spec Section	Description	Unit	Approx. Qty	Unit Price	Extension
1	*1-09.7*	Mobilization and Demobilization	LS	1	29,175.00	$ 29,175.00
2	*1-07.16*	Temporary Construction Access and Staging	LS	1	10,300.00	$ 10,300.00
3	*1-05.4*	Construction Surveying	LS	1	500.00	$ 500.00
4	*2-01*	Clearing and Grubbing	LS	1	950.00	$ 950.00
5	*2-01.3*	Tree Falling and Removal	EA	18	395.00	$ 7,110.00
6		Temporary Utility Support	1	LS	3,300.00	$ 3,300.00
7	*2-02*	Removal of Existing Bridge	LS	1	13,250.00	$ 13,250.00
8	*2-02*	Removal of Existing Bridge Foundations	EST.	1	$ 10,000.00	$ 10,000.00
9	*2-02*	Removal of Asphalt	SY	98	19.00	$ 1,862.00
10		Pothole Utility Trench Prior to Abutment Excavation	EA	2	3,150.00	$ 6,300.00
11	*2-03*	Common Excavation Including Haul and Disposal	CY	126	48.35	$ 6,092.10
12	*2-03*	Common Excavation Including Placement	CY	20	84.00	$ 1,680.00
13	*4-04*	Crushed Surface Base Course	TON	98	96.35	$ 9,442.30
14	*4-04*	Crushed Surfacing Top Course	TON	49	77.80	$ 3,812.20
15	*6-03*	Install Owner-Supplied Prefab Bridge	LS	1	27,500.00	$ 27,500.00
16		Utility Hanger Installation & Utility Relocation	EST.	1	$ 10,000.00	$ 10,000.00
17	*8-01*	Erosion Control and Water Pollution Control	LS	1	5,000.00	$ 5,000.00
18	*08-02*	Site Restoration (Seed, Mulch, Coir)	LS	1	2,100.00	$ 2,100.00
19	*05-04*	Hot mix asphalt, HMA, class 3/8 in.	TON	67	266.84	$ 17,878.28
20	*9-14*	Coir Fabric, 9.8' x 165' rolls	EA	3	880.00	$ 2,640.00
21	*1-10*	Traffic & Pedestrian Control	LS	1	500.00	$ 500.00

22	*1-09 (SP)*	Minor Changes	EST.	1	$ 15,000.00	$ 15,000.00
					Schedule B Construction Cost Subtotal	184,391.88
					Washington State Sales Tax 8.900%	$ 16,410.88
					SCHEDULE B TOTAL (Construction Cost + Sales Tax)	$ 200,802.76

Acknowledgement of Addendums: #1

By: _____

Signature of Authorized Person

Date: 7/9/26

Print Name & Title: PAT KRAMME, PROJECT MANAGER

July 5th, 2026

Attn: Bidders

RE: Sudden Valley Community Association (SVCA)
Addendum #1 – Area Z Bridge Replacement

Addendum #1 to the Bid Documents

A. This Addendum shall be considered part of the bid documents for the above-mentioned project, and shall be incorporated integrally therewith. Where provisions of the following supplementary data differ from those of the original bid documents, this Addendum shall govern and take precedence.

B. Bidders are hereby notified that they shall make any necessary adjustments in their estimates as a result of this Addendum. It will be understood that each bidder's proposal is submitted with full knowledge of all modifications and supplemental data specified herein.

Bid Form: New bid form attached.

- Bid Item #5 – Tree Falling & Removal – Quantity was increased by 12 trees to accommodate additional trees that can be removed for crane access. All stumps to be left in place. Tree count assumes 4" diameter trees and larger. Smaller than 4" diameter are incidental.
- Sales tax was updated to 8.9%.

Changes to Submittal Date: None

Changes to Drawings:

- Onsite bridge welding shall be completed by a certified welder. Reference RTI Bridge Drawings S4 and S7 for bearing pad welding required.

End of Addendum No. 1

Questions shall be directed to Tyler Andrews at tylera@pnwcivil.com or 360-739-2072.

June 28th, 2026

Attn: SVCA On-Call Contractors
Stremler Gravel, Strider Construction, WRS

RE: Sudden Valley Community Association (SVCA)
Quote Request – Area Z Bridge Replacement

SVCA is requesting quotes for the Area Z Bridge Replacement Project. Bid proposals are due by 2:00pm on Thursday, 7-9-26. The project includes removal of the existing railroad car bridge, installation of owner provided new bridge, and associated site work. North side of bridge is next to 90 Honeycomb Ln, and south side of bridge is accessed through Area Z, SVCA's maintenance department, located at 2800 Lake Louis Road, Bellingham, WA 98229. The existing bridge has a 3-ton weight rating.

Bid documents were prepared by Chinook Engineering. In Chinook's documents this location is called Roy Road Bridge. The bid documents reference 3 schedules and locations of work. Only the Roy Road Bridge is being bid at this time, and contractor shall ignore references to Polo Park Bridge and Tumbling Water Culvert Repairs. The information noted in this Quote Request supersedes all other bid documents unless noted via addendum.

Contractor's bid submittal only requires the bid form attached to this quote request to be submitted via email. Bids shall be emailed to tylera@pnwcivil.com. As each contractor quoting has an on-call contract with SVCA, any force account work is assumed to utilize these contracted rates.

Summary of Work:

1. The project will go in front of SVCA's Finance Committee on Wednesday, 7-15-26, and then the Board on Thursday, 7-23-26, for contract award. NTP is anticipated 8-3-26, or upon contract execution.
2. All work is assumed to be completed under 1 mobilization.
   a. Contractor shall follow the Lake Whatcom Watershed soil disturbance requirement to not exceed 500SF from October 1st thru May 31st.
3. The contractor shall have 10 working days to complete. Substantial completion is Wednesday, 9-30-26. Liquidated damages shall be assessed at $515.00 per day for any days incurred after 9-30-26 or over the identified working days. Inclement weather is incidental to the substantial completion date. Final completion is 10-31-26.
4. SVCA work hours are 8:00am – 7:00pm Monday through Friday, and 8:00am – 6:00pm Saturday.
5. Contractor shall provide a schedule to SVCA within 2 weeks of contract execution.
6. Staging:
   - See attached map.
   - Limited staging is available on the Honeycomb Lane side. Contractor shall close the access across the bridge from the south side of the driveway at 90 Honeycomb Ln with a Type 3 Barricade with road closed sign, and cones. Access shall be

maintained to the driveway at all times unless coordinated with the homeowner a minimum of 72 hours in advance.
- Main access shall be through Area Z.
    - No staging within the community garden space.
    - Contractor may stage equipment in area shown from existing bridge back to where new bridge is stored.
    - Contractor shall allow pedestrian access through staging area between the hours of 6:30pm and 7:30am daily. Pedestrian access shall be delineated.
    - Contractor shall delineate staging area, and protect concrete bridge being stored.
- Overflow parking and material staging is assumed in the Gate 5 Staging Area. This is located across from the Gate 5 entrance at the intersection of Lake Louis Road and Tumbling Water Drive. Truck and trailer access is available at this staging area. It is assumed contractor will shuttle materials with solo dump trucks between staging area and bridge.

7. If contractor needs water, a hydrant is available with a water meter located at Area Z (SVCA's Maintenance Shop). Water fees will be paid direct by SVCA.
8. Vactor trucks may dump onsite at Area Z in SVCA's pit.
9. Traffic / pedestrian control per MUTCD and WSDOT standards.
10. Force account work to receive 15% markup.
11. Owner will hire a testing agency.
12. Contractor shall provide Performance and Payment Bonds. Bid bonds are not required.
13. This is a private project, and prevailing wages are not applicable.
14. Contractor shall warranty work for 1 year from final completion.

Bid Item Clarifications:

- Item 2 – Temporary Construction Access & Staging
    - This includes removal and reinstallation of the existing gate on the Area Z side of the bridge.
- Item 3 – Construction Survey
    - The engineer will establish control onsite, and stake centerline of proposed bridge location.
    - Professional survey is not required. Contractor can perform layout and offsets for installation of new bridge from staking by engineer.
- Item 5 – Tree Falling and Removal
    - Logs from removed trees down to 4" diameter shall be stockpiled in the fire wood area at Area Z for SVCA's residents.
    - Stumps to be left in place.
    - All other tree debris to be hauled offsite.
- Item 6 – Temporary Utility Support
    - There are 3 communications utilities crossing the existing bridge. A ½" cable, 2" PVC pipe, and 4" PVC pipe.
    - Contractor shall temporarily suspend these utilities for removal of existing bridge and installation of new bridge.
    - Item 16 installs hangers on new bridge and attaches utilities.

- Item 7 – Removal of Existing Bridge
    - Existing bridge is estimated to weigh approximately 60,000 pounds. Bridge can be lightened if existing timbers are removed.
    - Contractor shall sling around the existing truck wheel beams towards each end for picking. Bridge shall be picked from the Area Z side. Dragging across the creek channel will not be allowed.
    - Contractor shall excavate to expose each end of the bridge before lifting.
    - All existing bridge materials shall be disposed of offsite. Removal and disposal of bridge foundations is paid under Item 7.
- Item 10 – Pothole Utility Trench Prior to Abutment Excavation
    - A minimum of 5 working days prior to abutment excavation, contractor shall vactor excavate a 10" wide trench for the full length of the proposed abutment installation on both sides of bridge. Vactor excavation shall extend 6" below proposed abutment excavation depth. Utilities encountered shall be asbuilt and reported to the engineer.
    - This scope is exempt from the 10 working days identified.
- Item 15 – Install Owner Supplied Prefab Bridge
    - Bridge is to be set with a crane from the Area Z side.
    - Contractor shall inventory bridge materials a minimum of 2 weeks prior to bridge installation. All materials supplied by SVCA per RTI bridge drawings.
- Item 19 – Hot Mix Asphalt
    - Limits of asphalt paving on Honeycomb Lane side will be painted by the engineer. This is estimated to be approximately 40'x22' plus shoulder parking of 54'x8'.
    - Asphalt will be placed on the bridge at 4" depth. Prior to asphalt placement, CSTC shall be placed on the bridge to fill metal decking flush. Placement of CSTC is paid under Item 14.
    - Area Z will have an asphalt approach installed approximately 15'x12'.

Attachments:

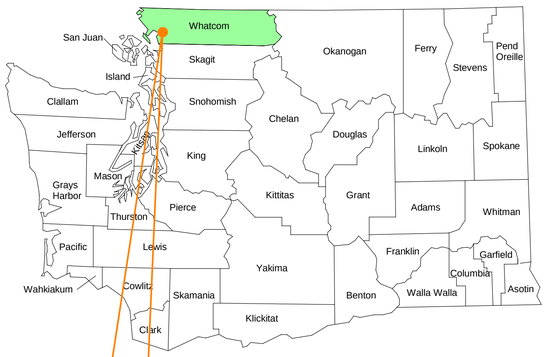
1. Bid Form – 2 Pages
2. Staging Map – 1 Page
3. Drawings – Roy Road – 16 Pages
4. RTI Bridge Drawings – 8 Pages
5. Specs – Roy Road – 43 Pages
6. HPA Permit – 9 Pages
7. Soils Report – 55 Pages
8. SVCA Standard Contract – 12 Pages

Questions shall be directed to Tyler Andrews at tylera@pnwcivil.com or 360-739-2072. Contractors are encouraged to independently visit the site; no formal pre-bid is scheduled. Email bid submissions to tylera@pnwcivil.com.

X = Existing Bridge
New Bridge Stored = Location of new bridge to install
S = Road closed staging area
Protect = Protect concrete bridge
M = Allow pedestrian access to community garden from 6:30pm to 7:30am daily
No staging in community garden

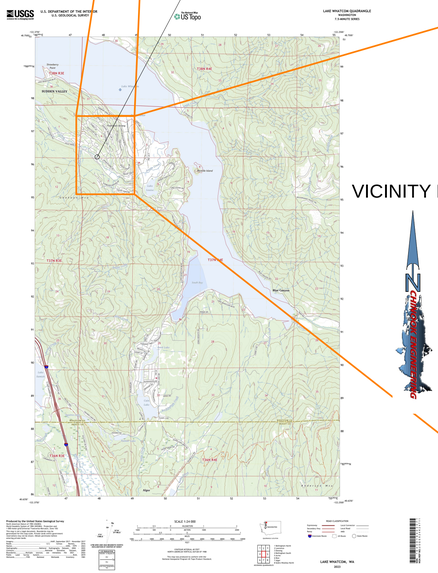
Roy Road Bridge Crossing Beaver Creek Stream Crossing Improvements Contract No. 2 Whatcom County Permit No. COMM2025-0084

Project Location: Whatcom County, WA

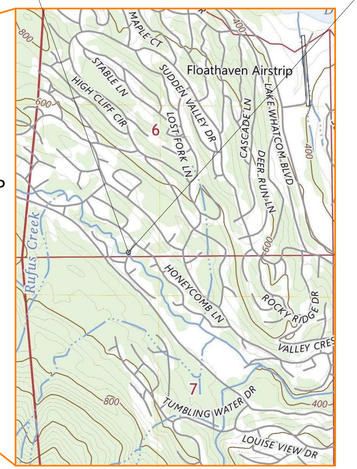


Know what's **below.** **Call** before you dig.

Project Location:



VICINITY MAP



Project Location:

Roy Road
SE 1/4 SW1/4
S6 T37N R4 E
LAT: 48.7135044845
LONG: -122.3440554236

INDEX OF DRAWINGS		
NO.	SHT NO.	TITLE
1	CVR	Cover Sheet
2	ABBV	Abbreviations
3	SPC	Specifications
4	C-0.1	Site Plan - Overall (Existing)
5	C-2.1	Roy Rd Bridge - Site Plan
6	C-2.2	Roy Rd Bridge - Site Plan (Enlarged)
7	C-2.3	Roy Rd Bridge - Detail Plan & Sections (Road)
8	C-2.4	Roy Rd Bridge - Detail Plan & Sections (Stream)
9	C-2.5	Roy Rd Bridge - Stream Profile
10	C-2.6	Roy Rd Bridge - Road Profile
11	C-2.7	Roy Rd Bridge - Bridge Footing Sections
12	C-2.8	Roy Rd Bridge - Schedule of Items
13	C-2.9	Roy Rd Bridge - Utility Plan
14	S-2.1	Roy Rd Bridge - Bridge Details
15	S-2.2	Roy Rd Bridge - Bridge Details
16	T-0.1	Typical Road Details

PREPARED BY

CHINOOK ENGINEERING

860 Windrose Drive
Coupeville, Washington 98239
(360) 672-5528
Professional Consulting Engineers

PREPARED FOR:

Prepared for the Sudden Valley Community

Project Manager

Tyler ~~Anderson~~ Andrews,
Sudden Valley Construction Manager,
Sudden Valley Community Association

Project Engineer

Jay S. Kidder, P.E.
Project Engineer
Chinook Engineering
360-672-5528

07/18/2025
APPROVED AT CHINOOK ENGINEERING: DATE

Chinook Engineering
860 Windrose Drive
Coupeville, WA 98239
P: 360.672.5528 www.chinook-engineering.com

REV	DATE	ISSUE	BY
1	12/11/2024	Issued for Permit Pre-application	JSK
2	02/27/2025	Issued for Permit	JSK
3	06/20/2025	Issued for Bidding	JSK
4	07/18/2025	Issued for Permit	JSK

1" Bar at Original Scale

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.7135044845, LONG: -122.3440554236
Roy Road Bridge Crossing Beaver Creek
Stream Crossing Improvements Contract No. 2
Whatcom County Permit No. COMM2025-0084

SHEET TITLE: Cover Sheet

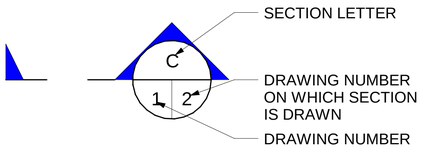
FILE NO:	24476
SCALE:	AS INDICATED
DATE:	07/18/2025
DRAWN BY:	ER
CHECKED BY:	JSK

SHEET NUMBER: **CVR**
1 OF 16

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

SECTION INDICATOR:

DRAWING ON WHICH SECTION IS CUT FROM:



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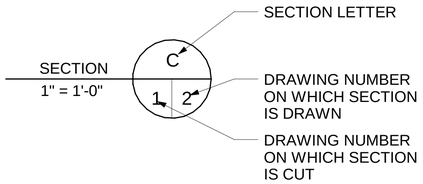

DETAIL INDICATOR:

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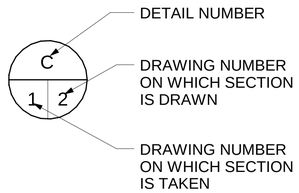

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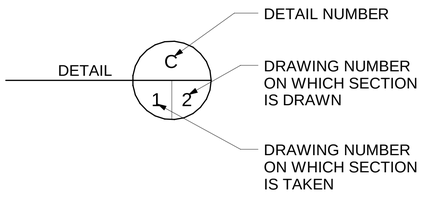
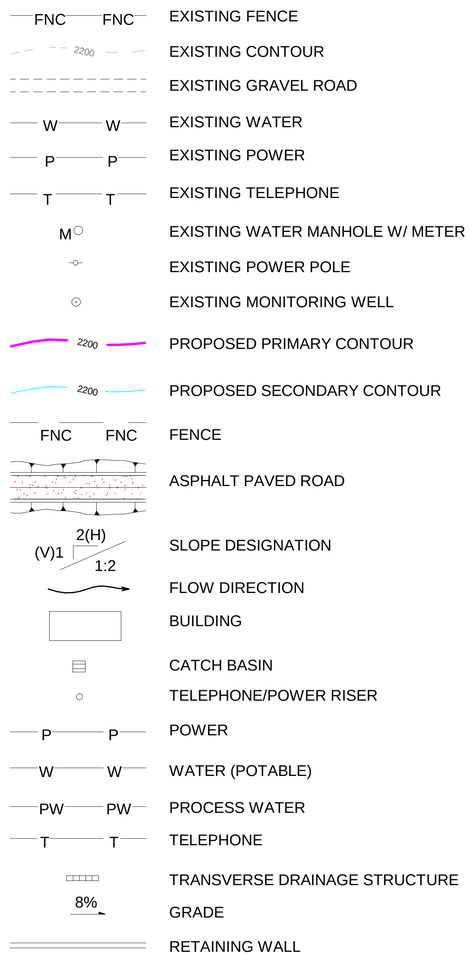


LEGEND:



Chinook Engineering
860 Windrose Drive
Coupeville, WA 98239
P: 360.672.2826 www.chinook-engineering.com

REV	DATE	ISSUE	BY
1	12/11/2024	Issued for Permit Pre-application	JSK
2	02/27/2025	Issued for Permit	JSK
3	06/20/2025	Issued for Bidding	JSK
4	07/18/2025	Issued for Permit	JSK

1" Bar at Original Scale

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.713504845, LONG: -122.3440554236

Roy Road Bridge Crossing Beaver Creek
Stream Crossing Improvements Contract No. 2
Whatcom County Permit No. COMM2025-0084

SHEET TITLE: Abbreviations

FILE NO: 24476
SCALE: AS INDICATED
DATE: 07/18/2025
DRAWN BY: ER
CHECKED BY: JSK

SHEET NUMBER: ABBV
2 OF 16

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

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. 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, 40% of the volume to be, sand - 2" rock, as per WSDOT 9-03.11(1) Streambed Sediment 40% of the volume to be, 2" - 4" rock, per WSDOT 9-03.11(4) Streambed Cobble, 20% of the volume to be, 4" - 12" rock as WSDOT 9-03.11(4) Streambed Cobble. 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
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.

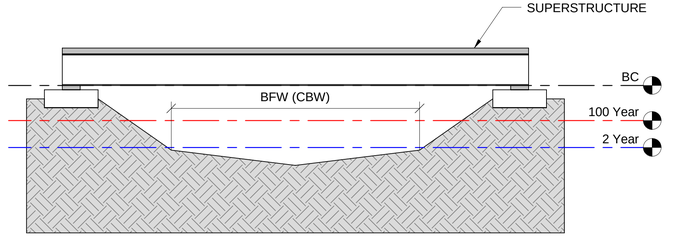
Anchor Bolts
Anchor bolts shall be hot dipped galvanized ASTM A307. Special inspection required. Set all anchor bolts by template.

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
Revegetate all disturbed areas of construction. Replant riparian areas as follows: mixed species 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 area shall be hand broadcast or hydroseeded in all upland disturbed areas. See bidform for quantity.



Bridge Cross section Legend 3
NTS SPC

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P: 360.672.2826 www.chinook-engineering.com

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4	07/18/2025	Issued for Permit	JSK

1" Bar at Original Scale

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.7135044845, LONG: -122.3440554236

Roy Road Bridge Crossing Beaver Creek
Stream Crossing Improvements Contract No. 2
Whatcom County Permit No. COMM2025-0084

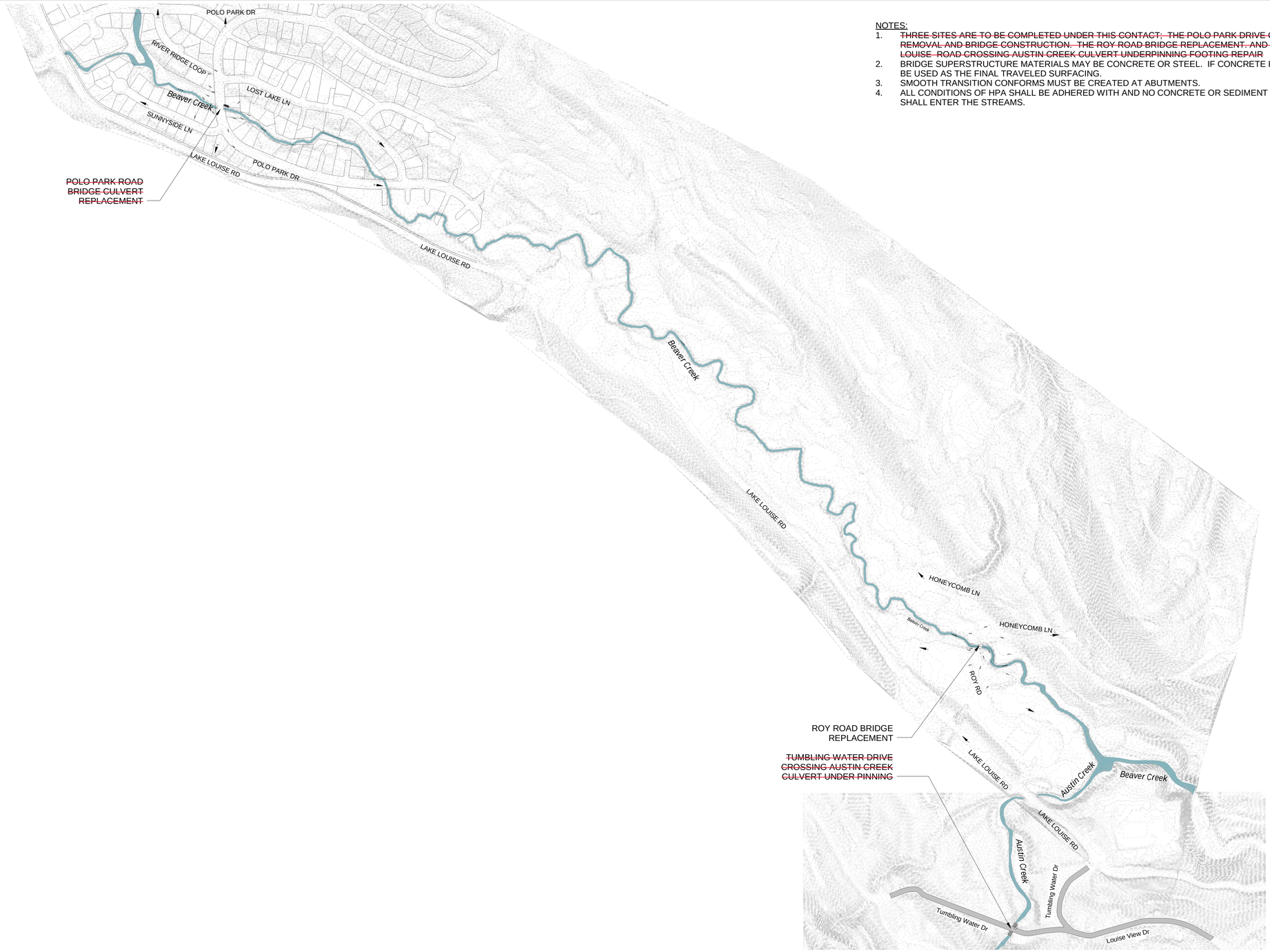
SHEET TITLE: Specifications

FILE NO: 24476
SCALE: AS INDICATED
DATE: 07/18/2025
DRAWN BY: ER
CHECKED BY: JSK

SHEET NUMBER: SPC
3 OF 16

NOTES:

1. ~~THREE SITES ARE TO BE COMPLETED UNDER THIS CONTACT: THE POLO PARK DRIVE CULVERT REMOVAL AND BRIDGE CONSTRUCTION, THE ROY ROAD BRIDGE REPLACEMENT, AND THE LAKE LOUISE ROAD CROSSING AUSTIN CREEK CULVERT UNDERPINNING FOOTING REPAIR~~
2. BRIDGE SUPERSTRUCTURE MATERIALS MAY BE CONCRETE OR STEEL. IF CONCRETE IS USED IT MAY BE USED AS THE FINAL TRAVELED SURFACING.
3. SMOOTH TRANSITION CONFORMS MUST BE CREATED AT ABUTMENTS.
4. ALL CONDITIONS OF HPA SHALL BE ADHERED WITH AND NO CONCRETE OR SEDIMENT MATERIAL SHALL ENTER THE STREAMS.



Site Plan - Overall (Existing)

1" = 300'-0"

300 0 300 600
SCALE FEET

1
C-0.1

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P: 360.672.2626 www.chinook-engineering.com

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1" Bar at Original Scale

STATE OF WASHINGTON — JAMES S. KNOWLES — 21615 — REGISTERED PROFESSIONAL ENGINEER — 07/18/2025

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.7135044845, LONG: -122.3440554236

Roy Road Bridge Crossing Beaver Creek
Stream Crossing Improvements Contract No. 2
Whatcom County Permit No. COMM2025-0084

FILE NO:	24476
SCALE:	AS INDICATED
DATE:	07/18/2025
DRAWN BY:	ER
CHECKED BY:	JSK

SHEET TITLE: Site Plan - Overall (Existing)

SHEET NUMBER: C-0.1
4 OF 16

NOTES:

1. 10" WIDE VACTOR TRENCH 6' DEEP BGS TO POTHOLE UTILITIES. EXPOSE AND IDENTIFY PRIOR TO EXCAVATIONS. ~~MAKE TEMPORARY DISCONNECT AND RECONNECTIONS FOR INTERRUPTION TO BUILD BRIDGE~~. NOTIFY EOR.
2. REMOVE AND REPLACE THE GATE SET IN CONCRETE.

Roy Rd Bridge - Site Plan

1" = 40'-0"

1" = 40'-0" SCALE: 40 0 40 80 FEET

1 / C-2.1

CHINOOK ENGINEERING
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1" Bar at Original Scale

07/14/2025

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.713504484845, LONG: -122.34405542360
Roy Road Bridge Crossing Beaver Creek
Stream Crossing Improvements Contract No. 2
Whatcom County Permit No. COMM2025-0084

SHEET TITLE: Roy Rd Bridge - Site Plan

FILE NO:	24476
SCALE:	AS INDICATED
DATE:	07/18/2025
DRAWN BY:	ER
CHECKED BY:	JSK

SHEET NUMBER: C-2.1

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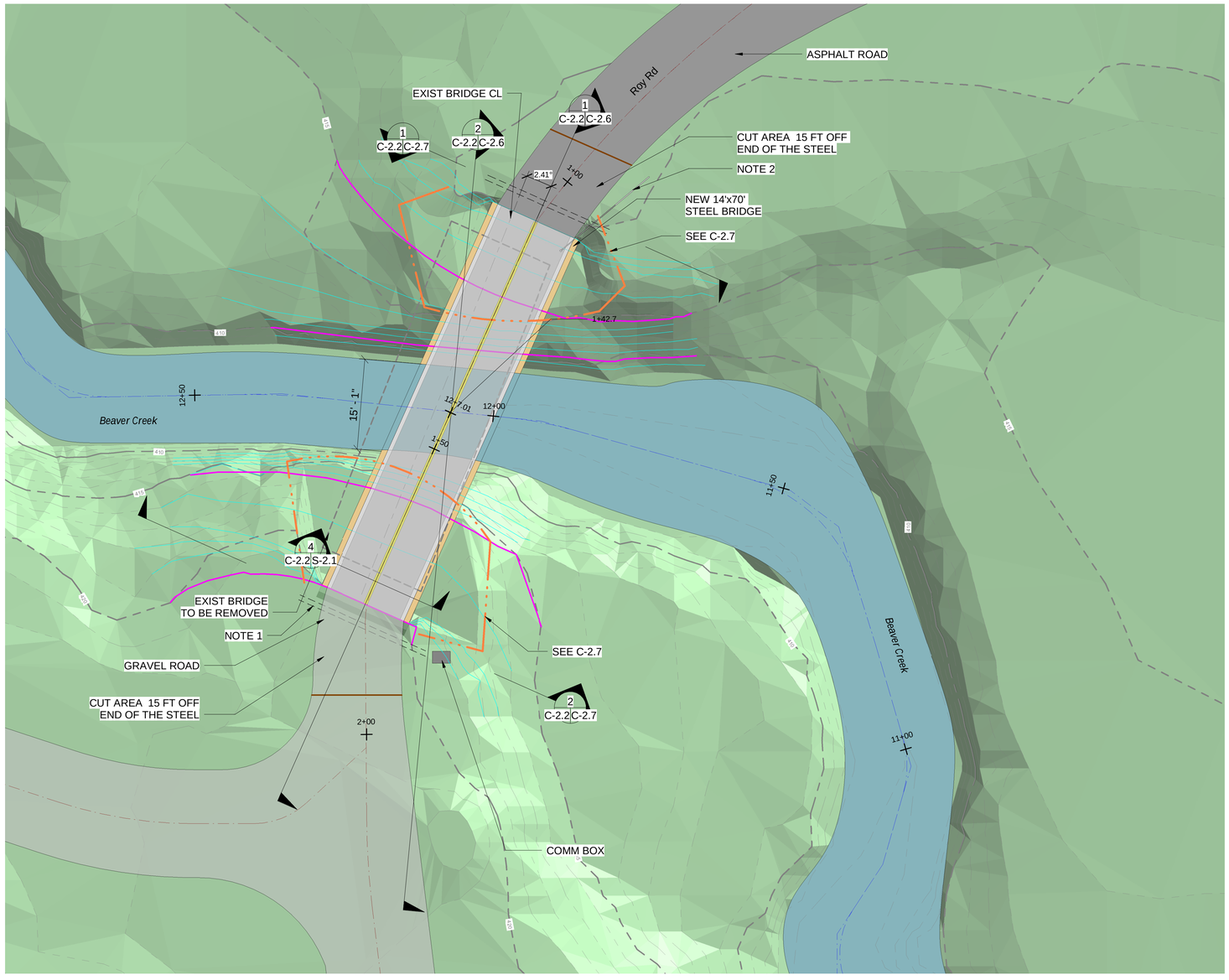

NOTES:

1. 10" WIDE VACTOR TRENCH 6' DEEP BGS TO POTHOLE UTILITIES. EXPOSE AND IDENTIFY PRIOR TO EXCAVATIONS. ~~MAKE TEMPORARY DISCONCET AND RECONNECTIONS FOR INTERUPTION TO BUILD BRIDGE.~~ NOTIFY EOR.
2. REMOVE AND REPLACE THE GATE SET IN CONCRETE.

Roy Rd Bridge - Site Plan (Enlarged)

1" = 10'-0"

1
C-2.2

10 0 10 20
1" = 10'-0" SCALE FEET

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1" Bar at Original Scale

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.71350448845, LONG: -122.34405542361
Roy Road Bridge Crossing Beaver Creek
Stream Crossing Improvements Contract No. 2
Whatcom County Permit No. COMM2025-0084

SHEET TITLE: Roy Rd Bridge - Site Plan (Enlarged)

FILE NO: 24476
SCALE: AS INDICATED
DATE: 07/18/2025
DRAWN BY: ER
CHECKED BY: JSK

SHEET NUMBER: C-2.2
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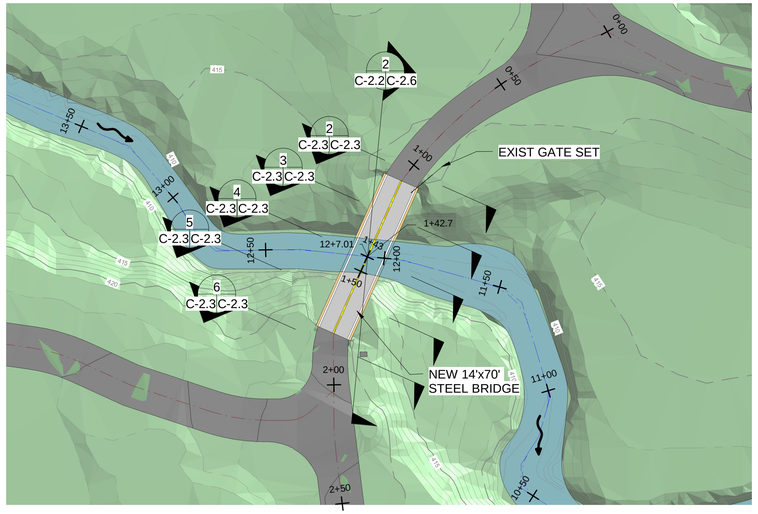


Roy Rd Bridge - Detail Plan & Sections (Road)

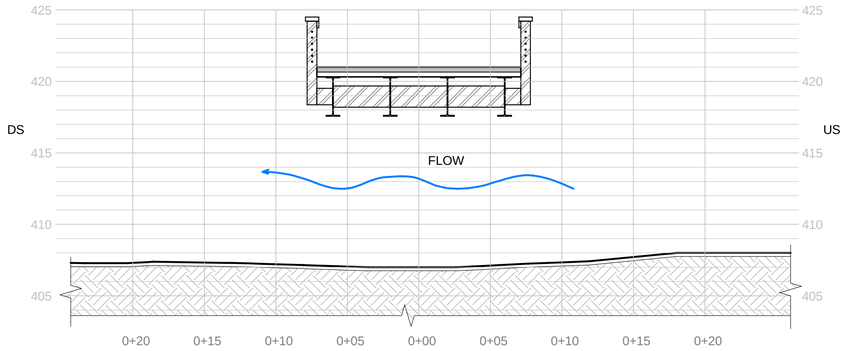
1

C-2.3

1" = 30'-0"

30 0 30 60

1" = 30'-0" SCALE FEET



Roy Rd Bridge - Road Section (STA 1+43)

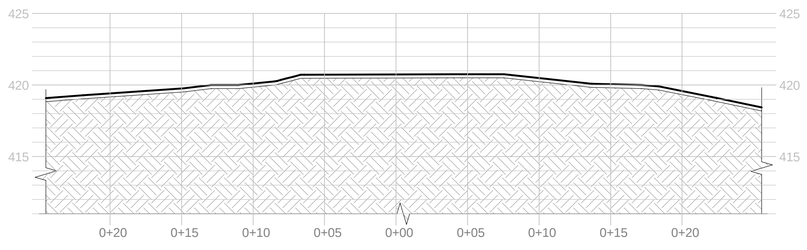
4

C-2.3 C-2.3

1" = 5'-0"

5 0 5 10

1" = 5'-0" SCALE FEET



Roy Rd Bridge - Road Section (STA 1+03)

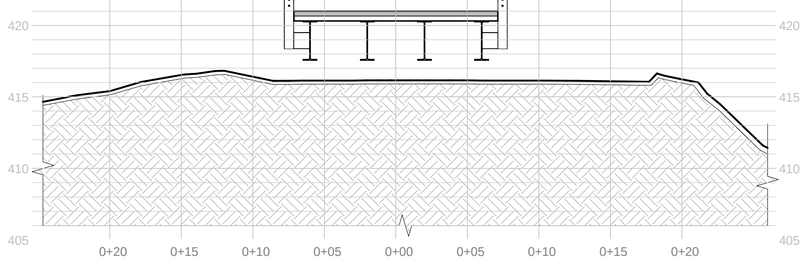
2

C-2.3 C-2.3

1" = 5'-0"

5 0 5 10

1" = 5'-0" SCALE FEET



Roy Rd Bridge - Road Section (STA 1+63)

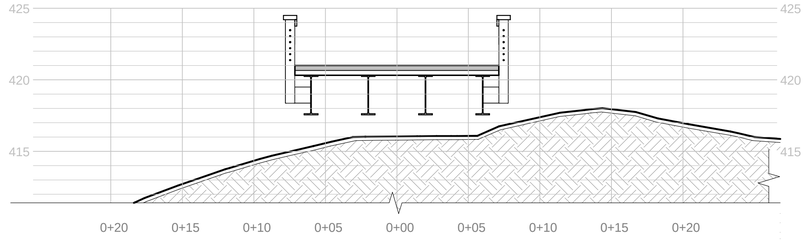
5

C-2.3 C-2.3

1" = 5'-0"

5 0 5 10

1" = 5'-0" SCALE FEET



Roy Rd Bridge - Road Section (STA 1+23)

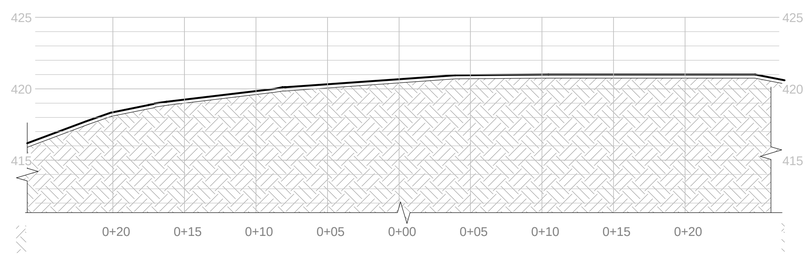
3

C-2.3 C-2.3

1" = 5'-0"

5 0 5 10

1" = 5'-0" SCALE FEET



Roy Rd Bridge - Road Section (STA 1+83)

6

C-2.3 C-2.3

1" = 5'-0"

5 0 5 10

1" = 5'-0" SCALE FEET

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1" Bar at Original Scale

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.7135044845, LONG: -122.3440554236

Roy Road Bridge Crossing Beaver Creek
Stream Crossing Improvements Contract No. 2
Whatcom County Permit No. COMM2025-0084

SHEET TITLE:
Roy Rd Bridge - Detail Plan & Sections (Road)

FILE NO: 24476
SCALE: AS INDICATED
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DRAWN BY: ER
CHECKED BY: JSK

SHEET NUMBER:
C-2.3
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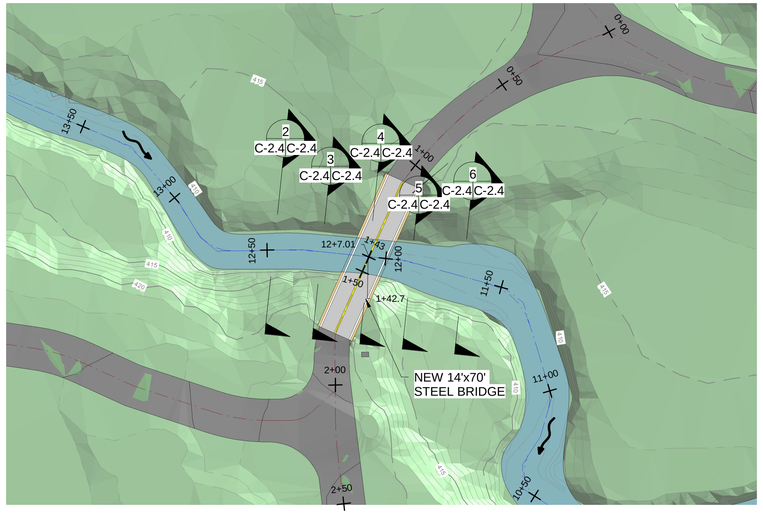
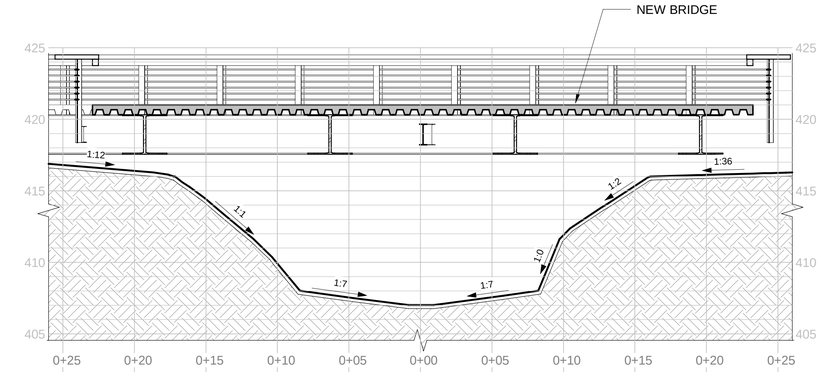


Roy Rd Bridge - Detail Plan & Sections (Stream)

1

1" = 30'-0" C-2.4

SCALE: 1" = 30'-0" (30 0 30 60 FEET)

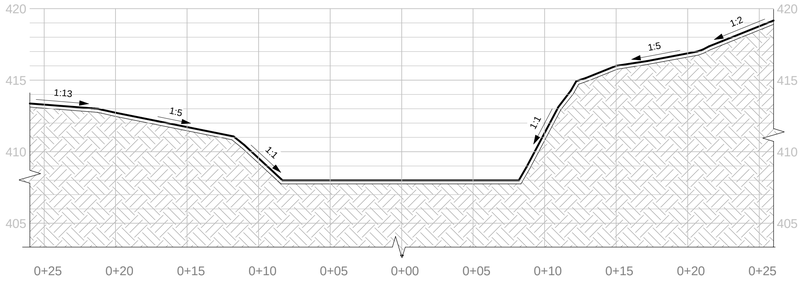


Roy Rd Bridge - Stream Section (STA 12+07)

4

1" = 5'-0" C-2.4 C-2.4

SCALE: 1" = 5'-0" (5 0 5 10 FEET)

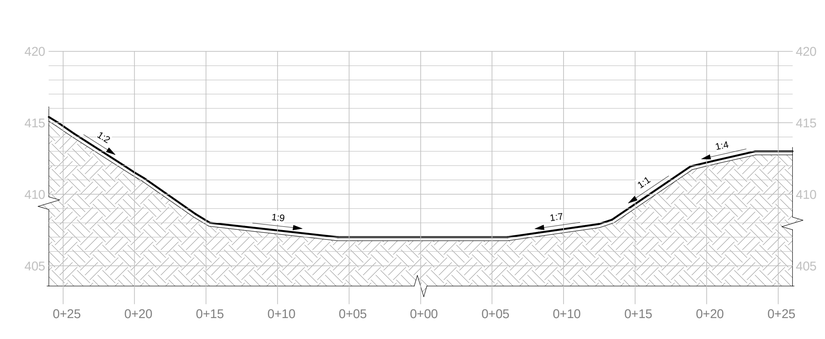


Roy Rd Bridge - Stream Section (STA 12+47)

2

1" = 5'-0" C-2.4 C-2.4

SCALE: 1" = 5'-0" (5 0 5 10 FEET)

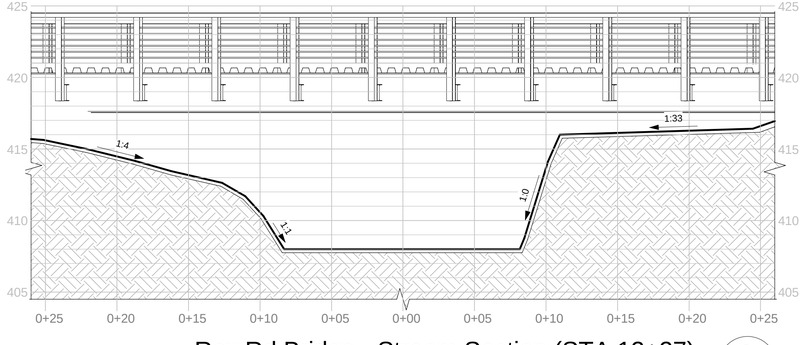


Roy Rd Bridge - Stream Section (STA 11+87)

5

1" = 5'-0" C-2.4 C-2.4

SCALE: 1" = 5'-0" (5 0 5 10 FEET)



Roy Rd Bridge - Stream Section (STA 12+27)

3

1" = 5'-0" C-2.4 C-2.4

SCALE: 1" = 5'-0" (5 0 5 10 FEET)

Roy Rd Bridge - Stream Section (STA 11+67)

6

1" = 5'-0" C-2.4 C-2.4

SCALE: 1" = 5'-0" (5 0 5 10 FEET)

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1" Bar at Original Scale

07/17/2025

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.7135044845, LONG: -122.3440554236

Roy Road Bridge Crossing Beaver Creek
Stream Crossing Improvements Contract No. 2
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SHEET TITLE: Roy Rd Bridge - Detail Plan & Sections (Stream)

FILE NO:	24476
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CHECKED BY:	JSK

SHEET NUMBER: C-2.4

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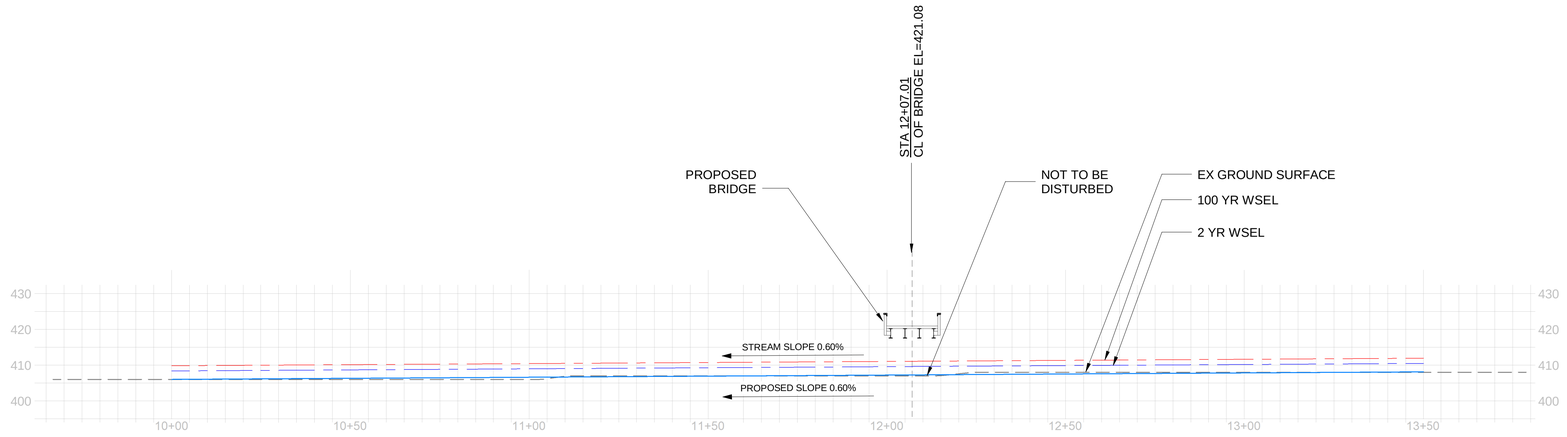

Stream Profile at Roy Rd Dr

1" = 20'-0"

1 / C-2.5

1" = 20'-0" SCALE: 20 0 20 40 FEET

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2	02/27/2025	Issued for Permit	JSK
3	06/20/2025	Issued for Bidding	JSK
4	07/18/2025	Issued for Permit	JSK

1" Bar at Original Scale

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.7135044845, LONG: -122.3440554236

Roy Road Bridge Crossing Beaver Creek
Stream Crossing Improvements Contract No. 2
Whatcom County Permit No. COMM2025-0084

SHEET TITLE: Roy Rd Bridge - Stream Profile

FILE NO:	24476
SCALE:	AS INDICATED
DATE:	07/18/2025
DRAWN BY:	ER
CHECKED BY:	JSK

SHEET NUMBER: C-2.5

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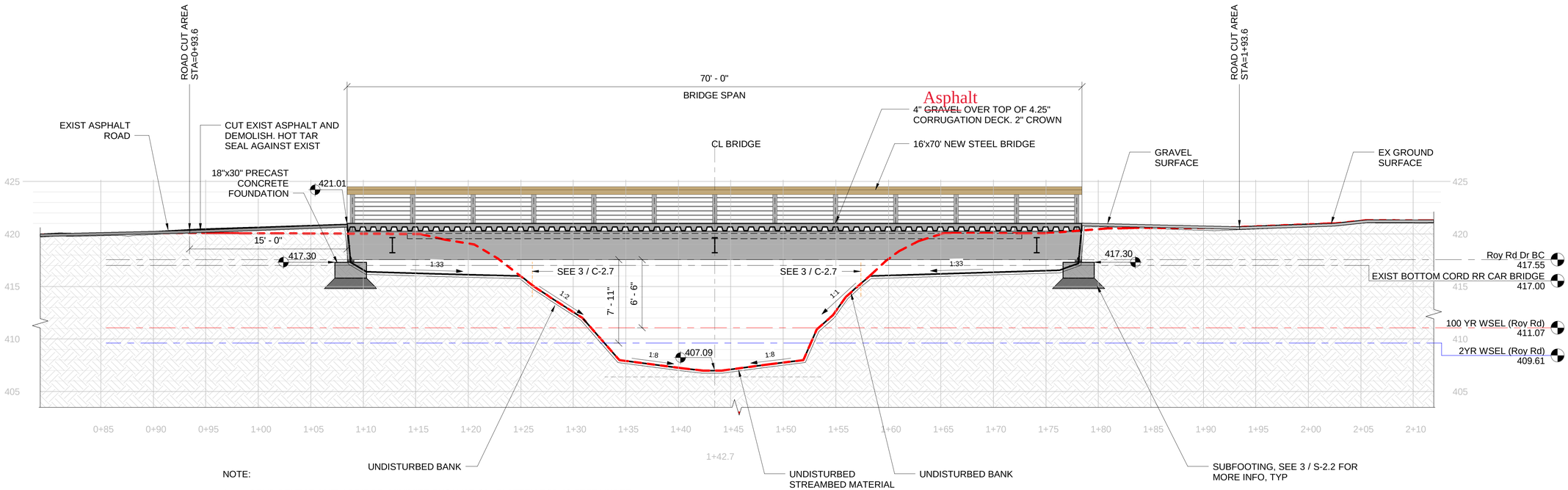
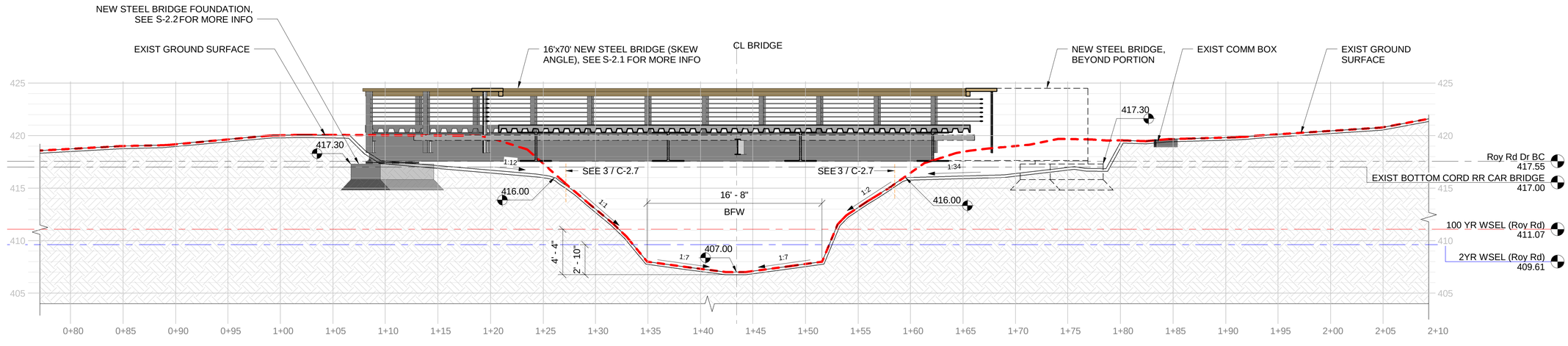


NOTE:

1. GRUB BENEATH NEW BRIDGE. MINIMIZE EXCAVATION. FLATTEN TOP 10 FEET UNDER EACH END BUT DO NOT RESHAPE STREAM BANK BELOW EL= 416.

Roy Rd - Road Profile 1

1" = 5'-0" C-2.2 C-2.6



Roy Rd Road Profile - (Perpendicular to Stream) 2

1" = 5'-0" C-2.2 C-2.6

1" = 5'-0" SCALE: 5 0 5 10 FEET

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4	07/18/2025	Issued for Permit	JSK

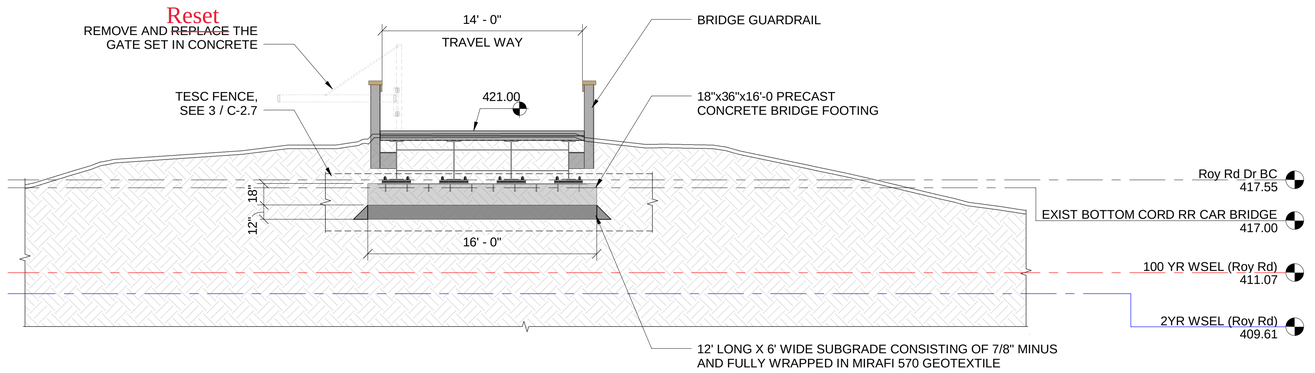
1" Bar at Original Scale

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.213504845 LONG: -122.344055236
Roy Road Bridge Crossing Improvements Contract No. 2
Stream Crossing Improvements Contract No. 2
Whatcom County Permit No. COMM2025-0084

SHEET TITLE: Roy Rd Bridge - Road Profile

FILE NO:	SCALE:	DATE:	DRAWN BY:	CHECKED BY:
24476	AS INDICATED	07/18/2025	ER	JSK

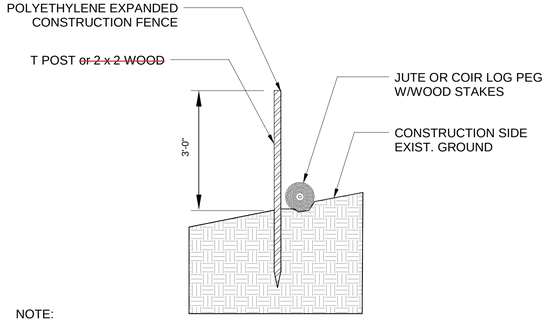
SHEET NUMBER: C-2.6
10 OF 16



Roy Rd Bridge - Bridge Footing Section (North) 1

1" = 5'-0" C-2.2 C-2.7

5 0 5 10
1" = 5'-0"
SCALE FEET

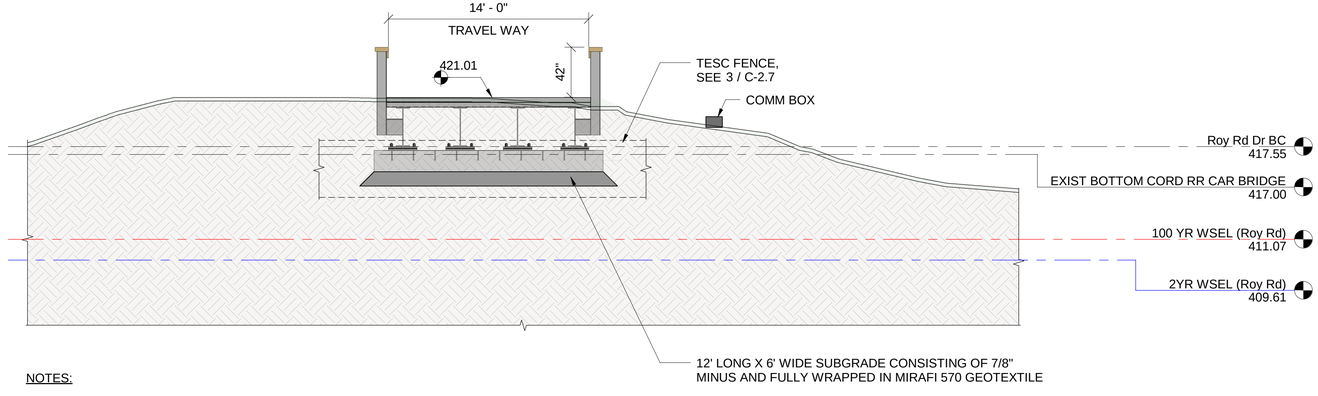


NOTE:

FENCE ALIGNMENT APPROXIMATELY SAME AS LINES OF AREA OF DISTURBANCE.

TESC Fence Section 3

NTS C-2.7



NOTES:

1. SEE1 / C-2.7 FOR MORE INFORMATION.

Roy Rd Bridge - Bridge Footing Section (South) 2

1" = 5'-0" C-2.2 C-2.7

5 0 5 10
1" = 5'-0"
SCALE FEET

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1" Bar at Original Scale

07/14/2025

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.713504484S, LONG: -122.3440554236

Roy Road Bridge Crossing Beaver Creek
Stream Crossing Improvements Contract No. 2
Whatcom County Permit No. COMM2025-0084

SHEET TITLE: Roy Rd Bridge - Bridge Footing Sections

FILE NO: 24476
SCALE: AS INDICATED
DATE: 07/18/2025
DRAWN BY: ER
CHECKED BY: JSK

SHEET NUMBER: C-2.7
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Bridge General Notes:

Perform Construction in Conformance with the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction M41-10 most recent edition.

Bridge Design:

1) Design in accordance with the AASHTO LRFD Bridge Design Specifications (9th Edition 2017).
   a) Design Loads
      i) Dead Load: Bridge Dead Load Plus 80 PSF Total Wearing Surface.
      ii) Live Load: HL-93, Max ADT< 10, U80, L90 OVERLOADS, EV3.
      iii) Wind Loading: AASHTO LRFD Bridge Design per Specification Section 3.8:
      Wind Speed = 130 mph, Wind Exposure Category —C, Max Height of Structure = 33 feet.
      iv) Bridge Rail Design for T L-1, non crash tested.
      v) Bridge Handrail AASHTO 42" minimum height.
      vi) Seismic Loading AASHTO LRFD Bridge Design per Specifications Section 3.10
      (1) Site Class B @ Polo Park Dr Bridge and D @ Roy Rd Bridge, SDS spectral accel. = 0.586, Ground Motion Ss = 0.976, S1=0.344.

2) Recommended Foundations Designed to a Maximum Nominal (unfactored) Bearing Resistance of 4500 psf (Strength Limit State Bearing of 2025 psf (Nominal Bearing x 0.45).

3) ~~Pile friction value 0.33psf~~

4) ~~Sheet pile Load test shall be by gravity drop hammer and shall result in 6 US tons/foot of abutment width. That is 12kip/foot of abutment width. All testing shall be after a 48 hour waiting period from time of pile installation.~~

5) Structural Materials:
   a) Structural Bridge Superstructure Concrete Steel: ASTM A588 Weathering Steel strength as per prefabricated bridge manufacturer.
   b) Structural Sheet Pile Steel: ASTM A572 Grade 50ksi.
   c) Structural Bridge Pile cap Steel: ASTM A572 Grade 50ksi.
   d) Elastomeric Pads: Grade 4, 60 Durometer.
   e) Anchor Bolts: ASTM F1554 Grade 55 or Better.

6) Hydrology and Hydraulics: The Bridges are designed to pass 100 year flood value of 457 cfs with climate change as estimated for the year 2080 as per WDFW. HECRAS completed by Chinook Engineering 07/09/2024.

Roy Rd Cut/Fill Schedule		
Name	Cut	Fill
Roy Road	98.50 CY	11.02 CY

~~Rebar Schedule~~			
~~Type~~	~~Bar Diameter~~	~~Quantity~~	~~Bar Length~~
~~#5~~	~~0.63"~~	~~1~~	~~15' - 10"~~
~~#5~~	~~0.63"~~	~~1~~	~~15' - 10"~~
~~#5~~	~~0.63"~~	~~1~~	~~15' - 10"~~
~~#5~~	~~0.63"~~	~~1~~	~~15' - 10"~~
~~#5~~	~~0.63"~~	~~19~~	~~8' - 1 5/32"~~
~~#6~~	~~0.75"~~	~~17~~	~~9' - 2 3/8"~~
~~#6~~	~~0.75"~~	~~1~~	~~15' - 10"~~
~~#6~~	~~0.75"~~	~~1~~	~~15' - 10"~~
~~#6~~	~~0.75"~~	~~1~~	~~15' - 9"~~
~~#6~~	~~0.75"~~	~~1~~	~~15' - 10"~~
~~#6~~	~~0.75"~~	~~1~~	~~15' - 10"~~
~~#6~~	~~0.75"~~	~~1~~	~~15' - 10"~~
~~#6~~	~~0.75"~~	~~1~~	~~15' - 10"~~
~~Grand total: 14~~		~~48~~	~~207' - 2 9/16"~~

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1" Bar at Original Scale

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.7135044845, LONG: -122.3440554236

Roy Road Bridge Crossing Beaver Creek
Stream Crossing Improvements Contract No. 2
Whatcom County Permit No. COMM2025-0084

SHEET TITLE: Roy Rd Bridge - Schedule of Items

FILE NO: 24476
SCALE: AS INDICATED
DATE: 07/18/2025
DRAWN BY: ER
CHECKED BY: JSK

SHEET NUMBER: C-2.8
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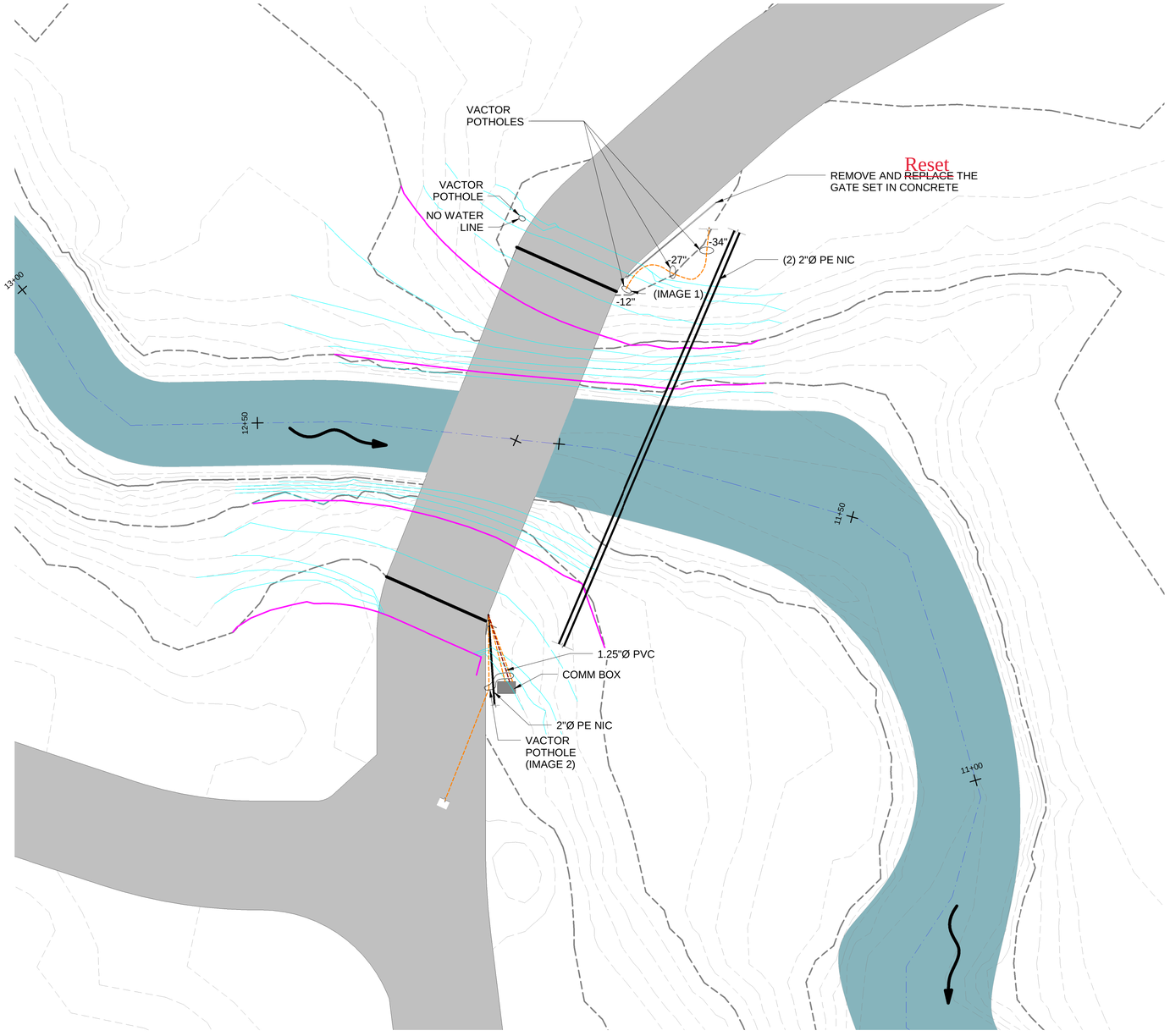

UTILITY LEGEND

- COMMUNICATION LINE
- POWER LINE (UNDERGROUND)
- POWER LINE (OVHD)
- WATER LINE
- SEWER LINE

IMAGE 1

IMAGE 2

Roy Rd Bridge - Existing Utility Plan

1" = 10'-0"

10 0 10 20
1" = 10'-0" SCALE FEET

1
C-2.9

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1" Bar at Original Scale

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.713504484845, LONG: -122.34405542360
Roy Road Bridge Crossing Beaver Creek
Stream Crossing Improvements Contract No. 2
Whatcom County Permit No. COMM2025-0084

SHEET TITLE: Roy Rd Bridge - Utility Plan

FILE NO:	24476		
SCALE:	AS INDICATED	DRAWN BY:	ER
DATE:	07/18/2025	CHECKED BY:	JSK

SHEET NUMBER: C-2.9
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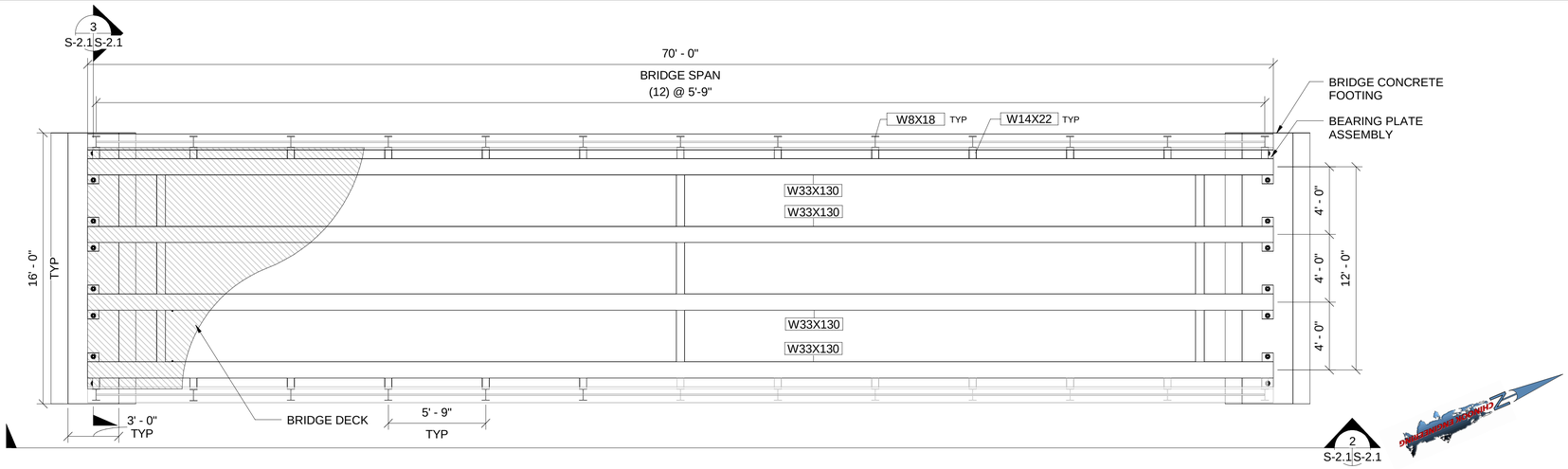
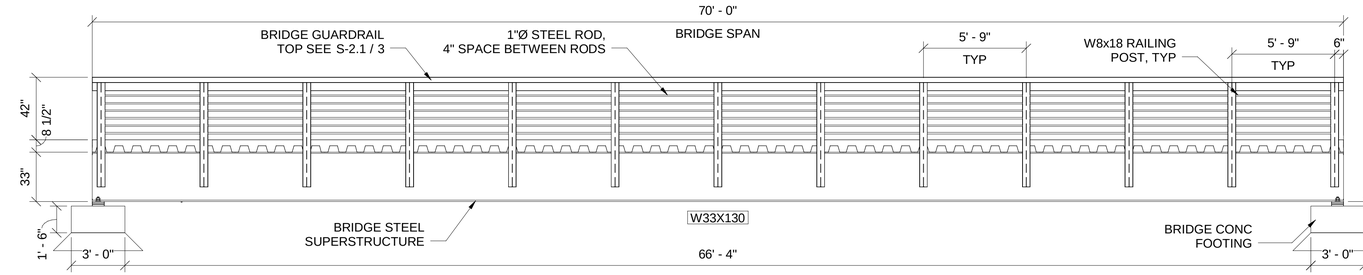


Roy Rd Bridge - Structural Plan

1/4" = 1'-0"

1

S-2.1



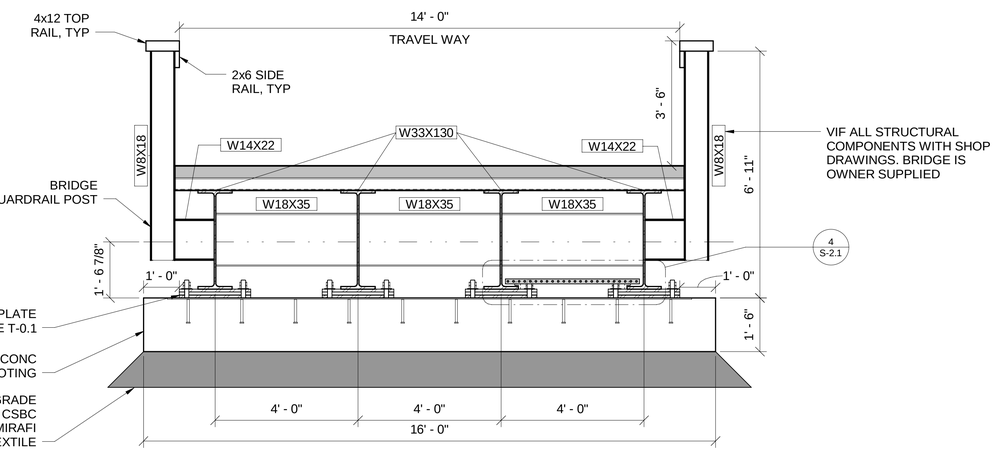
Roy Rd Bridge - Section (Length)

1/4" = 1'-0"

2

S-2.1

S-2.1



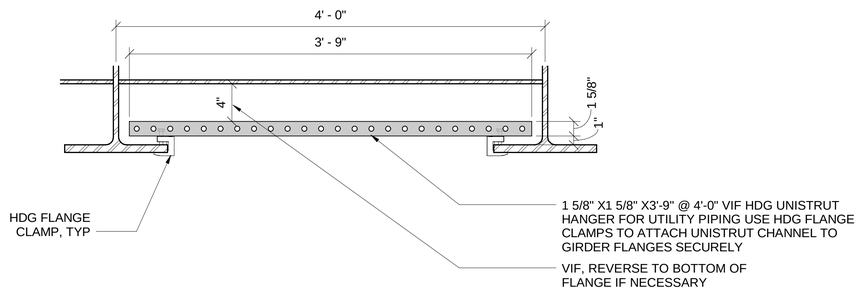
Roy Rd Bridge - Section (Width)

1/2" = 1'-0"

3

S-2.1

S-2.1



NOTE:

1. TRANSFER ALL UTILITIES UNDER BRIDGE BETWEEN 2 DS GIRDERS. PENETRATE BACKWALL AND MAKE CONNECTIONS TO EXISTING RUNS BOTH SIDES OF BRIDGE AT CORRECT BURIAL AND TRENCHING CODES

Unistrut Hanger

1 1/2" = 1'-0"

4

C-2.2

S-2.1

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1" Bar at Original Scale

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.7135044845, LONG: -122.3440554236

Roy Road Bridge Crossing Beaver Creek
Stream Crossing Improvements Contract No. 2
Whatcom County Permit No. COMM2025-0084

SHEET TITLE: Roy Rd Bridge - Bridge Details

FILE NO: 24476
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SHEET NUMBER: S-2.1
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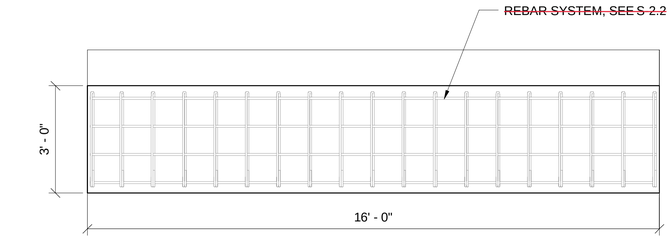
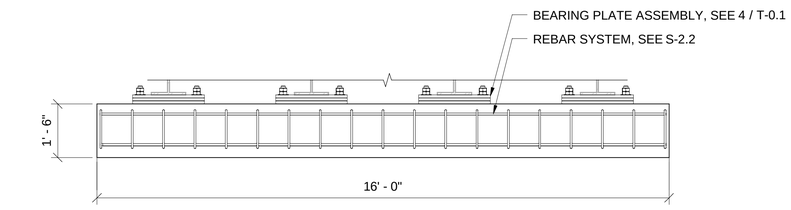


~~Roy Rd Bridge - Bridge Footing (Top) 2 REQ'D~~ 1

1/2" = 1'-0" S-2.2

1/2" = 1'-0" SCALE 1 0 1 2 3 4 5 FEET

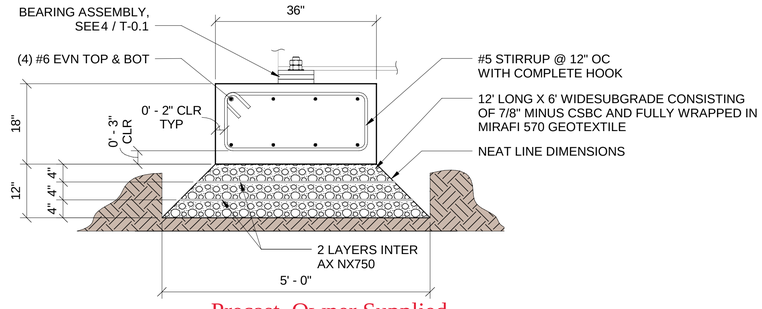


Precast, Owner Supplied

Roy Rd Bridge - Footing Detail (Section B) 2

1/2" = 1'-0" S-2.2

1/2" = 1'-0" SCALE 1 0 1 2 3 4 5 FEET



Precast, Owner Supplied

Roy Rd Bridge - Footing Detail 3

3/4" = 1'-0" S-2.2

3/4" = 1'-0" SCALE 1 0 1 2 3 FEET

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1" Bar at Original Scale

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.7135044845, LONG: -122.3440554236

Roy Road Bridge Crossing Beaver Creek
Stream Crossing Improvements Contract No. 2
Whatcom County Permit No. COMM2025-0084

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SCALE: AS INDICATED
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SHEET NUMBER: S-2.2
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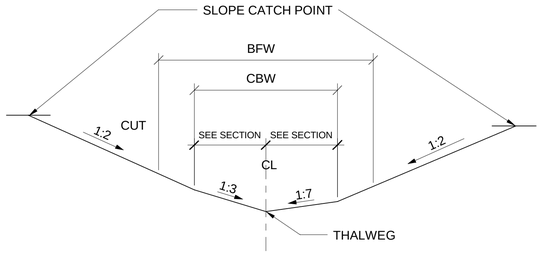
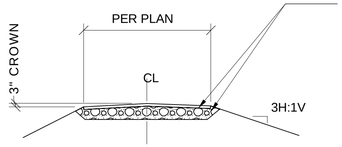


NOTE:
1. SHAPE STREAM WITH THALWEG AND AS DIRECTED BY ENGINEER.
2. CONSTRUCT A FLATTER SIDE 1:7 COINCIDENTAL WITH WIDWR SIDE OF STREAM SECTION.
3. CONSTRUCT SLEEPER SIDE AT 1:3 COINCIDENTAL WITH NARROW SIDE OF STREAM SECTION.
4. TYPICAL SECTION MAY BE OPPOSITE HAND FOR FLOW DIRECTION.
5. CARRY STREAM SECTION THROUGH STREAM SIMULATION CULVERTS OF BRIDGES WHERE APPLICABLE.
6. FOLLOW STREAM PROFILE WITH THALWEG OF CONSTRUCTED STREAM SECTION SHAPE. SEE PROFILE.

Typical Stream Section Detail

NTS

1 T-0.1



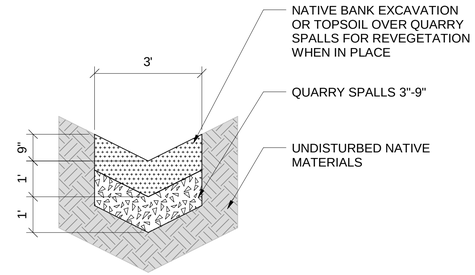
SAW CUT PAVEMENT AS SHOWN ON PLAN. STRIP EXISTING ASPHALT AND EXCAVATE TO 2.0' BGS. PROOF ROLL AND COMPACT. BACK FILL AND COMPACT WITH 1 1/4" MINUS CSBC TO 0.8' BGS ~~AND PLACE INTERAX NX750 TRIAXIAL GEOGRID TO COVER INTERIOR SPACE BETWEEN SHEETPILE AND ALL AREA OF RESTROED PAVEMENT THAT IS NEW.~~ PLACE AND COMPACT 3.5" LAYER OF 5/8" MINUS CSTC LEVELING THEN TWO LIFTS OF 2" THICK CLASS A HMA. ALL COMPACTION SHALL BE 95% MAX DENSITY AT OPTIMUM MOISTURE CONTENT. MATCH CONFORMS AT EXIST PAVEMENT, SEAL WITH HOT TAR AT MARGINS.

NOTE:
1. BASE COURSE SHALL BE 1 1/4" MINUS.
2. TOP COURSE SHALL BE 5/8" MINUS.

Typical Road Section

NTS

2 T-0.1

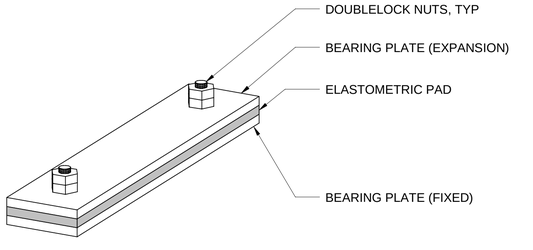


NOTE:
1. ALL DITCHES TYPICAL.
2. NO QUARRY SPALL SHALL BE EXPOSED.
3. COMPACT SPALLS AND SOIL WITH BACK OF EXCAVATOR BUCKET.
4. RIP RAP COVER SIMILAR.

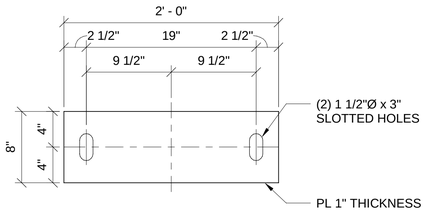
Typical Ditch Section

NTS

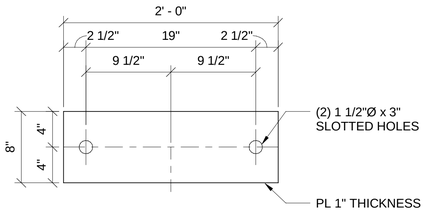
3 T-0.1



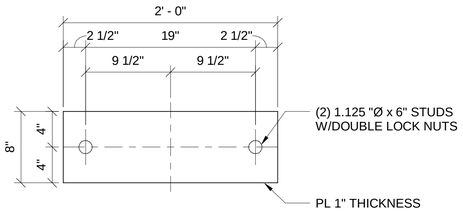
BEARING PLATE ASSEMBLY (ISOMETRIC VIEW)



BEARING PLATE (EXPANSION)



ELASTOMERIC PAD



BEARING PLATE (FIXED)

NOTES:
1. AS PER FABRICATOR, SEE SHOP DRAWINGS.
2. OWNER SUPPLIED.

Bearing Plate Assembley (8 Req'd)

1 1/2" = 1'-0"

4 T-0.1

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1" Bar at Original Scale

Roy Road
SE 1/4 SW1/4 S6 T37N R4 E
LAT: 48.7135044845, LONG: -122.3440554236

Roy Road Bridge Crossing Beaver Creek
Stream Crossing Improvements Contract No. 2
Whatcom County Permit No. COMM2025-0084

SHEET TITLE: Typical Road Details

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SHEET NUMBER: T-0.1
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GENERAL NOTES

STEEL: All structural steel shapes and plates shall conform to the requirements of AASHTO M270 Grade 50W (ASTM A588) unless noted otherwise.

CONNECTORS: All structural steel connections shall be made with high strength bolts and washer conforming to AASHTO M164 (ASTM F3125 Grade A325 Type 3).

STEEL DECKING: Steel decking shall be 4.25" deep by 12" lay length by 7 gauge "Type A" galvanized corrugated steel conforming to ASTM A609 Grade 50. Steel decking shall be installed perpendicular to the direction of the supporting girders.

TESTING: Certified Mill Test Reports shall be furnished for the steel stringers, structural steel plates and shapes, and high strength bolts.

WELDING: All Welding shall be in accordance with AWS D1.5. All electrodes shall be E70XX or E71-T.

BEARING PADS: Bearing pads shall 60 Durometer elastomeric bearing pads with a shear modulus of 180 psi (± 15%).

BRIDGE RAIL: 12 Ga. W-Beam shall conform to the requirements of Galvanizing Steel ASTM A525 or AASTHO M123. Connections shall utilize ⅝"Ø button head bolts, square washers, and nut, conforming to the requirements of AASHTO M153. Rail system meets **TL-1** requirements; rail system is owner designated and has not been crash tested.

PEDESTRIAN RAIL: Pedestrian Rail shall be untreated, full sawn 4x6, Douglas Fir No. 2 timber.

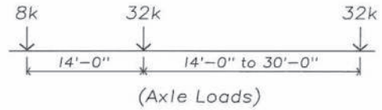
REFLECTORS: Place a butterfly reflector at approximately equal spacing (not to exceed 20 feet) between end rail posts. Both faces of reflector to have reflectorized sheeting.

END TREATMENT: End treatment shall be Trinity 907G with Delineator Panels (Galvanized Steel).

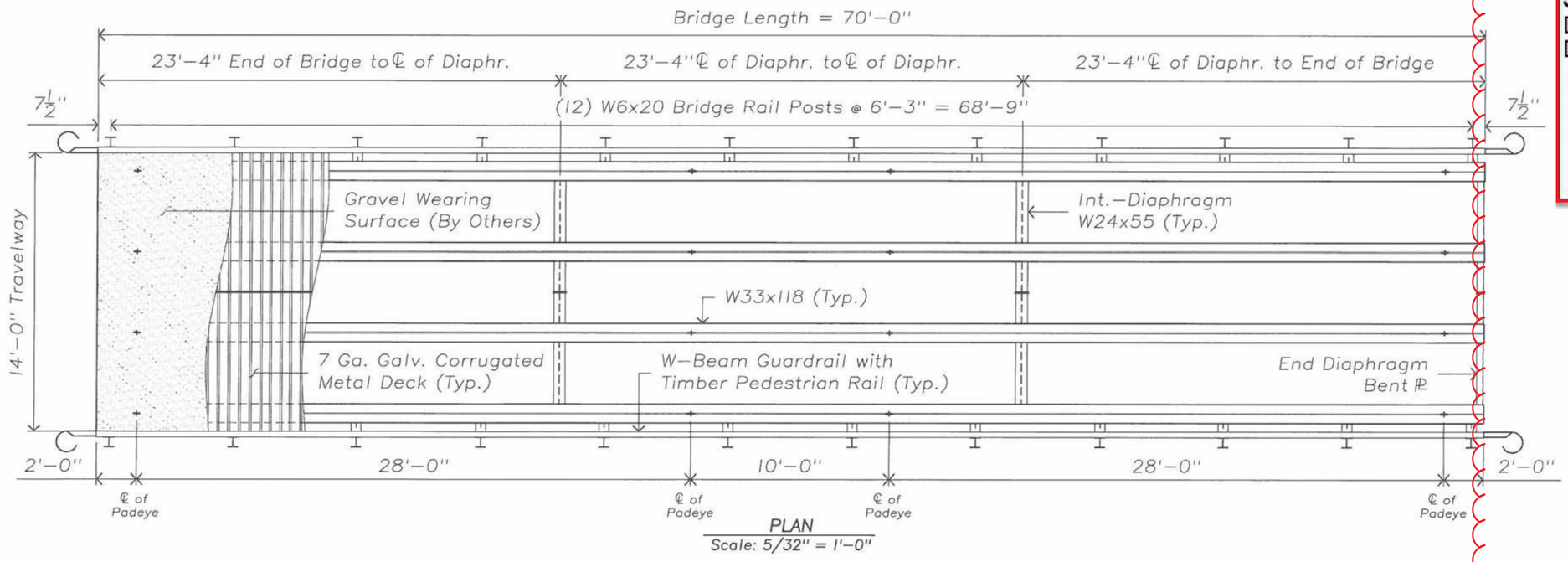
FINISH: Exterior Surfaces shall be cleaned per SSPC SP7 "Brush-Off Blast-Cleaning" prior to shipment to assure uniform weathering.

DESIGN NOTES

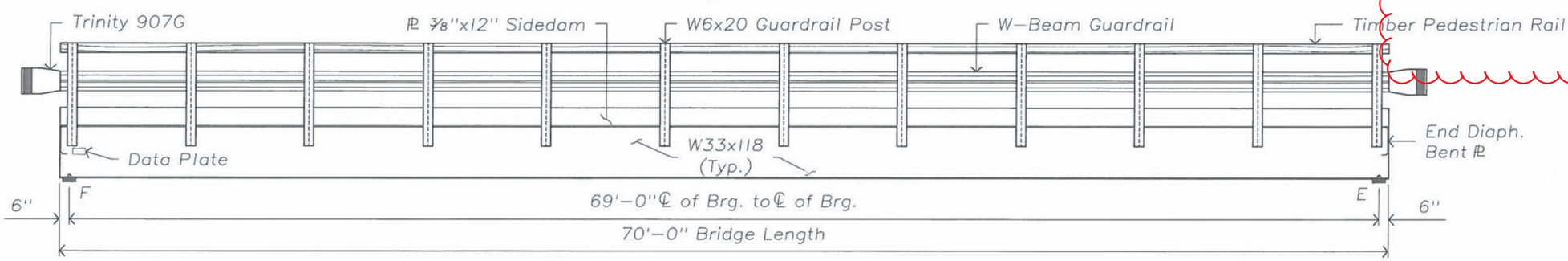
1. Strength I Live Load: **HL93 (GVW 36 Tons)**



2. Design is based on AASHTO LRFD Bridge Design Specification, Ninth Edition 2020 and all interim Specifications.
3. Live Load Deflection at Midspan is L/520
4. Bridge Weight: Approx 56,928 lb
   Module Weight: Approx 28,464 lb
   (Bridge Weight Does Not Include Wearing Surface)



PLAN
Scale: 5/32" = 1'-0"



ELEVATION
Scale: 5/32" = 1'-0"

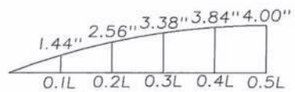
SHOP DRAWING / SUBMITTAL REVIEW

☑ REVIEWED ☐ REVIEWED WITH CHANGES NOTED
☐ REVISE AND RESUBMIT ☐ REJECTED_____

SUBMITTAL WAS REVIEWED FOR DESIGN CONFORMITY AND GENERAL CONFORMANCE TO CONTRACT DOCUMENTS ONLY. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING DIMENSIONS AT JOBSITE FOR TOLERANCE, CLEARANCE, QUANTITIES, FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATION OF HIS WORK WITH OTHER TRADES AND FULL COMPLIANCE WITH CONTRACT DOCUMENTS

CHINOOK ENGINEERING

All Sheets



Camber Diagram
Not to Scale

REVIEWED
Jay Kidder, PE
05/19/2025

FRANKLIN R. MUTH — STATE OF WASHINGTON — 34212 — REGISTERED PROFESSIONAL ENGINEER

MUTH CONSULTING ENGINEERS
MISSOULA, MONTANA

PRELIMINARY PLANS

RTI Fabrication, Inc.
Plains, Montana

S/N 70-14-HL93-04-3432

PNW Civil, Inc.
70'-0" Length x 14'-0" Width
Roy Road Bridge
Whatcom County, WA

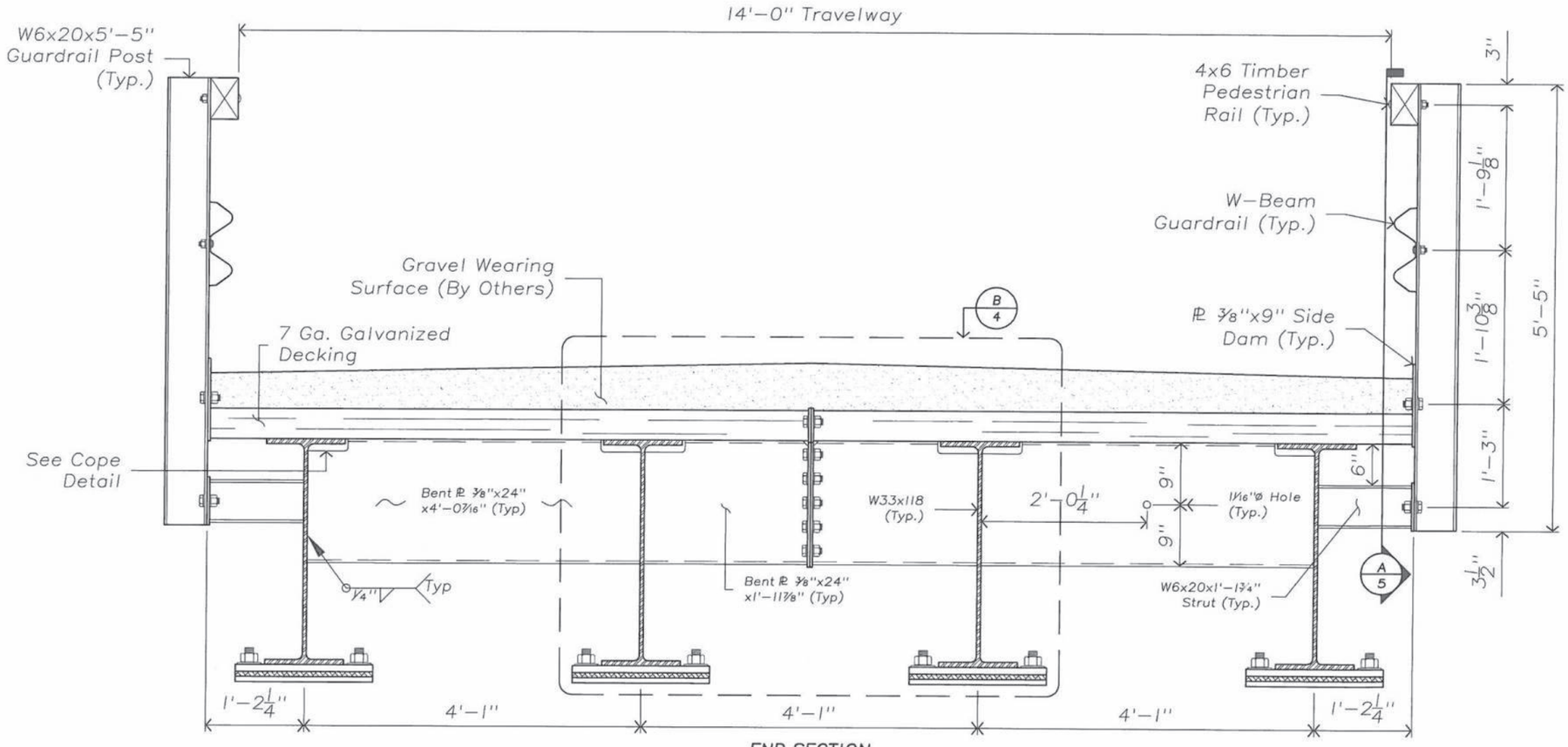
△ Date_____Revised_____
△ Date_____Revised_____

Engineers' Project No. : 25-M-622 | Sheet S1 of S8

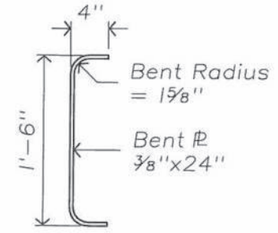
Designed : AJB
Drawn : AJB
Checked : FRM
Approved :

Sheet Title : General Layout

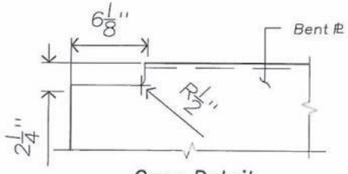
Plot Date: 5/16/2025



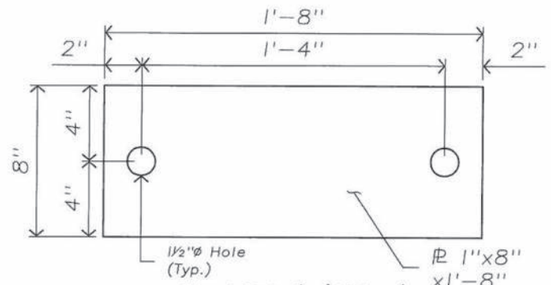
END SECTION
Scale: 5/8" = 1'-0"



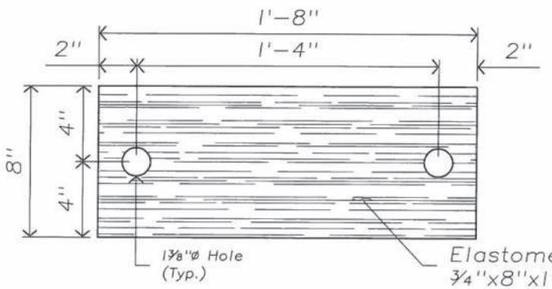
Bent ℄ Detail
Scale: 3/4" = 1'-0"



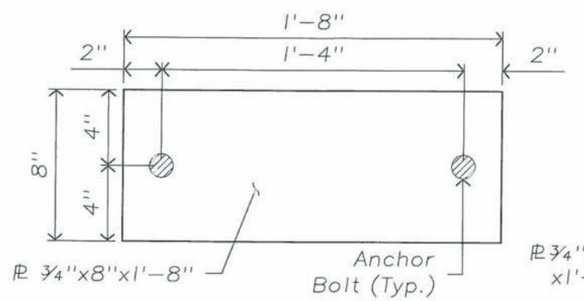
Cope Detail
Scale: 1" = 1'-0"

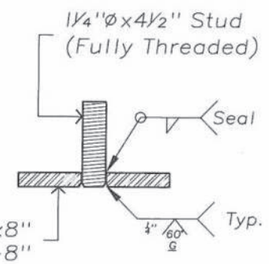


Fixed Sole ℄ (4 Thus)
Scale: 1 1/2" = 1'-0"

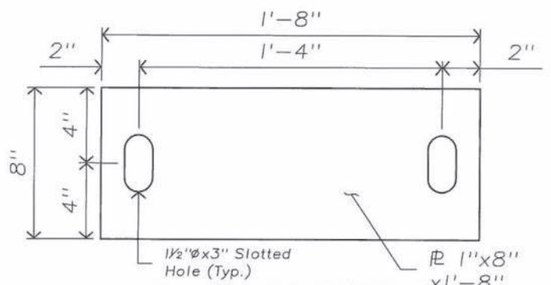


Bearing Pad (8 Thus)
Scale: 1 1/2" = 1'-0"





Anchor Plate (8 Thus)
Scale: 1 1/2" = 1'-0"



Expansion Sole ℄ (4 Thus)
Scale: 1 1/2" = 1'-0"

PRELIMINARY PLANS

RTI Fabrication, Inc.
Plains, Montana

S/N 70-14-HL93-04-3432

FRANKLIN R. MUTH — STATE OF WASHINGTON — 34212 — REGISTERED PROFESSIONAL ENGINEER

MUTH CONSULTING ENGINEERS
MISSOULA, MONTANA

PNW Civil, Inc.
70'-0" Length x 14'-0" Width
Roy Road Bridge
Whatcom County, WA

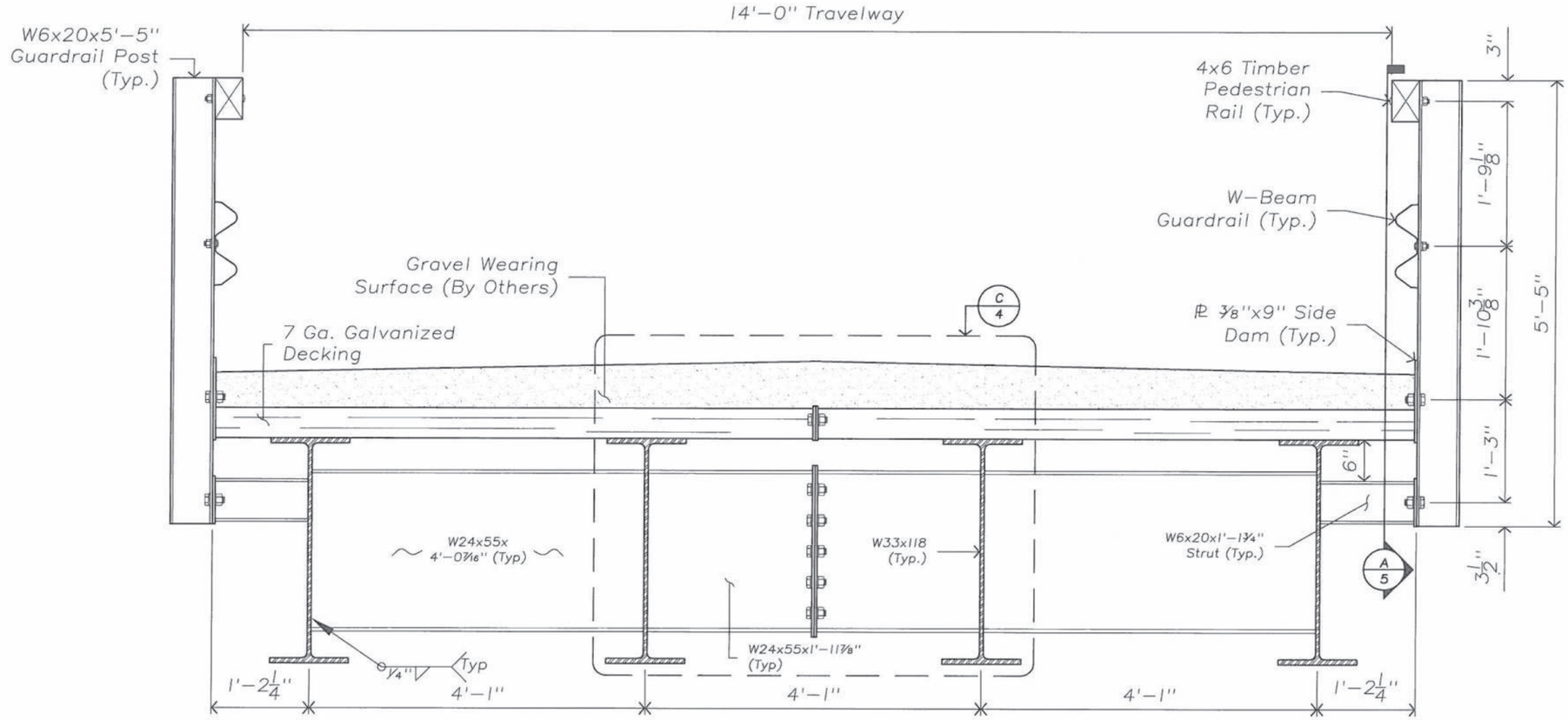
△ Date_____ Revised_____
△ Date_____ Revised_____

Engineers' Project No. : 25-M-622 | Sheet S2 of S8

Designed : AJB
Drawn : AJB
Checked : FRM
Approved :

Sheet Title :
End Section and Bearings

Plot Date: 5/16/2025



INTERMEDIATE SECTION
Scale: 5/8" = 1'-0"

Plot Date: 5/16/2025

PRELIMINARY PLANS

RTI Fabrication, Inc.
Plains, Montana

S/N 70-14-HL93-04-3432

PNW Civil, Inc.
70'-0" Length x 14'-0" Width
Roy Road Bridge
Whatcom County, WA

FRANKLIN R. MUTH STATE OF WASHINGTON 34212 REGISTERED PROFESSIONAL ENGINEER

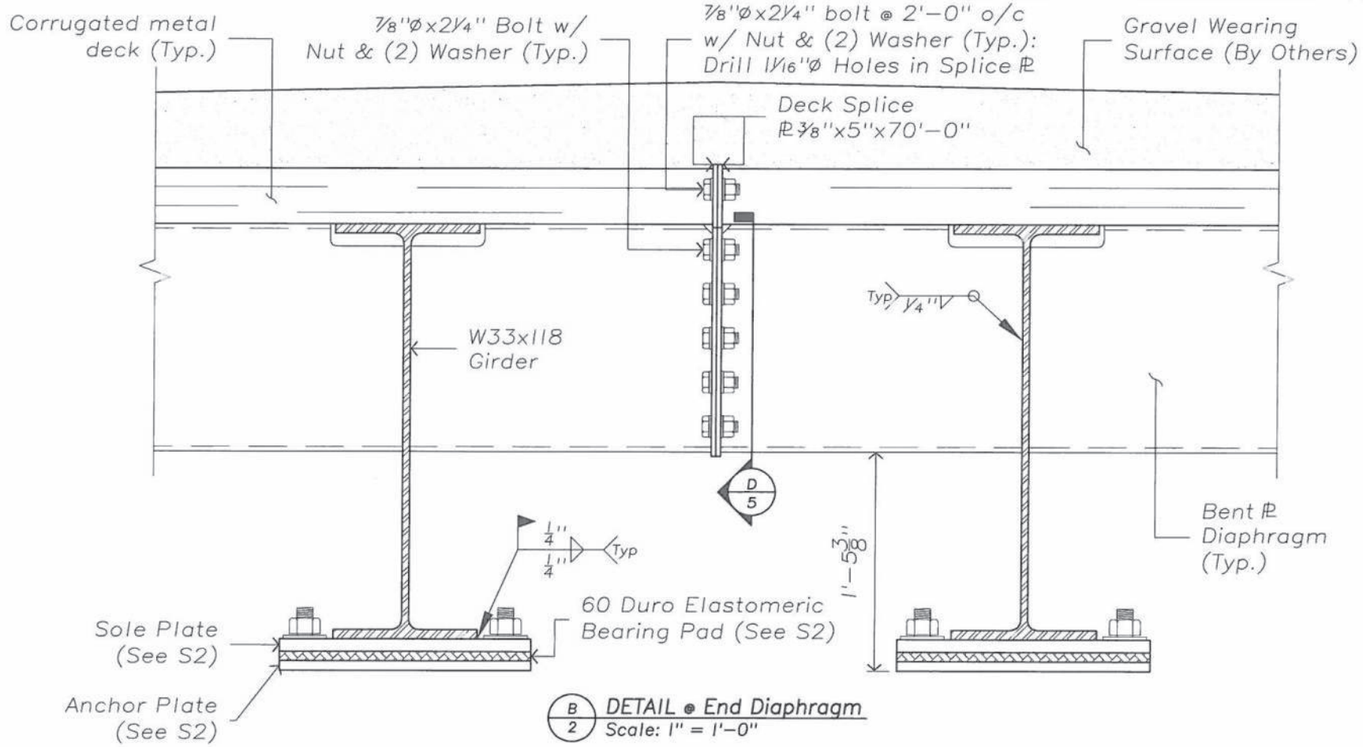
MUTH CONSULTING ENGINEERS
MISSOULA, MONTANA

△ Date_____Revised_____
△ Date_____Revised_____

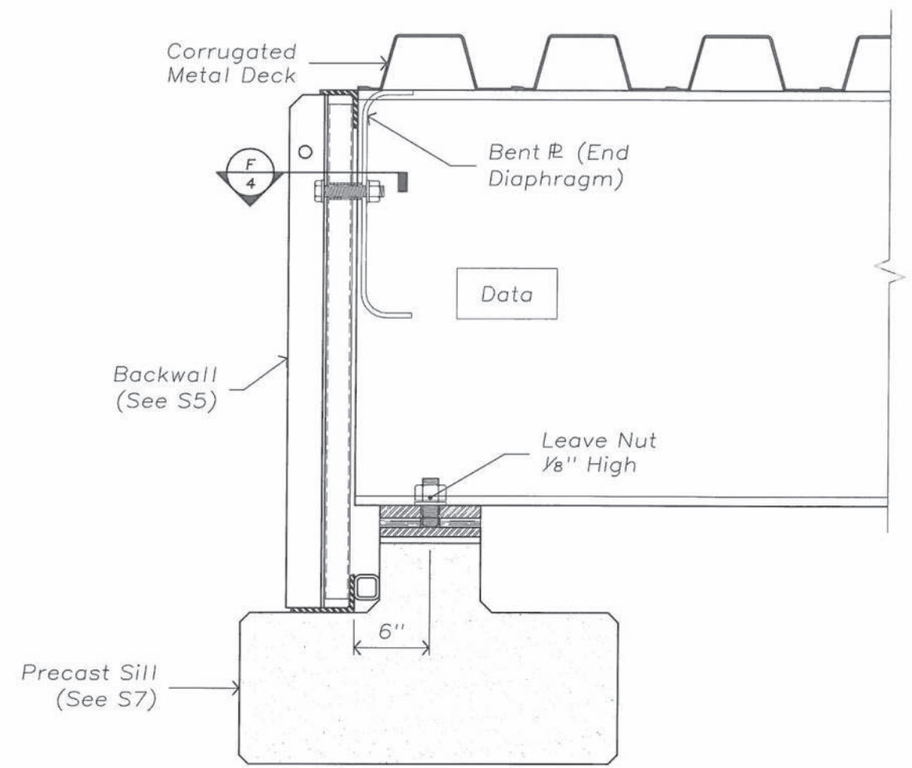
Engineers' Project No. : 25-M-622 | Sheet S3 of S8

Designed : AJB
Drawn : AJB
Checked : FRM
Approved :

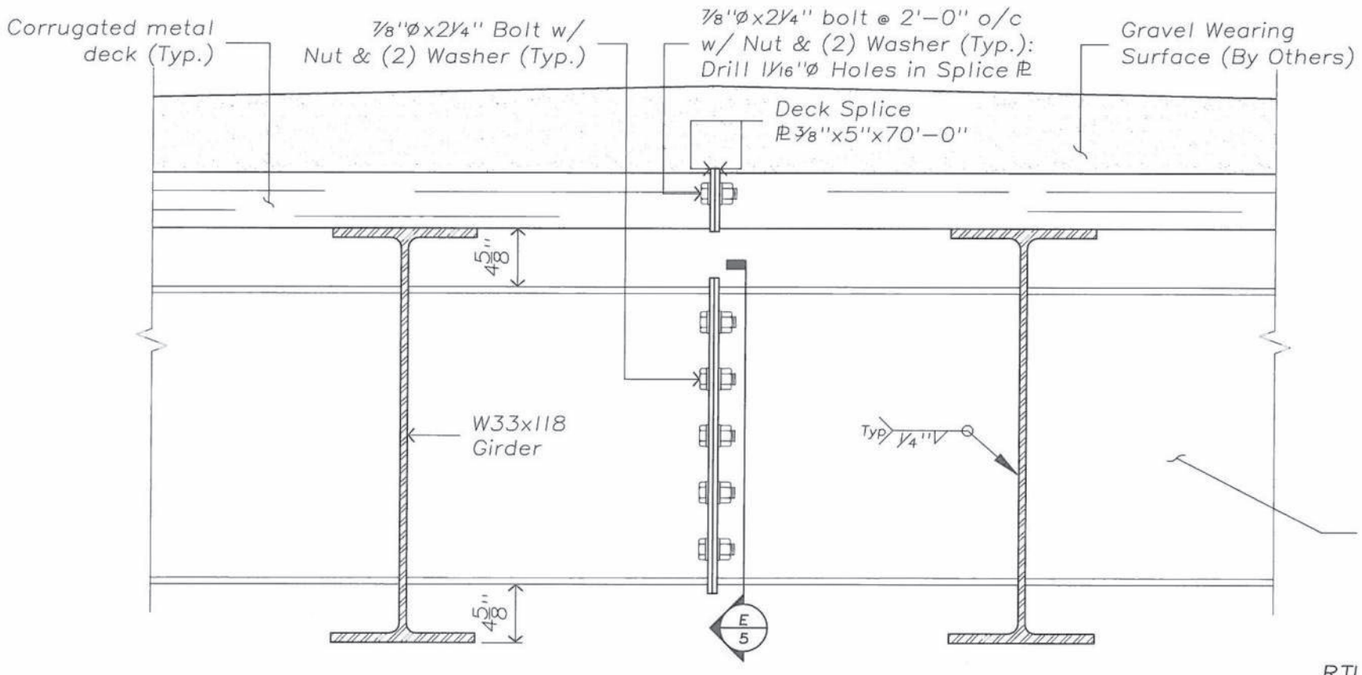
Sheet Title :
Intermediate Section



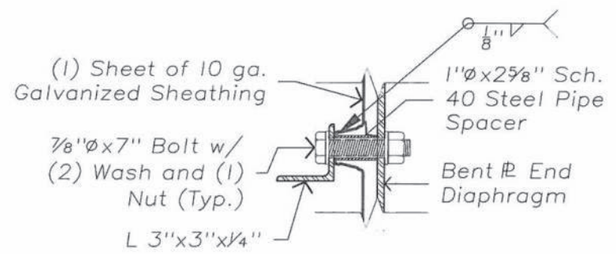
B 2 **DETAIL @ End Diaphragm**
Scale: 1" = 1'-0"



ABUTMENT DETAIL
Scale: 1" = 1'-0"



C 3 **DETAIL @ Int. Diaphragm**
Scale: 1" = 1'-0"



F 4 **Backwall Connection**
Scale: 1 1/2" = 1'-0"

FRANKLIN R. MUTH STATE OF WASHINGTON 3421 REGISTERED PROFESSIONAL ENGINEER

MUTH CONSULTING ENGINEERS MISSOULA, MONTANA

RTI Fabrication, Inc.
Plains, Montana

PRELIMINARY PLANS

S/N 70-14-HL93-04-3432

PNW Civil, Inc.
70'-0" Length x 14'-0" Width
Roy Road Bridge
Whatcom County, WA

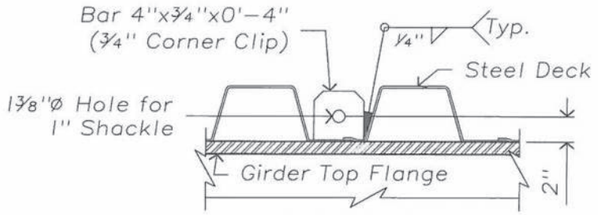
△ Date_____ Revised_____
△ Date_____ Revised_____

Engineers' Project No. : 25-M-622 | Sheet S4 of S8

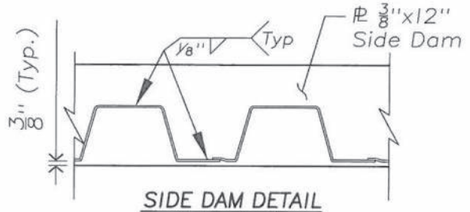
Designed : AJB
Drawn : AJB
Checked : FRM
Approved :

Sheet Title : Details

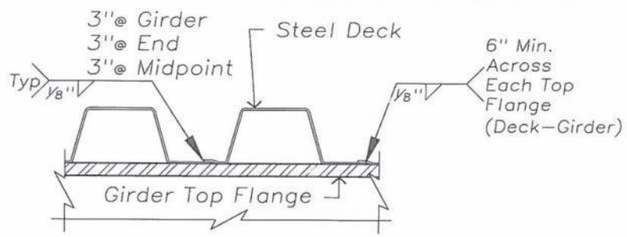
Plot Date: 5/16/2025



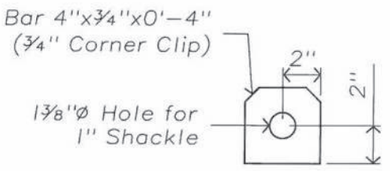
PAD-EYE DETAIL
Not to Scale



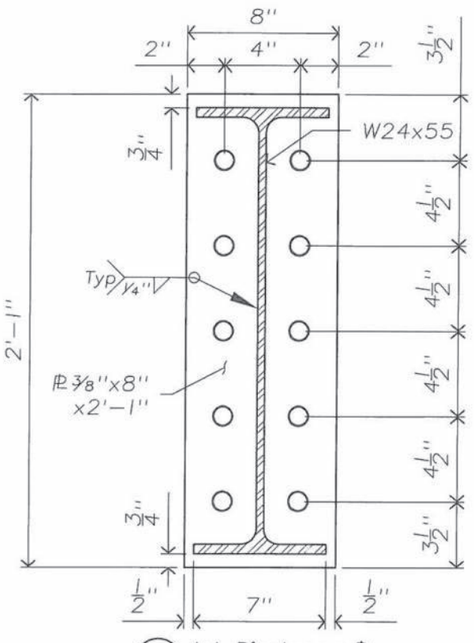
SIDE DAM DETAIL
Not to Scale



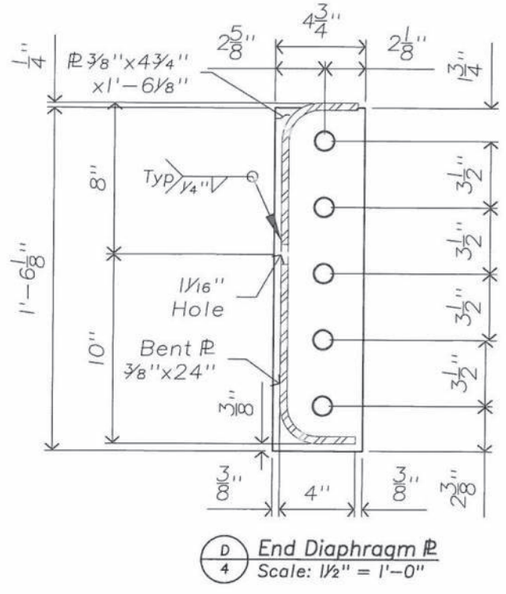
TOP. SECTION – Deck to Girder Conn.
Not to Scale



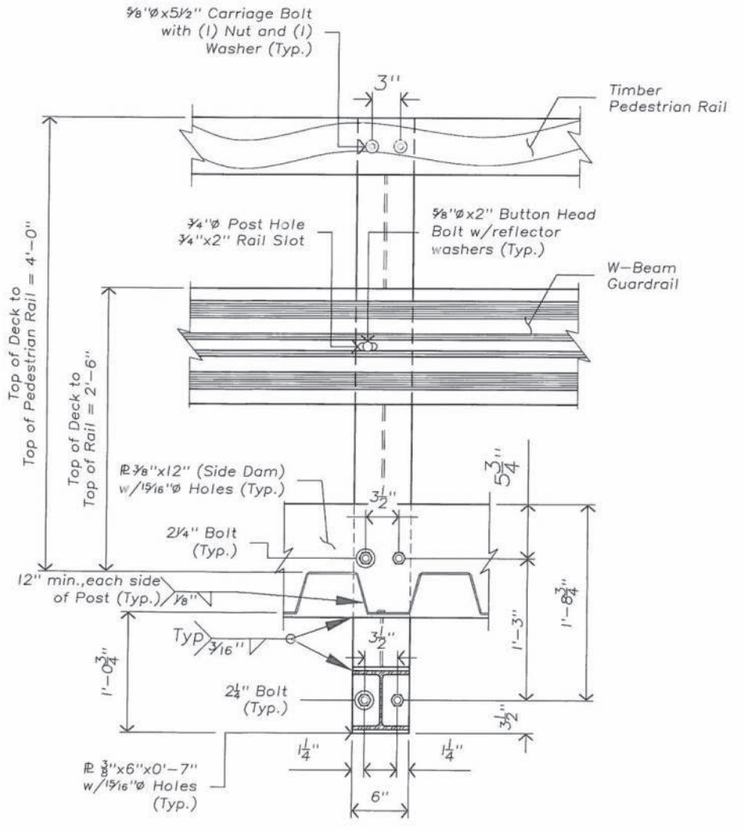
Padeye Detail
Scale: 1½" = 1'-0"



E/4 Int. Diaphragm ℄
Scale: 1½" = 1'-0"



D/4 End Diaphragm ℄
Scale: 1½" = 1'-0"



A/2 Bridge Rail Detail
Scale: ¾" = 1'-0"

FRANKLIN R. MUTH
STATE OF WASHINGTON
34212
REGISTERED
PROFESSIONAL ENGINEER

MUTH
CONSULTING ENGINEERS
MISSOULA, MONTANA

Plot Date: 5/16/2025

PRELIMINARY PLANS

RTI Fabrication, Inc.
Plains, Montana

S/N 70-14-HL93-04-3432

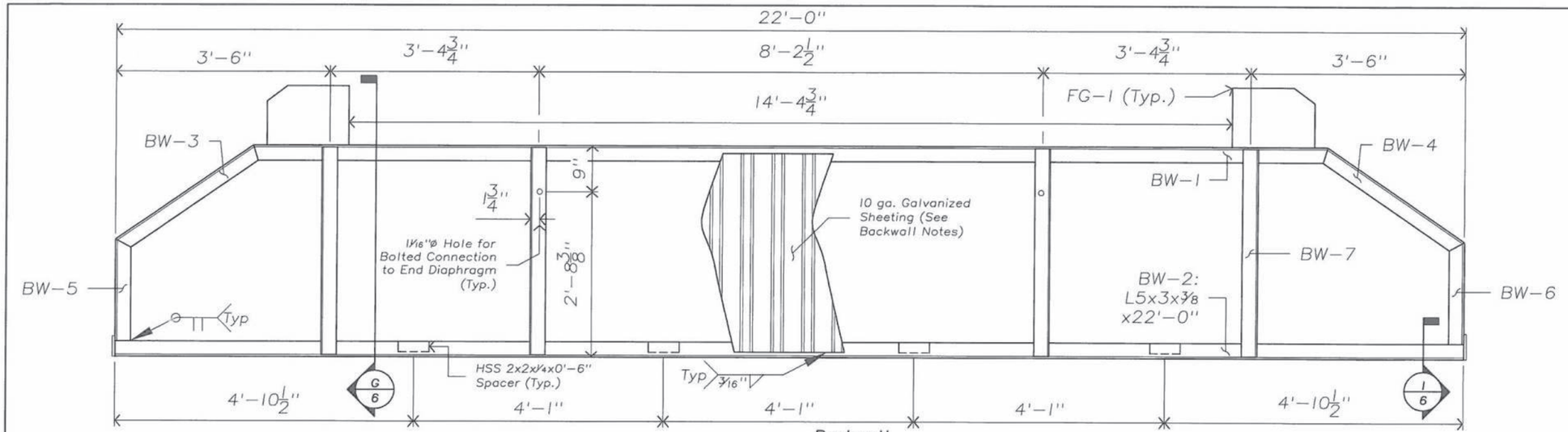
PNW Civil, Inc.
70'-0" Length x 14'-0" Width
Roy Road Bridge
Whatcom County, WA

△ Date_____ Revised_____
△ Date_____ Revised_____

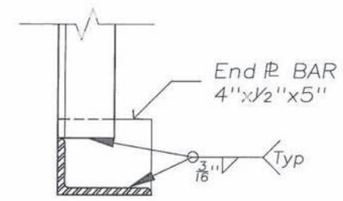
Engineers' Project No. : 25-M-622 | Sheet S5 of S8

Designed : AJB
Drawn : AJB
Checked : FRM
Approved :

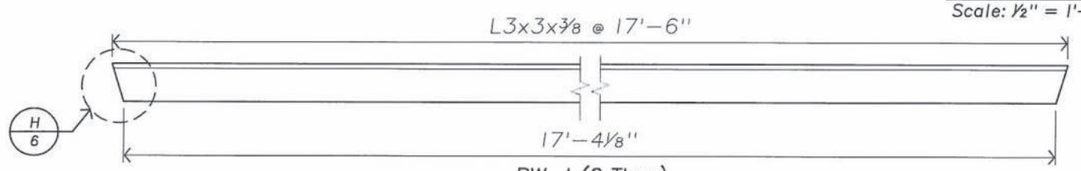
Sheet Title :
Details



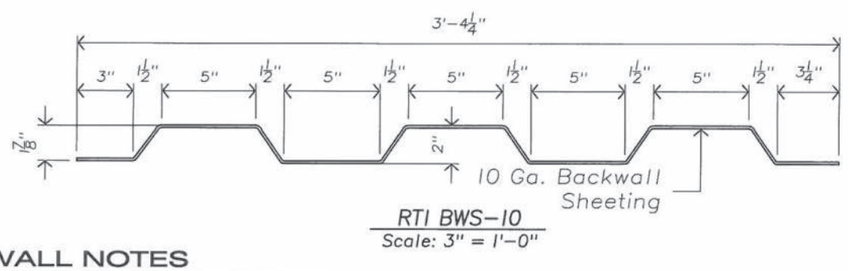
Backwall
Scale: 1/2" = 1'-0"



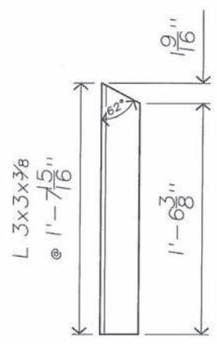
I/6 **End Pl Detail**
Scale: 1 1/2" = 1'-0"



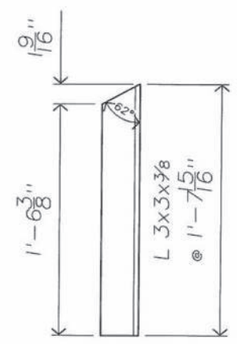
BW-1 (2 Thus)
Scale: 1" = 1'-0"



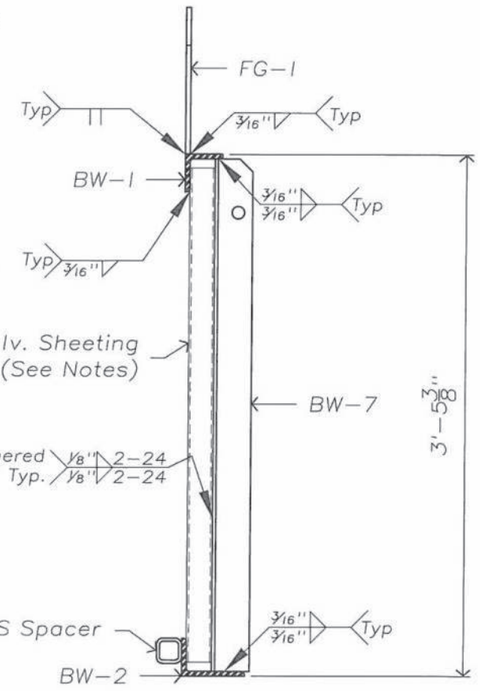
RTI BWS-10
Scale: 3" = 1'-0"



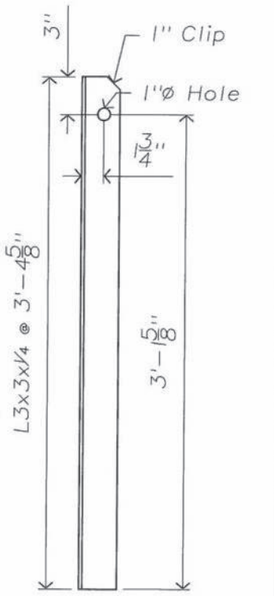
BW-5 (2 Thus)
Scale: 1" = 1'-0"



BW-6 (2 Thus)
Scale: 1" = 1'-0"



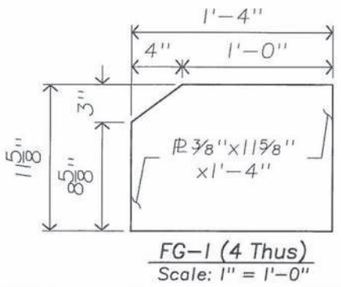
G/6 **Section**
Scale: 1" = 1'-0"



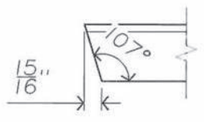
BW-7 (8 Thus)
Scale: 1" = 1'-0"

BACKWALL NOTES

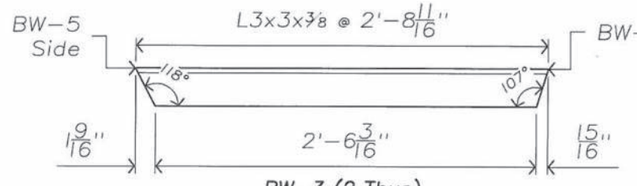
1. All backwall angles shall conform to the requirements of ASTM A572 Grade 50.
2. Steel backwall sheeting to be 2" deep by 40 1/4" lay length by 10 gauge galvanized "RTI BWS-10" conforming to the requirements of ASTM A653 (Grade 38 Minimum). Install with corrugations spanning vertically.
3. All black steel to be painted with Carboline Bitumastic 50 coal tar (Black) prior to shipment.
4. Approx. Backwall Weight = 965 lbs



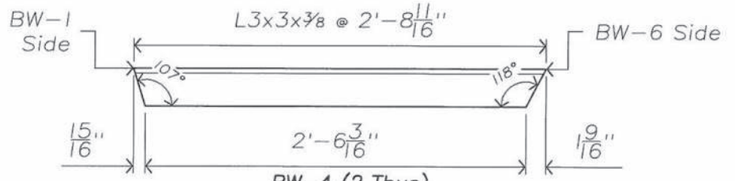
FG-1 (4 Thus)
Scale: 1" = 1'-0"



H/6 **Detail**
Scale: 1 1/2" = 1'-0"



BW-3 (2 Thus)
Scale: 1" = 1'-0"



BW-4 (2 Thus)
Scale: 1" = 1'-0"

RTI Fabrication, Inc.
Plains, Montana

PRELIMINARY PLANS

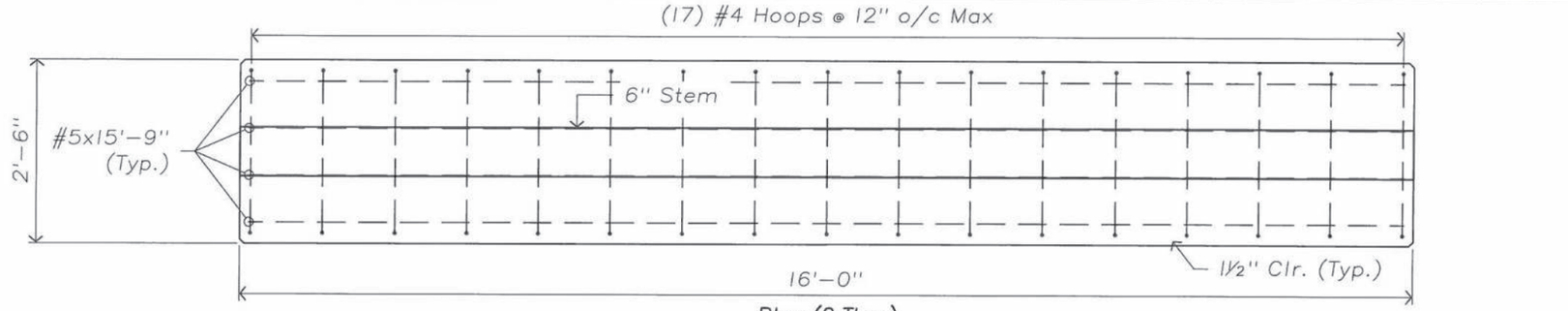
S/N 70-14-HL93-04-3432

FRANKLIN R. SMITH — STATE OF WASHINGTON — 34212 REGISTERED PROFESSIONAL ENGINEER

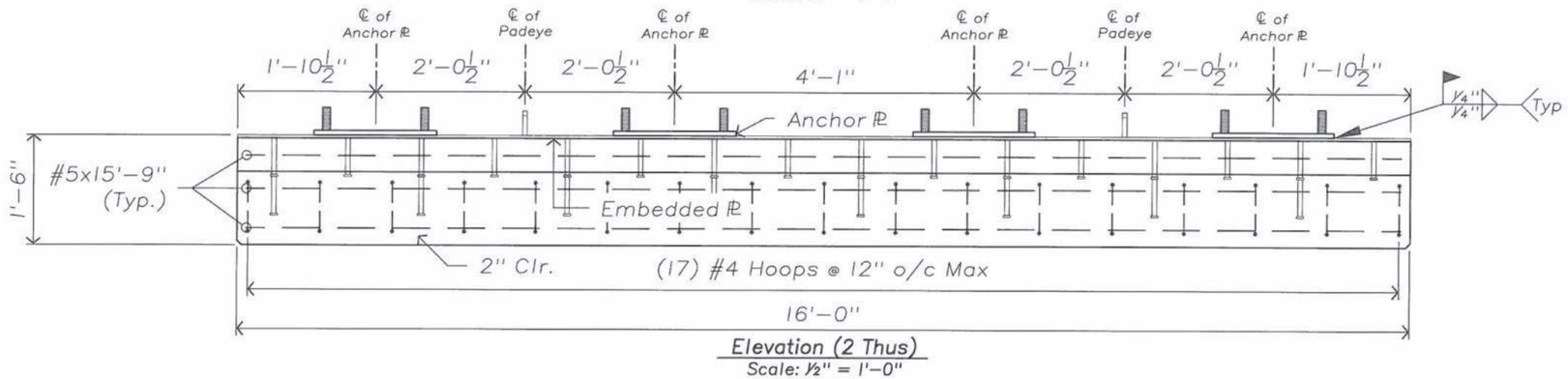
MUTH CONSULTING ENGINEERS — MISSOULA, MONTANA

PNW Civil, Inc. 70'-0" Length x 14'-0" Width Roy Road Bridge Whatcom County, WA	△ Date Revised △ Date Revised Engineers' Project No. : 25-M-622 Sheet S6 of S8 Designed : AJB Drawn : AJB Checked : FRM Approved : Sheet Title : Backwall

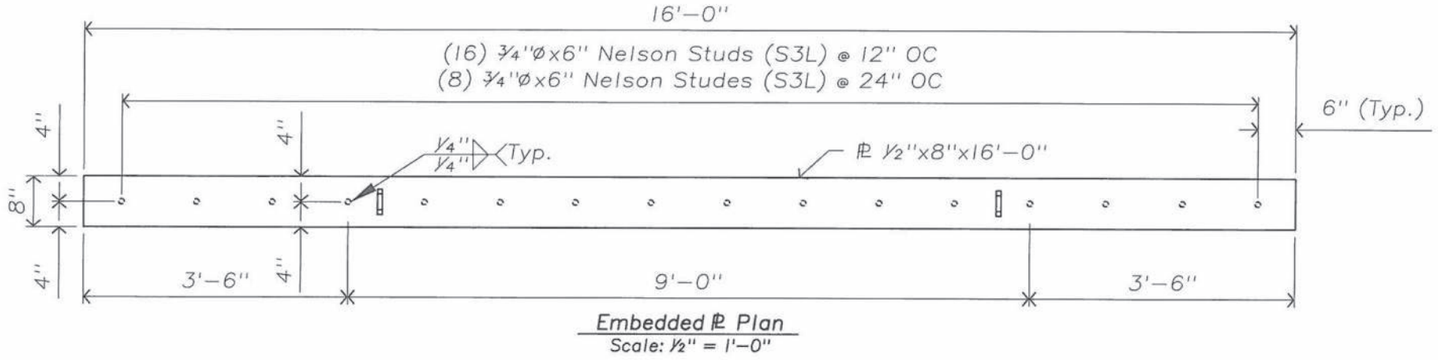
Plot Date: 5/16/2025



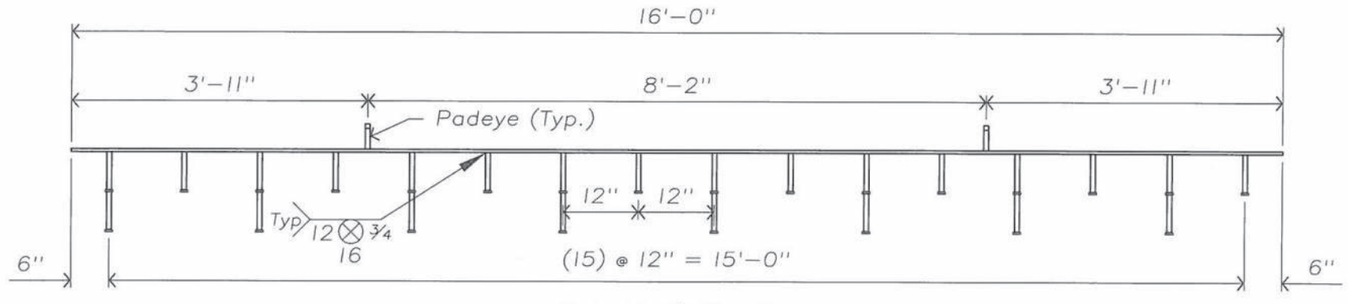
Plan (2 Thus)
Scale: ½" = 1'-0"



Elevation (2 Thus)
Scale: ½" = 1'-0"



Embedded Pl Plan
Scale: ½" = 1'-0"



Embedded Pl Elevation
Scale: ½" = 1'-0"

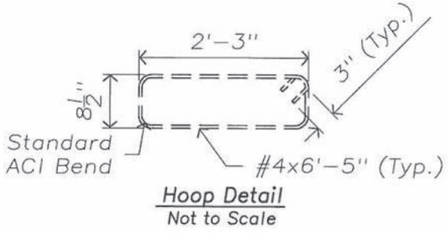
CONCRETE/REINFORCING NOTES

1. Mild steel reinforcing shall conform to the requirements of ASTM A615, Grade 60.
2. Embedment plate shall conform to the requirements of ASTM A588.
3. Shear studs to be ¾"Øx6" Nelson (S3L) Studs.
4. All concrete shall have 28 day compressive strength equal to or greater than f'c = 4000 psi.
5. All concrete shall have a compressive strength equal to or greater than f'ci = 3000 psi prior to shipping and handling.
6. All concrete shall be air entrained 5% ± 1%
7. ¾" Chamfer all exposed edges.
8. Surface finish to be "Mag Finish".

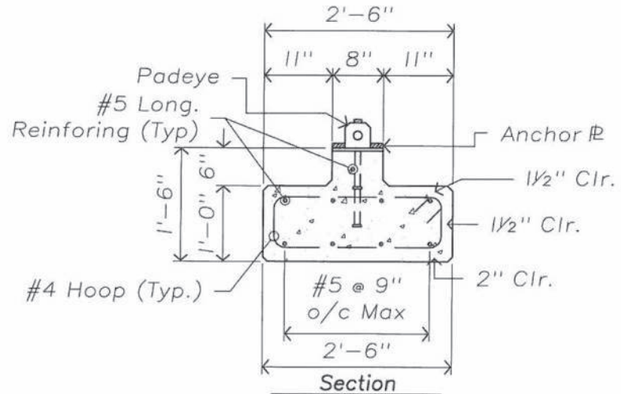
SILL SUMMARY

- (9) #5 x 15'-9"
- (17) #4 x 6'-5"
- V.C. Sill = 1.68 CY
- WT = 7,050 lb
- qsoil = 4.37 ksf (DL+LL)

(2 Thus)



Hoop Detail
Not to Scale



Section
Scale: ½" = 1'-0"

FRANKLIN R. MUTH STATE OF WASHINGTON 34212 REGISTERED PROFESSIONAL ENGINEER

MUTH CONSULTING ENGINEERS MISSOULA, MONTANA

RTI Fabrication, Inc.
Plains, Montana

PRELIMINARY PLANS

S/N 70-14-HL93-04-3432

PNW Civil, Inc.
70'-0" Length x 14'-0" Width
Roy Road Bridge
Whatcom County, WA

△ Date_____ Revised_____
△ Date_____ Revised_____

Engineers' Project No. : 25-M-622 Sheet S7 of S8

Designed : AJB
Drawn : AJB
Checked : FRM
Approved :

Sheet Title : Precast Sill

Plot Date: 5/16/2025

SUPERSTRUCTURE SUMMARY			
DESCRIPTION	DIMENSIONS	QUANTITY	TOTAL WEIGHT (lb)
Girder	W33x118x70'–0"	4	33,040.0
Mid Diaphragm	W24x55x4'–0 7/16"	4	888.0
Mid Diaphragm	W24x55x1'–11 7/8"	4	437.7
End Diaphragm	Bent PL 3/8"x24"x4'–0 7/16"	4	494.5
End Diaphragm	Bent PL 3/8"x24"x1'–11 7/8"	4	243.7
End Diaph. Plate	PL 3/8"x4 3/4"x1'–6 1/8"	4	36.6
Mid Diaph. Plate	PL 3/8"x8"x2'–1"	4	85.1
Guardrail Post	W6x20x5'–5"	24	2,600.0
Guardrail Strut	W6x20x1'–1 3/4"	24	550.0
Strut Plate	PL 3/8"x6"x0'–7"	24	107.2
Deck Splice	PL 3/8"x5"x70'–0"	2	893.2
Padeye	Bar 4"x3/4"x0'–4"	16	54.4
Sole Plate	PL 1"x8"x1'–8"	8	363.0
7 Ga. Decking Type A	7 gage Decking x 7'–3"	140	12,789.0
Side Dam	PL 3/8"x12"x70'–0"	2	2,143.8
W–Beam Guardrail (G)	12 gage x 70'–0"	2	946.4
End Terminal	Trinity 907G	4	88.0
Timber Pedestrian Rail	Full Sawn 4x6x70'–0"	2	1,166.7

PRECAST SILL SUMMARY			
DESCRIPTION	DIMENSIONS	QTY	TOTAL WEIGHT (lb)
#5 Rebar (Straight)	#5 x 15'–9"	18	295.7
#4 Rebar (Hoops)	#4 x 6'–5"	34	145.7
Embedment Plate	PL 1/2"x8"x16'–0"	2	435.6
Nelson Studs (S3L)	3/4"Ø x 6"	48	36.1
Padeye	Bar 4"x3/4"x0'–4"	4	13.6
Anchor Plate	PL 3/4"x8"x1'–8"	8	272.2

BACKWALL SUMMARY			
DESCRIPTION	DIMENSIONS	QUANTITY	TOTAL WEIGHT (lb)
10 Gage Galv. Sheeting	10 gage x 3'–3 1/8"x22'–0"	2	874.2
Top Chord (BW–1)	L 3x3x3/8x17'–6"	2	252.0
Bot. Chord (BW–2)	L 5x3x3/8x22'–0"	2	431.2
Diagonal Support (BW–3&4)	L 3x3x3/8x2'–8 1/16"	4	78.5
Side Support (BW–5&6)	L 3x3x3/8x1'–7 5/16"	4	47.9
Vertical Support (BW–7)	L 3x3x1/4x3'–4 5/8"	8	132.7
Fill Plate (FG–1)	PL 3/8"x11 5/8"x1'–4"	4	79.1
End Plate	BAR 4"x1/2"x0'–5"	4	11.3
HSS Spacer	HSS 2x2x1/4x0'–6"	8	21.6

BEARING PAD SUMMARY			
DESCRIPTION	DIMENSIONS	QUANTITY	Weight
Bearing Assembly	3/4"x8"x1'–8"	8	–

CONNECTOR SUMMARY		
DESCRIPTION	LENGTH	QUANTITY
5/8"Ø Galv. Carriage Bolt	5 1/2"	48
5/8"Ø Washer F436–1 (G)	––	48
5/8"Ø Nut A563–1 (G) DH	––	48
5/8"Ø Buttonhead	2"	56
Reflector	––	6
5/8"Ø Guardrail Nut	––	56
1"Ø Pipe Sleeve	2 5/8"	4
7/8"Ø ASTM F3125 Grade A325 Type 3	2 1/4"	162
7/8"Ø ASTM F3125 Grade A325 Type 3 (Backwall)	7"	4
7/8"Ø Washer F436–3	––	236
7/8"Ø Nut A563–3 DH	––	166
1 1/4"Ø Stud B7 Bar	4 1/2"	16
1 1/4"Ø Washer F436	––	16
1 1/4"Ø Nut ASTM A563 DH	––	16

RTI BRIDGE & FABRICATION
89 Kruger Road
Plains, MT 59859
406–826–5932

S/N: 70–14–HL93–04–3432
Mfg Date: May 16, 2025
Design Live Load: HL93

Data Plate

FRANKLIN R. MUTH STATE OF WASHINGTON 34212 REGISTERED PROFESSIONAL ENGINEER

MUTH CONSULTING ENGINEERS MISSOULA, MONTANA

PRELIMINARY PLANS

RTI Fabrication, Inc.
Plains, Montana
S/N 70-14-HL93-04-3432

PNW Civil, Inc.
70'–0" Length x 14'–0" Width
Roy Road Bridge
Whatcom County, WA

△ Date_____Revised_____
△ Date_____Revised_____

Engineers' Project No. : 25–M–622 Sheet S8 of S8

Designed : AJB
Drawn : AJB
Checked : FRM
Approved :

Sheet Title : Material List

Plot Date: 5/16/2025

CHINOOK ENGINEERING

860 Windrose Drive
Coupeville, WA 98239
(360) 672-5528 | www.chinook-engineering.com

REQUEST FOR BIDS

INSTRUCTIONS TO BIDDERS AND SPECIAL CONDITIONS

Sudden Valley Fish Passage and Culvert Improvements

~~*Three-Project Combined Bid Package*~~

~~**Schedule A — Polo Park Fish Passage Culvert Replacement**~~

Schedule B — Roy Road Fish Passage Culvert Replacement

~~**Schedule C — Tumbling Waters Main Culvert Foundation Underpinning**~~

Sudden Valley, Whatcom County, Washington

Sponsor: Sudden Valley Community Association (SVCA)

Project Engineer: Jay S. Kidder, P.E. — Chinook Engineering

Issued: June 25th **2026**

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Coupeville, WA 98239
(360) 672-5528 | www.chinook-engineering.com

ACRONYMS AND ABBREVIATIONS

BMP	Best Management Practices
CE	Chinook Engineering
Contractor	Chosen contractor selected to complete the subject work
EOR	Engineer of Record (Project Engineer)
FPCC	Fire Prevention Control and Countermeasures Plan
HPA	Hydraulic Project Approval (WDFW)
LF	Linear Foot
LWM	Large Woody Material
PM	Project Manager
PE	Professional Engineer
SPCC	Spill Prevention, Control and Countermeasures Plan
Sponsor	Sudden Valley Community Association (SVCA)
SVCA	Sudden Valley Community Association
WDFW	Washington Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation
WSST	Washington State Sales Tax
"Section 1-05.3"	Example WSDOT M41-10 Section reference

Contract documents for: Sudden Valley Community Association — Sudden Valley Fish Passage and Culvert Improvements (~~Three-Project Combined Bid Package~~).

The Notification of Bids, Form of Proposal, Bid Form, Notice to Bidders, General Conditions, and Special Conditions have been prepared and compiled under the direct supervision of the following Registered Professional Engineer:

Jay S. Kidder, P.E. Washington License #25405

CHINOOK ENGINEERING

860 Windrose Drive

Coupeville, WA 98239

(360) 672-5528 | www.chinook-engineering.com

Date: June 26th, 2026

860 Windrose Drive
Coupeville, WA 98239
(360) 672-5528 | www.chinook-engineering.com

PROJECT POINTS OF CONTACT

Sudden Valley Community Association (Owner)	
Office Phone	360-734-6430
Mailing Address	1850 Lake Whatcom Blvd., Bellingham, WA 98229
PNW Services, Inc. (Construction Manager)	
Project Manager	Tyler Andrews
Office Phone	[Office] (425) 954-9614
Email	[tylera@pnwcivil.com]
Mailing Address	PO Box 28273, Bellingham, WA 98228
Chinook Engineering (Project Engineer)	
Project Engineer	Jay S. Kidder, P.E.
Office / Cell	(360) 672-5528
Email	jay@chinook-engineering.com
Mailing Address	860 Windrose Drive, Coupeville, WA 98239

For information, please contact the Project Manager or Project Engineer.

SUMMARY AND INSTRUCTIONS TO BIDDERS

The Sudden Valley Community Association (SVCA) is requesting bids for the Sudden Valley Fish Passage and Culvert Improvements, a privately funded, ~~three project combined~~ bid package within the Sudden Valley community near Lake Whatcom, Whatcom County, Washington. The work is issued under one common set of Special Conditions and Amendments to the WSDOT M41-10 Standard Specifications, with a separate schedule of bid items for each project:

~~**Schedule A — Polo Park Fish Passage Culvert Replacement.** Removal of an existing undersized culvert at the Polo Park roadway crossing and replacement with an owner-supplied prefabricated bridge bearing on driven steel sheet pile abutments. Work includes road embankment removal, dewatering, fish exclusion, sheet pile installation, bridge placement and assembly, stream channel reconstruction with streambed aggregate placement, and road and site restoration.~~

Schedule B — Roy Road Bridge Replacement. Removal of an existing bridge at the Roy Road crossing and replacement with an owner-supplied prefabricated bridge. Scope is functionally similar to Schedule A, sized and configured per the Contract Drawings for the Roy Road site.

~~**Schedule C — Tumbling Waters Main Culvert Foundation Underpinning.** Foundation underpinning of the existing main culvert. Work consists of tremie or grout placement beneath scoured zones of the culvert foundation and restoration of streambed sediments and scour apron. This Schedule does not include removal or replacement of the existing culvert barrel.~~

Bidding Instructions and Conditions:

1. This is a private project of the SVCA. Bids will be issued to a limited list of SVCA-vetted contractors. Bids shall be emailed to Tyler Andrews, PNW Services, Inc., at tylera@pnwcivil.com by the date and time shown in the Project Schedule. Bid results will be emailed to submitting bidders within 24 hours of the bid due date.
2. Bidders shall complete and submit the Bid Form (Bid Sheets 1 through 9) in its entirety, ~~including the Schedule of Quantities for all three Schedules (A, B, and C) and the List of Subcontractors.~~ Include the company name on all pages and acknowledge receipt of all Addenda. Proposals will be accepted in electronic format only.
3. ~~Award may be made for all three Schedules to a single Contractor, or, at the owner's sole discretion, for one or two Schedules only.~~ The owner reserves the right to reject any and all bids. ~~Mobilization, Dewatering, Sheet Piling, and other common items shall be priced separately within each Schedule so the owner can fairly compare partial awards.~~ Bidders shall hold base bid prices for forty-five (45) days from bid opening.
4. Bidders are encouraged to independently visit each of the three sites prior to bidding; no formal pre-bid meeting is scheduled. Site locations are shown on the Contract Drawings.
5. A bid bond is not required. Performance and Payment Bonds will be required of the awarded Contractor for the full Contract amount including Washington State Sales Tax.
6. Change order and force account work will be allowed a 15% markup for overhead and profit. Contractor shall provide proposed force account rates for labor and equipment with the Bid Proposal.
7. This Project is privately funded. Washington State Prevailing Wage Law (RCW 39.12) and the federal Davis-Bacon Act do not apply. The Contractor shall comply with all other applicable Washington State and federal labor, safety, workers' compensation, and industrial insurance laws, including those of the Washington State Department of Labor and Industries (L&I).
8. The owner is responsible for all environmental and land-use permits. Whatcom County permits (right-of-way, grading, stormwater, and land-use approvals) and SVCA community approvals are

complete and on file with the owner; copies will be provided to the awarded Contractor. The WDFW Hydraulic Project Approval (HPA) is in hand and is included in this request for bids. The anticipated in-water work window is July 15, 2026 through September 30, 2026, subject to final HPA terms.

9. Installation shall follow the WSDOT M41-10 Standard Specifications and the attached Amendments and Special Conditions. The owner will hire the testing agency. The full Contract terms are governed by SVCA's standard construction contract, a copy of which is attached. Contractor shall warranty all work for one (1) year from final completion.

Attachments: Bid Form (Bid Sheets 1–9); Amendments and Special Conditions; Contract Drawings ~~(separate plan sets for each Schedule);~~ bridge drawings from ~~Rapid Span and~~ RTI; geotechnical reports; applicable permits; and SVCA's standard construction contract.

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Coupeville, WA 98239
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BID SHEET 1 — BID PROPOSAL

Bidder Name: _____

Address: _____

For the construction of:

Sudden Valley Fish Passage and Culvert Improvements ~~(Three Project Combined Bid Package),~~ hereinafter referred to as the Project.

Owner: Sudden Valley Community Association (SVCA)

We, the undersigned, having examined the Invitation to Bidders and the Contract Documents for the completion of the work, and having investigated each of the three project sites, offer to construct and complete the work in conformity with said documents, and to enter into an agreement according to the form hereto attached, in consideration of the unit price total arrived at by the proper extension of units of work shown in the following Schedule of Quantities (Schedules A, B, and C), or such sum as may be ascertained in accordance with said documents.

We acknowledge receipt, understanding, and full consideration of Addenda Number(s):

_____ (blank or "NA" if no addenda have been issued).

Signature: _____

BID SHEET 2 — SCHEDULE A: POLO PARK FISH PASSAGE CULVERT REPLACEMENT

Contractor Name: _____

SUDDEN VALLEY FISH PASSAGE AND CULVERT IMPROVEMENTS
Schedule A — Polo Park Culvert Replacement
Owner: Sudden Valley Community Association (SVCA) | Engineer: Chinook Engineering — Jay S. Kidder, P.E. | Bid Form

Bidder Name:
Date:

Item	Spec Section	Description	Unit	Approx. Qty	Unit Price	Extension
1	*1-09.7*	Mobilization and Demobilization	LS	1		$ -
2	*1-07.16*	Temporary Construction Access and Staging, De-watering and fish removal	LS	1		$ -
3	*1-05.4*	Construction Surveying	LS	1		$ -
4	*2-01*	Clearing and Grubbing	LS	1		$ -
5	*2-01.3*	Tree Falling and Removal	EA	8		$ -
6	*2-02*	Removal of Structures and Obstructions (existing culvert)	LS	1		$ -
7	*2-03*	Common Excavation Including Haul and Disposal	CY	240		$ -
8	*2-03*	Common Excavation Including Placement	CY	80		$ -
9	*4-04*	Crushed Road Base	TON	60		$ -
10	*4-04*	Crushed Surfacing Top Course	TON	40		$ -
11	*5-04*	Hot Mix Asphalt (HMA) Class 3/8 In., 4 in. Depth in 2 Lifts	TON	40		$ -
12	*6-05*	Bridge Foundation Sheet Piling PZ-22	LF	950		$ -
13	*6-05*	Sheet Pile Corner SKP90	EA	4		$ -
14	*6-03*	Bridge Movement and Assembly Installation, from SVCA Maintenance Yard to Site (Owner-Supplied Prefab	LS	1		$ -
15	*6-03*	Install Owner-Supplied Prefab Bridge (LABOR ONLY - bridge by Owner)	LS	1		$ -
16	*8-26*	Streambed Sediment	CY	50		$ -
17	*8-26*	Streambed Cobbles	CY	25		$ -
18	*8-30*	Dewatering System Pipe and Sheet Pile Diversion	LS	1		$ -
19	*8-01*	Erosion Control and Water Pollution Control	LS	1		$ -
20	*8-02*	Site Restoration (Seed, Mulch, Coir)	LS	1		$ -
21	*9-14*	Coir Fabric, 9.8' x 165' rolls	EA	8		$ -
22	*1-10*	Traffic Control	LS	1		$ -
23	*1-09 (SP)*	Additional Work Allowance (Owner-set Unit Price; for unanticipated work directed by Owner)	LS	1	$ 10,000.00	$ 10,000.00
					Schedule A Construction Cost Subtotal	**$ 10,000.00**
					Washington State Sales Tax 8.800%	**$ 880.00**
					SCHEDULE A TOTAL (Construction Cost + Sales Tax)	**$ 10,880.00**

Approximate quantities are for bidding purposes only. Unit prices shall be utilized for any additive or deductive work within 30% of the Total Bid for this Schedule, including

Please submit actual Excel bid form as supplied. Approximate quantities shown above are for bidding purposes only. Actual quantities install shall be paid. The unit prices shall be utilized for any additive and deductive work within thirty percent (30%) of the Total Bid for this Schedule, including sales tax.

BID BID SHEET 3 — SCHEDULE B: ROY ROAD BRIDGE REPLACEMENT

See Updated Bid Form

Contractor Name: _____

SUDDEN VALLEY FISH PASSAGE AND CULVERT IMPROVEMENTS
Schedule B — Roy Road Bridge Replacement
Owner: Sudden Valley Community Association (SVCA) | Engineer: Chinook Engineering — Jay S. Kidder, P.E. | Bid Form

Bidder Name:
Date:

Item	Spec Section	Description	Unit	Approx. Qty	Unit Price	Extension
1	1-09.7	Mobilization and Demobilization	LS	1		$ -
2	1-07.16	Temporary Construction Access and Staging, De-watering and fish removal.	LS	1		$ -
3	1-05.4	Construction Surveying	LS	1		$ -
4	2-01	Clearing and Grubbing	LS	1		$ -
5	2-01.3	Tree Falling and Removal	EA	8		$ -
6	2-02	Removal of Structures and Obstructions (existing bridge)	LS	1		$ -
7	2-03	Common Excavation Including Haul and Disposal	CY	120		$ -
8	2-03	Common Excavation Including Placement	CY	80		$ -
9	4-04	Crushed Road Base	TON	60		$ -
10	4-04	Crushed Surfacing Top Course	TON	40		$ -
11	6-02	Bridge Foundation Concrete Footing (incl. rebar, formwork, finishing)	CY	60		$ -
12	6-03	Concrete Foundation Anchor Bolts, Sole Plates, and Bearing Assemblies	LS	1		$ -
13	6-03	Bridge Movement and Assembly Installation, from SVCA Maintenance Yard to Site (Owner-Supplied Prefab Bridge)	LS	1		$ -
14	6-03	Install Owner-Supplied Prefab Bridge (LABOR ONLY - bridge by Owner)	LS	1		$ -
15	8-26	Streambed Sediment	CY	50		$ -
16	8-26	Streambed Cobbles	CY	25		$ -
17	8-30	Dewatering System Pipe and Sheet Pile Diversion	LS	1		$ -
18	8-01	Erosion Control and Water Pollution Control	LS	1		$ -
19	8-02	Site Restoration (Seed, Mulch, Coir)	LS	1		$ -
20	9-14	Coir Fabric, 9.8' x 165' rolls	EA	8		$ -
21	1-10	Traffic Control	LS	1		$ -
22	1-09 (SP)	Additional Work Allowance (Owner-set Unit Price; for unanticipated work directed by Owner)	LS	1	$ 10,000.00	$ 10,000.00
					Schedule B Construction Cost Subtotal	$ 10,000.00
					Washington State Sales Tax 8.800%	$ 880.00
					SCHEDULE B TOTAL (Construction Cost + Sales Tax)	$ 10,880.00

Approximate quantities are for bidding purposes only. Unit prices shall be utilized for any additive or deductive work within 30% of the Total Bid for this Schedule, including sales tax.

Please submit actual Excel bid form as supplied. Approximate quantities shown above are for bidding purposes only. Actual quantities installed shall be paid. The unit prices shall be utilized for any additive and deductive work within thirty percent (30%) of the Total Bid for this Schedule, including sales tax.

BID SHEET 4 — SCHEDULE C: TUMBLING WATERS MAIN CULVERT FOUNDATION UNDERPINNING

Contractor Name: _____

SUDDEN VALLEY FISH PASSAGE AND CULVERT IMPROVEMENTS
Schedule C — Tumbling Waters Main Culvert Foundation Underpinning
Owner: Sudden Valley Community Association (SVCA) | Engineer: Chinook Engineering — Jay S. Kidder, P.E. | Bid Form

Bidder Name:
Date:

Item	Spec Section	Description	Unit	Approx. Qty	Unit Price	Extension
1	1-09.7	Mobilization and Demobilization	LS	1		$ -
2	1-07.16	Temporary Construction Access and Staging	LS	1		$ -
3	1-05.4	Construction Surveying	LS	1		$ -
4	2-01	Clearing and Grubbing (limited to access)	LS	1		$ -
5	8-30	Dewatering System Pipe and Sheet Pile Diversion	LS	1		$ -
6	8-01	Erosion Control and Water Pollution Control	LS	1		$ -
7	6-02	Concrete Underpinning, Grout Pumped In Place	CY	20		$ -
8	2-03	Common Excavation Including Haul and Disposal	CY	40		$ -
9	2-03	Common Excavation Including Placement	CY	25		$ -
10	8-26	Streambed Sediment (Scour Apron Restoration)	CY	20		$ -
11	8-26	Streambed Cobbles	CY	12		$ -
12	8-02	Site Restoration (Seed, Mulch, Coir)	LS	1		$ -
13	1-10	Traffic Control	LS	1		$ -
14	1-09 (SP)	Additional Work Allowance (Owner-set Unit Price; for unanticipated work directed by Owner)	LS	1	$ 10,000.00	$ 10,000.00
					Schedule C Construction Cost Subtotal	**$ 10,000.00**
					Washington State Sales Tax 8.800%	**$ 880.00**
					SCHEDULE C TOTAL (Construction Cost + Sales Tax)	**$ 10,880.00**

Approximate quantities are for bidding purposes only. Unit prices shall be utilized for any additive or deductive work within 30% of the Total Bid for this Schedule, including sales tax.

Please submit actual Excel bid form as supplied. Approximate quantities shown above are for bidding purposes only. Actual quantities installed shall be paid. The unit prices shall be utilized for any additive and deductive work within thirty percent (30%) of the Total Bid for this Schedule, including sales tax.

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BID SHEET 5 — COMBINED BID TABULATION AND GRAND TOTAL

Contractor Name: _____

Schedule	Construction Cost	Schedule Total (incl. Sales Tax)
~~Schedule A — Polo Park Culvert Replacement~~	$	$
Schedule B — Roy Road Culvert Replacement	$	$
~~Schedule C — Tumbling Waters Main Culvert Foundation Underpinning~~	$	$
GRAND TOTAL — Combined Bid for Schedules A + B + C (including Sales Tax)		**$**

Notes on Award:

- ~~If the owner elects to award only one or two of the three Schedules, the basis of award shall be the sum of the Schedule Total(s) of the awarded Schedule(s) including sales tax.~~
- Unit prices shall remain valid for any combination of Schedules awarded.
- Contractor shall hold all base bid prices for forty-five (45) calendar days from the date of bid opening.
- Sales tax shown is the Whatcom County combined rate at the time this document was prepared (8.8%). The actual rate applied at the time of invoice shall be the Washington Department of Revenue published combined rate for the project location.

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BID SHEET 6 — LIST OF SUBCONTRACTORS

(See Section 1-02.6 of Amendments to the Standard Specification.)

For each category of work in this project, the bidder shall identify the category of any work expected to be more than five percent (5%) of the total combined work and the Subcontractor performing it. Failure to list Subcontractors shall render the bid NONRESPONSIVE.

Project Name: Sudden Valley Fish Passage and Culvert Improvements — Three Project Combined Bid Package

Prime Contractor Name: _____

Firm Name and Address	Type of Work
Subcontractor	
Subcontractor	
Subcontractor	
Subcontractor	
Subcontractor	
Subcontractor	

BID SHEET 8 — PROJECT SCHEDULE

Contractor Name: _____

Advertisement for Bids	June 26, 2026
Documents Available	June 26, 2026
Pre-Bid Meeting and Site Visit Visit on your own.	None is scheduled
Bids Due, 2 pm	July 9, 2026
~~Signed Contract~~ SVCA Board Approval	~~Prior to~~ July 23, 2026
Notice to Proceed - after contract execution, anticipated	~~Prior to~~ August 3, 2026
On-Site Staging, Tree Cutting, ~~Sheet Piling,~~ and Preparation	August 3, 2026 (earliest start)
In-Water Work Anticipated Start Date	July 16, 2026
In-Water Work Closure (per WDFW HPA)	September 30, 2026
Substantial Completion ~~(all three Schedules)~~	September 30, 2026
Complete Project ~~(all three Schedules)~~	October 31, 2026

Construction Sequence Approach

To be added and elaborated upon in Section 1-05.3 Sudden Valley Fish Passage and Culvert Improvements Contract Drawings, a written Construction Work Plan short narrative is requested at the time of signing the contract. It ~~shall address all three Schedules and~~ should include:

- ~~Haul routes for equipment and access methods to each of the three project sites, including staging and bridge off-loading locations and areas anticipated or agreed to between Contractor and Landowners.~~
- ~~Dewatering plan for each excavation and fishway removal.~~
- Other indicated submittals in this instruction.
- ~~Combined~~ Construction Schedule with critical path identified, showing the proposed sequence among Schedules ~~A,~~ B, and ~~C~~.
- Spill Prevention, Control and Countermeasures (SPCC) Plan.
- ~~Fire Prevention Control and Countermeasures (FPCC) Plan.~~

The Schedule shall be used for planning purposes and the milestones above shall act as legal dates for completion.

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— BID SHEET 9 — SUBMITTAL SIGNATURES

Sudden Valley Fish Passage and Culvert Improvements ~~(Three Project Combined Bid Package~~), Unit Price Contract.

By signing this you are signifying your interest in constructing the subject project(s) and it is your intent to enter into a written contract for delivery of the constructed project(s).

This Construction contract falls under the Standard Specifications for Road, Bridge and Municipal Construction, "current" M41-10, as published by the Washington State Department of Transportation (WSDOT), and is hereby appended. Attached is a copy of SVCA's construction contract.

Total ~~Combined~~ Unit Price Cost (written):

$ _____

Total ~~Combined~~ Unit Price Cost (numerical):

$ _____

Signatures:

_____ _____

Signature and Title *Date*

_____

Company Name, Address

We agree to begin work no later than _____ and to proceed so as to complete the project no later than _____.

We agree to provide performance and payment bonds.

DATED this _____ day of _____ 2026, at _____, Washington.

ADDRESS OF BIDDER (Principal Place of Business):

_____

Firm Name

By: _____

Signature

Telephone: _____ **Printed Name and Title:** _____

If the bidder is a corporation, this proposal must be executed by its duly authorized officials.

Contractor's State Registration Number: _____

State Industrial Insurance Number: _____

CONSTRUCTION CONTRACT

The Contract for this work shall be the Sudden Valley Community Association's standard construction contract, a copy of which is attached to this bid package. The successful bidder shall execute that contract, incorporating the accepted Bid Proposal, these Amendments and Special Conditions, the WSDOT M41-10 Standard Specifications, and the Contract Drawings.

AMENDMENTS AND SPECIAL CONDITIONS

Introduction

The Project shall be constructed in accordance with the *Washington State Department of Transportation Standard Specifications for Road, Bridge and Municipal Construction 2024 or current* (WSDOT Standard Specifications), including revisions in the following Amendments to the Special Conditions. Additional specifications in the following sections describe items not covered by the WSDOT Standard Specifications.

General Requirements and Amendments to the Standard Specifications

The following Amendments to the Standard Specifications are made a part of this Contract and supersede any conflicting provisions of the Standard Specifications. Each Amendment contains all current revisions to the applicable section of the Standard Specifications and may include references which do not apply to this particular project. All three Schedules (A, B, and C) shall be governed by the same Amendments and Special Conditions below unless explicitly noted otherwise.

DIVISION 1 — GENERAL REQUIREMENTS

1-01 Definitions and Terms — Local Agency

The following substitution of words shall prevail in the Standard Specifications:

- Wherever the word "State" is used, it shall mean the Sudden Valley Community Association (SVCA).
- Wherever the words "State Treasurer" are used, they shall mean the Sudden Valley Community Association.
- Wherever the words "State Auditor" are used, they shall mean the Sudden Valley Community Association Office.

Wherever, in the Contract, the specifications, and other Contract documents, the following words and terms or pronouns in place of them are used, the meaning will be construed as follows:

- Board, Board of Directors: The body having authority over the SVCA matters as provided by law and the SVCA bylaws.
- Engineer or EOR: The Project Engineer, Engineer of Record, acting directly or through their duly authorized representative.
- Laboratory: The laboratory designated by the Project Engineer of Record (EOR).
- Item of Work: For the purpose of this project, an item of work shall be considered a unit of work. Payment will be made for actual work performed at the Unit Contract Price for completed units of work.

1-02 Bid Procedures and Conditions

1-02.2 Plans and Specifications

This section is revised to read:

Bidders and contractor shall print their own contract documents.

1-02.3 Estimated Quantities

Include as written.

1-02.4 Examination of Plans, Specifications and Site of Work

1-02.4(1) General

This section is supplemented with the following:

All prospective bidders are REQUIRED to visit ~~each of~~ the ~~three~~ sites prior to bidding.

1-02.4(2) Subsurface Information

Include as written. Geotechnical report is attached.

1-02.5 Proposal Forms (Bid Forms)

Include as written. Bidders shall complete the Bid Form f~~or each of the three Schedules (A, B, C)~~ in this ~~combined~~ bid package.

~~**1-02.6 Preparation of Proposal**~~

~~Paragraph five, item #1, is revised to read:~~

- ~~The Bidder shall list all Subcontractors expected to perform any of the contracted work, across all three Schedules, on the consolidated Subcontractor list (Bid Sheet 6).~~

1-02.7 Bid Deposit

This section is supplemented with the following:

- Bid bond is not required. Performance and payment bonds will be required.

1-02.8 Non-collusion Declaration and Lobbying Certification

Include as written.

1-02.9 Delivery of Proposal

This section is revised to read:

Bids shall be emailed to Tyler Andrews at tylera@pnwcivil.com.

1-02.10 Withdrawal or Revision of Proposal

Include as written.

~~**1-02.11 Combination and Multiple Proposals**~~

~~This section is revised to read:~~

~~This solicitation is itself a combined bid covering three Schedules (A, B, and C). The owner reserves the right to award all three Schedules, any two Schedules, or any single Schedule based on responsiveness,~~

~~responsibility, and available funds. Bidders shall not submit multiple separate proposals for the same Schedule.~~

1-02.12 Public Opening of Proposals

This section is supplemented with the following:

Bid results will be emailed within 24 hours of bid submittal due date.

1-02.14 Disqualification of Bidders

Include as written.

1-02.15 Pre-Award Information

Include as written.

1-02.16 Bid Amounts

This section is added:

The Bidder agrees to hold the base bid prices ~~(for each Schedule and for the combined total)~~ for forty-five (45) days from date of bid opening.

The low bidder, for purposes of award, shall be the responsive bidder offering the low aggregate amount for the base bid items ~~of the Schedules elected to be awarded by the Sponsor, plus additive or deductive bid alternates and within funds available for the project.~~

1-03 Award and Execution of Contract

1-03.1 Consideration of Bids

Include as written.

~~**1-03.2 Award of Contract**~~

~~Include as written, with the addition that the owner may award all three Schedules to a single Contractor, may award two Schedules to a single Contractor, may award only one Schedule, or may reject all bids.~~

1-03.3 Execution of Contract

This section is revised to read:

The bidder shall return to the SVCA a signed contract, insurance certificate(s), and bonds within seven (7) days after receipt of contract. If the apparent successful bidder fails to sign all contractual documents or provide the bond and insurance as required, or fails to return the documents within seven (7) days after receipt of the contract, the SVCA may terminate the award of the contract.

1-03.4 Contract Bond

Include this section as written by WSDOT. A Contract Bond will be required for the full contract (bid) amount of all awarded Schedules, including tax.

This section is further supplemented with the following:

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In addition to a Contract Bond, the successful bidder shall provide an executed Payment Bond. All requirements listed regarding the Contract Bond shall also apply to the Payment Bond. Item 1 is revised to read:

- Be on a standard surety form.

1-04 Scope of Work

1-04.1 Intent of the Contract

Include as written.

1-04.2 Coordination of Contract Documents, Plans, Special Provisions, Specifications, and Addenda

Include as written.

1-04.4 Changes

This section is supplemented with the following:

If the SVCA desires to order a change in the Work, it may request a written Change Order proposal from Contractor.

- Due to the short and critical duration of this type of project, Contractor shall submit a Change Order proposal within 24 hours of the request from the SVCA, or within such other period as mutually agreed.
- Contractor's Change Order proposal shall be full compensation for implementing the proposed change in the Work, including any adjustment in the Contract Sum or Contract Time, and including compensation for all delays in connection with such change in the Work and for any expense or inconvenience, disruption of schedule, or loss of efficiency or productivity occasioned by the change in Work.
- Upon receipt of the Change Order proposal, or a request for equitable adjustment in the Contract Sum or Contract Time, the SVCA may accept or reject the proposal, request further documentation, or negotiate acceptable terms with the Contractor.
- Pending agreement on the terms of the Change Order, the SVCA may direct Contractor to proceed immediately with the Change Order Work. Contractor shall not proceed with any change in the Work until it has obtained the SVCA's approval. All Work done pursuant to any SVCA-directed change in the Work shall be executed in accordance with the Contract Documents.
- If the SVCA and Contractor reach agreement on the terms of any change in the Work, including any adjustment in the Contract Sum or Contract Time, such agreement shall be incorporated in a Change Order. The Change Order shall reflect full payment and final settlement of all claims for time and for direct, indirect, and consequential costs, including costs of delays, inconvenience, disruption of schedule, or loss of efficiency or productivity, related to any Work either covered or affected by the Change Order, or related to the events giving rise to the request for equitable adjustment.
- A request for an equitable adjustment in the Contract Sum shall be based on written notice delivered to the SVCA within 24 hours of the occurrence of the event giving rise to the request. For purposes of this part, "occurrence" means when Contractor knew, or in its diligent prosecution of the Work should have had knowledge of, the event giving rise to the request.

- Failure to properly give such written notice shall, to the extent the SVCA's interests are prejudiced, constitute a waiver of Contractor's right to an equitable adjustment.
- When the request for compensation relates to a delay or other change in Contract Time, Contractor shall demonstrate the impact on the critical path of the schedule attributable to the change of Work or event(s) giving rise to the request for equitable adjustment.
- Change orders will be allowed 15% markup for overhead and profit.

1-04.6 Variation in Estimated Quantities

Supplement this Section with the following:

Payment to the Contractor will be made only for the actual quantities of Work performed and accepted in conformance with the Contract. When the accepted quantity of Work performed under a unit item varies from the original Proposal quantity, payment will be at the unit Contract price for all Work unless the total accepted quantity of any Contract item, adjusted to exclude added or deleted amounts included in change orders accepted by both parties, increases or decreases by more than 30 percent from the original Proposal quantity. In that case, payment for Contract Work may be adjusted as described herein.

Identification of Specifications

The WSDOT Standard Specifications for Road, Bridge, and Municipal Construction, M41-10, most current revision, are the Specifications for this project for methods, testing, payment, quantities, materials, and other items as written. It may be superseded by the Contract Drawings unless noted otherwise.

The hierarchy of the contract documents is as follows:

- Schedule of Quantities Bid Form (Schedules A, B, and C).
- Bid Proposal and Contract.
- Contract Drawings and on-Sheet Specifications.
- WSDOT M41-10 Standard Specifications.

1-04.7 through 1-04.11 Differing Site Conditions to Final Cleanup

Include as written.

1-05 Control of Work

1-05.1 and 1-05.2 Authority of the Engineer, Project Manager, Assistants, and Inspectors

Include as written. This section is supplemented with the following: Contractor will be provided with a list of the SVCA / Chinook Engineering personnel and the supervisory chain of responsibility.

1-05.3 Plans and Working Drawings

This section is supplemented with the following:

Not later than 14 days prior to the scheduled start of construction, the Contractor shall submit a written Construction Work Plan covering all awarded Schedules. No physical work is to be performed at any of the sites until the Construction Work Plan is reviewed and approved by the Project Manager and Sponsor. It shall include:

- A list of construction personnel and the supervisory chain of responsibility.

- Procedures and sequence for removing culverts, fill, and stockpiling materials ~~at each of the three sites.~~
- ~~Haul routes for equipment between sites and within the Sudden Valley community.~~
- ~~Dewatering plan to include anticipated stream flow water bypass and dam system arrangement and proposed sizing for each site.~~
- ~~Sediment laden water pumping and handling description and quantity and size of pumps and pipes anticipated.~~
- Location of excavated unsuitable fill material waste site, located off-site.
- Other indicated submittals in this instruction.
- Construction Schedule ~~integrating all awarded Schedules with a single critical path.~~
- ~~Traffic control and flagging plan for offloads, stockpiling, and day-to-day construction. Sudden Valley internal roadways are private; Contractor shall coordinate all traffic control with the SVCA Public Safety Department.~~
- Spill Prevention, Control and Countermeasures (SPCC) Plan.
- ~~Fire Protection Control and Countermeasures (FPCC) Plan.~~
- Absolutely no construction may begin until written approval is granted for the construction of any item.

1-05.4 Conformity with and Deviation from Plans and Stakes

This section is supplemented with Special Condition 1-14.

1-05.13 Superintendents, Labor, and Equipment of Contractor

Include as written, with the addition:

Contractor Policy to Ban Text Messaging While Driving. Definitions, requirements, and subcontract flow-down per Executive Order 13513 and as defined in the standard WSDOT M41-10 amendment language used in similar projects. The Contractor shall insert the substance of this clause in all subcontracts that exceed $10,000.

1-07 Legal Relations and Responsibilities to the Public

1-07.1 Laws to be Observed

Include as written, and include:

Indemnification. The Contractor shall defend, indemnify, and hold the Sponsor and its officers, directors, employees, and agents harmless from all claims, demands, or suits at law or equity arising in whole or in part from the actual or alleged acts, errors, omissions, or negligence of, or the breach of any obligation under this Agreement by, the Contractor or the Contractor's agents, employees, subcontractors, or vendors of any tier, or any other persons for whom the Contractor may be legally liable. Nothing herein shall require the Contractor to defend or indemnify the Sponsor against, or hold harmless the Sponsor from, claims, demands, or suits based solely upon the negligence of the Sponsor.

1-07.2 State Taxes

Delete this WSDOT section and replace with the following:

The appropriate State of Washington retail sales tax shall be applied to the entire construction subtotal amount as shown on the Bid Form. The total bid amounts shall include Washington State Sales Tax (WSST) as a line item within each Schedule. All other taxes imposed by law shall be included in the bid amount. The SVCA will include WSST in progress payments according to the percent of completion. The Contractor shall pay the WSST to the Department of Revenue and shall furnish proof of payment to the SVCA if requested.

[Note: Contractor must bond for contract amount plus the WSST.]

1-07.5 Fish and Wildlife and Ecology Regulations

1-07.5(1) General

This section is supplemented with the following:

This specification describes requirements originating from the Washington Department of Fish and Wildlife (WDFW), U.S. Fish & Wildlife Service (USFWS), and U.S. Army Corps of Engineers (ACOE), whose collective responsibility in this case is to make sure aquatic resources and fish communities are adequately protected during construction projects.

The Contractor is advised that many of the requirements for protection of fish life, water quality, etc., are shown on the drawings, described in Division 2. Some other agency requirements are reflected in specifications and/or drawings related to site clearing, excavation limits, re-vegetation, etc.

1-07.5(2) State Department of Fish and Wildlife

This section is supplemented with the following:

- The Contractor shall coordinate all stream diversions and stream dewatering work with the SVCA and the Project Engineer to allow for fish removal by qualified personnel from the dewatered stream sections and safe return of these fish to adjacent stream habitat.
- Prepare a Spill Prevention, Control and Countermeasures (SPCC) Plan as outlined in 1-07.15(1). Oil absorbent pads and personnel trained in spill prevention and control shall be on site during all heavy equipment operations.
- Inspect heavy equipment at least on a daily basis for any leaks of petroleum products. Repair as needed.
- Heavy equipment needs to be pressure washed to be visibly free of all soil before shipping to the project site, in accordance with WDFW invasive species protocols. Equipment that has been used outside the Lake Whatcom watershed shall be inspected for aquatic invasive species (including but not limited to zebra and quagga mussels) prior to entering the project sites.

1-07.6 Permits and Licenses

This section is supplemented with the following:

The Sponsor is responsible for obtaining all environmental and land-use permits required for construction. As of the date of this solicitation:

- Whatcom County right-of-way, grading, and stormwater permits applicable to the three project sites are COMPLETED and on file with the Sponsor.
- The Washington Department of Fish and Wildlife (WDFW) Hydraulic Project Approval (HPA) ~~is IN PROGRESS. The HPA may not be issued before the bid advertisement date and may not be~~

~~issued before bid opening~~. The Sponsor will provide an executed copy of the HPA to the Contractor upon issuance.

- All other applicable SVCA architectural and community approvals are COMPLETED.

Excluding business licenses and permits required for the Contractor's own business, the Sponsor will provide the Contractor with copies of all issued permits. The Contractor shall comply with all permit requirements and keep copies of all issued permits on site at all times. Should the issued HPA materially alter the work scope, sequence, or in-water work window from what is anticipated in these Documents, the Contractor and Sponsor will negotiate an equitable adjustment under Section 1-04.4.

1-07.8 High Visibility Apparel

First paragraph is modified to read:

The Contractor shall require all personnel at the work site under their control (including Subcontractors and lower tier subcontractors) and working outside of vehicles and potentially in presence of traffic on private or public roads to comply with the requirements. Remaining paragraphs as written.

1-07.9 Wages

This Project is privately funded by the Sudden Valley Community Association. Washington State Prevailing Wage Law (RCW 39.12) and the federal Davis-Bacon Act do not apply to this Contract. The Contractor shall comply with all other applicable Washington State and federal wage, hour, workers' compensation, and labor laws, including but not limited to those administered by the Washington State Department of Labor and Industries.

1-07.11 Requirements for Nondiscrimination

(a) The Contractor shall not discriminate against its employees or applicants because of their race, color, religion, sex, national origin, age, status as Disabled or Vietnam Veterans, or physical or mental handicaps. The Contractor certifies that it does not, and will not, maintain segregated facilities or accommodations on the basis of race, color, religion, or national origin. Regarding any position for which an employee or an applicant is qualified, the Contractor agrees to take affirmative action to employ, train, advance in employment, and retain individuals in accordance with applicable laws and regulations including:

- For nondiscrimination based on race, color, religion, sex, or national origin: the U.S. Constitution, and Parts II and IV of Executive Order 11246, September 24, 1965 (30 Fed. Reg. 12319), with disputes handled per 41 CFR 60.
- For nondiscrimination based on the Handicapped: Section 503 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 793); Executive Order 11758, January 15, 1974; and 41 CFR Part 60-741.
- For nondiscrimination based on Age: Executive Order 11141, February 12, 1964 (29 CFR 2477).

1-07.17 Utilities and Similar Facilities

This section is supplemented with the following:

- Locations and dimensions shown in the plans for existing facilities are in accordance with available information obtained without uncovering, measuring, or other verification. Public and private utilities, or their contractors, will furnish all work necessary to adjust, relocate, replace, or construct their facilities unless otherwise provided for in the Plans or these Special Provisions.

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- The contractor shall locate all utilities by a pothole method using a light touch VACTOR system rather than an excavator and shovel. Utilities were preliminarily located using this technique and are reflected to the best of our knowledge on the contract documents. Further investigation by the contractor for their own use shall be completed prior to excavations and after a locate service call to the 811 call center.
- The Contractor shall call the Utility Location Request Center (One Call Center) for field location not less than two nor more than ten business days before the scheduled date for commencement of excavation or sheet pile installation which may affect underground utility facilities, unless otherwise agreed upon by the parties involved. The telephone number for the One Call Center is 811 or 1-800-424-5555.
- The Contractor is alerted to the existence of Chapter 19.122 RCW, a Washington State law relating to underground utilities. Any cost to the Contractor incurred as a result of this law shall be at the Contractor's expense.
- Sudden Valley is served by private water (Lake Whatcom Water and Sewer District), sewer, and various overhead and underground utilities. Contractor shall coordinate with all utility providers prior to excavation at each of the three sites.

1-07.18 Public Liability and Property Damage Insurance

Include as written, except replace "State of Washington" or "State" with the Sudden Valley Community Association.

Contractor must provide Certificate of Liability Insurance naming the SVCA and each affected Landowner as an additional insured(s) and Contractor's license number to the SVCA prior to start of work.

CONTRACTOR will maintain throughout this agreement the following insurance:

- A. Workers compensation and employers liability insurance required by the State of Washington.
- B. Automobile Liability coverage for all owned, hired, and non-owned vehicles for Bodily Injury and Property Damage with a limit of liability not less than $1,000,000 combined single limit.
- C. Commercial or comprehensive general liability insurance covering bodily injury liability, property damage liability, contractual liability, and personal injury liability with limits of liability not less than $1,000,000 each occurrence and $2,000,000 aggregate.
- D. Contractor's Equipment Insurance providing coverage for physical damage to subcontractor-owned, leased, rented, or borrowed equipment.
- E. Professional Liability Insurance of not less than $1,000,000 where applicable.

An Environmental Pollution Liability insurance policy is required to provide coverage for claims involving remediation, disposal, or other handling of pollutants arising out of:

- Contractor's operations related to this project.
- Transportation of hazardous materials to or from any site related to this project.
- Remediation, abatement, repair, maintenance, or other work with lead-based paint or materials containing asbestos.

Such Environmental Pollution Liability policy shall provide the following minimum coverage for Bodily Injury and Property Damage: $1,000,000 per occurrence.

Prior to contract execution, the Contractor shall file with the Sudden Valley Community Association at ~~4 Clubhouse Circle~~ 1850 Lake Whatcom Blvd., Bellingham, WA 98229, ACORD Form Certificates of Insurance evidencing the minimum insurance coverage required under these specifications.

The Contractor shall defend, indemnify, and hold the SVCA, its officers, officials, employees, and volunteers harmless from any and all claims, injuries, damages, losses, or suits, including attorney fees, arising out of or in connection with the performance of this Agreement, except for injuries and damages caused by the sole negligence of the SVCA.

1-07.19 through 1-07.27 Gratuities to No Waiver of Sponsor's Legal Rights

Include as written.

1-08 Prosecution and Progress

1-08.1 through 1-08.4 Subcontracting through Prosecution of Work

Include as written.

1-08.3 Progress Schedule

The second paragraph of this section is revised to read:

The Contractor shall submit two copies of the progress schedule (total working days) to the Project Manager no later than 14 days prior to the scheduled start of work. This schedule shall be a single integrated schedule ~~covering all awarded Schedules (A, B, and/or C),~~ and shall show: (1) physical completion of all work within the specified contract time, (2) the proposed order of work, and (3) projected starting and completion times for major phases of the work and for the total project. The schedule shall be developed by a critical-path method. The Contractor shall provide sufficient material, equipment, and labor to meet the completion times in this schedule.

1-08.5 Times for Completion

This section is added:

The time of substantial completion shall occur before September 30, 2026. Final completion shall occur before October 31, 2026. The Contractor shall accomplish all work requiring in-stream construction between July 16, 2026 and September 30, 2026 (subject to confirmation in the issued WDFW Hydraulic Project Approval). ~~Site preparation and other preliminary work (not requiring entry into a stream) may be started on May 1, 2026. Sheet pile installation and road work may begin May 1, 2026 at each of the three sites, subject to traffic control and SVCA approval.~~

1-08.6 through 1-08.8 Suspension of Work to Extensions of Time

Include as written.

1-08.9 Liquidated Damages

This section is revised to read:

Project Completion: For each calendar day after the time of completion ("Final Completion") that the work remains uncompleted, the Owner shall retain the sum of FIVE HUNDRED AND FIFTEEN DOLLARS ($515) per day as fixed, liquidated damages for the purpose of recovering additional administrative and compliance costs, but not as a penalty. Should an extension of time be granted to Contractor, Contractor

shall indemnify and hold harmless the Owner from any loss to any other contractor caused by such extension of time.

~~The Contractor further agrees that, from the compensation otherwise to be paid, the Sponsor may charge actual costs to the Contract for any time over the agreed-to completion date where work remains uncompleted. These actual costs may include, but are not limited to:~~

- ~~Any fines by permitting agencies for work not being completed within the time frame stipulated in the permit.~~
- ~~Any costs imposed by the local authorities due to the work not being completed on time.~~
- ~~Additional special inspections and engineering services that might be required.~~
- ~~It is not the intent of the Sponsor to recoup extra management expenses.~~

1-08.10 Termination of Contract

Include as written.

1-09 Measurement and Payment

Include as written.

1-09.9 Payments

This section is added: Per SVCA's contract, within 30 days of receipt of approved pay estimate.

~~The SVCA intends to use a 45-day payment turnaround schedule under this contract due to partial payment approvals and required signatures by the SVCA Board of Directors. The start of that 45-day clock will be based upon the WRITTEN APPROVAL of the Contractor's partial pay request by the Engineer, and verification that prevailing wage affidavits have been properly filed and approved monthly by the Contractor with the State of Washington.~~

SPECIAL CONDITIONS

1-11 Safety Precautions

This section is added:

- Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the work.
- In carrying out its responsibilities according to the Contract Documents, Contractor shall protect the lives and health of employees performing the work and other persons who may be affected by the work; prevent damage to materials, supplies, and equipment whether on site or stored off site; and prevent damage to other property at the site or adjacent thereto. Contractor shall comply with chapter 296-800 WAC and all applicable laws, ordinances, rules, regulations, and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss; shall erect and maintain all necessary safeguards for such safety and protection; and shall notify the Sponsor of adjacent property and utilities when prosecution of the work may affect them.
- Contractor shall maintain an accurate record of exposure data on all incidents relating to the work resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment. Contractor shall immediately report any such incident to the SVCA and appropriate jurisdictions.

- All work shall be performed with due regard for the safety of the public. Contractor shall perform the work so as to cause a minimum of interruption of vehicular traffic or inconvenience to pedestrians on the private residential roadways of Sudden Valley. All arrangements to care for such traffic shall be Contractor's responsibilities. All expenses involved in the maintenance of traffic by way of detours shall be borne by Contractor.
- In an emergency affecting the safety of life or the work or of adjoining property, Contractor is permitted to act, at its discretion, to prevent such threatened loss or injury, and Contractor shall so act if authorized or instructed.
- Nothing provided in this section shall be construed as imposing any duty upon the SVCA with regard to, or as constituting any express or implied assumption of control or responsibility over, project site safety, or over any other safety conditions relating to employees or agents of the Contractor or any of its Subcontractors, or the public.

1-13 Temporary Utilities

This section is added:

Contractor shall supply and maintain all necessary and temporary electrical services and required water and sanitation facilities as needed for construction of this project. Any water required on site will be hauled by the Contractor from a safe and legal source. No water, at any time, may be drawn from the site streams, except to dewater work area to facilitate construction as described in the plans, or as specifically and legally permitted by the Washington Department of Fish and Wildlife. No water may be drawn directly from Lake Whatcom. Contractor will be responsible for the acquisition of any such water withdrawal permits.

1-14 Staking

This section is added:

- The Engineer will furnish all primary control and establish control coordinates for locating the principal components of the Work with a suitable number of benchmarks and control points adjacent to the work on a one-time basis at each of the three sites.
- The Contractor will develop and make all detailed surveys needed for construction of the work involved. The Contractor shall be held responsible for the preservation of all primary and other control coordinate stakes.
- The Contractor shall be responsible for setting, maintaining, and resetting all alignment stakes, slope stakes, and grades necessary for the construction of this project.
- The Contractor shall provide the Engineer copies of any calculations and staking data when requested by the Engineer.
- The Contractor shall ensure a surveying accuracy within 0.1 feet vertical and horizontal of the specified elevations and dimensions.

Documents Included:

- Bid Form ~~(Schedules A, B, and C)~~
- Contract Form
- Drawings & Specifications (separate plan sets for each Schedule)
- Applicable Permits; Whatcom County Permits, and Washington State HPA.

Bonds and Insurance Required:

- ~~Bid Deposit (Bid Bond, Proposal Bond) — 5% of Total Combined Bid~~
- Contract Bond (Performance Bond) — full Contract amount including WSST
- Payment Bond — full Contract amount including WSST
- Standard Liability Insurance (as described in WSDOT Standards 1-07.18 above)
- Environmental Pollution Liability Insurance (as described above in 1-07.18)

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DIVISION 2 — EARTHWORK

2-01 Clearing, Grubbing, and Roadside Cleanup

2-01.1 Description

Replace the first paragraph of Section 2-01.1 with the following:

The Work consists of furnishing all materials, labor, and equipment necessary to locate, install, maintain, and remove the construction limits flagging, provide site clearing and disposal, protect vegetation larger than 6" diameter, and incorporate cleared vegetation into adjacent structures. The Contractor shall limit clearing and grubbing to the minimum area required for construction ~~at each of the three sites~~. The Contractor shall not clear and/or grub areas beyond the staging areas, access paths, and other areas shown on the Contract Plans unless approved by the Engineer.

The Contractor shall be responsible for the protection and preservation of all existing native vegetation including trees, shrubs, and other objects outside of the limits of the staging areas and access paths. Any existing tree, shrub, and bush located outside of the staging areas and access paths that is damaged or destroyed during construction shall be replaced by the Contractor in like type and size as indicated by the Engineer at no cost to the Owner.

Several live and dead trees may exist within the construction sites ~~for Schedules A and B~~ and adjacent danger trees may be located next to the future bridge locations. Trees are to be identified by the EOR to be felled and removed to SVCA Area Z's firewood stockpile. Approximate tree counts are shown on the plans for each Schedule. Root wads will not be removed but will remain in the embankment to support that bank unless directed by the EOR. Embankment that is to be excavated shall have the root wads removed with the soil. Trees and roots that are not removed off site shall be utilized as racking material in the LWM installation area of the restored stream beds.

2-01.2 Disposal of Usable Materials and Debris

Replace Section 2-01.2 with the following:

All excess materials are to be disposed of off-site at a location in accordance with all applicable local and state laws. As directed on the plans, salvage on-site streambed gravels, sands, and fines for use during streambed construction and for future maintenance needs. This material does not need to be disposed off-site. Open burning shall not be used to dispose of debris resulting from clearing and grubbing. Chipping shall be performed by machines that can grind debris into wood chips meeting Section 9-14.4(3).

2-01.3 Construction Requirements

2-01.3(1) Clearing

Section 2-01.3(1) is supplemented with the following:

Contractor shall minimize clearing to the minimum needed to access and stage for construction activities and additional cleared areas shown on the Contract Plans. The Contractor shall stake and flag all proposed areas of clearing within the construction limits, which shall be limited to the access routes and staging areas, at least 3 days prior to construction. Flagging shall be high-visibility survey tape installed on 3-foot-long wood lath stakes at 20 foot maximum spacing. Contractor shall inform Engineer when flagging is installed. Engineer will inspect and approve proposed clearing areas.

Contractor shall not disturb the area outside of the construction limits, access, and staging flagging — including the vegetation — unless approved by the Engineer. Contractor shall not clear vegetation greater than 6" in diameter without prior engineer approval. Cleared vegetation shall be incorporated into log structures or channel construction as directed by Engineer. Vegetation greater than 6" diameter not indicated for removal shall be protected from damage. Equipment shall not pass within the dripline of protected trees unless specifically permitted and supervised by Engineer.

2-01.3(5) Temporary Construction Access and Staging

This work shall consist of identifying and installing staging areas and access routes within each project with minimal disturbance to existing vegetation and soils. This work includes furnishing all materials, labor, and equipment necessary to locate, install, maintain, and remove the access route(s) and staging areas. Contractor shall install access and staging areas as specified in the project plans for each Schedule. Contractor may propose alternate access areas with review and approval from the Engineer.

The Contractor shall keep the premises clean, free of excess soils and other materials, including refuse and debris, resulting from work throughout the operation for all phases of construction, including planting. The Contractor shall not stockpile materials or equipment in any manner that may create hazards or obstacles to adjacent roadways. Sudden Valley roadways are private and shared with residents; staging on adjacent SVCA common areas requires prior written approval from SVCA.

The Contractor shall restore the areas used for temporary access at the conclusion of the work. All access route(s) into the sites shall be restored as specified on the Project Plans. No ground shall be left with bare soils caused by construction activities. De-compact top 12" of upland machine access routes prior to planting or application of straw or mulch. Mulch may consist of approved bark, clean hog fuel free of pallets and nails, or weed-free straw.

2-01.3(6) Remove Trees

Trees shown within the clear-and-grub extents on the drawings and existing fallen (downed) trees/logs/rootwads that lie within the clearing limits shall be carefully removed and stockpiled in locations not conflicting with subsequent channel construction. During channel construction, the trees/logs/rootwads shall be incorporated within the log structures and within the channel in random locations and placement angles as directed by EOR. Tree removal shall be paid under line item "Tree Falling and Removal."

2-01.4 Measurement

Section 2-01.4 is supplemented with the following:

- No unit of measurement shall apply to the lump sum price for Temporary Construction Access and Staging.
- No unit of measurement shall apply to the lump sum price for Construction Surveying.
- No unit of measurement shall apply to the lump sum price for Clearing and Grubbing.
- Trees will be paid by the tree as "Tree Falling and Removal."

2-01.5 Payment

Replace paragraphs 1, 2, and 3 of Section 2-01.5 with the following:

Payment will be made in accordance with General Terms and Conditions for each of the following bid items that are included in the proposal for each Schedule:

- "Temporary Construction Access and Staging," lump sum.
- "Construction Surveying," lump sum.
- "Clearing and Grubbing," lump sum.
- "Tree Falling and Removal," each.

2-02 Removal of Structures and Obstructions

2-02.1 Description

This section is supplemented with the following:

The work includes removal of all identified structures and features ~~from each of the three project areas~~ as shown in the contract documents. For Schedule~~s A and~~ B, this shall include removal of the existing ~~fish barrier culvert at the Polo Park and~~ bridge at Roy Road crossing, respectively. ~~For Schedule C (Tumbling Waters), removal is limited to demolition of existing scour damaged invert components, deteriorated wing wall sections, and the existing scour apron only; the main culvert barrel shall remain in service and protected.~~

2-02.2 Construction Access

The Contractor shall develop a construction access plan to be reviewed and approved by the Engineer before staging any equipment and materials on site. The Contractor will be responsible for repair of any existing roads, walls, stairs, and landscaped areas to pre-project condition. The Contractor shall provide traffic control for all vehicles coming and leaving the sites to ensure safety to the public and to Sudden Valley residents.

2-02.3 Construction Requirements

Miscellaneous existing man-made debris within the construction, access, and staging areas, and those items and structures called out on the Contract Plans, shall be removed and disposed of at a permitted disposal site. Disposal of man-made debris, recyclables, or hazardous materials shall be in accordance with current law.

2-02.4 and 2-02.5 Measurement and Payment

Removal of Structures and Obstructions will be measured and paid by lump sum as noted in the Schedule of Quantities for each affected Schedule. Payment will be based on the completed actions, and must meet all actions shown in the project plans.

2-03 Roadway Excavation and Embankment

2-03.3(7)A General

Section 2-03.3(7)A is supplemented with the following:

The Contractor shall be solely responsible for loading, hauling, and the disposing of all surplus material and construction debris in a manner complying with all local, state, and federal statutes and regulations. All costs involved in the loading, hauling, and disposal of all surplus material and construction debris shall be included in the unit contract price shown on the proposal for Temporary Construction Access and Staging, and no further payment will be made.

2-03.3(20) Common Excavation Including Haul and Disposal

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Partial excavation on each site shall be paid for as Common Excavation Incl. Haul and Disposal, which shall include that excavation for roadway excavation, channel excavation, foundation excavation, and all other types of excavation performed in the course of the project. Material shall be hauled off site and disposed of at an approved facility outside of the SVCA properties.

2-03.3(21) Common Excavation Including Placement

Partial excavation on each site shall be paid for as Common Excavation Incl. Placement, which shall include that excavation for roadway excavation, channel excavation, and all other types of excavation performed in the course of the project. Excavated material placed on site to create the project, plus minor excavation for installation of the in-channel logs, streambed cobble, and log structures, shall be considered under this item. All permanent fill placed on the site shall be installed in maximum 12" lifts and compacted using a jumping jack or track hoe mounted plate compactor to a minimum of 90% per ASTM D 1557 (modified proctor). The lower course of stream sediment shall have the washing in of the fine sediments complete prior to initiating installation of each subsequent course.

2-03.4 Measurement

- "Common Excavation Including Haul and Disposal," per cubic yard.
- "Common Excavation Including Placement," per cubic yard.

2-03.5 Payment

Section 2-03.5 is supplemented with paragraphs identical to those of the Elliot Road specification, applied independently within each Schedule's bid items.

END OF DIVISION 2

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DIVISION 4 — BASES

4-01 Road

4-01.1 Description

This item includes fill to raise the road to meet the new bridge and to surface the final road. ~~For Schedule C (Tumbling Waters), road work is limited to restoration of any disturbed surfacing over the underpinning excavation.~~

4-01.2 Materials

- Crushed Surfacing — 9-03.9(3)
- Common Borrow — 9-03.14(3)

4-01.3 Construction Requirements

The footprint for the road fill approaches shall be cleared of vegetation and grass, and Crushed Surfacing shall be placed and compacted in 6-inch lifts at the optimum moisture condition. Soil compaction of structural fill at road and bridge approaches shall be 95% maximum density at optimum moisture content for the material. Water shall be applied to the structural fill material as needed.

The Crushed Surfacing shall be hauled, dumped, graded, and compacted in 6” lifts per the plans. Final grade around the structure shall be compacted and hand-raked and sloped to drain.

4-01.4 Measurement and Payment

Measurement and payment for this item will be per the bid list for the completed road installation and will include the full price for hauling, placing, and compacting for the following bid items:

- Crushed Road Base
- Crushed Surfacing Top Course

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PART 2 — 6-03 CONCRETE AND STEEL BRIDGE STRUCTURES (SCHEDULES A AND B ONLY)

Replace the WSDOT specification with the following. This section applies to Schedules ~~A and~~ B (prefabricated bridge installations). ~~It does not apply to Schedule C (foundation underpinning).~~

The prefabricated bridge systems have been purchased by the owner, and are stored at Area Z. Contractor shall reload and haul from Area Z. ~~SVCA will provide 1 set of lifting clutches, 4, for the Rapid Span bridge.~~

6-03.1 Description

This specification covers a pre-engineered, pre-fabricated weathering steel bridge structure, or concrete and steel composite prefabricated sill foundations, with nominal dimensions as specified in the plans for ~~each~~ Schedule ~~(A and~~ B), to be installed at the locations shown on the respective Contract Drawings.

6-03.2 Design Loads

Live load for bridge design shall be in accordance with AASHTO HL-93 with L90 Overload and EV3 Emergency Vehicles, single lane low volume traffic, Standard Specifications for Highway Bridges 17th edition with errata (HS 25 45-ton vehicle).

6-03.3 Materials

a. Superstructure

- See attached bridge drawings.

b. Deck

See attached bridge drawings.

c. Guardrails and Hardware

Guardrails shall be installed per materials provided and as shown on bridge drawings.

d. Foundation Connections

Connections for bridge structure to foundation shall be provided and shall be compatible with bridge foundation design. ~~The concrete bridge at Polo Park assumes that rebar dowels shall be epoxy grouted in place to provide connection and uplift resistance for the concrete slab components prior to finally grouting as per manufacturer's recommendations. The concrete slab bridge shall be connected on the top of a sheet pile foundation system with supplied dowel and beam cap in the form of a channel with welded upright dowels. Shop drawings shall show this detail and are included in this package.~~ The Steel Bridge design assumes steel stringer beams welded to weathering steel bearing plates, which are in turn welded on top of a weldment insert in the pre-fabricated concrete footers.

~~If the bridge installation is sloped greater than 2%, bearing plates shall be designed to accommodate the slope of the bridge as shown on the plans. Structural calculations shall accompany the shop drawing submittal and be sealed by a Licensed Professional Engineer in the State of Washington.~~

6-03.4 Bridge Placement and Assembly

The on-site Contractor shall complete all bridge placement and assembly. Assembly includes, but is not limited to, hauling from Area Z, swinging bridge components together so bridge beams rest on bearing plates, welding beams to bearing plates, installing nuts on anchor bolts at the top of footings or foundation channels welded to sheet piles, bolting bridge halves together, or installing deck panels and grouting studs for bridge completion. Field welding is required for this project.

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6-03.5 Payment

Payment will be made in accordance with Section 1-04.1 for each of the following bid items, included separately in Schedule A and Schedule B:

- "Install Bridge" — lump sum, for bridge placement and assembly.

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6-05 SHEET PILING AND FOUNDATION (Sheep Pile Applies To Polo Park Schedule only)

~~6-05.1 Description~~

~~This Work consists of furnishing and installing steel sheet piles of the sizes and types shown on the Contract Drawings or as the Engineer of Record (EOR) may require. This Work also includes cutting off or building up piles when required. In furnishing and installing piles, the Contractor shall comply with the requirements of this Section, the Contract, and the EOR.~~

~~Please see the formal geotechnical investigation for these projects and included in this request for bids. The Contractor shall be prepared to install piles as directed by the EOR based on observed driving resistance and the in-field load test required by 6-05.3(12).~~

~~6-05.2 Materials~~

~~Include as written and supplement with the following:~~

~~Sheet Piling shall be unpainted steel PZ22, sheet piling NO equal. Submittals are required prior to construction. Quantity counts and dimensions are provided on the Contract Drawings as guidelines and will be the basis of payment unless indicated by the Contractor at time of bidding to be conflicting with their quantity takeoffs.~~

~~Sheet pile shall be new or salvaged and in "good condition," meaning used no more than twice and straight, no bends or driving anomalies, and without flaking rust. Clutch interlock slots and knobs must be true and functional for tension loads. EOR shall approve all pieces of sheet pile in writing as they are delivered and prior to installation.~~

~~Corner pile connectors are required to hold alignments close to drawn dimensions. Alternate methods are allowed when explained in writing at time of bids with a letter of explanation provided with bid proposal. Corner piles may be welded to adjacent pile for installation convenience.~~

~~6-05.3(11) Installing Piles and Readying for Bridge Installation~~

~~Include as written and supplement with the following:~~

~~Piling installed in this work shall be installed with a Vibratory Side Grip head, no equal. No diesel, air-driven, or spring gravity-drive hammer shall be used to install the piling. Gravity or spring hammers shall be used to test the bearing capacity of the foundation piles and approved by the EOR. Crane-deployed vibratory drive heads are allowed due to overhead clearance conditions, particularly within Sudden Valley's private roadways.~~

~~All sheet pile shall be marked in 1' painted increments clearly visible to the operator and the EOR observer but hidden when installed. Zero shall start at the bottom and 1' increments shall increase from the bottom to the top of the pile.~~

~~Foundation (Schedule A)~~

~~Sheet pile shall be installed in a straight line to mount the bridge foundation channel on a flat cut surface of the pile abutment. Foundation channel shall be welded to sheet pile at the contact point with a minimum of 200" of lineal 5/16" fillet welds. Welds may also be plug or slot welds from above position where possible in lieu of overhead welds from below. All other welds shall be spaced evenly and intermittent across the foundation channel-to-sheet pile contact in 4" or 5" long welds. Bridge size and shape shall be cut into sheet pile wall to match the opening for the bridge geometry to rest on the bearing plate assemblies and the foundation channel.~~

~~At the Polo Park (Schedule A) crossing, the Contractor shall vactor pothole across Polo Park and verify there are no utility conflicts prior to driving sheet pile. Any conflicts shall be reported to the Engineer before installation proceeds.~~

Foundation (Schedule B)

Precast concrete footings shall be set on a crushed gravel subgrade that has been excavated to subgrade, prepared, proof rolled and compacted in accordance with the Contract Drawings. Subgrade shall be proof-rolled and compacted to a firm 95% of modified Proctor, unyielding condition, and the bearing surface shall be graded level and true to the elevations shown on the contract documents before footing placement. Footings shall be placed in a straight line at the dimensions and elevations shown, and bridge bearing plate assemblies shall rest on the footings such that the bridge geometry matches the placement. Any soft, unsuitable, or over-excavated areas shall be reported to the Engineer and backfilled with compacted crushed gravel before the footings are set.

At the Roy Road (Schedule B) crossing, the Contractor shall vactor pothole across Roy Road and verify there are no utility conflicts prior to footing excavation. Any conflicts shall be reported to the Engineer before installation proceeds.

~~**Underpinning (Schedule C)**~~

~~For Schedule C (Tumbling Waters Main Culvert Foundation Underpinning), rock replacement may occur by replacing fallen boulders from the stream bed as directed by the EOR or their representative back into the existing culvert wing walls in accordance with the Contract Drawings. Hand or mini excavator excavation may occur to observe and reconnoiter extent of required underpinning no greater than 5 ft at a time if existing concrete footing is undermined. contractor may use plywood form boards that may remain in place permanently to provide limits to place grout. Tremie or grouted concrete shall be placed beneath scour damaged invert zones to restore vertical support. Proper vibration shall be critical for the effect of underpinning.~~

~~**6-05.3(12) Determination of Bearing Values**~~

~~Include as written and supplement with the following:~~

~~Load tests shall be accomplished only after piling to be tested has rested 48 hours since installation. Testing of load capacity of the sheet pile may be accomplished with a gravity force drive hammer falling from a known distance or strain gage method approved by the EOR. Load test a minimum of two piling on each end of each bridge or each underpinning array, at each abutment used as the foundation of the bridge or culvert, and perpendicular to the traffic traveled way of the bridge. These two pilings shall be separated by 8' minimum horizontal distance. Calculate the ultimate bearing capacity with the EOR and in accordance with this section. Each test pile (not a sheet pile pair) shall achieve an Ultimate Bearing Capacity of 12 kips or greater or as approved by the EOR.~~

~~Top elevations of sheet pile shall be trimmed as directed by the EOR and together with the Contractor.~~

~~**6-05.4 Measurement**~~

~~Measurement for installation of steel sheet pile will be by the amount of linear footage of single symmetrical PZ-22 piling sheets shown on the Bid Form for each Schedule. No equal section is allowed. This sheet piling does not require pairs to install in a continuous wall arrangement. Install sheet pile as directed by the EOR or shown on the plans.~~

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The Contractor shall prepare for splicing as per these specifications. The Contractor shall also prepare for partial lengths of sheet pile installed to a depth as directed by the Engineer and cut to a finished elevation mark as directed by the EOR. The EOR may require a sloping bottom elevation based on installed length to save on material. Partial pile lengths are the property of the Contractor and will be paid for in accordance with the Bid Form. Steel sheet pile PZ-22 weight is 40.3 pounds/LF and shall be the basis of LF pay amounts if needed.

The Contractor shall also be prepared with additional pile on hand in case additional lengths are to be installed. This additional length of pile may be no greater than one day away from the work sites but may be on-call and stored in a warehouse for its possible use.

6-05.5 Payment

Payment will be made for each of the following Bid items, included independently in each applicable Schedule's Bid Form:

- "Bridge Foundation Sheet Piling" Schedule A.
- "Sheet Pile Corner SKP90" Schedule A.

The unit Contract price per lineal foot of PZ-22 for the applicable bid item shall be full pay for furnishing the piling specified, including furnishing, fabricating, welding, splicing, installation, and testing. Sheet piling shall include the SKP90 corners as indicated in the bid form.

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DIVISION 8 — MISCELLANEOUS CONSTRUCTION

8-01 Erosion Control and Water Pollution Control

8-01.1 Description

This section as written.

8-01.3(1) General

This section is supplemented with the following:

The Contractor shall be aware of the potential for erosion and silt entrained from newly excavated surfaces. The Contractor shall control the potential for erosion of materials from freshly exposed excavated surfaces.

In anticipation of rain events, the Contractor shall be prepared to place erosion and sediment control Best Management Practices (BMPs) with Project Manager approval. It is the Contractor's responsibility to install and maintain BMPs as necessary to prevent siltation. Erosion and sediment control BMPs to be used shall conform to the current Stormwater Management Manual for Western Washington, Department of Ecology Publication #21-10-030, Chapter 3 — "Construction Stormwater Pollution Prevention."

Lake Whatcom is a designated drinking water source. The Contractor shall exercise extraordinary care to prevent any sediment, oil, fuel, or other pollutant from entering tributaries that discharge to the lake. All fuel storage, equipment fueling, and equipment maintenance shall occur at least 100 feet from any waterbody or stormwater conveyance.

8-01.3(1)C Water Management

This section is modified as follows:

- Ground water and dewatering water experienced during construction shall be pumped from a sump to dewater the excavation. Water that comes in contact with construction activity shall be pumped away from the site into a forest or field location approved by the project EOR. The Contractor shall be responsible for the proper disposal of the sediment-laden water and sediment in the containment tank or an approved site as determined in the Water Management Plan.
- Process Water. No change.
- Offsite Water. No change.
- ~~Stream Water (added). The Contractor shall install a cofferdam and pumped bypass pipe to isolate each work area from flowing water. Any water leaking around the cofferdam shall be pumped into the forest or field discharge if deemed dirty by the Engineer, or, if clean, into the bypass pipe or downstream to ensure the work area is dewatered. The cofferdam should be located upstream of the project as shown on the project plans. This cofferdam may not exceed an impounded water height of 3.5' measured from the lowest invert, and should be located upstream from the work site enough to provide adequate slope for proper operation. The pump intake shall have a fish screen affixed to prevent entrainment of fish into the bypass. The screen open spacing shall not exceed 0.067".~~

~~The contractor (with assistance from a qualified fish biologist) shall remove any fish trapped in the work area. Timing of fish removal shall be identified in the progress schedule submitted by the Contractor.~~

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Owner shall be notified at least 48 hours in advance of planned dewatering. No pumping will be initiated without owner or designated biologist on-site to ensure fish are safely removed.

~~Dewatering and rewatering of the stream channel after completion of the in-stream construction shall be done gradually so there is no discernible change in streamflow downstream of the Project. Dewatering, rewatering, and any other changes to streamflow shall be done only after approval of the Project Engineer.~~

All work shall be scheduled per the FPA/HPA. All excavation shall be done "in the dry," meaning that no excavation shall occur where water is flowing immediately adjacent to the excavation, or where the elevation of flowing water is less than one vertical foot below the elevation of the excavation rim.

8-01.4 Measurement and 8-01.5 Payment

Measurement and payment for these items shall be on an each or lump sum basis as indicated on the Schedule of Quantities within each affected Schedule, including:

- Dewatering pumps with pipelines and generators if used.
- Dewatering cofferdam or floating booms.
- Dewatering bypass pipeline.

~~8-05 Channel Excavation and Disposal~~

~~8-05.1 Description~~

~~The work consists of removing fill beneath the road prism and around the existing culverts (Schedules A and B), and excavation of scour-damaged streambed materials around the Tumbling Waters culvert inverts (Schedule C).~~

~~8-05.3 Construction Requirements~~

~~The Contractor shall excavate and backfill to the lines, grades, slopes, and elevations shown on the Contract Drawings. After the site is dewatered, excavation may proceed to the neat lines and grades shown on the plans. Material shall be stockpiled on site, or removed and end Halt Offsite Outside of SVCA.~~

~~8-05.4 and 8-05.5 Measurement and Payment~~

~~Measurement and Payment will be based on the portion of this item completed for the construction of "Structural Excavation" and "Culvert Disposal." Payment is full compensation for all costs of procuring, hauling, placing, treating, or otherwise disposing of the material.~~

~~8-26 Streambed Sediment~~

~~8-26.1 Description~~

~~This work includes grading the new channel as shown on the plans (Schedules A and B) or restoring the scour apron and invert sediments at the Tumbling Waters site (Schedule C), and installing streambed gravels.~~

~~8-26.2 Materials~~

~~Material shall meet the requirements of Section 9-03.11(1) Streambed Sediment, with actual sizes as shown on the plans for each Schedule.~~

8-26.3 Construction Requirements

- Excavate the channel to grade and dimensions shown on the project plans (Schedules A and B), or restore the scour zones to design grade (Schedule C).
- Create a channel thalweg as directed by the Engineer and place streambed sediment.
- Wash in the streambed sediment using a trash pump and nozzle to wash the fine sediment into the voids to provide a stream flow that is on the surface and not subsurface when stream flows begin in the fall.
- Collect and reuse all sediment washing in water, or discharge to forest for disposal.

8-26.4 and 8-26.5 Measurement and Payment

Measurement and Payment will be based on the cubic yards of streambed sediment in place and graded with a thalweg low-flow channel as aka fishmix gravel.

8-28 Restoration

8-28.1 Description

The work consists of seeding and mulching all disturbed ground surfaces, and seeding, mulching, and covering with Coir on steep construction-disturbed slopes which drain directly to the streams as called for by the EOR. This item also includes removing all debris from the sites as directed by the project manager and cleanup of the work and staging areas. Steep slopes shall be defined as steeper than 45% slope and will be identified by the EOR.

If the HPA requires revegetation and planting of disturbed areas, the Contractor shall supply a revegetation and replanting plan for that activity as described in the HPA. The plan shall include: Timing Schedule, Requirements of plant species, spacing, and size of plants. This plan shall be submitted during the course of construction and shall be for an allowance for a subcontractor to revegetate during the winter months when plants are dormant.

8-28.2 Materials

Coir blankets shall be Coir BioD 90 woven blanket by Rolanka Erosion Control Fabric (or similar) and shall be on hand for use as indicated by the EOR.

8-28.3 Construction Requirements

The Contractor shall seed and then cover with mulch or with Coir if indicated by the EOR per the manufacturer's specifications. Seed mix shall be approved by the Project Manager and shall be appropriate for the Lake Whatcom shoreline buffer zone. Seed first, then cover with mulch. Mulch shall consist of grass hay or straws (2000 lbs/acre). The soil to be covered shall be graded or raked free of clods and large stones without compacting. Seed and mulch shall be distributed evenly over the prepared soil. Coir shall be secured at the top of the slope by toeing in 6" deep. Reinforce with a row of 5 staples or wooden stakes at one-foot spacing and cover with soil. Roll fabric down the slope (leave loose, do not over-stretch) to a level elevation. Fold 6 inches under and secure with staples. Place staples 18" to 24" apart throughout to secure matting to ground. All staples must be driven flush with soil surface. Overlap the edges a minimum of 6".

8-28.4 and 8-28.5 Measurement and Payment

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Measurement and Payment will be based on the item from the bid list completed as shown on the project plans for each Schedule:

- Coir fabric, 9.8’ wide x 165’ rolls, by each, and shall be on hand or readily available if called for by the EOR.
- "Coir Fabric" Per roll
- “Site Restoration,” Lump Sum.
- Force account, subcontractor or “Revegetation Planting” Requirements of the HPA

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9-00 Definitions and Tests

9-00.10 Restrictions on Certain Foreign Purchases

(a) Except as authorized by the Office of Foreign Assets Control (OFAC) in the Department of the Treasury, the Contractor shall not acquire, for use in the performance of this contract, any supplies or services if any proclamation, Executive order, or statute administered by OFAC, or if OFAC's implementing regulations at 31 CFR Chapter V, would prohibit such a transaction by a person subject to the jurisdiction of the United States.

(b) Except as authorized by OFAC, most transactions involving Cuba, Iran, and Sudan are prohibited, as are most imports from Burma or North Korea, into the United States or its outlying areas. Lists of entities and individuals subject to economic sanctions are included in OFAC's List of Specially Designated Nationals and Blocked Persons at http://www.treas.gov/offices/enforcement/ofac/sdn.

(c) The Contractor shall insert this clause, including this paragraph (c), in all subcontracts.

9-03 Aggregates

- 9-03.9(3) — Crushed Surfacing
- 9-03.11(1) — Streambed Sediment
- 9-03.11(2) — Streambed Cobbles
- 9-03.14(1) — Gravel Borrow
- 9-03.14(2) — Select Borrow

Materials in Section 8 and 9

All materials specifications noted within these Contract Documents shall be as specified in Section 8 and 9 of WSDOT M41-10 unless indicated otherwise.

Conflicts in specifications shall follow this hierarchy:

- The Bid Form shall be the highest authority,
- then the Drawings, to include shop drawings
- then the Special Conditions,
- then WSDOT M41-10, latest edition.

END OF SPECIFICATIONS — DRAWINGS FOLLOW

HYDRAULIC PROJECT APPROVAL

Washington Department of
Fish and Wildlife
PO Box 43234
Olympia, WA 98504-3234
(360) 902-2200

Issue Date: 06/12/2026
Project End Date: 10/30/2026

Permit Type: HPA - Standard
Permit Number: 2026-4-428+01
Application ID: 0042631

PERMITTEE	AUTHORIZED AGENT
ATTENTION Sudden Valley Community Association Michael Bennett 4 Clubhouse Circle Bellingham, Washington 98229-2735	ATTENTION Chinook Engineering Jay Kidder 860 Windrose Dr Coupeville, Washington 98239-3539

Project Name: Sudden Valley Community Polo Park Fish Passage Culvert Replacement to Bridge, and Tumbling Water Drive crossing Austin Creek Culvert ImprovementsRoy Street Bridge Replacement, and

Project Description: The work includes the replacement of a failing culvert on Polo Park Drive where it crosses Beaver Creek in Sudden Valley with a new steel bridge, replacement of an aging rail car bridge on Roy Avenue near the Maintenance Yard with a new steel bridge, and concrete structural underpinning of the foundation footing of the Tumbling Water Drive crossing at the Austin Creek culvert.

PROVISIONS

AUTHORIZED WORK TIMES

1. You may begin the project immediately and you must complete the project by October 30, 2026. Work below the ordinary high water line must only occur between July 15 and September 30 of any permitted year.

PROJECT APPROVALS

2. Work must be accomplished per the plans and specifications submitted with the application and approved by the Washington Department of Fish and Wildlife, entitled "ProjectPlanDrawings_Sudden Valley Bridge.R24", sheets 1-18 of 18, dated January 27, 2025, except as modified by this Hydraulic Project Approval (HPA). You must have a copy of these plans and this HPA available on site during all phases of the project construction.

NOTIFICATION REQUIREMENTS

3. FISH KILL/WATER QUALITY PROBLEM NOTIFICATION: If a fish kill occurs or fish are observed in distress at the job site, immediately stop all activities causing harm. Immediately notify the Washington Department of Fish and Wildlife of the problem. If the likely cause of the fish kill or fish distress is related to water quality, also notify the Washington Military Department Emergency Management Division at 1-800-258-5990. Activities related to the fish kill or fish distress must not resume until the Washington Department of Fish and Wildlife gives approval. The Washington Department of Fish and Wildlife may require additional measures to mitigate impacts.
4. You or your agent must contact the Washington Department of Fish and Wildlife by e-mail at HPAapplications@dfw.wa.gov; mail to Post Office Box 43234, Olympia, Washington 98504-3234; or fax to (360) 902-2946 at least three business days before starting work, one day before removing the temporary bypass, and again within seven days after completing the work. The notification must include the permittee's name, project location, starting date for work or date the work was completed, and the permit number. The Washington Department of Fish and Wildlife may conduct inspections during and after construction; however, the Washington Department of Fish and Wildlife will notify you or your agent before conducting the inspection.

REPORTING REQUIREMENTS

5. PHOTOGRAPHS: You, your agent, or contractor must take photographs of the job site before the work begins and after the work is completed. You must upload the photographs to the post-permit requirement page in the Aquatic Protection Permitting System (APPS) or mail them to Washington Department of Fish and Wildlife at Post Office Box 43234, Olympia, Washington 98504-3234 within 30-days after the work is completed.

INVASIVE SPECIES CONTROL

6. Follow Method 1 for low-risk locations (i.e., clean/drain/rinse/dry). Thoroughly remove visible dirt and debris from all equipment and gear—including vessels, boots, waders, drive mechanisms, wheels, tires, tracks, buckets, and undercarriage—before arriving at and leaving the job site to prevent the transport and introduction of aquatic invasive species. For contaminated or high-risk sites, refer to the Method 2 Decontamination protocol. Clean, rinse, and dry all decontamination equipment used and properly dispose of any water and chemicals used for cleaning. For additional decontamination details, including specific protocols for freshwater, marine, and estuarine environments, refer to the Washington Department of Fish and Wildlife Invasive Species Management Protocols, available online at https://wdfw.wa.gov/species-habitats/invasive/prevention/clean-drain-dry#decontamination

STAGING, JOB SITE ACCESS, AND EQUIPMENT

7. Establish staging areas (used for activities such as equipment storage, vehicle storage, fueling, servicing, and hazardous material storage) in a location and manner that will prevent contaminants such as petroleum products, hydraulic fluid, fresh concrete, sediments, sediment-laden water, chemicals, or any other toxic or harmful materials from entering waters of the state.
8. Clearly mark boundaries to establish the limit of work associated with site access and construction.
9. Equipment used in or near water must use environmentally acceptable lubricants composed of biodegradable base oils. These are vegetable oils, synthetic esters, and polyalkylene glycols.
10. Check equipment daily for leaks and complete any required repairs in an upland location before using the equipment in or near the water.
11. Limit the use of equipment waterward of the ordinary high water line to that necessary to gain position for the work.
12. If wet or muddy conditions exist, in or near a riparian zone or wetland area, use equipment that reduces ground pressure.
13. Use existing roadways or travel paths whenever possible.

SEDIMENT, EROSION, AND POLLUTION CONTAINMENT

14. Before starting work, install sediment and erosion control measures to prevent sediment from entering waters of the state. Inspect the sediment and erosion control measures regularly during construction and make all needed repairs if any damage occurs.
15. Protect all disturbed areas from erosion. Maintain erosion and sediment control until all work and cleanup of the job site is complete.
16. Deposit waste material from the project, such as construction debris, silt, excess dirt, or overburden, in an upland area above the limits of anticipated floodwater unless the material is approved by the Washington Department of Fish and Wildlife for reuse in the project.
17. Do not stockpile construction material waterward of the ordinary high water line.
18. Straw used for erosion and sediment control, must be certified free of noxious weeds and their seeds.
19. If excavation or other construction activities take place waterward of the ordinary high water line, isolate the work area from the stream flow (if present) by using a cofferdam, bypass, or similar structure.
20. If flow conditions arise that will result in erosion or siltation of waters of the state, stop all hydraulic project activities except those needed to control erosion and siltation.
21. Install and maintain curbs or wheel guards to prevent aggregate or earth-type paving material from entering the stream.
22. Prevent project contaminants, such as petroleum products, hydraulic fluid, fresh concrete, sediments, sediment-laden water, chemicals, or any other toxic or harmful materials, from entering or leaching into waters of the state.
23. All erosion control materials that will remain onsite must be composed of 100% biodegradable materials.

24. Remove soil or debris from the drive mechanisms (wheels, tires, tracks, etc.) and undercarriage of equipment prior to operating the equipment waterward of the ordinary high water line.
25. Route the construction water (wastewater) from the project to an upland area above the limits of anticipated floodwater. Remove fine sediment and other contaminants before discharging the construction water to waters of the state.
26. Store all construction and deconstruction material in a location and manner that will prevent contaminants such as petroleum products, hydraulic fluid, fresh cement, sediments, sediment-laden water, chemicals, or any other toxic or harmful materials from entering waters of the state.
27. To minimize sediment delivery to the stream or stream channel, do not return in-stream flows to the work area until all in-channel work is completed and the bed and banks are stabilized.
28. Do not release overburden material into the waters of the state when resloping the bank.
29. All equipment fueling and servicing must be done so that petroleum products do not get into the body of water or frequent scour zone. If a petroleum sheen or spill is observed, you must immediately stop work, remove the equipment from the body of water, and contact the Washington Military Department Emergency Management Division (1-800-258-5990). You may not return your equipment to the water until the problem is corrected. You must store fuel and lubricants outside the frequent scour zone, and in the shade when possible.
30. Return water flow slowly to the in-water work area to prevent the downstream release of sediment laden water. If necessary, install silt fencing above the bypass outlet to capture sediment during re-watering of the channel.

CONSTRUCTION MATERIALS

31. To prevent leaching, construct forms to contain any wet concrete. Place impervious material over any exposed wet concrete that will come in contact with waters of the state. Forms and impervious materials must remain in place until the concrete is cured.
32. Use material for the approaches that is structurally stable and that will not harm fish life if it erodes into the water.
33. Do not use wood treated with oil-type preservative (creosote, pentachlorophenol) in any hydraulic project. Wood treated with waterborne preservative chemicals (ACZA, ACQ) may be used if the Western Wood Preservers Institute has approved the waterborne chemical for use in the aquatic environment. The manufacturer must follow the Western Wood Preservers Institute guidelines and the best management practices to minimize the preservative migrating from treated wood into aquatic environments. To minimize leaching, wood treated with a preservative by someone other than a manufacturer must follow the field treating guidelines. These guidelines and best management practices are available at https://preservedwood.org.

HABITAT FEATURES

34. Limit the removal of native bankline vegetation to the minimum amount needed to construct the project.
35. Retain all natural habitat features on the bed or banks including large woody material and boulders. You may move these natural habitat features during construction but you must place them near the pre-project location before leaving the job site.

MAINTENANCE AND OPERATION

36. The owner(s) must maintain the culvert to ensure it provides continued, unimpeded fish passage. If the culvert becomes a hindrance to fish passage, the owner must obtain an HPA and provide prompt repair.

IN-WATER WORK AREA ISOLATION

37. Install the cofferdam, dike, or similar structure and remove fish prior to the start of other work in the wetted perimeter.
38. Isolate fish from the work area by using block nets.
39. Maintain water quality when installing and removing the cofferdam, dike or similar structure.
40. Sequence the work to minimize the duration of dewatering.
41. After the first block net is secured at the upstream end, use a second block net to herd fish downstream and out of the project area.
42. Block net openings must not exceed 3/32 inch.
43. Check block nets at least three times a day for entangled fish and accumulated debris.

44. Do not install block nets at sites with heavy vegetation, large cobble or boulders, undercut banks, or deep pools unless you can secure and maintain them.
45. Install a downstream block net if fish may reenter the work area from downstream.
46. Install block nets at an angle to the direction of flow (not perpendicular to the flow) to avoid entrapping fish in the nets.
47. Install block nets at sites with reduced flow volume or velocity, uniform depth, and good accessibility.
48. Secure block nets along both banks and the channel bottom to prevent failure from debris accumulation, high flows, and/or flanking.
49. To anchor block nets, place bags filled with clean round gravel along the bottom of the nets.
50. To keep fish out of the job site, leave block nets in place until the work is complete and conditions are suitable for fish.
51. Use a cofferdam, dike, or similar structure to exclude water from the work area.
52. Design the temporary bypass to minimize the length of the dewatered stream channel.
53. Use the least-impacting feasible method to temporarily bypass water from the work area. Consider the physical characteristics of the site and the anticipated volume of water flowing through the work area.
54. During all phases of bypass installation and decommissioning, maintain flows downstream of the project site to ensure survival of all downstream fish.
55. Install a cofferdam or similar device at the upstream and downstream end of the bypass to prevent backwater from entering the work area.
56. Isolate fish from the work area by using either a total or partial bypass to reroute the stream through a temporary channel or pipe.
57. Isolate pump hose intakes with block nets so that fish cannot get near the intake.
58. Provide fish passage during times of the year when fish are expected to migrate.
59. The hydraulic capacity of the stream bypass must be sufficient to accommodate expected flows during the period of operation.
60. If the bypass is a pumped diversion, once started it must run continuously until it is no longer necessary to bypass flows. This requires back-up pumps on-site and twenty-four-hour monitoring for overnight operation.
61. If the diversion inlet is a gravity diversion that provides fish passage, place the diversion outlet where it facilitates gradual and safe reentry of fish into the stream channel.
62. If the diversion inlet is a pump diversion in a fish-bearing stream, the pump intake structure must have a fish screen installed, operated, and maintained in accordance with RCW 77.57.010 and 77.57.070. Screen the pump intake with one of the following:

    a. Perforated plate: 0.094 inch (maximum opening diameter);
    b. Profile bar: 0.069 inch (maximum width opening); or
    c. Woven wire: 0.087 inch (maximum opening in the narrow direction).

    The minimum open area for all types of fish screens is twenty-seven percent. The screened intake facility must have enough surface area to ensure that the velocity through the screen is less than 0.4 feet per second. Maintain fish screens to prevent injury or entrapment of fish.
63. Remove fish screens on dewatering pumps in the isolated work area only after all fish are safe and excluded from the work area.
64. Return diverted water to the channel immediately downstream of the work area. Dissipate flow energy from the diversion to prevent scour or erosion of the channel and bank.
65. The fish screen must remain in place whenever water is withdrawn from the stream through the pump intake.

FISH LIFE REMOVAL

66. All persons participating in capture and removal must have training, knowledge, and skills in the safe handling of fish life.

67. If electrofishing is conducted, a person with electrofishing training must be on-site to conduct or direct all electrofishing activities.
68. Capture and safely move fish life from the work area to the nearest suitable free-flowing water.
69. If personnel are available, the Washington Department of Fish and Wildlife and affected tribes may help capture and move fish life from the job site.
70. Place block nets upstream and downstream of the in-water work area before capturing and removing fish life.

PROJECT LOCATION

71. Locate the waterward face of all bridge elements including abutments, piers, pilings, sills, foundations, aprons, wing walls, and approach material landward of the ordinary high water line.

PROJECT DESIGN

72. Design and construct both bridges to pass water, ice, large wood, and associated woody material and sediment likely to move under the bridge during the 100-year flood flows.
73. The length of the Polo Park new bridge must not exceed 40 feet, and the length of the Roy Road new bridge must not exceed 70 feet as indicated in the approved plans.
74. Approach material must be structurally stable and composed of material that if eroded into the water will not harm fish life.
75. Size streambed material to mimic the stream's natural gradation as found in nearby reference channel reaches. The material must be well-graded (includes all size classes), non-porous, with 5-10% fines with sieve size U.S. No. 200 to prevent subsurface flow. Create a low-flow channel and a high-flow bench on both sides of the channel. Angular rock is not permitted within the channel.
76. Install biotechnical slope protection outside the bridge shadow if applicable.

PROJECT IMPLEMENTATION

77. Work in the dry watercourse (when no natural flow is occurring in the channel, or when flow is diverted around the job site).
78. Minimize disturbance or damage to the bed and banks when removing/installing bridges and repairing and removing culverts.
79. Remove the culvert in the dry or in isolation from the stream flow by using a bypass channel or culvert, or by pumping the stream flow around the work area. The Washington Department of Fish and Wildlife may grant exception if removing the culvert in the flowing stream reduces siltation or turbidity.
80. Reslope the banks to vertical as specified in the approved plans.

DEMOBILIZATION AND CLEANUP

81. Deposit all trash from the project at an appropriate upland disposal location.
82. Remove temporary erosion and sediment control methods after job site is stabilized or within three months of project completion, whichever is sooner.
83. Restore the disturbed bed, bank, and riparian zone elevations and contours to pre-project condition or the extent possible.
84. To prevent fish from stranding, backfill trenches, depressions, and holes in the bed that may entrain fish during high water.
85. Upon completion of the project, remove all materials or equipment from the site and dispose of all excess spoils and waste materials in an upland area above the limits of anticipated floodwater.

PLANTING

86. Seed areas disturbed by construction activities with a native seed mix suitable for the site that has at least one quick-establishing plant species.
87. Replant the job site with the plant species composition and planting densities approved by the Washington Department of Fish and Wildlife.

Issue Date: 06/12/2026
Project End Date: 10/30/2026

Permit Type: HPA - Standard
Permit Number: 2026-4-428+01
Application ID: 0042631

88. Complete replanting of riparian vegetation during the first dormant season (late fall through late winter) after project completion per the approved plan. Maintain plantings for at least three years to ensure at least eighty percent of the plantings survive. Failure to achieve the eighty percent survival in year three will require you to submit a plan with follow-up measures to achieve requirements or reasons to modify requirements.

PROJECT LOCATION(S)

Location		
Polo Park Bridge		
Latitude	**Longitude**	**County**
48.722021684589000	-122.363326611911000	Whatcom
WRIA	**Waterbody**	**Tributary to**
WRIA		
Location		
Roy Road		
Latitude	**Longitude**	**County**
48.713504500000000	-122.344055400000000	Whatcom
WRIA	**Waterbody**	**Tributary to**
WRIA	Beaver Creek (lb)	Beaver Creek (lb)
Location		
Tumbling Water		
Latitude	**Longitude**	**County**
48.708720000000000	-122.343220000000000	Whatcom
WRIA	**Waterbody**	**Tributary to**
WRIA	Austin Creek (ls)	Austin Creek (ls)

APPLIES TO ALL HYDRAULIC PROJECT APPROVALS

HYDRAULIC PROJECT APPROVAL

Washington Department of
Fish and Wildlife
PO Box 43234
Olympia, WA 98504-3234
(360) 902-2200

Issue Date: 06/12/2026
Project End Date: 10/30/2026

Permit Type: HPA - Standard
Permit Number: 2026-4-428+01
Application ID: 0042631

This Hydraulic Project Approval (HPA) pertains only to those requirements of the Washington State Hydraulic Code, specifically Chapter 77.55 RCW. Additional authorization from other public agencies may be necessary for this project. The person(s) to whom this HPA is issued is responsible for applying for and obtaining any additional authorization from other public agencies (local, state, and/or federal) that may be necessary for this project.

This Hydraulic Project Approval (HPA) shall be available on the job site at all times and all its provisions followed by the person(s) to whom this HPA is issued and operator(s) performing the work.

This Hydraulic Project Approval does not authorize trespass.

The person(s) to whom this Hydraulic Project Approval (HPA) is issued and operator(s) performing the work may be held liable for any loss or damage to fish life or fish habitat that results from failure to comply with the provisions of this HPA.

Failure to comply with the provisions of this Hydraulic Project Approval could result in a civil action against you, including, but not limited to, a stop work order or notice to comply, and/or a gross misdemeanor criminal charge, possibly punishable by a fine and/or imprisonment.

All Hydraulic Project Approvals (HPA) issued under RCW 77.55.021 are subject to additional restrictions, conditions, or revocation if the Washington Department of Fish and Wildlife determines that changed conditions require such action. The person(s) to whom this HPA is issued has the right to appeal those decisions. Procedures for filing appeals are listed below.

MINOR MODIFICATIONS TO THIS HYDRAULIC PROJECT APPROVAL (HPA): You may request approval of minor modifications to the required work timing or the plans and specifications approved in this HPA unless this is a General HPA. If this is a General HPA you must use the Major Modification process described below. Any approved minor modification will require the issuance of a letter documenting the approval. A minor modification to the required work timing means any change to the work start or end dates of the current work season to enable project or work phase completion. Minor modifications will be approved only if spawning or incubating fish are not present within the vicinity of the project. You may request subsequent minor modifications to the required work timing. A minor modification of the plans and specifications means any changes in the materials, characteristics, or construction of your project that do not alter the project's impact to fish life or habitat and do not require a change in the provisions of the HPA to mitigate the impacts of the modification. If you originally applied for your HPA through the online Aquatic Protection Permitting System (APPS), you may request a minor modification through APPS. A link to APPS is at https://hpa.wdfw.wa.gov/s. If you did not use APPS you must submit a written request for a minor modification to an existing HPA. Written requests must include the name of the permittee, the name of the authorized agent if applicable, the APP ID or HPA number, the date issued, the permitting biologist, the requested changes to the HPA, the reason for the requested change, the date of the request, and the requestor's signature. Send your written request by email to HPAapplications@dfw.wa.gov, or by mail to Washington Department of Fish and Wildlife, PO Box 43234, Olympia, Washington 98504-3234. You should allow up to 45 days for the Department to process your request.

MAJOR MODIFICATIONS TO THIS HYDRUALIC PROJECT APPROVAL (HPA): You may request approval of major modifications to any aspect of your HPA. Any approved change other than a minor modification to your HPA will require the issuance of a new HPA. If you originally applied for your HPA through the online Aquatic Protection Permitting System (APPS), you may request a major modification through APPS. A link to APPS is at https://hpa.wdfw.wa.gov/s. If you did not use APPS you must submit a written request for a major modification to an existing HPA. Written requests must include the name of the permittee, the name of the authorized agent if applicable, the APP ID or HPA number, the date issued, the permitting biologist, the requested changes to the HPA, the reason for the requested change, the date of the request, and the requestor's signature. Send your written request by email to HPAapplications@dfw.wa.gov or by mail to Washington Department of Fish and

Wildlife, PO Box 43234, Olympia, Washington 98504-3234. You should allow up to 45 days for the Department to process your request.

APPEALS INFORMATION

If you wish to appeal the issuance, denial, conditioning, or modification of a Hydraulic Project Approval (HPA), the Washington Department of Fish and Wildlife (WDFW) recommends that you first contact the WDFW employee who issued, denied, or conditioned the HPA to discuss your concerns. Such a discussion may resolve your concerns without the need for further appeal action. If you proceed with an appeal, you may request an informal or formal appeal. WDFW encourages you to take advantage of the informal appeal process before initiating a formal appeal. The informal appeal process includes a review by WDFW management of the HPA or denial and often resolves issues faster and with less legal complexity than the formal appeal process. If the informal appeal process does not resolve your concerns, you may advance your appeal to the formal process.

A. INFORMAL APPEALS: WAC 220-660-460 is the rule describing how to request an informal appeal of WDFW actions taken under Chapter 77.55 RCW. Please refer to that rule for complete informal appeal procedures. The following information summarizes that rule:

   A person who is aggrieved by the issuance, denial, conditioning, or modification of an HPA may request an informal appeal of that action. You must send your request to WDFW by mail to the HPA Appeals Coordinator, Department of Fish and Wildlife, Habitat Program, PO Box 43234, Olympia, Washington 98504-3234; e-mail to HPAapplications@dfw.wa.gov; fax to (360) 902-2946; or hand-delivery to the WDFW Habitat Program, Natural Resources Building, 1111 Washington St SE, Olympia, Washington 98501. WDFW must receive your request within 30 days from the date you receive notice of the decision. If you agree, and you applied for the HPA, resolution of the appeal may be facilitated through an informal conference with the WDFW employee responsible for the decision and a supervisor. If a resolution is not reached through the informal conference, or you are not the person who applied for the HPA, the HPA Appeals Coordinator or designee may conduct an informal hearing or review and recommend a decision to the Habitat Program Director or designee. If you are not satisfied with the results of the informal appeal, you may file a request for a formal appeal.

B. FORMAL APPEALS: WAC 220-660-470 is the rule describing how to request a formal appeal of WDFW actions taken under Chapter 77.55 RCW. Please refer to that rule for complete formal appeal procedures. The following information summarizes that rule:

   A person who is aggrieved by the issuance, denial, conditioning, or modification of an HPA may request a formal appeal of that action. You must send your request for a formal appeal to the clerk of the Pollution Control Hearings Boards and serve a copy on WDFW within 30 days from the date you receive notice of the decision. You may serve WDFW by mail to the HPA Appeals Coordinator, Department of Fish and Wildlife, Habitat Program, PO Box 43234, Olympia, Washington 98504-3234; e-mail to HPAapplications@dfw.wa.gov; fax to (360) 902-2946; or hand-delivery to the Habitat Program, Natural Resources Building, 1111 Washington St SE, Olympia, Washington 98501. The time period for requesting a formal appeal is suspended during consideration of a timely informal appeal. If there has been an informal appeal, you may request a formal appeal within 30 days from the date you receive the Habitat Program Director's or designee's written decision in response to the informal appeal.

C. FAILURE TO APPEAL WITHIN THE REQUIRED TIME PERIODS: If there is no timely request for an appeal, the WDFW action shall be final and unappealable.

HYDRAULIC PROJECT APPROVAL

Washington Department of
Fish and Wildlife
PO Box 43234
Olympia, WA 98504-3234
(360) 902-2200

Issue Date: 06/12/2026
Project End Date: 10/30/2026

Permit Type: HPA - Standard
Permit Number: 2026-4-428+01
Application ID: 0042631

Lizzi Lutes
Regional Habitat Biologist
(564) 676-1491
lizzi.lutes@dfw.wa.gov

For Director
DFW

NW Geologic PLLC

April 5, 2024
Report No.: 24-002

PNW Services, Inc.
PO Box 30498
Bellingham, WA 98228

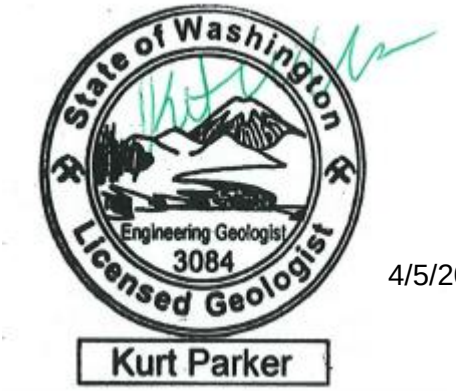
Attn: Tyler Andrews

RE: Subsurface Investigation Report for Culvert and Bridge Improvements, Sudden Valley, WA.

Dear Mr. Andrews:

NW Geologic, PLLC (NW Geo) thanks you for the opportunity, and respectfully submits the following geotechnical investigation report summarizing the results of our evaluation for the proposed culvert and bridge improvements at two locations in the Sudden Valley community near Bellingham, Washington. This report has been prepared in general accordance with the terms and conditions established in our Proposal for Services dated February 5, 2024. Should you have any further questions regarding the information contained within the report, or if we may be of service in other regards, please contact the undersigned.

Respectfully Submitted,



4/5/2024

Kurt Parker, Owner
Licensed Engineering Geologist
NW Geologic, PLLC
Ferndale, Washington

PROJECT DESCRIPTION

We understand that the Sudden Valley Community Association (SVCA) intends to replace two structures within the Sudden Valley community, near Bellingham, WA. The first location is a culvert replacement located on Polo Park Drive near the intersection with Sunnyside Lane and Lost Lake Lane in the southwestern area of Sudden Valley. The location contains a paved roadway over a culvert that sustained damage during the November 2021 flood events. It is our understanding that the culvert that provides conveyance of the waters of Beaver Creek will be replaced with a premanufactured steel bridge. The second location is a steel bridge replacement over Beaver Creek at the north entrance to the SVCA maintenance facility, herein referred to as Area Z, and accessed from Honeycomb Lane in the south-central area of Sudden Valley.

The *Vicinity Map* and *Site Maps* can be found as Figures 1 through 3 at the end of this report. *Topographic Maps* are found as Figures 4 and 5. The *Site and Exploration Plans* showing test locations are found as Figure 6. A Unified Soil Classification System (USCS) chart is provided as Figure 7.

SCOPE OF SERVICES

The purpose of this investigation is to establish general surface and subsurface conditions beneath the site from which geotechnical design and construction recommendations for the proposed development could be formulated. Our scope of services specifically includes the following tasks:

1. Perform a site visit to observe existing conditions, then mark and file an underground utility locate request as required by Washington State law.
2. Provide geologic reconnaissance and mapping of site and slope conditions to determine the potential for geologic hazards such as landslide or erosion concerns.
3. Explore the subsurface soil and groundwater conditions along the roadway alignments by advancing four geotechnical soil borings with a subcontracted drilling service to depths ranging from 6.5 to 66.5 feet below present grade (BPG).
4. Our findings, conclusions and recommendations are summarized within this geotechnical report containing the following information:
    - A description of site surface, subsurface, groundwater and mapped geologic conditions.
    - A site plan showing the approximate location of the explorations accomplished for this project.
    - Detailed exploration logs with a Unified Soil Classification System chart included explaining the soil classification criteria and the terminology and symbols used on the exploration logs.
    - Laboratory analysis of select soil samples to determine the engineering properties of the soils encountered.
    - An evaluation of geologic hazards and applicable mitigations per Whatcom County Code 16.16.
    - Recommendations for site preparation and earthwork, including reuse of site soil, and criteria for selection, placement, and compaction of structural fill.
    - Foundation support recommendations for bridge foundation design including relevant soil parameters, allowable soil bearing capacity, bearing elevations, frost penetration and depth and resistance to lateral loads.
    - Recommendations for geotechnical consulting during construction.

INVESTIGATION METHODOLOGY

On March 18, 2024, a NW Geologic Licensed Engineering Geologist visited the site to perform subsurface exploration by hollow stem auger borehole methods with a drilling crew from Boretec 1, Inc., of Bellevue, WA.

Subsurface investigation included the advancement of two geotechnical borings at each of the two project locations. Pocket penetrometer testing was performed in the field on select drill intervals along with visual classification, recovery measurements and photography of each sample interval.

Disturbed but representative samples were obtained during the drilling process by using the Standard Penetration Test (SPT) procedure in accordance with American Society for Testing and Materials (ASTM) D1586 during the explorations. This test and sampling method consists of driving a standard 2-inch outside-diameter, split-barrel sampler a distance of 18 inches into the soil with a 140-pound hammer free-falling a height of 30 inches. A rope and cat head system provide the energy for driving the hammer. The number of blows for each 6-inch interval is recorded and the number of blows required to drive the sampler the final 12 inches is known as the Standard Penetration Resistance ("N") or blow count. If a total of 50 blows is recorded within one 6-inch interval, the blow count is recorded as the number of blows for the corresponding number of inches of penetration. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils. The boreholes were terminated at depths ranging from approximately 6.5 to 66.5 feet below BPG.

Sampling of the soils consisted of a grab sample at 1 foot depth from the drill cuttings, followed by split barrel samples at 2.5-foot intervals to a depth of 10 feet BPG. The remainder of the sampling was advanced on 5-foot intervals to termination depth. Soils within the boreholes were sampled and classified per the American Society for Testing and Materials (ASTM) D2487 - *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System*), with ASTM D2488 - *Standard Practice For Description And Identification Of Soils (Visual-Manual Procedure)* and in conjunction with USDA Textural Triangle methods.

Please reference Figure 6 – *Site and Exploration Plans* for approximate locations of our subsurface testing. Detailed boring logs can be found at the end of this report. The attached logs contain standard nomenclature for soil classification. In addition, the pocket penetrometer values are noted on the boring logs in tons per square foot as PP= 1.5 tsf, for example. Where definite contact between units was recorded, a solid line is found on the logs. Where the contact between units is estimated, a dashed line is found on the logs.

We also provided visual reconnaissance of the surface and topographic features of the subject property and adjacent terrain for a geologic hazard assessment and site characterization in accordance with Whatcom County Code requirements.

Laboratory testing was performed by Simply Soil Testing of Burlington, WA. Analysis performed includes textural classification that followed ASTM D422 - *Standard Test Method for Particle-Size Analysis of Soils* (Hydrometer Method). The percentages of clay, silt, sand and gravel were determined and reported through the USDA Textural Triangle classification. The material size percentages were then converted to USCS Soil Classification for the purpose of documentation in this report. The USDA textural classification method excludes gravel content. Organic content of soils was analyzed per the American Association of Highway and Transportation Officials (AASHTO) T267 – *Standard Method of Test for Determination of Organic Content in Soils by Loss on Ignition*. Laboratory analysis data is attached at the end of this report.

We also reviewed geologic literature resources and geologic hazard maps published by the Washington State Department of Natural Resources (DNR), Washington State Department of Ecology (DOE), US Geological Survey, US Department of Agriculture, Whatcom County and other public sources, as available.

SITE CONDITIONS

Surface Summary

The general area of both project sites are located within the Sudden Valley community development. The first area explored on Polo Park Drive is located between Sunnyside Lane to the south and Lost Lake Lane to the north on a residential roadway. The project vicinity contains single-family residences on level to gentle sloping terrain. Polo Park Drive is aligned generally north-south over Beaver Creek. The roadway is approximately 25 feet wide at the culvert centerline and is located about 13 feet vertically above the creek bottom. The creek passage contains a steel corrugated culvert approximately 10 feet wide that will be replaced with the new manufactured steel bridge. The culvert is armored with 1-to-3-man boulders. The valley of Beaver Creek in this area is incised into the surrounding terrain approximately 6 to 8 feet below the surrounding topography. The area overall is vegetated with mature Pacific northwest tree canopy and common understory.

The second area of exploration is located near Area Z that contains the Sudden Valley Maintenance facility. The area is accessed via Honeycomb Lane to the immediate north, or via Lake Louise Road to the south. Honeycomb Lane is surfaced with asphalt to the north and with crushed gravel to the south of the established bridge. The existing bridge is a steel structure of unknown age and surfaced with wood decking. The bridge dimensions are 54 feet long and about 12 feet wide. The bridge deck is located approximately 12 feet above the bottom of the creek. The existing bridge is heavily oxidized, and loads are currently limited to 5 tons. The bridge is typically gated and access across to Area Z from the north is limited in nature. The Beaver Creek valley in this location is incised approximately 6 to 12 feet at the bridge location. Areas to the north of the bridge contain single-family residences on forested parcels, while the vicinity to the south within Area Z is mostly cleared of timber and surfaced with grasses and other low-lying vegetation, community gardens, gravel roads, parking and maintenance buildings. Vegetation at the project site is common junior to mature Pacific Northwest tree canopy with common understory.

The only observed surface water at both locations was contained within the southeast flowing Beaver Creek valley. General signs of global or local slope instability related to landslides were not observed during our reconnaissance of the project areas. Beyond general slope morphology within the creek valley, we did not observe previous landslide evidence such as tension cracks, scarps or landslide runout debris. We did observe signs of erosion within the creek channel in select locations, much of which was attributed to the November 2021 flood events that impacted the region. Photographs of site conditions are provided in Appendix A at the end of this report.

Subsurface Conditions

Subsurface conditions were observed by advancing four geotechnical borings (B-1 to B-4). Two borings were advanced at each waterway crossing – one on each side of Beaver Creek. At Polo Park Drive, boreholes B-1 and B-2 were located in the southbound lane and spaced laterally approximately 20 to 40 feet from the culvert center line. At Area Z, borings B- 3 and B-4 were advanced in the center of the paved or gravel roadway and spaced laterally approximately 20 feet from the north and south bridge margins, respectively.

At Polo Park Drive, boring B-1 was advanced to approximately 6.5 feet below present grade (BPG) where refusal conditions were encountered. We encountered about 6 inches of asphalt pavement at the surface, followed by grade fill or pit run fill to a depth of about 5.0 feet BPG. The auger advanced was limited after this depth due to very dense conditions. A last attempt to advance the sampler met with hard refusal at 6.5 feet in depth. Recovery was mostly poor for this borehole. However, fragments of quarry spalls similar to those used to armor the culvert alignment were recovered in the last sample at 6.5 feet. Because of the fill conditions encountered at B-1, borehole B-2 was moved further to the south and away from potential dense fill encounters.

Borehole B-2 contained about 4 inches of asphalt pavement at the surface, and similar pit run fill soil to a depth of about 2 to 2.5 feet BPG. Native soils consisting of light gray, damp, very stiff, silty sand were encountered below the fill and continued to a depth of 5.5 feet below grade. We interpret the native soils to be Pleistocene glacial drift. Below this depth, bedrock conditions were encountered. The drill team was able to advance the auger and sampler from the 7.5-foot depth interval to 9 feet BPG and recovered light to dark brown, dry, hard, moderately to strongly weathered sandstone. The borehole was terminated at this depth due to refusal conditions.

At B-3 on the north side of the Area Z bridge, we encountered approximately 5 inches of older asphalt pavement in the near subsurface. Below the pavement, and continuing to about 7 feet BPG, we encountered a silty, gravelly sand pit run fill that was variably light gray to orange brown, damp and dense to very dense. The drill rig was shaking and advance of the sampler was difficult through this interval. Native conditions were encountered below about 7 feet in depth and continued to termination depth of 66.5 feet BPG. The soils encountered are interpreted to be late Pleistocene to Holocene lacustrine (lake) deposits overlying fluvial (river) deposits positioned over glacial deposits at depth. The lake deposits consisted of mostly loose to medium dense or soft to medium stiff, damp to wet, silty sands to clayey, sandy silts in general. Disseminated and concentrated organics were noted within the sample intervals from 8.2 to 15 feet BPG, mostly notably a thin band of peat from 8.2 to 8.5 feet BPG. Below the lake deposits at about 20 feet in depth, the stratigraphy transitioned to river deposits consisting of mostly dark gray, wet, medium dense, silty sand to sand with varying gravel content. Some interbedding of materials were noted mostly at greater depths near the base of the unit. Glacial deposits were encountered by the 60-foot depth interval and consisted of dark gray, wet, dense, silty sand with some gravel. The borehole was terminated at 66.5 feet at refusal conditions of 50 blows for a 1-inch interval.

At B-4 on the south side of the existing bridge, we encountered about 6 feet of pit run fill from the surface. Lake deposits similar to B-3 were encountered to a depth of 18 feet BPG, before again intersecting medium dense river sands and silts to termination depth. Because of budget and time constraints B-4 was terminated at 31.5 feet within the fluvial strata. The table below presents a comparison of USCS and USDA classifications, percent fines and organic content. Note the elevated organic content at B-3 at 8.2 feet of over 20 percent.

Boring Location	USCS	USDA	Percent Fines	Organic Content
B-1 @ 1’	Gravelly sand	Sandy Loam	19	1.0
B-2 @ 5’	Gravelly, silty sand	Sandy Loam	29	1.6
B-3 @ 2.5’	Silty, gravelly sand	Sandy Loam	22	1.0
B-3 @ 5’	Silty, gravelly sand	Sandy Loam	26	1.0
B-3 @ 7.5’	Gravelly, silty sand	Sandy Loam	38	3.8
B-3 @ 8.2’	Sandy, clayey silt	Silt Loam	70	20.9
B-3 @ 10’	Silty sand	Loam	48	5.8
B-3 @ 15’	Clayey, sandy silt	Silt Loam	67	2.2
B-3 @ 20’	Clayey, sandy silt	Loam	67	1.6
B-3 @ 30’	Silty sand	Loamy sand	20	1.1
B-3 @ 50’	Gravelly sand	Sand	6	0.6
B-4 @ 5’	Silty, gravelly sand	Sandy loam	21	1.0
B-4 @ 7.5’	Silty sand	Sandy loam	37	1.8
B-4 @ 10’	Silty sand	Sandy loam	22	1.0
B-4 @ 15’	Silty sand	Loamy sand	23	1.2
B-4 @ 20’	Silty sand	Sandy Loam	38	1.1
B-4 @ 25’	Silty sand	Sandy loam	39	1.0

Groundwater

Groundwater was not observed at B-1 and B-2 on Polo Park Drive. We presume that the regional groundwater table closely mimics the water level within Beaver Creek. Groundwater was encountered at the Area Z bridge at a depth of about 17 feet BPG in both borings, which is near the elevation of Beaver Creek at this location. We consider both locations to be subject to groundwater encounters depending on the depths of new excavations. Because of the hard, generally low permeability bedrock intersected at relatively shallow depths at B-2, we advise that the contractor be prepared to manage groundwater encounters. The depth of groundwater at the Area Z bridge should not drastically impact construction based on elevation differences. We advise that both projects be completed in the dry summer months to avoid the chance of groundwater occurrence during construction. The contractor should incorporate a dewatering plan within the project documents prior to construction.

General Geologic Conditions

The mapped geologic conditions in the vicinity of the Polo Park Drive project site were referenced from the *Geologic Map of the Bellingham 1:100,000 Quadrangle, Washington* (Lapen, 2000). The author maps the Padden Member of the Eocene Chuckanut Formation (Unit Ec_{cp}) bedrock in the vicinity of the project site. Lapen describes the Padden Member as moderately to well sorted sandstone and conglomerate alternating with mudstone and minor coal beds. Sandstone ranges from fine to coarse grained, with pebbly to conglomeratic sandstone layers common. Planar cross bedding, flat-bedding, trough cross bedding, and ripple lamination are common bedding features. Sandstone is rich in chert and volcanic lithic clasts. Conglomerate is commonly massive to poorly stratified or cross bedded and composed primarily of rounded chert, volcanic, and plutonic clasts as much as 16 cm in diameter. The matrix is commonly medium- to coarse-grained sandstone. Mudstone is commonly massive to thinly laminated and usually associated with coal; sandstone and conglomerate layers as much as 50 m thick alternate with mudstone. The color is light olive-gray to pale yellowish brown. The thickness is possibly more than 3,000 meters. Age is younger than the underlying 49.9 ±1.2 Ma dacitic tuff in the upper Bellingham Bay Member and as young as Late Eocene. Honeycomb weathering patterns are common on exposures near sea water. Outcrops are widespread on the mainland and occur on Lummi, Matia, Sucia, and Patos Islands. The Padden Member has been the source of substantial amounts of coal in the vicinity of the City of Bellingham. The type locality is exposed near Lake Padden south of Bellingham (Lapen, 2000).

Lapen maps the geology at the Area Z project site as the Bellingham Bay Member of the Eocene Chuckanut Formation (Unit Ec_{cb}) bedrock. The unit is described as well-sorted sandstone, conglomerate, and mudstone, with lesser coal. Sandstone is commonly coarse-grained arkose with lesser medium- to fine-grained sandstone composed predominantly of quartz and feldspar (K-feldspar and plagioclase). This member is commonly trough cross-bedded and ripple or flat-laminated. Conglomerate, occurring most notably at the base of the section, contains clasts derived from underlying units (phyllite and vein quartz) as well as clasts from more distant sources. Bedding is generally massive to crudely stratified. Mudstone is commonly massive or laminated and contains plant fossils (for example, palm fronds) and local coal layers. Coarse- to fine-grained lithologies are often interbedded and form upward-fining sequences averaging 29 meters thick near Bellingham Bay. The color is yellowish gray to gray with a salt and pepper appearance for sandstones; color of conglomerates varies with lithologic content. Mudstone ranges from bluish gray to dark gray, and coal is generally black. The thickness is estimated to be 2,700 m, based on a measured section along Bellingham Bay (Lapen, 2000).

The Washington State Department of Natural Resources (DNR) *Geologic Information Portal* maps no active landslides within the immediate vicinity of the planned improvements. There are mapped alluvial fan deposits to the northwest of the Area Z project location. There are no active faults in the vicinity of the project sites. The closest mapped active fault is north of the town of Deming, located about 11 miles or more to the north.

Based on the drilling results, along with local experience in the terrain found at and around the project site, it is our opinion that the site geologic conditions at the Polo Park Drive culvert represent a thin mantle of imported fill

over native glacial drift overlying Chuckanut Formation bedrock. Our findings generally appear to support the nearby mapped geology at Polo Park Drive.

At Area Z, the site geology is interpreted to be imported fill over late Pleistocene to Holocene lake and river deposits overlying glacial drift at depth, with Chuckanut Formation bedrock positioned below the glacial drift. Our findings are discordant with the mapped geology and may represent previously unknown or unexplored geologic conditions. As the Area Z location falls within a narrow valley between elevated foothills to the north and mountainous terrain to the south on Lookout Mountain, we consider it plausible that a lake and river system existed here coeval or immediately following deglaciation at the end of the Pleistocene. It should be noted that the published soil types are representative of regional conditions and some variation between on-site soils and mapped geologic units should generally be anticipated.

Web Soil Survey

According to the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) *Web Soil Survey* website, one soil unit is mapped within the Polo Park Drive and Area Z project sites. Sehome loam, 2 to 8 percent slopes, are mapped across both project locations. Please reference the table below for additional characteristics.

Map Unit Symbol	139
Map Unit Name	Sehome loam, 2 to 8% slopes
Soil Description	Medial loam over gravelly medial loam over very gravelly loam
Landform	Valley sides, mountain slopes
Parent Material	Volcanic ash and loess over glacial drift
Land Capability Classification	3w
Erosion K Factor, Whole Soil	0.43 – High

Values of erosion factor K range from 0.02 to 0.69, and the higher the value, the more susceptible the soil is to sheet and rill erosion by water. Unit 139 is rated as having a **high** erosion susceptibility with an erosion K factor of 0.43. We consider the potential for erosion to be moderate to high overall if soils are left in an exposed condition over time around the new bridge locations due to general topography within the Beaver Creek valley. Part of our recommendations to reduce erosion potential within the subject waterway will be discussed further below. We consider that soil erosion will be greatly reduced once our recommendations are incorporated into the project plans. Erosion can be managed during and after construction with best management practices and general maintenance.

Lidar Imagery Review

Light detection and ranging (Lidar) imagery of the site vicinity was reviewed during the research process. Lidar information was acquired through the *Washington Lidar Portal* and the Whatcom County *Tax Parcel Viewer* websites. Based on our review, the valley areas surrounding both project sites are characterized by the presence of low to moderate angle slopes. Beaver Creek is clearly incised into the narrow valley as demonstrated by its meandering channelization. Alluvial fan landforms are evident in select locations within the Beaver Creek valley but are not located within the project specific areas. There were no indications of tension cracks, large-scale head scarps, landslide tracts or other indicators associated with global or local slope instability observed.

Please note that not all signs of slope instability can be observed in Lidar imagery review because of resolution and scale. In addition, any signs of instability on the site slopes or vicinity that have occurred within the last approximately 7 years, if present, have occurred after the imagery acquisition.

GEOLOGICALLY HAZARDOUS AREAS

According to Whatcom County Code (WCC) section 16.16.310(a), geologically hazardous areas include areas *susceptible to erosion, landslide, rock fall, subsidence, earthquake, tsunami, alluvial fans or other geological events that pose a threat to the health and safety of citizens when incompatible development is sited in areas of significant hazard.*

Based on the project site locations within an incised creek channel, we have identified potential landslide and erosion hazards to be relevant to development at both creek crossings. These geologic hazards are discussed below. In addition, for the benefit of the client and development, seismic hazards are also addressed herein.

Landslide Hazard Areas

Whatcom County Code section 16.16.310(c)(1) defines potential landslide hazard areas as *areas potentially susceptible to landslides based on a combination of geologic, topographic, and hydrologic factors, as specified below. They include any areas susceptible to mass movement due to any combination of bedrock, soil, slope (gradient), slope aspect, slope form (concave, convex, planar), geological structure, surface and subsurface hydrology, or other factors. Landslide hazard areas shall also include areas along which landslide material may be routed or which may be subject to deposition of landslide-delivered material.* Whatcom County Code specifically names 14 criteria to identify a potential landslide hazard zone. Of those criteria, the following are relevant to the subject site in our opinion.

- Areas with all three of the following characteristics:

  (A) Slopes steeper than 15 percent;

  (B) Hillsides intersecting geologic contacts with a relatively permeable sediment overlying a relatively impermeable sediment or bedrock; and

  (C) Springs or groundwater seepage

- Potentially unstable slopes resulting from river or stream erosion or undercutting by wave erosion;

- Any area with a slope of 40 percent or steeper and with a vertical relief of 10 or more feet except areas composed of competent bedrock or properly engineered slopes designed and approved by a geotechnical engineer licensed in the state of Washington and experienced with the site.

Based on our review of drill data, regional geology, Lidar imagery, field reconnaissance and previous experience in the project area, we did not observe indications of slope instability in the vicinity of the new bridge improvements. However, both locations meet the above criteria due to their location within an incised creek valley. We assume that any landslide event would be triggered by erosion of the creek channel more than any other factor.

Therefore, the project areas which are contained within the Beaver Creek valley, are considered potential landslide hazard areas as defined by WCC. Due to the fact that no evidence of ongoing slope failure was observed in the vicinity of the project sites, these slopes are not considered to be active landslide hazard areas. We understand that Whatcom County considers the anticipated design life of a new structure to be 100 years.

Based on the information collected, we consider the potential for a deep-seated soil slope failure that would impact the proposed structures over the design life to be **low** under static conditions but would have **high** consequences.

It is our opinion that relatively shallow translational landslides, have a generally **low** potential to impact the proposed improvements over the design life, with the consequences being **minor to moderate**.

Based on qualitative risk matrix analysis, and assuming the potential for deep seated failure is unlikely, but that the impact would be high, it is our opinion the overall risk associated with global slope instability is considered to be **low to moderate** at the project site. Similarly, we assume that it is possible for a shallow translational slide to impact the proposed bridge improvements over its planned lifetime, but that the impact would be **minor to moderate**. As such, it is our opinion that there is a **low level of risk** associated with deep or shallow-sourced landslides occurring and impacting the proposed bridge improvements assuming that the mitigations prescribed within this report and proper construction techniques are utilized during new development.

Erosion Hazards

Whatcom County Code section 16.16.310(c)(5) defines erosion hazards as *lands or areas in channel migration zones, that are defined as the areas along a river or stream within which the channel(s) can be reasonably predicted to migrate over time. This is a result of natural and normally occurring geomorphic, hydrological, and related processes when considered with the characteristics of the river or stream and its surroundings, and in consideration of river and stream management plans. Channel migration hazard areas shall include potential channel migration, channel avulsion, bank erosion, and stability of slopes along the river or stream.* Coastal erosion hazards are defined as *erosion areas that are subject to shoreline retreat from wind, wave, and tidal erosion.*

Based on the criteria set forth above, it is our opinion that **both bridge locations are considered to be within an erosion hazard area.** Based on the site topography within a creek valley, the potential erodible nature of near surface soils and evidence of previous erosion within the Beaver Creek valley, we recommend that the following measures be implemented into the project design and construction to mitigate and prevent excessive erosion from occurring at the project site.

- All clearing and grading activities for future construction will need to incorporate Best Management Practices (BMPs) for erosion control in compliance with current Whatcom County codes and standards.
- We recommend that appropriate silt fencing be incorporated into the construction plan for erosion control.
- We recommend that construction occur in the dry summer months when the potential to impact the site and soils are minimal.
- We recommend that onsite BMPs be implemented during construction. Areas of native vegetation left in place could also be enhanced by adding additional native plant species and/or other vegetation enhancements.
- Removal of vegetation without proper mitigation may increase the risk of failure for the surficial soils during periods of wet weather. Planting additional vegetation within the subject site and in areas disturbed by excavation activities will help maintain near surface slope stability by providing a stable root base within the near surface soils.
- Proper drainage controls have a significant effect on erosion. All surface water and any collected drainage water should not be allowed to be concentrated and discharged down the face of steep site slopes near the bridge locations. All collected stormwater should be directed to an appropriate collection system in accordance with the approved civil stormwater design.
- All areas disturbed by construction practices should be vegetated or otherwise protected to limit the potential for erosion as soon as practical during and after construction. Areas requiring immediate protection from the effects of erosion should be covered with either plastic, mulch or erosion control netting/blankets. Areas requiring permanent stabilization should be seeded with an approved grass seed

mixture, hydroseeded with an approved seed-mulch-fertilizer mixture or landscaped with a suitable design.
- Rock armoring of the bridge foundation areas as well as slopes within proximity of the new bridge developments to reduce erosion potential should be included in the project plans.

Seismic Hazards

Whatcom County Code section 16.16.310 (c)(2) defines seismic hazard areas as the following:

- *Areas designated as having a "high" and "moderate to high" risk of liquefaction susceptibility as mapped on the Liquefaction Susceptibility Map by the Washington State Department of Natural Resources.*
- *Areas that are identified as underlain by liquefiable soils and due to local topography are also subject to or interpreted as being potentially impacted by lateral spreading.*
- *Areas located within 500 feet of quaternary fault zones with surface offsets.*

Based on a review of the *Geologic Information Portal*, both project sites are mapped as having a **Not Applicable (N/A)** liquefaction susceptibility. We consider the potential for liquefaction and lateral spreading to be low based on soil or bedrock type, groundwater elevations and type of structure proposed. In addition, there are no active faults mapped within 500 feet of the project site. **As such, the subject property is not considered to fall within a seismic hazard area based on Whatcom County Code definitions.** However, the subject property is located within Seismic Design Category D_1, which states that site slopes may be unstable during a seismic event. In accordance with Whatcom County Code section 16.16.340, *development activities are required to conform to the applicable provisions of the International Building Code which contains structural safeguards to reduce the risk from seismic activity.* Outside of the mitigative requirements established in the International Building Code, we do not anticipate that additional mitigations will be required to address this potential hazard.

The client should understand that the Pacific Northwest is seismically active. Large Cascadia subduction zone earthquakes with possible magnitudes of 8 or 9 could produce ground shaking events with the potential to significantly impact the region and subject property. Cascadia subduction zone earthquakes have occurred 6 times in the last 3,500 years with the most recent occurrence in 1700, approximately 324 years ago. They have been determined to have an average reoccurrence interval of approximately 300 to 700 years (Atwater and Haley, 1997).

Mitigation of Geologic Hazards

Potential landslide and erosion hazards, as defined by Whatcom County Code, exist within proximity of the new bridge locations. As the sites contain relatively modest slopes within an incised creek valley, an increase in landslide or erosion potential exists, especially during flooding events. The culvert crossing at Polo Park Drive sustained significant damage in November 2021 when the creek water volume exceeded the capacity of the culvert, thus leading to undermining of the road and subsequent roadway subsidence. The implementation of a bridge with a wider span than the existing 10-foot-wide culvert will mitigate the hazard associated with landslide and erosion events in this location. We recommend that rock armoring of the bridge approach, foundation and outfall areas be implemented into the project plans. While the final design is the purview of the project engineer, we recommend that 1-to 3-man angular boulders, rip rap or similar materials be used to reinforce the new bridge vicinity on Polo Park Drive. In addition, benching of the slopes adjacent to the bridge foundation should be considered, depending on final design.

At Area Z, the bridge did not sustain damage during the November 2021 flood events, however age and deterioration make replacement of the structure necessary. Bank erosion is evident on the creek channel near the approach and outfall areas. Areas of adjacent properties immediately downstream to the southeast contain rock armoring. We recommend that rock armoring of the bridge approach, foundation and outfall areas be

implemented into the project plans. We recommend that 1-to 3-man angular boulders, rip rap or similar materials be used to armor the new bridge vicinity at Area Z.

At both new bridge locations, we recommend that benched cut slopes be graded and armored to maintain a roughly 2:1 permanent slope inclination or flatter. Any stormwater generated from new impervious surfaces should be collected via appropriate civil design and directed to a municipally approved discharge location.

Once the final civil and structural plans for the development have been prepared, NW Geo recommends that we be allowed to review those plans to verify that the recommendations presented in this report have been incorporated into the final plan for site development.

Provided that the previously presented mitigations as well as recommendations presented in the *Erosion Hazards* section of this report are implemented, it is our opinion that the geologic hazards that are present on the subject property can be adequately mitigated in conformance with Whatcom County Code. Assuming appropriate civil and structural design, and that our recommended mitigations have been incorporated into the plan for site development, it is our opinion that:

- The proposed development will not increase the threat to the health or safety of people and will not increase the potential for landslides on or off-site.
- The proposed development will be adequately mitigated to ensure at least 100 years of useful life for the proposed structure(s) or infrastructure.
- The proposed alteration shall not decrease slope stability on or off the site.
- The development shall not increase the risk or frequency of landslide occurrences.

It should be noted that no amount of engineering can completely mitigate or prevent flooding or subsequent slope instability. Mitigation is intended to reduce the risk posed at the site and it should not be interpreted that mitigation is representative of eliminating any and all risk that might be present on the site. It is assumed that the SVCA is aware of the potential flood, landslide and erosion hazards that are present at the proposed bridge locations and that they have been adequately informed and are accepting of the risks associated with new development.

Geologically hazardous critical area review is often a multi-phase process. Evaluations typically consist of at least two stages; First, the geologic hazards are identified, and applicable mitigations are recommended. Stage two typically consists of a plan review stage in which the final civil and structural plans are reviewed to assess the incorporation of the recommended mitigations, presented herein, into the project plan sets. Our client should be aware that Whatcom County may require a formal review and a brief letter from this firm stating that the relevant civil and structural site plans have adequately implemented the recommendations presented in this report.

CONCLUSIONS AND RECOMMENDATIONS

Based on the evaluation of data collected during this investigation, it is our opinion that the conditions at both new bridge locations are feasible for construction provided the recommendations contained herein are included with the project design. At Polo Park Drive, we anticipate a wider span bridge deck than what exists at the current culvert alignment, but do not anticipate that the width of the bridge will increase based on the width of the established roadway. At Area Z, the new bridge may extend laterally based on soil conditions and our recommendations herein, however, it will be in the same approximate position as the existing bridge.

For the Polo Park Drive culvert replacement, we recommend all existing fill and native soils be excavated to competent bedrock in the foundation locations, followed by the placement of structural fill for new pre-cast concrete foundation support. We estimate that bedrock will be encountered within 5 to 10 feet below the existing pavement, and that structural fill and rock armoring or spalls will be encountered adjacent to the existing culvert. Bedrock intersection may be shallower or deeper than estimated based on the undulating nature of the Chuckanut Formation sandstone and previous earthworks. Keying and benching of soils on the creek margins slopes, as well as temporary shoring may be necessary. Rock armoring of the new bridge vicinity should be incorporated into the project plans. Installation of the new bridge is likely to require de-watering or re-routing of Beaver Creek during construction as we estimate that the creek flows all year.

For the Area Z bridge replacement, we recommend removal of all existing fill supporting the established bridge margins down to native soils. Since the native lacustrine deposits were observed to be of lower density or consistency, we recommend the use of triaxial geogrid support in conjunction with new structural fill placement. The triaxial geogrid should be placed at the base of the native soil horizon and continue within the structural fill prism in two-foot lifts in conjunction crushed surfacing base course structural fill. Without the geogrid application supporting the new precast concrete bridge foundation, piles, piers or other deep foundation support will have to be utilized. We recommend the use of Tensar TriAx® TX 160 (or industry equivalent) geogrid for this application.

Excavation depths to native soils will likely vary based on our borehole exploration. We estimate that 5 to 10 feet of vertical excavation will be necessary to reach native soil. We also recommend the removal of any organic-rich, peat type deposits such as those encountered at 8.2 feet BPG at B-3. Keying and benching of soils on the creek margins slopes, as well as temporary shoring may be necessary. Rock armoring of the new bridge vicinity should be incorporated into the project plans. Dewatering and management of the creek flow is less likely than at Polo Park Drive because of elevation differences but should be considered by the design team.

Construction for both locations should occur in the dry summer months when creek levels are at seasonal lows.

Surface and near surface stormwater runoff will need to be managed by civil engineering design so that erosion control at and adjacent to the new bridges is managed throughout the lifetime of the structures.

Once the final civil and structural plans for the development have been prepared, NW Geo recommends that we be allowed to review those plans to verify that the recommendations presented in this report have been incorporated into the final plan for site development.

Earthwork

NW Geologic recommends that construction of the new bridge foundation base pads take place in the summer months to reduce the effects of soil moisture and groundwater seepage on construction. We anticipate the construction sequence to include stripping of existing asphalt and fill soils down to native conditions at both locations. We advise that the contractor will probably have to manage the water flow of Beaver Creek at Polo Park Drive following culvert removal.

We anticipate stripping depths of 5 to 10 feet at Polo Park Drive to reach competent bedrock. Stripping depths at Area Z will likely extend to 5 to 10 feet BPG to reach suitable native soils. We recommend the removal of any organic rich horizons at Area Z or otherwise, such as the peat deposits encountered at borehole B-3 at 8.2 feet BPG.

Prior to the placement of any foundation elements or structural fill, the exposed bedrock or native soil subgrade under all areas to be occupied by bridge foundations should be verified as suitable by our firm. We do not consider proof rolling feasible due to limited access conditions for large machinery. The suitability of native soil conditions should be accomplished with soil probe or DCP techniques and approved by our firm. Bedrock is typically verified visually and by hand tool evaluation for competency.

Temporary shoring may be necessary at both locations due to the depth of cuts and a limited workspace area, where shallower cut slope angles or benching may not be possible. Prior to placement of any structural fill or foundation elements, the exposed subgrade should be observed and approved by NW Geologic. The purpose of this effort is to identify possible loose, soft or organic soil deposits or unsuitable bedrock prior to structural fill placement. Unsuitable soils or bedrock should be excavated to firm conditions. Over-excavated areas should be back filled with compacted granular material placed in accordance with subsequent recommendations for structural fill.

Keying and Benching

Benching of sloping terrain adjacent to Beaver Creek should be considered by the project team depending on final design locations. Where fill is to be placed on or near slopes steeper than 5:1 (H:V), the base of new structural fill should be tied to native soils by appropriate keying and benching. A keyway is a trench cut into native soil that will act as a shear key and embed the toe of new structural fill into native conditions. Keyways for sloping site conditions should be at least 2 feet wide, 1 foot deep, and cut into the native material. Level benches can then be cut following the contours of the slope so that new fill will be less likely to slide as it will be placed and compacted on a level surface. Benches in native soils are typically cut a few feet wider than the equipment being used to cut them. No structural fill supporting bridge foundations should be placed on sloping soils, and every effort should be made to level foundation areas prior to structural fill placement.

We recommend that a keyway be cut into native soils at the Area Z bridge location prior to the placement of structural fill supporting the precast foundations. Shear keys or keyways are not typically utilized for bedrock conditions unless the competency of the rock is questionable. Benching of sloping terrain adjacent to Beaver Creek should be considered by the project team depending on final design locations.

Fill and Compaction

Structural fill used to obtain final subgrade elevations for bridge foundation footings must be properly placed and compacted. Material containing topsoil, wood, trash, organics, or construction debris will not be suitable for use as structural fill and should be properly disposed of offsite. Soils containing more than 5 percent fines are considered moisture sensitive and can be difficult to compact to a firm and unyielding condition when over the optimum moisture content by more than approximately 2 percent. The optimum moisture content is that which allows the greatest dry density to be achieved at a given level of compaction effort.

Any non-organic, predominantly granular soil may be used for structural fill for general backfill improvements provided the material is properly moisture conditioned prior to placement and compaction, and the specified degree of compaction is obtained. Specific material for the new bridge foundation base pad design is provided below in the *Imported Structural Fill* section below.

For the bridge base pad foundation areas, we recommend that 95% or greater compaction by modified proctor per ASTM D1557 is obtained within the structural fill prism supporting any new structural elements.

Reuse of Site Soil

Due to the generally elevated fines content and moisture concerns of the existing fill and native soils, the reuse of the existing fill or native soil as general structural fill is not considered suitable. We recommend that any existing fill or native soil excavated for the new bridge foundations be exported offsite or utilized in other project areas for landscape grading.

The reuse of existing quarry spalls or rock armoring is considered suitable if the existing material is within comparison to the below recommendations for riprap, spalls or rock armoring.

Imported Structural Fill

For imported construction materials, we recommend referencing the Washington State Department of Transportation, *Standard Specifications for Road, Bridge and Municipal Construction*, publication M 41-10, 2024.

For new pre-cast foundation support, both bridges should utilize an engineered crushed rock product. We recommend utilizing *Crushed Surfacing Base Course* (CSBC), with gradations similar to Specification 9-03.9(3). The gravel base pad should be at least 6 to 12-inches thick at Polo Park Drive, but may be extended to greater thicknesses, depending on actual conditions encountered during construction. The overall fill zone at Area Z may extend to 5 to 10 feet below existing grade, depending on actual conditions encountered during construction.

Streambed aggregates should follow the guidelines of Specification 9-03.11.

Riprap, quarry spalls, slope protection and rock for erosion and scour protection should follow the guidelines of section 9-13 of the Specifications manual.

General structural fill for areas not supporting new bridge foundations should utilize materials similar to the Specification for *Gravel Borrow* (9-03.14(1)) or *Select Borrow* (9-03.14(2)) depending on the season of construction and the type of fill application.

Although we do not anticipate significant road improvements away from the bridge approaches, some areas of both projects will likely have roadway modifications. For any new roadway improvements, we recommend import material consist of clean, well-graded sandy gravel, gravelly sand, or other approved naturally occurring granular material (pit run) or a well-graded crushed rock.

Backfill and Compaction

Structural fill should be placed in horizontal lifts 6 to 8 inches in loose thickness and thoroughly compacted with appropriate machinery. All structural fill placed under load bearing areas should be compacted to at least 95% of the maximum dry density, as determined using test method ASTM D1557. The top of the compacted structural fill should extend outside all foundations and other structural improvements a minimum distance equal to the thickness of the fill placed beneath the footing up to 5 feet laterally.

Wet Weather Earthwork

Native soils found at the site can be susceptible to degradation during wet weather conditions. As a result, it may be difficult to control moisture content of the site soil during wet weather. We strongly recommend that construction occur in the dry summer months. During the earthwork phase, the contractor may reduce soil disturbance by:

- Limiting the size of the areas that are stripped and left exposed
- Performing earthwork and wall construction in small sections
- Limiting construction traffic over unprotected soil
- Sloping surfaces to promote runoff
- Utilizing the proper type and size of equipment
- Provide gravel supported working mats over areas of prepared subgrade
- Installing perimeter ditches, berms and sumps to collect runoff

Seismic Design Category

The Pacific Northwest is seismically active, and the site could be subject to ground motion from a moderate to major earthquake. Consequently, moderate levels of earthquake shaking should be anticipated during the design life of the project, and the proposed structure should be designed to resist earthquake loading using appropriate design methodology.

Polo Park Drive

For structures designed using the seismic design provisions of the 2021 International Building Code, the Chuckanut Formation bedrock interpreted to underlie the site within the upper 100 feet classifies as *Site Class BC*, according to ASCE 7-22 Standard – Table 20.2-1, *Site Class Definitions*. The structural engineer should incorporate the appropriate design response spectrum based on *Site Class BC* and the geographic location of the structure.

Area Z

For structures designed using the seismic design provisions of the 2021 International Building Code, the native soils interpreted to underlie the site within the upper 100 feet classifies as *Site Class DE*, according to ASCE 7-22 Standard – Table 20.2-1, *Site Class Definitions*. The structural engineer should incorporate the appropriate design response spectrum based on *Site Class DE* and the geographic location of the structure.

Foundation Support

Polo Park Drive

New precast concrete bridge foundations should be placed on an imported crushed surfacing (CSBC) structural fill pad over approved, level bedrock conditions. We recommend that qualified geotechnical personnel from our company confirm that suitable bearing conditions have been reached prior to placement of structural fill or foundation concrete. We recommend a minimum 6 to 12-inch-thick crushed surfacing structural fill pad be placed over bedrock for proper foundation support and leveling purposes.

To provide proper support, we recommend the stripping and removal of existing fill soils within the new foundation vicinity down to competent, hard, firm and unyielding Chuckanut Formation bedrock. The bedrock will likely have to be leveled by mechanical removal including possible hydraulic rock breaking equipment.

Once suitable bearing conditions have been confirmed, the bridge foundation footprints can be constructed with property compacted structural fill as described above. The CSTC structural fill material should extend laterally beyond the edge of each side of the footing a distance equal to the depth of the excavation below the base of the footing.

Area Z

New precast concrete bridge foundations should be placed on imported crushed surfacing (CSBC) structural fill in conjunction with Tensar TriAx® TX 160 over approved native soil conditions. A keyway should be incorporated into the excavation of native soil process as addressed above. The triaxial geogrid should be placed directly on approved native soil after keyway excavation, followed by the placement of CSBC structural fill. We recommend a new lift of geogrid be placed every 2 feet vertically within the structural fill prism supporting the new precast foundation. The geogrid should extend laterally across the entirety of the CSBC structural fill zone. We also recommend that underground utilities be located horizontally away from the geogrid-CSBC structural fill zone, so that the geogrid is not damaged or otherwise impacted during construction.

We recommend at least 5 vertical feet of new CSBC structural fill with lifts of geogrid every two feet be used for bridge support. In this scenario, three layers of geogrid would be placed horizontally. As stripping depths may extend to 10 feet at Area Z, we anticipate that construction will be able to achieve this recommendation. As previously discussed, if CSBC and geogrid are not utilized, then deep foundation support in the form of piles or piers should be considered by the design team.

To provide proper support, we recommend the stripping and removal of existing fill and organic native soils from beneath the bridge foundation areas down to medium dense or medium stiff or greater, inorganic native soils. The contractor should make every effort to compact the native soils to a firm and unyielding condition with a heavy plate compactor, hoe-pack or a similar piece of construction equipment. Once suitable bearing conditions have been confirmed, the bridge foundation footprints can be constructed with property compacted structural fill and geogrid as described above. The CSBC structural fill material and geogrid should extend laterally beyond the edge of each side of the footing a distance equal to the depth of the excavation below the base of the footing.

The new foundation base pads for both locations should be founded a minimum of 18 inches below the lowest adjacent final grade for frost protection.

Allowable Bearing Capacity

Polo Park Drive

Assuming the above foundation support criteria are satisfied, the precast new bridge foundations placed on at least 6 to 12 inches of compacted CSBC structural fill placed upon hard, competent bedrock, may be proportioned using a net allowable soil bearing pressure of up to 4,000 pounds per square foot (psf).

The term "net allowable bearing pressure" refers to the pressure that can be imposed on the soil at foundation level resulting from the total of all dead plus live loads, including the weight of the footing or any backfill placed above the footing. The net allowable bearing pressure may be increased by one-third for transient wind or seismic loads. The above recommendation includes a safety factor of 3, which is considered the industry standard.

Area Z

Assuming the above foundation support criteria are satisfied, the precast new bridge foundations placed on compacted CSBC structural fill in conjunction with a keyway and geogrid reinforcement, placed upon medium dense or medium stiff native soils may be proportioned using a net allowable soil bearing pressure of up to 1,500 pounds per square foot (psf).

The term "net allowable bearing pressure" refers to the pressure that can be imposed on the soil at foundation level resulting from the total of all dead plus live loads, including the weight of the footing or any backfill placed above the footing. The net allowable bearing pressure may be increased by one-third for transient wind or

seismic loads. The above recommendation includes a safety factor of 3, which is considered the industry standard.

Foundation Settlement

Assuming construction is accomplished as recommended and for the maximum allowable bearing pressures addressed above, we estimate the total settlement of new foundations should be less than about one inch and differential settlement between two adjacent load-bearing components supported on competent soil should be less than about one half the total settlement. The above tolerance values are considered industry standards.

The soil response to applied stresses caused by bridge foundation and soil loads is expected to be predominantly elastic in nature, with most of the settlement occurring during construction as loads are applied. This settlement estimate assumes that foundations have been placed on properly placed and compacted imported crushed surfacing structural fill over firm and unyielding native conditions as detailed above.

Lateral Load Resistance

We recommend the project team utilize the following tables of values for engineering design at the two project sites.

Polo Park Drive

Material Type (Position)	Assumed Subsurface Parameters for Bridge Foundation Design							
	Unit Weight (γ) -pcf-	Internal Friction Angle (φ) - degrees-	Cohesion -psf-	Allowable Coefficient of Friction (Soil to Concrete)	Allowable Bearing Capacity -psf-	Passive Earth Pressure -pcf-	Active Earth Pressure -pcf-	At-Rest Earth Pressure -pcf-
Native Soil (Retained)	110	28	500	N/A	N/A	150	40	60
***Compacted Structural Fill (Backfilled / Retained)**	135	35	0	0.45	4,000	300	35	55
***Chuckanut Formation bedrock (Retained)**	150	N/A	N/A	0.55	4,000	600	N/A	N/A

Notes:
1. psf – pounds per square foot; pcf – pounds per cubic foot
2. Passive Pressure and Coefficient of Friction assumes a safety factor of 1.5 (permanent conditions)
3. *Compacted structural fill is CSBC for base pad foundation support.
4. The provided parameters assume drained conditions.

Area Z

Material Type (Position)	Assumed Soil Parameters for Bridge Foundation Design							
	Unit Weight (γ) -pcf-	Internal Friction Angle (φ) - degrees-	Cohesion -psf-	Allowable Coefficient of Friction (Soil to Concrete)	Allowable Bearing Capacity -psf-	Passive Earth Pressure -pcf-	Active Earth Pressure -pcf-	At-Rest Earth Pressure -pcf-
Native Soil (Retained)	95	27	300	N/A	N/A	140	40	70
***Compacted Structural Fill (Backfilled / Retained)**	135	36	0	0.45	1,500	300	35	55

Notes:
1. psf – pounds per square foot; pcf – pounds per cubic foot
2. Passive Pressure and Coefficient of Friction assumes a safety factor of 1.5 (permanent conditions)
3. *Compacted structural fill is CSBC for base pad foundation support.
4. The provided parameters assume drained conditions.

Temporary and Permanent Slopes

Actual construction slope configurations and maintenance of safe working conditions are the responsibility of the contractor. All applicable local, state, and federal safety codes should be followed. Open cuts should be monitored during and after excavation for any evidence of instability. If instability is detected, the contractor should flatten the side slopes or install temporary shoring.

Temporary excavations in excess of 4 feet in depth should be shored or sloped in accordance with Safety Standards for Construction Work, Washington Administrative code (WAC) 296-155-66403. According to WAC 296-155-66401, temporary unsupported excavations in the near surface fill or native soils site are classified as Type C and may be sloped as steep as 1H: 1V. All soils encountered are classified as Type C in the presence of groundwater seepage. Flatter slopes or temporary shoring may be required in areas where groundwater flow is present and unstable conditions develop. Areas excavated into competent bedrock may be sloped vertically. Temporary slopes and excavations should be protected as soon as possible using appropriate methods to prevent erosion from occurring during periods of wet weather. We recommend that permanent cut or fill slopes be designed for inclinations of 2H: 1V or flatter. All permanent slopes should be retained, vegetated or otherwise protected to limit the potential for erosion as soon as practical after construction.

Temporary Shoring

Based on our field explorations and understanding of the projects, we anticipate that deep excavations and temporary shoring may be necessary. No conceptual plans were provided at the time of the writing of this report. NW Geologic recommends reviewing our recommendations, if temporary shoring is required per the project specifications. Temporary shoring typically utilizes ecology blocks, driven sheet piles or similar means when lateral space for excavation is confined by project boundaries, property lines or waterways. The contractor is ultimately responsible for providing temporary shoring based on their construction approach and methods.

Geotechnical Consultation During Construction

NW Geo recommends that we be involved in the project design review process. The purpose of the review is to verify that the recommendations presented in this report are understood and incorporated in the design and specifications. We also recommend that geotechnical construction monitoring services be provided. The purpose of these services is to observe compliance with the design concepts, specifications, and recommendations of this report. In the event that subsurface conditions differ from those anticipated before the start of construction, we would be pleased to provide revised recommendations appropriate to the conditions revealed during construction. NW Geologic will provide construction inspection services for construction of the project elements at the request of the client.

LIMITATIONS AND USE OF THIS REPORT

Recommendations contained in this report are based on our understanding of the proposed development and construction activities, our field observations, exploration and interpreted results. It is possible that soil and groundwater conditions could vary and differ between or beyond the points explored. If soil or groundwater conditions are encountered during construction that vary or differ from those described herein, NW Geo shall be notified immediately in order that a review may be made and supplemental recommendations provided. If the scope of the proposed construction, including the proposed loads or structural locations, changes from that described in this report, our recommendations shall also be reviewed.

We have prepared this report in substantial accordance with the generally accepted geotechnical engineering practice as it exists in the site area at the time of our study. No warranty, expressed or implied, is made. The recommendations provided in this report are based on the assumption that an adequate program of tests and observations will be conducted by NW Geo during the construction phase in order to evaluate compliance with our recommendations. Other standards or documents referenced in any given standard cited in this report, or otherwise relied upon by the author of this report, are only mentioned in the given standard; they are not incorporated into it or “included by reference”, as that latter term is used relative to contracts or other matters of law.

This report may be used only by the Sudden Valley Community Association and their design consultants and only for the purposes stated within a reasonable time from its issuance, but in no event later than 5 years from the date of the report. Note that if another firm assumes Geotechnical Engineer of Record responsibilities, they need to review this report and either concur with the findings, conclusions, and recommendations or provide alternate findings, conclusions and recommendation under the guidance of a professional engineer registered in the State of Washington. The recommendations of this report are based on the assumption that the Geotechnical Engineer of Record has reviewed and agrees with the findings, conclusion and recommendations of this report.

Land or facility use, on- and off-site conditions, regulations, or other factors may change over time, and additional work may be required with the passage of time. Based on the intended use of the report, NW Geo may recommend that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the Sudden Valley Community Association or anyone else will release NW Geo from any liability resulting from the use of this report by any unauthorized party and the Sudden Valley Community Association agrees to defend, indemnify, and hold NW Geo harmless from any claim or liability associated with such unauthorized use or non-compliance. We recommend that NW Geo be given the opportunity to review the final project plans and specifications to evaluate if our recommendations have been properly interpreted. We assume no responsibility for misinterpretation of our recommendations.

The scope of work for this geotechnical report did not include stormwater calculations, slope stability analysis, environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances in the soil, surface or groundwater monitoring at this site.

REFERENCES

American Association of Highway and Transportation Officials (AASHTO) T267 – *Standard Method of Test for Determination of Organic Content in Soils by Loss on Ignition*.

American Society for Testing and Materials (ASTM) D2487 - *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).*

American Society for Testing and Materials (ASTM) D2488 - *Standard Practice For Description And Identification Of Soils (Visual-Manual Procedure).*

American Society for Testing and Materials (ASTM) D1557 - *Standard Test Methods for Laboratory Compaction Characterization of Soils Using Modified Effort.*

American Society for Testing and Materials (ASTM) D1586 - *Standard Test Methods for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils.*

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Whatcom County Municipal Code – *Critical Areas, Geologically Hazardous Areas,* Sections 16.16.300-16.16.340 (2024).

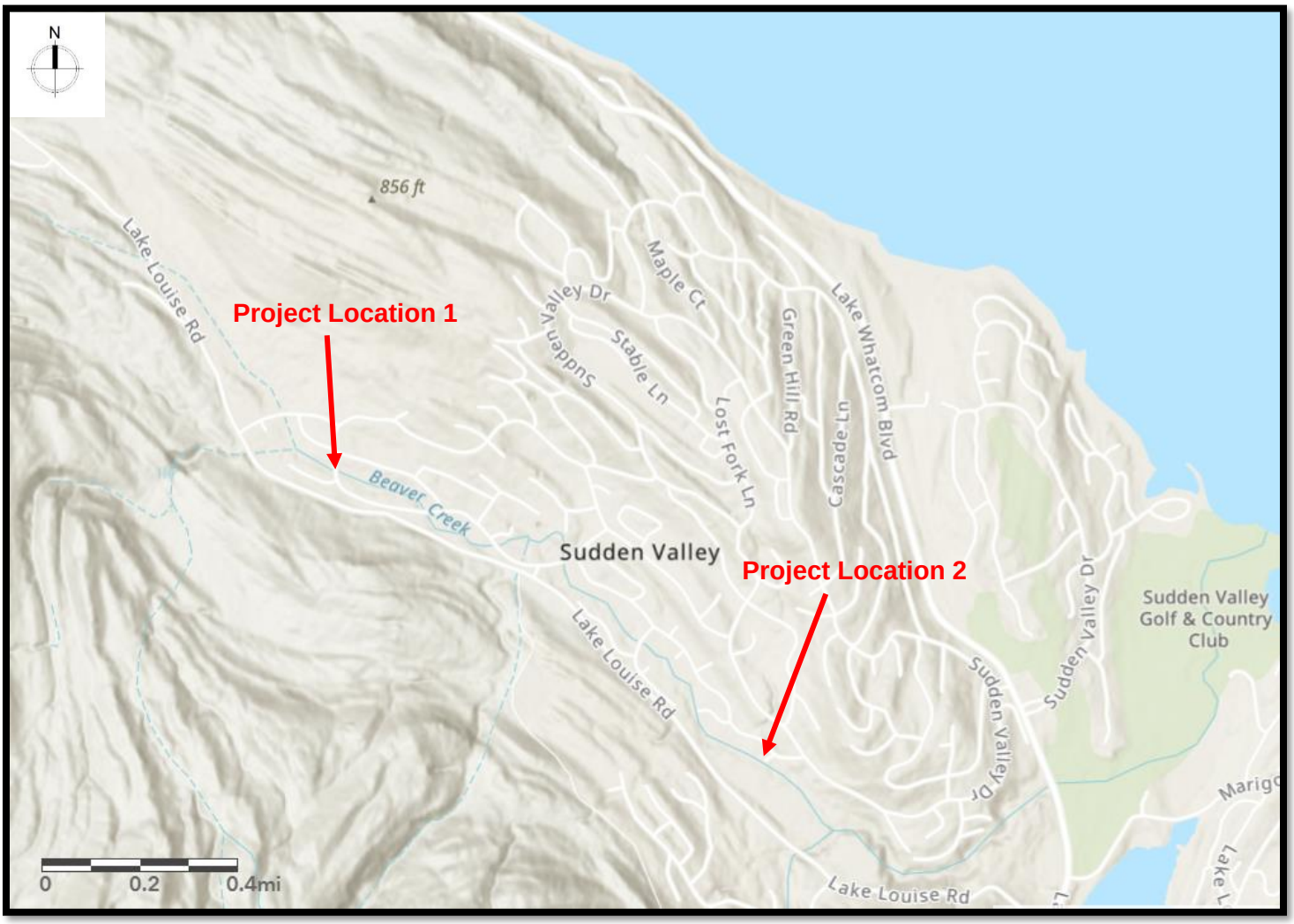


Figure 1: *Vicinity Map* showing general project locations within the Sudden Valley community. Image courtesy of ArcGIS.

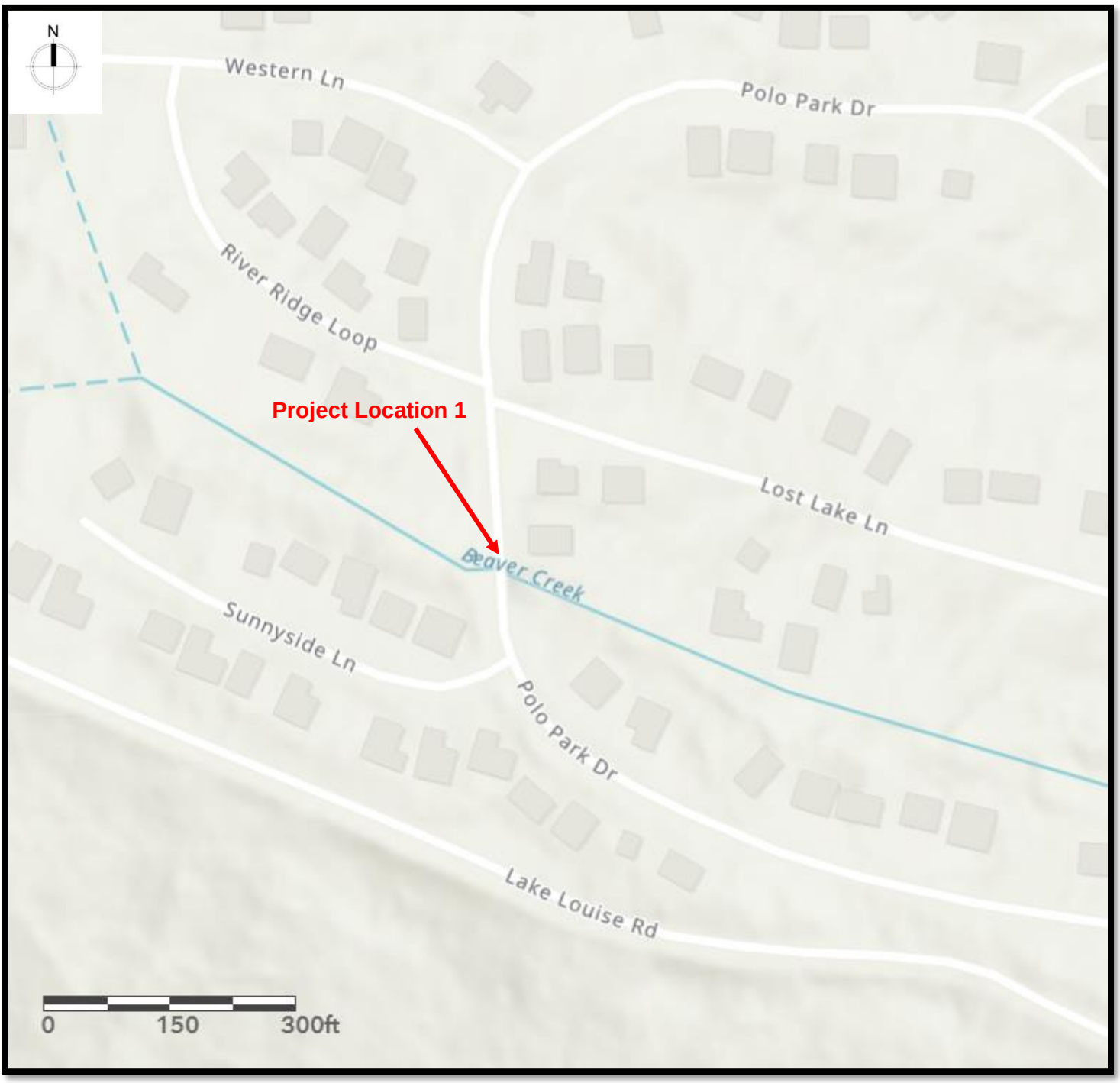


Figure 2: *Site Map* showing the culvert project location on Polo Park Drive within the Sudden Valley community. Image courtesy of ArcGIS.

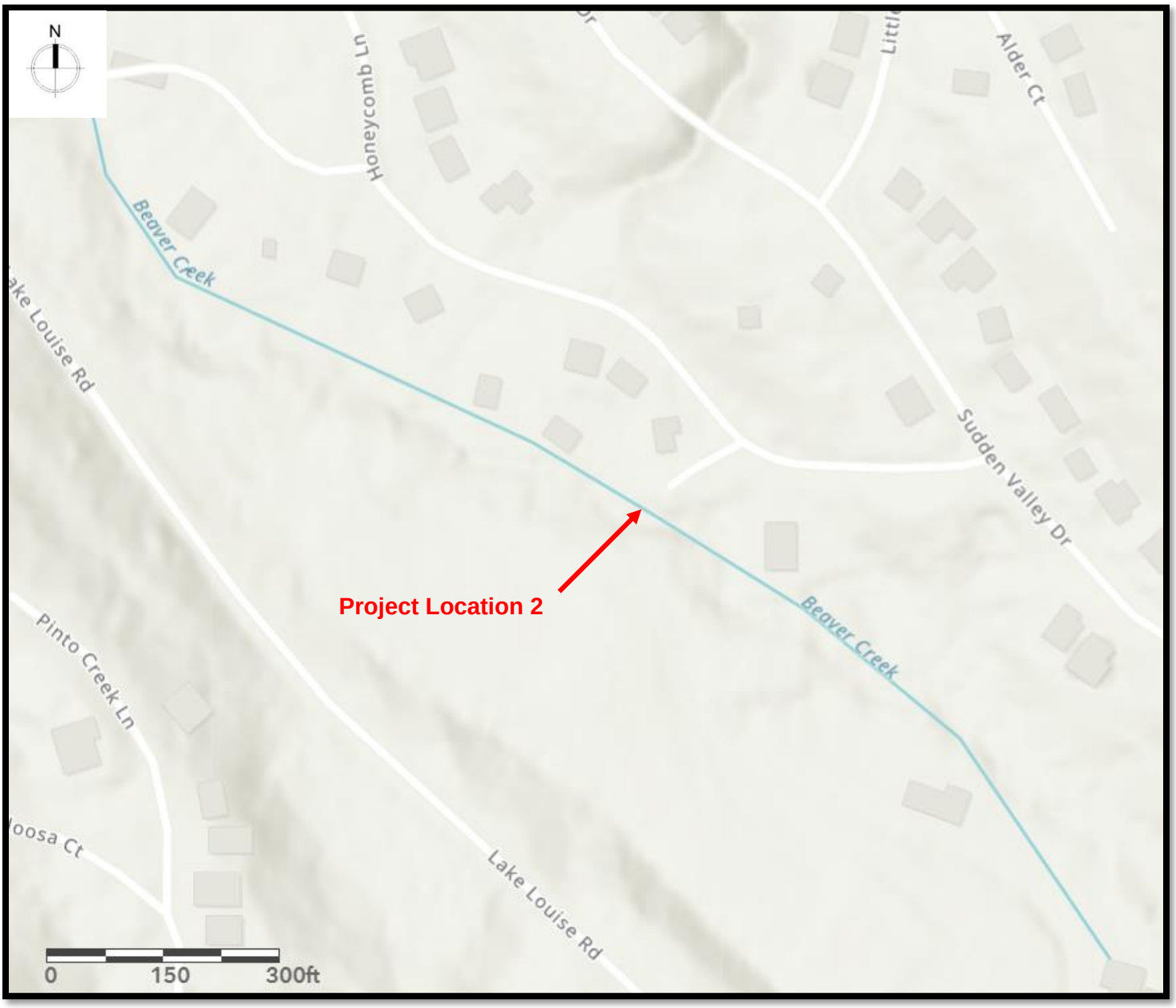


Figure 3: *Site Map* showing the bridge replacement project location adjacent to Honeycomb Lane and Area Z within the Sudden Valley community. Image courtesy of ArcGIS.

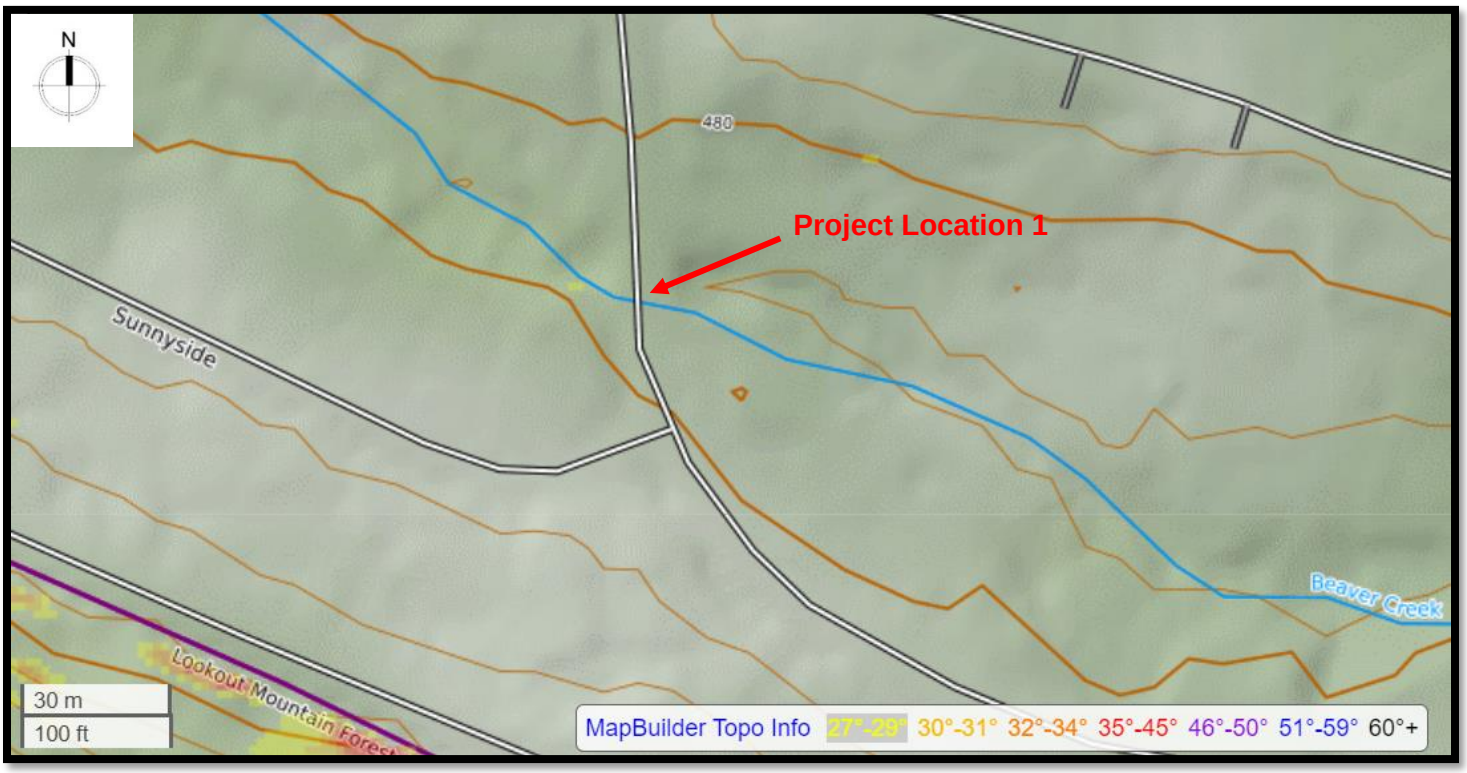


Figure 4: *Topographic Map* showing gentle slope gradients in the area of the culvert project on Polo Park Drive. Image courtesy of *CalTopo™ MapBuilder*.

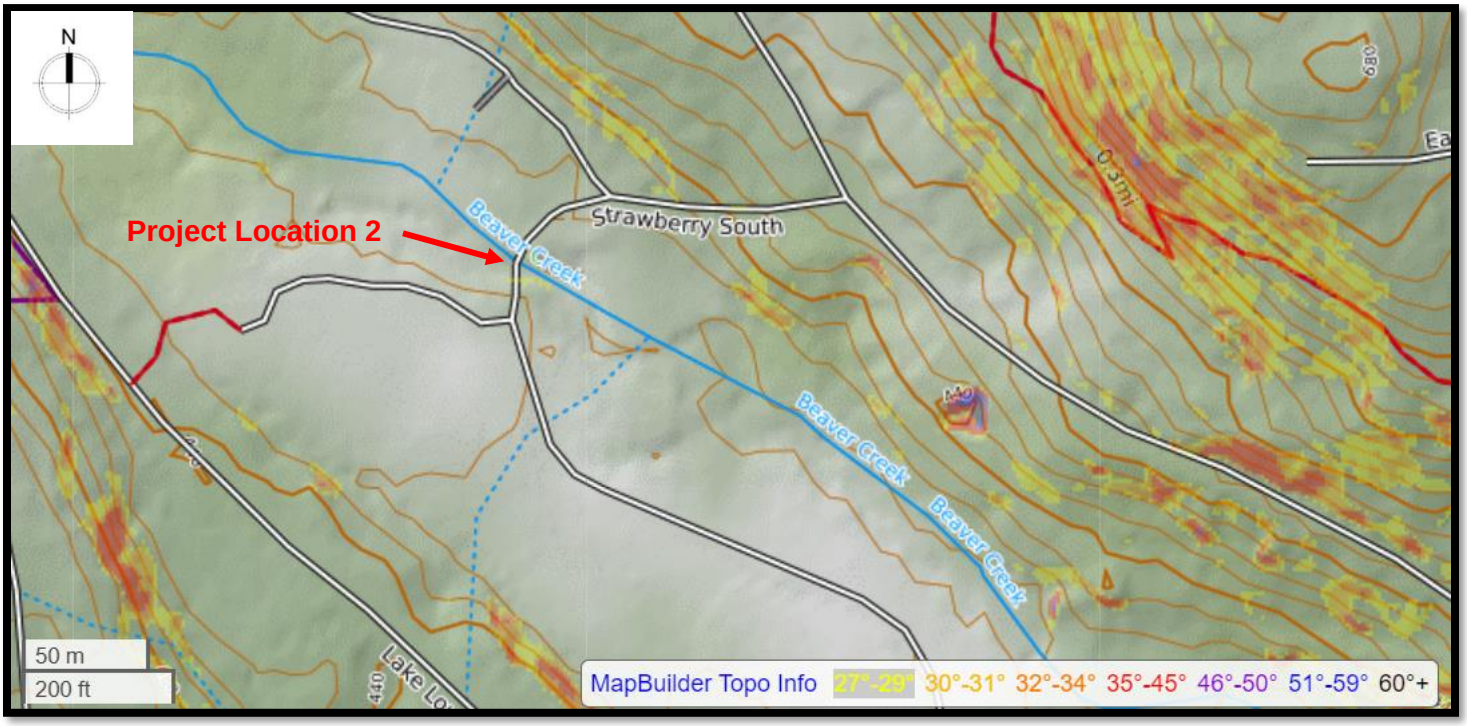


Figure 5: *Topographic Map* showing variable slope gradients in the area of the bridge replacement project near Area Z and Honeycomb Lane. Image courtesy of *CalTopo™ MapBuilder*.

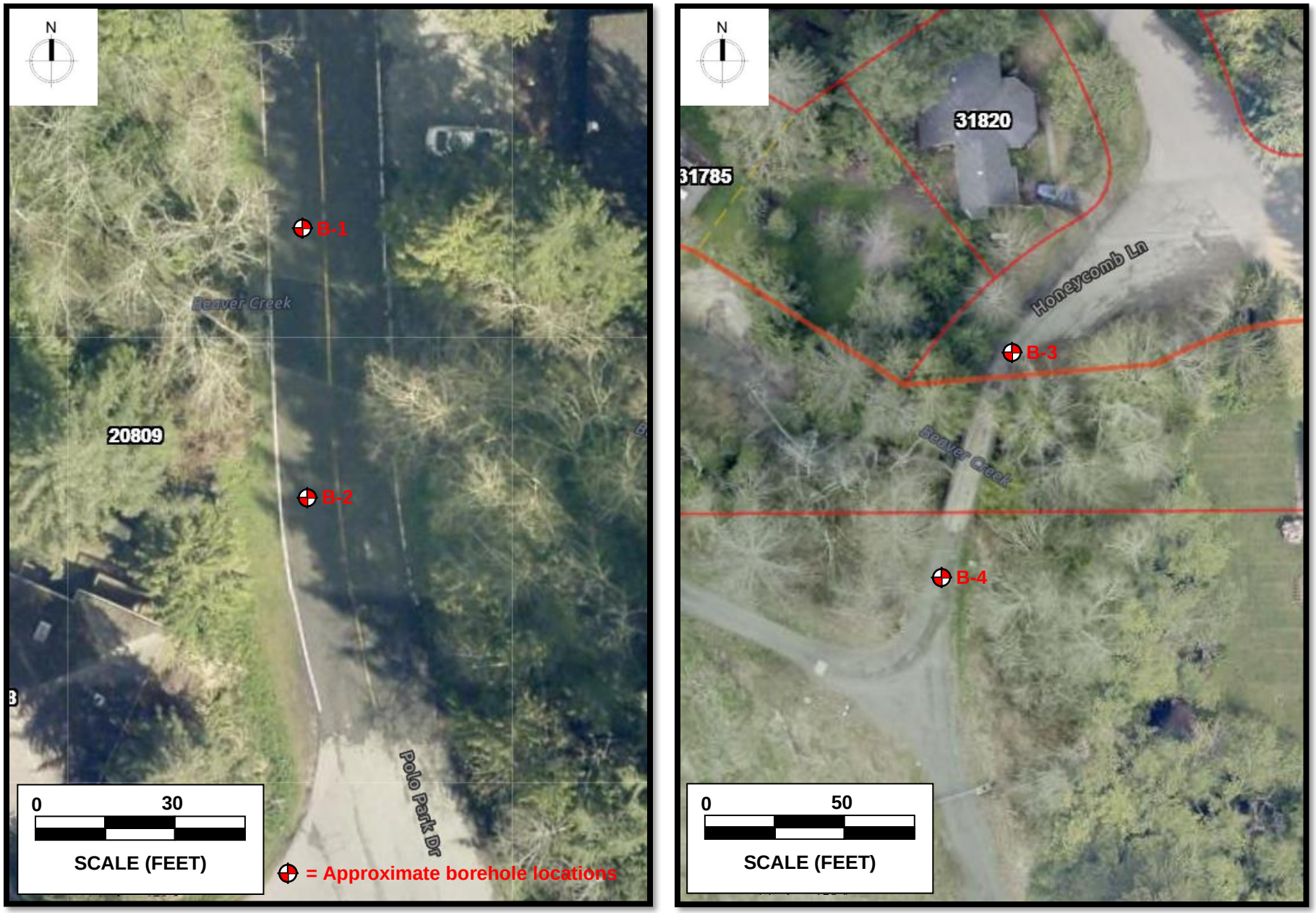


Figure 6: *Site and Exploration Plans* showing approximate borehole locations on Polo Park Drive and Area Z. Images courtesy of *Whatcom County Tax Parcel Viewer*. Scales are approximate.

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)			
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)			
SILTS AND CLAYS Liquid limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent ..... GW, GP, SW, SP
More than 12 percent ..... GM, GC, SM, SC
5 to 12 percent ..... Borderline cases requiring dual symbols

PLASTICITY CHART

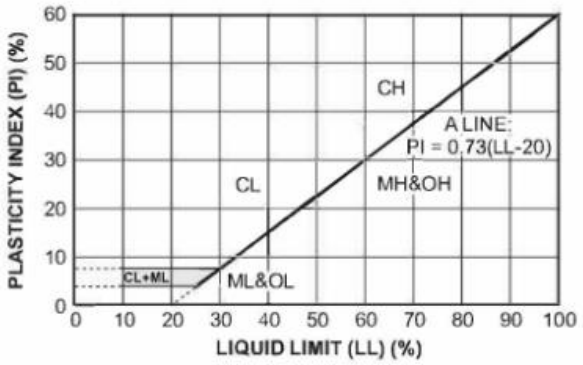


Figure 7: Unified Soil Classification System (USCS) chart.

Project: SVCA Bridges	**Log #:** B-1	**Staff:** NW Geo KP	**Date:** 3/18/2024	Page 1 of 1
Job No: 24-002	**Driller/Excavator:** Boretec1, Inc.		**Method:** Hollow Stem Auger/SPT	

Sample #	Depth (Feet)	Blow Count	N-Value	USCS		Description
	0			ASP	0.0-0.5'	Hot mix asphalt, 2 lifts
1	1			SW	0.5-5.0'	Light brown to gray, damp, medium dense, gravelly SAND, some silt (Pit run fill) 1' - hand sample taken from cuttings
	2					
2		6,8,7	15			2.5' - poor recovery, rock in shoe, 0.4' recovered
	3					
	4					
						4.5' - difficult advance, rig shaking
3	5	29,45,50	50/1"			
				SM	5.0-6.5'	Medium gray, damp, dense, silty SAND, some gravel and spalls, difficult advance, 0.9' recovery
4	6	50/0"	50/0"			(Culvert Fill)
						6.5' - 0.3' recovery, spall frag in shoe
	7					No groundwater observed Boring terminated at 6.5' BPG on hard conditions Location is 19' N of culvert center in S bound lane, on Polo Park Drive. See Site and Exploration Plan
	8					
	9					
	10					

Project: SVCA Bridges	**Log #:** B-2	**Staff:** NW Geo KP	**Date:** 3/18/2024	Page 1 of 1
Job No: 24-002	**Driller/Excavator:** Boretec1, Inc.		**Method:** Hollow Stem Auger/SPT	

Sample #	Depth (Feet)	Blow Count	N-Value	USCS	Description
	0			ASP	0.0-0.3' Hot mix asphalt, 1 lift
				SM	0.3-2.5' Light brown, damp, medium dense, gravelly silty SAND (Pit run fill)
5	1				
					1' - hand sample taken from cuttings
	2				
6		10,12,10	22		
				SM	2.5-5.5' Light gray, damp, medium dense, silty SAND, minor wood debris, 1.3' recovery, PP= 2.5-3 tsf (Glacial Drift)
	3				
	4				
					5' - PP= 2.5 tsf, 1.2' recovery
7	5	50	50/4"		
					5.5' - sharp contact with bedrock
	6			SNS	5.5-9.0' Light to dark brown, hard, moderately to strongly weathered SANDSTONE, trace to moderate oxidation, difficult advance with rig shaking (Chuckanut Formation)
	7				
					7.5' - 1.5' recovery
8		50	50/5"		
	8				
	9				
					No groundwater observed
					Boring terminated at 9.0' BPG on bedrock/refusal
					Location is 41' S of culvert center in S bound lane,
	10				on Polo Park Drive, See Site and Exploration Plan

Project: SVCA Bridges	**Log #:** B-3	**Staff:** NW Geo KP	**Date:** 3/18/2024	Page 1 of 4
Job No: 24-002	**Driller/Excavator:** Boretec1, Inc.		**Method:** Hollow Stem Auger/SPT	

Sample #	Depth (Feet)	Blow Count	N-Value	USCS		Description
	0			ASP	0.0-0.4'	Hot mix asphalt, 1 lift
9	2			SM	0.4-7.0'	Golden brown, damp, dense to very dense, silty, gravelly SAND (Pit run fill)
10	4	17,19,37	56			1' - hand sample taken from cuttings 2.5' - color change to light gray to orange brown, 0.9' recovery
11	6	19,26,50	50/4"			5' - sampler bouncing on dense fill, 1.4' recovery 6' - rig shaking, difficult advance
12	8	2,2,1	3	SM	7.0-8.5'	Gray brown, damp, soft, silty SAND, some gravel, moderate organic content (Lacustrine deposits)
				PT		8.2-8.5' - peat - strong organic odor
13	10	1	1	ML	8.5-22.0'	Light gray to dark brown, damp, very soft to medium stiff, sandy SILT, trace gravel subround, lenses and disseminated organics (Lacustrine deposits)
	12					10' - PP=0.5-1.0 tsf 1.5' recovery continues to TD
	14					
14	16	3,2,3	5	ML		15' - Medium to dark gray color, compositional change to clayey SILT, medium stiff, PP=0.5-1.0 tsf,
	18					17' - groundwater encountered, wet conditions
15	20	6,7,7	14			

Borehole continues on page 2

Project:	SVCA Bridges	**Log #:**	B-3	**Staff:**	NW Geo KP	**Date:**	3/18/2024
Job No:	24-002	**Driller/Excavator:**		Boretec1, Inc.		**Method:**	Hollow Stem Auger/SPT

Sample #	Depth (Feet)	Blow Count	N-Value	USCS		Description
	22			ML		20' - sandy SILT to clayey SILT Stiff conditions, no organics visible PP=0.5-1.0 tsf
	24			SM-SW	22-57'	Medium gray, wet, medium dense, silty SAND to SAND, trace organics (Fluvial Deposits)
16	26	6,8,9	17			25' - trace organics
	28					
17	30	5,5 6	11			30' - trace gravel content, no visible organics
	32					
	34					
18	36	5,6,6	12	SM-ML		35' - medium dense to stiff, silty SAND to sandy SILT, some disseminated organics
	38					
19	40	3,5, 4	9			40' - slight color change to gray brown

Borehole continues on page 3

Project:	SVCA Bridges	**Log #:**	B-3	**Staff:**	NW Geo KP	**Date:**	3/18/2024
Job No:	24-002	**Driller/Excavator:**		Boretec1, Inc.		**Method:**	Hollow Stem Auger/SPT

Sample #	Depth (Feet)	Blow Count	N-Value	USCS	Description
	42				
	44				
20	46	7,8,12	20	CL-SM	45' - medium to dark gray, silty CLAY to silty SAND, trace gravel, interbedded (Fluvial deposits, con't)
	48				
21	50	6,5,7	12	SW	50' - Dark gray, wet, medium dense, gravelly SAND, some silt, clasts dominantly phyllite with minor quartz (Fluvial Deposits, con't)
	52				
	54				
22	56	4,6,6	12	CL-SM	55' - Dark gray, wet, medium dense to stiff, silty CLAY to silty SAND, some gravel, interbeds on 6" scale
	58			SM	57-66.5' Dark gray, damp, dense to very dense, silty SAND, some gravel (Glacial Till)
23	60	8,9,22	31		

Borehole continues on page 4

Project: SVCA Bridges	**Log #:** B-3	**Staff:** NW Geo KP	**Date:** 3/18/2024	Page 4 of 4
Job No: 24-002	**Driller/Excavator:** Boretec1, Inc.		**Method:** Hollow Stem Auger/SPT	

Sample #	Depth (Feet)	Blow Count	N-Value	USCS	Description
	62				60' - Glacial Till continues to TD
	64				62.5' - drill advance become more difficult
24	66	50	50/1"		66.5' - termination depth
	68				Groundwater observed at 17' BPG Boring terminated at 66.5' BPG on hard conditions Location is 22' N of N bridge margin on Honeycomb Lane in center of paved road See Site and Exploration Plan
	70				
	72				
	74				
	76				
	78				
	80				

Project:	SVCA Bridges	**Log #:**	B-4	**Staff:**	NW Geo KP	**Date:**	3/18/2024
Job No:	24-002	**Driller/Excavator:**		Boretec1, Inc.		**Method:**	Hollow Stem Auger/SPT

Sample #	Depth (Feet)	Blow Count	N-Value	USCS	Description	
	0			SM	0.0-6.0'	Medium brown, damp, dense, silty SAND with gravel, crushed gravel at surface (Pit run fill)
25	2	23,22,16	38			2.5' - color change to orange brown, some oxidation, 1.5' recovery
26	4	11,10,4	14			5' - some oxidation, density decrease 1.2' recovery
	6			SM	6.0-13.0'	Light brown to orange brown, damp, medium dense, silty SAND, minor organic content, moderate to strong oxidation bands (Lacustrine Deposits) 7.5' - PP= 1.5 tsf
27	8	3,6,7	13			
28	10	3,3,3	6			10' - pervasive oxidation, minor gravel content, trace organics, slight increase in moisture
	12					
	14			SM	13-31.5'	Light to medium gray, wet, loose to medium dense, silty SAND (Fluvial Deposits)
29	16	3,3,4	7			17' - groundwater encountered
	18					
30	20	4,5,5	10			20' - slight increase in density

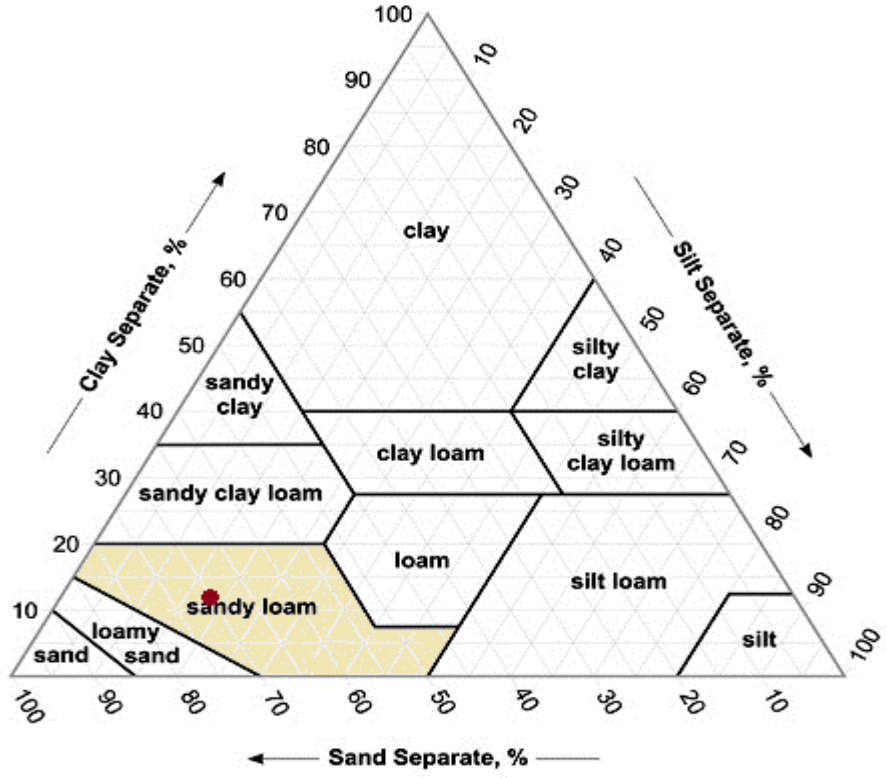
Borehole continues on page 2

Project: SVCA Bridges	**Log #:** B-3	**Staff:** NW Geo KP	**Date:** 3/18/2024	Page 2 of 2
Job No: 24-002	**Driller/Excavator:** Boretec1, Inc.		**Method:** Hollow Stem Auger/SPT	

Sample #	Depth (Feet)	Blow Count	N-Value	USCS	Description
	22			SM	20' - silty SAND, trace gravel, interbeds on 2" scale
	24				
31	26	3,6,7	13	SM	25' - Medium gray, wet, medium dense, silty SAND, PP= 1.0-1.5 tsf fluvial deposits continue
	28				
32	30	3,5,9	14		30' - interbeds on 1/2" scale, trace gravel. PP= 1.5-2.0 tsf 31.5' - termination depth
	32				Groundwater observed at 17' BPG Boring terminated at 31.5' BPG at planned depth Location is 23' S of S bridge margin in center of gravel road See Site and Exploration Plan
	34				
	36				
	38				
	40				

Analytical Results	*Sample: SVCA Bridges B-1 @ 1'*	Simply Soil Testing

Customer:	Kurt Parker NW Geologic 6131 Venus Pl Ferndale, WA 98248	Date received: Report date: Sample reference # Plant code: Tests requested:	03/22/24 03/30/24 14210 00 - General / not specified Texture



Soil Texture Classification: Sandy Loam

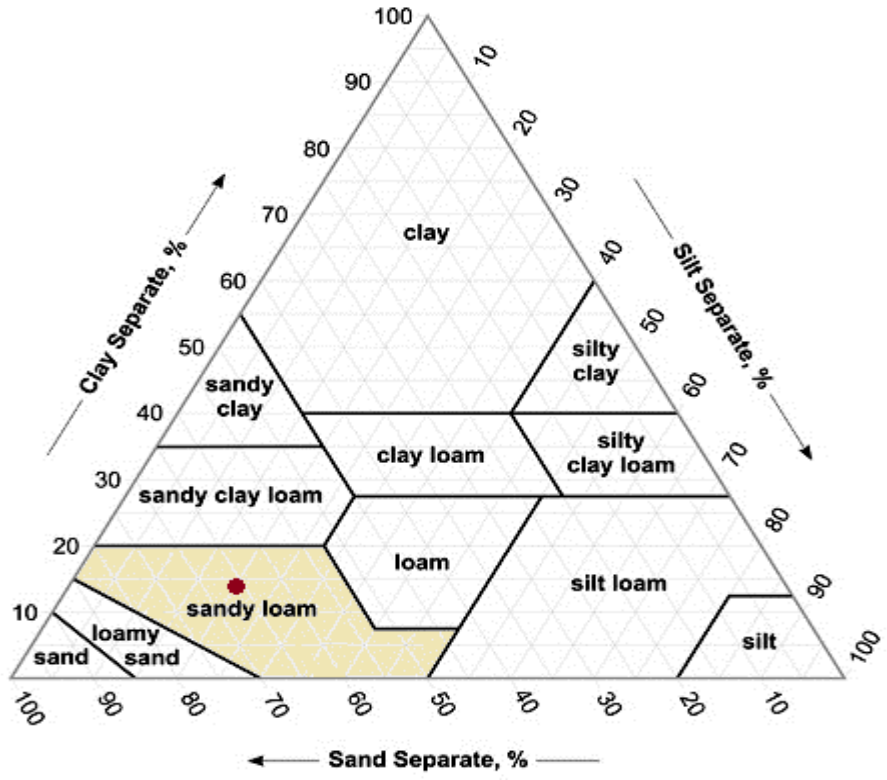
Sand: 70% Silt: 18% Clay: 12%

The un-sifted soil contains 56% gravel.

In gardens and lawns, sandy loam soils are capable of quickly draining excess water but cannot hold substantial amounts of water or nutrients. Plants grown in this type of soil will require more frequent watering and fertilization than those grown in soils with a higher concentration of silt and clay. High levels of organic matter improve the ability of the soil to hold water and nutrients.

Organic matter: 1.0 %

Analytical Results	*Sample: SVCA Bridges B-2 @ 5'*	Simply Soil Testing	
Customer:	Kurt Parker NW Geologic 6131 Venus Pl Ferndale, WA 98248	Date received: Report date: Sample reference # Plant code: Tests requested:	03/22/24 03/30/24 14211 00 - General / not specified Texture



Soil Texture Classification: Sandy Loam

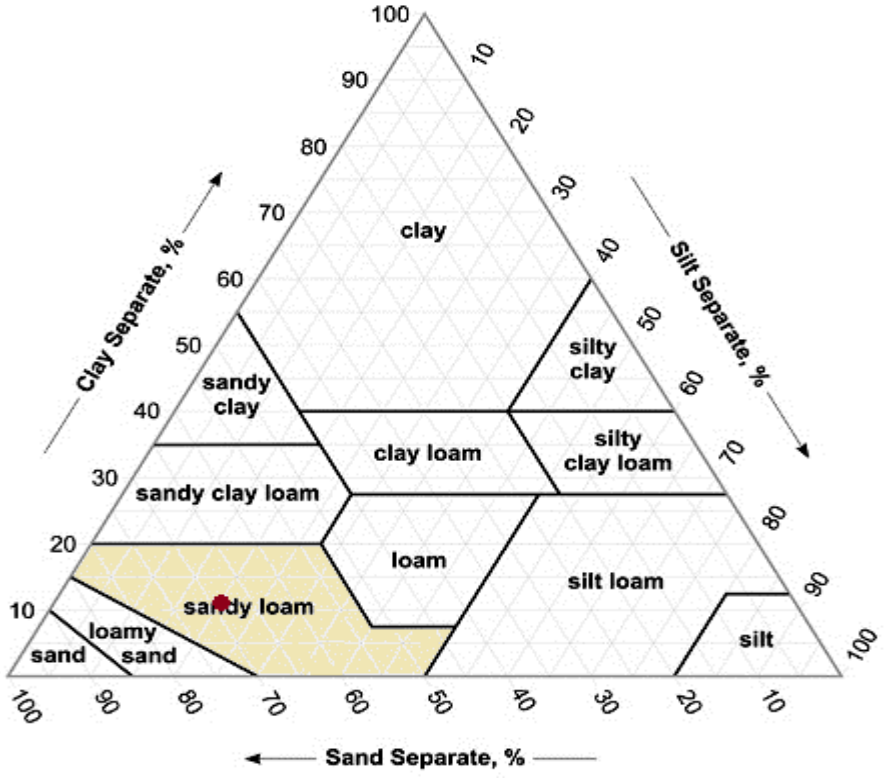
Sand: 66% Silt: 20% Clay: 14%

The un-sifted soil contains 15% gravel.

In gardens and lawns, sandy loam soils are capable of quickly draining excess water but cannot hold substantial amounts of water or nutrients. Plants grown in this type of soil will require more frequent watering and fertilization than those grown in soils with a higher concentration of silt and clay. High levels of organic matter improve the ability of the soil to hold water and nutrients.

Organic matter: 1.6 %

Analytical Results	*Sample: SVCA Bridges B-3 @ 2.5'*		Simply Soil Testing
Customer:	Kurt Parker NW Geologic 6131 Venus Pl Ferndale, WA 98248	Date received: Report date: Sample reference # Plant code: Tests requested:	03/22/24 03/30/24 14212 00 - General / not specified Texture



Soil Texture Classification: Sandy Loam

Sand: 69% Silt: 20% Clay: 11%

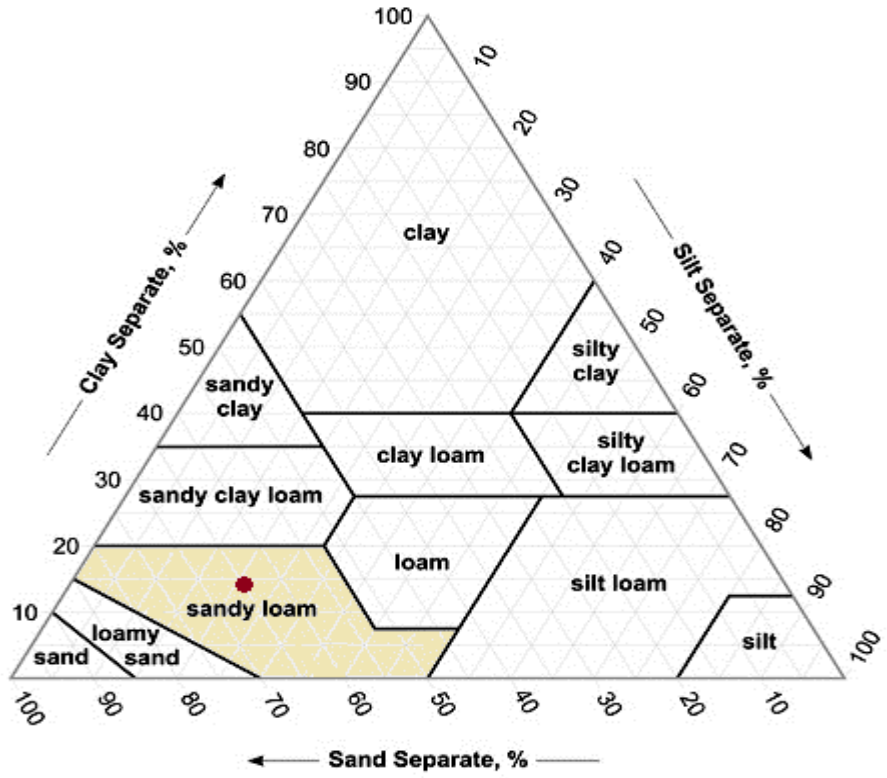
The un-sifted soil contains 48% gravel.

In gardens and lawns, sandy loam soils are capable of quickly draining excess water but cannot hold substantial amounts of water or nutrients. Plants grown in this type of soil will require more frequent watering and fertilization than those grown in soils with a higher concentration of silt and clay. High levels of organic matter improve the ability of the soil to hold water and nutrients.

Organic matter: 1.0 %

Analytical Results	*Sample: SVCA Bridges B-3 @ 5'*	Simply Soil Testing

Customer:	Kurt Parker NW Geologic 6131 Venus Pl Ferndale, WA 98248	Date received: Report date: Sample reference # Plant code: Tests requested:	03/22/24 03/30/24 14213 00 - General / not specified Texture



Soil Texture Classification: Sandy Loam

Sand: 65% Silt: 21% Clay: 14%

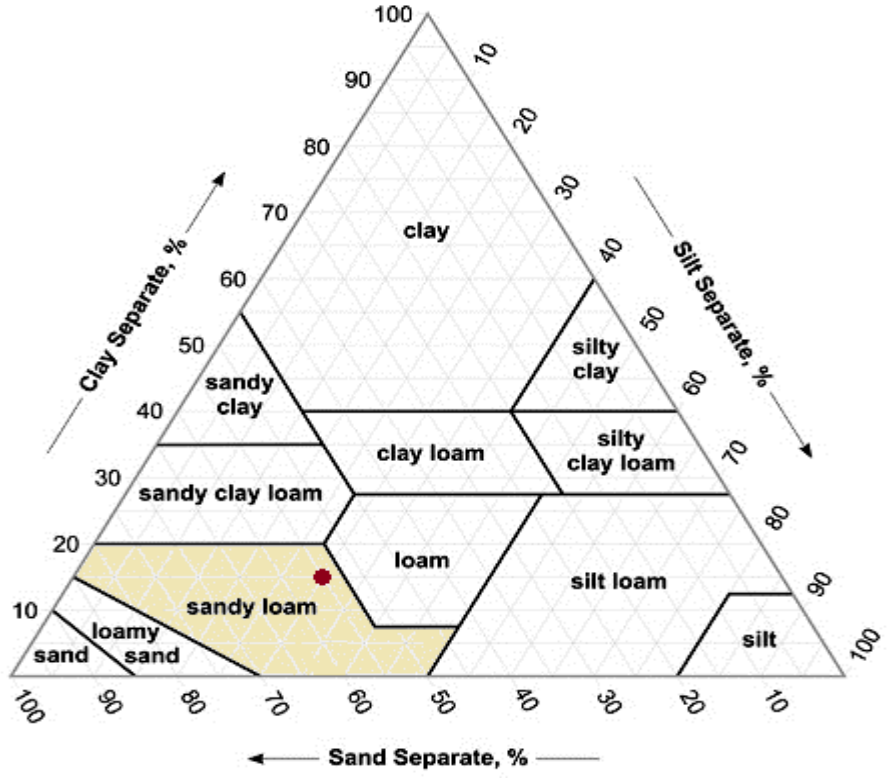
The un-sifted soil contains 33% gravel.

In gardens and lawns, sandy loam soils are capable of quickly draining excess water but cannot hold substantial amounts of water or nutrients. Plants grown in this type of soil will require more frequent watering and fertilization than those grown in soils with a higher concentration of silt and clay. High levels of organic matter improve the ability of the soil to hold water and nutrients.

Organic matter: 1.0 %

Analytical Results	*Sample: SVCA Bridges B-3 @ 7.5'*	Simply Soil Testing

Customer:	Kurt Parker	Date received:	03/22/24
	NW Geologic	Report date:	03/30/24
	6131 Venus Pl	Sample reference #	14214
	Ferndale, WA 98248	Plant code:	00 - General / not specified
		Tests requested:	Texture



Soil Texture Classification: Sandy Loam

Sand: 55% Silt: 30% Clay: 15%

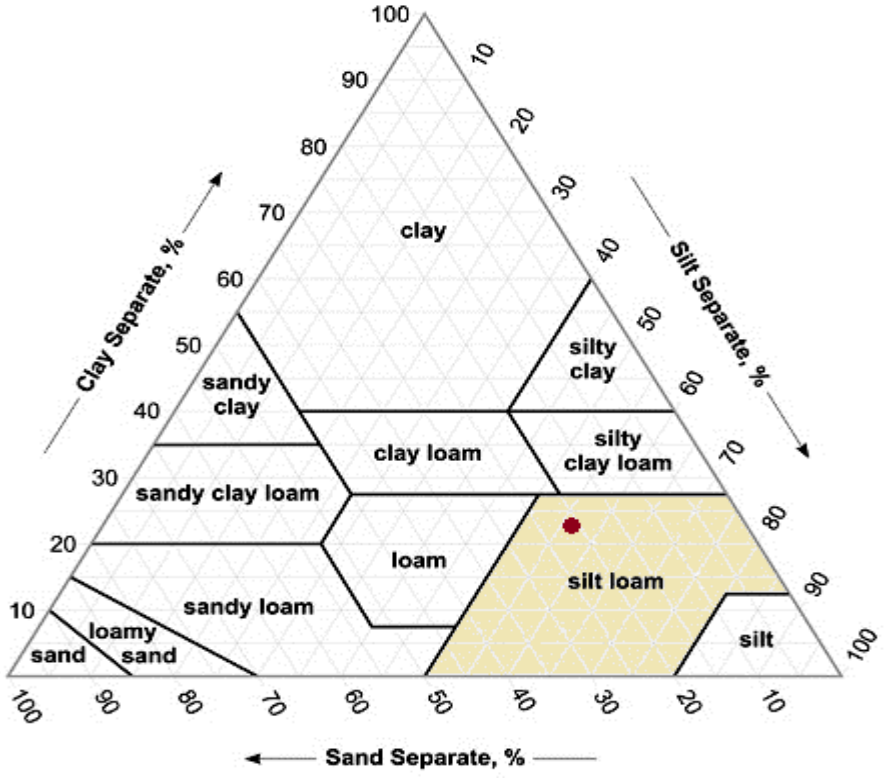
The un-sifted soil contains 15% gravel.

In gardens and lawns, sandy loam soils are capable of quickly draining excess water but cannot hold substantial amounts of water or nutrients. Plants grown in this type of soil will require more frequent watering and fertilization than those grown in soils with a higher concentration of silt and clay. High levels of organic matter improve the ability of the soil to hold water and nutrients.

Organic matter: 3.8 %

Analytical Results	*Sample: SVCA Bridges B-3 @ 8.2' organic**	Simply Soil Testing

Customer:	Kurt Parker	Date received:	03/22/24
	NW Geologic	Report date:	03/30/24
	6131 Venus Pl	Sample reference #	14215
	Ferndale, WA 98248	Plant code:	00 - General / not specified
		Tests requested:	Texture



Soil Texture Classification: Silt Loam

Sand: 21% Silt: 56% Clay: 23%

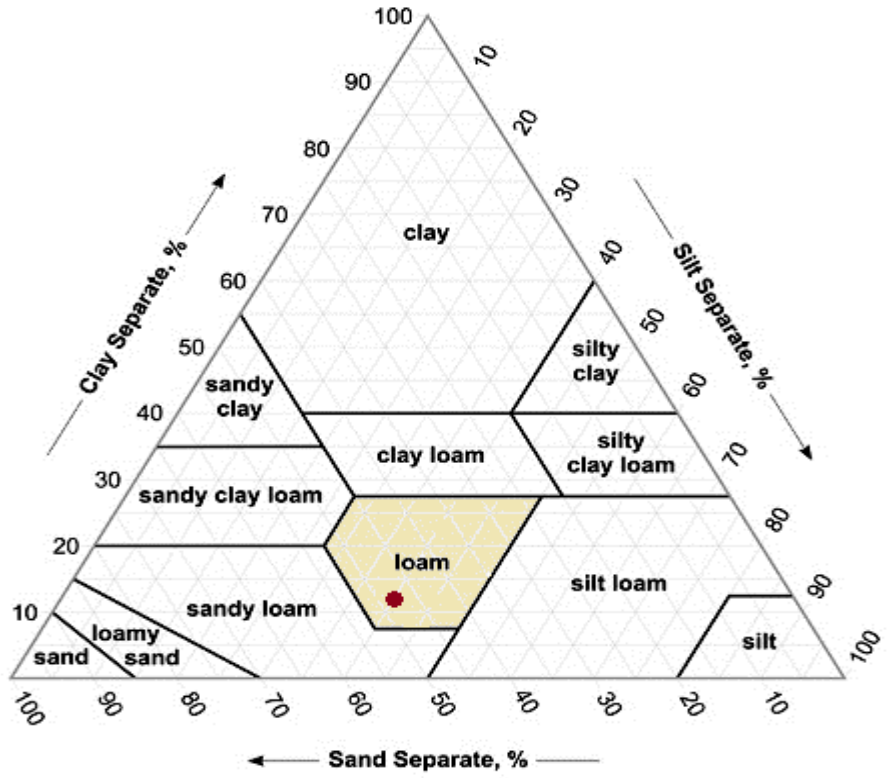
The un-sifted soil contains 12% gravel.

In gardens and lawns, silt loam soils are capable of holding substantial amounts of water and nutrients, but can be poor at draining excess water. They are also vulnerable to becoming compacted. High levels of organic matter counteract the negative characteristics of silt loam by improving the soil's aeration and drainage, and reducing its tendency to become compacted.

Organic matter: 20.9 %

Analytical Results	*Sample: SVCA Bridges B-3 @ 10'*	Simply Soil Testing

Customer:	Kurt Parker NW Geologic 6131 Venus Pl Ferndale, WA 98248	Date received: Report date: Sample reference # Plant code: Tests requested:	03/22/24 03/30/24 14216 00 - General / not specified Texture



Soil Texture Classification: Loam

Sand: 48% Silt: 40% Clay: 12%

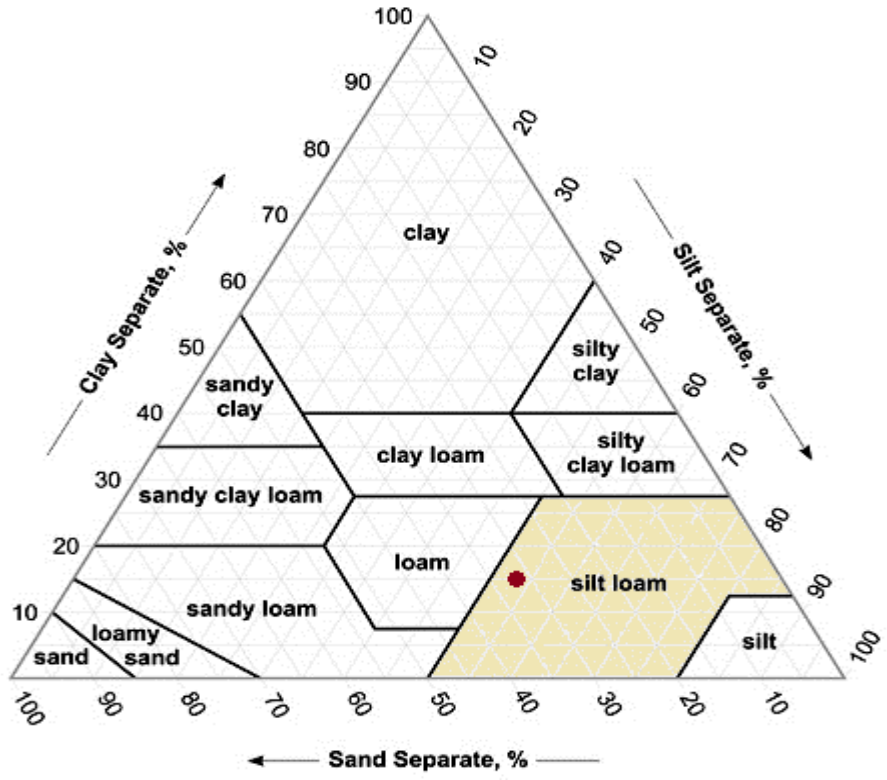
The un-sifted soil contains 9% gravel.

In gardens and lawns, loam soils are the preferred type of soil since they have a combination of desirable characteristics. Loam soils are capable of draining excess water, and are also able to hold substantial amounts of water or nutrients. Loam soils are also workable and resist compaction.

Organic matter: 5.8 %

Analytical Results	*Sample: SVCA Bridges B-3 @ 15'*	Simply Soil Testing

Customer:	Kurt Parker	Date received:	03/22/24
	NW Geologic	Report date:	03/30/24
	6131 Venus Pl	Sample reference #	14217
	Ferndale, WA 98248	Plant code:	00 - General / not specified
		Tests requested:	Texture



Soil Texture Classification: Silt Loam

Sand: 32% Silt: 53% Clay: 15%

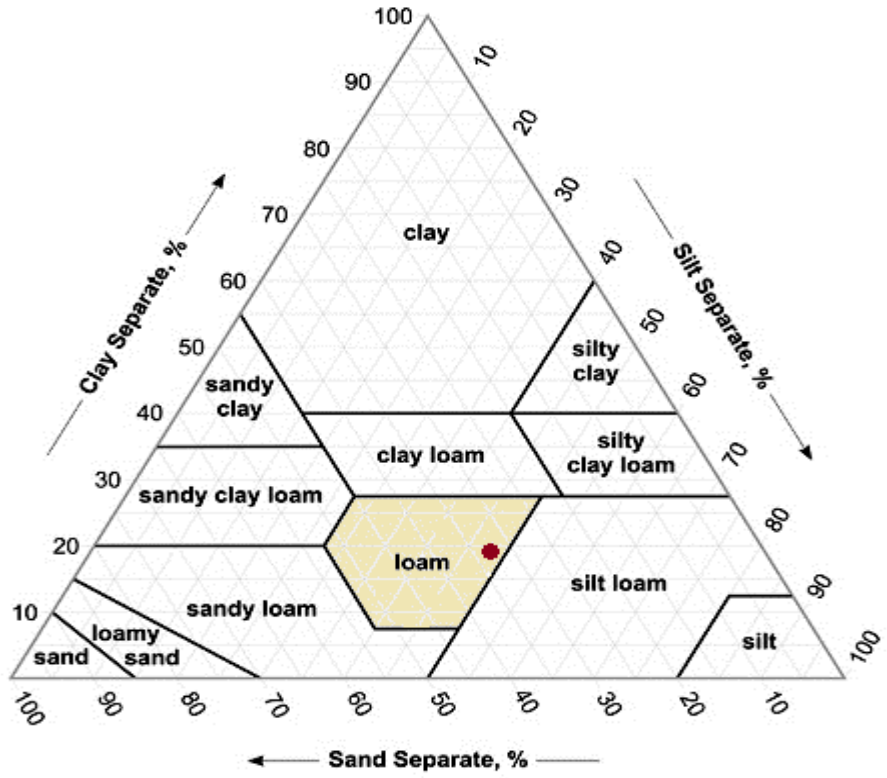
The un-sifted soil contains 1% gravel.

In gardens and lawns, silt loam soils are capable of holding substantial amounts of water and nutrients, but can be poor at draining excess water. They are also vulnerable to becoming compacted. High levels of organic matter counteract the negative characteristics of silt loam by improving the soil's aeration and drainage, and reducing its tendency to become compacted.

Organic matter: 2.2 %

Analytical Results	*Sample: SVCA Bridges B-3 @ 20'*	Simply Soil Testing

Customer:	Kurt Parker NW Geologic 6131 Venus Pl Ferndale, WA 98248	Date received: Report date: Sample reference # Plant code: Tests requested:	03/22/24 03/30/24 14218 00 - General / not specified Texture



Soil Texture Classification: Loam

Sand: 33% Silt: 48% Clay: 19%

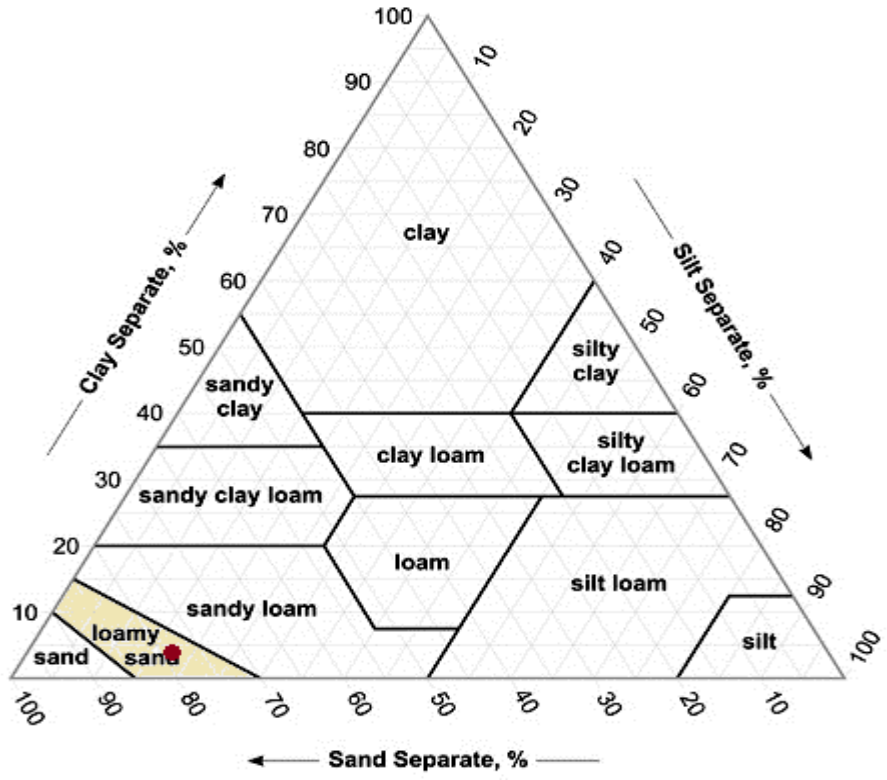
The un-sifted soil contains 0% gravel.

In gardens and lawns, loam soils are the preferred type of soil since they have a combination of desirable characteristics. Loam soils are capable of draining excess water, and are also able to hold substantial amounts of water or nutrients. Loam soils are also workable and resist compaction.

Organic matter: 1.6 %

Analytical Results	*Sample: SVCA Bridges B-3 @ 30'*	Simply Soil Testing

Customer:	Kurt Parker	Date received:	03/22/24
	NW Geologic	Report date:	03/30/24
	6131 Venus Pl	Sample reference #	14219
	Ferndale, WA 98248	Plant code:	00 - General / not specified
		Tests requested:	Texture



Soil Texture Classification: Loamy Sand

Sand: 79% Silt: 17% Clay: 4%

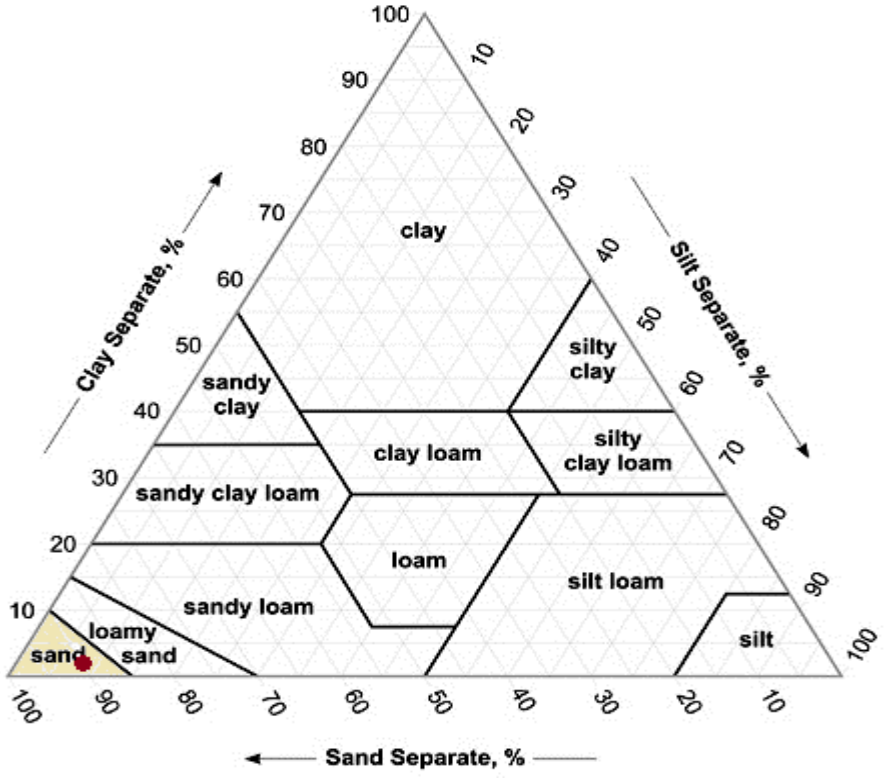
The un-sifted soil contains 8% gravel.

In gardens and lawns, loamy sand soils are capable of quickly draining excess water but are poor at retaining water and nutrients. Plants grown in this type of soil will require more frequent watering and fertilization than those grown in soils with a higher concentration of silt and clay. Highly mobile nutrients such as nitrogen and sulfur may be quickly leached out of the soil by rain water. Nutrient and water retention can be increased by adding organic matter.

Organic matter: 1.1 %

Analytical Results	*Sample: SVCA Bridges B-3 @ 50'*	Simply Soil Testing

Customer:	Kurt Parker	Date received:	03/22/24
	NW Geologic	Report date:	03/30/24
	6131 Venus Pl	Sample reference #	14220
	Ferndale, WA 98248	Plant code:	00 - General / not specified
		Tests requested:	Texture



Soil Texture Classification: Sand

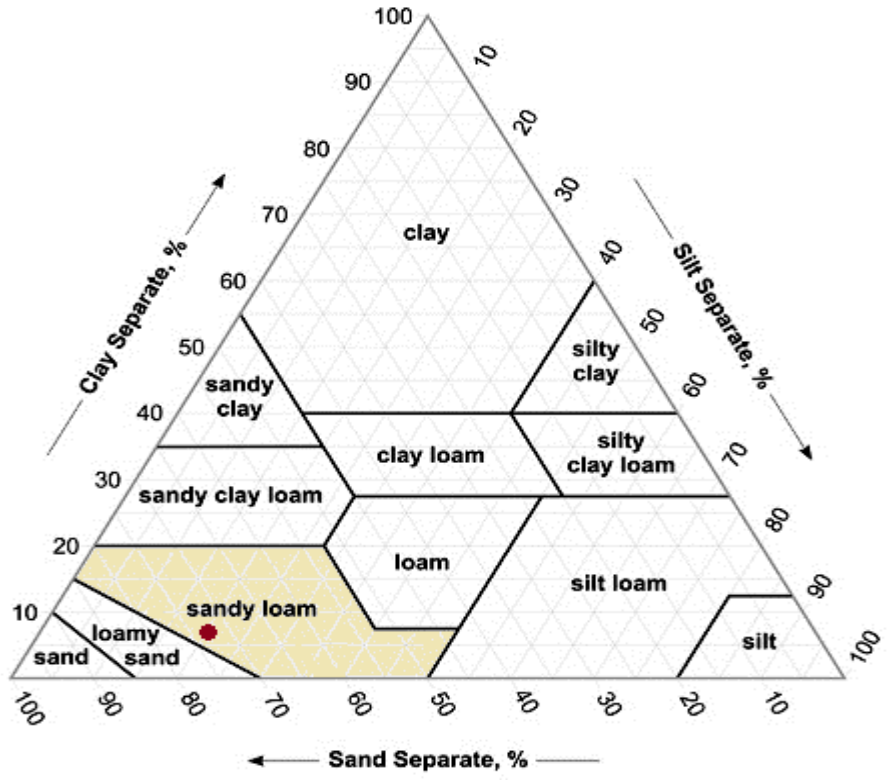
Sand: 90% Silt: 8% Clay: 2%

The un-sifted soil contains 54% gravel.

In gardens and lawns, sandy soils are capable of quickly draining excess water but are poor at retaining water and nutrients. Plants grown in this type of soil will require more frequent watering and fertilization than those grown in soils with a higher concentration of silt and clay. Highly mobile nutrients such as nitrogen and sulfur may be quickly leached out of the soil by rain water. Nutrient and water retention can be increased by adding organic matter.

Organic matter: 0.6 %

Analytical Results	*Sample: SVCA Bridges B-4 @ 5'*	Simply Soil Testing	
Customer:	Kurt Parker NW Geologic 6131 Venus Pl Ferndale, WA 98248	Date received: Report date: Sample reference # Plant code: Tests requested:	03/22/24 03/30/24 14221 00 - General / not specified Texture



Soil Texture Classification: Sandy Loam

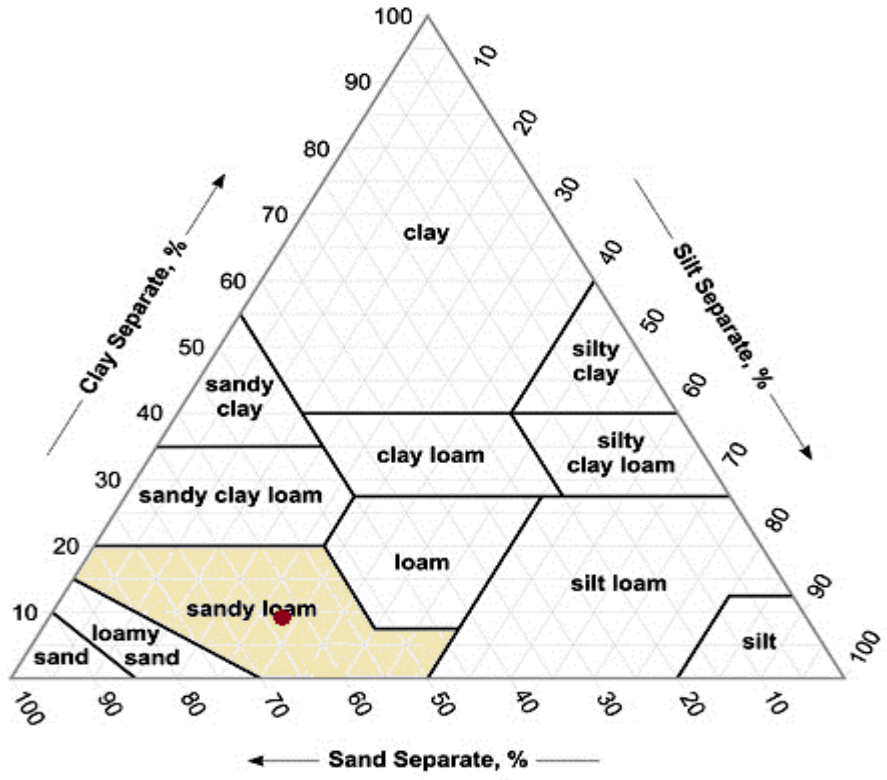
Sand: 73% Silt: 20% Clay: 7%

The un-sifted soil contains 30% gravel.

In gardens and lawns, sandy loam soils are capable of quickly draining excess water but cannot hold substantial amounts of water or nutrients. Plants grown in this type of soil will require more frequent watering and fertilization than those grown in soils with a higher concentration of silt and clay. High levels of organic matter improve the ability of the soil to hold water and nutrients.

Organic matter: 1.0 %

Analytical Results	*Sample: SVCA Bridges B-4 @ 7.5'*		Simply Soil Testing
Customer:	Kurt Parker NW Geologic 6131 Venus Pl Ferndale, WA 98248	Date received: Report date: Sample reference # Plant code: Tests requested:	03/22/24 03/30/24 14222 00 - General / not specified Texture



Soil Texture Classification: Sandy Loam

Sand: 63% Silt: 28% Clay: 9%

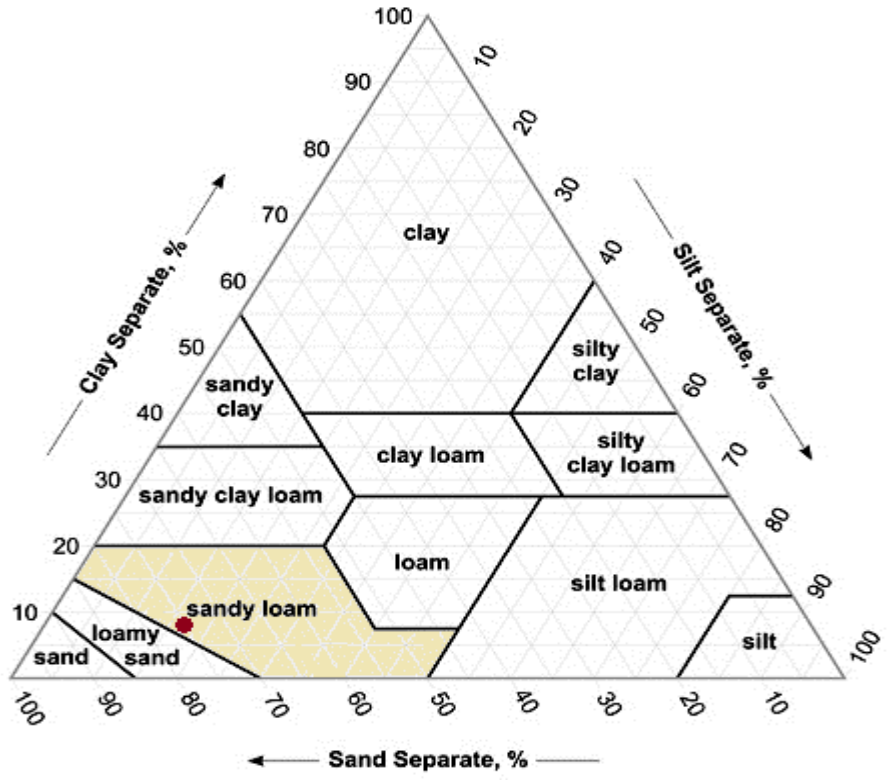
The un-sifted soil contains 1% gravel.

In gardens and lawns, sandy loam soils are capable of quickly draining excess water but cannot hold substantial amounts of water or nutrients. Plants grown in this type of soil will require more frequent watering and fertilization than those grown in soils with a higher concentration of silt and clay. High levels of organic matter improve the ability of the soil to hold water and nutrients.

Organic matter: 1.8 %

Analytical Results	*Sample: SVCA Bridges B-4 @ 10'*	Simply Soil Testing

Customer:	Kurt Parker NW Geologic 6131 Venus Pl Ferndale, WA 98248	Date received: Report date: Sample reference # Plant code: Tests requested:	03/22/24 03/30/24 14223 00 - General / not specified Texture



Soil Texture Classification: Sandy Loam

Sand: 75% Silt: 17% Clay: 8%

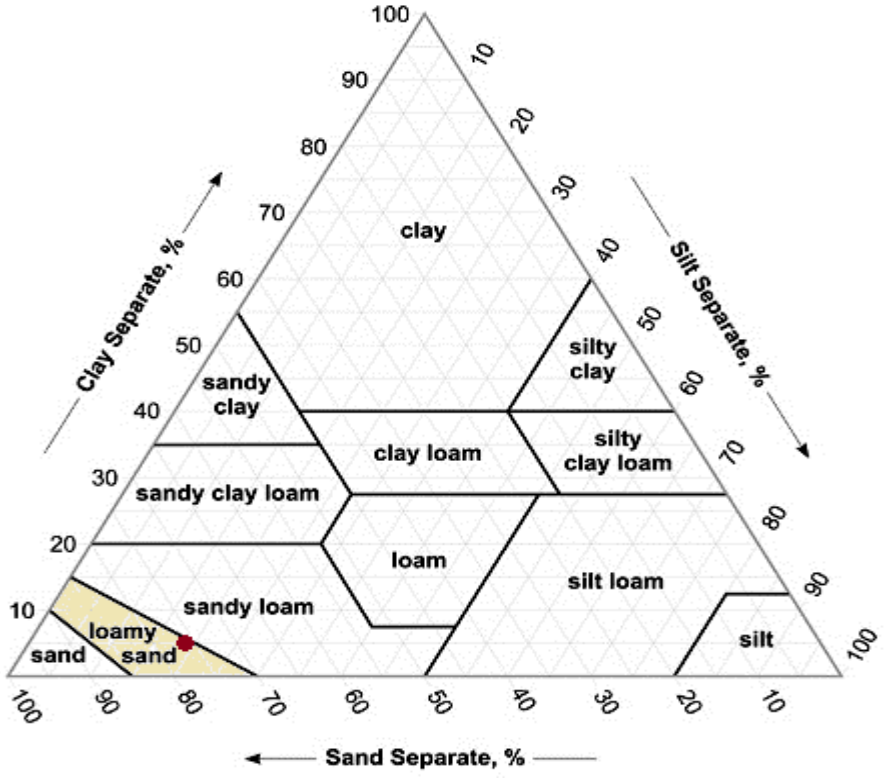
The un-sifted soil contains 12% gravel.

In gardens and lawns, sandy loam soils are capable of quickly draining excess water but cannot hold substantial amounts of water or nutrients. Plants grown in this type of soil will require more frequent watering and fertilization than those grown in soils with a higher concentration of silt and clay. High levels of organic matter improve the ability of the soil to hold water and nutrients.

Organic matter: 1.0 %

Analytical Results	*Sample: SVCA Bridges B-4 @ 15'*	Simply Soil Testing

Customer:	Kurt Parker	Date received:	03/22/24
	NW Geologic	Report date:	03/30/24
	6131 Venus Pl	Sample reference #	14224
	Ferndale, WA 98248	Plant code:	00 - General / not specified
		Tests requested:	Texture



Soil Texture Classification: Loamy Sand

Sand: 76% Silt: 19% Clay: 5%

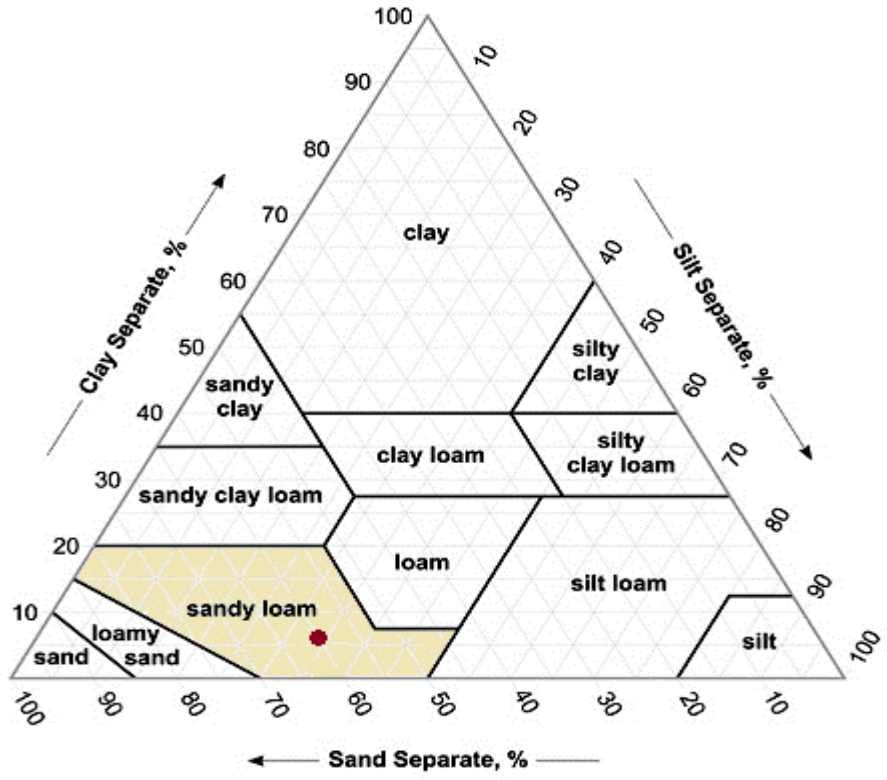
The un-sifted soil contains 3% gravel.

In gardens and lawns, loamy sand soils are capable of quickly draining excess water but are poor at retaining water and nutrients. Plants grown in this type of soil will require more frequent watering and fertilization than those grown in soils with a higher concentration of silt and clay. Highly mobile nutrients such as nitrogen and sulfur may be quickly leached out of the soil by rain water. Nutrient and water retention can be increased by adding organic matter.

Organic matter: 1.2 %

Analytical Results	*Sample: SVCA Bridges B-4 @ 20'*	Simply Soil Testing

Customer:	Kurt Parker NW Geologic 6131 Venus Pl Ferndale, WA 98248	Date received: Report date: Sample reference # Plant code: Tests requested:	03/22/24 03/30/24 14225 00 - General / not specified Texture



Soil Texture Classification: Sandy Loam

Sand: 60% Silt: 34% Clay: 6%

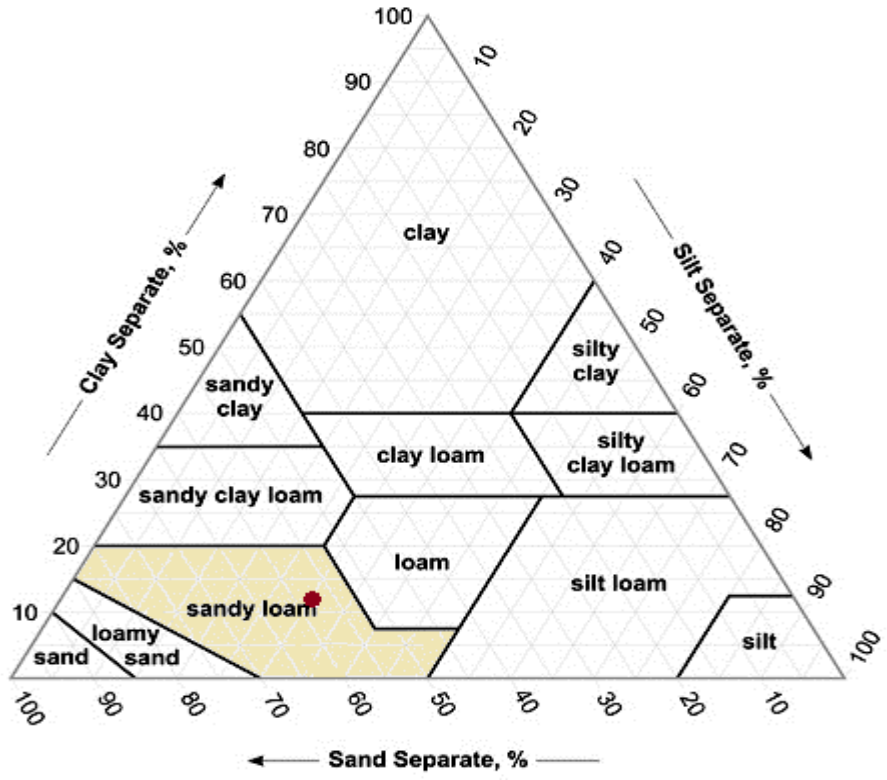
The un-sifted soil contains 7% gravel.

In gardens and lawns, sandy loam soils are capable of quickly draining excess water but cannot hold substantial amounts of water or nutrients. Plants grown in this type of soil will require more frequent watering and fertilization than those grown in soils with a higher concentration of silt and clay. High levels of organic matter improve the ability of the soil to hold water and nutrients.

Organic matter: 1.1 %

Analytical Results	*Sample: SVCA Bridges B-4 @ 25'*	Simply Soil Testing

Customer:	Kurt Parker NW Geologic 6131 Venus Pl Ferndale, WA 98248	Date received: Report date: Sample reference # Plant code: Tests requested:	03/22/24 03/30/24 14226 00 - General / not specified Texture



Soil Texture Classification: Sandy Loam

Sand: 58% Silt: 30% Clay: 12%

The un-sifted soil contains 6% gravel.

In gardens and lawns, sandy loam soils are capable of quickly draining excess water but cannot hold substantial amounts of water or nutrients. Plants grown in this type of soil will require more frequent watering and fertilization than those grown in soils with a higher concentration of silt and clay. High levels of organic matter improve the ability of the soil to hold water and nutrients.

Organic matter: 1.0 %

Appendix A: Photographs of Site Conditions

Photo 1: Existing conditions facing north on Polo Park Drive looking at the culvert crossing at Beaver Creek on March 18, 2024.

Photo 2: Existing conditions facing north from Area Z looking at the steel bridge crossing Beaver Creek on March 18, 2024.

Photo 3: Location of borehole B-1 in the southbound lane of Polo Park Drive on March 18, 2024.

Photo 4: Facing north at borehole B-4 on the south side of Beaver Creek at Area Z on March 18, 2024.

Photo 5: Borehole B-2 at 7.5 feet BPG showing weathered Chuckanut Formation sandstone bedrock on March 18, 2024.

Photo 6: Borehole B-3 at 15 feet BPG showing lacustrine (lake) deposits with notable organic content on March 18, 2024.