



**Coos County
Planning Department
Application to Develop in a
Special Flood Hazard Area**

Official Use Only

Fee \$500.00
Receipt No. 239992
Check No./Cash 1063
Date 7/21/23
Received By A. Dinkley
File No. FP-23-009

The undersigned hereby makes application for a permit to develop in a designated Special Flood Hazard Area ("floodplain"). The work to be performed is described below and in attachments hereto. The undersigned agrees that all such work shall be done in accordance with the requirements of the Coos County Comprehensive Plan, Coos County Zoning and Land Development Ordinance, and any other applicable Local, State, and Federal regulations. This application does not create liability on the part of the Coos County Planning Department or any officer or employee thereof for any flood damage that results from the reliance on this application or any decision made lawfully thereunder.

Owner(s): Robert (Bob) P. Little Telephone: 425-281-5823
Address: 93594 Easy LN
City/State: Coos Bay, OR Zip Code: 97420
Agent(s): _____ Telephone: _____
Address: _____
City/State: _____ Zip Code: _____
Township: 245 Section: 30C
Range: 11 W Tax Lot: 700
Situs Address: N/A
City/State: _____ Zip Code: _____

A. Description of Work (Complete for All Proposals):

1. Proposed Development Description:

- New Building Improvement to Existing Building
 Manufactured Structure Fill
 Other New bridge over W. Fork Millicoma River

2. Size and location of proposed development (a site plan must be attached):

See attached drawings.

3. Is the proposed development in a Special Flood Hazard Area (Zones A, AE, A1-A30, AH, AO, V, or VE)?

- Yes Zone: A - see attachment
- No

4. Per the FIRM, what is the zone and panel number of the area of the proposed development?

Zone: A

Panel Number: 41011C0210F - attached

5. Have any other Federal, State, or Local permits been obtained?

- Yes - Copies of all permits must be attached. - County right of way
- ODF notifications
- No

6. Is the proposed development in an identified floodway?

- Yes - A "No Rise Certification" with supporting data must be attached.
- No - see attached hydrology report

B. Complete for New Structures and Building Site:

1. Base Flood Elevation (BFE) at the site (complete one):

NGVD 29 _____ feet Source: _____

NAVD 88 _____ feet Source: _____

2. Required lowest floor elevation, including basement (complete one):

NGVD 29 _____ feet Source: _____

NAVD 88 _____ feet Source: _____

3. Number and area of flood openings (vents): _____

4. Enclosed area below BFE (in square feet): _____

C. Complete for Alterations, Additions, or Improvements to Existing Structures:

1. What is the estimated market value of the existing structure? Justification for the estimate must be attached and may include, but is not limited to, appraisals completed by private agencies or the County Assessor's office.

2. What is the cost of the proposed construction? Justification for the estimate must be attached. The estimate is required to include fair market value for any work provided by the property owner or without compensation.

3. If the cost of the proposed construction equals or exceeds 50 percent of the market value of the structure, then the substantial improvement provisions shall apply.

D. Complete for Non-Residential Floodproofed Construction:

1. Type of floodproofing method:

2. The required floodproofing elevation is (complete one):

NGVD 29 _____ feet Source: _____

NAVD 88 _____ feet Source: _____

3. Floodproofing certification by a registered engineer must be attached.

E. Complete for Land Divisions, Subdivisions, and Planned Unit Development:

1. Does the proposal contain 50 lots or 5 acres?

Yes - The plat or proposal must clearly identify base flood elevation.

No

2. Are the 100-year Floodplain and Floodway delineated on the site plan?

Yes

No

F. Authorization: All areas must be initialed by all applicant(s) prior to the Planning Department accepting any application.

RPL

Applicant

I hereby attest that I am authorized to make the application for Application to Develop in a Special Flood Hazard Area and the statements within this application are true and correct to the best of my knowledge and belief. I affirm that this is a legally created tract, lot or parcel of land. I understand that I have the right to an attorney for verification as to the creation of the subject property. I understand that any action authorized by Coos County may be revoked if it is determined that the action was issued based upon false statements or misrepresentation.

RPL

Applicant

I understand it is the function of the Planning Department to impartially review my application and to address all issues affecting it regardless of whether the issues promote or hinder the approval of my application. In the event a public hearing is required to consider my application, I agree I bear the burden of proof. I understand that approval is not guaranteed and the applicant(s) bear the burden of proof to demonstrate compliance with the applicable review criteria.

RPL

Applicant

As applicant(s) I/we acknowledge that is in my/our desire to submit this application and staff has not encouraged or discouraged the submittal of this application.



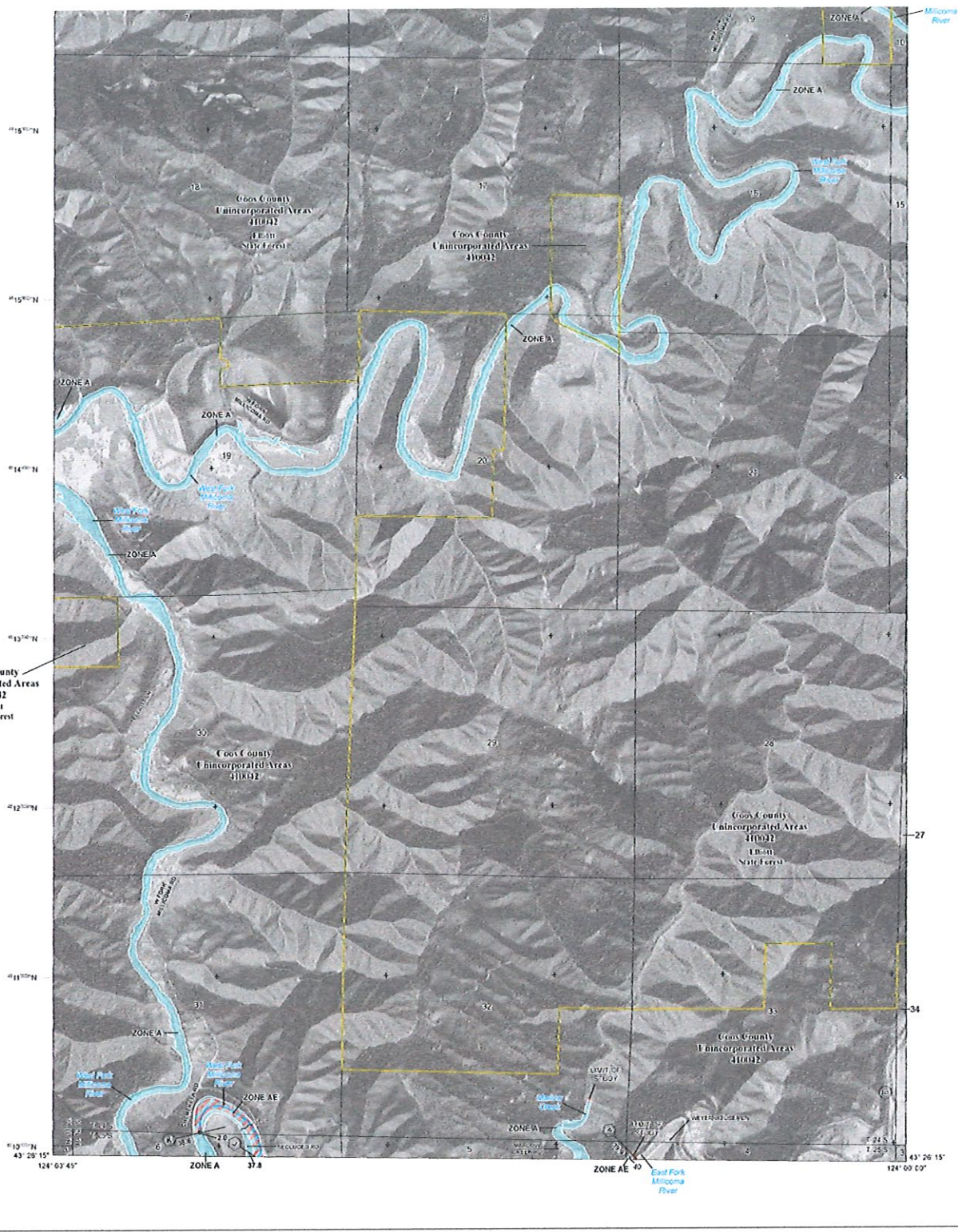
Applicant(s) Original Signature

7/21/2023

Date

Applicant(s) Original Signature

Date



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP
 THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING
 DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
[HTTP://MSC.FEMA.GOV](http://MSC.FEMA.GOV)

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE)
- With BFE or Depth (Zone AE, AD, AH, VE, AR)
- Regulatory Floodway
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile (Zone X)
- Future Conditions 1% Annual Chance Flood Hazard (Zone X)

OTHER AREAS OF FLOOD HAZARD

- Area with Reduced Flood Risk due to Levee (See Notes, Zone X)
- Areas Determined to be Outside the 0.2% Annual Chance Floodplain (Zone X)
- Area of Undetermined Flood Hazard (Zone D)

OTHER AREAS

- (NO SCREEN)

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall
- Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)

NOTES TO USERS

For information and questions about the map, available products associated with the FIRM including historic versions of the FIRM, the user products of the National Flood Insurance Program in general, please visit the FEMA Map Information Exchange at 1-877-FEMA-MAP (1-877-368-6227) or visit the FEMA Map Service Center website at www.fema.gov. Available products may include: previously issued Letters of Map Change or Flood Insurance Study Reports, digital versions of a map, Map of Risk products can be ordered or obtained directly from the website. Users may determine the current map data for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information Exchange.

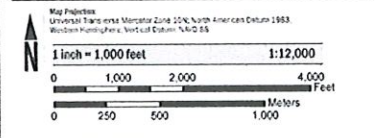
Communities receiving flood or adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map data refer to the Flood Insurance Study report for the jurisdiction.

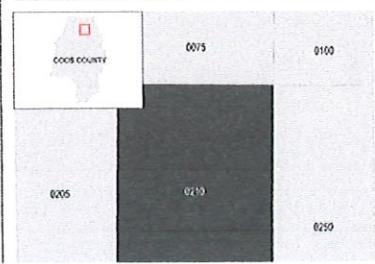
Basic map information is available in the community contact your insurance agent or call the National Flood Insurance Program at 1-800-633-6227.

Base map information shown on the FIRM was provided by Coos County GIS Department at a scale of 1:5000. The following general used base map information provided by the U.S. Geological Survey at a scale of 1:25000 12S102, 142.

SCALE



PANEL LOCATOR



FEMA
 National Flood Insurance Program

**NATIONAL FLOOD INSURANCE PROGRAM
 FLOOD INSURANCE RATE MAP**

COOS COUNTY, OREGON
 And Unincorporated Areas

PANEL 210 of 1200

COMMUNITY: COOS COUNTY
 NUMBER: 410042
 PANEL: 0075
 SUFFIX: F

National Flood Hazard Layer FIRMette



124°33'0"W 43°27'27"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

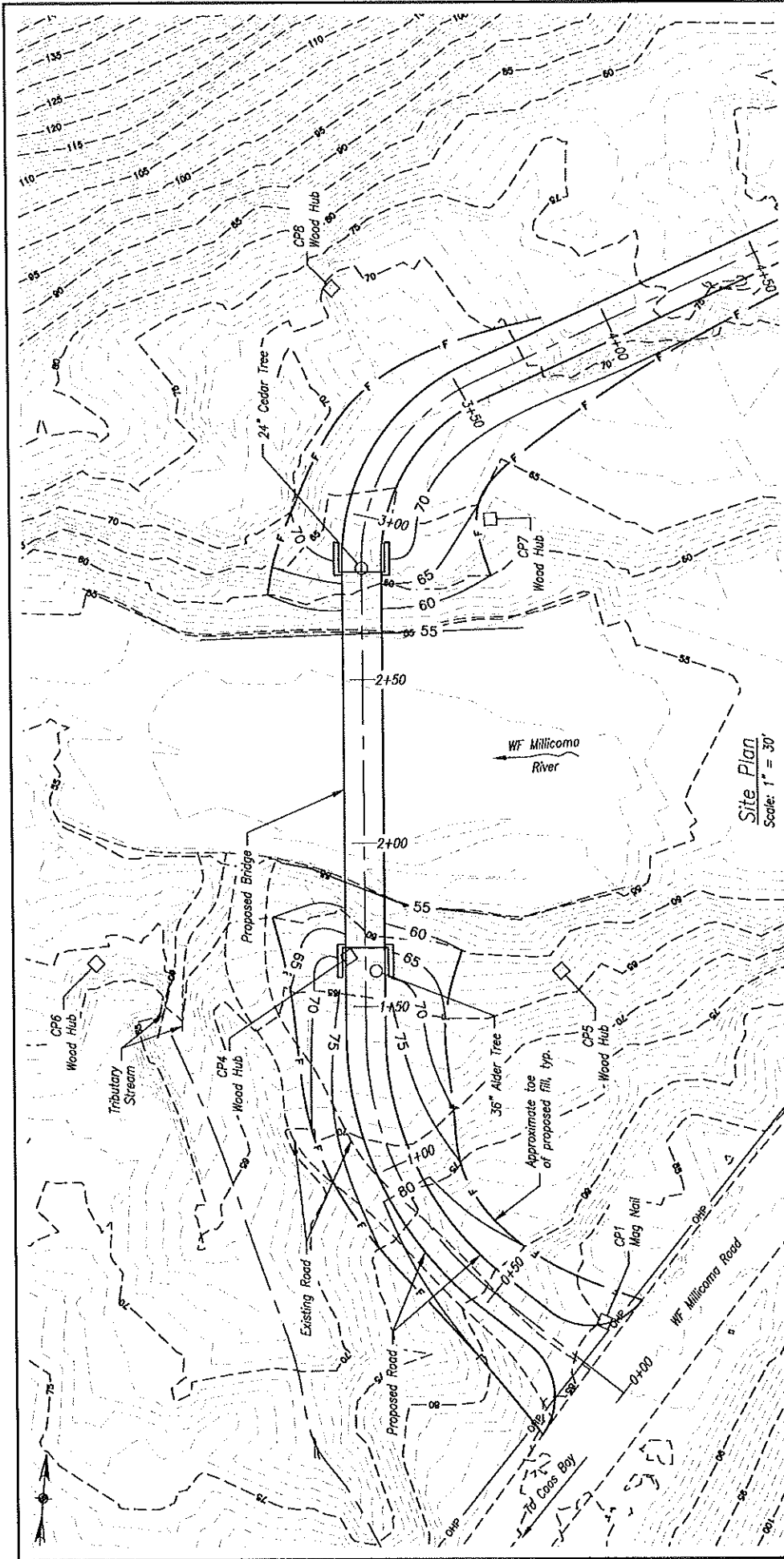
- | | |
|------------------------------------|--|
| SPECIAL FLOOD HAZARD AREAS | <ul style="list-style-type: none"> Without Base Flood Elevation (BFE)
Zone A, V, A99 With BFE or Depth Zone AE, AO, AH, VE, AR Regulatory Floodway |
| OTHER AREAS OF FLOOD HAZARD | <ul style="list-style-type: none"> 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X Future Conditions 1% Annual Chance Flood Hazard Zone X Area with Reduced Flood Risk due to Levee. See Notes. Zone X Area with Flood Risk due to Levee Zone D |
| OTHER AREAS | <ul style="list-style-type: none"> NO SCREEN Area of Minimal Flood Hazard Zone X Effective LOMRs Area of Undetermined Flood Hazard Zone D |
| GENERAL STRUCTURES | <ul style="list-style-type: none"> Channel, Culvert, or Storm Sewer Levee, Dike, or Floodwall |
| OTHER FEATURES | <ul style="list-style-type: none"> Cross Sections with 1% Annual Chance Water Surface Elevation Coastal Transect Base Flood Elevation Line (BFE) Limit of Study Jurisdiction Boundary Coastal Transect Baseline Profile Baseline Hydrographic Feature |
| MAP PANELS | <ul style="list-style-type: none"> Digital Data Available No Digital Data Available Unmapped |
- The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/20/2022 at 8:31 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

0 250 500 1,000 1,500 2,000 Feet 1:6,000
 Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020



Near: Allegany, OR	Bob Little
Road: Private Driveway	Coos Bay, OR
Milepost: ---	
Over: WF Millicoma River	WF Millicoma River Bridge
TWP: 24S	RNG: X11W
SEC: 30	1/4: SW
Latitude: N 43° 27.233'	Designed: A. Dunn
Longitude: W 124° 03.233'	Checked: ---
	Date: 6/8/2023
	Sheet 1 of 3

PRELIMINARY DRAWINGS
NOT FOR CONSTRUCTION

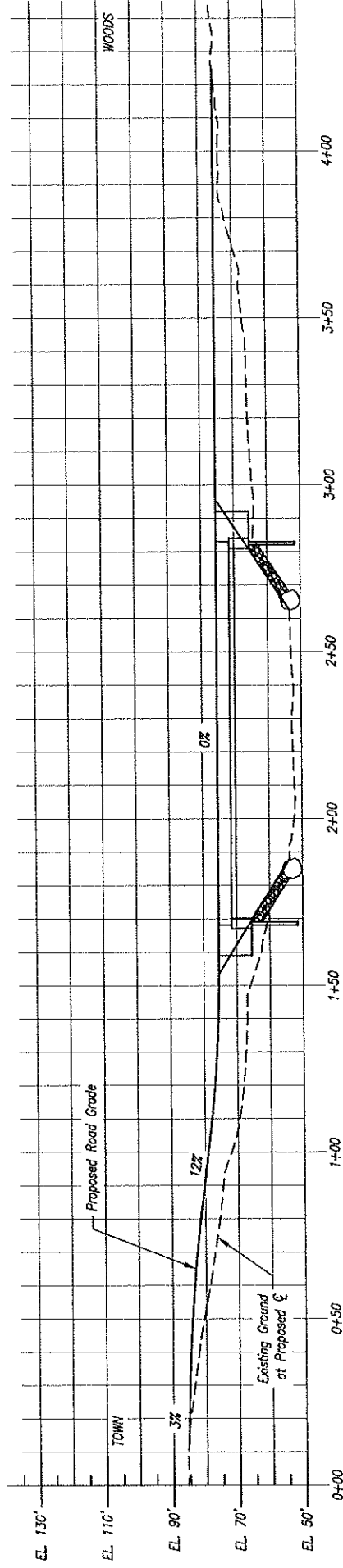
P.O. Box 1067
Corvallis, OR 97339
Phone: (541) 757-1270
Fax: (541) 758-6885

Measures one inch on original drawing.
Adjust scales accordingly.

Rev	Description	By	Date

--	--	--	--


Existing Contours
 Proposed Contours



Road Profile
Scale: 1" = 30'

Near: Allegany, OR	Bob Little
Road: Private Driveway	Coos Bay, OR
Milepost: ---	
Over: WF Millicoma River	WF Millicoma River Bridge
TWP: 24S	RNG: X11W
SEC: 30	1/4: SW
Latitude: N 43° 27.233'	Designed: A. Dunn
Longitude: W 124° 03.233'	Checked: ---
	Date: 6/8/2023
	Sheet 2 of 3

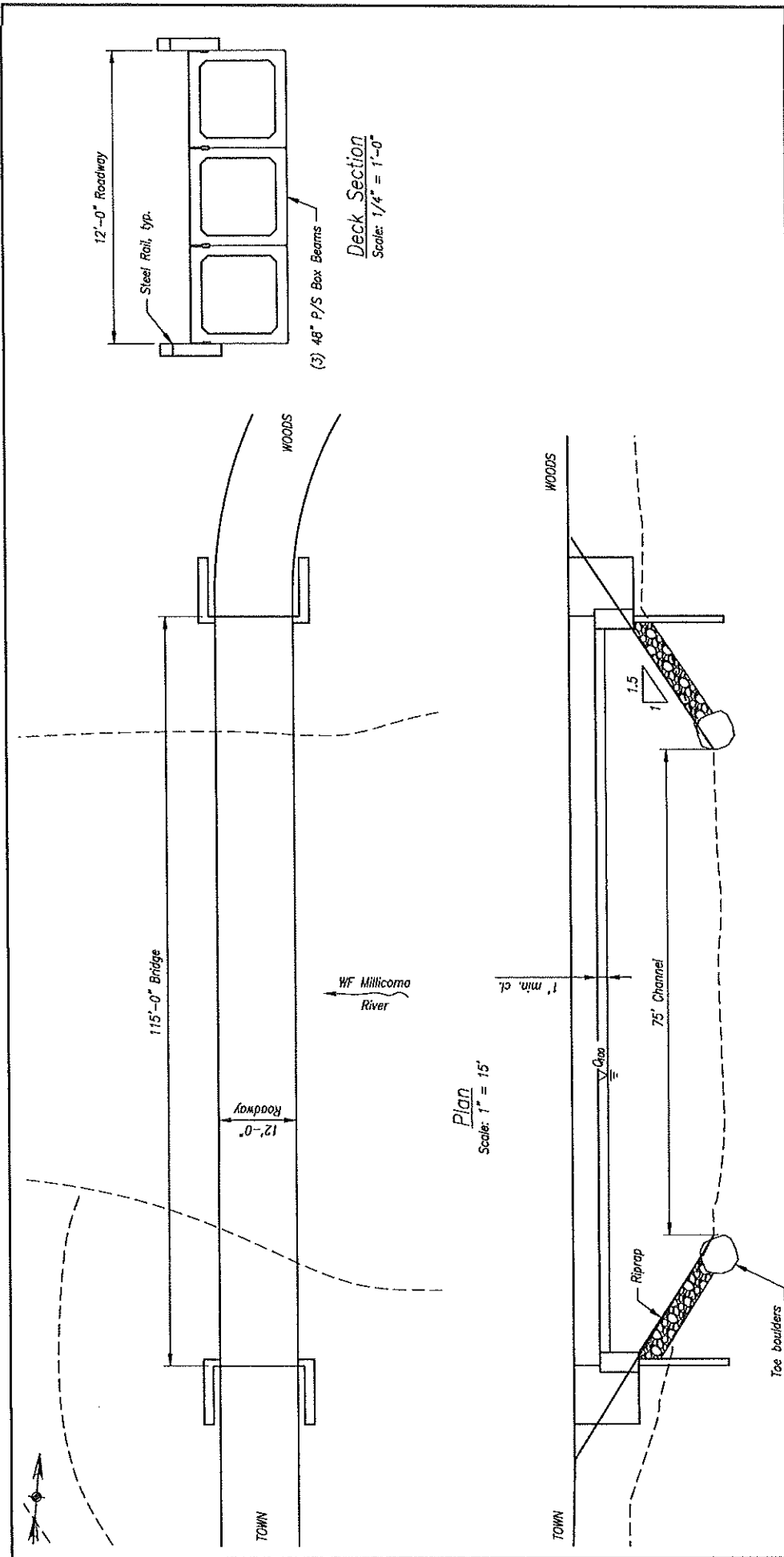
PRELIMINARY DRAWINGS
NOT FOR CONSTRUCTION



P.O. Box 1067
Corvallis, OR 97339
Phone: (541) 757-1270
Fax: (541) 758-6885

Measures one inch on original drawing.
Adjust scales accordingly.

Rev	Description	By	Date



 P.O. Box 1067 Corvallis, OR 97339 Phone: (541) 757-1270 Fax: (541) 758-6585 Measures one inch on original drawing. Adjust scales accordingly.		Near: Allegany, OR Road: Private Driveway Milepost: --- Over: WF Millicoma River TWP: 24S R1NG: X11W SEC: 30 1/4: SW Latitude: N 43° 27.233' Longitude: W 124° 03.233'		Bob Little Coos Bay, OR WF Millicoma River Bridge		
		PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION		Plan Elevation & Deck Section Designed: A. Dunn Date: 6/8/2023 Checked: --- Sheet 3 of 3		
Rev	Description	By	Date			

Elevation
Scale: 1" = 15'

Plan
Scale: 1" = 15'

Deck Section
Scale: 1/4" = 1'-0"

Bridge Hydraulic Design

*Private Road Bridge over West Fork Millicoma River
Coos County, Oregon*

REPORT

JULY 13, 2023



Prepared For:

McGee Engineering, Inc.
PO Box 1067
Corvallis, OR 97339
(541) 757-1270



Prepared By:

WEST Consultants, Inc.
2601 25th St. SE, Suite 450
Salem, OR 97302
(503) 485-5490



EXPIRES: 12/31/2024

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APPENDICES

- Appendix 1: Figures
- Appendix 2: Photographic Log
- Appendix 3: HEC-RAS Output

1. Introduction

A new private bridge is proposed to cross the West Fork Millicoma River approximately two miles north of Allegany, in Coos County, Oregon. There is currently no road access west of the West Fork Millicoma River at this location and the proposed bridge will provide access to private property to the north and west of the project site. A hydraulic design analysis was conducted for the proposed bridge. A scour assessment was not conducted as there is shallow bedrock at the proposed bridge location. A bridge location and drainage basin map is shown in **Figure 1** (all figures are provided in **Appendix A**).

The design for the replacement bridge was provided by McGee Engineering, Inc. (McGee). The new bridge will be a 115'-0" long single span bridge that is approximately 12 ft in width. The superstructure will consist of three 48-inch, prestressed box beams that will span the river channel. The abutments will be generally aligned with the high flow path of the West Fork Millicoma River. The bridge deck will include a steel rail that is 1.25 ft tall. The bridge deck and rail will have a combined thickness of approximately 63 inches. The minimum low chord elevation will be 71.5 ft. Plans for the proposed bridge are provided in **Figure 2**. The design life of the proposed bridge is 75 years.

All elevations in this report are referenced to the North American Vertical Datum of 1988, unless stated otherwise.

2. Research

The contributing drainage area for the West Fork Millicoma River at the proposed bridge site is approximately 49.9 square miles. The watershed varies in elevation from about 52 ft at the bridge site to approximately 2,130 ft near the headwaters along the northern boundary of the basin. The mean annual precipitation over the watershed is approximately 83.7 inches (USGS, 2019). No USGS gages are currently active on the West Fork Millicoma River; however, an inactive gage with 27 years of record (1955-1981) is located approximately 2.5 river miles upstream (north) of the proposed bridge site (USGS gage # 14324500, West Fork Millicoma River near Allegany, Oregon). This stream gage has a contributing drainage area of 46.2 square miles (USGS, 2016).

A Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) is available for the unincorporated areas of Coos County, Oregon (FEMA, 2018) which includes the West Fork Millicoma River. The West Fork Millicoma River near the project site was studied by approximate methods. Therefore, discharges and water surface elevations for the site are not provided in the study report. However, a detailed study of the West Fork Millicoma River was conducted from the confluence with the East Fork Millicoma River to River Mile 2.0 (2 miles downstream of the bridge site). The FIS provides the regional flow equation which was used to calculate the hydrology for the detailed study.

3. Regulatory Standards

The proposed bridge structure is located within a regulatory (FEMA) floodplain; however, no floodway has been defined for the West Fork Millicoma River at the project location. According to information provided by the County, a analysis is required which shows that the proposed development will not result in a cumulative increase of more than one foot during the occurrence of the base flood (personal email communication between Amy Dibble and Alex Dunn, 8/25/2022). The West Fork Millicoma River bridge structure will be privately owned and maintained; however, since the bridge is likely to serve both

commercial and residential users, it is recommended that the proposed bridge comply with Oregon Department of Transportation (ODOT) guidelines (ODOT, 2014) for hydraulic design. For a bridge located in a regulatory floodplain, a minimum of 1 foot of clearance above the 100-year base flood is desired. According to the ODOT Hydraulic Manual (2014), because the bridge is located in a regulatory FEMA floodplain, the design flood for the West Fork Millicoma River bridge is the 100-year event.

4. Site Investigation

A site investigation of the bridge site was conducted by Ken Puhn, P.E., WEST Consultants, Inc., on May 31, 2023. A topographic and hydrographic survey of the area was conducted by WEST on May 25, 2023. Nine cross sections were surveyed: six sections downstream of the proposed bridge and three sections upstream of the proposed bridge. One additional cross section surveyed by Civil West immediately upstream of the proposed bridge was also used for developing the bridge hydraulic design. A plan view showing the location of the survey data and cross sections is shown in **Figure 3**. A photographic log of the project area is presented in **Appendix B**.

Observations made during the site investigation are summarized as follows:

1) Lateral Channel Stability

The channel banks along WF Millicoma River appear stable and well vegetated; however, some minor erosion was noted along the right bank in a cleared area near the proposed bridge site.

2) Aggradation/Degradation

No signs of aggradation or degradation were observed. The reach appears to be vertically stable, and degradation of the channel bed is limited by the presence of bedrock.

3) Manning's n

Manning's n values for the main channel of the West Fork Millicoma River are estimated to be 0.045. This matches the main channel roughness value used in the FIS study downstream of the project site. The overbank areas are well vegetated, consisting of trees and shrubs, with Manning's n values estimated to be about 0.10. These values were selected based upon the investigator's judgment and experience.

4) Riprap

No riprap was observed near the project site.

5) Bed Material

The stream bed is bedrock throughout the majority of the site, with some gravel, cobble, and boulder size material present. Additional channel material data was unavailable, as geotechnical borings were not conducted for this project.

6) Evidence of Scour

No evidence of channel scour was observed.

7) Pier Alignment

N/A - there is no existing bridge at the site.

8) Hydraulic Controls

A bedrock riffle containing cobble and boulder size material is present approximately 60 ft downstream of the proposed bridge location. The channel also narrows at this point. This riffle controls the upstream water surface elevations during low flow conditions.

9) High Water Marks

No high water marks were observed.

10) Debris

The channel was generally free of debris, though some small twig and branch size material was noted near the toe of the right bank at the riffle located approximately 60 ft downstream of the bridge site.

11) Bed Forms

No bed forms were observed since the channel is mostly bedrock.

5. Hydrology

Discharges for the 100-year and 500-year flood events were calculated using two methods: (1) using the regional flow equation provided in the FIS, and (2) using a Bulletin 17C Flood Frequency Analysis on the USGS gage West Fork Millicoma River near Allegany, Oregon (Gage # 14324500), scaled by the ratio of the gage's watershed area to the contributing watershed area at the proposed bridge site.

The FIS regional flow equation was developed using the standard log-Pearson Type-III method using gage data up to the year 1982. The following is the regional flow equation from the FIS:

$$Q = KA^n$$

where Q is the discharge in cubic ft per second, A is the drainage area in square miles, and K and n are constants. The value of K is 708 for the 1% annual-chance (100-year) flow and 830 for the 0.2% annual-chance (500-year) flow. The value of n is 0.74 for both the 100-year and 500-year flows. By inputting the drainage area at the project site, the regional flow equation may be used to calculate the hydrology for the bridge. Based on the regional equation, the 100-yr and 500-yr peak flood flows were calculated to be 12,783 cfs and 14,986 cfs, respectively.

For comparative purposes, a Flood Frequency Analysis (FFA) was conducted on the nearby USGS gage, using the U.S. Army Corps of Engineers Statistical Software Program (HEC-SSP Version 2.2). Based on a Bulletin 17C analysis of the 27 years of record, the 1% annual-chance and 0.2% annual-chance peak flood flows were calculated to be 10,195 cfs and 10,864 cfs, respectively.

Since the FIS calculated flows are conservatively higher than those determined by the FFA, and to maintain consistency with the FIS, the FIS flows were used for the hydraulics analysis of the proposed bridge. The final modeled flows are provided in **Table 1**.

Table 1. Peak Discharges for the Proposed Bridge Site

Recurrence Interval (Years)	Peak Flow (cfs)
100-year	12,783
500-year	14,986

6. Hydraulics

The U.S. Army Corps of Engineers River Analysis System standard-step backwater computer program (HEC-RAS Version 6.3.1) was used to compute the channel hydraulics (USACE, 2022). The cross sections extracted from the survey data and supplemented with available LiDAR data, were used to develop the hydraulic models of the reach in the vicinity of the proposed bridge location. The cross sections were selected to adequately model flow contraction and expansion through the bridge opening. The model begins approximately 1,700 ft downstream of the bridge site and extends for a distance of about 4,900 ft, terminating at a point approximately 3,200 ft upstream of the bridge site. Channel and overbank resistance values were selected based upon the investigator's experience and judgment and from information contained in the effective FIS. The downstream boundary water surface elevation for the cross section at River Station 24 (**Figure 3**) was determined using a normal depth slope of 0.005 ft/ft. Hydraulic models were developed for existing conditions and the proposed bridge design. Model results indicate that the simulated floodplain for existing conditions is wider than shown on the floodplain map provided in the effective FIS.

Neither the 100-year base (design) flood or the 500-year check flood will overtop the proposed superstructure. The 100-year water surface elevation is 1.4 ft below the low chord of the bridge at the upstream face. Water surface profiles for existing and proposed conditions are shown in **Figure 4** and **Figure 5**, respectively. Water surface elevations at the downstream bridge face cross section for existing and proposed conditions are shown in **Figure 6** and **Figure 7**, respectively. Summary tables of HEC-RAS outputs for the bridge replacement design are presented in **Appendix C**.

A hydraulic data sheet for the existing and proposed conditions is provided in **Table 2**. A comparison of existing and proposed water surface elevations for all cross sections is shown in **Table 3**. As seen in the tables, the proposed bridge will cause a minor increase in backwater for the 100-year base flood. Water surface elevations are increased by 0.16 ft at the upstream face of the bridge and by a maximum of 0.26 ft at a point approximately 360 ft upstream of the proposed bridge. The upstream extent of the backwater from the proposed bridge (measured to the 0.00 ft level of accuracy) is River Station 3,787, approximately 2,075 ft upstream of the proposed bridge. Based on a review of Google Earth aerial imagery, no structures appear to be located within the floodplain in the area that will be influenced by the proposed bridge. A small cluster of residential homes is located in the left overbank of the river beginning approximately 75 ft

upstream of River Station 3,787. Most of these homes are located outside the effective FEMA floodplain, but inside the simulated floodplain developed from this analysis. The flood risk for these homes is not affected by the proposed bridge (to the 0.00 ft level of accuracy).

Table 2. Hydraulic Data Sheet for Proposed Bridge

	Design (Base) Flood		Check Flood	
	Design (Base) Flood	Check Flood	Design (Base) Flood	Check Flood
Recurrence Interval (years)	100	500	100	500
Discharge (ft³/s)	12,783	14,986	12,783	14,986
Discharge through Bridge Opening (ft³/s)	--	--	12,783	14,986
Approach Section W.S. Elevation¹ (ft)	70.32	71.83	70.57	73.02
Backwater⁵ (ft)	--	--	0.25	1.19
W.S. Elevation at Upstream Face of Bridge² (ft)	69.96	71.49	70.12	72.53
W.S. Elevation at Downstream Face of Bridge³ (ft)	69.69	71.19	69.66	71.13
Waterway Area at Downstream Face of Bridge^{3,4} (ft²)	1,859	2,170	1,854	2,155
Average Cross Section Velocity at Downstream Face of Bridge³ (ft/s)	6.88	6.92	8.00	8.47

¹ Approach section located at River Station 1788.

² Located at upstream face of bridge opening.

³ Located at downstream face of bridge opening.

⁴ Area normal to channel centerline.

⁵ Values relative to existing vs proposed conditions at approach section.

Table 3. Comparison of Existing and Proposed Conditions Water Surface Elevations

River Station	Existing Conditions W.S. Elev. (ft, NAVD 88)	Proposed Conditions W.S. Elev. (ft, NAVD 88)	W.S. Elev. Change
4885	79.886	79.888	0.00
4636	78.860	78.862	0.00
4368	78.464	78.466	0.00
4196	78.136	78.139	0.00
4003	77.684	77.688	0.00
3787	77.272	77.277	0.01
3630	77.042	77.047	0.01
3514	76.679	76.684	0.01
3336	75.742	75.749	0.01
3203	75.027	75.035	0.01
3074	74.304	74.314	0.01
2954	74.251	74.263	0.01
2792	74.318	74.329	0.01
2657	73.402	73.418	0.02
2501	73.038	73.052	0.01
2334	71.659	71.789	0.13
2182	69.990	70.236	0.25
2071	70.073	70.331	0.26
1940	70.275	70.525	0.25
1788	70.317	70.567	0.25
1712	69.958	70.121	0.16
Bridge			
1687	69.686	69.661	-0.03
1612	69.579	69.579	0.00
1575	68.802	68.802	0.00
1527	68.163	68.163	0.00
1388	68.042	68.042	0.00
1304	67.312	67.312	0.00
1145	66.681	66.681	0.00
1018	66.663	66.663	0.00
895	66.255	66.255	0.00
764	66.308	66.308	0.00
634	65.527	65.527	0.00
506	65.449	65.449	0.00
311	64.774	64.774	0.00
183	64.579	64.579	0.00
24	62.337	62.337	0.00

7. Abutment Protection

Abutment riprap protection was designed using ODOT and HEC-11 criteria. According to the ODOT Hydraulics Manual (2014), the abutment protection is to be sized for the 100-year discharge and checked against the 500-year discharge to ensure the riprap will remain in place during a larger flood. Riprap size was computed using the following ODOT equation:

$$D_{50} = \frac{0.001CV_a^3}{d_{avg}^{0.5}K_1^{1.5}}$$

where D_{50} is the median riprap particle size in ft, C is a correction factor (a stability factor of $SF = 2$ was selected to account for potential turbulent mixing flow at the bridge abutment, resulting in a C of 2.15 ($C=(SF/1.2)^{1.5}$)), V_a is the average velocity in the main channel, d_{avg} is the average flow depth in the main channel, and:

$$K_1 = \left(1 - \frac{(\sin \theta)^2}{(\sin \phi)^2}\right)^{0.5}$$

where θ is the bank angle with the horizontal (33.69 degrees) and ϕ is the riprap angle of repose (41 degrees). The side slope was determined to be 1.5H on 1V based on the proposed bridge plans.

Using the above equations, the D_{50} for the 100-year event was calculated to be 1.00 ft, corresponding to ODOT Class 700 riprap. The check flood event (500-year recurrence interval) indicates that the stability factor (SF) would be reduced to 1.8 from 2.0 to maintain a calculated D_{50} of 1.00 ft, which is acceptable given that the minimum SF allowed is 1.2 (FHWA, 2012). Parameters and results of the calculation are summarized in **Table 4**.

Table 4. Summary of ODOT Riprap Sizing for Proposed Bridge

C	V_a	D_{avg}	θ	ϕ	K_1	D_{50}	ODOT Riprap Class
2.15	9.09	17.11	33.69	41.00	0.53	1.00	700

Riprap size and weight gradation requirements for Class 700 riprap are shown in **Table 5** and **Table 6**. The minimum recommended blanket thickness (T) for Class 700 riprap is 3.0 ft. A riprap geotextile filter fabric or granular filter blanket should be used at the interface between the riprap and native bank material. The filter prevents migration of fine soil particles through the voids in the riprap. The riprap filter should be either a geotextile meeting ODOT specification for a Type 2 riprap geotextile or a 9-inch layer of well graded 6-inch – 0 stone embankment material. Since the channel bottom is comprised of bedrock which likely prevents the typical ODOT buried toe trench configuration, ODOT Method 4 placement shown in **Figure 8** is recommended as an alternative installation method. The top of the revetment should be set at or above 71.1 ft, which is equivalent to 1 foot above the 100-year water surface elevation. It is recommended that the riprap embankment protection extend to the upstream and downstream extents of the right-of-way.

Table 5. Class 700 Riprap Gradation

Percent by Weight	Stone Weight (lb)
20	700 – 500
30	500 – 200
40	200 – 20
10 - 0	20 – 0

Table 6. D₅₀, W₅₀, D₁₀₀ and W₁₀₀ for Class 700 Riprap

D ₅₀ (ft)	W ₅₀ (lbs)	D ₁₀₀ (ft)	W ₁₀₀ (lbs)
1.32	200	2.01	700

8. Summary

A hydraulic evaluation for a new bridge over the West Fork Millicoma River, located approximately 2 miles north of Allegany, Oregon, was conducted. The proposed bridge is a single span, approximately 115' long and 12' wide, structure. The superstructure will consist of three 48-inch, prestressed box beams that will span the river channel. The abutments will be generally aligned with the high flow path of West Fork Millicoma River. The bridge section, including the rail, will have a total thickness of approximately 63 inches and will have a minimum low chord elevation of 71.5 ft.

Neither the 100-year base (design) flood or the 500-year check flood will overtop the proposed superstructure. The 100-year water surface elevation is 1.4 ft below the low chord of the bridge at the upstream face. The proposed bridge will cause a minor increase in backwater for the 100-year base flood of approximately 0.16 ft at the upstream face of the bridge and 0.26 ft at a point approximately 360 ft upstream of the proposed bridge. The bridge is not expected to increase the 100-year flood risk for any existing nearby structures.

Embankment protection using riprap is recommended for the bridge abutments. Using the ODOT and HEC-11 criteria for riprap revetments, ODOT Class 700 riprap is recommended for embankment protection.

9. References

- Federal Emergency Management Agency (FEMA), Flood Insurance Study for Coos County, Oregon and Incorporated Areas, December 7, 2018.
- Federal Highway Administration (FHWA), Evaluating Scour at Bridges, FHWA-HIF-12-003, Hydraulic Engineering Circular No. 18, Fifth Edition, Washington, D.C., April 2012.
- Oregon Department of Transportation (ODOT) Highway Division, Hydraulics Manual, ODOT, Salem, Oregon, April 2014.

U.S. Army Corps of Engineers (USACE), HEC-RAS River Analysis System Computer Program, Version 5.3.1, September 2022.

U.S. Army Corps of Engineers (USACE), HEC-SSP Statistical Software Package, Version 2.2, June 2019.

United States Geological Survey (USGS). 2019. The StreamStats program, online at <http://streamstats.usgs.gov>, accessed on June 1, 2023.

Appendix A
Figures

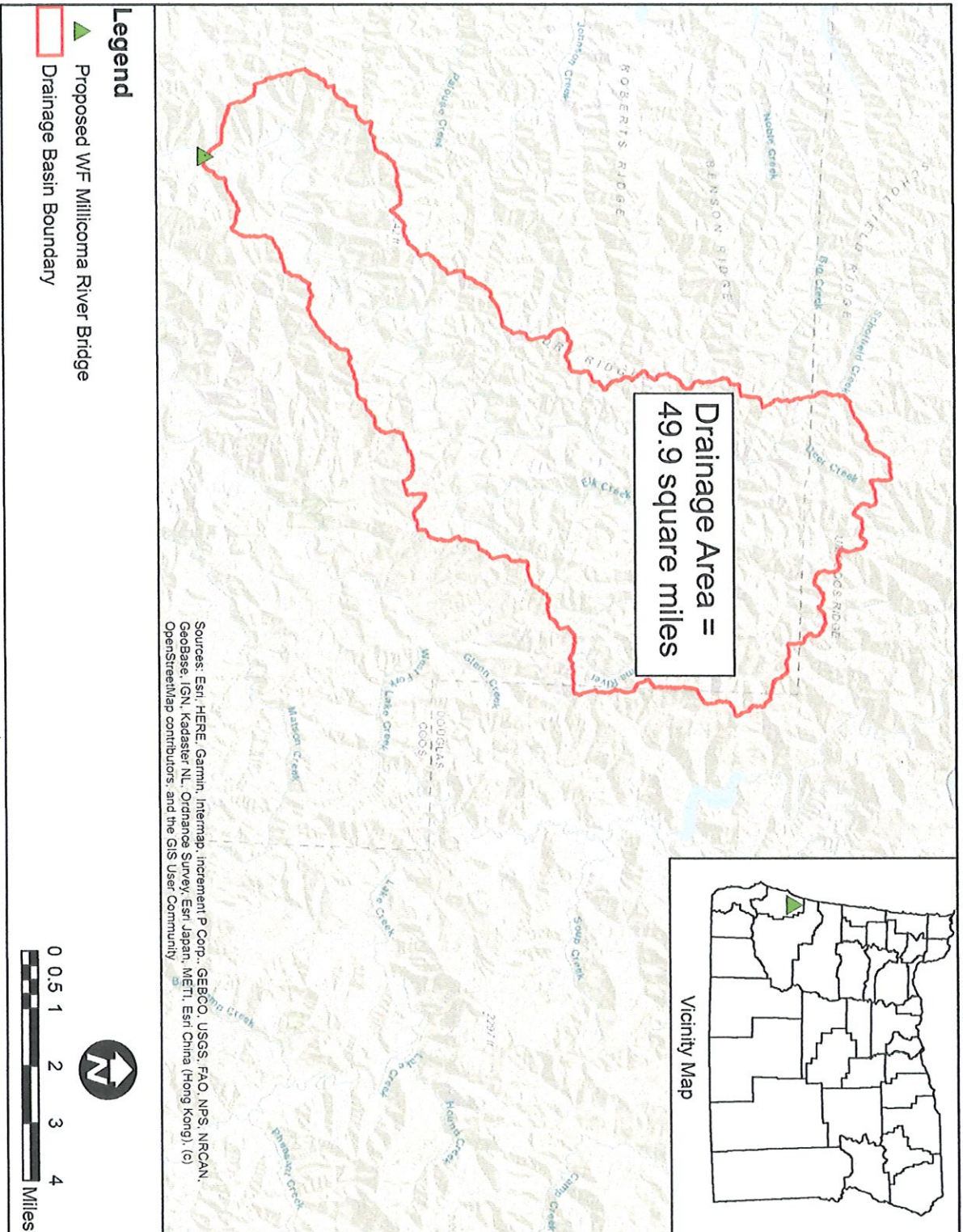
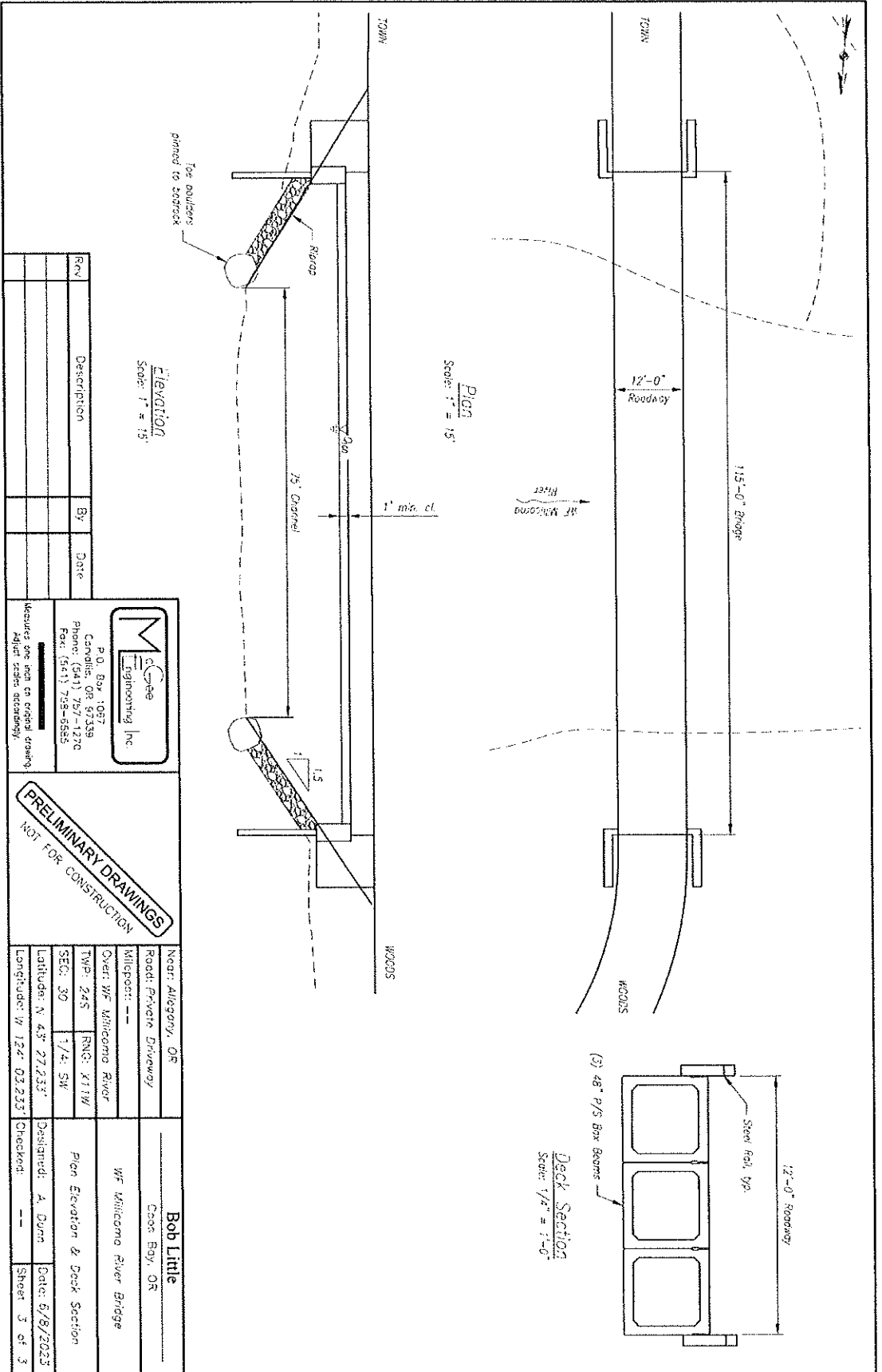
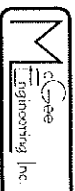


Figure 1. Drainage Basin and Bridge Location Map



Rev	Description	By	Date



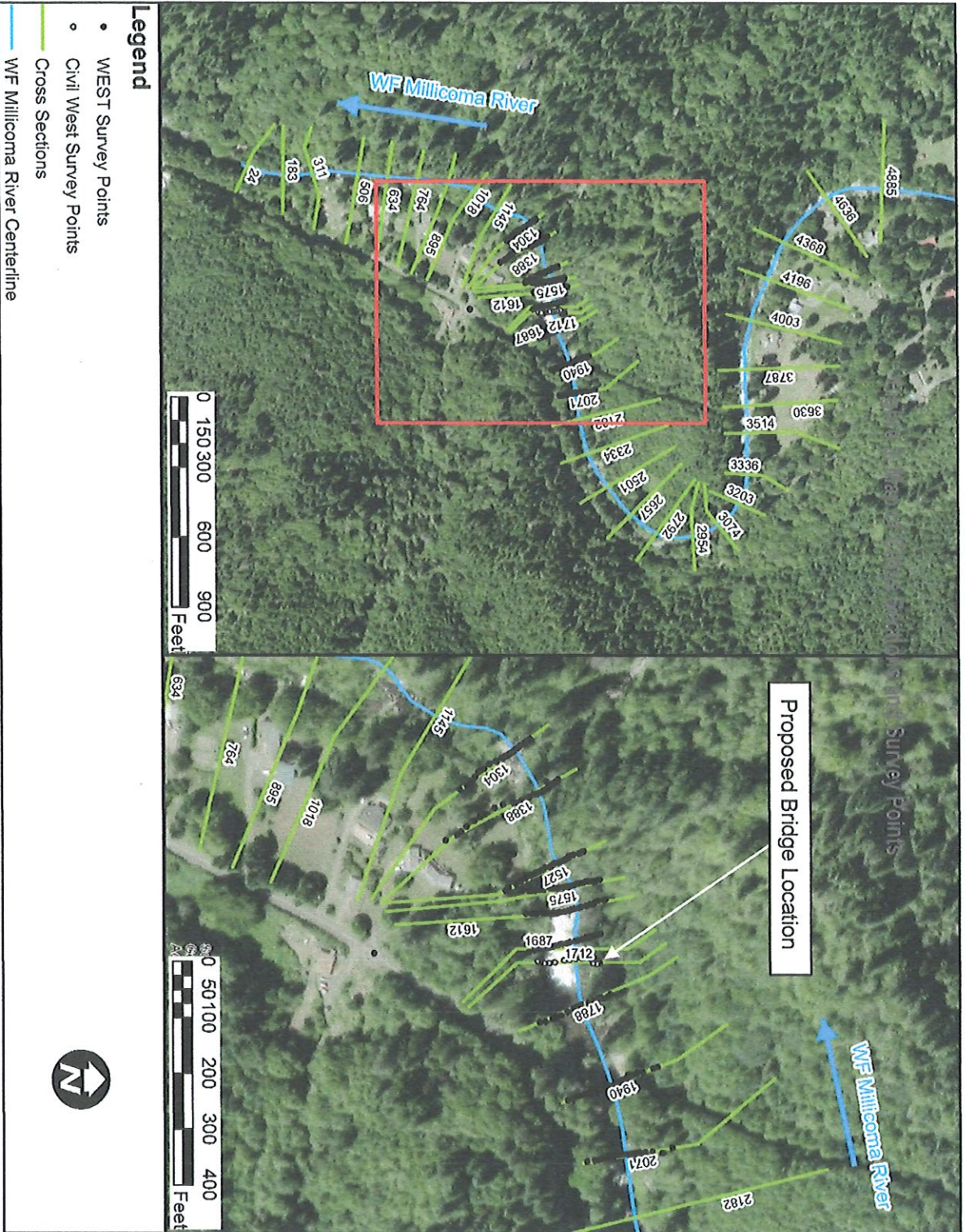
 P.O. Box 1087
 Canby, OR 97139
 Phone: (541) 757-1270
 Fax: (541) 758-0585

Measures per inch on original drawing.
 Adjust scales accordingly.

PRELIMINARY DRAWINGS
 NOT FOR CONSTRUCTION

Near: Allegany, OR	Bob Little
Road: Private Driveway	Casey Bay, OR
Millposts: --	WF Millcorno River Bridge
Over: WF Millcorno River	Plan Elevation & Deck Section
Typ: 24S	RNG: X1TW
SEC: 30	1/4 SW
Latitude: N 43° 27.233'	Designer: A. Dunn
Longitude: W 124° 02.233'	Checked: --
	Date: 6/8/2023
	Sheet 3 of 3

Figure 2. Plans for Proposed Replacement Bridge



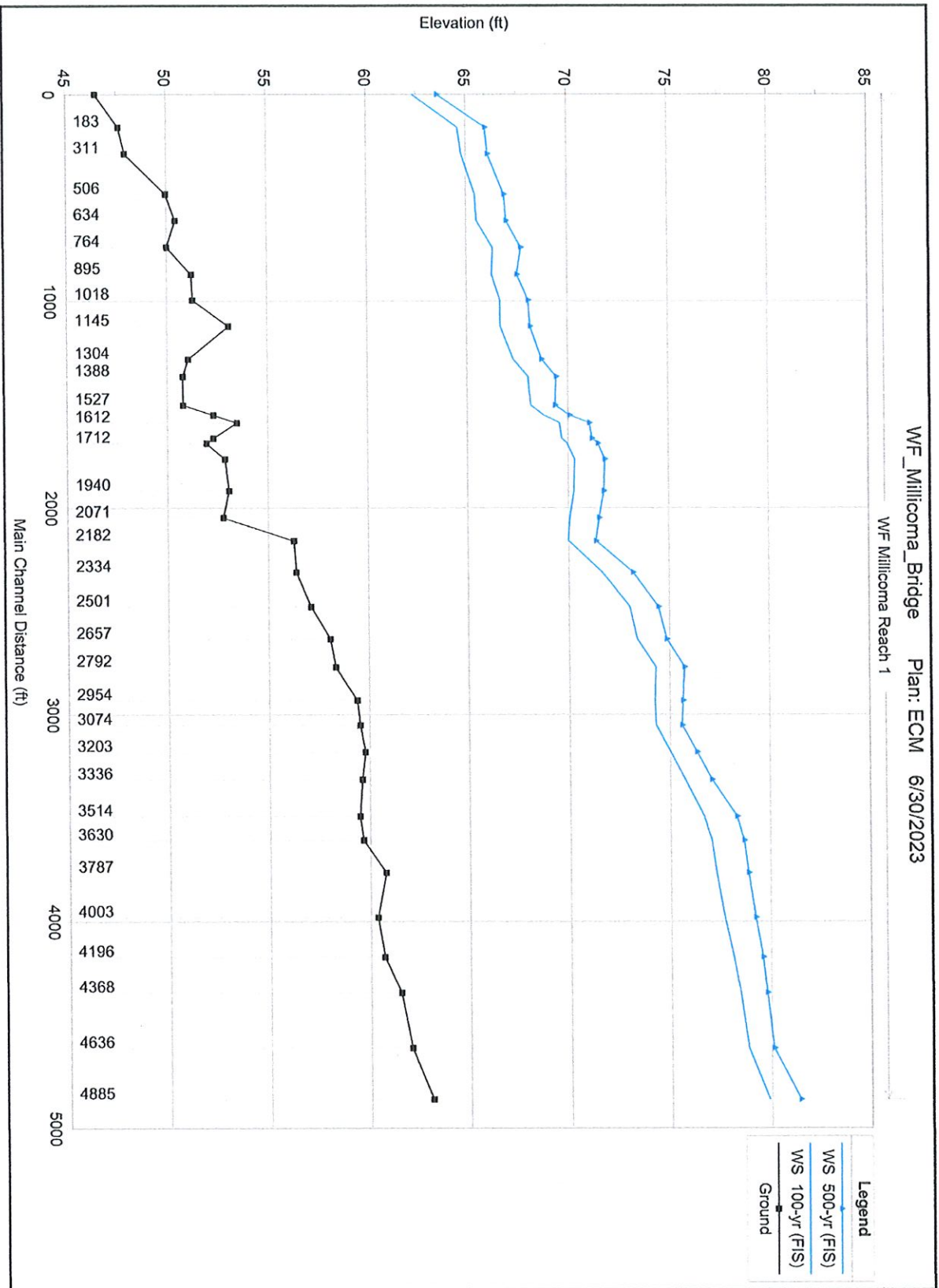


Figure 4. Water Surface Profiles for Existing Conditions

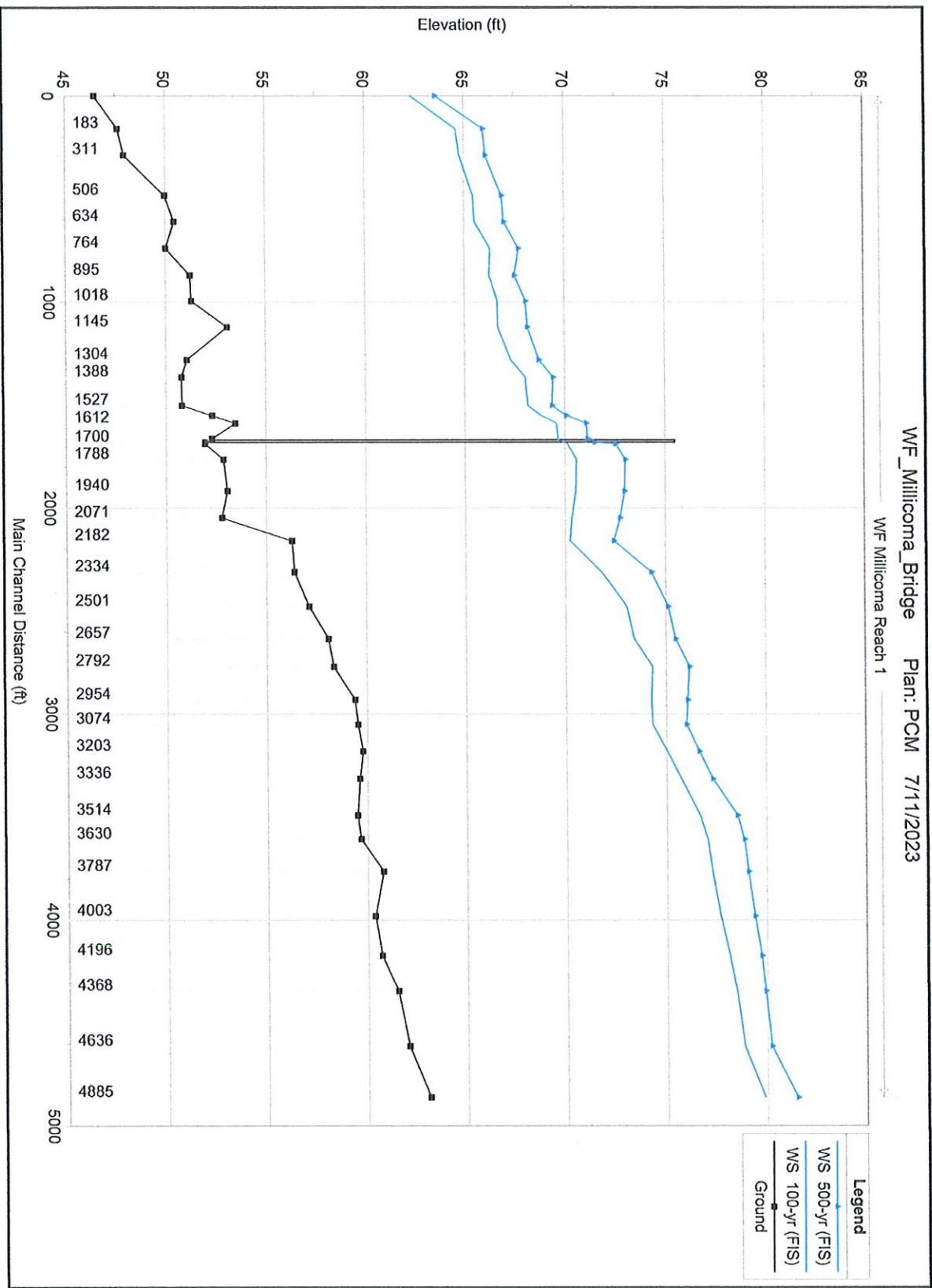


Figure 5. Water Surface Profiles for Proposed Conditions

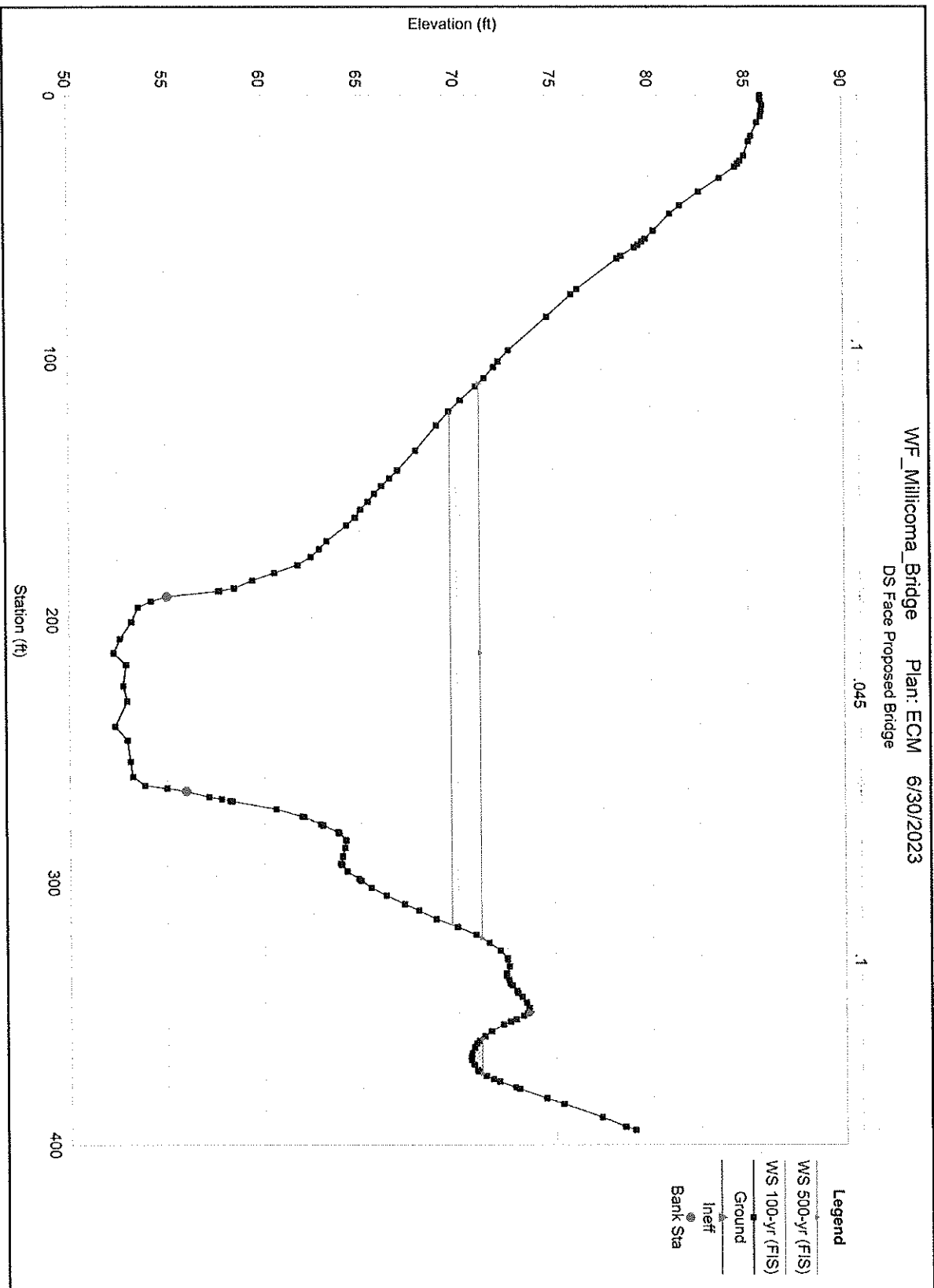


Figure 6. Downstream Bridge Cross Section for Existing Conditions

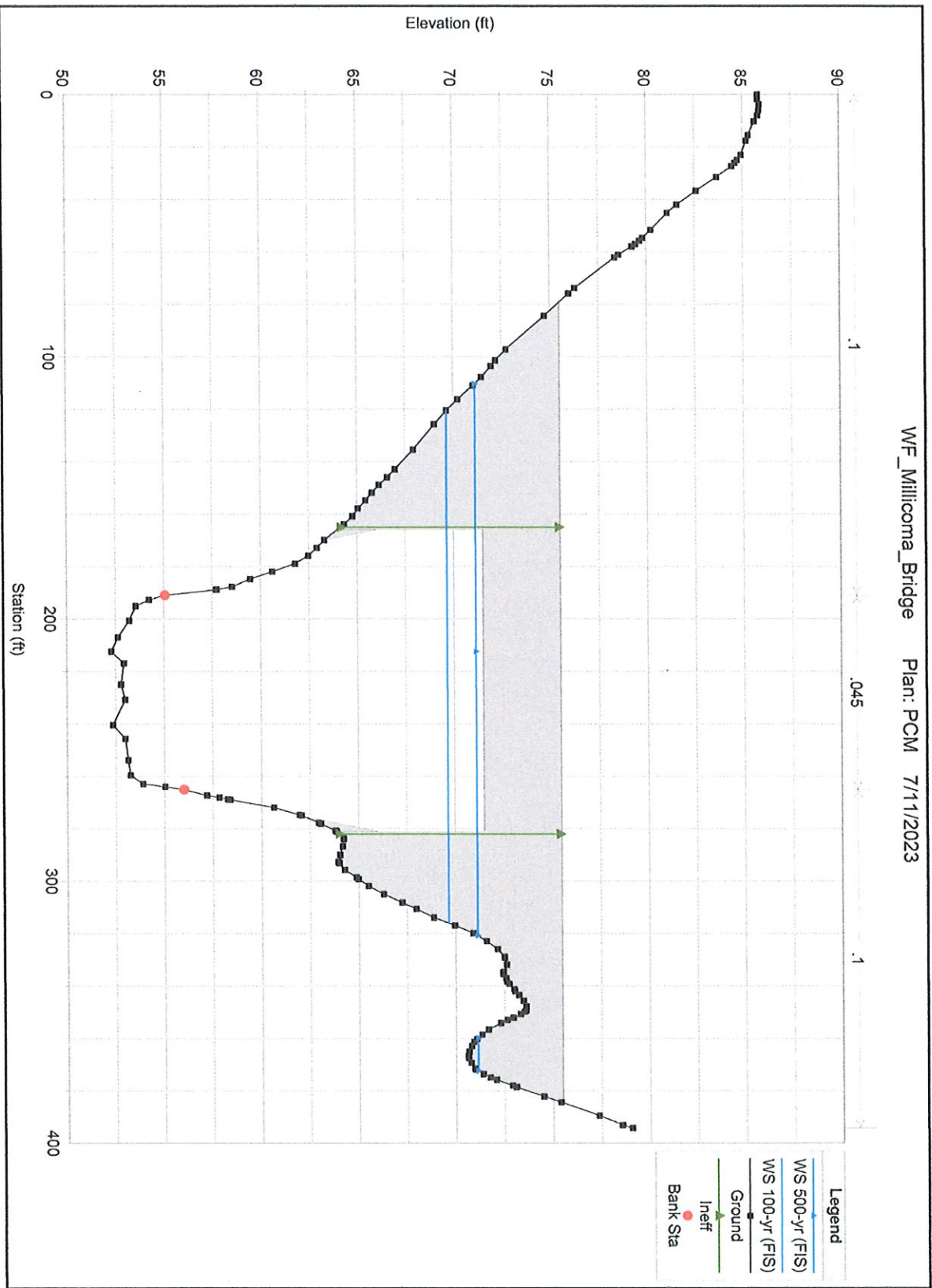
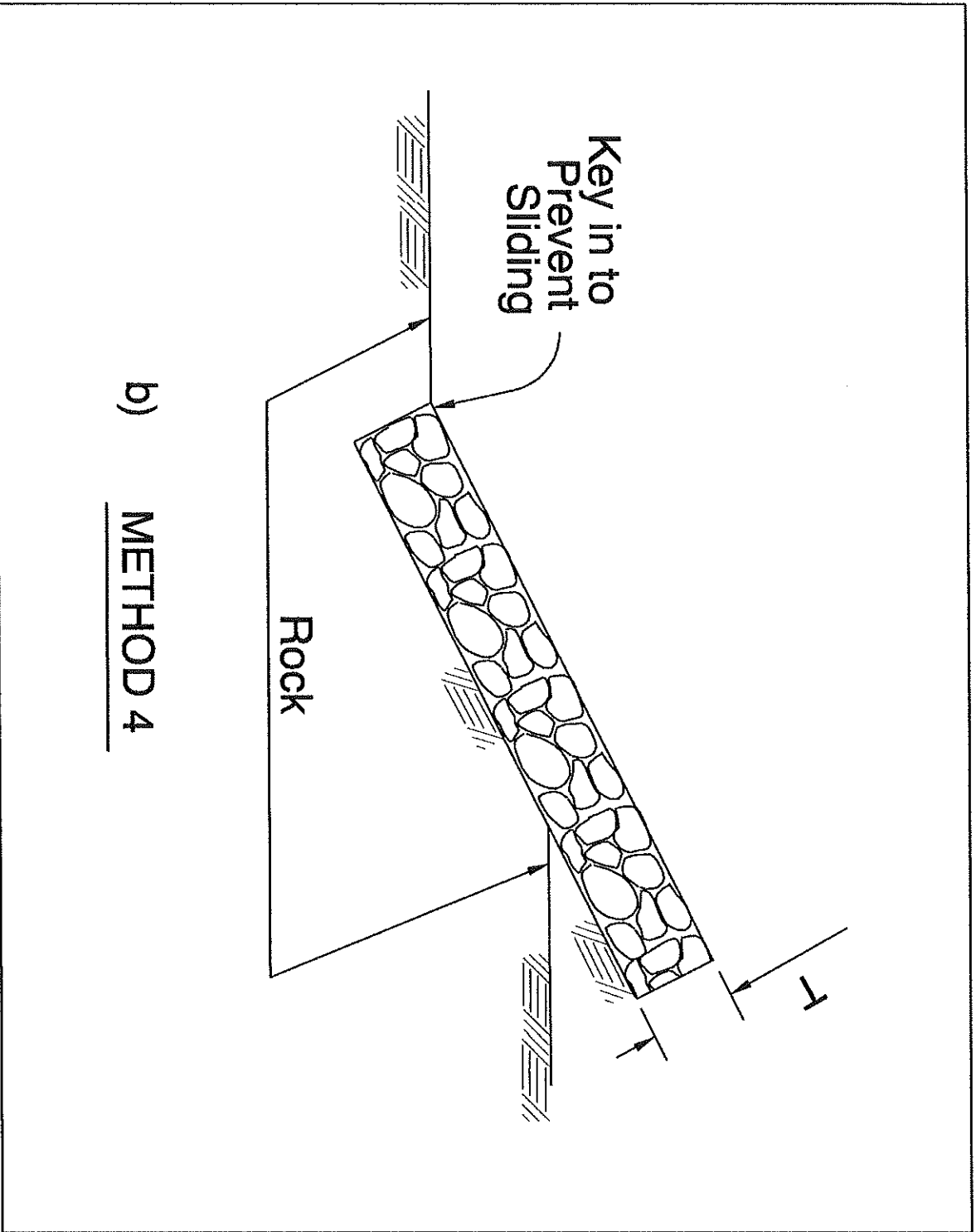


Figure 7. Downstream Bridge Cross Section for Proposed Conditions



b) METHOD 4

Figure 8. ODOT Riprap Blanket Section

Appendix B
Photographic Log

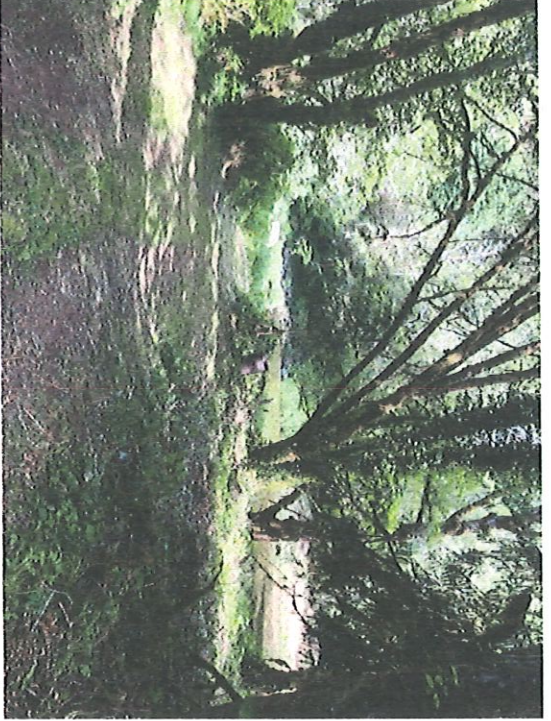


Photo 1. Looking at river from left overbank along access road

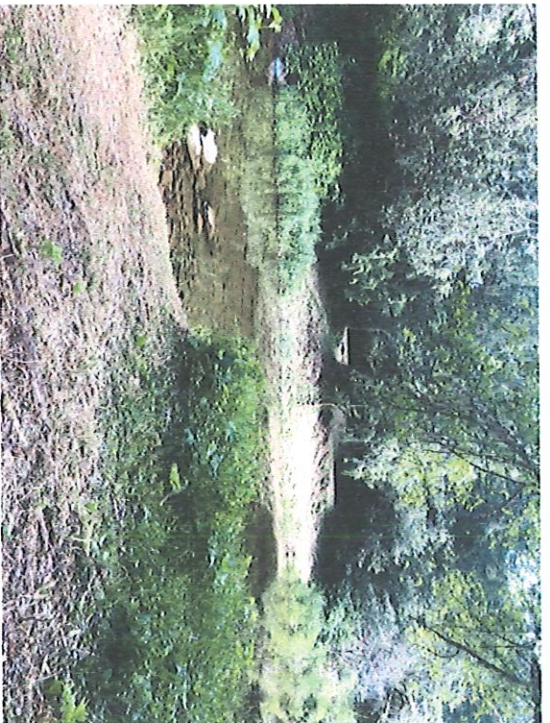


Photo 2. Looking left bank to right bank near access road

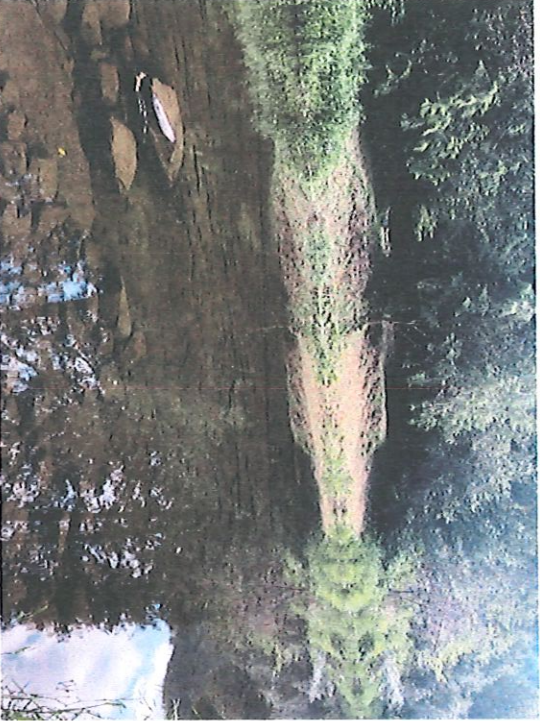


Photo 3. Bedrock channel near proposed bridge site (note boulder size material)



Photo 4. Looking upstream from access road

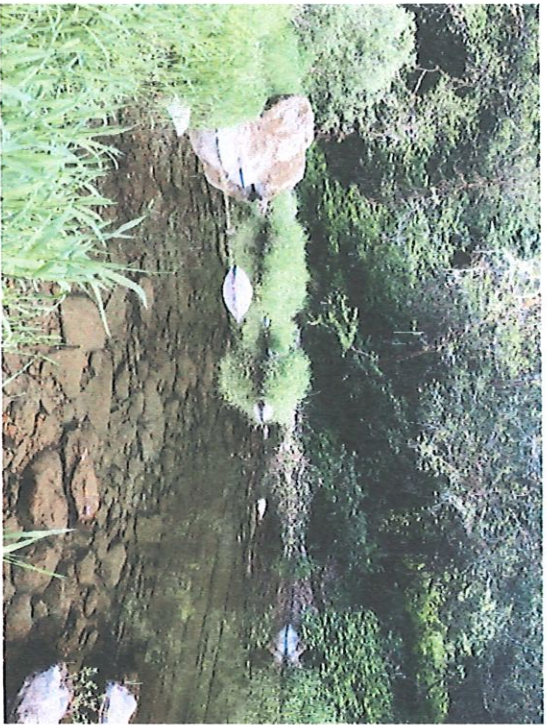


Photo 5. Looking downstream at riffle located downstream (RS 1612) of proposed bridge site

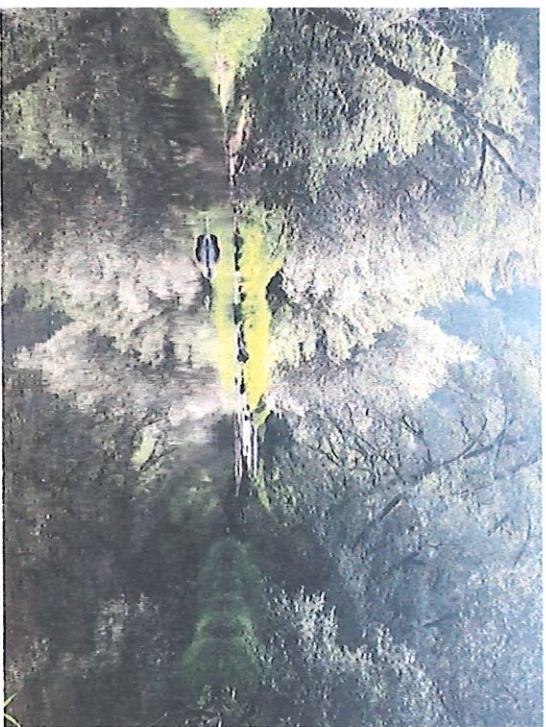


Photo 6. Looking upstream at riffles (RS 1940 and 2071)



Photo 7. Looking upstream at LOB near proposed bridge site



Photo 8. Looking left bank to right bank near proposed bridge site

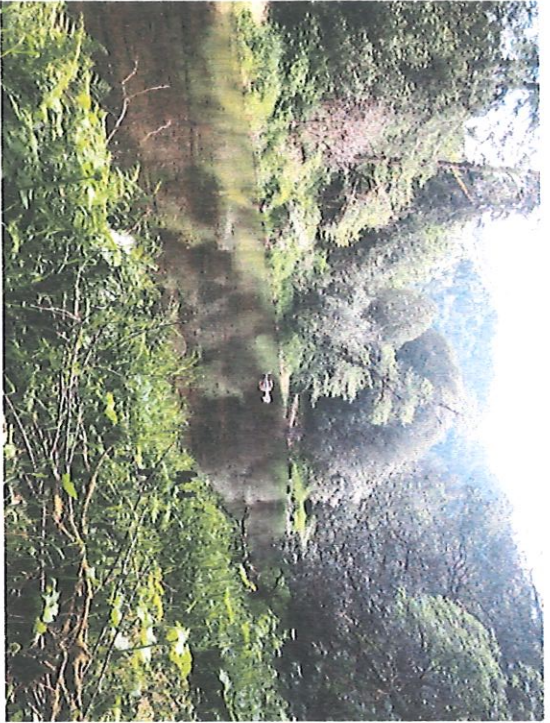


Photo 9. Looking upstream from proposed bridge site



Photo 10. Riffle acting as hydraulic control near RS 1612

Appendix C
HEC-RAS Output

Existing Conditions Flood Profiles

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Ch
Reach 1	4865	100-yr (FIS)	12783.00	63.12	79.89	72.10	80.63	0.001255	7.44	2674.56	345.72	0.33
Reach 1	4865	500-yr (FIS)	14986.00	63.12	81.43	73.00	82.18	0.001165	7.62	3218.11	358.72	0.32
Reach 1	4636	100-yr (FIS)	12783.00	62.06	78.66	72.26	80.17	0.002147	9.91	1883.57	171.67	0.43
Reach 1	4636	500-yr (FIS)	14986.00	62.06	80.11	73.32	81.70	0.002350	10.89	2136.75	248.54	0.46
Reach 1	4368	100-yr (FIS)	12783.00	61.51	78.46	71.65	79.55	0.002061	9.45	1974.84	214.63	0.42
Reach 1	4368	500-yr (FIS)	14986.00	61.51	79.78	72.60	81.00	0.002112	10.09	2291.98	266.01	0.43
Reach 1	4196	100-yr (FIS)	12783.00	60.70	78.14	70.51	79.22	0.001788	9.11	2102.21	307.09	0.39
Reach 1	4196	500-yr (FIS)	14986.00	60.70	79.59	71.44	80.63	0.001632	9.19	2572.78	339.23	0.38
Reach 1	4003	100-yr (FIS)	12783.00	60.36	77.68	71.12	78.85	0.001975	9.32	1982.86	310.71	0.41
Reach 1	4003	500-yr (FIS)	14986.00	60.36	79.24	72.09	80.31	0.001709	9.22	2476.30	324.49	0.39
Reach 1	3787	100-yr (FIS)	12783.00	60.78	77.27	70.88	78.42	0.001990	9.35	1997.63	295.44	0.41
Reach 1	3787	500-yr (FIS)	14986.00	60.78	78.89	71.84	79.94	0.001706	9.23	2499.54	321.54	0.39
Reach 1	3630	100-yr (FIS)	12783.00	59.66	77.04	69.92	78.10	0.001778	9.20	2134.32	283.02	0.39
Reach 1	3630	500-yr (FIS)	14986.00	59.66	78.66	70.84	79.67	0.001563	9.17	2619.21	306.02	0.37
Reach 1	3514	100-yr (FIS)	12783.00	59.50	76.68	70.13	77.87	0.001955	9.34	1876.22	256.70	0.41
Reach 1	3514	500-yr (FIS)	14986.00	59.50	78.34	71.21	78.46	0.001716	9.33	2323.75	283.39	0.39
Reach 1	3336	100-yr (FIS)	12783.00	59.62	75.74	69.79	77.42	0.002661	10.65	1425.84	118.78	0.47
Reach 1	3336	500-yr (FIS)	14986.00	59.62	77.07	70.82	79.00	0.002768	11.46	1592.17	131.24	0.49
Reach 1	3203	100-yr (FIS)	12783.00	59.78	75.03	70.37	76.98	0.003503	11.63	1343.33	118.06	0.54
Reach 1	3203	500-yr (FIS)	14986.00	59.78	76.34	71.46	78.55	0.003554	12.40	1501.79	122.78	0.55
Reach 1	3074	100-yr (FIS)	12783.00	59.53	74.30	70.45	76.47	0.004164	12.50	1348.30	134.97	0.58
Reach 1	3074	500-yr (FIS)	14986.00	59.53	75.60	71.55	78.03	0.004206	13.31	1533.29	146.20	0.59
Reach 1	2954	100-yr (FIS)	12783.00	59.39	74.25	69.40	75.87	0.003121	10.72	1583.49	170.14	0.50
Reach 1	2954	500-yr (FIS)	14986.00	59.39	75.65	70.35	77.39	0.003028	11.24	1826.54	180.44	0.50
Reach 1	2792	100-yr (FIS)	12783.00	58.34	74.32	67.35	75.31	0.001710	8.32	1930.11	200.48	0.38
Reach 1	2792	500-yr (FIS)	14986.00	58.34	75.75	68.23	76.83	0.001680	8.76	2287.79	308.42	0.38
Reach 1	2657	100-yr (FIS)	12783.00	58.08	73.40	67.90	74.96	0.002908	10.59	1732.15	227.43	0.49
Reach 1	2657	500-yr (FIS)	14986.00	58.08	74.87	68.82	76.49	0.002744	10.96	2157.07	337.06	0.48
Reach 1	2501	100-yr (FIS)	12783.00	57.12	73.04	67.04	74.51	0.002528	10.24	1674.25	221.78	0.46
Reach 1	2501	500-yr (FIS)	14986.00	57.12	74.46	68.03	76.08	0.002519	10.84	2060.32	308.90	0.47
Reach 1	2334	100-yr (FIS)	12783.00	56.39	71.66	68.00	73.88	0.004513	13.18	1600.29	219.70	0.61
Reach 1	2334	500-yr (FIS)	14986.00	56.39	73.20	69.10	75.48	0.004171	13.55	2013.71	298.30	0.60
Reach 1	2182	100-yr (FIS)	12783.00	56.28	69.99	67.70	72.97	0.008846	15.05	1231.30	138.50	0.73
Reach 1	2182	500-yr (FIS)	14986.00	56.28	71.36	68.65	74.60	0.008593	15.78	1433.03	237.64	0.73
Reach 1	2071	100-yr (FIS)	12783.00	52.79	70.07	66.09	72.12	0.004047	12.65	1533.35	148.50	0.56
Reach 1	2071	500-yr (FIS)	14986.00	52.79	71.53	67.52	73.73	0.003952	13.26	1753.78	221.09	0.56
Reach 1	1940	100-yr (FIS)	12783.00	53.07	70.28	63.62	71.49	0.002159	9.45	1869.42	174.17	0.41
Reach 1	1940	500-yr (FIS)	14986.00	53.07	71.76	64.78	73.10	0.002119	9.83	2127.61	191.12	0.42
Reach 1	1788	100-yr (FIS)	12783.00	52.67	70.32	61.82	71.13	0.001196	7.54	2183.77	190.69	0.32
Reach 1	1788	500-yr (FIS)	14986.00	52.67	71.83	62.72	72.73	0.001198	7.99	2474.42	193.13	0.33
Reach 1	1712	100-yr (FIS)	12783.00	51.95	69.96	62.15	71.00	0.001600	8.69	2099.00	214.10	0.37
Reach 1	1712	500-yr (FIS)	14986.00	51.95	71.49	63.05	72.61	0.001564	9.09	2434.59	236.25	0.37
Reach 1	1687	100-yr (FIS)	12783.00	52.29	69.69	62.80	70.94	0.001954	9.40	1859.06	195.63	0.41
Reach 1	1687	500-yr (FIS)	14986.00	52.29	71.19	63.86	72.54	0.001919	9.67	2165.26	224.42	0.41
Reach 1	1612	100-yr (FIS)	12783.00	53.48	69.58	63.38	70.77	0.002152	9.45	1932.50	234.63	0.42
Reach 1	1612	500-yr (FIS)	14986.00	53.48	71.06	64.39	72.38	0.002140	10.01	2233.22	263.80	0.43
Reach 1	1576	100-yr (FIS)	12783.00	52.30	68.80	63.32	70.60	0.004119	13.00	1794.32	174.83	0.58
Reach 1	1576	500-yr (FIS)	14986.00	52.30	70.07	65.32	72.19	0.004384	14.14	2026.67	209.84	0.61
Reach 1	1527	100-yr (FIS)	12783.00	50.80	68.16	62.96	70.35	0.005204	14.66	1668.82	166.81	0.64
Reach 1	1527	500-yr (FIS)	14986.00	50.80	69.37	65.58	71.92	0.005579	15.93	1878.30	192.14	0.67
Reach 1	1388	100-yr (FIS)	12783.00	50.80	68.04	62.99	69.62	0.003153	11.36	1854.94	199.55	0.51
Reach 1	1388	500-yr (FIS)	14986.00	50.80	69.43	64.52	71.10	0.003072	11.87	2137.58	207.98	0.51
Reach 1	1304	100-yr (FIS)	12783.00	51.08	67.31	63.82	69.28	0.004371	13.26	1775.49	193.74	0.60
Reach 1	1304	500-yr (FIS)	14986.00	51.08	68.72	64.26	70.77	0.004185	13.68	2055.86	205.07	0.60

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 1	1145	100-yr (FIS)	12783.00	53.09	66.68	63.58	68.55	0.004730	12.69	1664.63	188.49	0.61
Reach 1	1145	500-yr (FIS)	14986.00	53.09	68.15	64.67	70.08	0.004344	13.05	1951.20	201.77	0.60
Reach 1	1018	100-yr (FIS)	12783.00	51.29	66.66	61.76	67.89	0.002914	10.34	1992.78	189.02	0.49
Reach 1	1018	500-yr (FIS)	14986.00	51.29	68.06	62.59	69.48	0.002964	11.11	2278.17	218.43	0.50
Reach 1	695	100-yr (FIS)	12783.00	51.23	66.26	61.16	67.53	0.003230	10.48	1902.16	188.90	0.50
Reach 1	695	500-yr (FIS)	14986.00	51.23	67.50	62.03	69.09	0.003514	11.60	2169.46	245.30	0.53
Reach 1	764	100-yr (FIS)	12783.00	50.02	66.31	58.79	67.13	0.001388	7.75	2292.67	322.84	0.34
Reach 1	764	500-yr (FIS)	14986.00	50.02	67.72	59.62	68.61	0.001370	8.15	2607.52	337.19	0.34
Reach 1	634	100-yr (FIS)	12783.00	50.45	65.53	60.13	66.85	0.002536	9.61	1809.55	293.73	0.45
Reach 1	634	500-yr (FIS)	14986.00	50.45	67.00	61.02	68.34	0.002325	9.64	2188.31	335.30	0.44
Reach 1	506	100-yr (FIS)	12783.00	49.98	65.45	58.76	66.49	0.001821	8.42	1676.29	244.63	0.39
Reach 1	506	500-yr (FIS)	14986.00	49.98	66.69	59.83	68.01	0.001759	8.81	2166.78	326.06	0.39
Reach 1	311	100-yr (FIS)	12783.00	47.94	64.77	58.00	66.08	0.002053	9.54	1669.83	140.45	0.42
Reach 1	311	500-yr (FIS)	14986.00	47.94	66.08	59.02	67.59	0.002151	10.28	1862.24	152.73	0.43
Reach 1	183	100-yr (FIS)	12783.00	47.62	64.58	58.03	65.80	0.001978	9.54	2010.20	210.05	0.41
Reach 1	183	500-yr (FIS)	14986.00	47.62	65.96	59.00	67.27	0.001966	10.03	2325.21	231.12	0.42
Reach 1	24	100-yr (FIS)	12783.00	46.47	62.34	58.75	65.16	0.005006	14.28	1277.80	164.87	0.64
Reach 1	24	500-yr (FIS)	14986.00	46.47	63.68	59.95	66.62	0.005002	15.04	1511.53	191.33	0.65

Existing Conditions - Approach Section

Plan: ECM WF Millicoma Reach 1 RS: 1788 Profile: 100-yr (FIS)

E.G. Elev (ft)	71.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	70.32	Reach Len. (ft)	101.30	76.00	57.20
Crit W.S. (ft)	61.82	Flow Area (sq ft)	274.30	1552.31	357.16
E.G. Slope (ft/ft)	0.001196	Area (sq ft)	274.30	1552.31	357.16
Q Total (cfs)	12783.00	Flow (cfs)	566.68	11700.79	515.52
Top Width (ft)	190.69	Top Width (ft)	28.10	90.80	71.79
Vel Total (ft/s)	5.85	Avg. Vel. (ft/s)	2.07	7.54	1.44
Max Chl Dpth (ft)	17.44	Hydr. Depth (ft)	9.76	17.10	4.97
Conv. Total (cfs)	369704.0	Conv. (cfs)	16389.4	338404.9	14909.8
Length Wtd. (ft)	76.55	Wetted Per. (ft)	34.02	91.51	75.85
Min Ch El (ft)	52.87	Shear (lb/sq ft)	0.60	1.27	0.35
Alpha	1.53	Stream Power (lb/ft s)	1.24	9.54	0.51
FrcIn Loss (ft)	0.11	Cum Volume (acre-ft)	21.48	42.05	10.23
C & E Loss (ft)	0.02	Cum SA (acres)	3.96	2.76	1.52

Plan: ECM WF Millicoma Reach 1 RS: 1788 Profile: 500-yr (FIS)

E.G. Elev (ft)	72.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.90	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	71.83	Reach Len. (ft)	101.30	76.00	57.20
Crit W.S. (ft)	62.72	Flow Area (sq ft)	317.09	1690.01	467.33
E.G. Slope (ft/ft)	0.001198	Area (sq ft)	317.09	1690.01	467.33
Q Total (cfs)	14986.00	Flow (cfs)	700.50	13495.68	789.82
Top Width (ft)	193.13	Top Width (ft)	28.46	90.80	73.87
Vel Total (ft/s)	6.06	Avg. Vel. (ft/s)	2.21	7.99	1.69
Max Chl Dpth (ft)	18.96	Hydr. Depth (ft)	11.14	18.61	6.33
Conv. Total (cfs)	432955.2	Conv. (cfs)	20237.9	389898.8	22818.5
Length Wtd. (ft)	76.47	Wetted Per. (ft)	35.62	91.51	78.45
Min Ch El (ft)	52.87	Shear (lb/sq ft)	0.67	1.38	0.45
Alpha	1.58	Stream Power (lb/ft s)	1.47	11.03	0.75
FrcIn Loss (ft)	0.10	Cum Volume (acre-ft)	27.73	45.91	12.44
C & E Loss (ft)	0.02	Cum SA (acres)	4.83	2.76	1.68

Proposed Conditions Flood Profiles

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S Elev (ft)	Crit WS (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Cnt
Reach 1	4885	100-yr (FIS)	12783.00	63.12	79.89	72.10	80.63	0.001254	7.44	2875.26	345.73	0.33
Reach 1	4885	500-yr (FIS)	14986.00	63.12	81.52	73.00	82.26	0.001141	7.57	3249.13	359.46	0.32
Reach 1	4636	100-yr (FIS)	12783.00	62.06	78.86	72.28	80.17	0.002146	9.91	1863.98	171.90	0.43
Reach 1	4636	500-yr (FIS)	14986.00	62.06	80.23	73.32	81.78	0.002288	10.79	2166.04	250.22	0.45
Reach 1	4368	100-yr (FIS)	12783.00	61.51	78.47	71.65	79.55	0.002060	9.45	1975.43	214.70	0.42
Reach 1	4368	500-yr (FIS)	14986.00	61.51	79.92	72.60	81.10	0.002034	9.96	2329.25	266.03	0.42
Reach 1	4196	100-yr (FIS)	12783.00	60.70	78.14	70.51	79.22	0.001787	9.10	2103.21	307.18	0.39
Reach 1	4196	500-yr (FIS)	14986.00	60.70	79.74	71.44	80.74	0.001561	9.04	2625.35	340.88	0.37
Reach 1	4003	100-yr (FIS)	12783.00	60.36	77.69	71.12	78.85	0.001973	9.31	1934.16	310.74	0.41
Reach 1	4003	500-yr (FIS)	14986.00	60.36	79.41	72.09	80.43	0.001628	9.05	2531.79	325.88	0.38
Reach 1	3787	100-yr (FIS)	12783.00	60.78	77.28	70.88	78.43	0.001987	9.35	1999.06	295.52	0.41
Reach 1	3787	500-yr (FIS)	14986.00	60.78	79.08	71.84	80.08	0.001615	9.05	2581.39	323.50	0.38
Reach 1	3630	100-yr (FIS)	12783.00	59.66	77.05	69.92	78.11	0.001775	9.19	2135.80	283.10	0.39
Reach 1	3630	500-yr (FIS)	14986.00	59.66	78.88	70.84	79.83	0.001482	8.99	2681.77	310.52	0.37
Reach 1	3514	100-yr (FIS)	12783.00	59.50	76.68	70.13	77.88	0.001952	9.33	1877.70	256.84	0.41
Reach 1	3514	500-yr (FIS)	14986.00	59.50	78.55	71.21	79.83	0.001625	9.15	2385.98	288.61	0.38
Reach 1	3336	100-yr (FIS)	12783.00	59.62	75.75	69.79	77.42	0.002658	10.64	1426.57	118.83	0.47
Reach 1	3336	500-yr (FIS)	14986.00	59.62	77.32	70.82	79.19	0.002628	11.28	1625.44	133.57	0.48
Reach 1	3203	100-yr (FIS)	12783.00	59.78	75.04	70.37	78.99	0.003496	11.62	1344.27	118.09	0.54
Reach 1	3203	500-yr (FIS)	14986.00	59.78	76.85	71.48	78.77	0.003320	12.15	1540.19	124.09	0.53
Reach 1	3074	100-yr (FIS)	12783.00	59.53	74.31	70.45	76.47	0.004153	12.49	1349.73	135.20	0.58
Reach 1	3074	500-yr (FIS)	14986.00	59.53	76.02	71.55	78.29	0.003810	12.89	1595.50	148.32	0.57
Reach 1	2954	100-yr (FIS)	12783.00	59.39	74.26	69.40	75.88	0.003112	10.71	1585.47	170.19	0.50
Reach 1	2954	500-yr (FIS)	14986.00	59.39	76.07	70.35	77.71	0.002744	10.90	1907.20	204.60	0.48
Reach 1	2792	100-yr (FIS)	12783.00	58.34	74.33	67.35	75.32	0.001705	8.31	1932.42	201.05	0.38
Reach 1	2792	500-yr (FIS)	14986.00	58.34	76.19	68.23	77.20	0.001518	8.47	2425.27	318.24	0.36
Reach 1	2657	100-yr (FIS)	12783.00	58.08	73.42	67.90	74.97	0.002895	10.57	1735.89	227.58	0.49
Reach 1	2657	500-yr (FIS)	14986.00	58.08	75.49	68.82	76.90	0.002316	10.34	2371.31	350.91	0.45
Reach 1	2501	100-yr (FIS)	12783.00	57.12	73.05	67.04	74.52	0.002524	10.24	1677.37	223.79	0.46
Reach 1	2501	500-yr (FIS)	14986.00	57.12	75.12	68.03	76.55	0.002137	10.25	2272.62	325.91	0.43
Reach 1	2334	100-yr (FIS)	12783.00	56.39	71.79	68.00	73.98	0.004362	13.03	1629.32	224.54	0.60
Reach 1	2334	500-yr (FIS)	14986.00	56.39	74.29	69.10	76.09	0.003116	12.23	2359.85	333.50	0.52
Reach 1	2182	100-yr (FIS)	12783.00	56.28	70.24	67.70	73.10	0.008413	14.75	1265.71	142.13	0.71
Reach 1	2182	500-yr (FIS)	14986.00	56.28	72.42	68.65	75.37	0.005407	14.98	1734.28	282.48	0.67
Reach 1	2071	100-yr (FIS)	12783.00	52.79	70.33	66.09	72.29	0.003799	12.39	1571.78	152.39	0.55
Reach 1	2071	500-yr (FIS)	14986.00	52.79	72.74	67.52	74.59	0.003076	12.24	1945.53	242.18	0.50
Reach 1	1940	100-yr (FIS)	12783.00	53.07	70.53	63.82	71.69	0.002037	9.27	1912.02	177.18	0.40
Reach 1	1940	500-yr (FIS)	14986.00	53.07	72.97	64.78	74.08	0.001656	9.17	2335.98	206.74	0.37
Reach 1	1788	100-yr (FIS)	12783.00	52.87	70.57	61.82	71.35	0.001133	7.41	2231.50	191.00	0.31
Reach 1	1788	500-yr (FIS)	14986.00	52.87	73.02	62.72	73.79	0.000955	7.43	2705.57	198.39	0.29
Reach 1	1712	100-yr (FIS)	12783.00	51.95	70.12	62.15	71.17	0.001566	8.65	1811.00	215.28	0.37
Reach 1	1712	500-yr (FIS)	14986.00	51.95	72.53	63.17	73.61	0.001368	8.82	2092.44	246.82	0.35
Reach 1	1700		Bridge									
Reach 1	1687	100-yr (FIS)	12783.00	52.29	69.66	62.80	70.99	0.002042	9.60	1597.92	195.58	0.42
Reach 1	1687	500-yr (FIS)	14986.00	52.29	71.13	64.18	72.63	0.002077	10.24	1769.26	222.93	0.42
Reach 1	1612	100-yr (FIS)	12783.00	53.48	69.58	63.38	70.77	0.002152	9.45	1932.50	234.63	0.42
Reach 1	1612	500-yr (FIS)	14986.00	53.48	71.06	64.39	72.38	0.002140	10.01	2233.22	263.80	0.43
Reach 1	1575	100-yr (FIS)	12783.00	52.30	68.80	63.32	70.60	0.004119	13.00	1794.32	174.83	0.58
Reach 1	1575	500-yr (FIS)	14986.00	52.30	70.07	65.32	72.19	0.004384	14.14	2028.67	209.84	0.61
Reach 1	1527	100-yr (FIS)	12783.00	50.80	68.16	62.96	70.35	0.005204	14.66	1666.82	166.81	0.64
Reach 1	1527	500-yr (FIS)	14986.00	50.80	69.37	65.58	71.92	0.005579	15.93	1878.30	192.14	0.67
Reach 1	1388	100-yr (FIS)	12783.00	50.80	68.04	62.99	69.62	0.003153	11.38	1854.94	199.55	0.51
Reach 1	1388	500-yr (FIS)	14986.00	50.80	69.43	64.52	71.10	0.003072	11.87	2137.56	207.98	0.51

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 1	1304	100-yr (FIS)	12783.00	51.06	67.31	63.82	69.28	0.004371	13.36	1775.49	193.74	0.60
Reach 1	1304	500-yr (FIS)	14986.00	51.06	68.72	64.28	70.77	0.004185	13.88	2055.86	205.07	0.60
Reach 1	1145	100-yr (FIS)	12783.00	53.09	66.68	63.58	68.55	0.004730	12.69	1684.63	188.49	0.61
Reach 1	1145	500-yr (FIS)	14986.00	53.09	68.15	64.67	70.08	0.004344	13.05	1951.20	201.77	0.60
Reach 1	1018	100-yr (FIS)	12783.00	51.29	66.66	61.76	67.89	0.002914	10.34	1692.76	189.02	0.49
Reach 1	1018	500-yr (FIS)	14986.00	51.29	68.06	62.59	69.48	0.002964	11.11	2278.17	218.43	0.50
Reach 1	895	100-yr (FIS)	12783.00	51.23	66.28	61.16	67.53	0.003230	10.48	1902.16	188.90	0.50
Reach 1	895	500-yr (FIS)	14986.00	51.23	67.50	62.03	69.09	0.003514	11.60	2169.46	245.30	0.53
Reach 1	784	100-yr (FIS)	12783.00	50.02	66.31	58.78	67.13	0.001388	7.75	2292.67	322.84	0.34
Reach 1	784	500-yr (FIS)	14986.00	50.02	67.72	59.82	68.61	0.001370	8.15	2607.52	337.19	0.34
Reach 1	834	100-yr (FIS)	12783.00	50.45	65.53	60.13	66.85	0.002536	9.61	1809.55	293.73	0.45
Reach 1	834	500-yr (FIS)	14986.00	50.45	67.00	61.02	68.34	0.002325	9.84	2168.31	335.30	0.44
Reach 1	508	100-yr (FIS)	12783.00	49.98	65.45	58.76	66.48	0.001821	8.42	1876.29	244.63	0.39
Reach 1	508	500-yr (FIS)	14986.00	49.98	66.89	59.63	68.01	0.001758	8.81	2166.78	328.06	0.39
Reach 1	311	100-yr (FIS)	12783.00	47.94	64.77	58.00	66.08	0.002053	9.54	1669.83	140.45	0.42
Reach 1	311	500-yr (FIS)	14986.00	47.94	66.08	59.02	67.58	0.002151	10.28	1862.24	152.73	0.43
Reach 1	183	100-yr (FIS)	12783.00	47.62	64.58	58.03	65.80	0.001978	9.54	2010.20	219.05	0.41
Reach 1	183	500-yr (FIS)	14986.00	47.62	65.98	59.00	67.27	0.001966	10.03	2325.21	231.12	0.42
Reach 1	24	100-yr (FIS)	12783.00	46.47	62.34	58.75	65.16	0.005006	14.28	1277.80	184.87	0.64
Reach 1	24	500-yr (FIS)	14986.00	46.47	63.58	59.95	66.62	0.005002	15.04	1511.53	191.33	0.63

Proposed Conditions - Approach Section

Plan: PCM WF Millicoma Reach 1 RS: 1788 Profile: 100-yr (FIS)

E.G. Elev (ft)	71.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.78	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	70.57	Reach Len. (ft)	101.30	76.00	57.20
Crit W.S. (ft)	61.82	Flow Area (sq ft)	281.33	1575.02	375.15
E.G. Slope (ft/ft)	0.001133	Area (sq ft)	281.33	1575.02	375.15
Q Total (cfs)	12783.00	Flow (cfs)	572.50	11667.66	542.84
Top Width (ft)	191.00	Top Width (ft)	28.13	90.80	72.06
Vel Total (ft/s)	5.73	Avg. Vel. (ft/s)	2.03	7.41	1.45
Max Chl Dpth (ft)	17.69	Hydr. Depth (ft)	10.00	17.35	5.21
Conv. Total (cfs)	379838.5	Conv. (cfs)	17011.4	346696.8	16130.2
Length Wtd. (ft)	76.71	Wetted Per. (ft)	34.27	91.51	76.22
Min Ch El (ft)	52.87	Shear (lb/sq ft)	0.58	1.22	0.35
Alpha	1.53	Stream Power (lb/ft s)	1.18	9.02	0.50
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	21.43	42.08	10.16
C & E Loss (ft)	0.08	Cum SA (acres)	3.94	2.76	1.50

Plan: PCM WF Millicoma Reach 1 RS: 1788 Profile: 500-yr (FIS)

E.G. Elev (ft)	73.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.77	Wt. n-Val.	0.100	0.045	0.100
W.S. Elev (ft)	73.02	Reach Len. (ft)	101.30	76.00	57.20
Crit W.S. (ft)	62.72	Flow Area (sq ft)	351.51	1797.45	556.60
E.G. Slope (ft/ft)	0.000955	Area (sq ft)	351.51	1797.45	556.60
Q Total (cfs)	14986.00	Flow (cfs)	719.67	13354.84	911.49
Top Width (ft)	198.39	Top Width (ft)	29.72	90.80	77.87
Vel Total (ft/s)	5.54	Avg. Vel. (ft/s)	2.05	7.43	1.64
Max Chl Dpth (ft)	20.14	Hydr. Depth (ft)	11.83	19.80	7.15
Conv. Total (cfs)	484857.3	Conv. (cfs)	23284.2	432082.6	29490.5
Length Wtd. (ft)	76.60	Wetted Per. (ft)	37.35	91.51	82.67
Min Ch El (ft)	52.87	Shear (lb/sq ft)	0.56	1.17	0.40
Alpha	1.62	Stream Power (lb/ft s)	1.15	8.70	0.66
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	27.77	46.07	12.45
C & E Loss (ft)	0.09	Cum SA (acres)	4.81	2.76	1.66



NOTIFICATION OF OPERATIONS/PERMIT TO OPERATE POWER-DRIVEN MACHINERY (NOAP)



Notification Number: 2022-740-09621C
Operation Name: Little West Fork

This NOAP includes the following for the lands described in the NOAP:

- < The notifier has given notice to the State Forester that an operation will be conducted.
- < The Oregon Department of Forestry or local Forest Protective Association has issued a permit to use fire or operate power-driven machinery.
- < The notifier has given notice to the State Forester and the Department of Revenue of the intent to harvest timber.

Person Submitting the NOAP: Robert Little This NOAP was CONTINUED on 12/19/2022
Date NOAP Submitted: August 8, 2022 and will expire on 12/31/2023
Report Generated: July 21, 2023

Waiting Period

You must wait at least 15 days after successful submittal of this NOAP before starting the activities in the NOAP (see OAR 629-605-0150(1)). You may ask the Stewardship Forester to waive this 15-day waiting period, **but you must wait the full 15 days unless the Stewardship Forester notifies you that you may start sooner.**

Oregon Department of Forestry Contact Info

Coos Bay
63612 Fifth Road
Coos Bay, Oregon 97420
Phone: (541) 267-4136
Stewardship Forester: Jennifer Ward
Email: jennifer.d.ward@oregon.gov

Operator's Fire Emergency Contact

Contact Name: Robert Little
Phone: (425) 281-5823

Landowner(s)

Robert Little
93594 Easy Ln
Coos Bay, Oregon 97420
(425) 281-5823

Notice to Landowner(s)

Reforestation may be required after timber harvesting. The Oregon Department of Forestry may conduct on-site inspections for compliance with forest practice and fire protection laws. Land use conversion to non-forest use is subject to other state and local regulations, which may affect use or development of a site.

Timber Owner

Robert Little
93594 Easy Ln
Coos Bay, Oregon 97420
(425) 281-5823

Notice to Timber Owner

If timber is harvested, the party owning the timber at the point it is first measured is responsible for payment of Oregon timber taxes.

Written Plans

A Written Plan (in addition to this NOAP) is required before operation activities can begin near the protected resources listed with the Unit information or Site Conditions below or otherwise described to you by the Stewardship Forester ([OAR 629-605-0170](http://www.oregon.gov/DFR/Pages/629-605-0170) (2), (3), and (5)). The Written Plan must describe in detail how the resource(s) will be protected during the operation. There is a waiting period for Written Plans that is separate from the notification waiting period. Contact your Stewardship Forester for more information.

Formal Comments from Oregon Department of Forestry

Jennifer Ward on 5/25/2023

Required Statutory Written Plan was received on 5/15/2023; comment period is in effect.

Jennifer Ward on 8/10/2022

A Statutory Written Plan is required prior to operations within 100' of West Fork Millicoma River Large Type F stream.

Site Conditions (reported by the Notifier)

Stream within 100 feet of area.

Notices

Submitting this Notification of operations on lands described in the NOAP constitutes consent for Department staff to access the property to ensure compliance with state law and rules governing forest practices through on-site inspections. The landowner must notify the stewardship forester to withdraw this consent.

Permission from Landowner and Timber Owner Required for Operators, purchasers, contractors, general public: Submitting this notification does *not* give permission for operators, purchasers, contractors, or the general public to enter someone else's land or remove forest products. Anyone doing so must first obtain permission from the landowner and timber owner.

Pesticide Use: Pesticide users must follow all pesticide product label requirements, including any that prohibit applications near or into streams or other water bodies! Pesticide users must be sure the label that comes with the pesticide product allows the planned use! Contact the Oregon Department of Agriculture [here](#) or at 503-986-4635 for information on allowed uses of pesticide products.

Operations Near Utility Lines: If you are conducting timber harvesting or road construction within 100 feet of overhead utility lines contact the local utility in accordance with ORS 757.805 - Oregon's Overhead Safety Act and OAR 437-007-0230 - Power Line Safeguards. Identification tags are located on each pole.

Call the Oregon Utility Notification Center at 811 at least 2 business days before starting timber harvesting, road construction, or any other activities involving excavation that may affect an underground utility line. The Center will coordinate with the appropriate utility companies to locate underground utility lines that may be affected by your activities.

Using Water for Pesticides or Slash Burning: If you plan to use on-site water (water from a stream, for example) to mix pesticides or for slash burning, you must provide a copy of this NOAP to the local offices of the Oregon Water Resources Department and the Oregon Department of Fish and Wildlife (see ORS 537.141).

Registrants & Subscribers: There may be registrants and/or subscribers who receive this Notification. See the Notification Summary page within the E-Notification system or contact ODF for more details.

NOAP Changes: The notifier must inform the Oregon Department of Forestry of any changes in a NOAP before the activity takes place. A new NOAP may be required.

Unit 1 of 2: Little

Coos County(s)

T24S R11W Sec30

Regulated Use Area: CS-2

Operator:

Joey Walczak
Farline Bridge, Inc.
PO Box 149
Stayton, Oregon 97383
(503) 769-3014

Activity: Constructing Type F stream crossing

Start: 9/1/2022 **End:** 12/31/2023

Remarks: Activity will continue until approximately October 1, 2023, and may consist of installing a temporary bridge for construction

Method(s): Excavator,
Dozer, Crane

Quantity: 2.00 BRidges

Resources on or near this Unit

Statutory Written Plan required within 100 feet of

Unknown: Unknown - Type F Stream

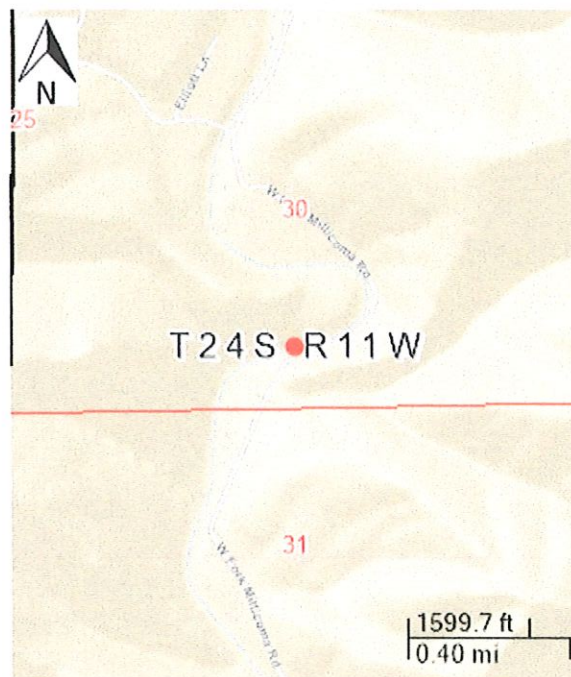
Statutory Written Plan required within 300 feet of

NS Owl

Notes:

1. A statutory written plan is required for operations within *300 feet* of Estuarine or Marine Wetlands, not 100 feet as may be shown above.
2. Contact your Stewardship Forester about streams not shown on the map.

Unit Map: Little



Unit 2 of 2: Rd. Construction

134.7 feet Coos County(s)

T24S R11W Sec30

Regulated Use Area: CS-2

Resources on or near this Unit

Statutory Written Plan required within 100 feet of

Statutory Written Plan required within 300 feet of

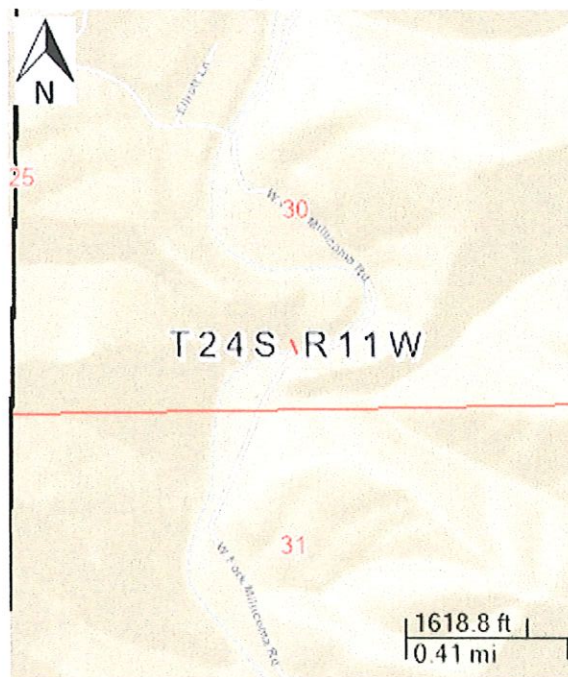
Unknown: Unknown - Type F Stream

NS Owl

Notes:

- 1. A statutory written plan is required for operations within *300 feet* of Estuarine or Marine Wetlands, not 100 feet as may be shown above.
- 2. Contact your Stewardship Forester about streams not shown on the map.

Unit Map: Rd. Construction





NOTIFICATION OF OPERATIONS/PERMIT TO OPERATE POWER-DRIVEN MACHINERY (NOAP)



Notification Number: 2022-740-09664C
Operation Name: Little Millicoma Access

This NOAP includes the following for the lands described in the NOAP:

- < The notifier has given notice to the State Forester that an operation will be conducted.
- < The Oregon Department of Forestry or local Forest Protective Association has issued a permit to use fire or operate power-driven machinery.

Person Submitting the NOAP: Robert Little This NOAP was CONTINUED on 12/19/2022 and will expire on 12/31/2023
Date NOAP Submitted: August 9, 2022
Report Generated: July 21, 2023

Notifier Comment

The landowner, Mr. Miller, has stated that he just wants the trees removed after construction is completed. Therefore, there is no intent to sell the few trees that need to be cleared in the work area. As such, the responsible party/owner of the bridge has been labeled as the timber owner in this notice.

Waiting Period

You must wait at least 15 days after successful submittal of this NOAP before starting the activities in the NOAP (see OAR 629-605-0150(1)). You may ask the Stewardship Forester to waive this 15-day waiting period, *but you must wait the full 15 days unless the Stewardship Forester notifies you that you may start sooner.*

Oregon Department of Forestry Contact Info

Coos Bay
63612 Fifth Road
Coos Bay, Oregon 97420
Phone: (541) 267-4136
Stewardship Forester: Jennifer Ward
Email: jennifer.d.ward@oregon.gov

Operator's Fire Emergency Contact

Contact Name: Robert Little
Phone: 425-281-5823

Landowner(s)

Shane Miller
67530 West Fork Millicoma Rd
Coos Bay, Oregon 97420
541-266-7393

Notice to Landowner(s)

Reforestation may be required after timber harvesting. The Oregon Department of Forestry may conduct on-site inspections for compliance with forest practice and fire protection laws. Land use conversion to non-forest use is subject to other state and local regulations, which may affect use or development of a site.

Timber Owner

Robert Little
93594 Easy Ln
Coos Bay, Oregon 97420
(425) 281-5823

Notice to Timber Owner

If timber is harvested, the party owning the timber at the point it is first measured is responsible for payment of Oregon timber taxes.

Written Plans

A Written Plan (in addition to this NOAP) is required before operation activities can begin near the protected resources listed with the Unit information or Site Conditions below or otherwise described to you by the Stewardship Forester ([OAR 629-605-0170](#) (2), (3), and (5)). The Written Plan must describe in detail how the resource(s) will be protected during the operation. There is a waiting period for Written Plans that is separate from the notification waiting period. Contact your Stewardship Forester for more information.

Formal Comments from Oregon Department of Forestry

Jennifer Ward on 5/25/2023

Required Statutory Written Plan was received on 5/15/2023; comment period is in effect.

Jennifer Ward on 8/10/2022

A Statutory Written Plan is required prior to operations within 100' of West Fork Millicoma River Large Type F stream.

Site Conditions (reported by the Notifier)

Stream within 100 feet of area.

Notices

Submitting this Notification of operations on lands described in the NOAP constitutes consent for Department staff to access the property to ensure compliance with state law and rules governing forest practices through on-site inspections. The landowner must notify the stewardship forester to withdraw this consent.

Permission from Landowner and Timber Owner Required for Operators, purchasers, contractors, general public:

Submitting this notification does *not* give permission for operators, purchasers, contractors, or the general public to enter someone else's land or remove forest products. Anyone doing so must first obtain permission from the landowner and timber owner.

Pesticide Use: Pesticide users must follow all pesticide product label requirements, including any that prohibit applications near or into streams or other water bodies! Pesticide users must be sure the label that comes with the pesticide product allows the planned use! Contact the Oregon Department of Agriculture [here](#) or at 503-986-4635 for information on allowed uses of pesticide products.

Operations Near Utility Lines: If you are conducting timber harvesting or road construction within 100 feet of overhead utility lines contact the local utility in accordance with ORS 757.805 - Oregon's Overhead Safety Act and OAR 437-007-0230 - Power Line Safeguards. Identification tags are located on each pole.

Call the Oregon Utility Notification Center at 811 at least 2 business days before starting timber harvesting, road construction, or any other activities involving excavation that may affect an underground utility line. The Center will coordinate with the appropriate utility companies to locate underground utility lines that may be affected by your activities.

Using Water for Pesticides or Slash Burning: If you plan to use on-site water (water from a stream, for example) to mix pesticides or for slash burning, you must provide a copy of this NOAP to the local offices of the Oregon Water Resources Department and the Oregon Department of Fish and Wildlife (see ORS 537.141).

Registrants & Subscribers: There may be registrants and/or subscribers who receive this Notification. See the Notification Summary page within the E-Notification system or contact ODF for more details.

NOAP Changes: The notifier must inform the Oregon Department of Forestry of any changes in a NOAP before the activity takes place. A new NOAP may be required.

Unit 1 of 1: Easement and Work Area

Coos County(s)

T24S R11W Sec30

Regulated Use Area: CS-2

Operator:
 Joey Walczak
 Farline Bridge, Inc.
 PO Box 149
 Stayton, Oregon 97383
 (503) 769-3014

Activity: Constructing Type F stream crossing
Start: 9/1/2022 **End:** 12/31/2023
Remarks: Temporary bridge to be used during construction

Method(s): Excavator, Dozer, Crane
Quantity: 2.00 Bridges

Resources on or near this Unit

Statutory Written Plan required within 100 feet of

Statutory Written Plan required within 300 feet of

Unknown: Unknown - Type F Stream

NS Owl

Unknown: Unknown - Type F Stream

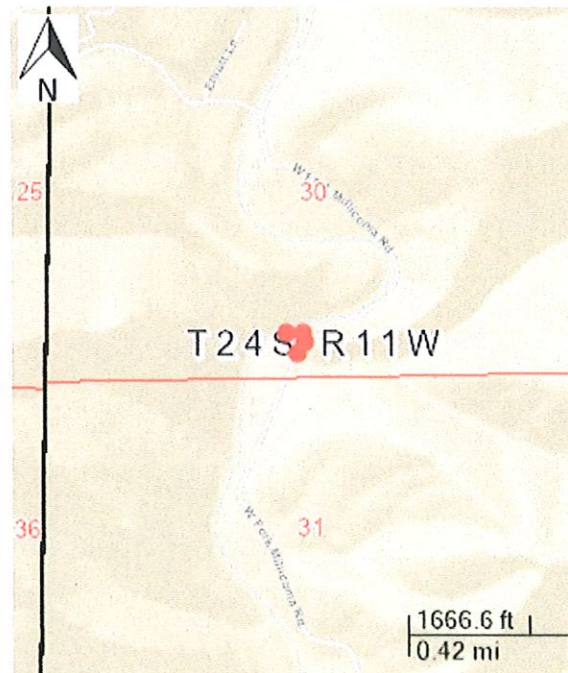
Unknown: Unknown - Type F Stream

Wetlands: Freshwater Emergent Wetland

Notes:

1. A statutory written plan is required for operations within 300 feet of Estuarine or Marine Wetlands, not 100 feet as may be shown above.
2. Contact your Stewardship Forester about streams not shown on the map.

Unit Map: Easement and Work Area



6/12/23

PERMIT

No: 23-067

BEFORE THE ROADMASTER OF COOS COUNTY

This permit is issued to Bob Little Phone 425-281-5823
for the placement and/or construction of the following facility Access upon the West Fork
milliloma Rd County Road No. 47, at the following location: Approx 2.2 miles

All work shall be in strict conformity with all terms of this permit, with any exhibits attached hereto, and with Article Four, Division One of the Coos County Code and ORS 374.305 to 374.340.

TS 245 R 11W S 30C TL: 700

GENERAL PROVISIONS

Permit Holder shall be solely responsible for any and all damages of or destruction to any road, road structure, utility, cable, pipe, waterline, ditch or culvert arising out of or incident to this permit. Permit Holder shall repair or reimburse the County or Utility for any and all costs of repair, restoring or replacing damaged or destroyed property.

Permit Holder shall indemnify, hold harmless, and defend Coos County, its elected officials, officers and employees from any liability, claim, damage, loss and/or expense, including, but not limited to, reasonable attorneys fees, arising out of or resulting from the performance of or failure to perform the obligations of this Permit by Permit Holder, its employees, agents and subcontractors.

Permit Holder shall supply all materials and labor at own expense.

Permit Holder shall provide adequate warning and traffic control in a manner to insure public safety and cause minimum inconvenience.

A minimum of two-lane traffic will be maintained at all times and control of traffic will be in accordance with the current provisions in the Manual on Uniform Traffic Control Devices for Streets and Highways.

This permit authorizes no work other than that specifically mentioned.

SPECIAL PROVISIONS

- // Permit Holder shall compact backfill material to 95% of original density and maintain finish conformation same as original for 90 days after completion of construction replacing any rock and/or asphalt to its original depth.
- // Permit Holder shall supply the county with a performance bond or cash in the amount of _____ to be refunded 90 days after completion of the project if at that time an inspection is made and all measures in this permit are found to have been complied with.
- // Permit Holder shall install a minimum of _____ culvert located as directed by county.
- // Permit Holder shall not fell trees within the traveled portion of the roadway and shall clear the right-of-way of any slash or debris caused from the felling of said trees.
- // This permit is issued pursuant to ORS 368.942 and is for the explicit purpose of allowing the construction and maintenance of a tourism sign within the county right-of-way. This sign shall in no way impede vision or cause an unsafe traffic condition Permit is revocable for non-maintenance of sign or signs for which permit holder is responsible.
- // Permit Holder shall construct driveway to meet at right angles with county road and shall construct driveway to be at same level as county road for a distance of 20 feet more or less.
- // This permit is revocable at any time when area is determined to be needed for road purposes.
- // Permit Holder or his contractor shall notify the Coos County Road Dept., at 396-7660, forty-eight (48) hours prior to commencing work and after completing work covered by this permit.
- // All construction operations will be performed off limits of the highway travel way and shoulders.
- // Additional Special Provisions attached. *Traffic control must meet MUTCD spec. see attached details*

I accept and agree to the conditions herein: _____
Permittee

6/26/23
Date

This permit shall be void unless the work herein contemplated shall have been completed before: 9/15/23 10-1-23

[Signature]
Access Foreman

6/26/23
6/27/23 JJ
Date

ISSUED BY AGENT OF BOARD OF COMMISSIONERS

Roadmaster

Date