



*Land of Cheese, Trees and Ocean Breeze*

## Floodway Development Permit #851-22-000239-PLNG: Whitaker

*NOTICE TO MORTGAGEE, LIENHOLDER, VENDOR OR SELLER:  
ORS 215 REQUIRES THAT IF YOU RECEIVE THIS NOTICE,  
IT MUST BE PROMPTLY FORWARDED TO THE PURCHASER*

### NOTICE OF ADMINISTRATIVE REVIEW Date of Notice: August 11, 2022

Notice is hereby given that the Tillamook County Department of Community Development is considering the following:

**#851-22-000239-PLNG:** A review of a Floodway Development Permit for an addition to an existing single-family dwelling near the Nestucca River and within the Nestucca River Floodway. The subject property is accessed from via Brooten Road, a County road, is located at 34080 Brooten Road and is designated as Tax Lot 5703, of Section 19AC of Township 4 South, Range 10 West of the Willamette Meridian, Tillamook County, Oregon. The property is located in the Pacific City/Woods Low Density Residential (PCW-R1) Zone and Flood Hazard Overlay Zone. The applicant and property owner is Debbie Whitaker.

Written comments received by the Department of Community Development prior to 4:00p.m. on August 25, 2022, will be considered in rendering a decision. Comments should address the criteria upon which the Department must base its decision. A decision will be rendered no sooner than the next business day, August 26, 2022.

Notice of the application, a map of the subject area, and the applicable criteria are being mailed to all property owners within 250 feet of the exterior boundaries of the subject parcel for which an application has been made and other appropriate agencies at least 14 days prior to this Department rendering a decision on the request.

A copy of the application, along with a map of the request area and the applicable criteria for review are available for inspection on the Tillamook County Department of Community Development website: <https://www.co.tillamook.or.us/commdev/landuseapps> and is also available for inspection at the Department of Community Development office located at 1510-B Third Street, Tillamook, Oregon 97141.

If you have any questions about this application, please call the Department of Community Development at 503-842-3408 Ext. 3301 or [mjenck@co.tillamook.or.us](mailto:mjenck@co.tillamook.or.us)

Sincerely,

Melissa Jenck, CFM, Senior Planner

A handwritten signature in blue ink that reads "Sarah Absher". The signature is fluid and cursive.

Sarah Absher, CFM, Director

Enc. Applicable Ordinance Criteria, Maps

## REVIEW CRITERIA

### ARTICLE III – ZONE REGULATIONS

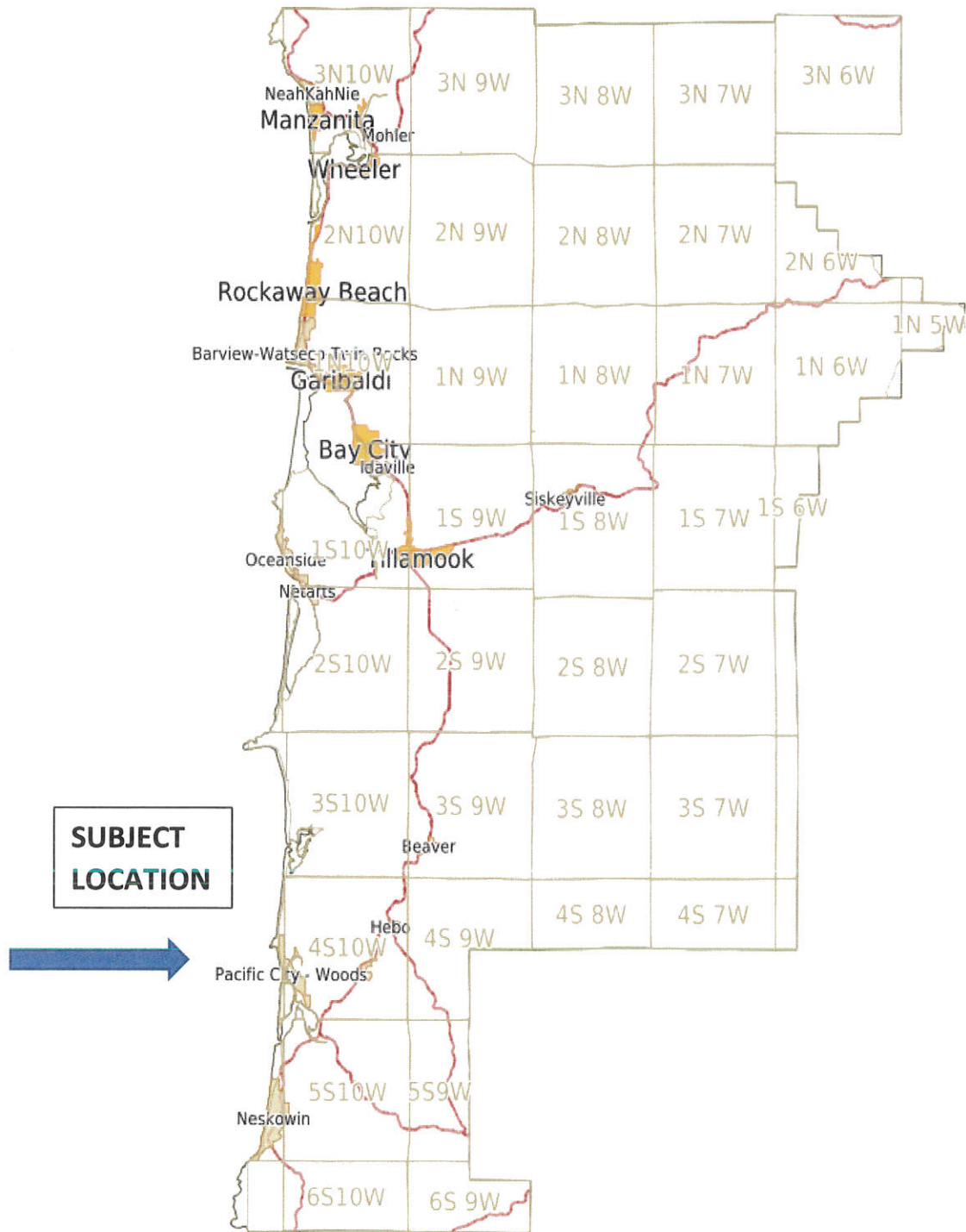
#### **TCLUO SECTION 3.510: FLOOD HAZARD OVERLAY ZONE**

- (1) The fill is not within a Coastal High Hazard Area.
- (2) Fill placed within the Regulatory Floodway shall not result in any increase in flood levels during the occurrence of the base flood discharge.
- (3) The fill is necessary for an approved use on the property.
- (4) The fill is the minimum amount necessary to achieve the approved use.
- (5) No feasible alternative upland locations exist on the property.
- (6) The fill does not impede or alter drainage or the flow of floodwaters.
- (7) If the proposal is for a new critical facility, no feasible alternative site is available.
- (8) For creation of new, and modification of, Flood Refuge Platforms, the following apply, in addition to (14)(a)(1-4) and (b)(1-5):
  - i. The fill is not within a floodway, wetland, riparian area or other sensitive area regulated by the Tillamook County Land Use Ordinance.
  - ii. The property is actively used for livestock and/or farm purposes,
  - iii. Maximum platform size = 10 sq ft of platform surface per acre of pasture in use, or 30 sq ft per animal, with a 10-ft wide buffer around the outside of the platform,
  - iv. Platform surface shall be at least 1 ft above base flood elevation,
  - v. Slope of fill shall be no steeper than 1.5 horizontal to 1 vertical,
  - vi. Slope shall be constructed and/or fenced in a manner so as to prevent and avoid erosion.

Conditions of approval may require that if the fill is found to not meet criterion (5), the fill shall be removed or, where reasonable and practical, appropriate mitigation measures shall be required of the property owner. Such measures shall be verified by a certified engineer or hydrologist that the mitigation measures will not result in a net rise in floodwaters and be in coordination with applicable state, federal and local agencies, including the Oregon Department of Fish and Wildlife.

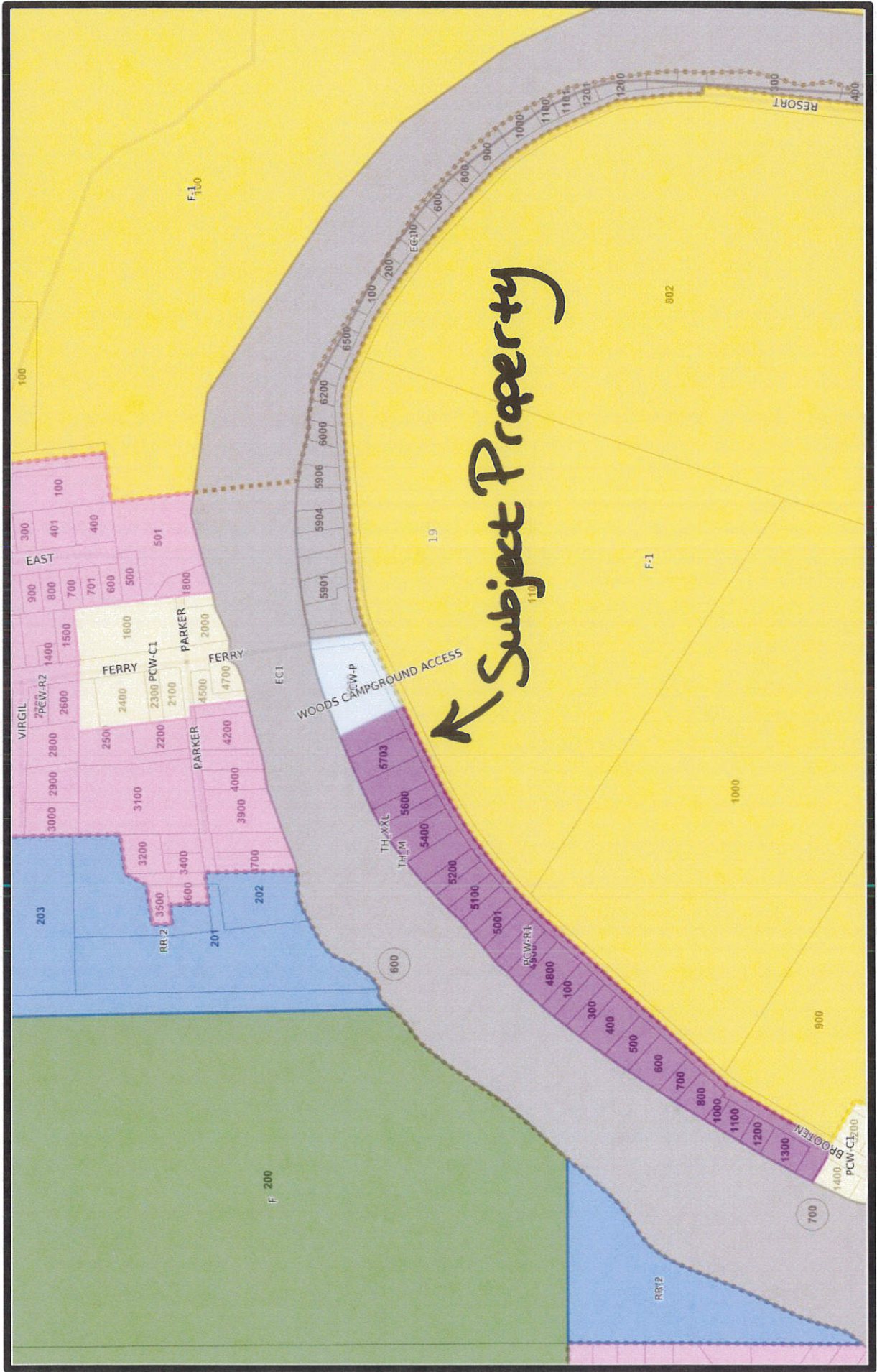
# EXHIBIT A

# VICINITY MAP



#851-22-00239-PLNG: WHITAKER

# Map



# EXHIBIT B



Tillamook County Department of Community Development  
 1510-B Third Street, Tillamook, OR 97141 | Tel: 503-842-3408 Fax: 503-842-1819  
 www.co.tillamook.or.us

### PLANNING APPLICATION

OFFICE USE ONLY	
Date Stamp	
JUN 09 2022	
Email	
<input type="checkbox"/> Approved	<input type="checkbox"/> Denied
Received by:	
Receipt #:	
Fees: 983.00	
Permit No:	
851-22-000239 PLNG	

**Applicant**  (Check Box if Same as Property Owner)  
 Name: Debbie Whitaker Phone: 503 709 3334  
 Address: 34080 Broomfield Rd.  
 City: Clatskanie State: OR Zip: 97112  
 Email: dwhitakerco24@gmail.com

**Property Owner**  
 Name: Same Phone: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
 Email: \_\_\_\_\_

Request: addition

- | Type II  | Type III   | Type IV   |
|--|--|---|
| <input type="checkbox"/> Farm/Forest Review                                | <input type="checkbox"/> Appeal of Director's Decision           | <input type="checkbox"/> Appeal of Planning Commission Decision |
| <input type="checkbox"/> Conditional Use Review                            | <input type="checkbox"/> Extension of Time                       | <input type="checkbox"/> Ordinance Amendment                    |
| <input type="checkbox"/> Variance  | <input type="checkbox"/> Detailed Hazard Report                  | <input type="checkbox"/> Large-Scale Zoning Map Amendment       |
| <input type="checkbox"/> Exception to Resource or Riparian Setback         | <input type="checkbox"/> Conditional Use (As deemed by Director) | <input type="checkbox"/> Plan and/or Code Text Amendment        |
| <input type="checkbox"/> Nonconforming Review (Major or Minor)             | <input type="checkbox"/> Ordinance Amendment                     |   |
| <input type="checkbox"/> Development Permit Review for Estuary Development | <input type="checkbox"/> Map Amendment                           |   |
| <input type="checkbox"/> Non-farm dwelling in Farm Zone                    | <input type="checkbox"/> Goal Exception                          |   |
| <input type="checkbox"/> Fore-dune Grading Permit Review                   |  |   |
| <input type="checkbox"/> Neskowin Coastal Hazards Area                     |  |   |

**Location:**  
 Site Address: \_\_\_\_\_  
 Map Number: Taylor 5703 45-10-19 AC lot 9 a portion of lot 709  
Township Range Section Tax Lot(s)

Clerk's Instrument #: \_\_\_\_\_

**Authorization**

This permit application does not assure permit approval. The applicant and/or property owner shall be responsible for obtaining any other necessary federal, state, and local permits. The applicant verifies that the information submitted is complete, accurate, and consistent with other information submitted with this application.

Debbie Whitaker  
 Property Owner Signature (Required) 4-5-22  
Date

Applicant Signature Date



Tillamook County Department of Community Development  
 1510-B Third Street, Tillamook, OR 97141 | Tel: 503-842-3408 Fax: 503-842-1819  
 www.co.tillamook.or.us

## DEVELOPMENT PERMIT

Applicant  (Check Box if Same as Property Owner)  
 Name: Debbie Whitaker Phone: 503 709 3334  
 Address: 34080 Brooten road  
 City: Clatskanie State: OR Zip: 97112  
 Email: dwhitaker024@gmail.com

Property Owner  
 Name: Same Phone: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
 Email: \_\_\_\_\_

OFFICE USE ONLY	
Date Stamp	
<input type="checkbox"/> Approved <input type="checkbox"/> Denied	
Received by:	
Receipt #:	
Fees:	
Permit No:	
851-__-____-PLNG	

Description of Work: addition

Location:  
 Site Address: 34080 Brooten road  
 Map Number: Tax lot 5703 45-10-19-AC lot 8 a portion of 7e9  
Township Range Section Tax Lot(s)

### Complete all applicable fields:

Regulatory Floodway: <input checked="" type="checkbox"/>	Estuary: <input type="checkbox"/>	Floodplain: <input type="checkbox"/>
New: <input type="checkbox"/>	Addition: <input type="checkbox"/>	Replacement: <input type="checkbox"/>
Remodel: <input type="checkbox"/>	Demolish: <input type="checkbox"/>	
Dwelling: _____	Accessory Structure: <u>800</u>	
Culvert Diameter: _____	Bridge Length: _____	
Length: _____	Width: _____	
Fence Height: _____	Retaining Wall Height: _____	
Streambank Stabilization: _____	Other: _____	
Fill/Removal/Grading: _____ CY	Vegetation Removal: _____ CY	

### Flood Insurance Rate Map (FIRM) Panel Info

Tillamook County	Panel Number: <u>410196</u>
Effective Date: _____	Property Flood Zone(s): _____
Floodway: <input type="checkbox"/> Y <input type="checkbox"/> N	Project Flood Zone(s): _____
Stream/Waterbody Name: _____	

### Elevation Data (NAVD 88)

Base Flood Elevation: _____	First Habitable Floor: _____
Lowest Floor/Horizontal Member: _____	
Enclosed Area: _____	Flood Vent Area: _____

Structure/Damage \$: _____	5 Year Construction \$: _____
<i>Substantial Improvement/damage threshold 50% cost vs. value</i>	

### Other Required Permits


### Authorization

This permit application does not assure permit approval. The applicant and/or property owner shall be responsible for obtaining any other necessary federal, state, and local permits. The applicant verifies that the information submitted is complete, accurate, and consistent with other information submitted with this application.

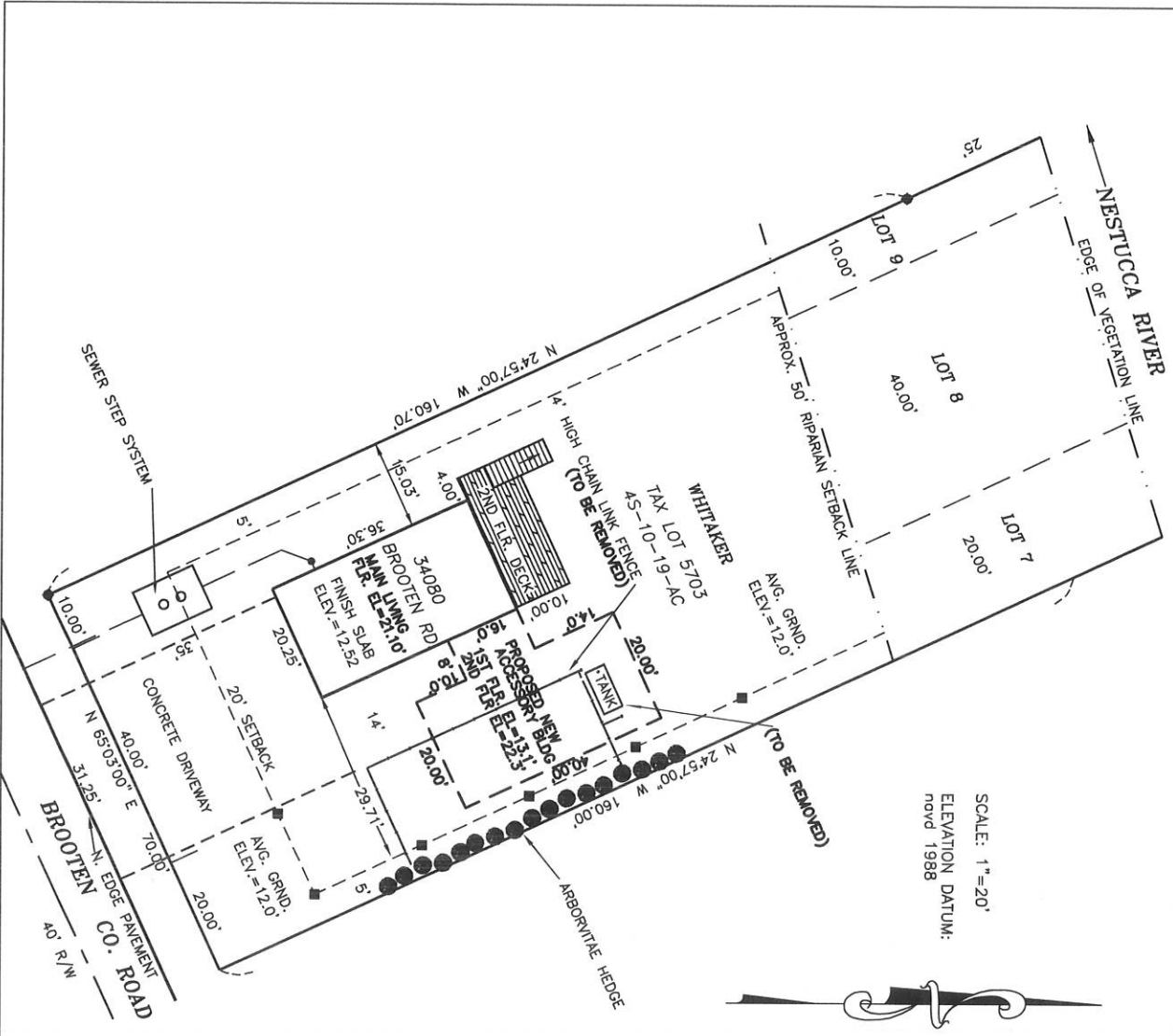
Debbie Whitaker  
 Property Owner Signature (Required)

4-5-22  
 Date

Applicant Signature \_\_\_\_\_

Date \_\_\_\_\_





SCALE: 1"=20'  
 ELEVATION DATUM:  
 noid 1988

**PLOT PLAN FOR  
 JAMES & DEBORAH WHITTAKER**

IN LOT 8 AND A PORTION LOTS 7 AND 9, "HARRIS' NESTUCCA BEACH"  
 NARRATIVE:

THE PURPOSE OF THIS SURVEY WAS TO SHOW THE LOCATION OF EXISTING HOUSE AND TO SHOW THE OTHER IMPROVEMENTS TO SAID TRACT OF LAND.  
 THE LOWER FINISH (SLAB) FLOOR ELEVATION HAS BEEN SHOWN IN NVD 1988 DATUM.  
 ALSO, I HAVE INDICATED THE APPROXIMATE "50 FOOT RIPARIAN SETBACK" ON THE RIVER SIDE OF THE SUBJECT TRACT...AND THE AVERAGE GROUND ELEVATION ON THE NORTHEAST SIDE OF THE TRACT.  
 ALSO: TO SHOW THE LOCATION AND PROPOSED ELEVATIONS OF THE NEW ACCESSORY BUILDING TO BE CONSTRUCTED ON THE SUBJECT PARCEL.

SURVEY & MAP BY:  
 KELLOW LAND SURVEYING  
 P.O. BOX 335  
 PACIFIC CITY, OR 97135  
 503-801-3537  
 JULY 19, 2019  
 REVISED: AUG. 9, 2019  
 REVISED: JULY 5, 2022

REGISTERED  
 PROFESSIONAL  
 LAND SURVEYOR  
*Douglas H. Kellow*  
 OREGON  
 FEBRUARY 3, 1983  
 DOUGLAS H. KELLOW  
 2027  
 RENEWS: 08/30/23

SET WOOD HUB & STAKE - ■

Melissa Jenck

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**From:** debbie whitaker <dwhitaker004@gmail.com>  
**Sent:** Thursday, June 16, 2022 11:01 AM  
**To:** Melissa Jenck  
**Subject:** Re: EXTERNAL: Whitaker

- 1. No, fill is not within the Coastal High Hazard Area.**
- 2. The hydraulics report by Waterways Consulting shows that the fill placed in the regulatory floodway will have no effect on the flood levels during the occurrence of the base flood discharge.**
- 3. Yes, the fill is necessary for the approved use.**
- 4. Yes, the fill is the minimum amount necessary for the approved use.**
- 5. The entire property is located within the regulatory floodway, so there is no feasible alternative to this approved use location.**
- 6. This fill will not impede or alter drainage flow of the floodwaters.**
- 7. This is not a critical facility.**
- 8. This is not a flood refuge platform.**

These are the answers to these questions. I was having difficulty finding the form to fill out. Does this work?

# ELEVATION CERTIFICATE

**Important:** Follow the instructions on pages 1-9.

Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

SECTION A – PROPERTY INFORMATION				FOR INSURANCE COMPANY USE	
A1. Building Owner's Name JAMES AND DEBORAH WHITAKER				Policy Number:	
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. 34080 BROOTEN ROAD				Company NAIC Number:	
City PACIFIC CITY		State Oregon		ZIP Code 97135	
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.) TAX LOT 5703, 4S-10-19-AC; LOT 8 AND A PORTION OF LOTS 7 AND 9, "HARRIS' NESTUCCA BEACH", TILLAMOOK CO., OR					
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) <u>ACCESSORY</u>					
A5. Latitude/Longitude: Lat. <u>45.21100</u> Long. <u>123.95500</u> Horizontal Datum: <input type="checkbox"/> NAD 1927 <input checked="" type="checkbox"/> NAD 1983					
A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.					
A7. Building Diagram Number <u>1A</u> <input type="checkbox"/>					
A8. For a building with a crawlspace or enclosure(s):					
a) Square footage of crawlspace or enclosure(s) <u>722</u> sq ft					
b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade <u>11</u>					
c) Total net area of flood openings in A8.b <u>781</u> sq in					
d) Engineered flood openings? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
A9. For a building with an attached garage:					
a) Square footage of attached garage _____ sq ft					
b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____					
c) Total net area of flood openings in A9.b _____ sq in					
d) Engineered flood openings? <input type="checkbox"/> Yes <input type="checkbox"/> No					
SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION					
B1. NFIP Community Name & Community Number TILLAMOOK COUNTY 410196			B2. County Name TILLAMOOK		B3. State Oregon <input type="checkbox"/>
B4. Map/Panel Number 41057C0855	B5. Suffix F	B6. FIRM Index Date 09/28/2018	B7. FIRM Panel Effective/ Revised Date 09/28/2018	B8. Flood Zone(s) AE	B9. Base Flood Elevation(s) (Zone AO, use Base Flood Depth) 19.3
B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9: <input type="checkbox"/> FIS Profile <input checked="" type="checkbox"/> FIRM <input type="checkbox"/> Community Determined <input type="checkbox"/> Other/Source: _____					
B11. Indicate elevation datum used for BFE in Item B9: <input type="checkbox"/> NGVD 1929 <input checked="" type="checkbox"/> NAVD 1988 <input type="checkbox"/> Other/Source: _____					
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Designation Date: _____ <input type="checkbox"/> CBRS <input type="checkbox"/> OPA					

# ELEVATION CERTIFICATE

OMB No. 1660-0008  
Expiration Date: November 30, 2022

<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>			<b>FOR INSURANCE COMPANY USE</b>
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. <u>34080 BROOKEN ROAD</u>			Policy Number:
City <u>PACIFIC CITY</u>	State <u>OREGON</u>	ZIP Code <u>97135</u>	Company NAIC Number

## SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on:  Construction Drawings\*  Building Under Construction\*  Finished Construction

\*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. Complete Items C2.a–h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: TILL.CO.SURVEY PC#8 Vertical Datum: NAVD 1988

Indicate elevation datum used for the elevations in items a) through h) below.

NGVD 1929  NAVD 1988  Other/Source: \_\_\_\_\_

Datum used for building elevations must be the same as that used for the BFE.

Check the measurement used.

- |   |      |  |                                 |
|---|------|--|---------------------------------|
| a) Top of bottom floor (including basement, crawlspace, or enclosure floor)   | 13.1 | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters |
| b) Top of the next higher floor   | 22.3 | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters |
| c) Bottom of the lowest horizontal structural member (V Zones only)   |      | <input type="checkbox"/> feet            | <input type="checkbox"/> meters |
| d) Attached garage (top of slab)  |      | <input type="checkbox"/> feet            | <input type="checkbox"/> meters |
| e) Lowest elevation of machinery or equipment servicing the building<br>(Describe type of equipment and location in Comments) | 22.3 | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters |
| f) Lowest adjacent (finished) grade next to building (LAG)  | 12.3 | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters |
| g) Highest adjacent (finished) grade next to building (HAG)   | 12.5 | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters |
| h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support                                  | 12.3 | <input checked="" type="checkbox"/> feet | <input type="checkbox"/> meters |

## SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

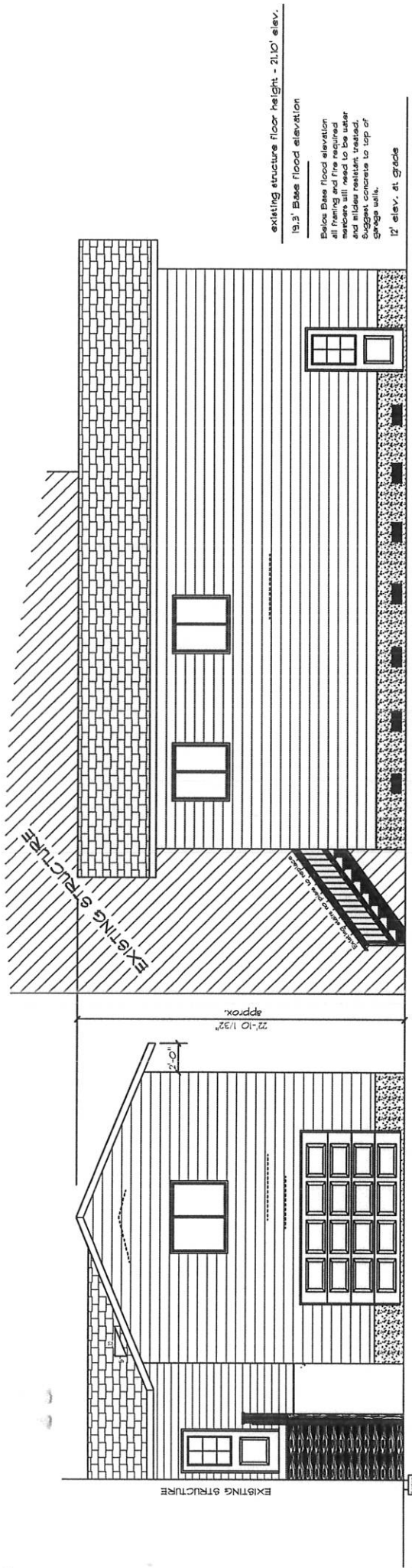
This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

Were latitude and longitude in Section A provided by a licensed land surveyor?  Yes  No  Check here if attachments.

Certifier's Name DOUGLAS H. KELLOW	License Number OREGON PLS NO. 2027	<div style="border: 1px solid black; padding: 5px; margin: 0 auto; width: 80%;"> <p style="text-align: center; margin: 0;">REGISTERED PROFESSIONAL LAND SURVEYOR</p> </div>	
Title PROFESSIONAL LAND SURVEYOR			
Company Name KELLOW LAND SURVEYING			
Address P.O. BOX 335		<div style="border: 1px solid black; padding: 5px; margin: 0 auto; width: 80%;"> <p style="text-align: center; margin: 0;">OREGON February 3, 1983 DOUGLAS H. KELLOW 2027 Renewal: 06/30/23</p> </div>	
City PACIFIC CITY	State Oregon		ZIP Code <input checked="" type="checkbox"/> 97135
Signature 	Date 07/06/2022	Telephone 503-801-3537	Ext.

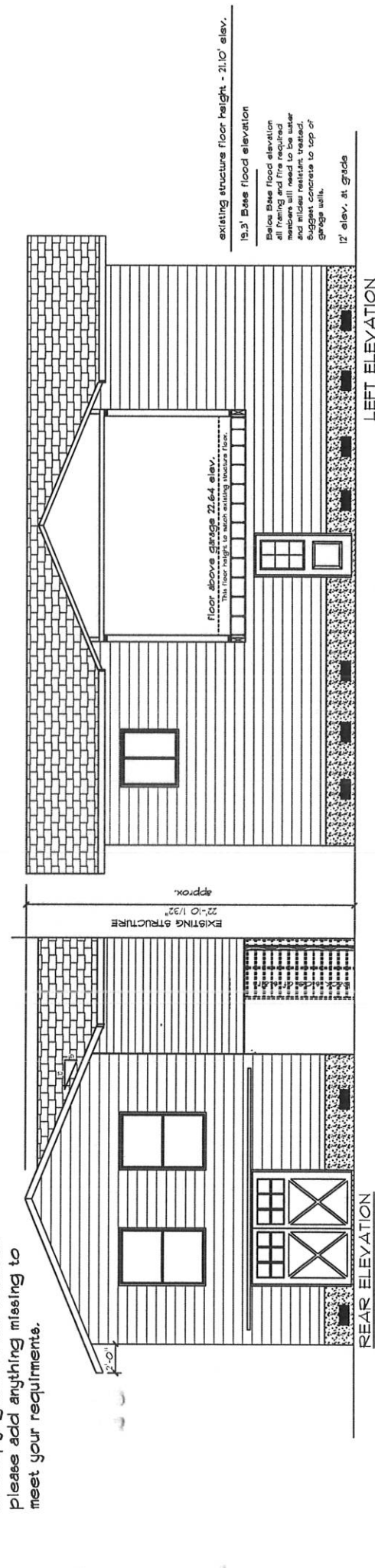
Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

Comments (including type of equipment and location, per C2(e), if applicable)  
C2e.) THE WATER HEATER WILL BE LOCATED ON THE UPPER FLOOR OF THE ACCESSORY STRUCTURE AT AN ELEVATION OF 22.3 FEET (MINIMUM) ABOVE MSL NAVD 1988.



RIGHT ELEVATION

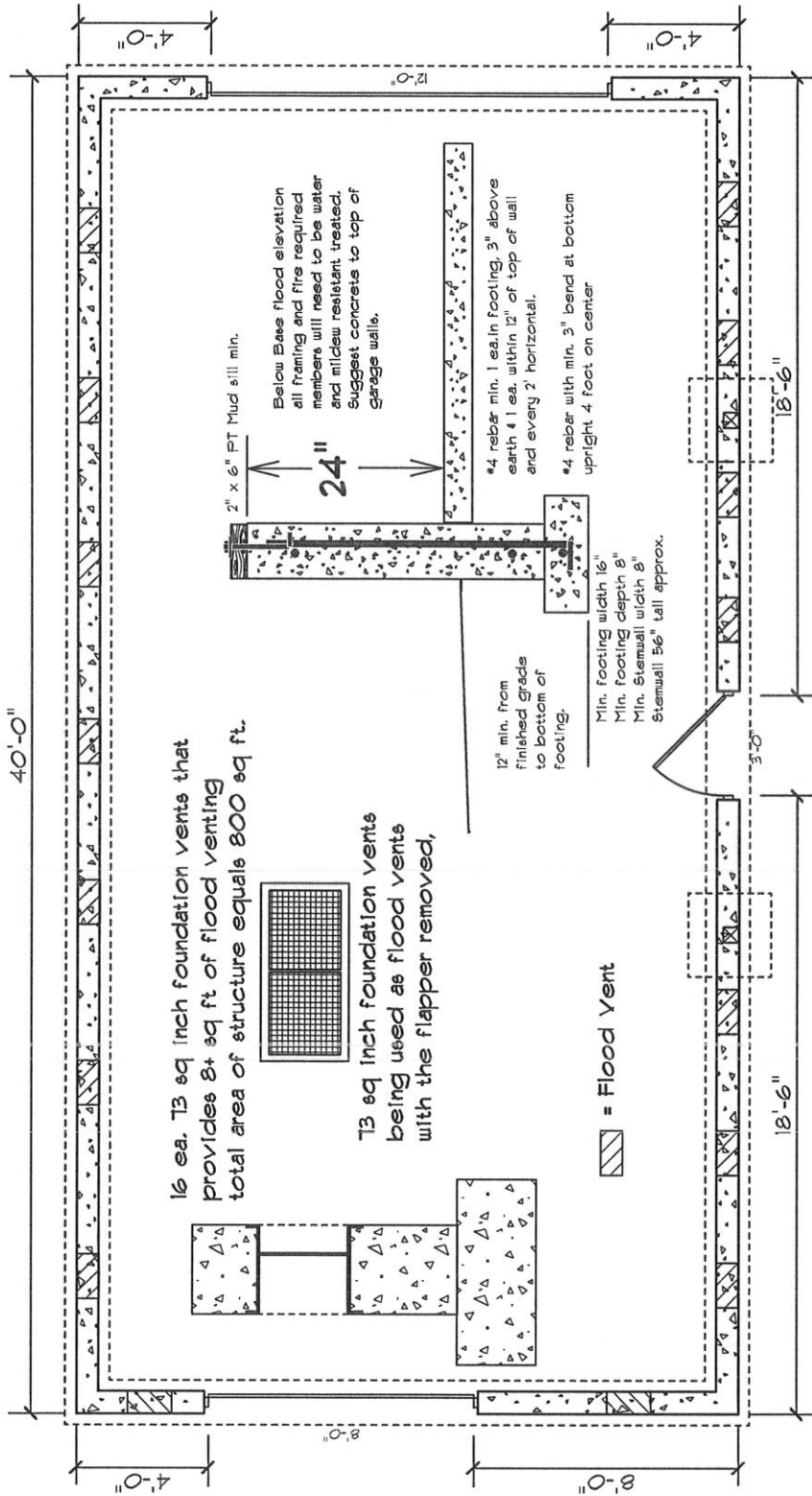
Not to any given scale so this would fit page.



REAR ELEVATION

LEFT ELEVATION

All plans for this structure are not copyrighted. Plans examiner please add anything missing to meet your requirements.



16 ea. 73 sq inch foundation vents that provides 84 sq ft of flood venting total area of structure equals 800 sq ft.

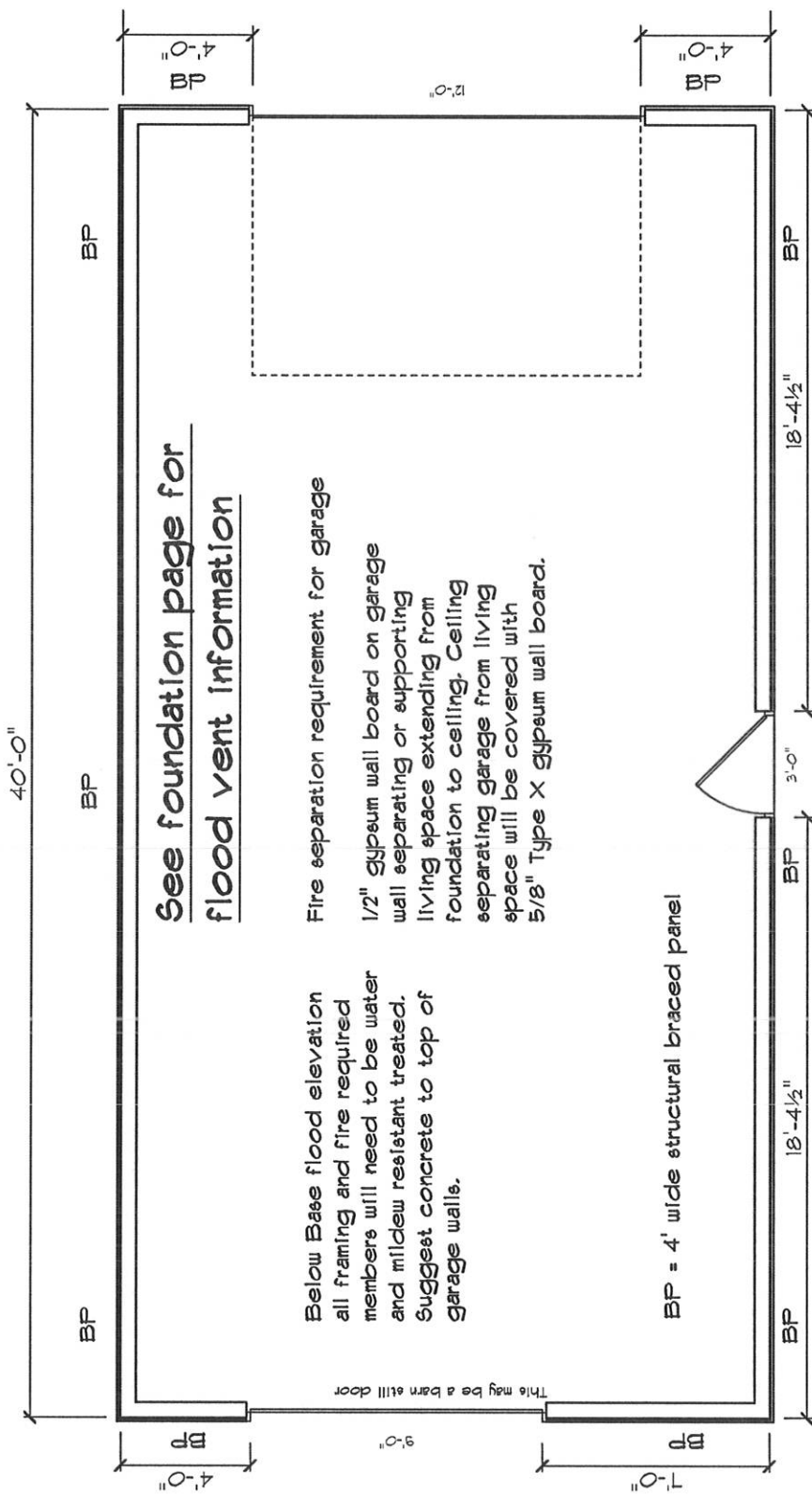
73 sq inch foundation vents being used as flood vents with the flapper removed,

▨ = Flood Vent

30" x 30" x 10"  
 footing for beam  
 #4 bar @ 9" oc  
 e/w (4) min

All plans for this structure are not copyrighted. Plans examiner please add anything missing to meet your requirements.

EXISTING STRUCTURE



**See foundation page for flood vent information**

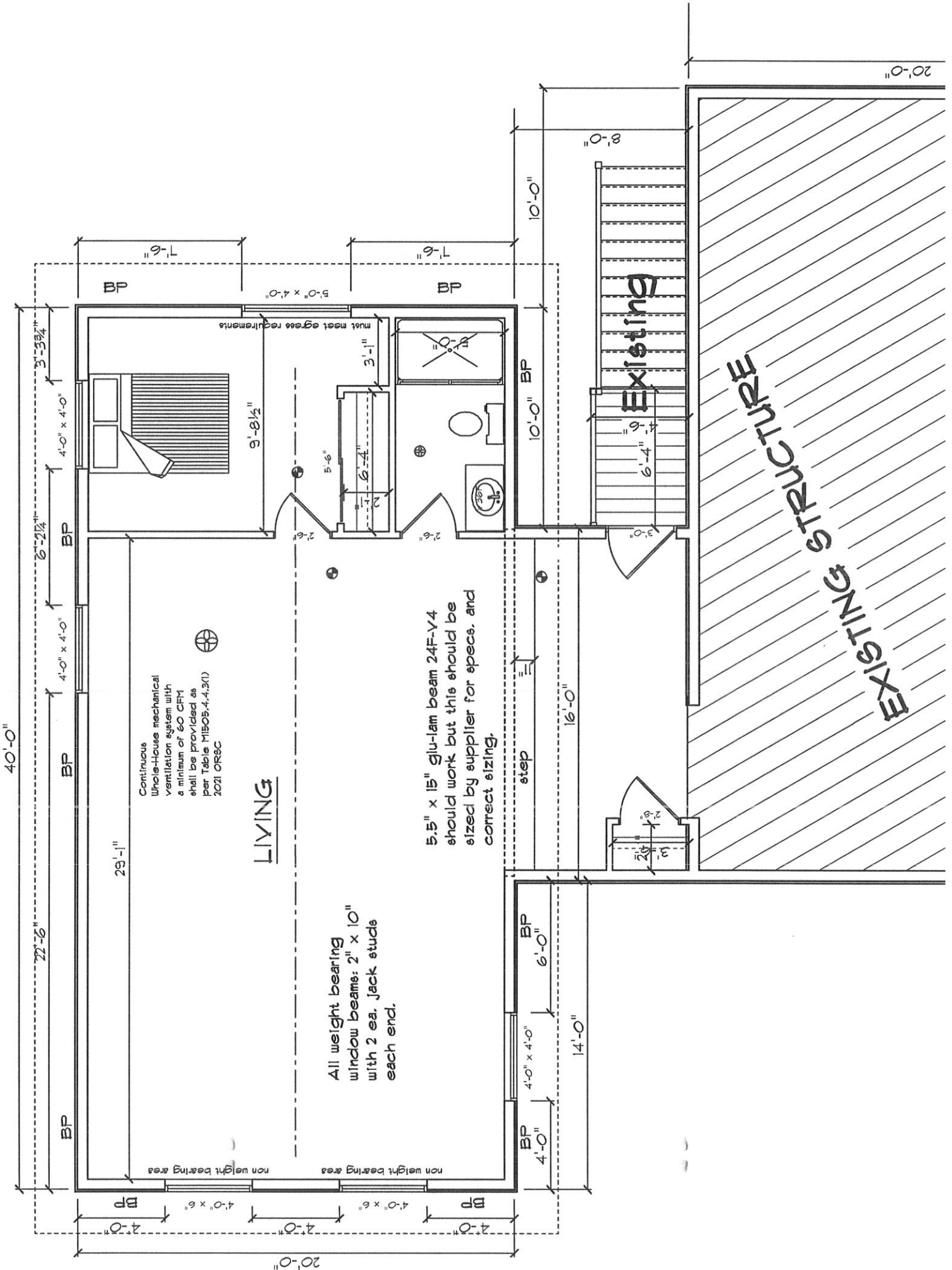
Fire separation requirement for garage

1/2" Gypsum wall board on garage wall separating or supporting living space extending from foundation to ceiling. Ceiling separating garage from living space will be covered with 5/8" Type X Gypsum wall board.

Below Base flood elevation all framing and fire required members will need to be water and mildew resistant treated. Suggest concrete to top of garage walls.

BP = 4' wide structural braced panel

All plans for this structure are not copyrighted. Plans examiner please add anything missing to meet your requirements.



40'-0"

20'-0"

BP

BP

Existing

EXISTING STRUCTURE

Continuous Whole-House mechanical ventilation system with a minimum of 60 CFM shall be provided as per Table M1505.4.4.3(1) 2021 ORSC

LIVING

5.5" x 15" glu-lam beam 24F-V4 should work but this should be sized by supplier for specs. and correct sizing.

All weight bearing window beams: 2" x 10" with 2 ea. Jack studs each end.

BP

BP

BP

BP

29'-1"

non weight bearing area

non weight bearing area

step

9'-6"

9'-6"

10'-0"

8'-0"

10'-0"

16'-0"

14'-0"

BP

BP

BP

BP

3'-5 3/4"

6'-2 1/4"

22'-6"

4'-0" x 4'-0"

4'-0" x 4'-0"

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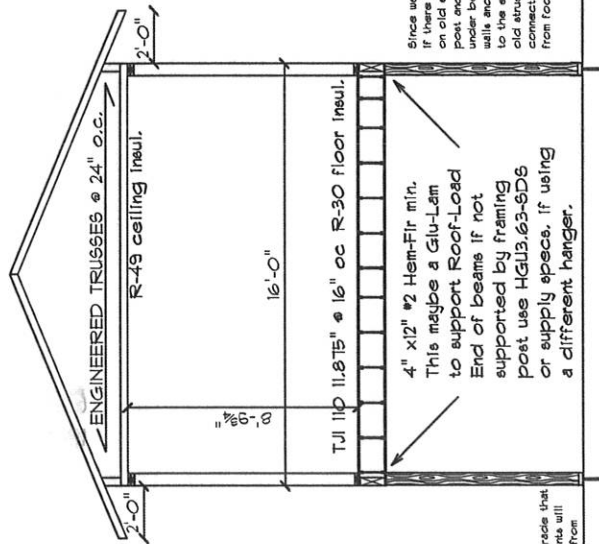
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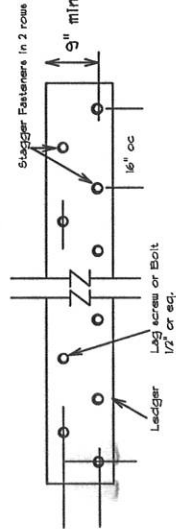
Not to any given scale



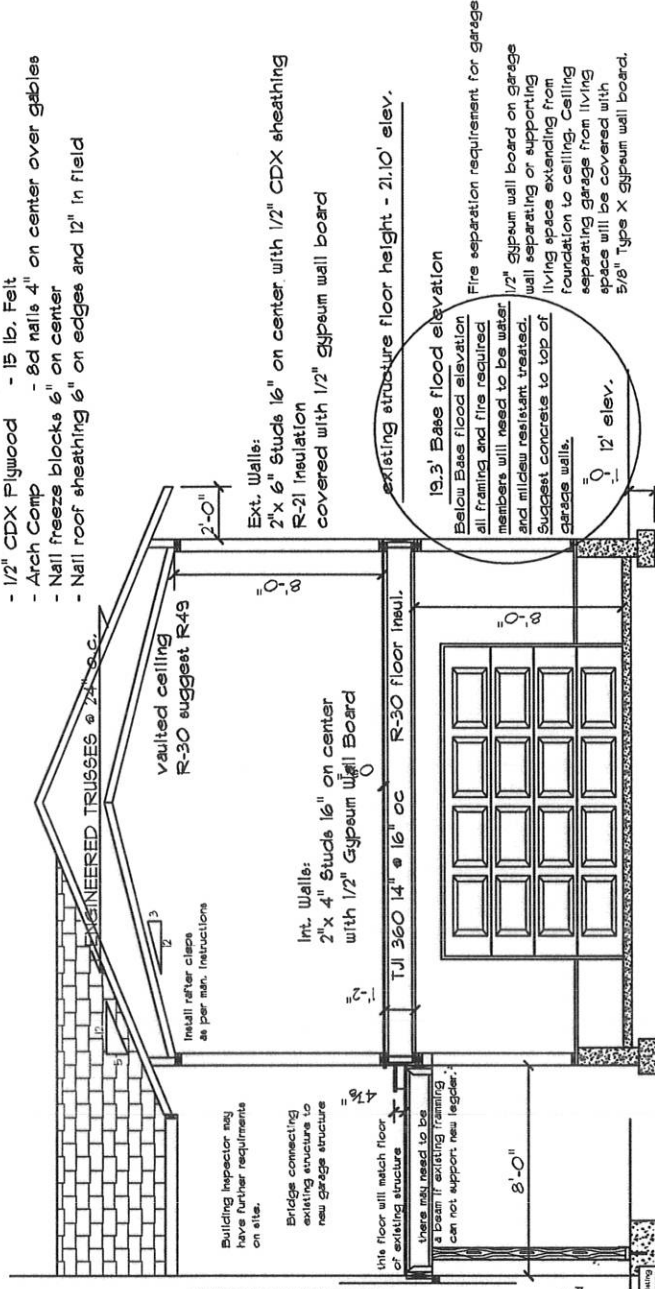
Since we don't know if there is proper support provided below footing under beam that supports wall and roof load close to the end of beam at the old structure end, Positive connection to be provided from footing and to beam.

Existing grade that measurements will be taken from

Ledger if used if not supported on walls in framing.



- Roofing Material
- Vents - Vent Block at Tails
  - 1/2" CDX Plywood - 15 lb. Felt
  - Arch Comp - 8d nails 4" on center over gables
  - Nail freeze blocks 6" on center
  - Nail roof sheathing 6" on edges and 12" in field



19.3' Base flood elevation  
 Below Base flood elevation all framing and fire required members will need to be water and mildew resistant treated. Suggest concrete to top of garage walls.  
 Fire separation requirement for garage  
 1/2" Gypsum wall board on garage wall separating or supporting living space extending from foundation to ceiling. Ceiling separating garage from living space will be covered with 5/8" Type X Gypsum wall board.

All plans for this structure are not copyrighted. Plans examiner please add anything missing to meet your requirements.

- ⊕ = Smoke Detector/Carbon Monoxide alarms - wired in with battery backup - and interconnected as per 2021 ORSC Sections R314, R315 and Table M1505.5
- ⊗ = Exhaust fan - intermittent - max. 3 holes - rooms with bathing facilities 80 cfm
- ⊙ = Exhaust fan - kitchen only rooms with out natural ventilation 50 cfm

ORSC 2021 Section M1505 and Table M1505.5

**Taken from ORSC 2021 Section R315 - CARBON MONOXIDE ALARMS**

R315.2 Where required, Carbon Monoxide alarms shall be provided in accordance with Sections R315.2.1. and R315.2.2 R315.2.1 New construction. For new construction, carbon monoxide alarms shall be provided in dwelling units, R315.2.2 Existing dwellings. Where a new carbon monoxide source is introduced or work requiring a structural permit occurs in existing dwellings, carbon monoxide alarms shall be provided in accordance with this section.

Exception: Work involving the exterior surfaces of dwellings, such as the replacement of footing or siding, the addition or replacement of windows or doors, of the addition of a porch or deck, are exempt from the requirements of this section. R315.3 Location. Carbon monoxide alarms shall be located in each sleeping room or within 15 feet outside of each sleeping room door. Sleeping rooms on separate floor levels in a structure consisting of two or more stories shall have separate carbon monoxide alarms serving each story. Where a fuel-burning appliance is located within a sleeping room or its attached bathroom, a carbon monoxide alarm shall be installed within the sleeping room.

315.4 Combination alarms. Combinations carbon monoxide and smoke alarms shall be permitted to be used in lieu of carbon monoxide alarms. R315.5 Interconnectivity. Where more than one carbon monoxide alarm is required to be installed within an individual dwelling unit in accordance with Section 315.3, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual dwelling unit. Physical interconnection of carbon monoxide alarm shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm. Exception: Interconnection of carbon monoxide alarms in existing areas shall not be required where alterations or repairs do not result in removal of interior wall or ceiling finishes exposing the structure.

R315.6 Power source. Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and, where primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and with out a disconnection switch other than those required for over current protection.

a6 per chapter 11 2021 ORSC

Table N101.1(1) page 450

Flat ceiling R-48

Vaulted ceiling R+30

Walls R-21

Floor R-30

Ductless heat pump, HSPF 10.0

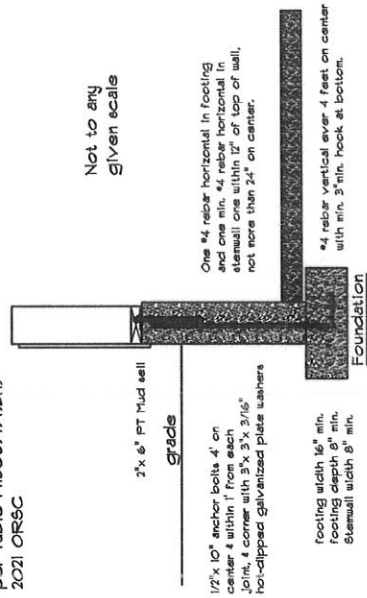
In primary zone of building.

Whole-House mechanical ventilation system with a minimum of 60 CFM shall be provided as per Table M1505.4.4.3(1) 2021 ORSC



Fire separation requirement for garage

1/2" Gypsum wall board on garage wall separating or supporting living space extending from foundation to ceiling. Ceiling separating garage from living space will be covered with 5/8" Type X Gypsum wall board. Door from garage to living space will be 20 minute fire rating.



# 34080 BROOTEN ROAD ADDITION HYDRAULIC ANALYSIS REPORT

## HYDRAULICS ANALYSIS REPORT



*prepared for*  
Debbie Whitaker

*prepared by*  
Jake Hofeld, P.E.



April 05, 2022



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EXPIRES: 6/30/2023

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Figure 4: Proposed Addition Site Plans and Elevations

Figure 5: Hydraulic Analysis Overview Map of Proposed Project

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Attachment A – HEC-RAS Model Output Files

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## **INTRODUCTION**

Waterways Consulting Inc. (Waterways) has been retained by Debbie Whitaker to evaluate the hydraulic effects on the Nestucca River during a 100-year base flood discharge from a proposed addition to an existing residential structure. The project is located on the east (left) bank floodplain of the Nestucca River at 34080 Brooten Road in Pacific City, Oregon (Figure 1). The existing property currently includes a building with an approximate 730 square foot footprint with an attached second story deck. The proposed addition will include an 800 square foot footprint structure immediately to the north of the existing structure connected. The new and existing structures will be connected by an enclosed “bridge” structure between the second story finished floors. This section will also include an exterior stairway that leads to the ground level. The entire property is located within the FEMA designated floodway, effective September 28, 2018 (Figure 2).

The following report has been prepared to support floodplain development permitting with Tillamook County for the proposed project and presents our hydraulic analysis of existing and proposed conditions for the 100-year flood event along the Nestucca River within the vicinity of the proposed residential structure addition. This report is based on the guidance outlined in Section 3.510(9)(a) of the Tillamook County Land Use Ordinance which requires, “...certification is provided by a professional registered civil engineer demonstrating through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that such encroachment shall not result in any increase in flood levels during the occurrence of the based flood discharge.”

## **HYDRAULIC MODELING METHODOLOGY**

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) has mapped Nestucca River at the project area as a Special Flood Hazard Area (SFHA) within the regulatory floodway Zone AE (Figure 2). Tillamook County provided Waterways with a hydraulic model of the Nestucca River covering the project area for a Letter of Map Revision (LOMR), effective September 24, 2015 (Case Number 14-10-1727P). The LOMR and corresponding hydraulic model conducted in the United States Army Corps of Engineers (USACE) Hydraulic Engineering Center River Analysis Software (HEC-RAS) by West Consultants updated the previous modeling and FIRM Panels dated August 1, 1978. All elevations are referenced to a NAVD 88 vertical datum. This model was used as the basis for all hydraulic modeling.

Waterways updated the hydraulic analysis using HEC-RAS, version 6.0.0. A one-dimensional hydraulic model was completed to characterize the existing and proposed conditions at the project site during the 100-year recurrence interval peak flow at the Nestucca River. Additional cross sections were added to the provided model in the vicinity of the project area. The two modeling scenarios include the Existing Conditions Model (“Ex. Cond.” is the Plan identifier in the model) and the Proposed Conditions Model (“Prop. Cond.” is the Plan identifier in the model). Figure 3 shows the proposed project location, cross section locations used in the hydraulic analysis, and the effective FEMA floodplain and floodway boundaries (FEMA 2018).

### Existing Conditions Model

Additional cross sections added to the LOMR model were sampled from a terrain surface derived from LiDAR data from the Department of Geology and Mineral Industries (DOGAMI) North Coast collected by Watershed Sciences Inc. in 2009. LiDAR was updated and overlain with existing topographic survey data for the project parcel. The existing topographic survey was provided by Kellow Land Surveying, dated August 9, 2019 (Figure 3). Bathymetry for the additional cross sections were interpolated from upstream and downstream cross sections of the LOMR model.

The downstream model boundary extends approximately 1.1 miles downstream of the project area and the upstream model boundary extends approximately 2.7 miles upstream of the project area (Figure 5). The bridge crossing geometry at Ferry Street and at Pacific Avenue downstream of the project area were included in the model from drawings provided by Oregon Department of Transportation (ODOT) and Tillamook County. Hydraulic roughness values for the additional cross sections were based on values published in the provided model. Hydraulic roughness values, known as Manning's Roughness, for the additional cross sections are outlined in Table 1.

**Table 1. Manning's Roughness for Different Land Use Types**

Land Use Type	Manning's 'n'
Channel	0.031
Open Pervious Areas (grassed)	0.04
Residential Area	0.08
Open Pervious Areas (trees)	0.10

### Proposed Conditions Model

The proposed conditions model included the additional cross sections created in the existing conditions model. The existing conditions terrain was updated with the proposed residential structure footprint of 40 feet by 20 feet provided by design drawings supplied from the client (Figure 4). The proposed residential structure was modeled as a blocked obstruction at cross sections located at the upstream and downstream sides of the proposed structure. The location of the proposed structure is approximate due to the surveyed property boundaries being in an arbitrary horizontal datum but is considered accurate enough for the purposes of this analysis. The proposed conditions model did not update the existing topography of the site.

### Boundary Conditions

The downstream boundary condition used in the two models was set to a known water surface elevation of 14.15 feet (NAVD 88) per the provided model. The downstream boundary condition is located downstream of FEMA Cross Section A near where Nestucca River meets the Nestucca Bay.

### Peak Flow Hydrology

According to the FEMA FIS report and the provided model, the 100-year peak flow event for this portion of the Nestucca River is 49,700 cubic feet per second (cfs). Therefore, 49,700 cfs was assumed for the 100-year peak flow (i.e. base flood discharge) in all models.

### RESULTS

Results of the hydraulic modeling are presented in Attachment A. These results show that the proposed structure will not result in a rise to the water surface elevations at any cross sections in the model. No change between the Existing Conditions Model and Proposed Conditions Model can likely be attributed to the relatively small building footprints as compared to a much larger/wider floodplain area.

### CONCLUSIONS

The results of this hydraulic analysis indicate no rise in the 100-year water surface elevations for the Proposed Conditions Model when compared to the Existing Conditions Model. Based on this, the proposed project satisfies the requirement of Section 3.510(9)(a) of the Tillamook County Land Use Ordinance.

## REFERENCES

- Federal Emergency Management Agency. 2018. Flood Insurance Rate Maps (FIRMs) for Tillamook County (panel 0855), Oregon and Incorporated Areas. September 28, 2018.
- Federal Emergency Management Agency. 2018. Flood Insurance Study (FIS) for Tillamook County, Oregon and Incorporated Areas. September 8, 2018.
- U.S. Army Corps of Engineers. Hydrologic Engineering Center. Computer Program HEC-RAS Version 6.0.0 Davis, California. March 2019.
- U.S. Army Corps of Engineers. Hydrologic Engineering Center. Hydraulic Reference Manual. Version 5.0 Davis, California. February 2016.
- Watershed Sciences. LiDAR Remote Sensing Data Collection Oregon North Coast. Prepared for Department of Geology and Mineral Industries (DOGAMI). December 21, 2009.
- West Consultants. Hydraulic Engineering Center River Analysis Software (HEC-RAS) Model of the Nestucca River. 2014.



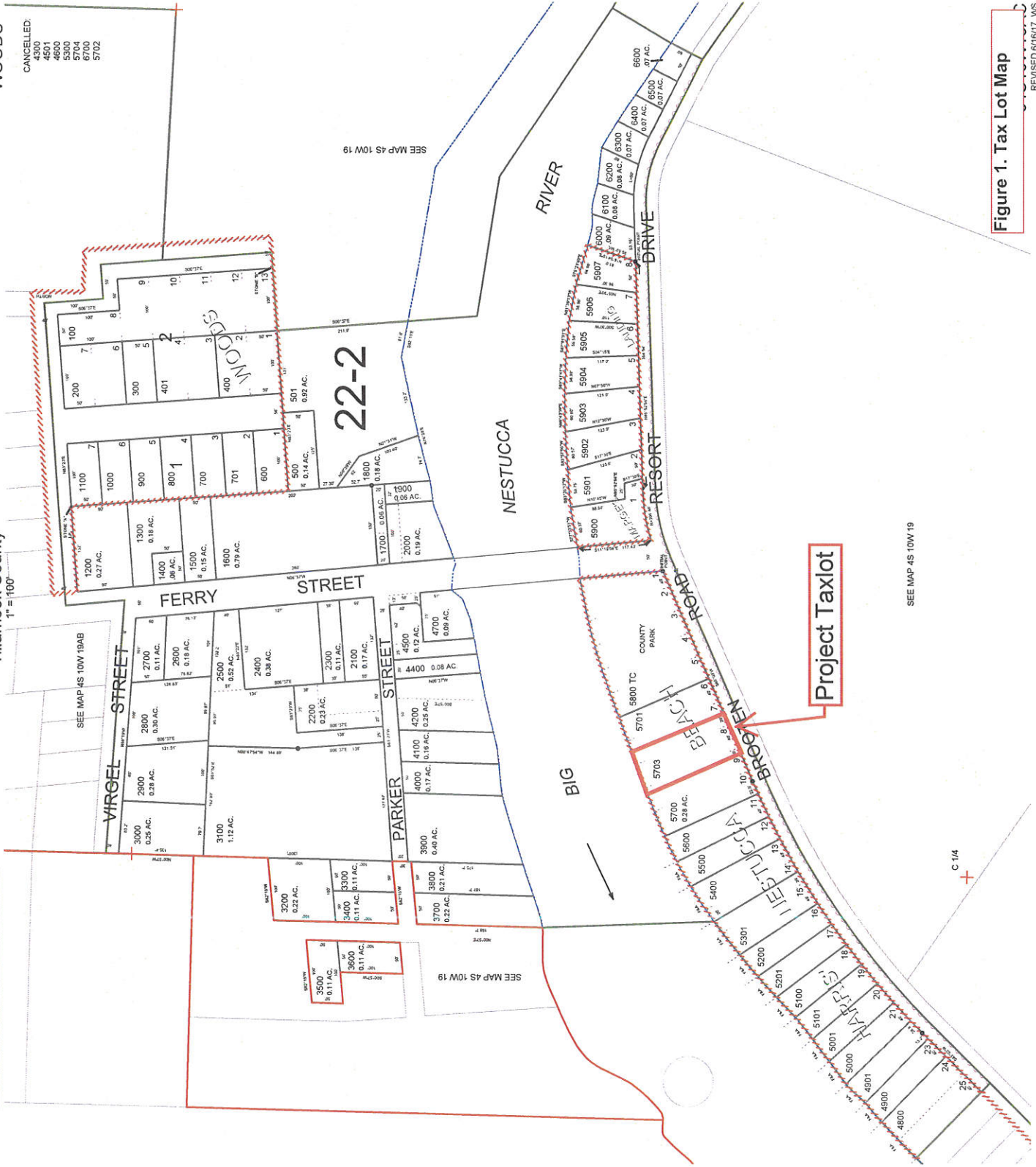
## FIGURES

FOR ASSESSMENT AND TAXATION ONLY. NOT SUITABLE FOR LEGAL ENGINEERING, OR SURVEY PURPOSES

S.W.1/4 N.E.1/4 SEC.19 T.4S. R.10W. W.M.  
Tillamook County

04S10W19AC  
WOODS

CANCELLED:  
4300  
4501  
4600  
4700  
5700  
6700  
5702



Project Taxlot

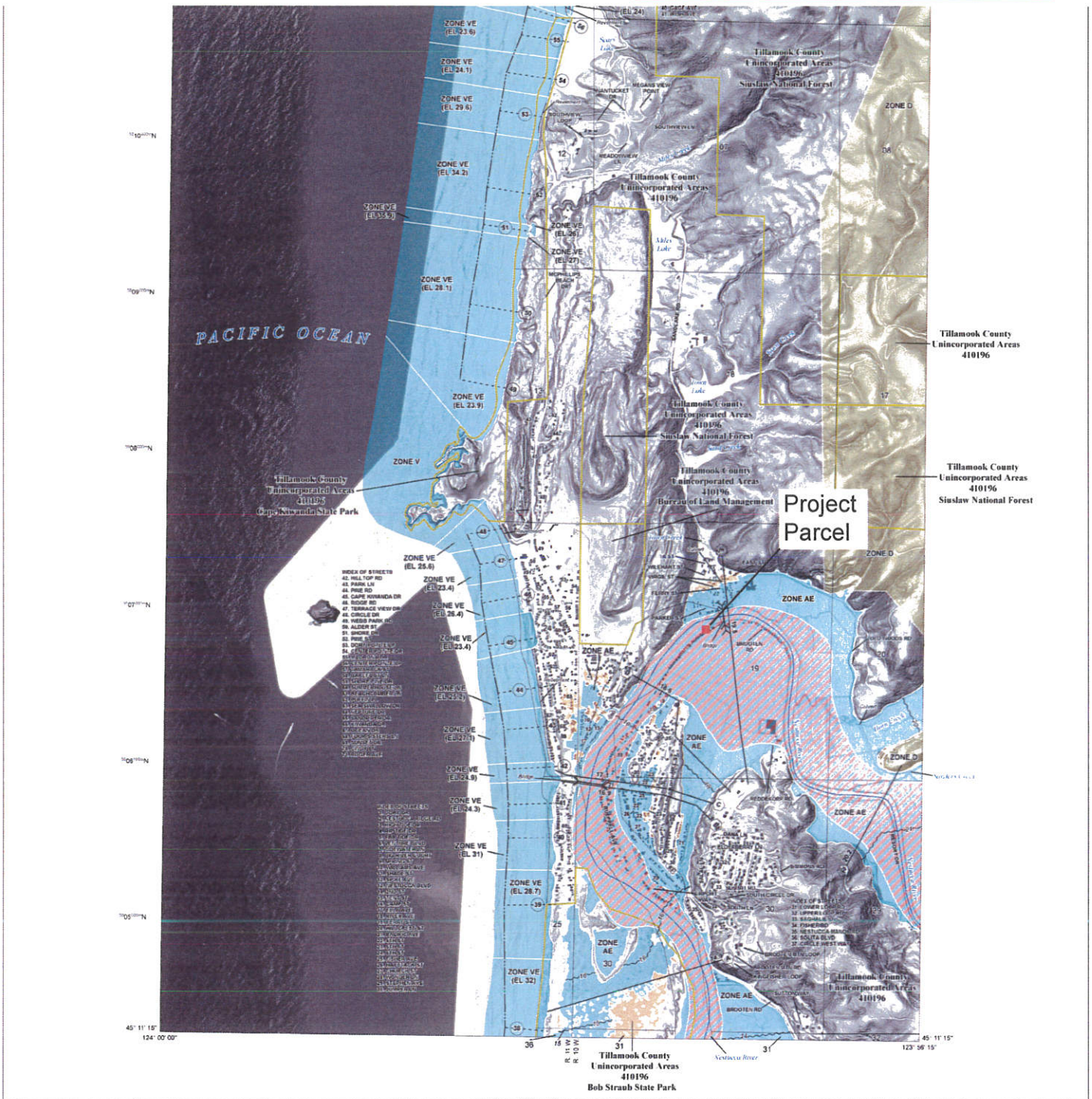
SEE MAP 4S 10W 19

C-114

Figure 1. Tax Lot Map

REVISED 6/16/17, WS

# Figure 2. FEMA Map



## FLOOD HAZARD INFORMATION

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

- Without Base Flood Elevation (BFE) (Zone AE, AD, AH, VE, AP)
- With BFE or Depth (Zone AE, AD, AH, VE, AP)
- 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 A)
- Future Conditions 1% Annual Chance Flood Hazard (Zone A)
- Area with Reduced Flood Risk due to Levee (Zone X)
- Area with Flood Risk due to Levee (Zone X)
- NO SCREEN Area of Minimal Flood Hazard (Zone X)
- Area of Undetermined Flood Hazard (Zone X)
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

## NOTES TO USERS

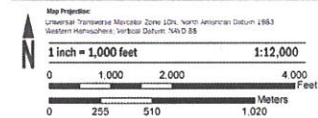
For information and questions about this map, available products associated with the FIRMS including historic versions of the FIRMS, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information Exchange at 1-877-FEMA-Map (1-877-368-2627) or visit the FEMA Map Service Center website at <http://www.fema.gov>. Available products may include preliminary notices. Updates of Map Changes or Flood Insurance Study Reports, or other digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRMS panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information Exchange.

Communities preparing and/or adjacent FIRMS panels must obtain a current copy of the adjacent panel as well as the current FIRMS index. These may be ordered directly from the Map Service Center at the number listed above. For community and countywide map date refer to the Flood Insurance Study report for the jurisdiction.

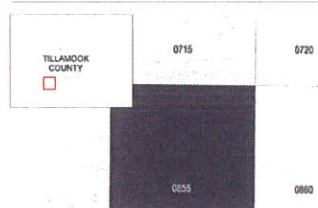
The delineation of flood insurance categories in the community, certain joint insurance agent or call the National Flood Insurance Program at 1-800-485-6842.

The hydrographic base map for this FIRMS revision is derived from aerial lidar surveys conducted between 2007 and 2011. Orthorectified imagery in 2010 was used where lidar topographic data was unavailable for portions of Tillamook County.

## SCALE



## PANEL LOCATOR



National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM  
 FLOOD INSURANCE RATE MAP  
 TILLAMOOK COUNTY, OREGON  
 Not Incorporated Areas  
 PANEL 855 OF 1075



COMMUNITY NUMBER PANEL SUFFIX  
 TILLAMOOK COUNTY 432196 0855 F

# PLOT PLAN FOR JAMES & DEBORAH WHITAKER

IN LOT 8 AND A PORTION LOTS 7 AND 9, "HARRIS' NESTUCCA BEACH"  
NARRATIVE.

THE PURPOSE OF THIS SURVEY WAS TO SHOW THE LOCATION OF  
EXISTING HOUSE AND TO SHOW THE OTHER IMPROVEMENTS TO  
SAID TRACT OF LAND.  
THE LOWER FINISH (SLAB) FLOOR ELEVATION HAS BEEN SHOWN  
IN NAVD 1988 DATUM.  
ALSO, I HAVE INDICATED THE APPROXIMATE "50 FOOT RIPARIAN  
SETBACK" ON THE RIVER SIDE OF THE SUBJECT TRACT...AND  
THE AVERAGE GROUND ELEVATION ON THE NORTHEAST SIDE OF  
THE TRACT.

SURVEY & MAP BY:

KELLOW LAND SURVEYING  
P.O. BOX 335  
PACIFIC CITY, OR 97135  
503-801-3537

JULY 19, 2019

REVISED: AUG. 9, 2019

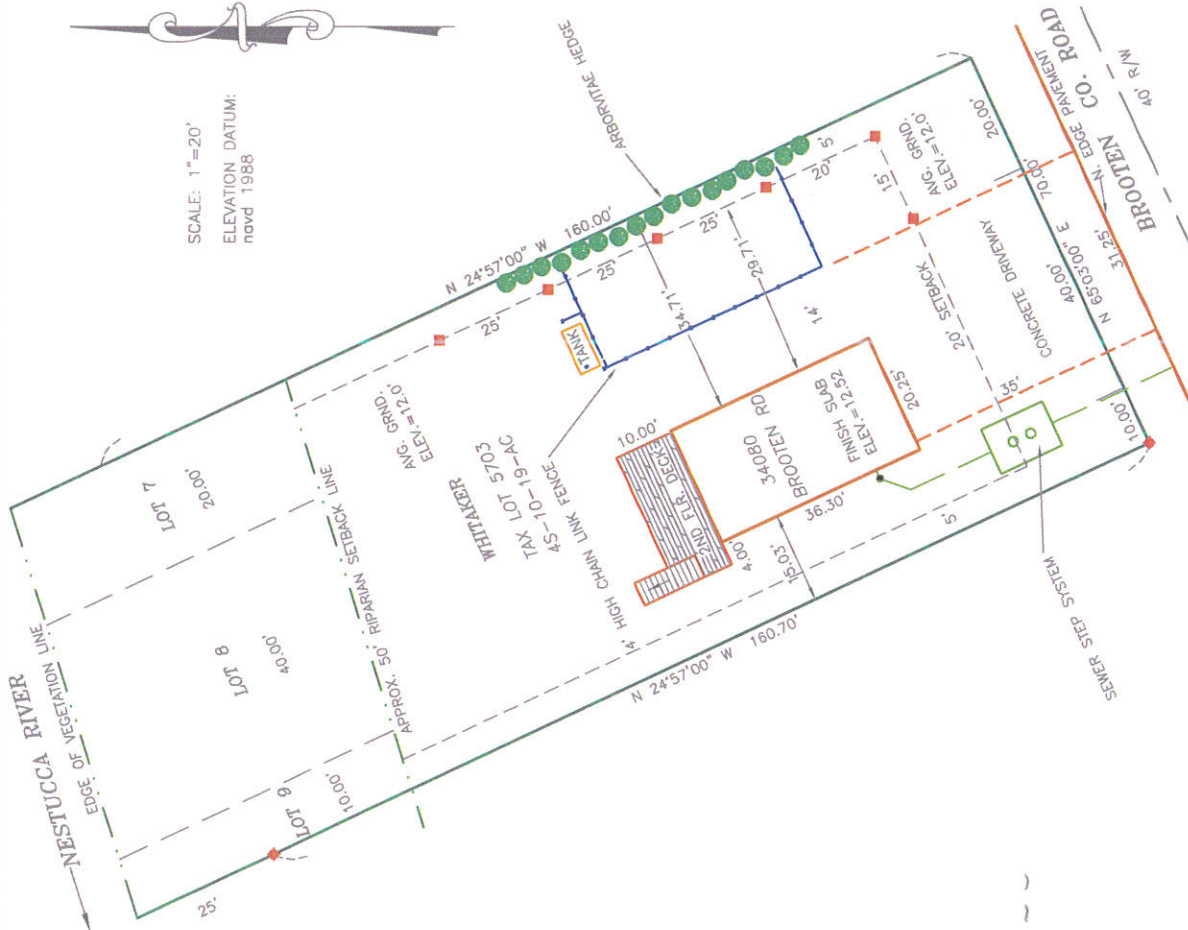
REGISTERED  
PROFESSIONAL  
LAND SURVEYOR

*Douglas H. Kellow*

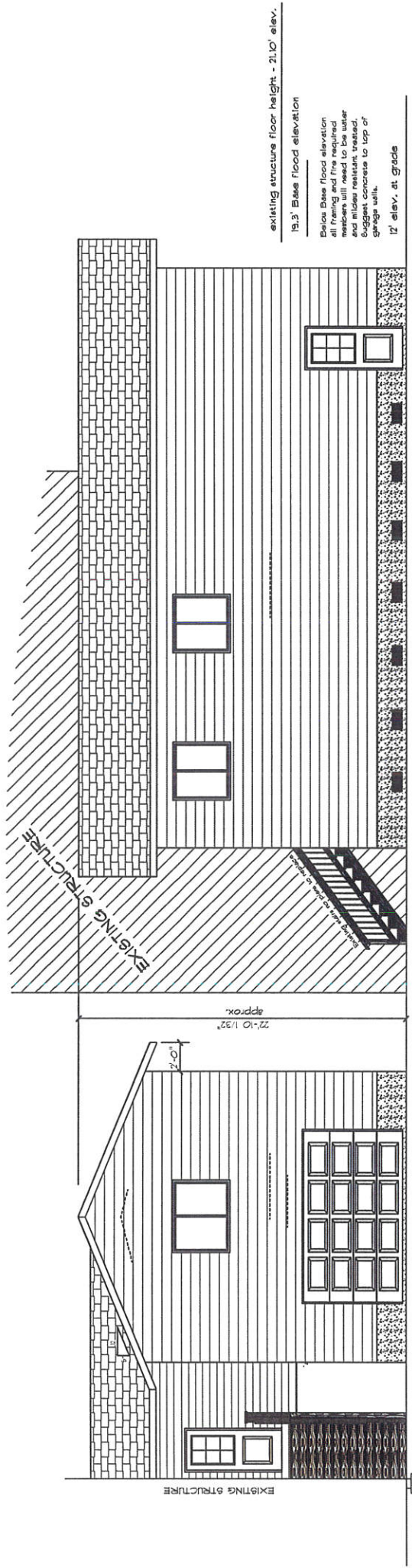
OREGON  
FEBRUARY 3, 1983  
DOUGLASH, KELLOW  
2027

RENEWS: 06/30/21

SET WOOD HUB & STAKE — ■



**Figure 3: Property Survey**



All plans for this structure are not copyrighted. Plans examiner please add anything missing to meet your requirements.

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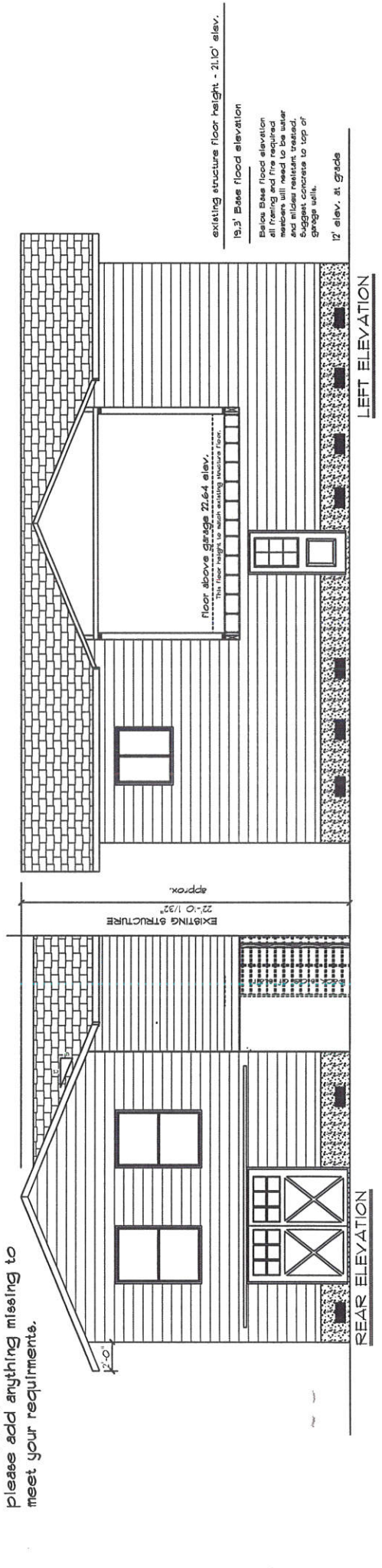


Figure 4a. Proposed Addition Site Elevations

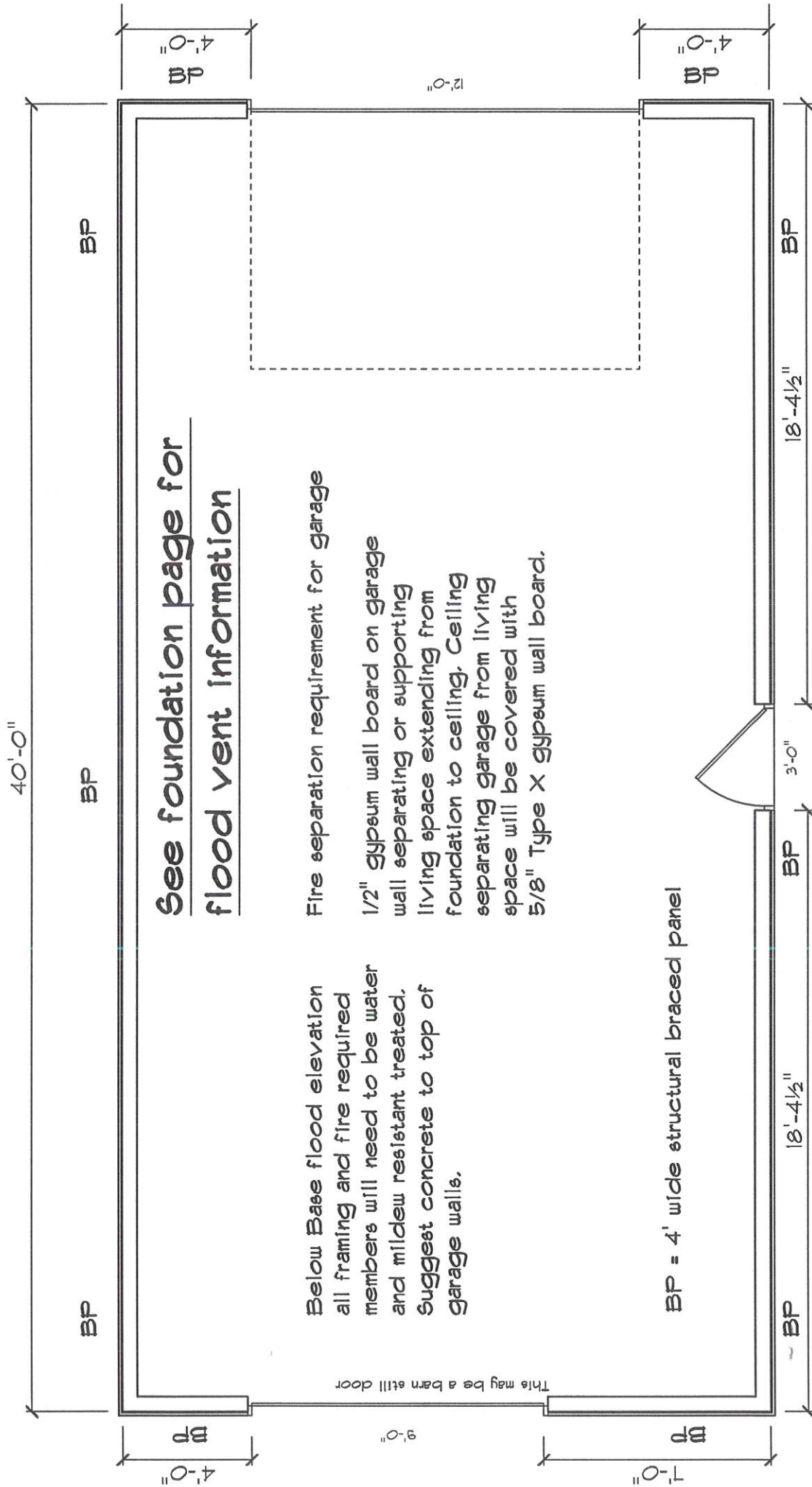
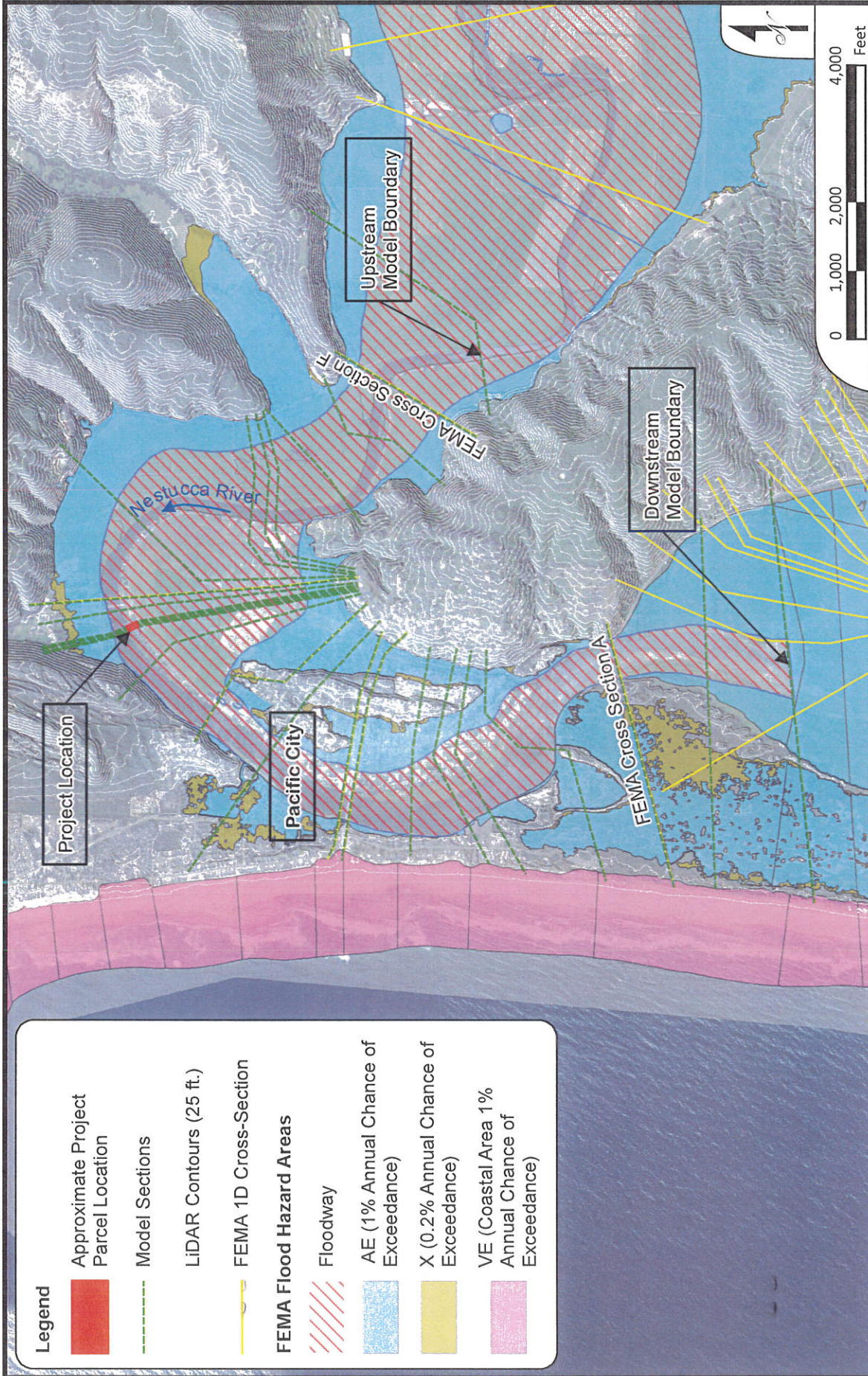


Figure 4b. Proposed Addition Site Plan



Hydraulic Analysis Overview Map

## Attachment A

### HEC-RAS Output Files



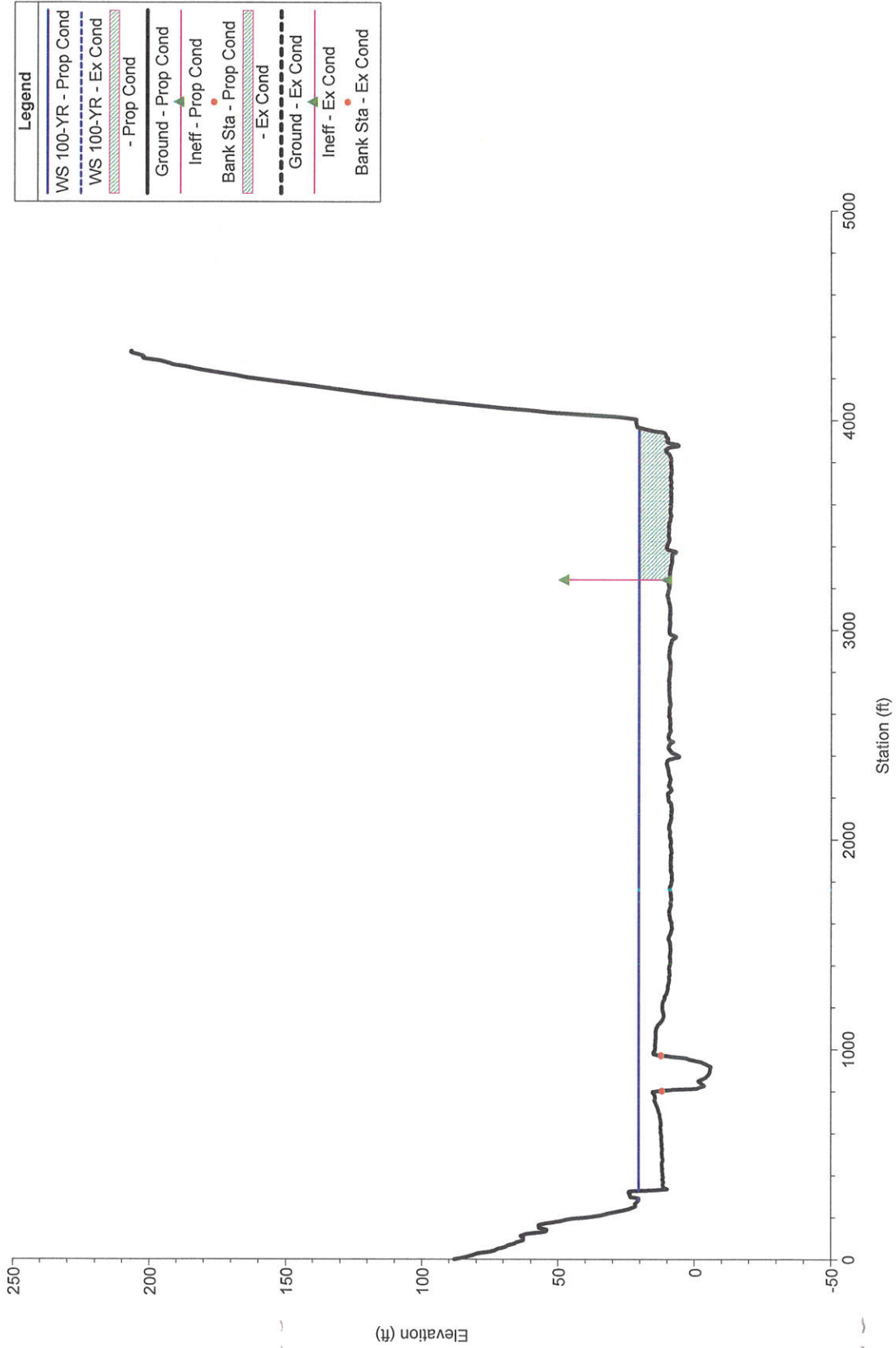
HEC-RAS River: Nestucca River Reach: Lower Profile: 100-YR

Reach	River Sta	Profile	Plan	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
Lower	22553.94	100-YR	Ex Cond	49700.00	-5.99	20.50	12.22	20.55	0.000090	3.06	32251.77	3644.73	0.11
Lower	22553.94	100-YR	Prop Cond	49700.00	-5.99	20.50	12.22	20.55	0.000090	3.06	32252.63	3644.74	0.11
Lower	21008.6	100-YR	Ex Cond	49700.00	-8.92	20.09		20.31	0.000259	5.18	17868.70	1743.78	0.20
Lower	21008.6	100-YR	Prop Cond	49700.00	-8.92	20.09		20.31	0.000259	5.18	17869.28	1743.78	0.20
Lower	20157.05	100-YR	Ex Cond	49700.00	-9.15	19.95	12.36	20.10	0.000212	4.43	20018.16	2302.31	0.17
Lower	20157.05	100-YR	Prop Cond	49700.00	-9.15	19.95	12.36	20.10	0.000212	4.43	20018.80	2302.31	0.17
Lower	19079.89	100-YR	Ex Cond	49700.00	-11.85	19.71		19.89	0.000228	5.02	20299.33	1888.76	0.18
Lower	19079.89	100-YR	Prop Cond	49700.00	-11.85	19.71		19.89	0.000228	5.02	20300.02	1888.76	0.18
Lower	18019.8	100-YR	Ex Cond	49700.00	-7.69	19.54	11.35	19.68	0.000186	4.31	22194.66	2668.28	0.16
Lower	18019.8	100-YR	Prop Cond	49700.00	-7.69	19.54	11.35	19.68	0.000186	4.31	22195.45	2668.28	0.16
Lower	17875.97	100-YR	Ex Cond	49700.00	-7.60	19.53	11.05	19.65	0.000168	4.13	23069.31	2677.07	0.16
Lower	17875.97	100-YR	Prop Cond	49700.00	-7.60	19.53	11.05	19.65	0.000168	4.13	23070.13	2677.07	0.16
Lower	17653.2	100-YR	Ex Cond	49700.00	-4.67	19.54	11.28	19.61	0.000095	3.21	29287.64	3181.66	0.12
Lower	17653.2	100-YR	Prop Cond	49700.00	-4.67	19.54	11.28	19.61	0.000095	3.21	29288.66	3181.66	0.12
Lower	15949.74	100-YR	Ex Cond	49700.00	-7.67	19.50	9.86	19.52	0.000032	1.90	46756.41	4377.65	0.07
Lower	15949.74	100-YR	Prop Cond	49700.00	-7.67	19.50	9.86	19.52	0.000032	1.90	46757.94	4377.65	0.07
Lower	14728.64	100-YR	Ex Cond	49700.00	-9.90	19.44	10.23	19.48	0.000043	2.46	37338.25	3855.81	0.09
Lower	14728.64	100-YR	Prop Cond	49700.00	-9.90	19.44	10.23	19.48	0.000043	2.46	37339.61	3855.82	0.09
Lower	14621.23		Bridge										
Lower	14544.91	100-YR	Ex Cond	49700.00	-8.62	19.42	10.32	19.46	0.000045	2.54	36922.60	3871.15	0.10
Lower	14544.91	100-YR	Prop Cond	49700.00	-8.62	19.42	10.32	19.47	0.000045	2.54	36923.95	3871.15	0.10
Lower	14278	100-YR	Ex Cond	49700.00	-8.55	19.41	10.38	19.45	0.000049	2.57	36885.62	3893.93	0.10
Lower	14278	100-YR	Prop Cond	49700.00	-8.55	19.41	10.38	19.45	0.000049	2.58	36581.84	3853.91	0.10
Lower	14255	100-YR	Ex Cond	49700.00	-8.54	19.41	10.35	19.45	0.000047	2.52	36698.96	3834.06	0.10
Lower	14255	100-YR	Prop Cond	49700.00	-8.54	19.41	10.35	19.45	0.000047	2.52	36698.96	3834.06	0.10
Lower	14226	100-YR	Ex Cond	49700.00	-8.53	19.41	10.29	19.45	0.000046	2.47	37040.01	3820.99	0.10
Lower	14226	100-YR	Prop Cond	49700.00	-8.53	19.41	10.29	19.45	0.000046	2.47	37040.01	3820.99	0.10

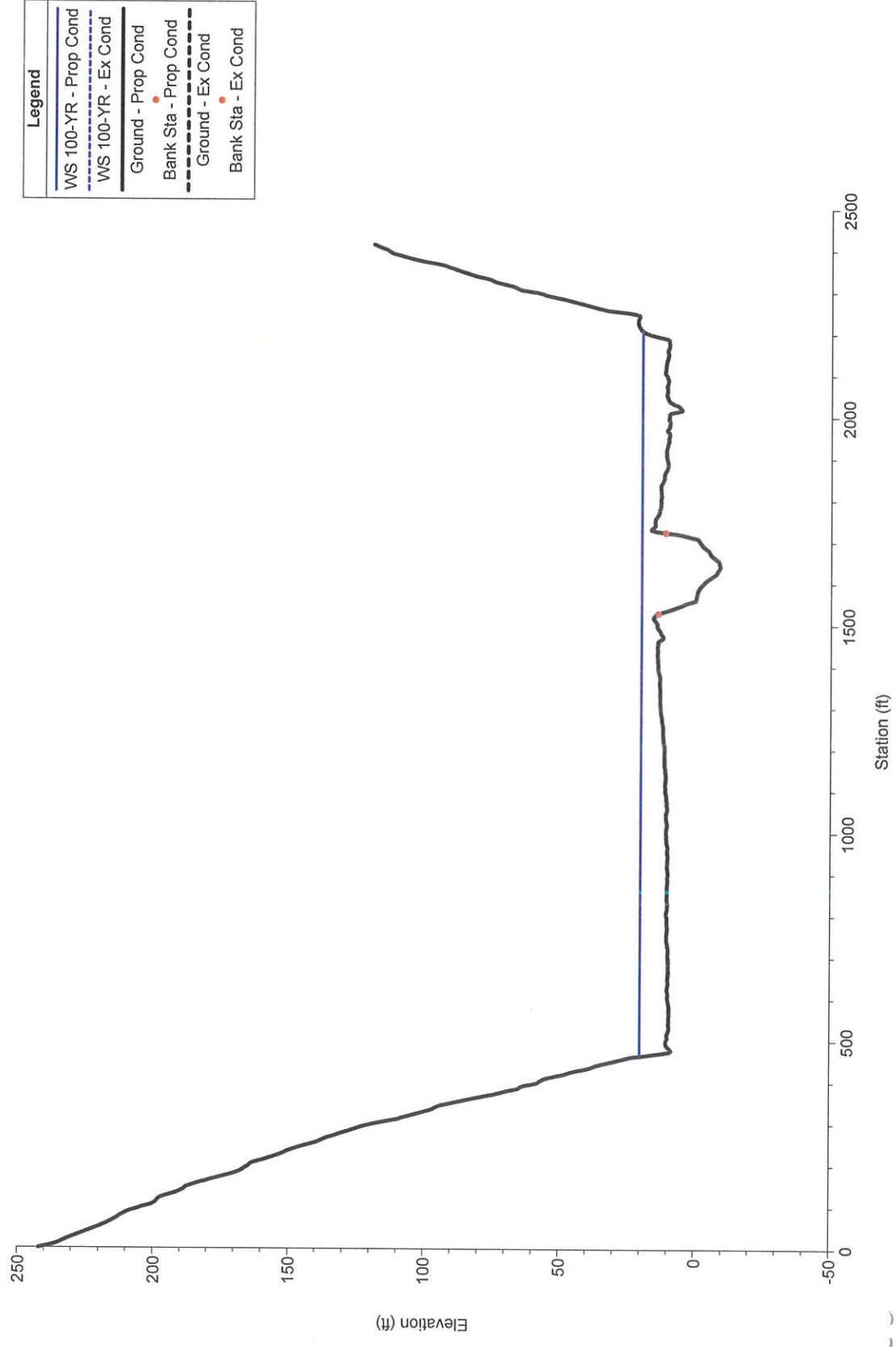
HEC-RAS River: Nestucca River Reach: Lower Profile: 100-YR (Continued)

Reach	River Sta	Profile	Plan	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
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Lower	14210	100-YR	Prop Cond	49700.00	-8.53	19.41	10.29	19.45	0.000046	2.45	37057.29	3902.26	0.10
Lower	13541.26	100-YR	Ex Cond	49700.00	-7.81	19.37	10.21	19.41	0.000052	2.50	32776.04	3280.36	0.10
Lower	13541.26	100-YR	Prop Cond	49700.00	-7.81	19.37	10.21	19.41	0.000052	2.50	32776.04	3280.36	0.10
Lower	12396	100-YR	Ex Cond	49700.00	-3.59	18.50		19.22	0.000463	7.06	9092.69	2049.83	0.30
Lower	12396	100-YR	Prop Cond	49700.00	-3.59	18.50		19.22	0.000463	7.06	9092.69	2049.83	0.30
Lower	11367.2	100-YR	Ex Cond	49700.00	-3.05	17.73	9.51	18.65	0.000621	7.83	7532.11	2017.15	0.34
Lower	11367.2	100-YR	Prop Cond	49700.00	-3.05	17.73	9.51	18.65	0.000621	7.83	7532.11	2017.15	0.34
Lower	10048.77	100-YR	Ex Cond	49700.00	-3.49	16.97	9.18	17.81	0.000619	7.53	8674.57	2062.18	0.34
Lower	10048.77	100-YR	Prop Cond	49700.00	-3.49	16.97	9.18	17.81	0.000619	7.53	8674.57	2062.18	0.34
Lower	9942.323		Bridge										
Lower	9904.361	100-YR	Ex Cond	49700.00	-8.44	16.82	8.05	17.51	0.000542	6.93	10023.92	2094.07	0.31
Lower	9904.361	100-YR	Prop Cond	49700.00	-8.44	16.82	8.05	17.51	0.000542	6.93	10023.92	2094.07	0.31
Lower	8988.11	100-YR	Ex Cond	49700.00	-4.80	16.61	8.14	16.97	0.000329	5.36	12949.13	1986.55	0.24
Lower	8988.11	100-YR	Prop Cond	49700.00	-4.80	16.61	8.14	16.97	0.000329	5.36	12949.13	1986.55	0.24
Lower	8192.259	100-YR	Ex Cond	49700.00	-18.19	16.35	6.30	16.72	0.000308	5.47	12921.58	2041.81	0.23
Lower	8192.259	100-YR	Prop Cond	49700.00	-18.19	16.35	6.30	16.72	0.000308	5.47	12921.58	2041.81	0.23
Lower	7839.108	100-YR	Ex Cond	49700.00	-6.96	16.25	6.76	16.61	0.000310	5.16	12464.76	1879.15	0.23
Lower	7839.108	100-YR	Prop Cond	49700.00	-6.96	16.25	6.76	16.61	0.000310	5.16	12464.76	1879.15	0.23
Lower	6628.945	100-YR	Ex Cond	49700.00	-1.36	16.04	6.84	16.27	0.000208	3.91	14212.35	3171.30	0.19
Lower	6628.945	100-YR	Prop Cond	49700.00	-1.36	16.04	6.84	16.27	0.000208	3.91	14212.35	3171.30	0.19
Lower	4746.314	100-YR	Ex Cond	49700.00	-11.72	14.76	7.45	15.56	0.000672	7.30	7417.23	2442.34	0.34
Lower	4746.314	100-YR	Prop Cond	49700.00	-11.72	14.76	7.45	15.56	0.000672	7.30	7417.23	2442.34	0.34
Lower	3370.732	100-YR	Ex Cond	49700.00	-3.40	14.28	6.63	14.73	0.000430	5.53	9803.55	3594.57	0.27
Lower	3370.732	100-YR	Prop Cond	49700.00	-3.40	14.28	6.63	14.73	0.000430	5.53	9803.55	3594.57	0.27
Lower	2099.855	100-YR	Ex Cond	49700.00	-3.90	14.15	5.85	14.31	0.000175	3.42	17693.71	5262.50	0.17
Lower	2099.855	100-YR	Prop Cond	49700.00	-3.90	14.15	5.85	14.31	0.000175	3.42	17693.71	5262.50	0.17

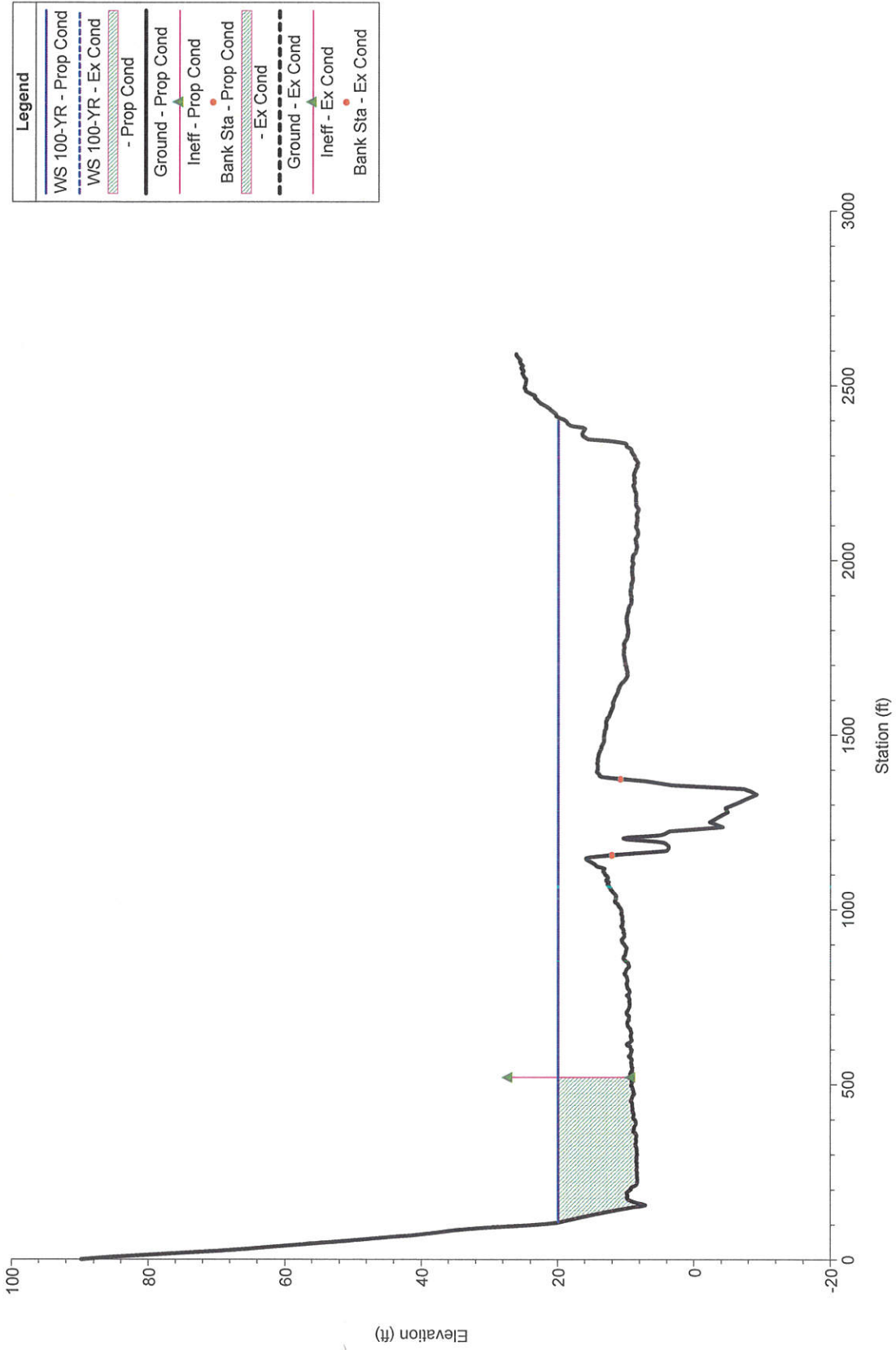
34080\_Brooten\_Rd\_Hydro  
RS = 22553.94



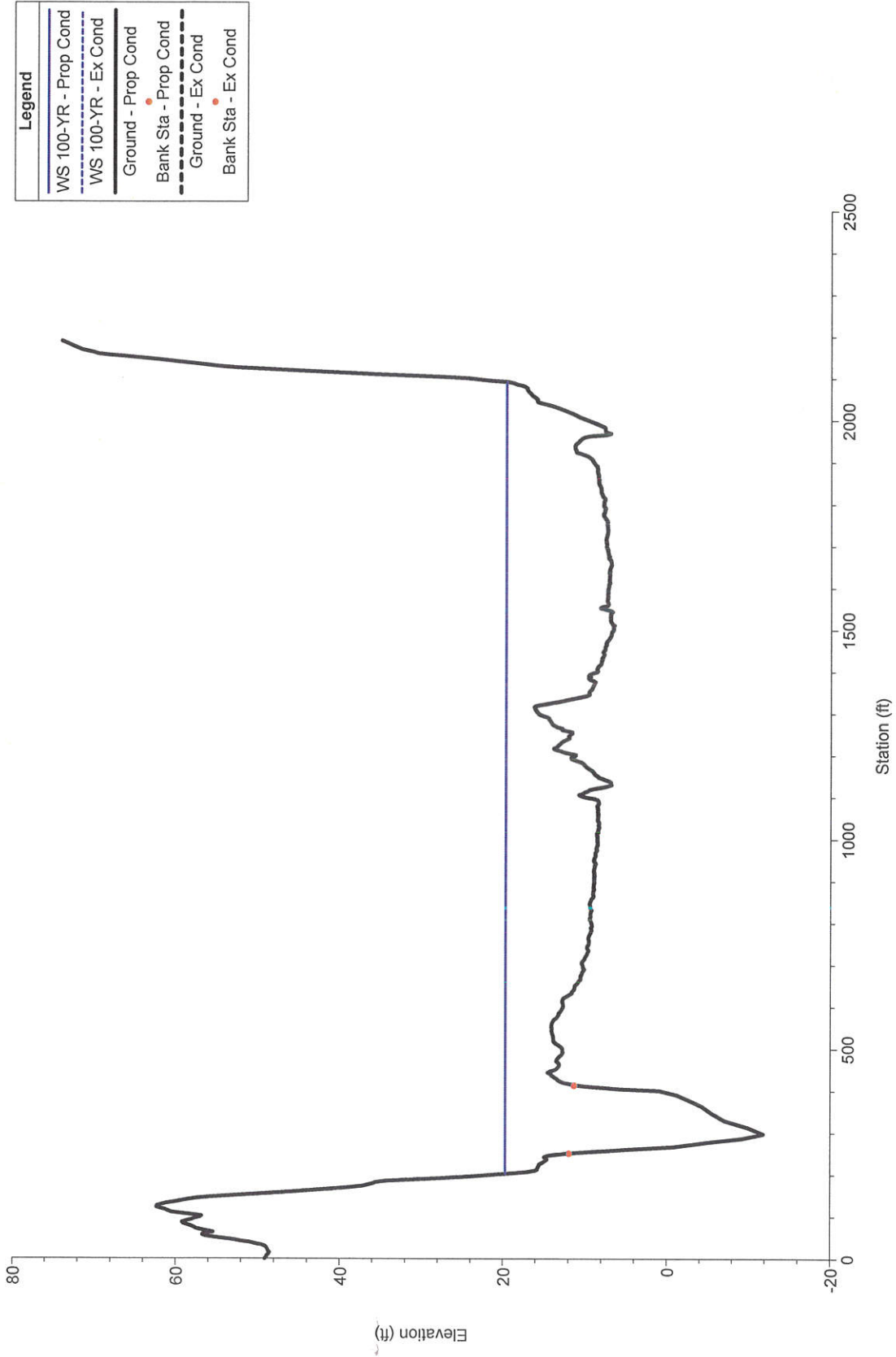
34080\_Brooten\_Rd\_Hydro  
RS = 2'1008.6



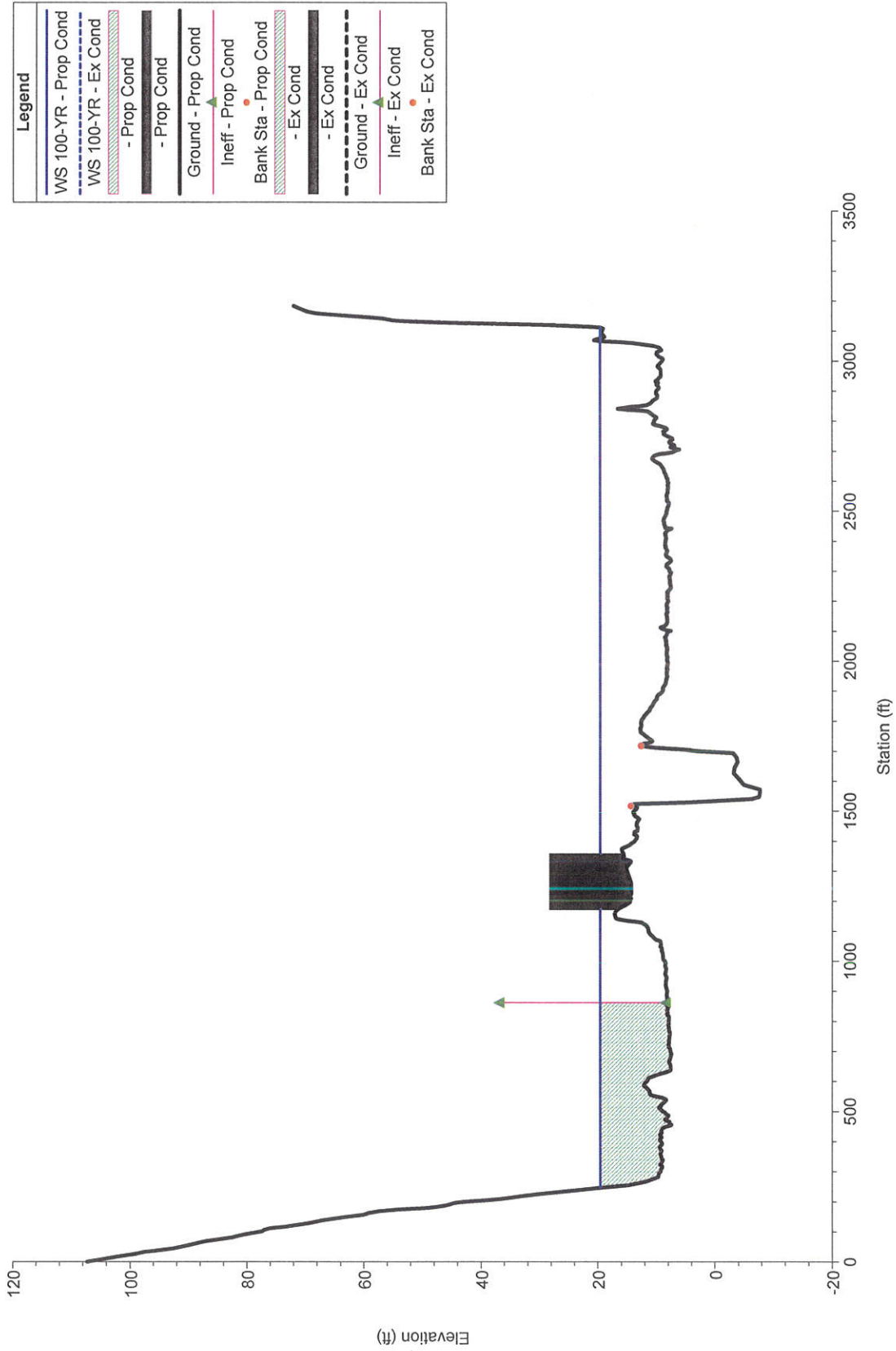
34080\_Brooten\_Rd\_Hydro  
RS = 20157.05



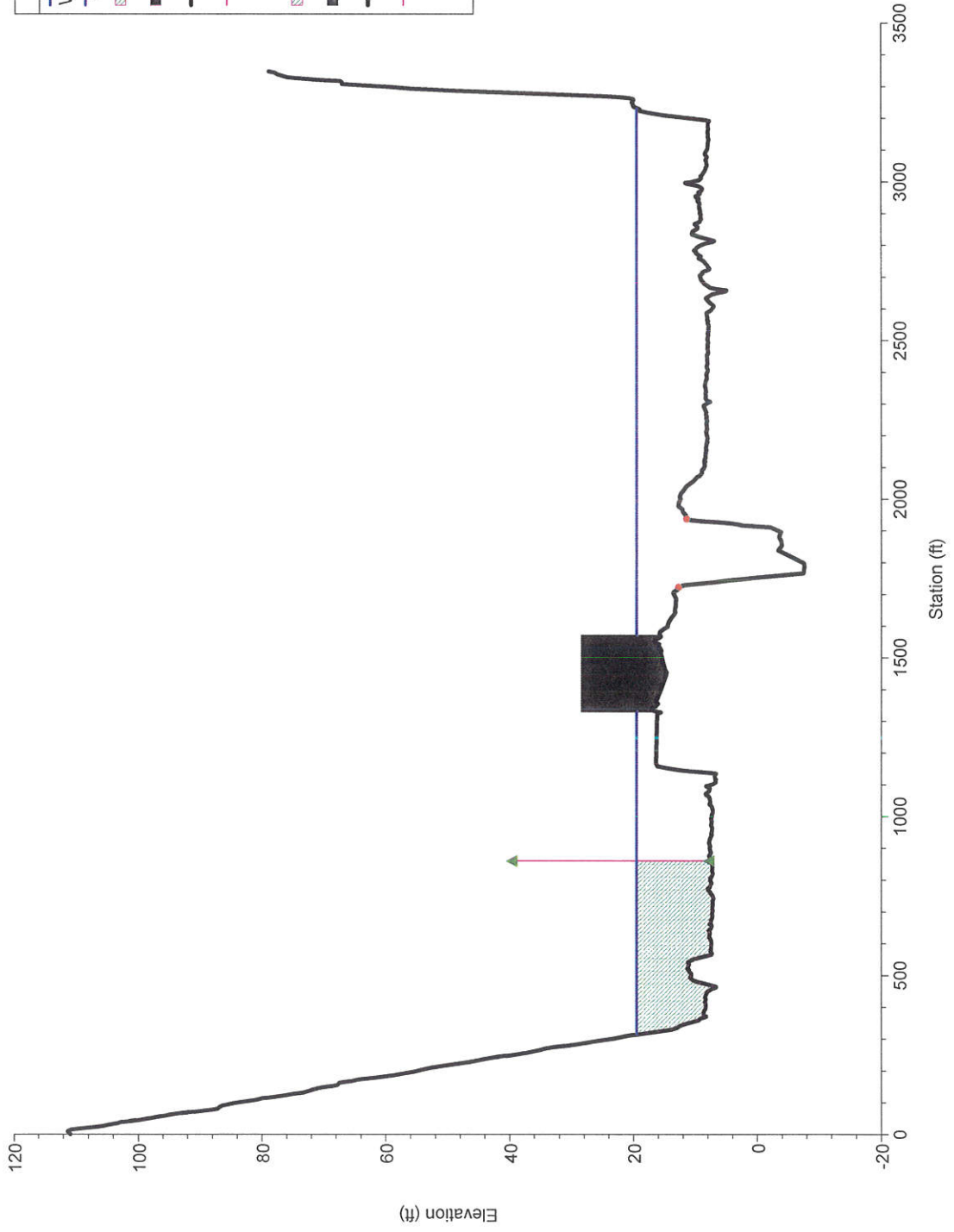
34080\_Brooten\_Rd\_Hydro  
RS = 19079.89



34080\_Brooten\_Rd\_Hydro  
RS = 18019.8



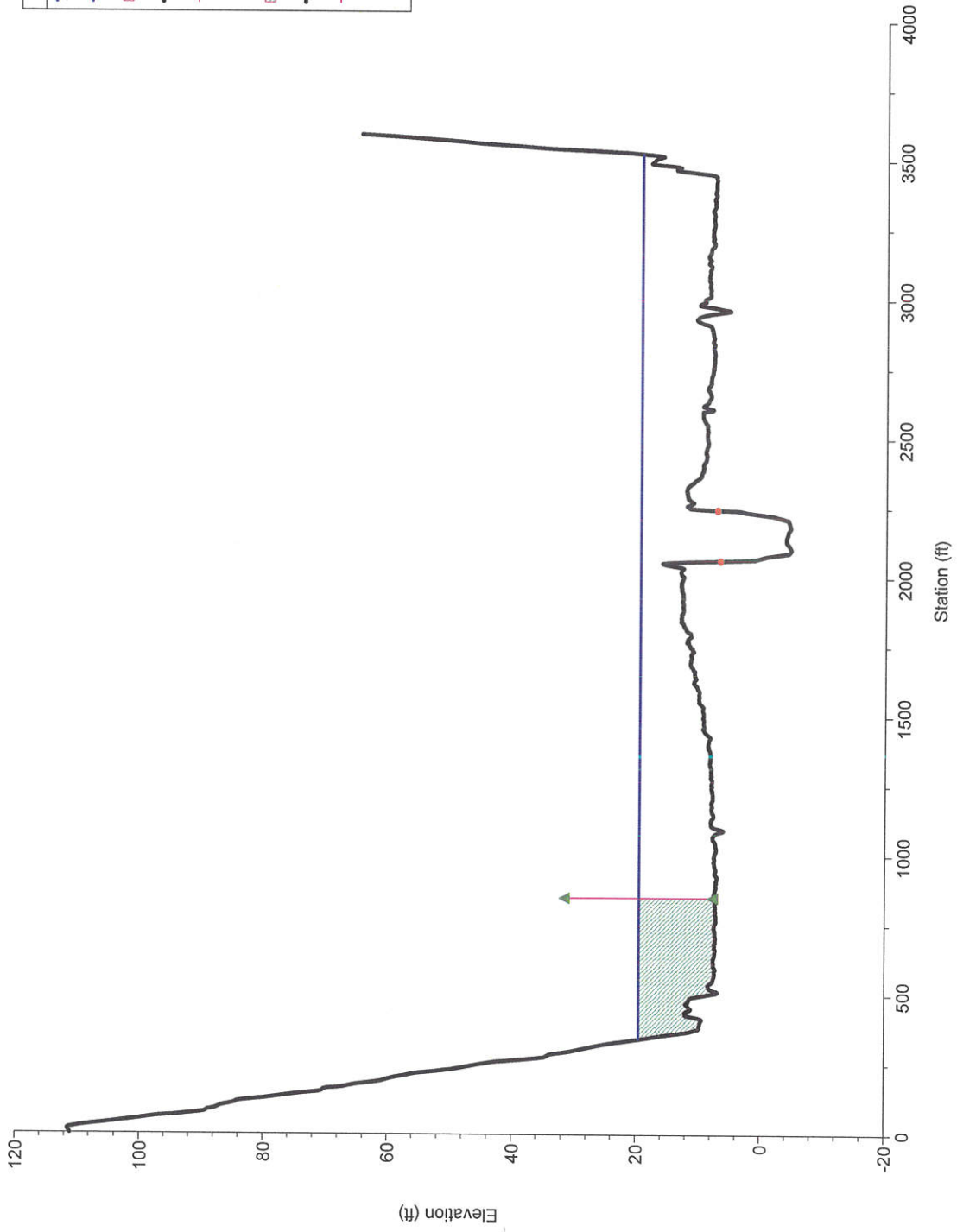
34080\_Brooten\_Rd\_Hydro  
RS = 17875.97



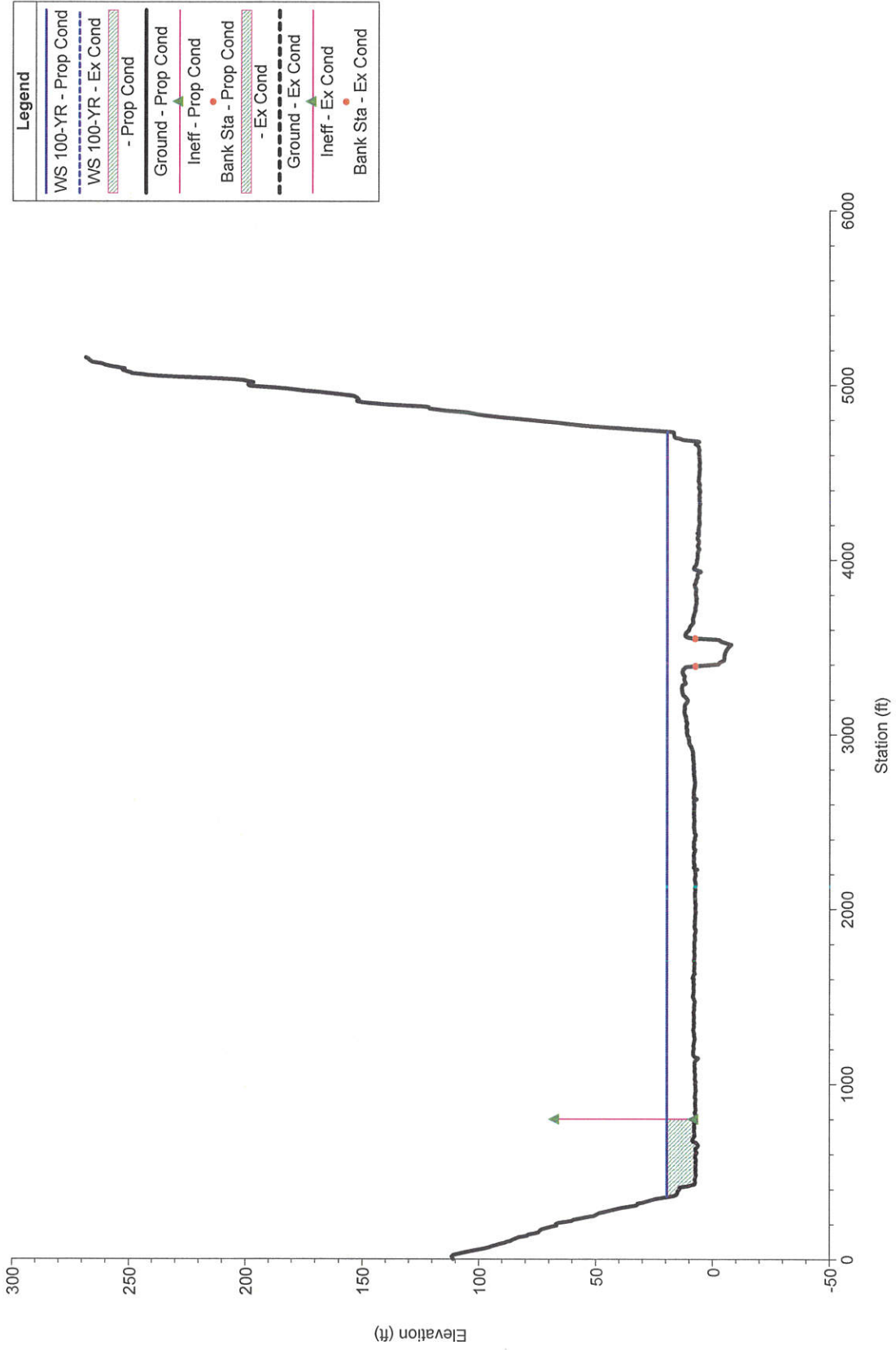
Legend	
WS 100-YR - Prop Cond	(Solid blue line)
WS 100-YR - Ex Cond	(Dashed blue line)
- Prop Cond	(Hatched pattern)
- Prop Cond	(Solid black line)
Ground - Prop Cond	(Solid black line)
Ineff - Prop Cond	(Pink line with upward arrow)
Bank Sta - Prop Cond	(Red dot)
- Ex Cond	(Hatched pattern)
- Ex Cond	(Solid black line)
Ground - Ex Cond	(Dashed black line)
Ineff - Ex Cond	(Pink line with upward arrow)
Bank Sta - Ex Cond	(Red dot)



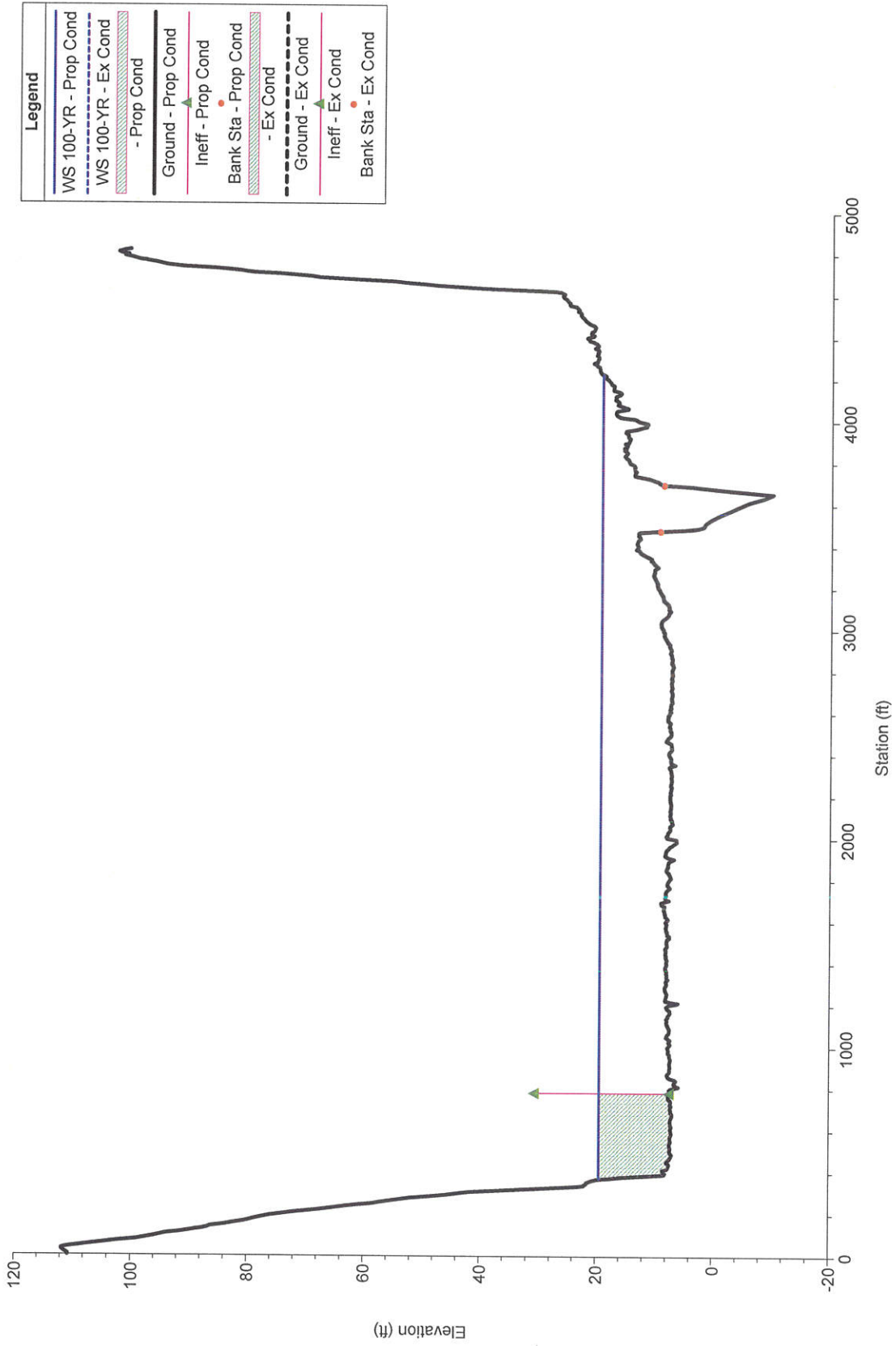
34080\_Brooten\_Rd\_Hydro  
RS = 17653.2



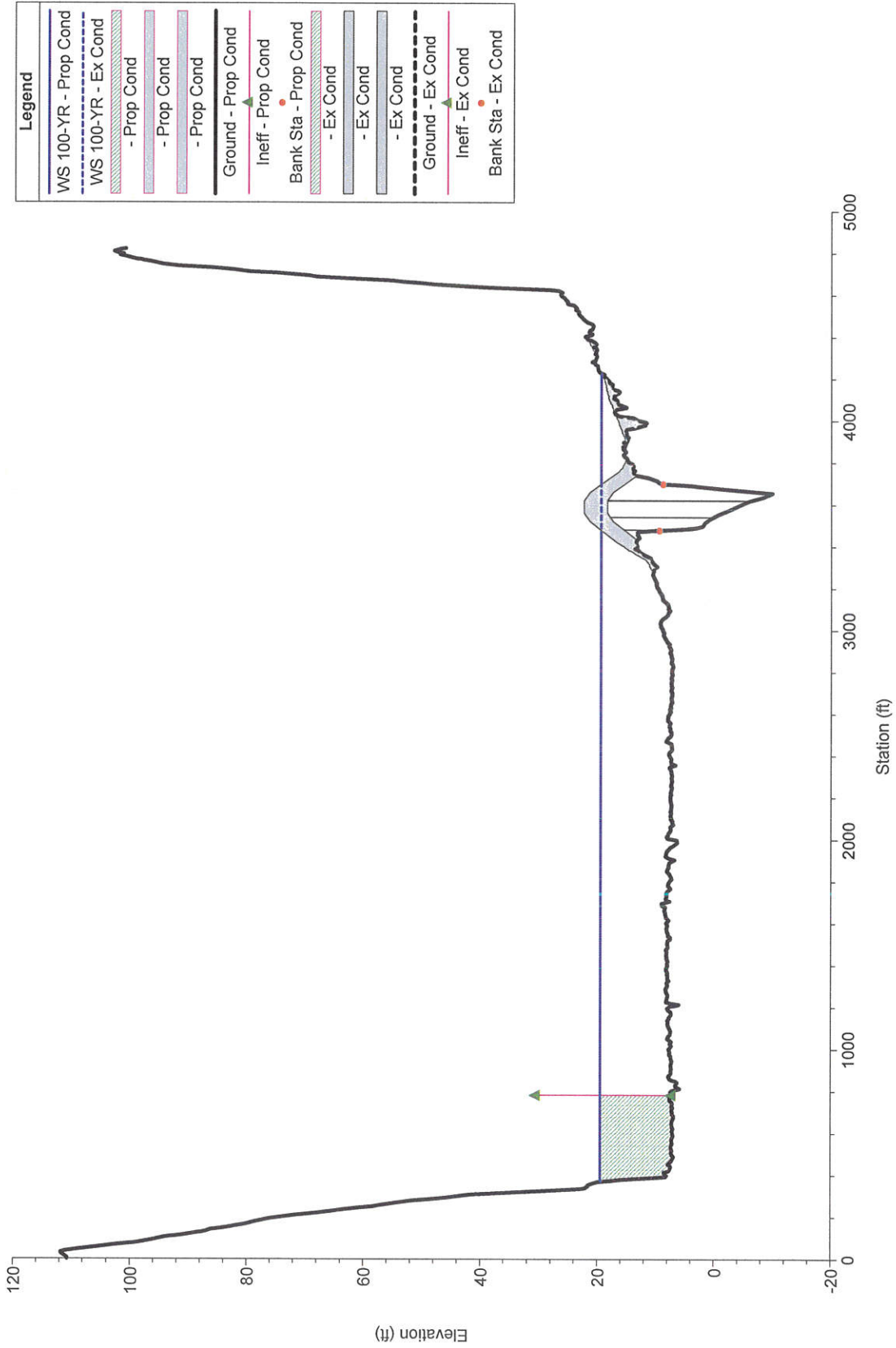
34080\_Brooten\_Rd\_Hydro  
RS = 15949.74



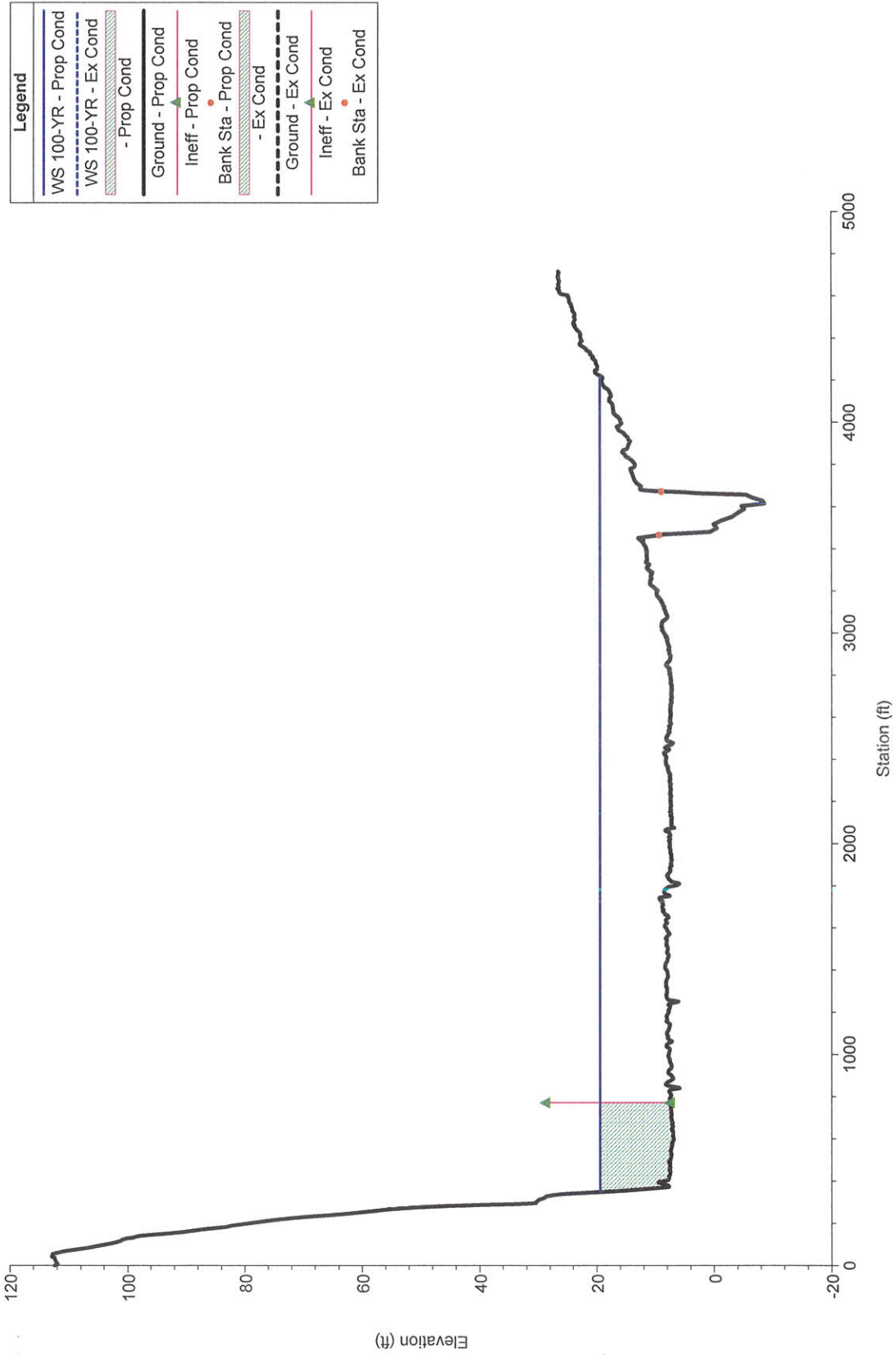
34080\_Brooten\_Rd\_Hydro  
RS = 14728.64



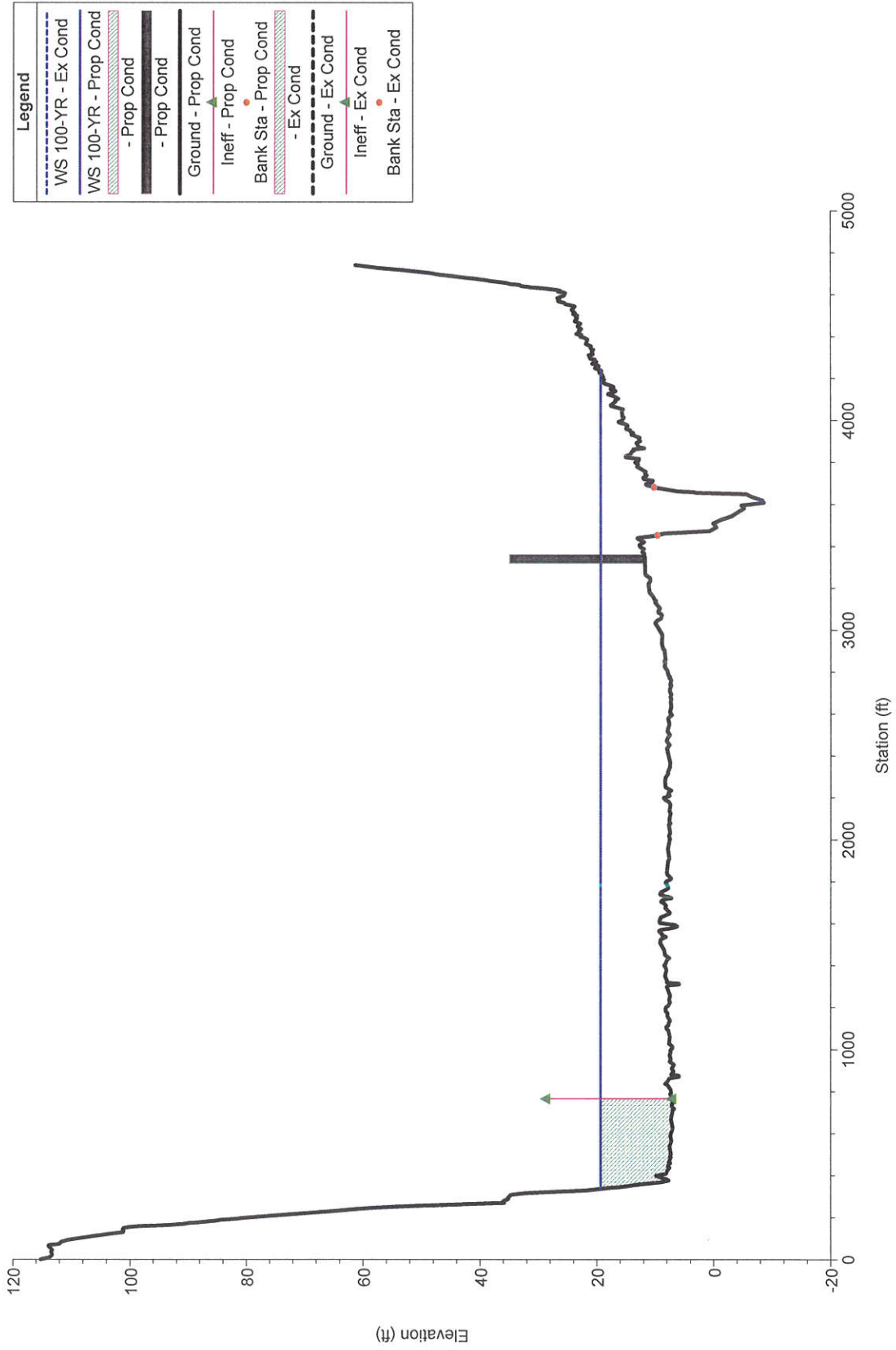
34080\_Brooten\_Rd\_Hydro  
RS = 14621.23 BR



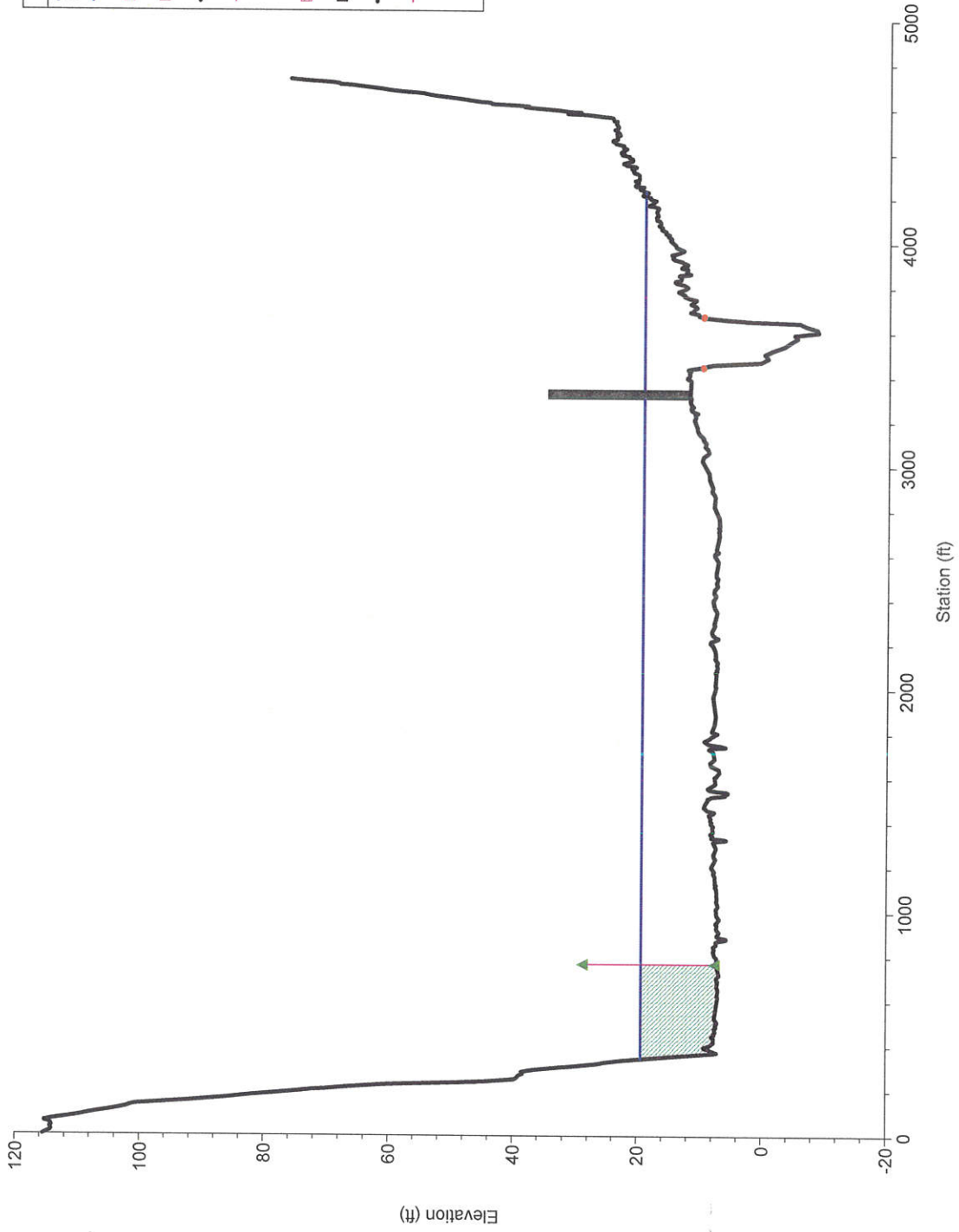
34080\_Brooten\_Rd\_Hydro  
RS = 14544.91



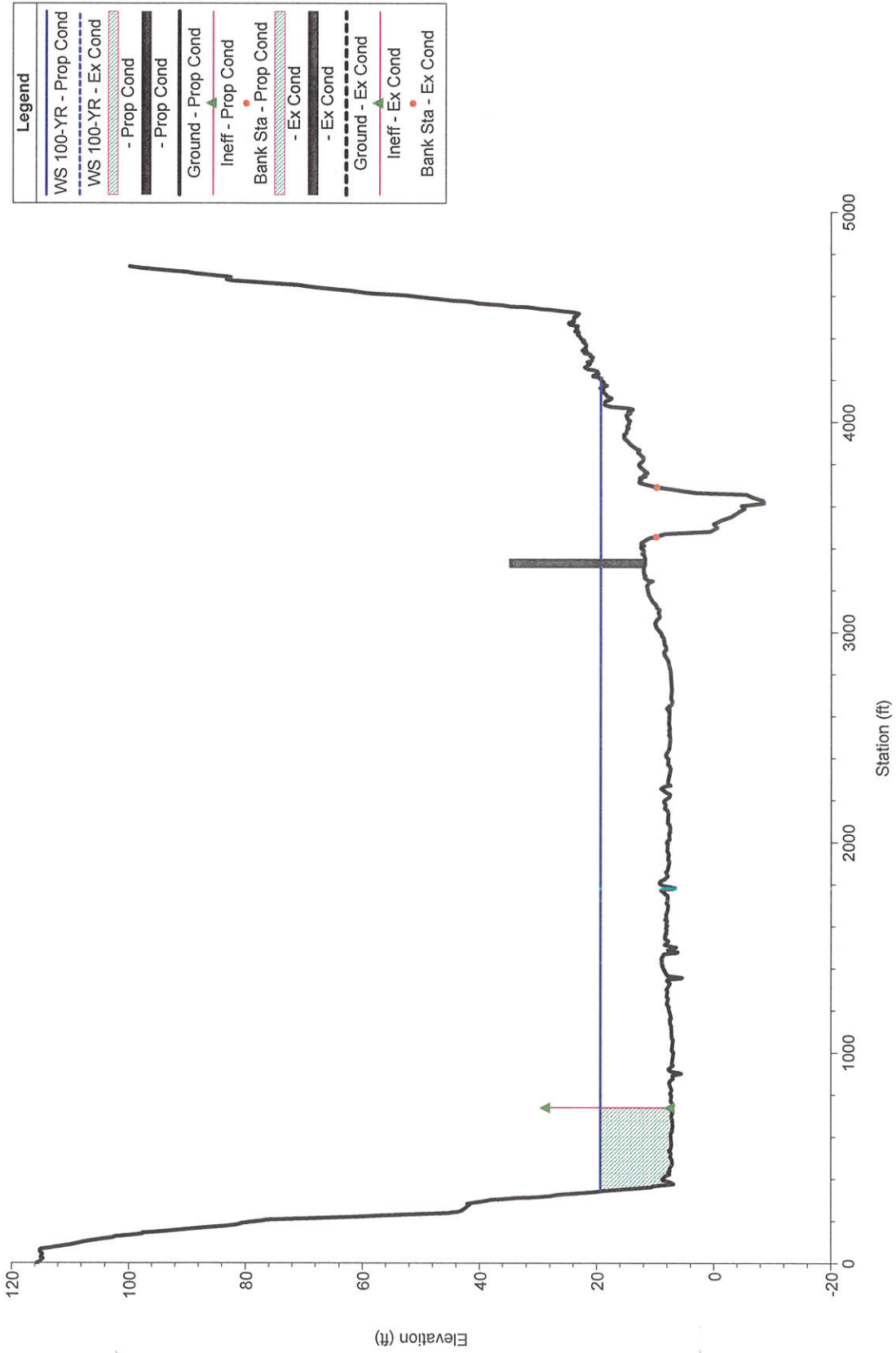
34080\_Brooten\_Rd\_Hydro  
RS = 14278



34080\_Brooten\_Rd\_Hydro  
RS = 14255

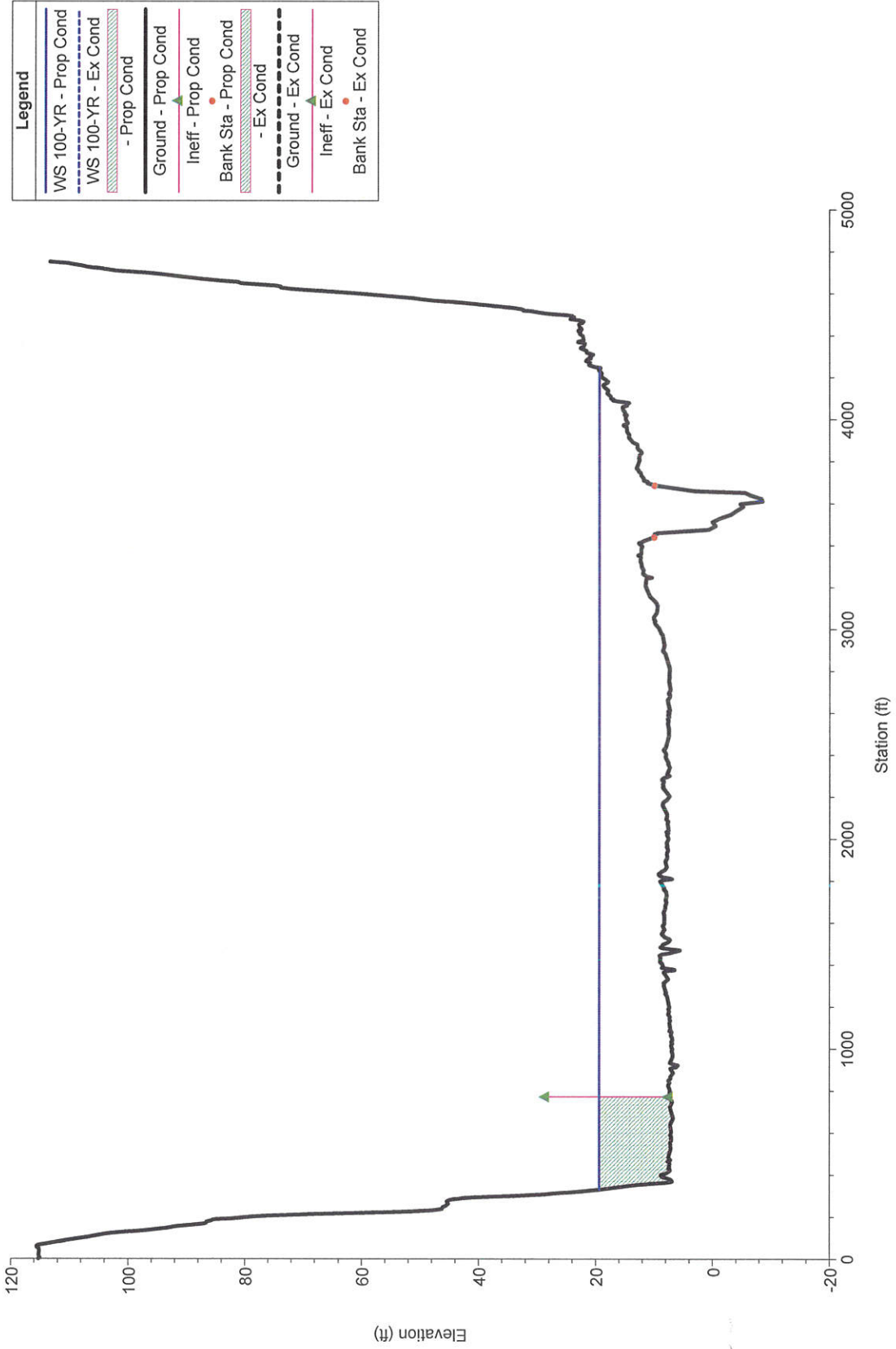


34080\_Brooten\_Rd\_Hydro  
RS = 14226

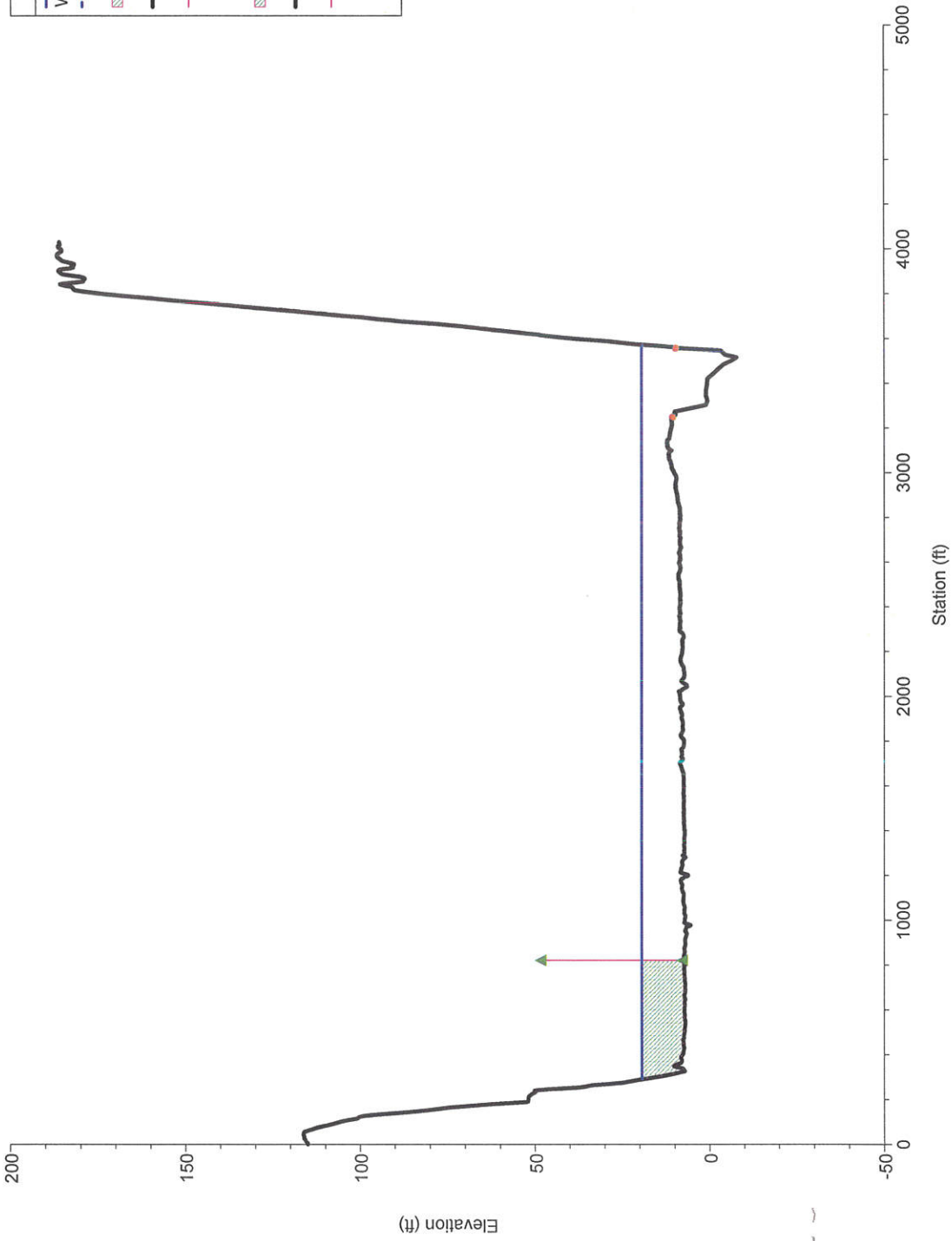




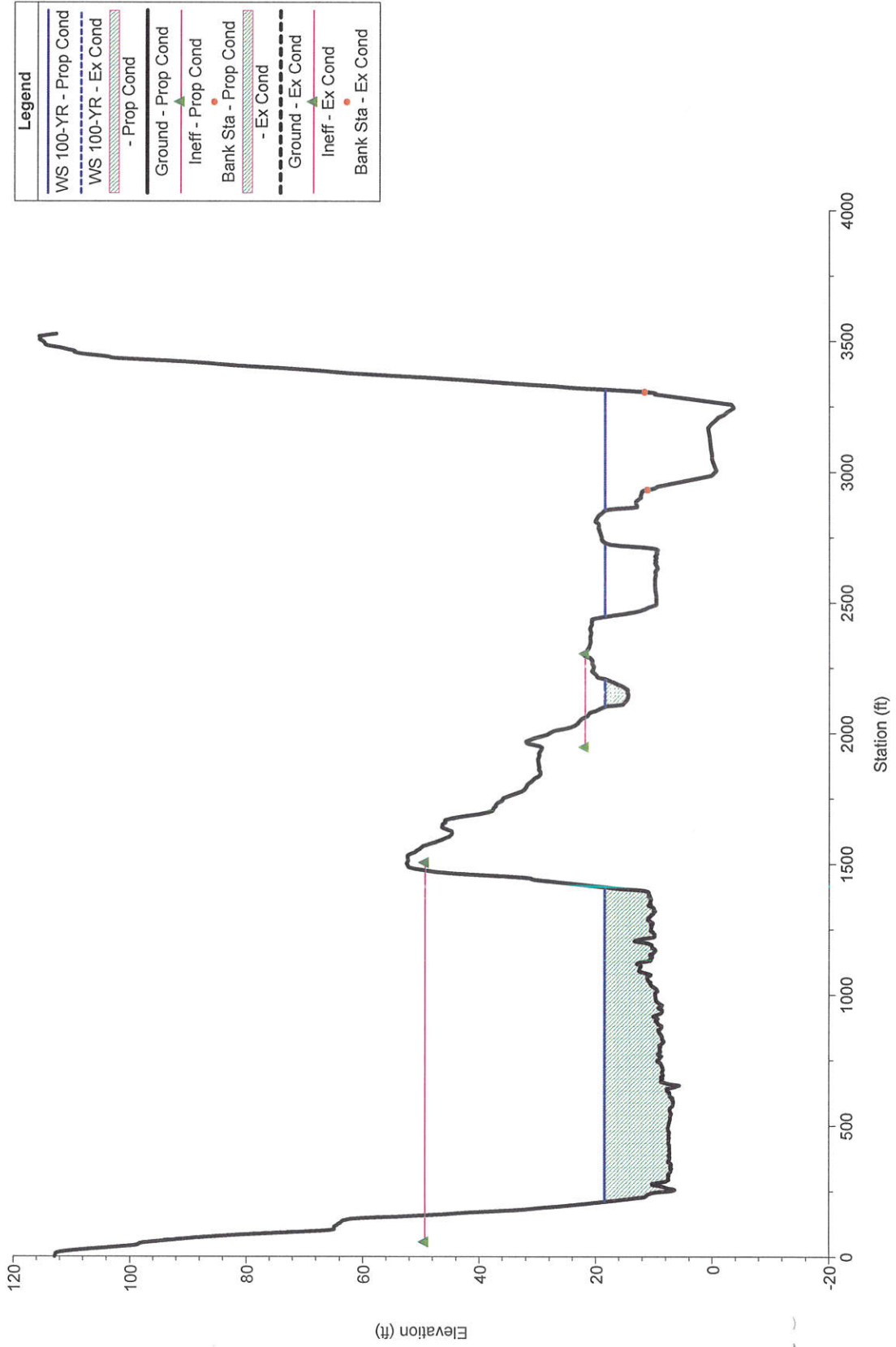
34080\_Brooten\_Rd\_Hydro  
RS = 14210



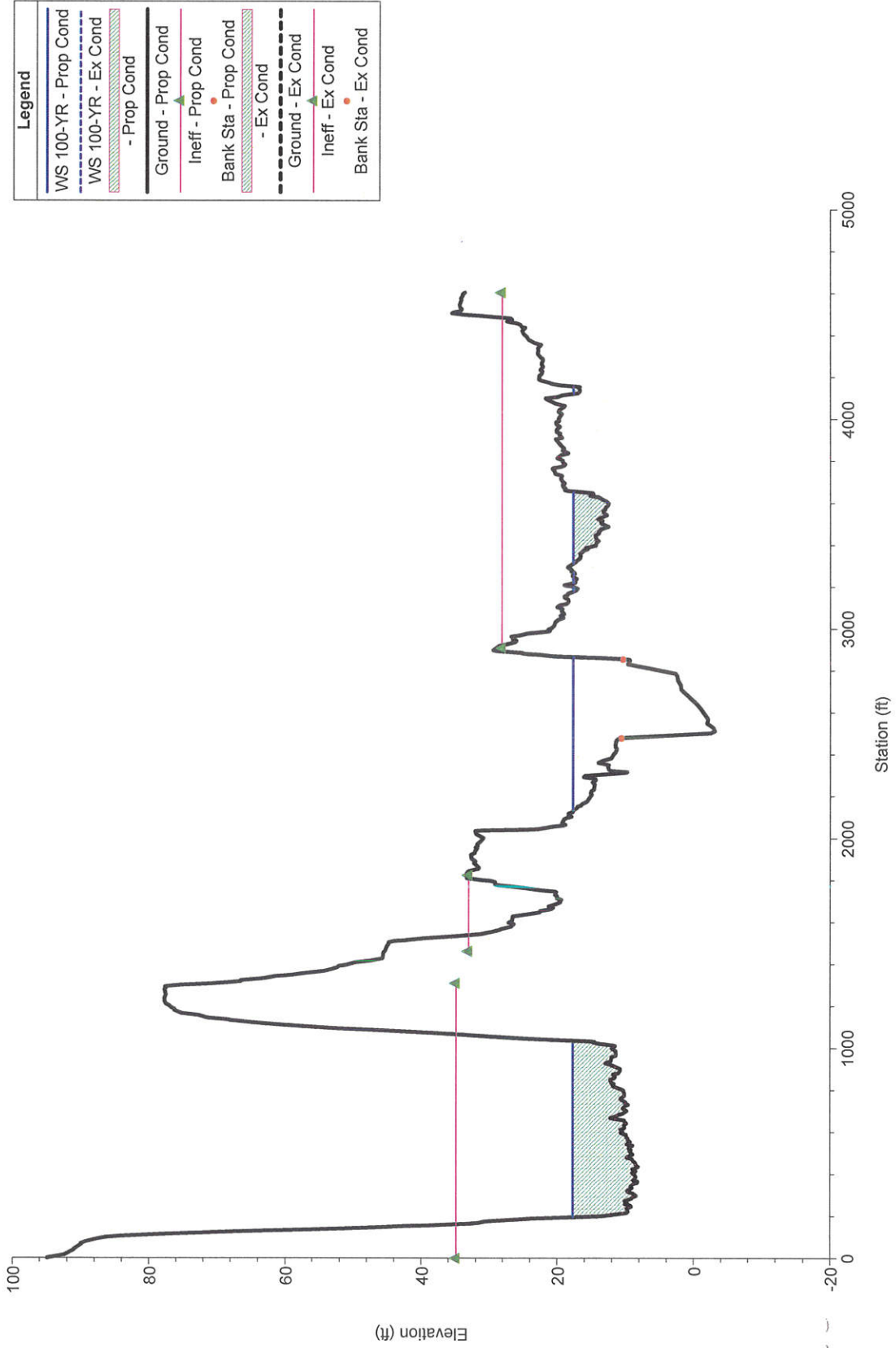
34080\_Brooten\_Rd\_Hydro  
RS = 13541.26



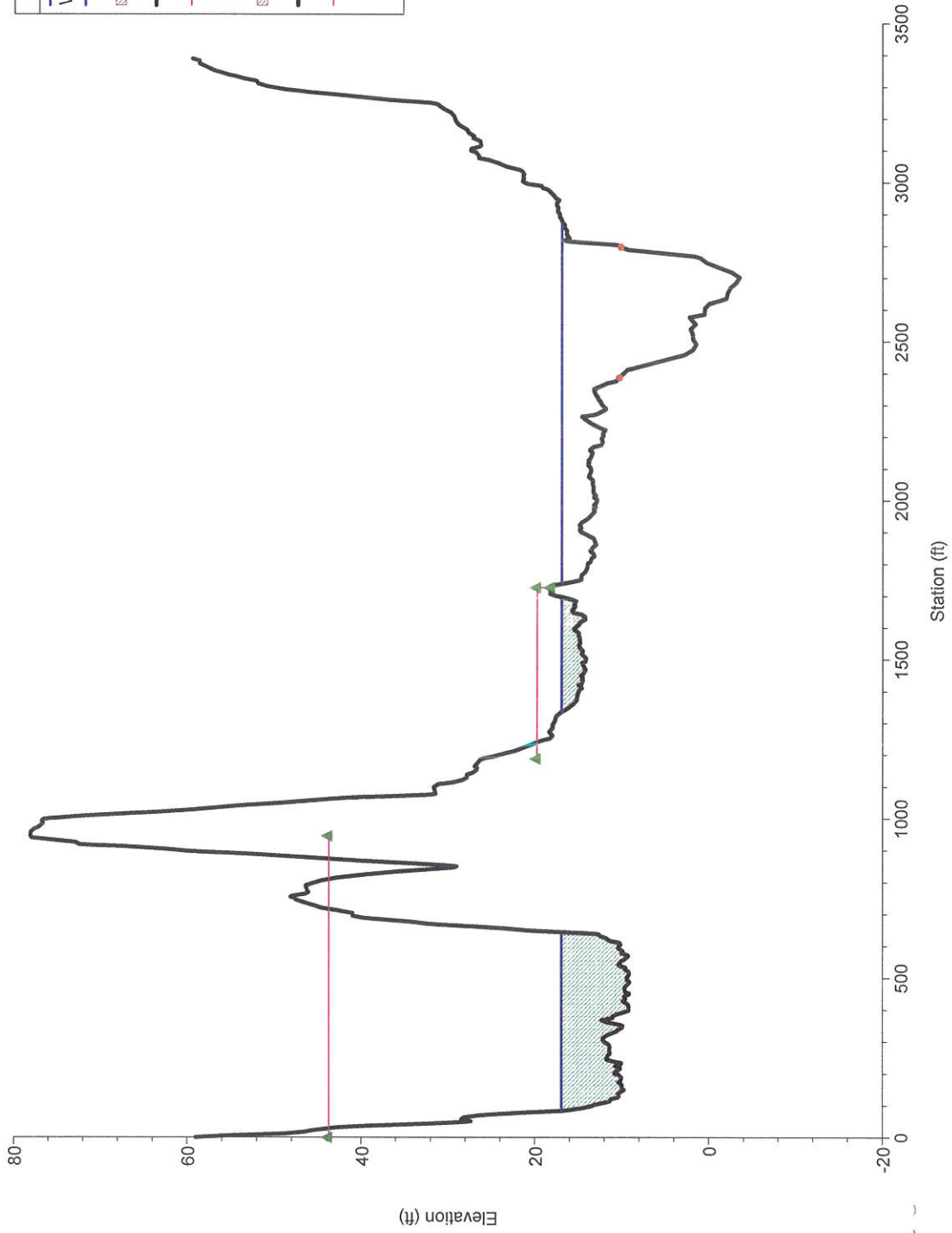
34080\_Brooten\_Rd\_Hydro  
RS = 12396



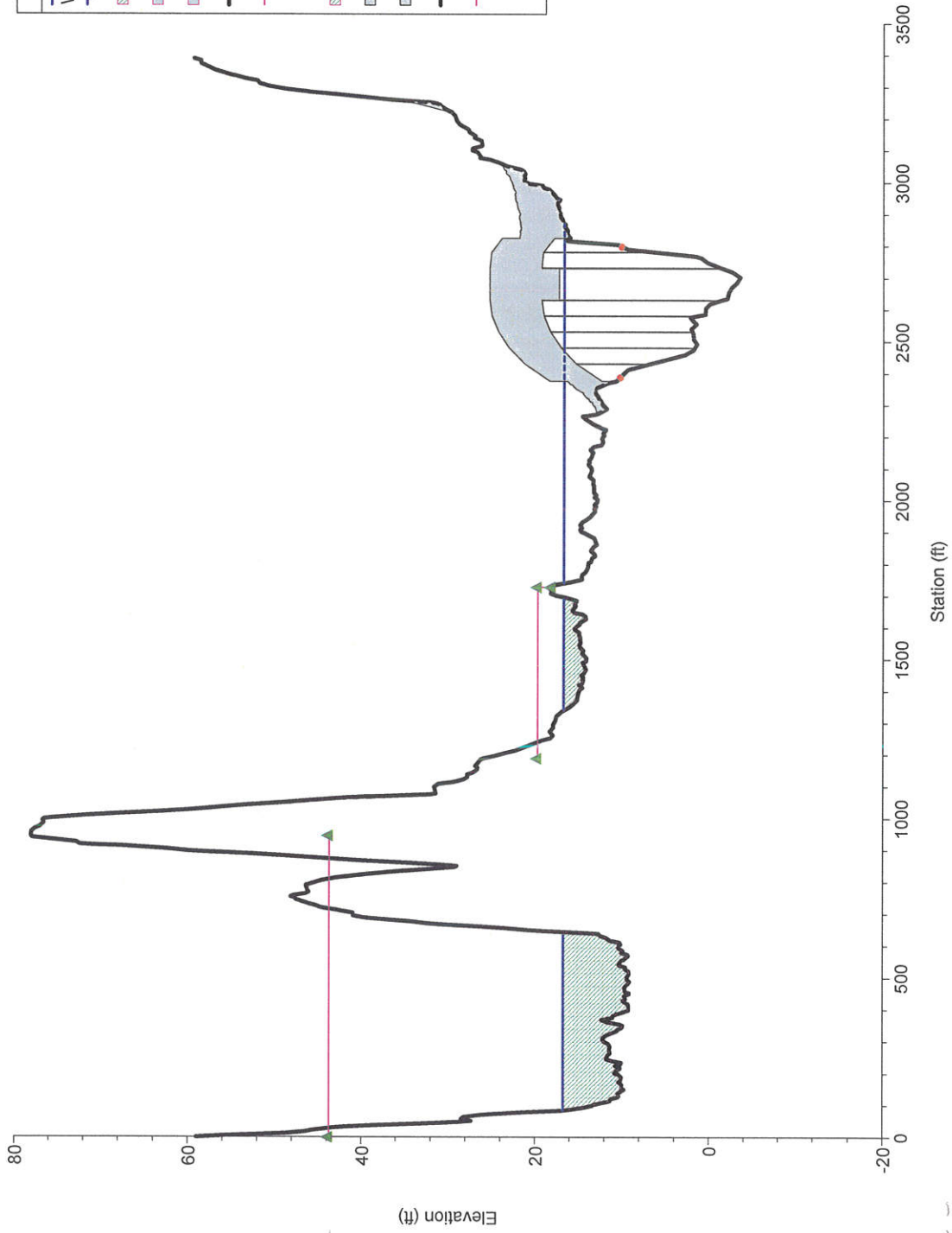
34080\_Brooten\_Rd\_Hydro  
RS = 11367.2



34080\_Brooten\_Rd\_Hydro  
RS = 10048.77

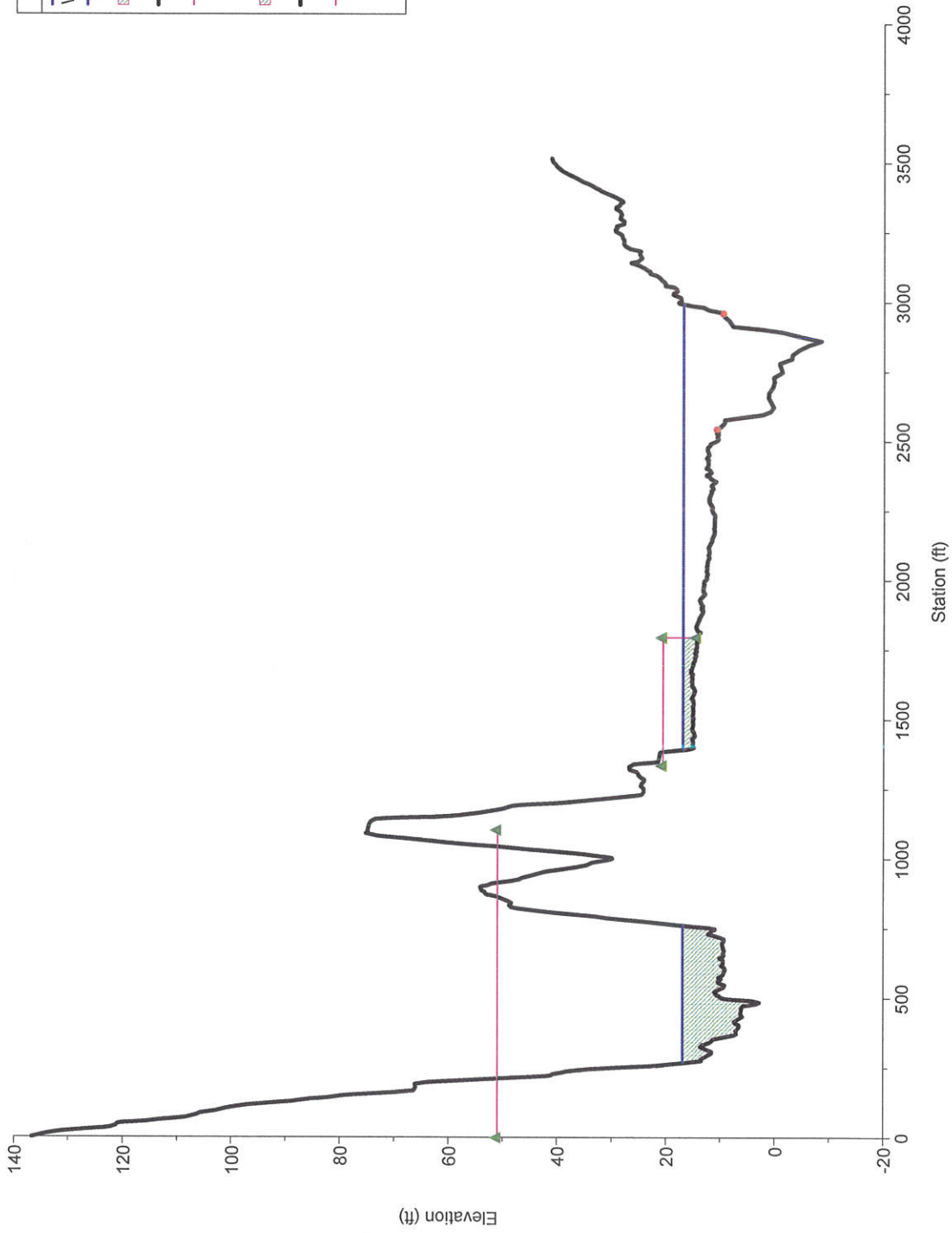


34080\_Brooten\_Rd\_Hydro  
RS = 9942.323 BR



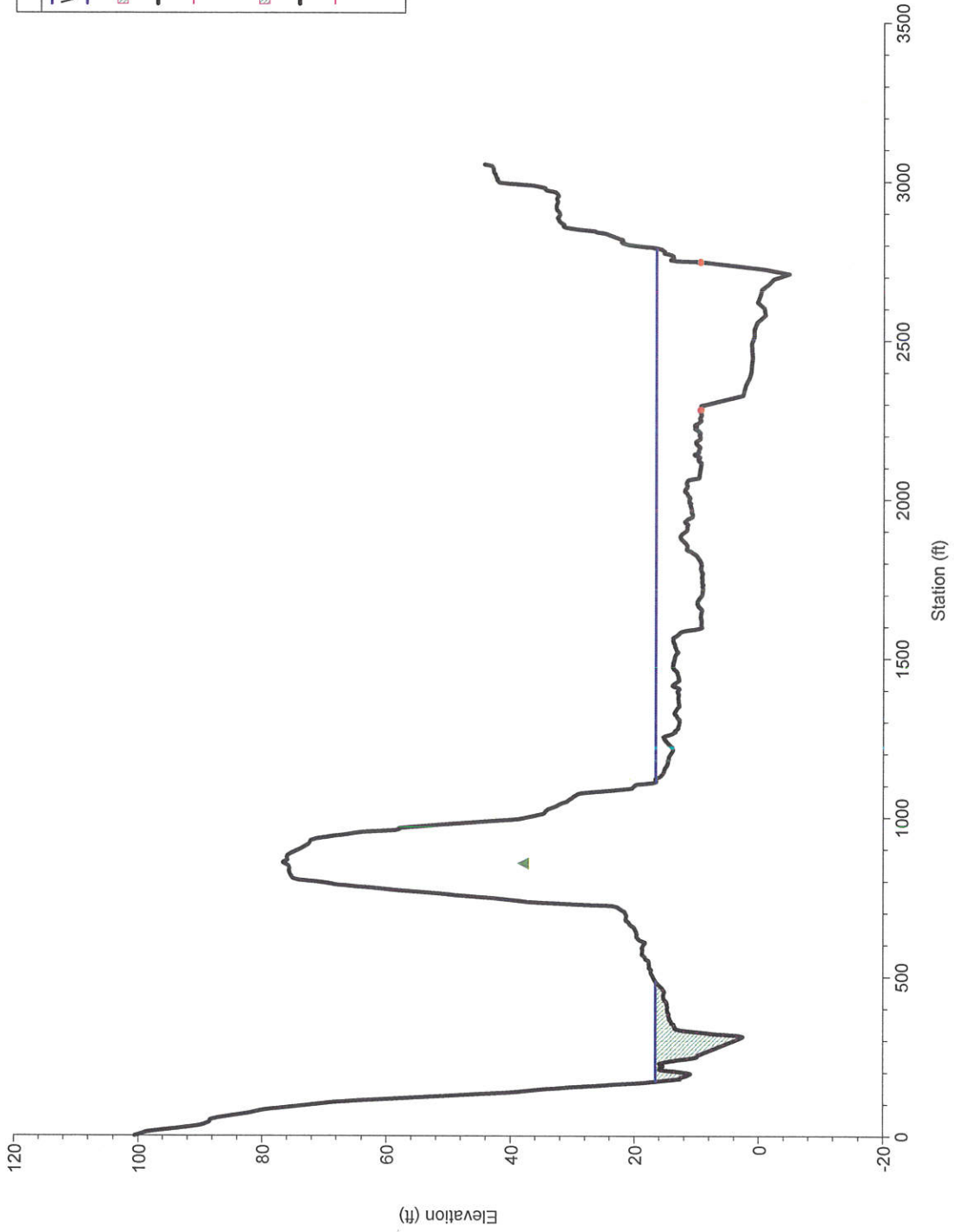
Legend	
WS 100-YR - Prop Cond	(Solid black line)
WS 100-YR - Ex Cond	(Dashed black line)
- Prop Cond	(Hatched area)
- Prop Cond	(Light blue shaded area)
- Prop Cond	(Light purple shaded area)
Ground - Prop Cond	(Solid black line)
Ineff - Prop Cond	(Red line with green triangle)
Bank Sta - Prop Cond	(Red line with red circle)
- Ex Cond	(Hatched area)
- Ex Cond	(Light blue shaded area)
- Ex Cond	(Light purple shaded area)
Ground - Ex Cond	(Dashed black line)
Ineff - Ex Cond	(Red line with green triangle)
Bank Sta - Ex Cond	(Red line with red circle)

34080\_Brooten\_Rd\_Hydro  
RS = 9904.361



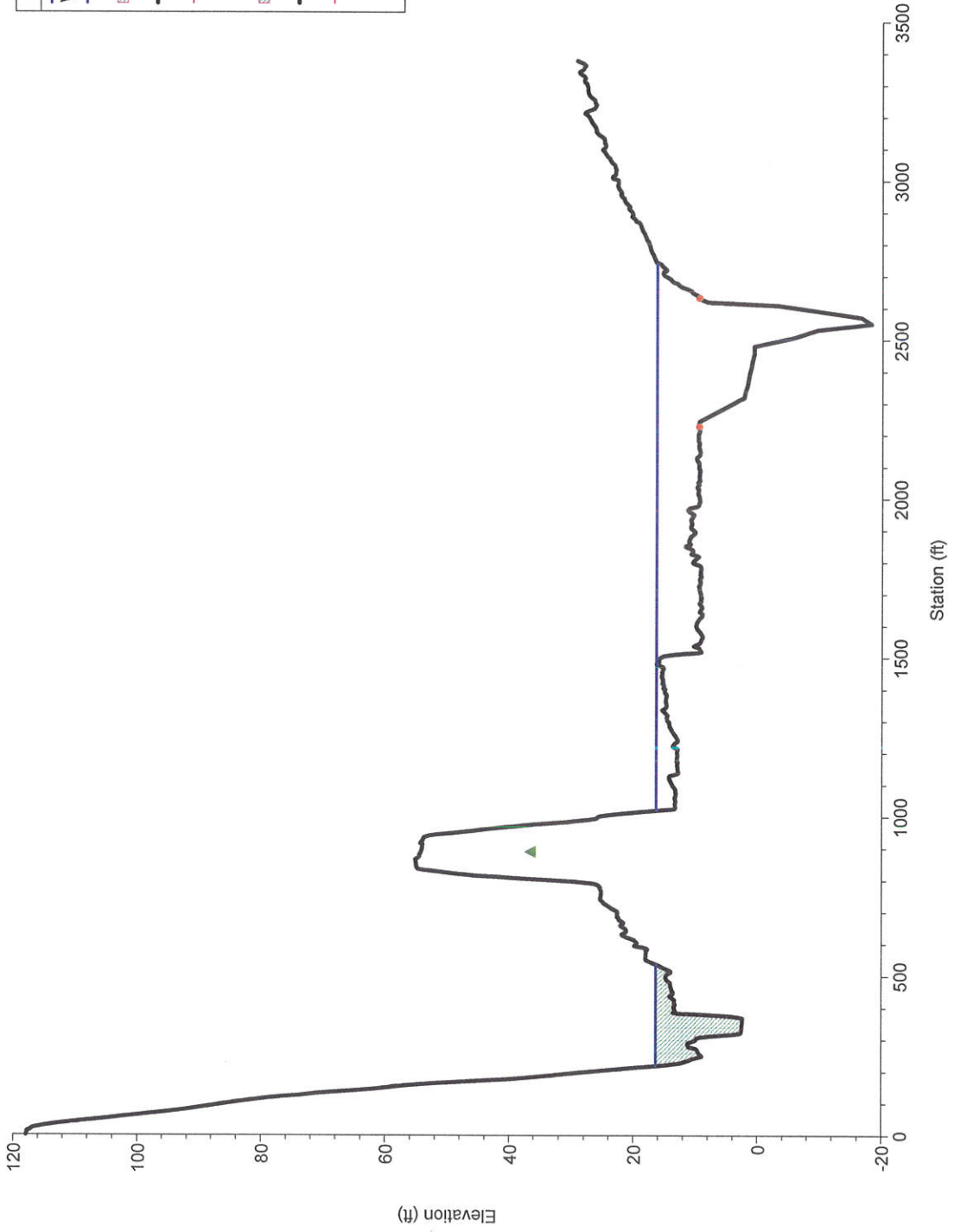
Legend	
WS 100-YR - Prop Cond	—
WS 100-YR - Ex Cond	- - -
- Prop Cond	▨
Ground - Prop Cond	—
Ineff - Prop Cond	▲
Bank Sta - Prop Cond	●
- Ex Cond	▨
Ground - Ex Cond	- - -
Ineff - Ex Cond	▲
Bank Sta - Ex Cond	●

34080\_Brooten\_Rd\_Hydro  
RS = 8988.11

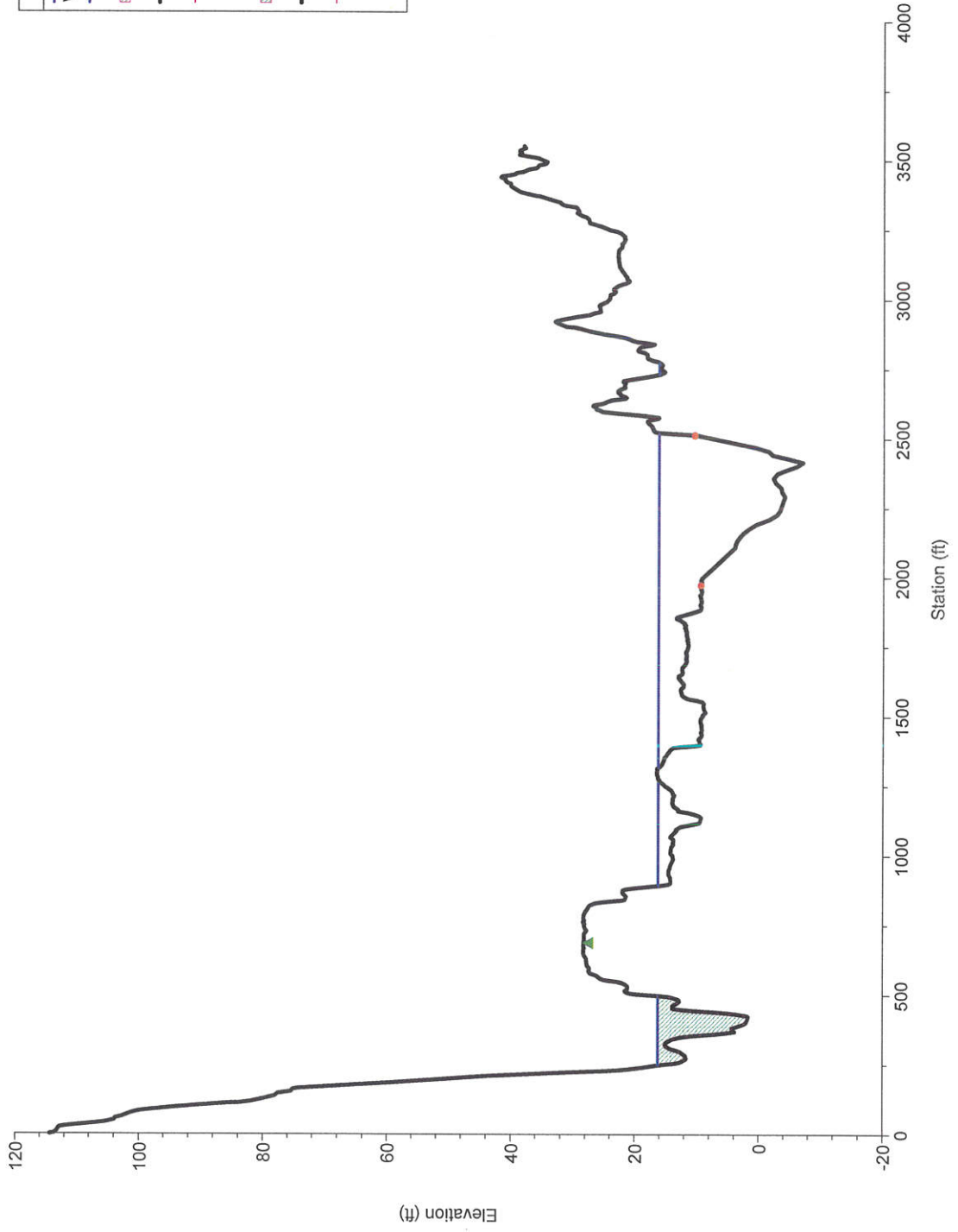




34080\_Brooten\_Rd\_Hydro  
RS = 8192.259

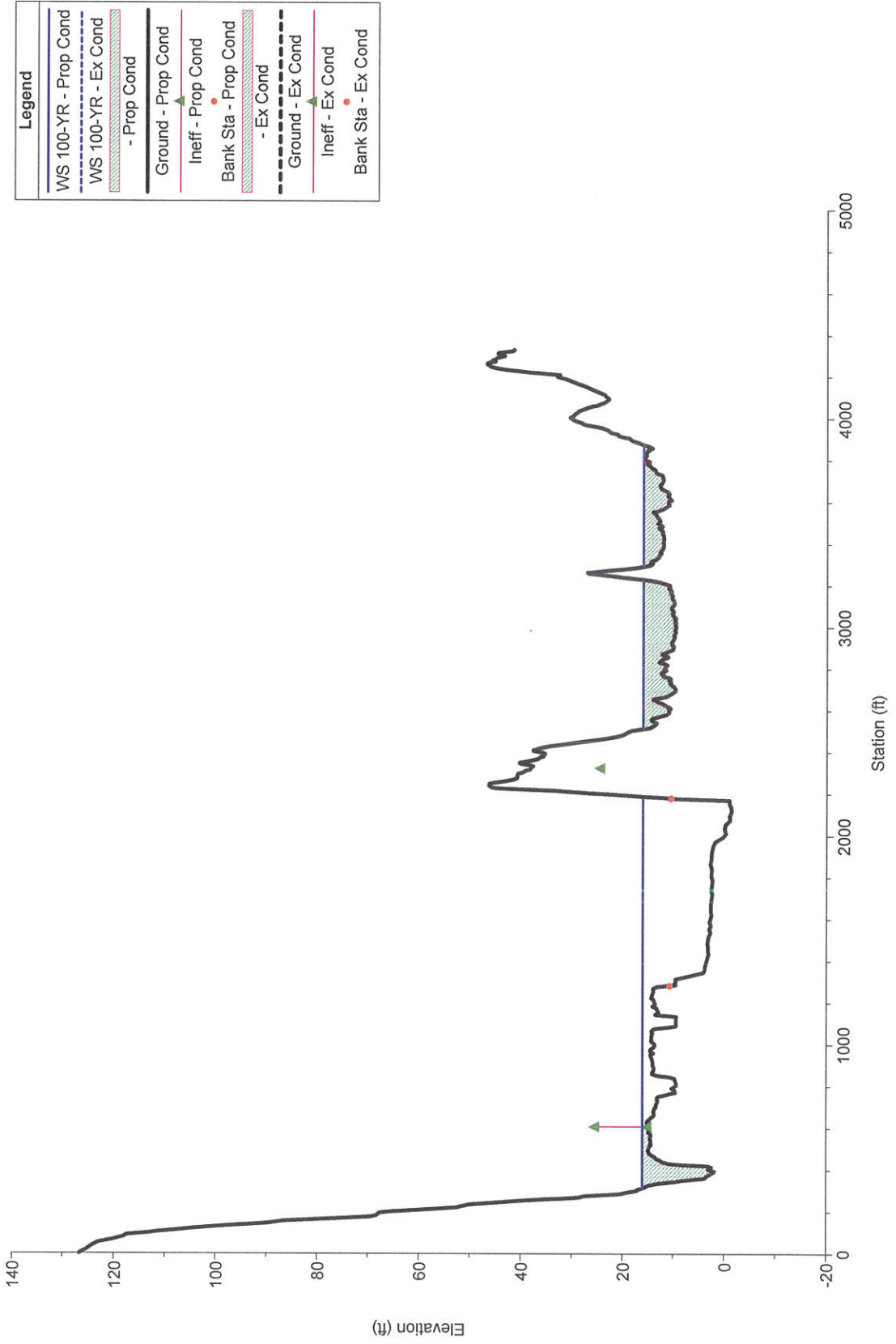


34080\_Brooten\_Rd\_Hydro  
RS = 7839.108

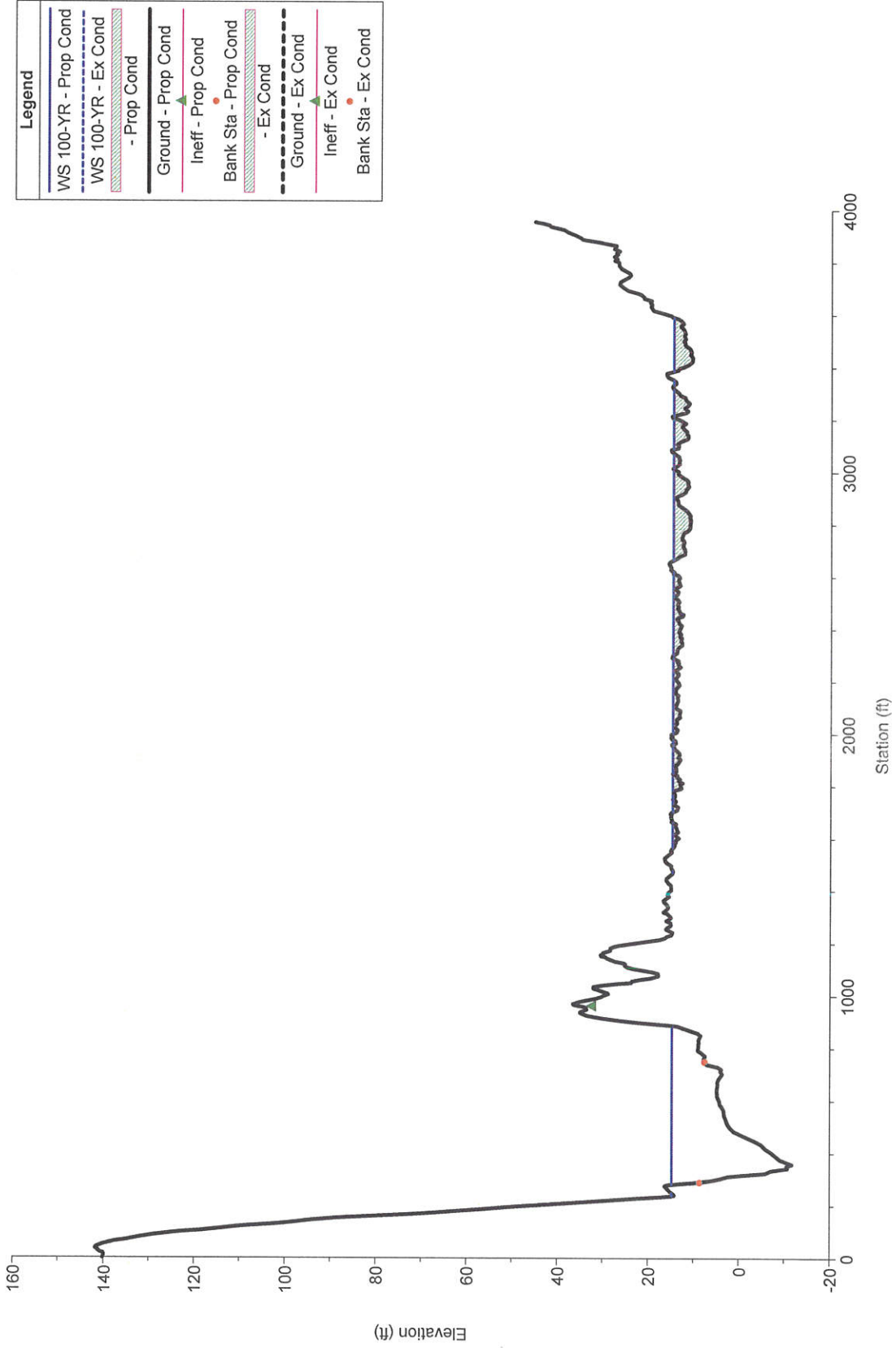


Legend	
WS 100-YR - Prop Cond	(Solid Blue Line)
WS 100-YR - Ex Cond	(Dashed Blue Line)
- Prop Cond	(Hatched Area)
Ground - Prop Cond	(Green Triangle)
Ineff - Prop Cond	(Red Circle)
Bank Sta - Prop Cond	(Red Circle)
- Ex Cond	(Hatched Area)
Ground - Ex Cond	(Black Line)
Ineff - Ex Cond	(Green Triangle)
Bank Sta - Ex Cond	(Red Circle)

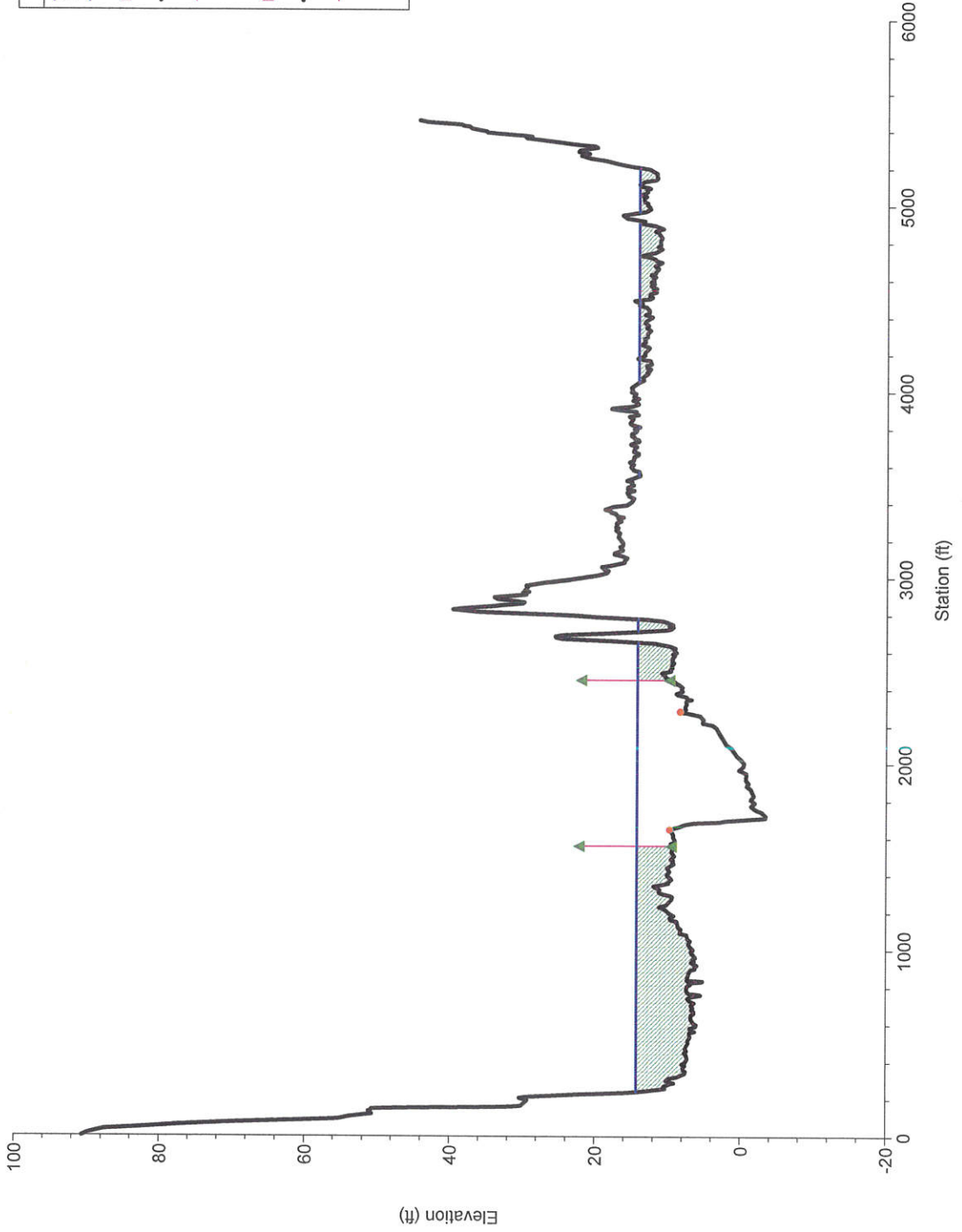
34080\_Brooten\_Rd\_Hydro  
RS = 6628.945



34080\_Brooten\_Rd\_Hydro  
RS = 4746.314

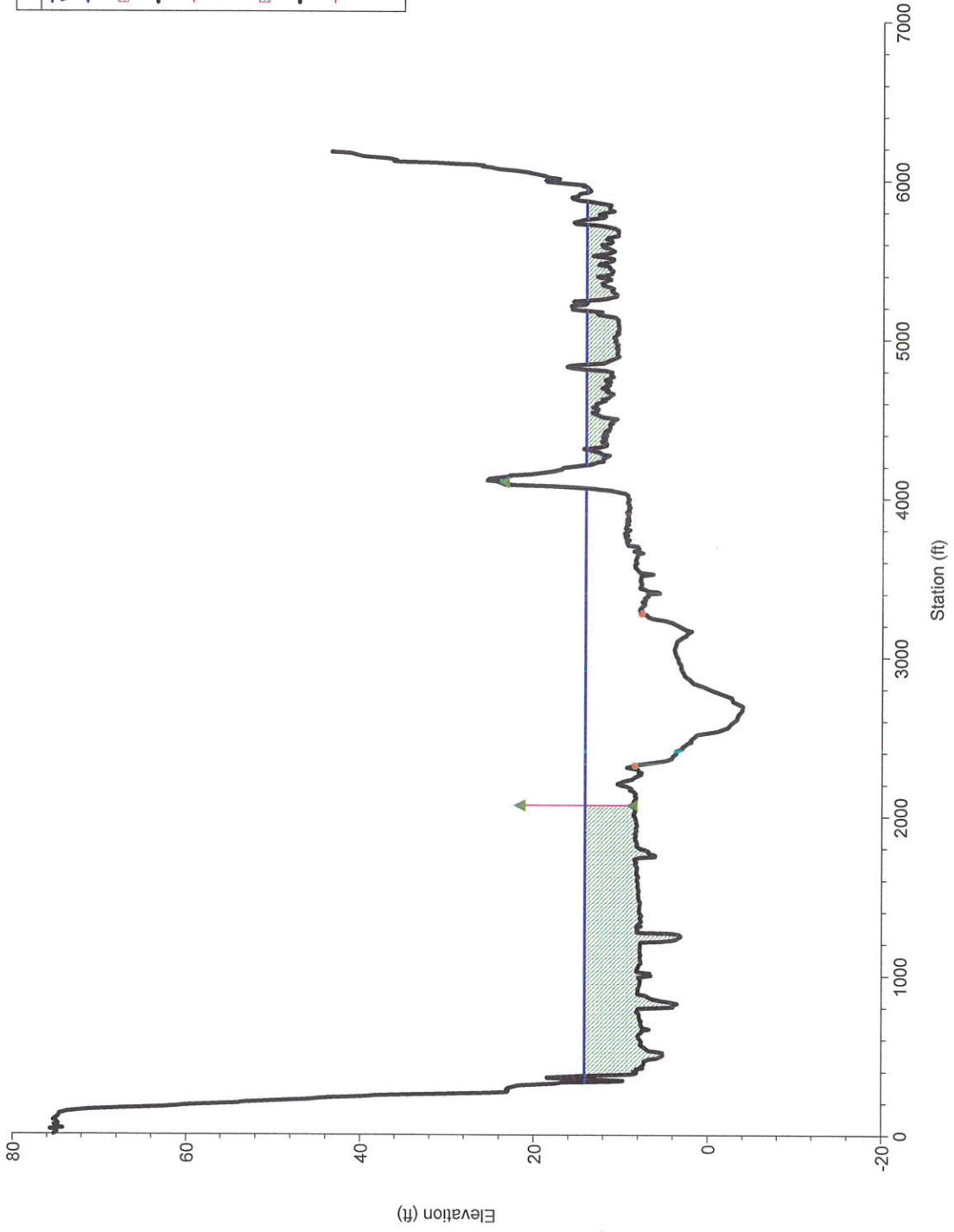


34080\_Brooten\_Rd\_Hydro  
RS = 3370.732



Legend	
WS 100-YR - Prop Cond	— (Blue solid line)
WS 100-YR - Ex Cond	- - - (Blue dashed line)
- Prop Cond	▨ (Hatched area)
Ground - Prop Cond	— (Black solid line)
Ineff - Prop Cond	— (Red solid line)
Bank Sta - Prop Cond	▨ (Hatched area)
- Ex Cond	- - - (Black dashed line)
Ground - Ex Cond	— (Black solid line)
Ineff - Ex Cond	— (Red solid line)
Bank Sta - Ex Cond	• (Red dot)

34080\_Brooten\_Rd\_Hydro  
RS = 2099.855



Legend	
WS 100-YR - Prop Cond	—
WS 100-YR - Ex Cond	- - -
- Prop Cond	▨
Ground - Prop Cond	—
Ineff - Prop Cond	▲
Bank Sta - Prop Cond	●
- Ex Cond	▨
Ground - Ex Cond	- - -
Ineff - Ex Cond	▲
Bank Sta - Ex Cond	●