



Grandview Reserve CLOMR REPORT

November 22, 2023

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Grandview Reserve CLOMR Report

Introduction

This report was prepared by HR Green to support the submission of MT-2 forms and documents in a request for a Conditional Letter of Map Revision (CLOMR) for channel improvements along Geick Ranch Tributary 2. This request impacts the current delineation of the 100-year boundary on Flood Insurance Rate Maps (FIRMs) 08041C0552G and 08041C0556G.

Grandview Reserve is located in Falcon, Colorado within El Paso County and contains approximately 776 acres within the south half of section 21 and 22 and the north half of section 27 and 28, Township 12 South, and Range 66 West of the Sixth Principal Meridian in El Paso County, Colorado.

Grandview Reserve (GVR) falls within the Geick Ranch Drainage Basin which covers approximately 22 square miles. This drainage basin is tributary to Black Squirrel Creek and joins said creek just to the south of Ellicott, CO about 18 miles to the south. Black Squirrel Creek eventually drains to the Arkansas River in Pueblo Colorado. Much of the Geick Ranch Drainage basin is undeveloped and consists of rural farmland. The Geick Ranch Drainage basin lies north of the Haegler Ranch drainage basin. The channels through the Grandview property can all be described as gently sloping drainages that roll through the site towards the creeks to which they are tributary.

Per the NRCS web soil survey, the site is made up entirely of Type A and B soils. The majority of which are Type B soils. The vegetation found within Grandview Reserve consists of wetland communities in the floodplain with a transitional area to shortgrass prairie communities that dominate the site. The primary species found in the shortgrass prairie regions include little bluestem, blue grama, and buffalograss. The transitional area between the wetlands and shortgrass prairie includes patches of snowberry, and wood's rose. There are a few plains cottonwoods along the main channels. The area has historically been heavily grazed and there are weeds throughout the site. Weeds found onsite include Canada thistle, Russian thistle, common mullein and yellow toadflax spp.

Observations of the existing channels suggest that they are at equilibrium with their watershed flows; evidence including relatively stable bank full channels, adequate floodplain (above bank full channel elevations) and in-tact plant communities that would be expected in this type of reach support the notion that the reach is in equilibrium.

At present, the preliminary analysis and design of Geick Ranch Tributary 2 (GRT2) has been completed. Proposed improvements for Geick Ranch Tributary 2 include refinement of the existing channel alignment and a stabilizing natural stream design that will allow a more predictable floodplain. There is to be a dedicated 100' wide corridor in which the channel valley will meander. The valley is the area needed to fully contain the 100-year event. Preliminary analysis indicates the valley will have an average width of approximately 63'; initial sizing approximates the bank full width to be 8.8' – 13.8'. The valley and channel thalweg will generally follow the same profile, with some deviation as the bank full channel meanders through the valley in turn decreasing the low flow channels average slope. The average valley profile is to be approximately 0.9% with a series of grade control structures to both decrease elevation and dissipate energy to meet natural channel criteria as outlined in El Paso County criteria.

Hydrology

El Paso County criteria states that all developments are required to detain storm flows down to their historic peaks. For this reason GRT2 has been designed using the flows that drain to it in the existing conditions.

HEC-HMS 4.11 was used to determine the existing flows. The terrain used to delineation basins was obtained from the Colorado Water Conservation Board LiDAR library on November 3, 2023.

The land cover data was obtained from United States Geological Survey Land Cover Data Download site, also on November 3. Upstream of this proposed project a development in in construction. This development, Meridian Ranch, will increase the imperviousness of the contributing basin to GRT2, therefore the imperviousness of the portion of the basin that will be developed has been updated based on this development. Appropriate excerpts from the Meridian Ranch drainage report can be found in Appendix J.

The soil hydric classification was determined using a downloaded GIS raster file from the Natural Resources Conservation Service. The land cover and soil hydric classification were combined to create a Curve Number grid as outlined in *Creating SCS Curve Number Grid using Land Cover and Soil Data*, by Dr. Venkatesh Merwade in February 2019. Currently the United States Army Corps of Engineers website containing guidelines on using HEC-HMS 4.11 to create a Curve Number grid is offline with no known date for when it will again be active.

The hydrologic method used was the SCS Unit Hydrograph method using a Frequency Storm Meteorologic Model with inputs taken from the National Oceanic and Atmospheric Administration's Atlas 14 Point Precipitation Estimates for Colorado, and more specifically at this site. These inputs can be found in Appendix J. The loss method used was the SCS Curve Number method and the Curve Number was derived using the procedure outlined previously on this page. The Reach Routing method used was the Muskingum-Cunge method due to the inputs for this method being readily available.

See **Error! Reference source not found.** for summaries of flows discharged to the existing GRT2 at specific design points. See Table 2 for summaries of flows discharged to the proposed GRT2 at the equivalent design points. Flows in the HEC-RAS model are rounded up to the nearest whole integer from the HEC-HMS results for simplicity.

Table 1 – FLOWS FOR THE EXISTING GEICK RANCH TRIBUTARY 2

STATION	CUMULATIVE 100-YR STORM (CFS)	INPUT DESCRIPTION AND FLOW (CFS)
70+29.02	262	Upstream end of Existing Model
48+58.05	536	Equivalent location for Rex Road
33+61.62	621	Equivalent location for Dawlish Road
6+13.67	649	Equivalent location for Low Water Crossing

Table 2- FLOWS FOR PROPOSED GEICK RANCH TRIBUTARY 2

STATION	CUMULATIVE 100-YR STORM (CFS)	INPUT DESCRIPTION AND FLOW (CFS)
9426.04	262	Upstream end of Existing Model
71+60.32	536	Immediately downstream of Rex Road
57+28.67	621	Immediately downstream of Dawlish Road
17+47.66	649	Immediately downstream of Low Water Crossing

Hydraulics

Design criteria were developed to guide a preliminary layout of channel dimension, planform, and profile for the realigned segment of GRT2. Published criteria from the Urban Stormwater Drainage Criteria Manual, Volume 1 (USDCM; Urban Drainage and Flood Control District, 2016), El Paso County DCM and various other reports

currently in process for the drainages through GVR and completed for GVR drainages were used for initial design parameter and flow rates. Parameters used and minimum bank full geometry is summarized in Table 2.

Table 2 - DESIGN PARAMETERS

Design Parameter	Design Value
Roughness values	EPC Table 10-2
Maximum 5-year velocity, main channel (within bank full channel width) (ft/s)	EPC: 2.5 ft/s MHFD: 5 ft/s*
Maximum 100-year velocity, main channel (within bank full channel width) (ft/s)	EPC: 2.5 ft/s MHFD: 7 ft/s*
Froude No., 5-year, main channel (within bank full channel width)	0.7
Froude No., 100-year, main channel (within bank full channel width)	0.85
Maximum shear stress, 100-year, main channel (within bank full channel width)	1.2 lb./sf
Minimum bank full capacity of bank full channel (based on future development conditions)	2-year, 19 - 33.5 cfs
Minimum bank full channel geometry¹	
Design Channel Type	C4
Entrenchment Ratio	2.7-31.65 (x=5.26)
Width to depth ratio	13.5-75.0 (x=29.28)
Sinuosity	1.43-2.80 (x=1.92)
Slope	0.0001-0.0184 (x=0.0045)
D₅₀	12-14mm (~0.5 in)
d₈₄	32-48mm (~1.6in)
Meander Length²	34-92 (x=56)
Belt Width²	18-55 (x=32)
Radius of Curvature²	7-28 (x=11)
Minimum Floodplain Terrace	6 ft
Maximum overbank side slope	4(H):1(V)
Maximum bank full side slope	2.5(H):1(V)
Maximum bank full side slope	2.5(H):1(V)
Minimum bottom width³	4.8 ft
Freeboard	1.5 ft

¹These values were derived from empirical data and will be used as guidelines for design and will be used in conjunction with hydraulic regime equations as outlined in "Spreadsheet Tools for River Evaluation, Assessment, and Monitoring: The STREAM Diagnostic Modules"

²These values are derived from "Spreadsheet Tools for River Evaluation, Assessment, and Monitoring: The STREAM Diagnostic Modules"

³Minimum bottom width shown is for the low flow channel only. The main channel will be ~41 ft wide

The 2-year frequency was selected for the design of the bank full channel to approximate the flow most likely to govern a stable geometry. Prior reports estimated future 2-year flow as ~15-cfs and assume no culvert effects, i.e., open channel flow un-affected by a culvert. The future 2-year flow (19-33.5 cfs) was used to size the low flow channel. This resulted in a channel with a minimum bottom width varying from 4.8 feet - 9.8 feet, 0.8 feet deep with 2.5:1 side slopes for a bank full width varying from 8.8 feet to 13.8 feet, assuming a mean channel longitudinal slope of 0.9%. Equations as shown in the spreadsheet should produce low shear values within the channel section. However, further analysis using HEC-RAS was completed to determine the final geometry of said channel. The effective discharge channel is highly correlated to the "bank full" channel (Leopold 1994) as

several channel geometrics are derived from bank full channel width, depth, cross sectional area and sinuosity, and that USDCM and the OSP report design criteria parameters relate to bank full width, we have chosen bank full width to serve as the foundation of design.

To determine an appropriate bank full width, Leopold's generalized width estimate was first calculated (1994, as presented in USDCM Vol 1):

$$W = aQ^{0.5}$$

Where:

w = bank full width of channel (top width when conveying bank full discharge)

Q = bank full discharge (10.5 cfs)

a = 2.7 (wide bank full channel)

2.1 (average bank full channel width)

1.5 (narrow bank full channel)

Assuming an average bank full width, the equation would estimate a 6.8-ft bank full width. It is important to note that the Leopold equation lumps all channel types of varying width-to-depth ratios. To perform a check on this estimation, worksheet alternative iterations of channel width from 4-12 feet were performed to find the depth associated with the 2-year flow. Channel slope was set to 0.09 to best fit the average valley slope, side slopes were assumed to be 2.5:1 and Manning's "n" was assumed to be 0.035. The resulting channel depth was divided into each iteration's width to identify the iteration with a width-to-depth ratio most closely associated with a Type-C channel. Given the valley type of the proposed project (Unconfined Alluvial Valley), we can expect Type-C and Type-E channels to represent stable channel geomorphologies. Given the setting and valley slope, we have chosen a Type-C (riffle-pool morphology) channel. Type-C channels typically have width-to-depth ratios >12, with gravel and sand bottomed systems averaging 29 and 27, respectively (13.5-28.7 for 60% of gravel bed streams 12.6-29.2 for 50% of sand bed streams; Rosgen 1996). Given these ranges, the channel alternative with a OPC 2-yr flow-dependent channel depth that, when divided into its corresponding width, yielded a W/D between 10.7 – 36.7.

The resulting channel, then, has the following general dimensions:

- Bottom width = 4.8 ft – 9.8 ft
- Top Width = 8.8 ft – 13.8 ft
- Average Depth R_{riffle} = 0.8 ft
- Width: Depth (W/D) Ratio = 11.3
- Cross Sectional Area = 5.44 ft² - 9.44 ft²

The resulting channel dimensions listed above were then used to do the initial site grading of GRT2. The channel was then modeled in HEC- RAS and the geometry was further refined to reduce velocities, shear stresses, and the Froude number to fall within acceptable ranges.

GRT1 is to be left in its current state as analysis indicates it will remain in a stable state after development. The only proposed change is to remove the existing stock pond; that segment of the channel is to be graded to match the adjacent existing geometry.

Ultimate project hydraulics were evaluated through HEC-RAS 5.0.5. The following sections delve into the use and evaluation of the duplicate effective model and the development of the proposed conditions model.

a. Duplicate Effective Model

There is no existing effective model.

b. Existing Conditions Model

The existing conditions models were created to serve as a baseline for comparing future conditions to existing conditions. The existing conditions models were created by exporting cross sections from CAD along the existing channel alignments. Manning's roughness "n" values were selected to represent the existing conditions of the channel by following EPC's guidance in table 10-2. Existing flow rates were derived as described in the hydrology section above and are summarized in **Error! Reference source not found.** and Table 1. Resulting water surface elevation for the 100-year event can be found in Appendix H.

c. Proposed Conditions Model

In the existing GRT2 model, the steady flow rate data included four changes in flow rate along the channel, these changes are described in the preceding hydrology section in Tables 1 and 2.

The proposed conditions model for GRT2 was developed to account for changes to the channel alignment, geometry, and the proposed culverts along the new channel alignment. The proposed conditions model was created by exporting sample lines along the new alignment that sampled the proposed grading. Manning's roughness "n" values were selected to represent the proposed conditions of the project area and follow EPC's guidance in table 10-2.

Ineffective flow areas were added to cross sections within the project reach upstream and downstream of culverts to account for areas not actively conveying water due to turbulence. The last three cross sections along the modeled channel are identical to the last three cross sections in the existing conditions model and were used to confirm the water surface elevation remained within tolerance and to adequately evaluate the tailwater. Cross sections can be referenced in Appendix I.

Maintenance Considerations

Natural stream design approaches take into consideration short- and long-term maintenance needs by providing a high functioning low maintenance stream (HFLMS). By spreading more frequent storm events into the floodplain terrace, water is introduced into the upland species of the riparian corridor to provide irrigation flows. Additionally, due to the use of naturally armored rundown riffles and pools vs larger grade control structures, maintenance is limited to mainly trash removal and noxious weed control. As outlined above, the design takes into consideration various flow regimes in order to analyze proposed stream corridor stresses and apply low maintenance stabilization measures to help stabilize and control sediment degradation and aggradation within the channel.

Conclusion

After evaluating the impacts of the proposed channel improvements to the segment of GRT2 between Eastonville Road to the northwest (upstream) and the south-central project boundary (downstream) it is anticipated that the BFE will not change outside of the project. The reevaluation of the 1% chance of annual exceedance event limits has been delineated and has a footprint for GRT2 that does not fall entirely within the boundary delineated in the FIRM effective 2018; this is largely due to the realignment of the channel, improved topography within the Zone A area and the overall footprint of the 1% chance of annual exceedance is significantly narrower than the previous delineation. BFEs at the location of tie in at the boundary of the site is not shown to rise more than 0.00' in the modeling completed in this assessment. Cross sections for GRT1 and GRT2 can be found in Appendix H and Appendix I to compare the 100year water surface elevation for both the existing and proposed conditions.

Appendix A MT-2 Forms

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20958-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

- ☒ **CLOMR:** A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).
- ☐ **LOMR:** A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Example: 480301 480287	City of Katy Harris County	TX TX	48473C 48201C	0005D 0220G	02/08/83 09/28/90
080059	EL PASO COUNTY	CO	08041C0552G	0552G	12/7/2018
080059	EL PASO COUNTY	CO	08041C0556G	0556G	12/7/2018

2. a. Flooding Source: **Geick Ranch Tributary 2**

- b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)
- ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: **GRANDVIEW RESERVE GEICK RANCH TRIBUTARY 2 IMPROVEMENTS**

4. FEMA zone designations affected: **A** (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

- ☒ Physical Change ☒ Improved Methodology/Data ☐ Regulatory Floodway Revision ☐ Base Map Changes
- ☐ Coastal Analysis ☒ Hydraulic Analysis ☒ Hydrologic Analysis ☐ Corrections
- ☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes
- ☒ New Topographic Data ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

Structures:

☒ Channelization

☐ Levee/Floodwall

☒ Bridge/Culvert

☐ Dam

☐ Fill

☐ Other (Attach Description)

6. ☐ Documentation of ESA compliance is submitted (required to initiate CLOMR review). Please refer to the instructions for more information.

C. REVIEW FEE

Has the review fee for the appropriate request category been included?

☒ Yes

Fee amount: \$_____

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm for Fee Amounts and Exemptions.

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: GREG PANZA

Company: HR GREEN

Mailing Address: 5619 DTC PARKWAY
SUITE 1150
GREENWOOD VILLAGE, CO 80111

Daytime Telephone No.: 720-602-4939

Fax No.:

E-Mail Address: gpanza@hrgreen.com

Signature of Requester (required):



Date: 11/20/2023

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirements for when fill is placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. For Conditional LOMR requests, the applicant has documented Endangered Species Act (ESA) compliance to FEMA prior to FEMA's review of the Conditional LOMR application. For LOMR requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: KEITH CURTIS, CFM, FLOODPLAIN ADMINISTRATOR

Community Name: EL PASO COUNTY/PPRBD

Mailing Address: 2880 INTERNATIONAL CIRCLE
COLORADO SPRINGS, CO 80910

Daytime Telephone No.: 719-327-2898

Fax No.:

E-Mail Address: KEITH@PPRBD.ORG

Community Official's Signature (required):



Date: 11/15/2023

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: GREG PANZA

License No.: 37081

Expiration Date: 10-31-2025

Company Name: HR GREEN

Telephone No.: 720-602-4939

Fax No.:

Signature:



Date: 11/20/2023

E-Mail Address: gpanza@hrgreen.com

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)

Required if ...

- | | |
|---|--|
| <input checked="" type="checkbox"/> Riverine Hydrology and Hydraulics Form (Form 2) | New or revised discharges or water-surface elevations |
| <input checked="" type="checkbox"/> Riverine Structures Form (Form 3) | Channel is modified, addition/revision of bridge/culverts,
addition/revision of levee/floodwall, addition/revision of dam |
| <input type="checkbox"/> Coastal Analysis Form (Form 4) | New or revised coastal elevations |
| <input type="checkbox"/> Coastal Structures Form (Form 5) | Addition/revision of coastal structure |
| <input type="checkbox"/> Alluvial Fan Flooding Form (Form 6) | Flood control measures on alluvial fans |



U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: **Geick Ranch Tributary 2**

Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

- | | | |
|--|--|--|
| <input type="checkbox"/> Not revised (skip to section B) | <input type="checkbox"/> No existing analysis | <input checked="" type="checkbox"/> Improved data |
| <input type="checkbox"/> Alternative methodology | <input type="checkbox"/> Proposed Conditions (CLOMR) | <input type="checkbox"/> Changed physical condition of watershed |

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)
Upstream of project site, west of Eastonville Road and through site	0.9	NA	242 offsite flows at beginning of site 262 additional offsite after first onsite reach 649 leaving site

3. Methodology for New Hydrologic Analysis (check all that apply)

- | | |
|---|--|
| <input type="checkbox"/> Statistical Analysis of Gage Records | <input checked="" type="checkbox"/> Precipitation/Runoff Model → Specify Model: <u>SCS Curve Number Method/HEC-HMS Model</u> |
| <input type="checkbox"/> Regional Regression Equations | <input checked="" type="checkbox"/> Other (please attach description) <u>See Narrative</u> |

Please enclose all relevant models in digital format, maps, computations (including computation of parameters), and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit*	Approx. 5,850 Feet DS of Eastonville Road	-734.97 / -561.36	6904.29	6904.26
Upstream Limit*	Approx. 1,400 Feet US of Eastonville Road	7029.02 / 9426.04	7052.94	7052.93

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

HEC RAS 6.1.0 (with vertical datum: North American Vertical Datum of 1988 (NAVD88))

2. Hydraulic Method/Model Used: _____

3. Pre-Submittal Review of Hydraulic Models*

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	Natural Run		Floodway Run		Datum
Duplicate Effective Model*	File Name: _____	Plan Name: _____	File Name: _____	Plan Name: _____	_____
		N/A			
Corrected Effective Model*	File Name: _____	Plan Name: _____	File Name: _____	Plan Name: _____	_____
Existing or Pre-Project Conditions Model	File Name: <u>GRT2.p03</u>	Plan Name: <u>GRT2_Existing</u>	File Name: _____	Plan Name: _____	_____
Revised or Post-Project Conditions Model	File Name: <u>GRT2.p05</u>	Plan Name: <u>GRT2_Proposed</u>	File Name: _____	N/A	_____
Other - (attach description)	File Name: _____	Plan Name: <u>N/A</u>	File Name: _____	Plan Name: _____	_____

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

☐ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: vertical datum: North American Vertical Datum of 1988 (NAVD88)

Source: EDWARD JAMES Date: 7/22/2022

Accuracy: +/- 0.08 ft

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM**, at the same scale as the original, annotated to show the boundaries of the revised 1%-and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%-and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No
- a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot compared to pre-project conditions.
 - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.
- b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☐ Yes ☒ No
If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.
2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☒ No
- If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(A)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.
3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☒ No
- If Yes, attach **evidence of regulatory floodway revision notification**. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)
4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program; Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Geick Ranch Tributary 2

Note: Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Geick Ranch Tributary 2

Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: LOCATED FROM EAST OF EASTONVILLE ROAD AND To NORTHWEST OF HIGHWAY 24

Downstream Limit/Cross Section: SECTION 2882.47

Upstream Limit/Cross Section: SECTION 2592.31

2. Name of Structure: Rex Road

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Approx. 600 feet DS of Eastonville Road

Downstream Limit/Cross Section: SECTION 7160.32

Upstream Limit/Cross Section: SECTION 7406.85

3. Name of Structure: Dawlish Road

Type (check one) ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Approx. 2,200 feet DS of Eastonville Road

Downstream Limit/Cross Section: SECTION 5728.67

Upstream Limit/Cross Section: SECTION 5852.4

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

B. CHANNELIZATION

Flooding Source: Geick Ranch Tributary 2

Name of Structure: Tributary 2

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the 100 -year flood.

The design elevation in the channel is based on (check one):

☒ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☒ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

THE CHANNEL WAS DESIGNED TO INCLUDE ARMORING AS NEEDED TO PREVENT ADVERSE SEDIMENT TRANSPORT/ SCOURING.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

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DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Geick Ranch Tributary 2

Note: Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Low Water Crossing
Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam
Location of Structure: Approx. 6,300 feet DS of Eastonville Road
Downstream Limit/Cross Section: SECTION 2213.94
Upstream Limit/Cross Section: SECTION 2256.6
2. Name of Structure: Glampton Drive
Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam
Location of Structure: Approx. 7,300 feet DS of Eastonville Road
Downstream Limit/Cross Section: SECTION 506.48
Upstream Limit/Cross Section: SECTION 593.08
3. Name of Structure: _____
Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam
Location of Structure: _____
Downstream Limit/Cross Section: _____

C. BRIDGE/CULVERT

Flooding Source: Geick Ranch Tributary 2

Name of Structure: Rex Road

1. This revision reflects (check one):

- ☒ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- | | |
|--|---|
| <input checked="" type="checkbox"/> Dimensions (height, width, span, radius, length) | <input checked="" type="checkbox"/> Distances Between Cross Sections |
| <input checked="" type="checkbox"/> Shape (culverts only) | <input type="checkbox"/> Erosion Protection |
| <input checked="" type="checkbox"/> Material | <input type="checkbox"/> Low Chord Elevations – Upstream and Downstream |
| <input type="checkbox"/> Beveling or Rounding | <input checked="" type="checkbox"/> Top of Road Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Wing Wall Angle | <input checked="" type="checkbox"/> Structure Invert Elevations – Upstream and Downstream |
| <input type="checkbox"/> Skew Angle | <input checked="" type="checkbox"/> Stream Invert Elevations – Upstream and Downstream |
| | <input checked="" type="checkbox"/> Cross-Section Locations |

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

THE CULVERT WAS DESIGNED TO INCLUDE ARMORING AS NEEDED TO PREVENT ADVERSE SEDIMENT TRANSPORT/ SCOURING.

C. BRIDGE/CULVERT

Flooding Source: Geick Ranch Tributary 2

Name of Structure: Dawlish Road

1. This revision reflects (check one):

- ☒ Bridge/culvert not modeled in the FIS
☐ Modified bridge/culvert previously modeled in the FIS
☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- | | |
|--|---|
| <input checked="" type="checkbox"/> Dimensions (height, width, span, radius, length) | <input checked="" type="checkbox"/> Distances Between Cross Sections |
| <input checked="" type="checkbox"/> Shape (culverts only) | <input type="checkbox"/> Erosion Protection |
| <input checked="" type="checkbox"/> Material | <input type="checkbox"/> Low Chord Elevations – Upstream and Downstream |
| <input type="checkbox"/> Beveling or Rounding | <input checked="" type="checkbox"/> Top of Road Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Wing Wall Angle | <input checked="" type="checkbox"/> Structure Invert Elevations – Upstream and Downstream |
| <input type="checkbox"/> Skew Angle | <input checked="" type="checkbox"/> Stream Invert Elevations – Upstream and Downstream |
| | <input type="checkbox"/> Cross-Section Locations |

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

THE CULVERT WAS DESIGNED TO INCLUDE ARMORING AS NEEDED TO PREVENT ADVERSE SEDIMENT TRANSPORT/ SCOURING.

C. BRIDGE/CULVERT

Flooding Source: Geick Ranch Tributary 2

Name of Structure: Low Water Crossing

1. This revision reflects (check one):

- ☒ Bridge/culvert not modeled in the FIS There is no existing FIS
- ☐ Modified bridge/culvert previously modeled in the FIS
- ☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- | | |
|--|---|
| <input checked="" type="checkbox"/> Dimensions (height, width, span, radius, length) | <input checked="" type="checkbox"/> Distances Between Cross Sections |
| <input checked="" type="checkbox"/> Shape (culverts only) | <input type="checkbox"/> Erosion Protection |
| <input type="checkbox"/> Material | <input type="checkbox"/> Low Chord Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Beveling or Rounding | <input checked="" type="checkbox"/> Top of Road Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Wing Wall Angle | <input checked="" type="checkbox"/> Structure Invert Elevations – Upstream and Downstream |
| <input type="checkbox"/> Skew Angle | <input checked="" type="checkbox"/> Stream Invert Elevations – Upstream and Downstream |
| | <input checked="" type="checkbox"/> Cross-Section Locations |

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

THE CULVERT WAS DESIGNED TO INCLUDE ARMORING AS NEEDED TO PREVENT ADVERSE SEDIMENT TRANSPORT/ SCOURING.

C. BRIDGE/CULVERT

Flooding Source: **Geick Ranch Tributary 2**

Name of Structure: **Glampton Drive**

1. This revision reflects (check one):

- ☒ Bridge/culvert not modeled in the FIS
- ☐ Modified bridge/culvert previously modeled in the FIS
- ☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): **HEC-RAS**
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- | | |
|--|---|
| <input checked="" type="checkbox"/> Dimensions (height, width, span, radius, length) | <input checked="" type="checkbox"/> Distances Between Cross Sections |
| <input checked="" type="checkbox"/> Shape (culverts only) | <input type="checkbox"/> Erosion Protection |
| <input checked="" type="checkbox"/> Material | <input type="checkbox"/> Low Chord Elevations – Upstream and Downstream |
| <input type="checkbox"/> Beveling or Rounding | <input checked="" type="checkbox"/> Top of Road Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Wing Wall Angle | <input checked="" type="checkbox"/> Structure Invert Elevations – Upstream and Downstream |
| <input type="checkbox"/> Skew Angle | <input checked="" type="checkbox"/> Stream Invert Elevations – Upstream and Downstream |
| | <input type="checkbox"/> Cross-Section Locations |

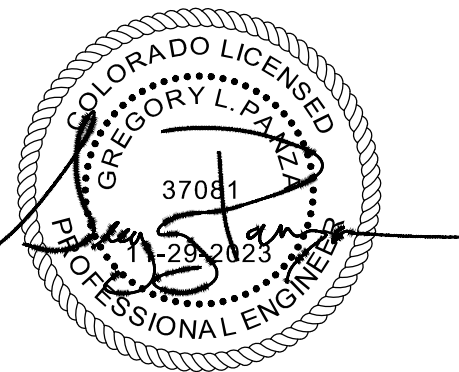
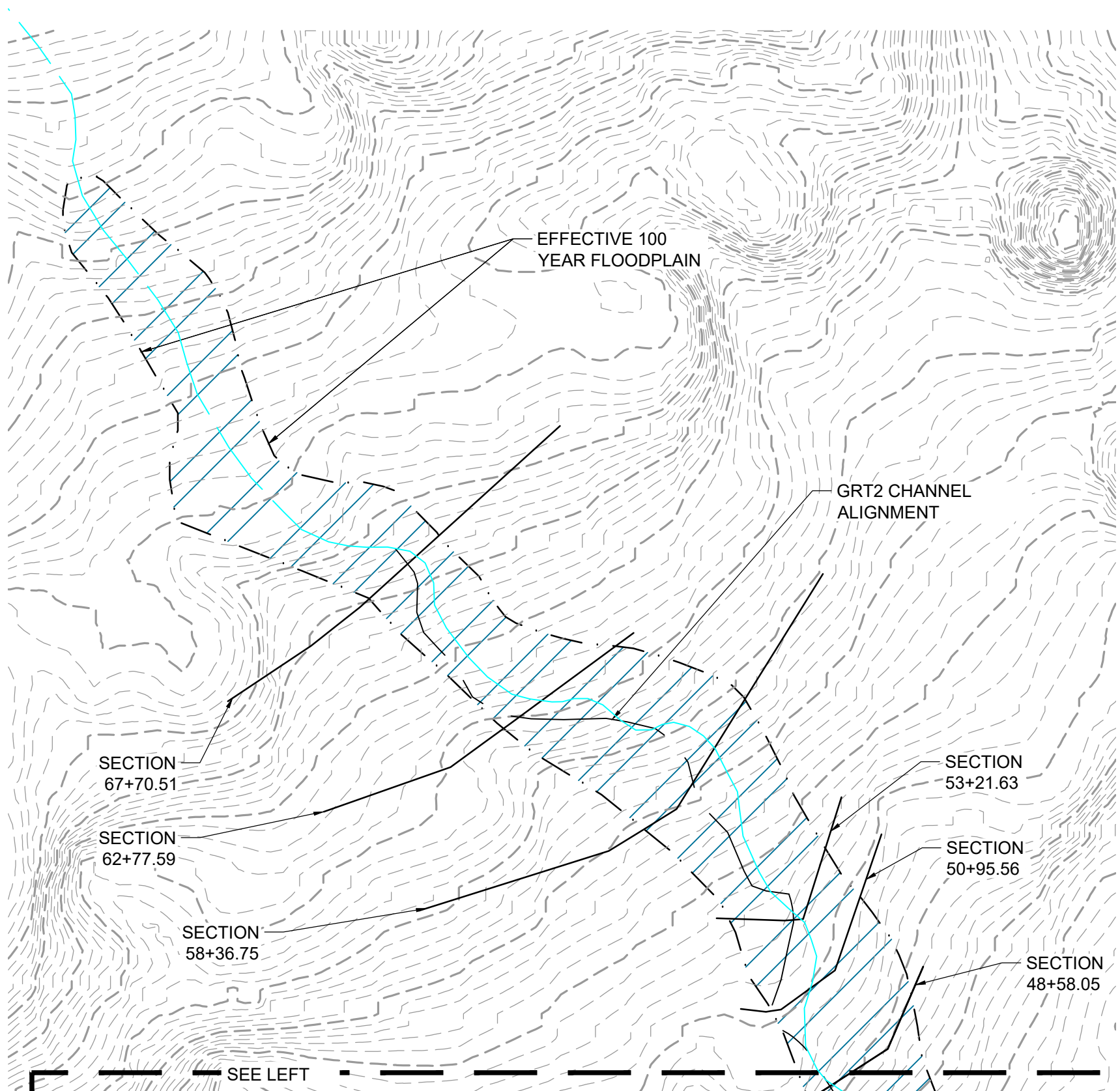
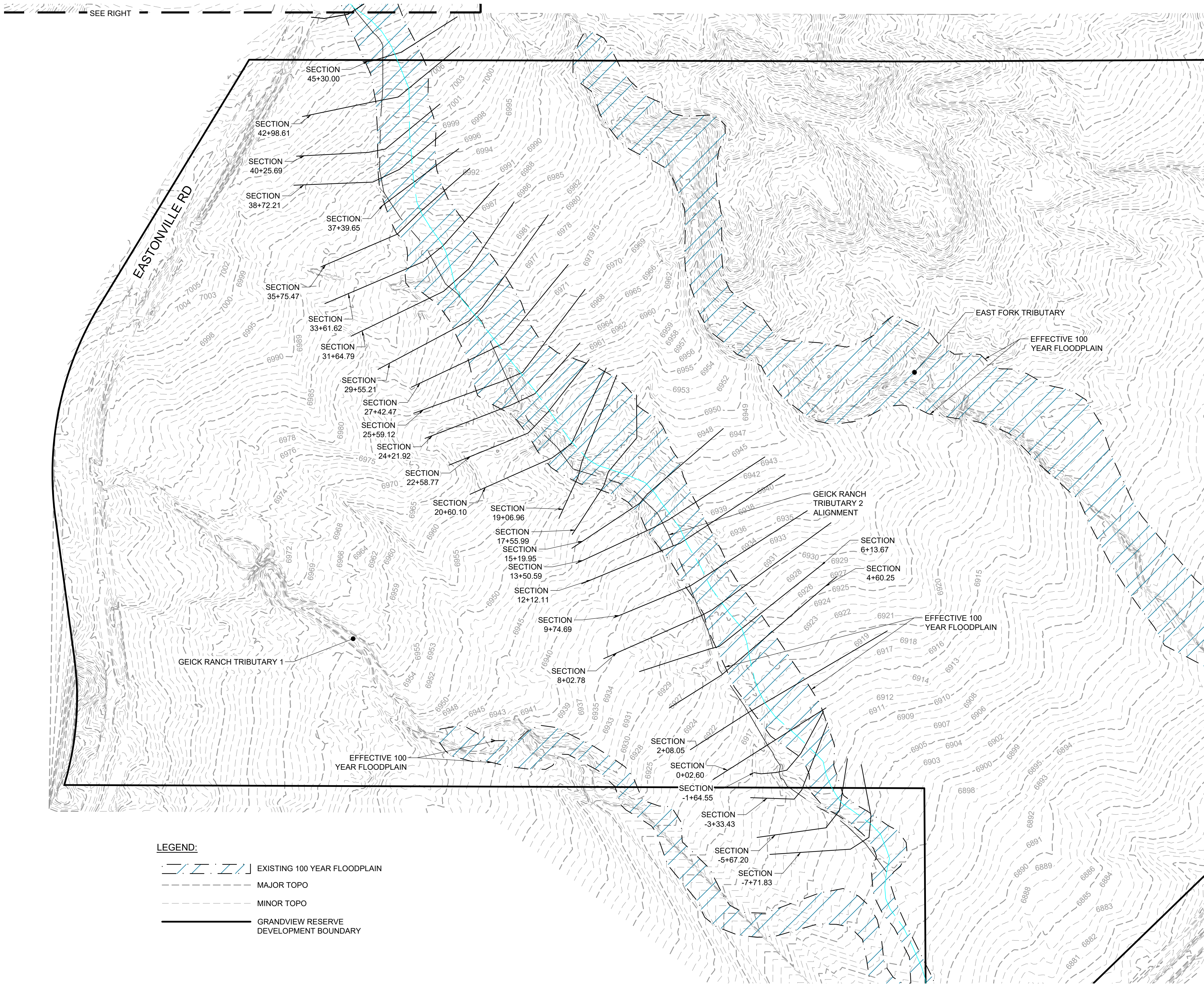
4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

THE CULVERT WAS DESIGNED TO INCLUDE ARMORING AS NEEDED TO PREVENT ADVERSE SEDIMENT TRANSPORT/ SCOURING.

Appendix B Certified Topo



NOTES:

1. BASIS OF BEARINGS: THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.

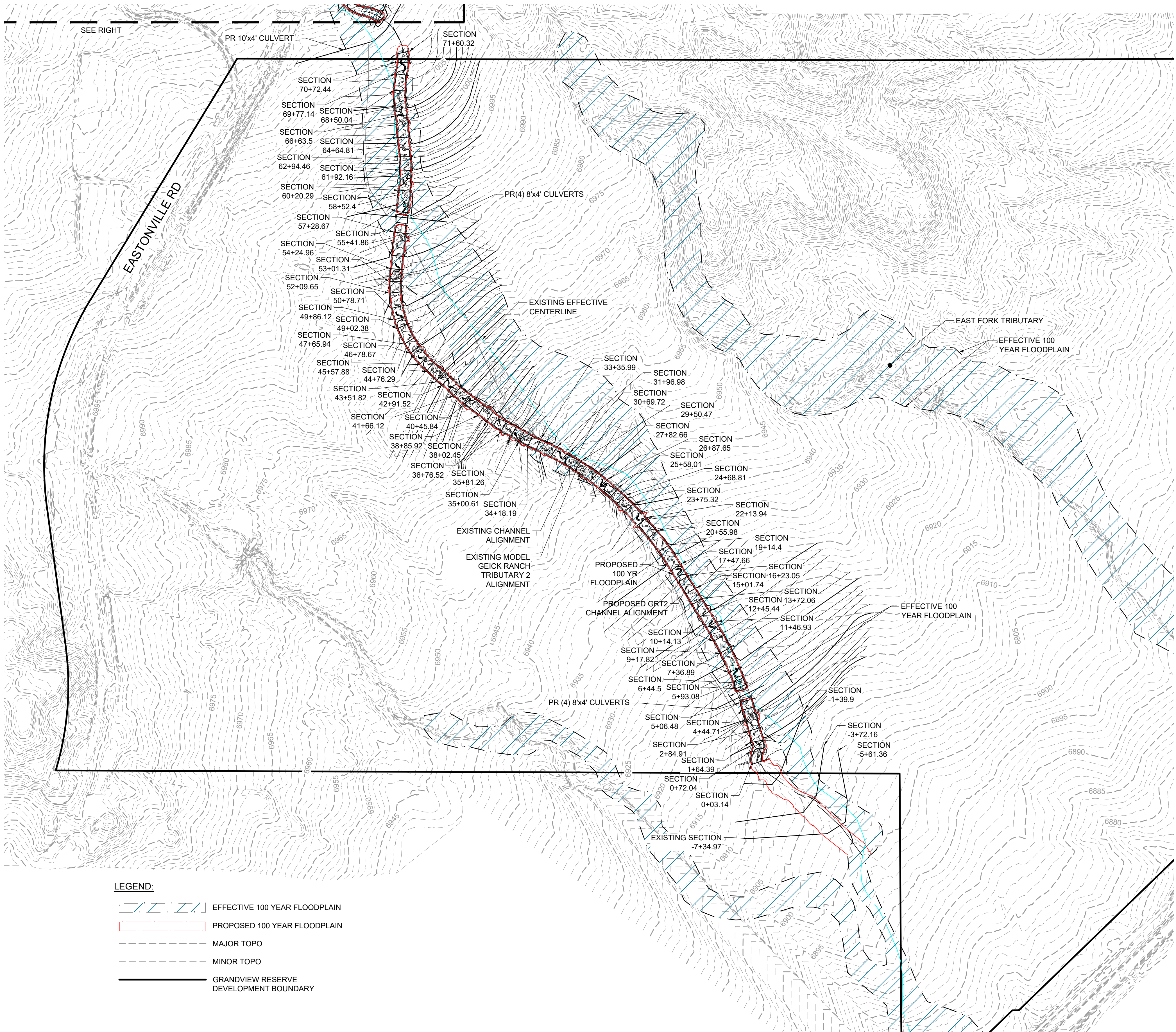
NAVD88 6866.33



Job No.:	201662
Prepared By:	SJF
Date:	11/29/2023

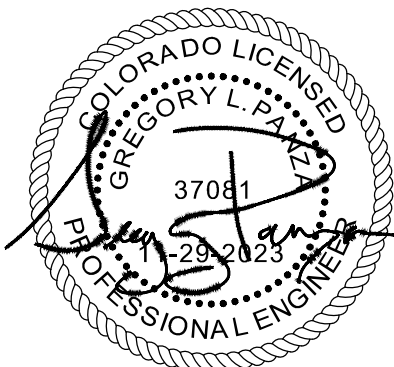
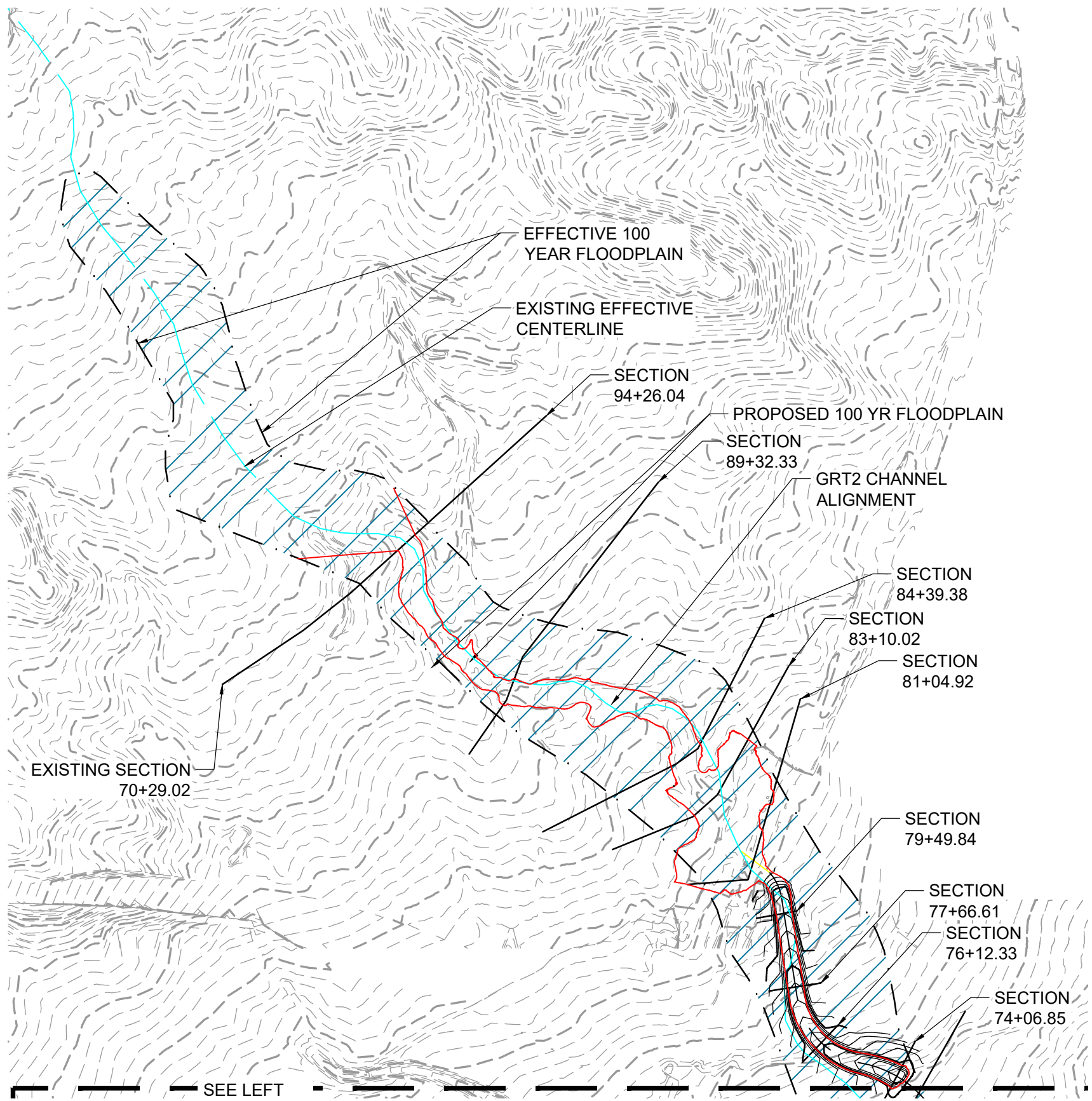
EXISTING FLOODPLAIN EXHIBIT

FIG.1



LEGEND:

- EFFECTIVE 100 YEAR FLOODPLAIN
- PROPOSED 100 YEAR FLOODPLAIN
- MAJOR TOPO
- MINOR TOPO
- GRANDVIEW RESERVE DEVELOPMENT BOUNDARY



NOTES:

1. BASIS OF BEARINGS: THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.

NAVD88



Job No.:	201662
Prepared By:	SJF
Date:	11/30/2023

FLOODPLAIN EXHIBIT

Appendix C Annotated Firm

to flooding, particularly from local drainage
map repository should be consulted for
d information.

was where **Base Flood Elevations (BFEs)**
suraged to consult the Flood
Elevations tables contained
ompanies this FIRM. Users
resent rounded whole-foot
e rating purposes only and
n information. Accordingly,
e utilized in conjunction with
anagement.

y only landward of 0.0' North
this FIRM should be aware
many of Stillwater Elevations
on. Elevations shown in the
red for construction and/or
nan the elevations shown on

s sections and interpolated
hydraulic considerations with
Program. Floodway widths
d Insurance Study report for

protected by flood control
ures" of the Flood Insurance
this jurisdiction.

was Universal Transverse
NAD83, GRS80 spheroid,
zones zones used in the
result in slight positional
s. These differences do not

1 American Vertical Datum
compared to structure and
n. For information regarding
tum of 1929 and the North
eodetic Survey website at
etic Survey at the following

formation for **bench marks**
ices Branch of the National
http://www.ngs.noaa.gov/.

l in digital format by El Paso
reau of Land Management,
d States Geological Survey,
current as of 2006.

channel configurations and
us FIRM for this jurisdiction.
on the previous FIRM may
annel configurations. As a
the Flood Insurance Study
may reflect stream channel
re profile baselines depicted
that match the flood profiles
ort. As a result, the profile
map channel representation

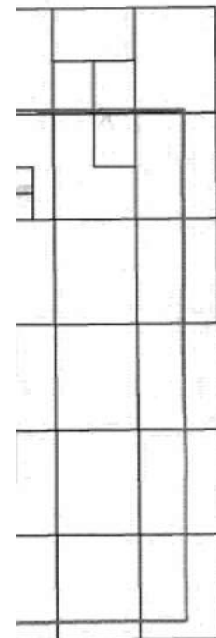
ast data available at the time
e de-annexations may have
should contact appropriate
ns.

overview map of the county
pository addresses; and a
nsurance Program dates for
i which each community is

Map Information eXchange
oducts associated with this
d Letters of Map Change, a
f this map. The MSC may
and its website at

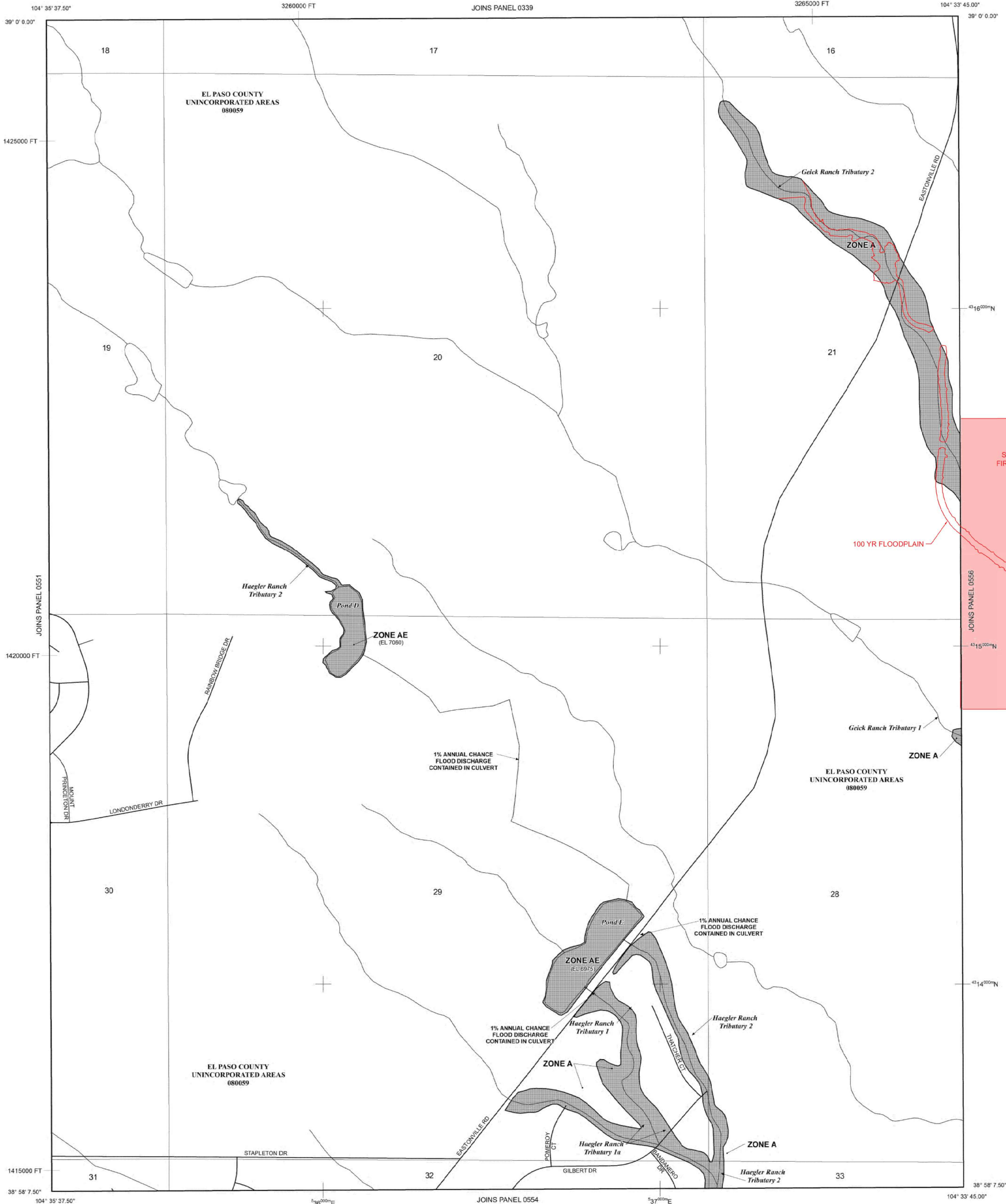
ncerning the National Flood
MAP (1-877-338-2627) or
ifip.

let Table
Vertical Datum Offset (ft)
IOD INSURANCE STUDY RSION INFORMATION



was produced through a
reen the State of Colorado
Emergency Management

formation and resources are
munities and the Colorado



INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987)
- Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1985 (NAVD 88)

- A A Cross section line
- 23 23 Transect line
- 97° 07' 30.00" 32° 22' 30.00" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 1000-meter Universal Transverse Mercator grid ticks, zone 13
- 6000000 FT 5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

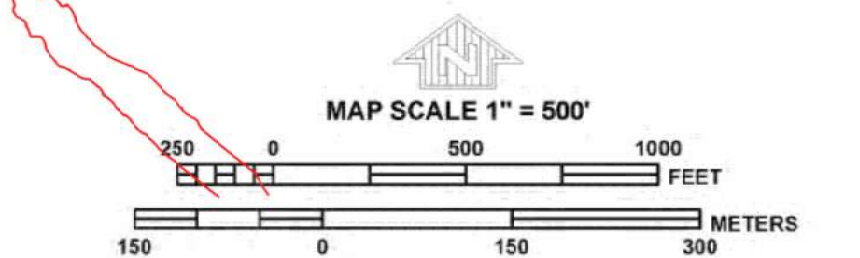
MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



PANEL 0552G

FIRM

FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 552 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY	080059	0552	G

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER
08041C0552G

MAP REVISED
DECEMBER 7 2018

subject to flooding, particularly from local drainage community map repository should be consulted for flood hazard information.

in areas where **Base Flood Elevations (BFEs)** are presented, users are encouraged to consult the Flood Insurance Rate Map (FIRM) Elevations tables contained within this FIRM. Users are presented rounded whole-foot elevations for rating purposes only and on information. Accordingly, these elevations should be utilized in conjunction with engineering judgment.

apply only downward of 0.0' from the BFE. Users of this FIRM should be aware that the Summary of Stillwater Elevations for this jurisdiction. Elevations should be used for construction purposes only if the elevations are higher than the elevations presented on the map.

is sections and interpolated hydraulic considerations with the Flood Insurance Study report.

are protected by **flood control structures** of the Flood Insurance Study for this jurisdiction.

was Universal Transverse Mercator (UTM) zones used in the result in slight positional differences. These differences do not affect the flood hazard information.

h American Vertical Datum (AVD) compared to structure and map. For information regarding datum of 1929 and the North Geodetic Survey website at National Geodetic Survey at the following:

information for **bench marks** is available from the National Geodetic Survey Branch of the National Geodetic Survey at <http://www.ngs.noaa.gov/>.

in digital format by El Paso County Engineering, Inc. These maps are for informational purposes only.

channel configurations and cross sections for this FIRM for this jurisdiction. The previous FIRM may contain different channel configurations. As a result, the Flood Insurance Study may reflect stream channel profile baselines depicted that match the flood profiles for this jurisdiction. As a result, the profile map channel representation may differ from the previous FIRM.

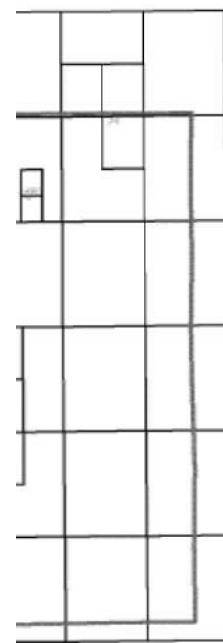
est data available at the time of the Flood Insurance Study or de-annexations may have been made. Users should contact appropriate agencies for more information.

overview map of the county showing the location of the community map repository addresses, and a map showing the location of the community map repository for each community in which each community is located.

A Map Information Exchange (MIX) is available for this map. For more information, contact the National Flood Insurance Program (NFIP) at 1-877-336-2627 or visit the NFIP website at <http://www.flood.gov/>.

concerning the National Flood Insurance Program (NFIP) is available at 1-877-336-2627 or visit the NFIP website at <http://www.flood.gov/>.

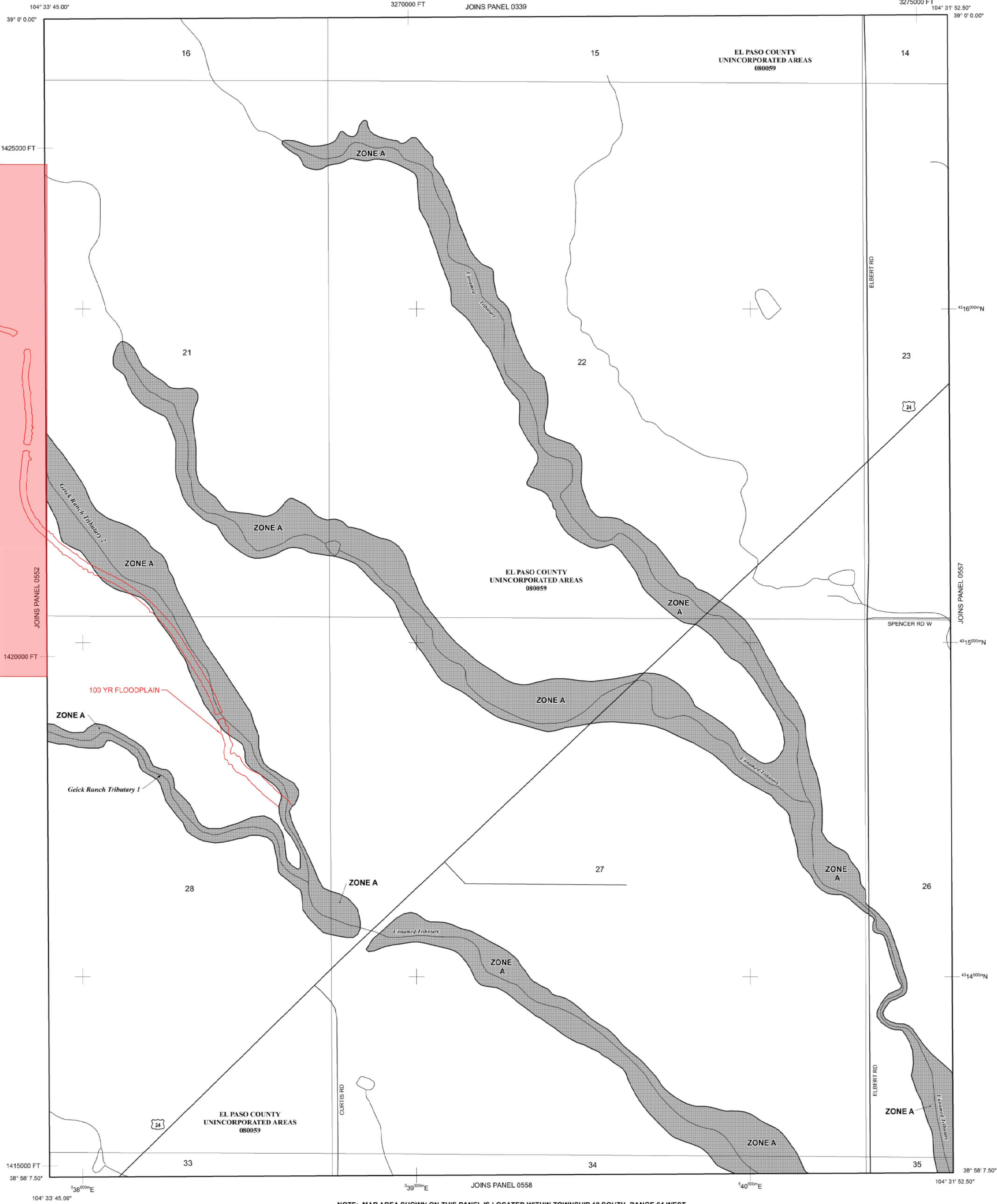
Legend
Vertical Datum Offset (ft)
FLOOD INSURANCE STUDY REVISION INFORMATION



was produced through a contract with the State of Colorado Department of Emergency Management.

information and resources are available from the community map repository and the Colorado Department of Emergency Management.

SEE ANNOTATED FIRM 08041C0552G



EL PASO COUNTY UNINCORPORATED AREAS 080059

THE 1% ANNUAL CHANCE FLOOD (100-YEAR FLOOD), ALSO KNOWN AS THE BASE FLOOD, IS THE FLOOD THAT HAS A 1% CHANCE OF BEING EQUATED OR EXCEEDED IN ANY GIVEN YEAR. THE SPECIAL FLOOD HAZARD AREA IS THE AREA SUBJECT TO FLOODING BY THE 1% ANNUAL CHANCE FLOOD. AREAS OF SPECIAL FLOOD HAZARD INCLUDE ZONES A, AE, AH, AD, AR, A99, V, AND VE. THE BASE FLOOD ELEVATION IS THE WATER-SURFACE ELEVATION OF THE 1% ANNUAL CHANCE FLOOD.

ZONE A No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AD Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS
ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS
ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS
OTHERWISE PROTECTED AREAS (OPAs)
CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Legend
Floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 Base Flood Elevation line and value; elevation in feet* (EL 513)
Base Flood Elevation value where uniform within zone; elevation in feet*
* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

Map Scale
1" = 500'
250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
PANEL 0556G

FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 556 OF 1300
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:
COMMUNITY EL PASO COUNTY
NUMBER 080059
PANEL 0556
SUFFIX G

Map Number
08041C0556G

Map Revised
DECEMBER 7, 2018

Appendix D

Excerpts from Proposed Plans

GRANDVIEW RESERVE

SECTIONS 21, 22, 27 & 28, TOWNSHIP 12 S, RANGE 64 W
CITY OF FALCON, EL PASO COUNTY, STATE OF COLORADO



VICINITY MAP

SCALE: 1" = 5000'

BASIS OF BEARINGS:

THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.

BENCHMARK:

DESIGNATION = F 24
PID = JK0240
DESCRIPTION = DISK ON TOP OF CONCRETE MONUMENT
CONTROL POINT COORDINATE SYSTEM: NAVD88
NORTHING: 1421049.80
EASTING: 3273631.55
ELEVATION: 6866.33

LEGAL DESCRIPTION:

A TRACT OF LAND BEING PORTIONS OF THE SOUTH HALF OF SECTION 21, SOUTH HALF OF SECTION 22, NORTH HALF OF SECTION 28 AND SECTION 27, TOWNSHIP 12 SOUTH, RANGE 64 WEST OF THE SIXTH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO, BEING DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 21; THENCE NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST ON THE EAST LINE OF SAID SECTION, A DISTANCE OF 2645.09 FEET TO THE NORTHEAST CORNER OF THE SOUTHEAST QUARTER OF SAID SECTION 21, SAID POINT BEING THE POINT OF BEGINNING; THENCE NORTH 89 DEGREES 41 MINUTES 03 SECONDS EAST ON THE NORTH LINE OF THE SOUTH HALF OF SAID SECTION 22, A DISTANCE OF 3938.20 FEET; THENCE SOUTH 00 DEGREES 41 MINUTES 58 SECONDS EAST ON THE EAST LINE OF THE WEST HALF OF THE SOUTHEAST QUARTER OF SECTION 22, A DISTANCE OF 2117.66 FEET TO A POINT ON THE NORTHWESTERLY RIGHT OF WAY LINE OF THE ROCK ISLAND REGIONAL TRAIL AS GRANTED TO EL PASO COUNTY IN THAT WARRANTY DEED RECORDED OCTOBER 21, 1994 IN BOOK 6548 AT PAGE 892, RECORDS OF EL PASO COUNTY, COLORADO; THENCE ON SAID NORTHWESTERLY RIGHT OF WAY, THE FOLLOWING FIVE (5) COURSES:

- (1) SOUTH 45 DEGREES 55 MINUTES 49 SECONDS WEST, A DISTANCE OF 758.36 FEET TO A POINT ON THE SOUTH LINE OF THE SOUTHEAST QUARTER OF SAID SECTION 22;
- (2) NORTH 89 DEGREES 38 MINUTES 06 SECONDS EAST ON SAID SOUTH LINE, A DISTANCE OF 36.18 FEET;
- (3) SOUTH 45 DEGREES 55 MINUTES 49 SECONDS WEST, A DISTANCE OF 3818.92 FEET TO A POINT ON THE NORTH LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 27;
- (4) SOUTH 89 DEGREES 39 MINUTES 01 SECONDS WEST ON SAID NORTH LINE, A DISTANCE OF 36.17 FEET;
- (5) SOUTH 45 DEGREES 55 MINUTES 49 SECONDS WEST, A DISTANCE OF 855.35 FEET TO A POINT ON THE EASTERLY LINE OF SAID SECTION 28;

THENCE NORTH 00 DEGREES 21 MINUTES 45 SECONDS WEST ON THE EAST LINE OF THE SOUTHEAST QUARTER OF SAID SECTION 28, A DISTANCE OF 591.16 FEET TO THE NORTHEAST CORNER OF SAID SOUTHEAST QUARTER; THENCE NORTH 00 DEGREES 21 MINUTES 38 SECONDS WEST ON THE EAST LINE OF THE NORTHEAST QUARTER OF SAID SECTION 28, A DISTANCE OF 1319.24 FEET TO THE SOUTH LINE OF THE NORTH HALF OF THE NORTH HALF OF SAID SECTION 28; THENCE NORTH 89 DEGREES 47 MINUTES 08 SECONDS WEST ON SAID SOUTH LINE, A DISTANCE OF 4692.55 FEET TO A POINT ON THE EASTERLY RIGHT OF WAY LINE OF EXISTING EASTONVILLE ROAD (60.00 FOOT WIDE); THENCE ON SAID EASTERLY RIGHT OF WAY AS DEFINED BY CERTIFIED BOUNDARY SURVEY, AS RECORDED JULY 18, 2001 UNDER RECEPTION NO. 201900096, THE FOLLOWING FIVE (5) COURSES:

- (1) ON THE ARC OF A CURVE TO THE LEFT, WHOSE CENTER BEARS NORTH 73 DEGREES 08 MINUTES 46 SECONDS WEST, HAVING A DELTA OF 24 DEGREES 31 MINUTES 32 SECONDS, A RADIUS OF 1630.00 FEET, A DISTANCE OF 697.73 FEET TO A POINT OF TANGENT;
- (2) NORTH 07 DEGREES 40 MINUTES 18 SECONDS WEST, A DISTANCE OF 777.34 FEET TO A POINT OF CURVE;
- (3) ON THE ARC OF A CURVE TO THE RIGHT, HAVING A DELTA OF 39 DEGREES 01 MINUTES 10 SECONDS, A RADIUS OF 1770.00 FEET, A DISTANCE OF 1205.40 FEET TO A POINT OF TANGENT;
- (4) NORTH 31 DEGREES 20 MINUTES 52 SECONDS EAST, A DISTANCE OF 1517.37 FEET TO A POINT OF CURVE;
- (5) ON THE ARC OF A CURVE TO THE LEFT, HAVING A DELTA OF 02 DEGREES 07 MINUTES 03 SECONDS, A RADIUS OF 1330.00 FEET, A DISTANCE OF 49.15 FEET TO A POINT ON THE NORTH LINE OF THE SOUTH HALF OF SAID SECTION 21;

THENCE SOUTH 89 DEGREES 50 MINUTES 58 SECONDS EAST ON SAID NORTH LINE, A DISTANCE OF 3635.53 FEET TO THE POINT OF BEGINNING;

ENGINEER'S STATEMENT

THESE DETAILED PLANS AND SPECIFICATIONS WERE PREPARED UNDER MY DIRECTION AND SUPERVISION. SAID PLANS AND SPECIFICATIONS HAVE BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR DETAILED ROADWAY, DRAINAGE, GRADING AND EROSION CONTROL PLANS AND SPECIFICATIONS, AND SAID PLANS AND SPECIFICATIONS ARE IN CONFORMITY WITH APPLICABLE MASTER DRAINAGE PLANS AND MASTER TRANSPORTATION PLANS. SAID PLANS AND SPECIFICATIONS MEET THE PURPOSES FOR WHICH THE PARTICULAR ROADWAY AND DRAINAGE FACILITIES ARE DESIGNED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARATION OF THESE DETAILED PLANS AND SPECIFICATIONS.

GREGORY PANZA PE # 37081

DATE

OWNER'S STATEMENT

I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH THE REQUIREMENTS OF THE GRADING AND EROSION CONTROL PLAN AND ALL OF THE REQUIREMENTS SPECIFIED IN THESE DETAILED PLANS AND SPECIFICATIONS.

MELODY HOMES

DATE

4 SITE INVESTMENTS LLC
1271 KELLY JOHNSON BLVD STE 100 COLORADO SPRINGS CO, 80902

EL PASO COUNTY:

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT. FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, DRAINAGE CRITERIA MANUAL VOLUMES 1 AND 2, AND ENGINEERING CRITERIA MANUAL, AS AMENDED, IN ACCORDANCE WITH ECM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VALID FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTOR'S DISCRETION.

JOSHUA PALMER, P.E.

DATE

COUNTY ENGINEER / ECM ADMINISTRATOR

ENGINEER CONTACT(S):

HR GREEN DEVELOPMENT, LLC
GREG PANZA, P.E.
5619 DTC PARKWAY, SUITE 1150
GREENWOOD VILLAGE, CO 80111
PH: 720-602-4999
gpanza@hrgreen.com

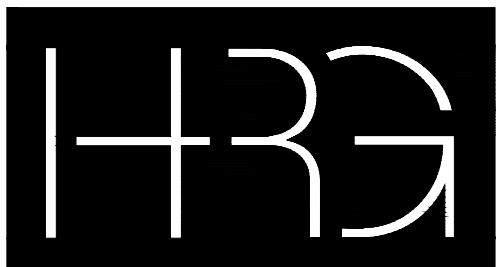
EL PASO PDC FILE NO.

CDR-228

SHEET INDEX		
Sheet Number	Sheet Description	Sheet Title
01	TS1	TITLE SHEET
02	GN1	GENERAL NOTES
03	SC1	SURVEY CONTROL PLAN
04	UP1	OVERALL UTILITY PLAN
05	GR1	TRIBUTARY 1 Grading
06	GR2	TRIBUTARY 2 Valley Grading
07	GR3	TRIBUTARY 2 Valley Grading
08	GR4	TRIBUTARY 2 Valley Grading
09	GR5	TRIBUTARY 2 Valley Grading
10	GR6	TRIBUTARY 2 Valley Grading
11	GR7	TRIBUTARY 2 Valley Grading
12	GR8	TRIBUTARY 2 Valley Grading
13	GR9	TRIBUTARY 2 Valley Grading
14	GR10	TRIBUTARY 2 Valley Grading
15	GR11	TRIBUTARY 2 Valley Grading
16	GR12	TRIBUTARY 2 Valley Grading
17	GR13	TRIBUTARY 2 Valley Grading
18	GR14	TRIBUTARY 2 Bankfull Grading
19	GR15	TRIBUTARY 2 Bankfull Grading
20	GR16	TRIBUTARY 2 Bankfull Grading
21	GR17	TRIBUTARY 2 Bankfull Grading
22	GR18	TRIBUTARY 2 Bankfull Grading
23	GR19	TRIBUTARY 2 Bankfull Grading
24	EC1	INITIAL EROSION CONTROL
25	EC2	INITIAL EROSION CONTROL
26	EC3	INITIAL EROSION CONTROL
27	EC4	FINAL EROSION CONTROL
28	EC5	FINAL EROSION CONTROL
29	EC6	FINAL EROSION CONTROL
30	PP1	DRAINAGE TRIBUTARY 1 PLAN AND PROFILE
31	PP2	DRAINAGE TRIBUTARY 2 PLAN AND PROFILE
32	PP3	DRAINAGE TRIBUTARY 2 PLAN AND PROFILE
33	PP4	DRAINAGE TRIBUTARY 2 PLAN AND PROFILE
34	PP5	DRAINAGE TRIBUTARY 2 PLAN AND PROFILE
35	PP6	DRAINAGE CULVERTS PLAN AND PROFILE
36	PP7	DRAINAGE CULVERT PLAN AND PROFILE
37	CS1	TRIBUTARY 2 CROSS SECTIONS
38	CS2	TRIBUTARY 2 CROSS SECTIONS
39	CS3	TRIBUTARY 2 CROSS SECTIONS
40	DT1	DETAILS
41	DT2	DETAILS
42	DT3	DETAILS
43	DT4	DETAILS
44	DT5	DETAILS
45	DT6	DETAILS

SYMBOLS, ABBREVIATIONS, AND LINETYPES LEGEND

	CWA	CONCRETE WASHOUT AREA
	CF	CONSTRUCTION FENCE
	IP	INLET PROTECTION
	OP	OUTLET PROTECTION
	SF	SILT FENCE
	VTC/SSA	VEHICLE TRACKING CONTROL/STABILIZED STAGING AREA
	LOC	LIMITS OF CONSTRUCTION
	CD	CHECK DAM
	SM	SEEDING AND MULCHING
	SB	SEDIMENT BASIN
	SR	SURFACE ROUGHENING
	ECB	EROSION CONTROL BLANKET
	CIP	CULVERT INLET PROTECTION
	RS	ROCK SOCK
		STORM INLET TYPE R
		STORM END SECTION
		STORM MANHOLE
		SANITARY MANHOLE
		FIRE HYDRANT
		LIGHT POLE
		WATER VALVE
		PROPERTY LINE
		ROAD CENTERLINE
		RIGHT-OF-WAY LINE
		PROPOSED DRAINAGE
		PROPOSED MAJOR CONTOUR
		PROPOSED MINOR CONTOUR
		EXISTING MAJOR CONTOUR
		EXISTING MINOR CONTOUR
		FLOW ARROW
		PROPOSED 100-YR FLOODPLAIN
		EFFECTIVE 100-YR FLOODPLAIN
		LIMITS OF DISTURBANCE
		POTENTIAL WALL
		STORM SEWER
		WATERMAIN
		SANITARY SEWER
		SANITARY SERVICE
	ARV	AIR RELEASE VALVE
	CP	CATHODIC PROTECTION
	STA	STATION
	MUE	MULTI USE EASEMENT
	APRX	APPROXIMATE
	PR	PROPOSED
	FT	FEET
	DIA	DIAMETER
	LF	LINEAL FEET
	EL	ELEVATION



HRGreen

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HR GREEN - DENVER
5613 DTC PARKWAY SUITE 950
DENVER CO 80111
PHONE: 720.602.4999
FAX: 713.965.0044

GRANDVIEW RESERVE
DR HORTON
FALCON, COLORADO

CONSTRUCTION DOCUMENTS
TITLE SHEET

SHEET

TS1

01

DRAWN BY: TBI
APPROVED: GLP
CAD DATE: 11/30/2023
CAD FILE: J:\2020\201662.03\CAD\dwgs\C\TITLE SHEET

JOB DATE: 11/6/2023
JOB NUMBER: 201662.03

BAR IS ONE INCH ON
OFFICIAL DRAWINGS.
0 1" IF NOT ONE INCH,
ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION

Engineering plan view of a proposed road project. The drawing shows a road alignment with stationing from 0+00 to 10+00. Key features include:

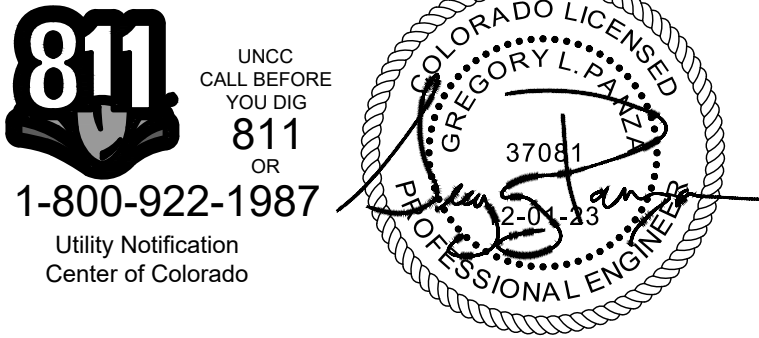
- Proposed 100 Year Floodplain:** Shaded blue area.
- Valley Channel Centerline:** Dashed line.
- Bankfull Channel Centerline:** Dashed line.
- Proposed 15.00' Maintenance Trail:** Dashed line.
- Proposed 100 Year Floodplain:** Shaded blue area.
- Limits of Construction:** Dashed line.
- Limits of Disturbance:** Dashed line.
- Match Line STA. 8+50:** See Sheet GR3.
- Match Line STA. 10+00:** See Sheet GR4.
- Curve Data Table:**

TRIBUTARY 2 UPSTREAM				
LINE # CURVE#	LENGTH	RADIUS	LNE/CHORD DIRECTION	CHORD LENGTH
C4	55.21	90.32	N4° 03' 37.62"E	54.35
L4	19.06		N15° 57' 12.45"E	
C5	30.10	64.61	N3° 11' 43.90"W	29.83
L5	249.66		N16° 01' 39.50"W	
- Other Labels:**
 - (4) 8' X 4' CONCRETE BOX CULVERTS 53' LONG WITH 45 DEGREE WING WALLS (PUBLIC). REFER TO PP5 FOR PLAN AND PROFILE.
 - 100.00' TRACT SA
 - BEGIN LIMITS OF CONSTRUCTION STA 5+77.43 N: 1419144.80 E: 3268530.87
 - TAG #C4 START STA 5+35.84 N: 1419117.23 E: 3268561.35

A map of the area around the intersection of Eastonville Rd and Hwy 24. The map shows a shaded area with labels GR13, GR9, GR1, GR3, and GR2. A red rectangle is located near GR3. A north arrow is in the bottom right corner.

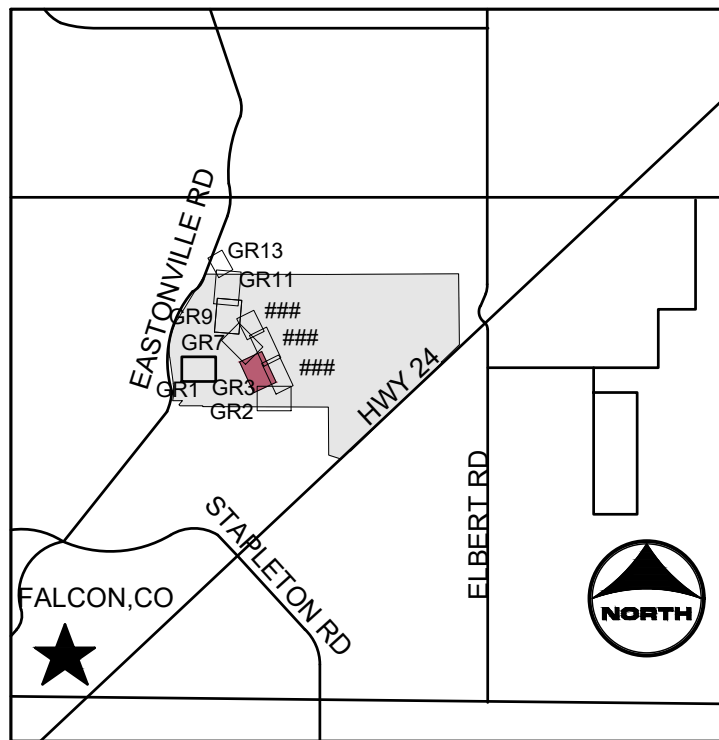
PROJECT LEGEND

- NOTES:**
- BASIS OF BEARINGS:** THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.
 - BENCHMARK:**
DESIGNATION = F 24
PID = JK0240
DESCRIPTION = DISK ON TOP OF CONCRETE MONUMENT
CONTROL POINT COORDINATE SYSTEM:
NAVD88
NORTHING: 1421049.80
EASTING: 3273631.55
ELEVATION: 6866.33






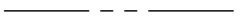












SHEET
GR2 06

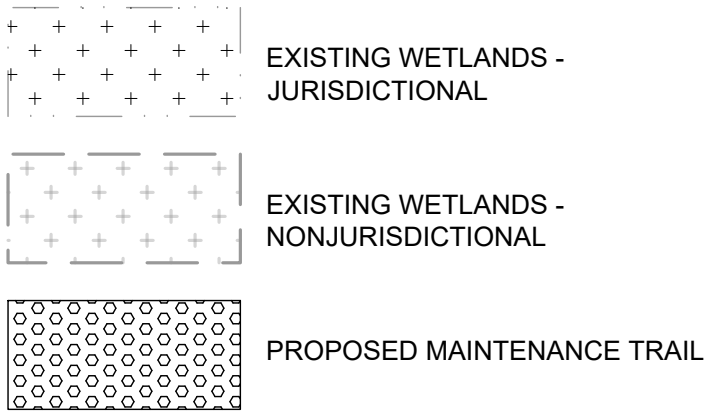
TRIBUTARY 2 UPSTREAM				
LINE #/ CURVE#	LENGTH	RADIUS	LNE/CHORD DIRECTION	CHORD LENGTH
C6	452.43	1990.27	N24° 32' 36.87"W	451.46
L6	428.69		N31° 44' 28.34"W	



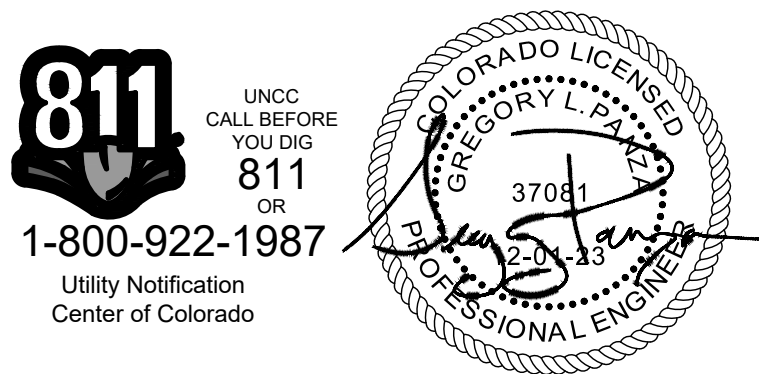
KEYMAP

PROJECT LEGEND:

	PROPERTY LINE
	ROAD CENTERLINE
	RIGHT-OF-WAY LINE
	SECTION LINE
	EXISTING EASEMENT
	EXISTING FENCE
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	CONSTRUCTION EASEMENT
	FLOW ARROW
	LIMITS OF DISTURBANCE
	LIMITS OF DISTURBANCE
	PROPOSED 100-YR FLOODPLAIN
	EFFECTIVE 100-YR FLOODPLAIN



- NOTES:**
- BASIS OF BEARINGS:** THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996"; BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996". BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.
 - BENCHMARK:**
DESIGNATION = F 24
PID = JK0240
DESCRIPTION = DISK ON TOP OF CONCRETE MONUMENT
CONTROL POINT COORDINATE SYSTEM:
NAD83
NORTHING: 1421049.80
EASTING: 3273631.55
ELEVATION: 6866.33



DRAWN BY: ACH	JOB DATE: 11/29/2023	BAR IS ONE INCH ON OFFICIAL DRAWINGS. 0 [REDACTED] 1" IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.
APPROVED: GLP	JOB NUMBER: 201662.03	
CAD DATE: 11/30/2023		
CAD FILE: J:\2020\201662.03\CAD\DWG\IC\GRADING		

NO.	DATE	BY	REVISION DESCRIPTION

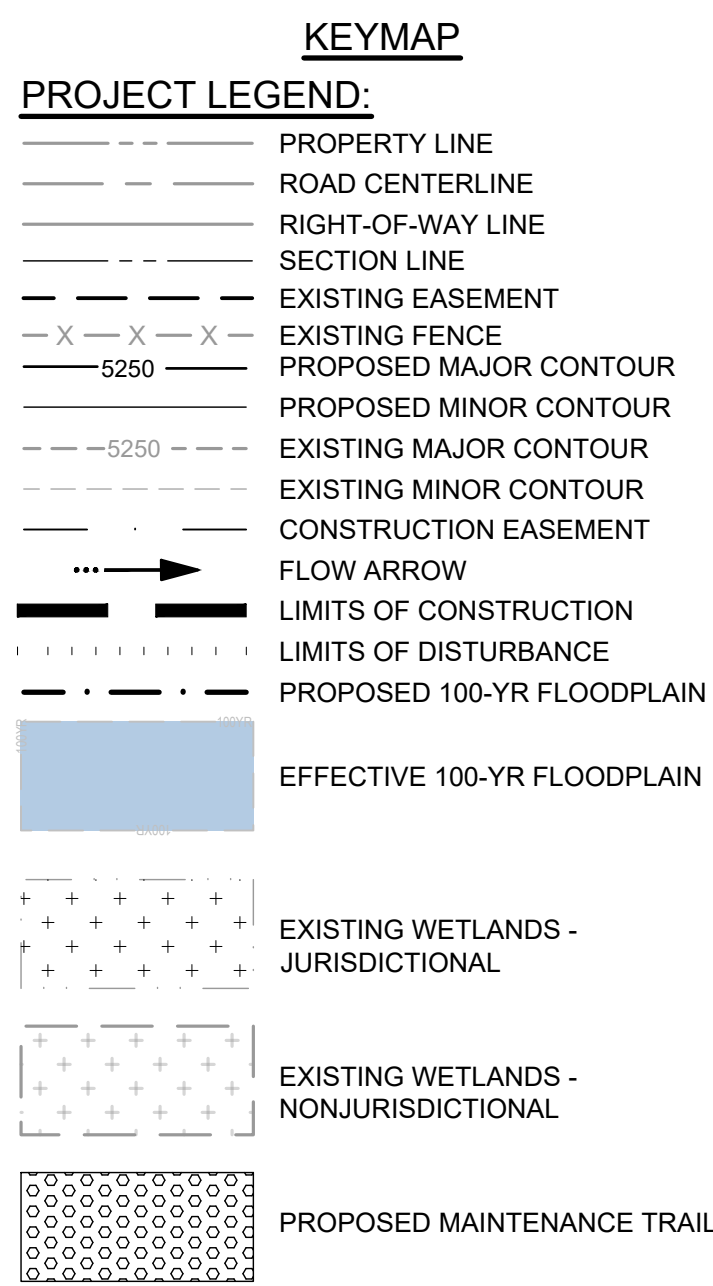
HRGreen
HR GREEN - DENVER
5613 DTC PARKWAY SUITE 950
DENVER CO 80111
PHONE: 720.602.4999
FAX: 713.965.0044

GRANDVIEW RESERVE
DR HORTON
FALCON, COLORADO

CONSTRUCTION DOCUMENTS
TRIBUTARY 2 VALLEY GRADING

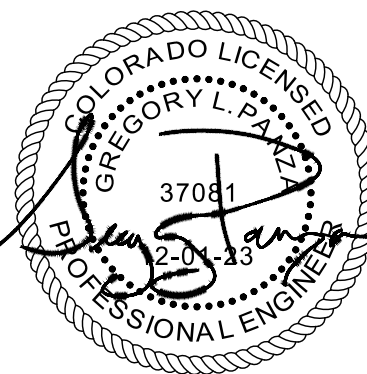
SHEET
GR3 07


This topographic map illustrates a proposed road alignment through a hilly area. The road is shown as a thick solid black line, flanked by dashed black lines representing the 'LIMITS OF CONSTRUCTION' and 'LIMITS OF DISTURBANCE'. The alignment starts at a 'MATCH LINE SEE SHEET GR3' on the left, rises to a peak, and then descends to the right. Contour lines are drawn at 1-foot intervals, with labels every 5 feet (e.g., 6920, 6925, 6930). A blue-shaded region at the bottom of the map indicates the '100YR' flood zone. A horizontal line at the bottom is labeled 'MATCH LINE SEE SHEET GR3'. A north arrow is located in the lower-left corner.



NOTES:

- BASIS OF BEARINGS:** THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.
- BENCHMARK:**
DESIGNATION = F 24
PID = JK0240
DESCRIPTION = DISK ON TOP OF CONCRETE MONUMENT
CONTROL POINT COORDINATE SYSTEM:
NAD83
NORTHING: 1421049.80
EASTING: 3273631.55
ELEVATION: 6866.33



DRAWN BY: ACH JOB DATE: 11/29/2023 BAR IS ONE INCH ON
APPROVED: GLP JOB NUMBER: 201662.03 OFFICIAL DRAWINGS.
0  1"
CAD DATE: 11/30/2023 IF NOT ONE INCH,
CAD FILE: J:\2020\201662.03\CAD\DWG\G\GRADING ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION



HR GREEN - DENVER
5613 DTC PARKWAY SUITE 950
DENVER CO 80111
PHONE: 720.602.4999
FAX: 713.965.0044

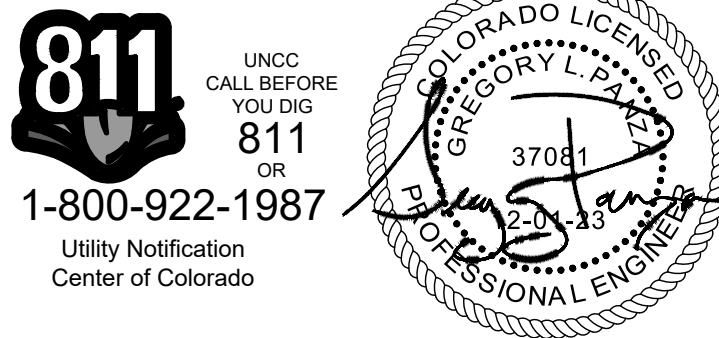
GRANDVIEW RESERVE
DR HORTON
FALCON, COLORADO

CONSTRUCTION DOCUMENTS
TRIBUTARY 2 VALLEY GRADING

SHEET	
GR4	08

PROJECT LEGEND

- NOTES:**
- BASIS OF BEARINGS:** THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.
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NAD83
NORTHING: 1421049.80
EASTING: 3273631.55
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NO.	DATE	BY	REVISION DESCRIPTION

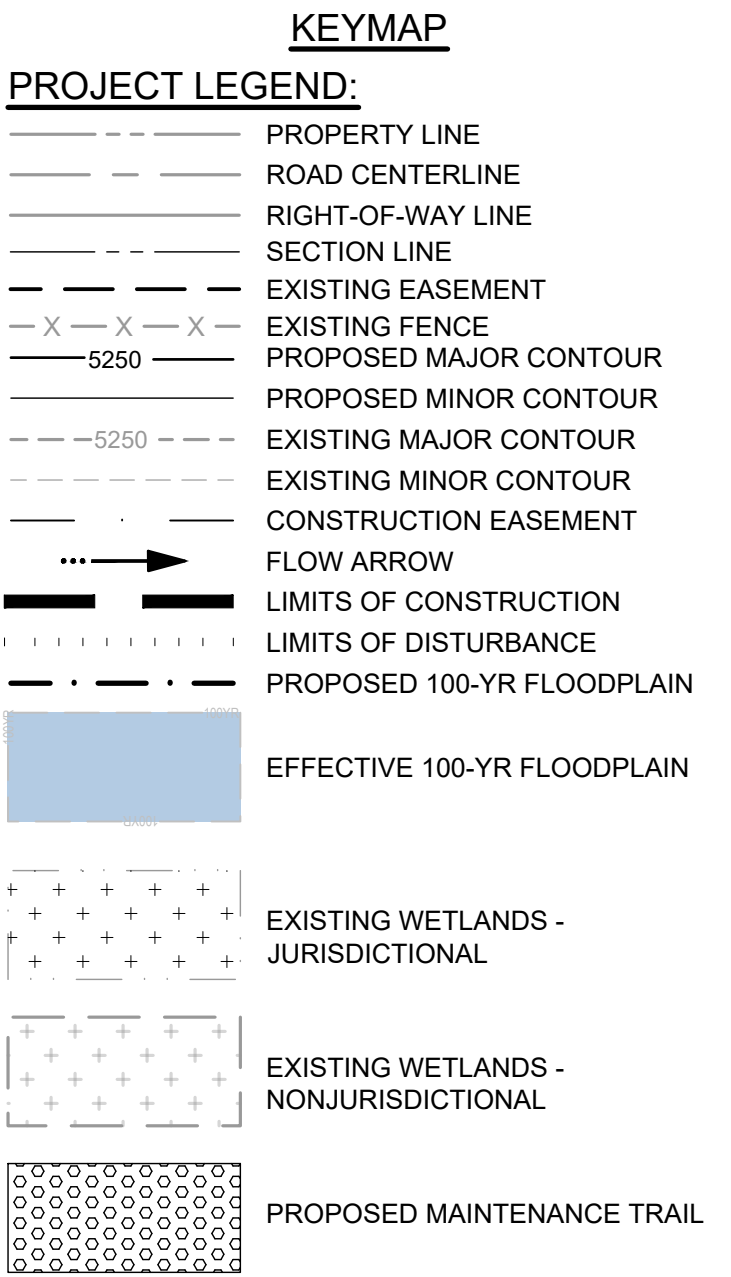
GRANDVIEW RESERVE
DR HORTON
FALCON, COLORADO

CONSTRUCTION DOCUMENTS

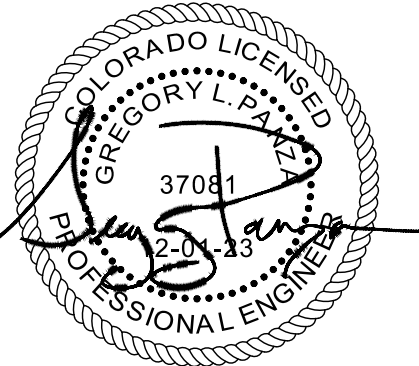
TRIBUTARY 2 VALLEY GRADING

SHEET
GR7

11



- NOTES:**
- BASIS OF BEARINGS:** THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.
 - BENCHMARK:**
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PID = JK0240
DESCRIPTION = DISK ON TOP OF CONCRETE MONUMENT
CONTROL POINT COORDINATE SYSTEM:
NAD83
NORTHING: 1421049.80
EASTING: 3273631.55
ELEVATION: 6866.33



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CAD DATE: 11/30/2023		IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.
CAD FILE: J:\2020\201662.03\CAD\DWG\IC\GRADING		

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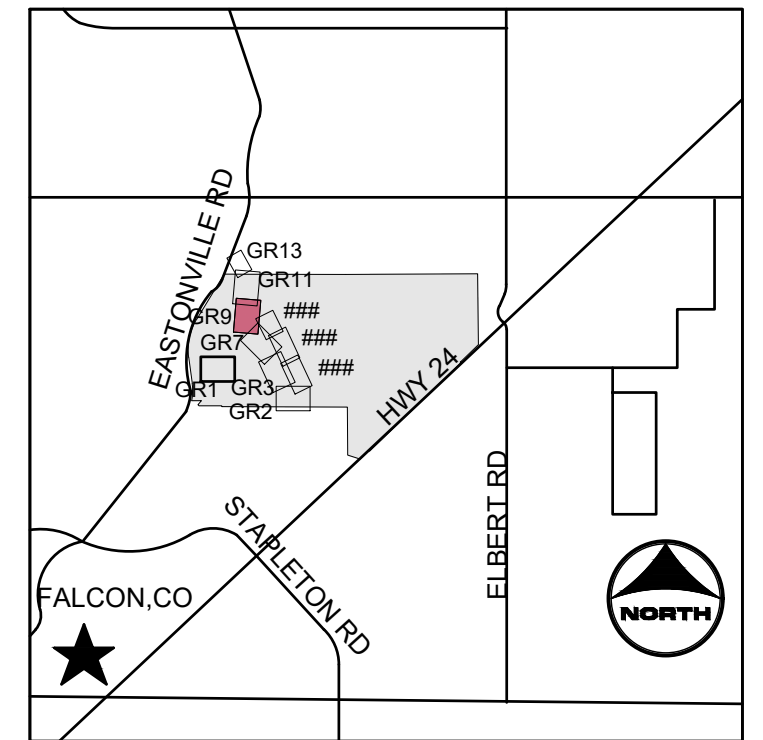
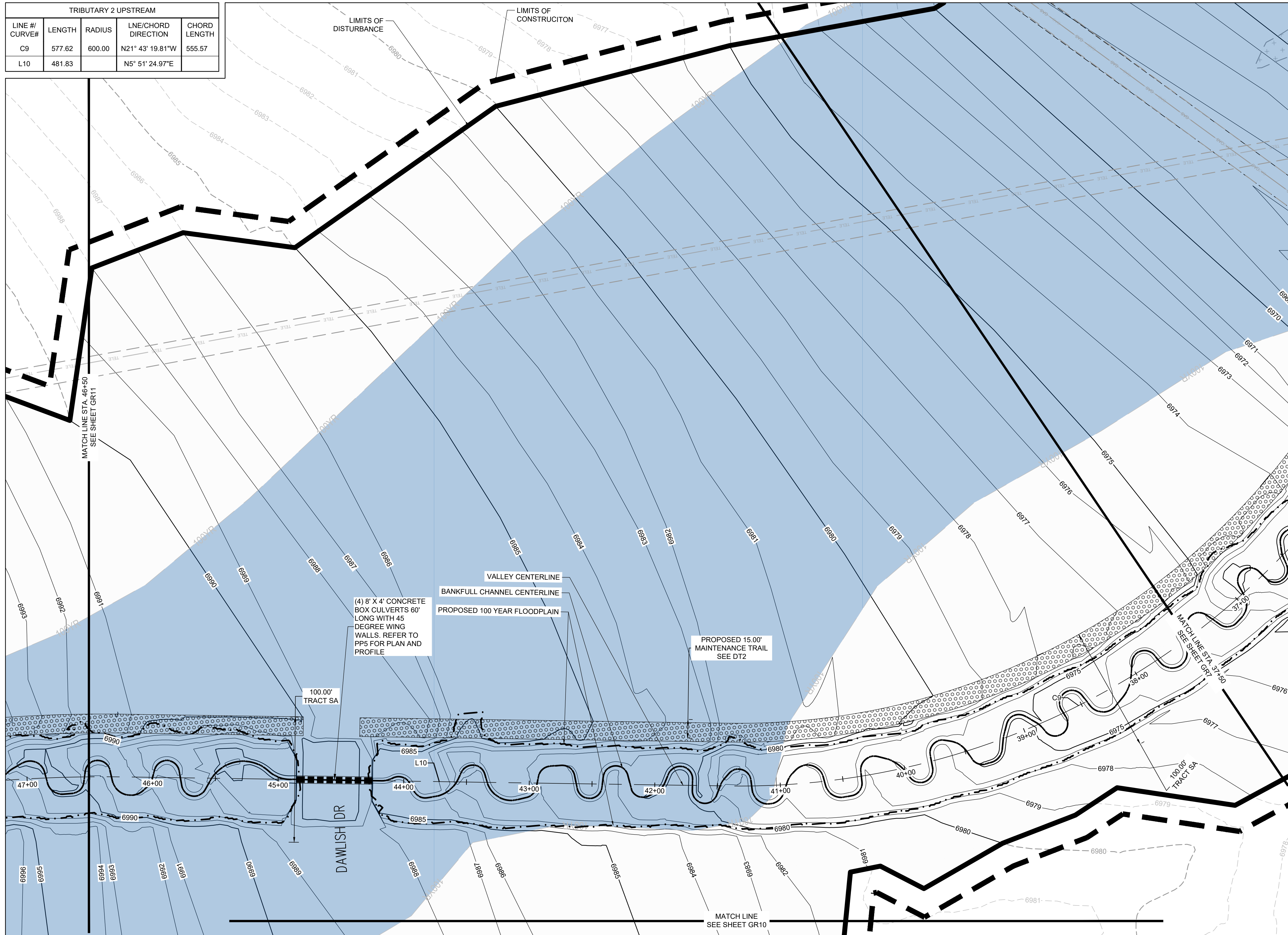
GRANDVIEW RESERVE
DR HORTON
FALCON, COLORADO

CONSTRUCTION DOCUMENTS
 TRIBUTARY 2 VALLEY GRADING

SHEET
GR8

12

TRIBUTARY 2 UPSTREAM				
LINE #/ CURVE#	LENGTH	RADIUS	LNE/CHORD DIRECTION	CHORD LENGTH
C9	577.62	600.00	N21° 43' 19.81"W	555.57
L10	481.83		N5° 51' 24.97"E	



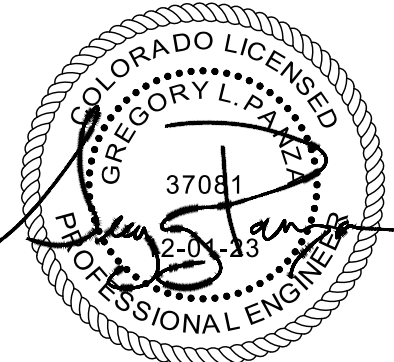
PROJECT LEGEND:

EXISTING WETLANDS - JURISDICTIONAL



PROPOSED MAINTENANCE TRAIL

NOTES:



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5613 DTC PARKWAY SUITE 950
DENVER CO 80111
PHONE: 720.602.4999
FAX: 713.965.0044


GRANDVIEW RESERVE
DR HORTON
FALCON, COLORADO

CONSTRUCTION DOCUMENTS
TRIBUTARY 2 VALLEY GRADING

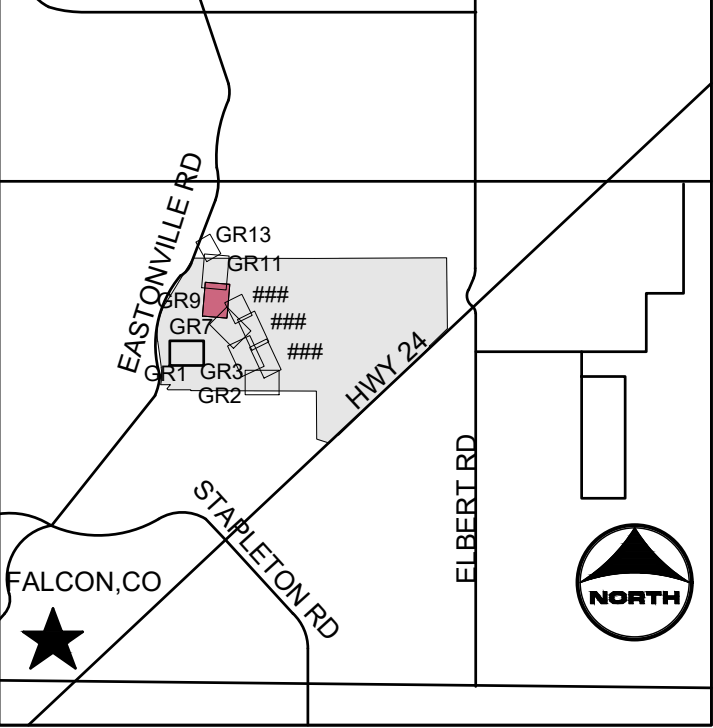
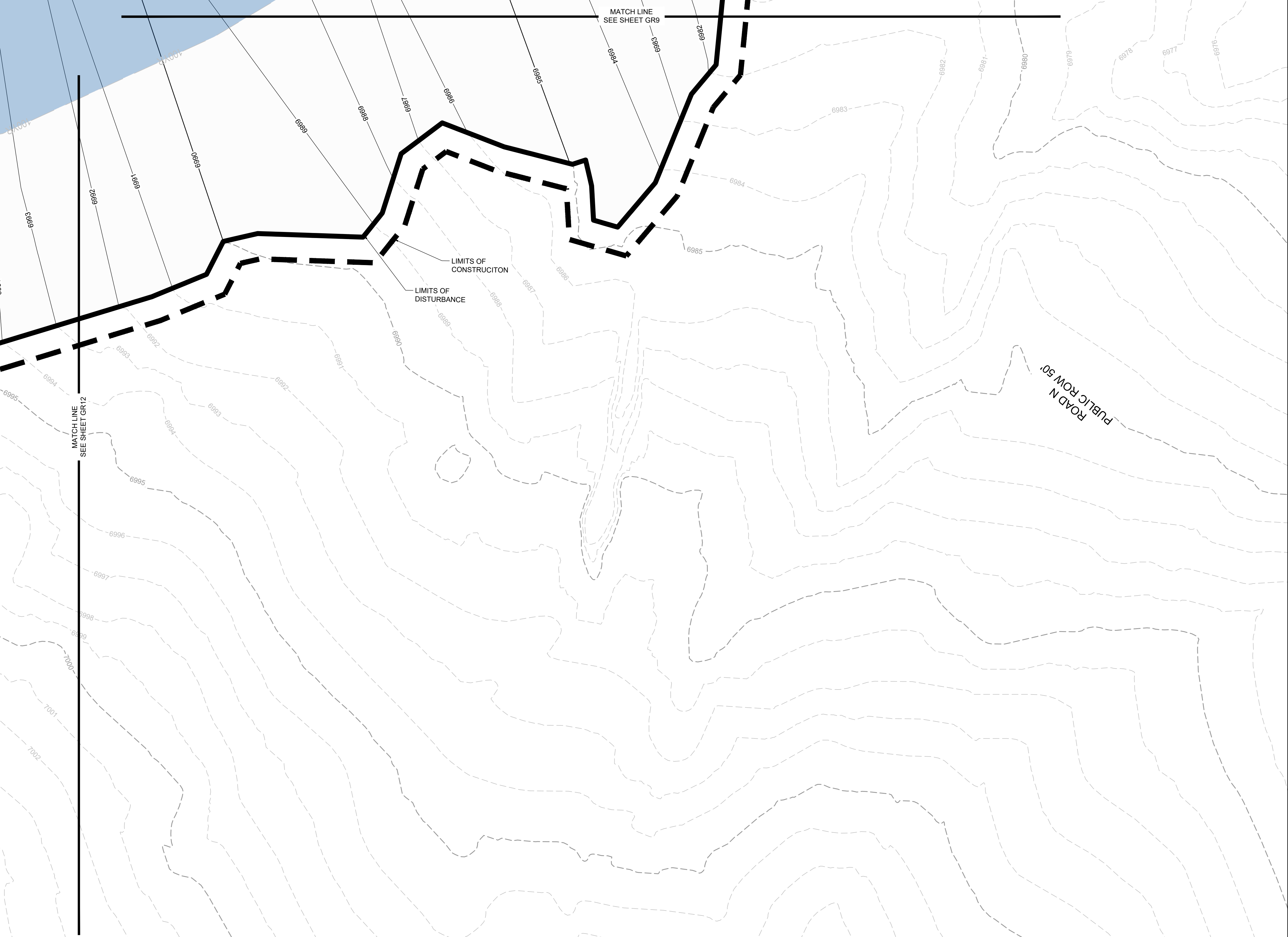
SHEET
GR9

13

DRAWN BY:	ACH	JOB DATE:	11/29/2023
APPROVED:	GLP	JOB NUMBER:	201662.03
CAD DATE:	11/30/2023		
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NO.	DATE	BY	REVISION DESCRIPTION

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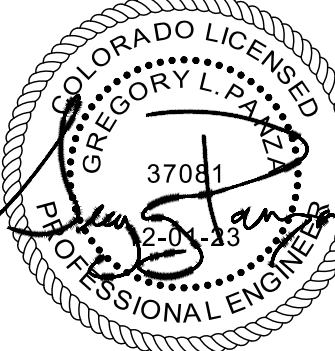
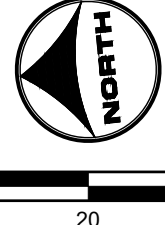
PROJECT LEGEND:

-
- PROPERTY LINE
 — ROAD CENTERLINE
 - - - RIGHT-OF-WAY LINE
 - · - SECTION LINE
 — X — X — X — EXISTING EASEMENT
 — 5250 — EXISTING FENCE
 — 5250 — PROPOSED MAJOR CONTOUR
 - - - PROPOSED MINOR CONTOUR
 - · - EXISTING MAJOR CONTOUR
 · · · EXISTING MINOR CONTOUR
 ——— CONSTRUCTION EASEMENT
 ———> FLOW ARROW
 ——— LIMITS OF CONSTRUCTION
 - - - LIMITS OF DISTURBANCE
 · · · PROPOSED 100-YR FLOODPLAIN
 [Solid Blue Area] EFFECTIVE 100-YR FLOODPLAIN

-
- EXISTING WETLANDS - JURISDICTIONAL
- EXISTING WETLANDS - NONJURISDICTIONAL
- PROPOSED MAINTENANCE TRAIL

NOTES:

1. **BASIS OF BEARINGS:** THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.
2. **BENCHMARK:**
DESIGNATION = F 24
PID = JK0240
DESCRIPTION = DISK ON TOP OF CONCRETE MONUMENT
CONTROL POINT COORDINATE SYSTEM:
NAVD88
NORTHING: 1421049.80
EASTING: 3273631.55
ELEVATION: 6866.33



DRAWN BY: ACH JOB DATE: 11/29/2023
 APPROVED: GLP JOB NUMBER: 201662.03
 CAD DATE: 11/30/2023
 CAD FILE: J:\2020\201662.03\CAD\Draws\C\GRADING

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NO.	DATE	BY	REVISION DESCRIPTION



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GRANDVIEW RESERVE
DR HORTON
FALCON, COLORADO

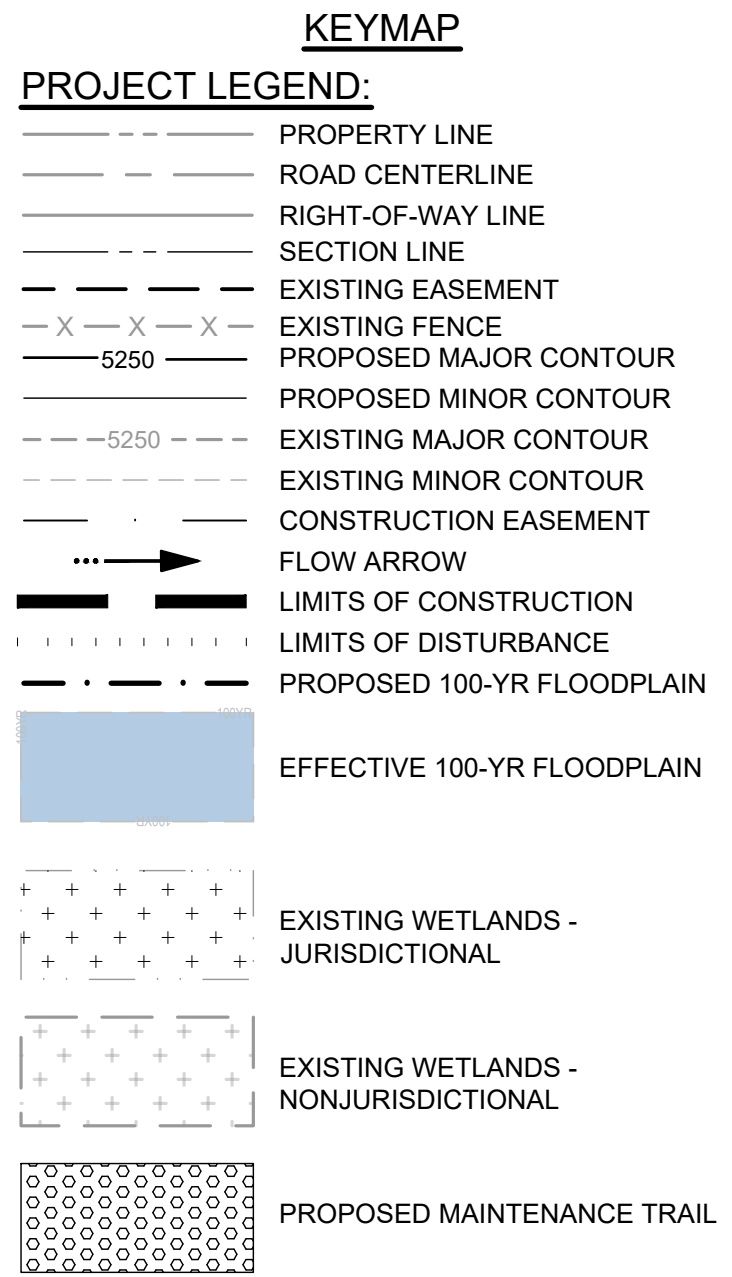
CONSTRUCTION DOCUMENTS

TRIBUTARY 2 VALLEY GRADING

SHEET
GR10

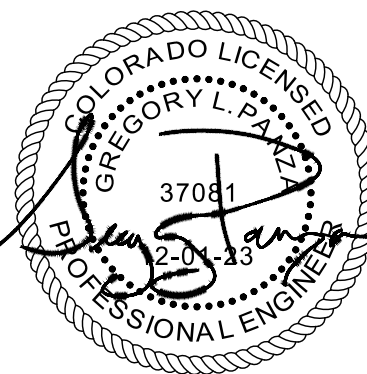
14

This topographic map depicts a rugged terrain with numerous contour lines indicating elevation. A proposed road, shown as a thick solid black line, traverses the upper portion of the map, starting from a 'MATCH LINE SEE SHEET GR11' at the top center and ending at a 'MATCH LINE SEE SHEET GR10' on the right side. A dashed black line follows a similar path below the solid road. In the lower-left corner, a railway line is visible, marked with 'OHE' (Overhead Electric) labels and small circles representing poles. The map also features a blue-shaded area in the top-left corner, possibly representing a body of water or a specific land use. Contour lines are labeled with values such as 6992, 6993, 6994, 6995, 6996, 6997, 6998, 6999, 7000, 7001, 7002, 7003, 7004, 7005, 7006, 7007, 7008, 7009, 7010, 7011, 7012, 7013, 7014, 7015, 7016, 7017, 7018, 7019, 7020, 7021, 7022, 7023, 7024, 7025, 7026, 7027, 7028, 7029, 7030, 7031, 7032, 7033, 7034, 7035, 7036, 7037, 7038, 7039, 7040, 7041, 7042, 7043, 7044, 7045, 7046, 7047, 7048, 7049, 7050, 7051, 7052, 7053, 7054, 7055, 7056, 7057, 7058, 7059, 7060, 7061, 7062, 7063, 7064, 7065, 7066, 7067, 7068, 7069, 7070, 7071, 7072, 7073, 7074, 7075, 7076, 7077, 7078, 7079, 7080, 7081, 7082, 7083, 7084, 7085, 7086, 7087, 7088, 7089, 7090, 7091, 7092, 7093, 7094, 7095, 7096, 7097, 7098, 7099, 7100, 7101, 7102, 7103, 7104, 7105, 7106, 7107, 7108, 7109, 7110, 7111, 7112, 7113, 7114, 7115, 7116, 7117, 7118, 7119, 7120, 7121, 7122, 7123, 7124, 7125, 7126, 7127, 7128, 7129, 7130, 7131, 7132, 7133, 7134, 7135, 7136, 7137, 7138, 7139, 7140, 7141, 7142, 7143, 7144, 7145, 7146, 7147, 7148, 7149, 7150, 7151, 7152, 7153, 7154, 7155, 7156, 7157, 7158, 7159, 7160, 7161, 7162, 7163, 7164, 7165, 7166, 7167, 7168, 7169, 7170, 7171, 7172, 7173, 7174, 7175, 7176, 7177, 7178, 7179, 7180, 7181, 7182, 7183, 7184, 7185, 7186, 7187, 7188, 7189, 7190, 7191, 7192, 7193, 7194, 7195, 7196, 7197, 7198, 7199, 7200, 7201, 7202, 7203, 7204, 7205, 7206, 7207, 7208, 7209, 7210, 7211, 7212, 7213, 7214, 7215, 7216, 7217, 7218, 7219, 7220, 7221, 7222, 7223, 7224, 7225, 7226, 7227, 7228, 7229, 7230, 7231, 7232, 7233, 7234, 7235, 7236, 7237, 7238, 7239, 7240, 7241, 7242, 7243, 7244, 7245, 7246, 7247, 7248, 7249, 7250, 7251, 7252, 7253, 7254, 7255, 7256, 7257, 7258, 7259, 7260, 7261, 7262, 7263, 7264, 7265, 7266, 7267, 7268, 7269, 7270, 7271, 7272, 7273, 7274, 7275, 7276, 7277, 7278, 7279, 7280, 7281, 7282, 7283, 7284, 7285, 7286, 7287, 7288, 7289, 7290, 7291, 7292, 7293, 7294, 7295, 7296, 7297, 7298, 7299, 7300, 7301, 7302, 7303, 7304, 7305, 7306, 7307, 7308, 7309, 7310, 7311, 7312, 7313, 7314, 7315, 7316, 7317, 7318, 7319, 7320, 7321, 7322, 7323, 7324, 7325, 7326, 7327, 7328, 7329, 7330, 7331, 7332, 7333, 7334, 7335, 7336, 7337, 7338, 7339, 7340, 7341, 7342, 7343, 7344, 7345, 7346, 7347, 7348, 7349, 7350, 7351, 7352, 7353, 7354, 7355, 7356, 7357, 7358, 7359, 7360, 7361, 7362, 7363, 7364, 7365, 7366, 7367, 7368, 7369, 7370, 7371, 7372, 7373, 7374, 7375, 7376, 7377, 7378, 7379, 7380, 7381, 7382, 7383, 7384, 7385, 7386, 7387, 7388, 7389, 7390, 7391, 7392, 7393, 7394, 7395, 7396, 7397, 7398, 7399, 7400, 7401, 7402, 7403, 7404, 7405, 7406, 7407, 7408, 7409, 7410, 7411, 7412, 7413, 7414, 7415, 7416, 7417, 7418, 7419, 7420, 7421, 7422, 7423, 7424, 7425, 7426, 7427, 7428, 7429, 7430, 7431, 7432, 7433, 7434, 7435, 7436, 7437, 7438, 7439, 7440, 7441, 7442, 7443, 7444, 7445, 7446, 7447, 7448, 7449, 7450, 7451, 7452, 7453, 7454, 7455, 7456, 7457, 7458, 7459, 7460, 7461, 7462, 7463, 7464, 7465, 7466, 7467, 7468, 7469, 7470, 7471, 7472, 7473, 7474, 7475, 7476, 7477, 7478, 7479, 7480, 7481, 7482, 7483, 7484, 7485, 7486, 7487, 7488, 7489, 7490, 7491, 7492, 7493, 7494, 7495, 7496, 7497, 7498, 7499, 7500, 7501, 7502, 7503, 7504, 7505, 7506, 7507, 7508, 7509, 7510, 7511, 7512, 7513, 7514, 7515, 7516, 7517, 7518, 7519, 7520, 7521, 7522, 7523, 7524, 7525, 7526, 7527, 7528, 7529, 7530, 7531, 7532, 7533, 7534, 7535, 7536, 7537, 7538, 7539, 7540, 7541, 7542, 7543, 7544, 7545, 7546, 7547, 7548, 7549, 7550, 7551, 7552, 7553, 7554, 7555, 7556, 7557, 7558, 7559, 7560, 7561, 7562, 7563, 7564, 7565, 7566, 7567, 7568, 7569, 7570, 7571, 7572, 7573, 7574, 7575, 7576, 7577, 7578, 7579, 7580, 7581, 7582, 7583, 7584, 7585, 7586, 7587, 7588, 7589, 7590, 7591, 7592, 7593, 7594, 7595, 7596, 7597, 7598, 7599, 7600, 7601, 7602, 7603, 7604, 7605, 7606, 7607, 7608, 7609, 7610, 7611, 7612, 7613, 7614, 7615, 7616, 7617, 7618, 7619, 7620, 7621, 7622, 7623, 7624, 7625, 7626, 7627, 7628, 7629, 7630, 7631, 7632, 7633, 7634, 7635, 7636, 7637, 7638, 7639, 7640, 7641, 7642, 7643, 7644,



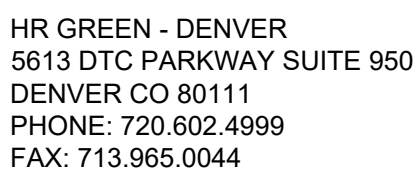
NOTES:

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CONTROL POINT COORDINATE SYSTEM:
NAD83
NORTHING: 1421049.80
EASTING: 3273631.55
ELEVATION: 6866.33



DRAWN BY: ACH	JOB DATE: 11/29/2023	BAR IS ONE INCH ON OFFICIAL DRAWINGS. 0 [REDACTED] 1" IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.
APPROVED: GLP	JOB NUMBER: 201662.03	
CAD DATE: 11/30/2023		
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NO.	DATE	BY	REVISION DESCRIPTION

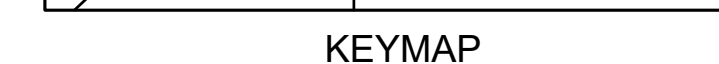
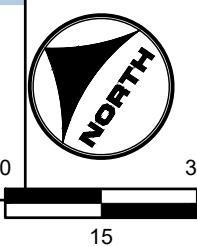


GRANDVIEW RESERVE
DR HORTON
FALCON, COLORADO

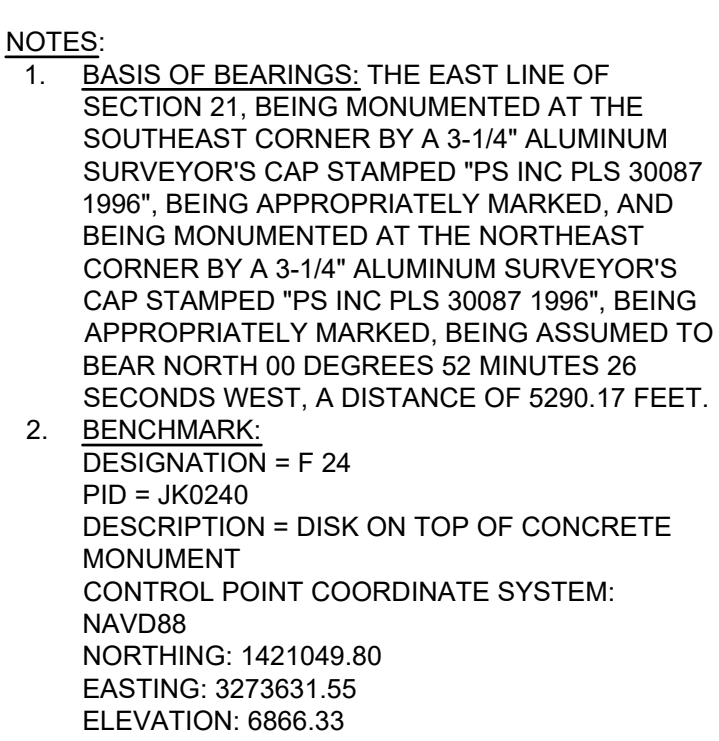
CONSTRUCTION DOCUMENTS


TRIBUTARY 2 VALLEY GRADING

SHEET
GR12 16

[illegible]

--- PROPERTY LINE
 ——— ROAD CENTERLINE
 --- RIGHT-OF-WAY LINE
 --- SECTION LINE
 --- EXISTING EASEMENT
 — X — X — X — EXISTING FENCE
 ———5250——— PROPOSED MAJOR CONTOUR
 ———5250——— PROPOSED MINOR CONTOUR
 --- EXISTING MAJOR CONTOUR
 --- EXISTING MINOR CONTOUR
 ——— CONSTRUCTION EASEMENT
 ... → FLOW ARROW
 ——— LIMITS OF CONSTRUCTION
 --- LIMITS OF DISTURBANCE
 PROPOSED 100-YR FLOODPLAIN
 [Solid Blue Area] EFFECTIVE 100-YR FLOODPLAIN



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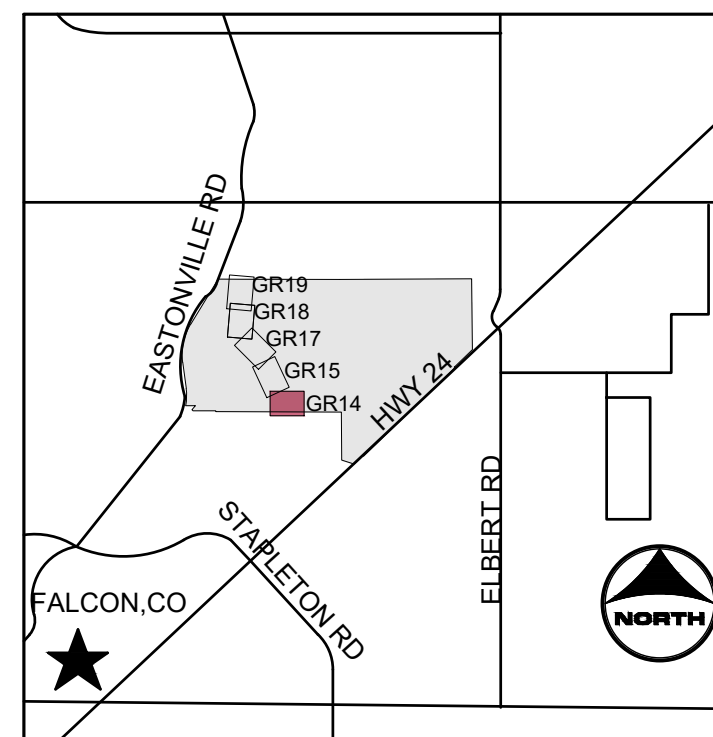
CONSTRUCTION DOCUMENTS
TRIBUTARY 2 VALLEY GRADING

SHEET	
GR13	17

TRIBUTARY 2 UPSTREAM				
LINE #/ CURVE#	LENGTH	RADIUS	LINE/CHORD DIRECTION	CHORD LENGTH
C17	23.57	41.88	N4° 01' 38.63"W	23.26
C18	10.83	12.19	N35° 29' 11.94"E	10.47
C19	18.75	8.48	N6° 39' 51.93"W	15.16
C20	34.91	14.90	N2° 05' 18.09"W	27.46
C21	26.77	22.42	N48° 21' 42.40"E	25.21
C22	19.16	10.32	N33° 07' 20.38"W	16.53
L42	7.09		N87° 12' 45.01"W	
C23	11.33	16.00	N66° 56' 06.46"W	11.09
L43	6.19		N46° 39' 27.92"W	
C24	21.24	10.00	N14° 10' 45.83"E	17.46
L44	8.71		N75° 00' 59.59"E	
C25	29.86	10.00	N10° 32' 25.13"W	19.94
L45	8.42		S83° 54' 10.16"W	
C26	28.24	10.00	N15° 11' 40.40"W	19.75
L46	10.54		N65° 42' 26.88"E	
C27	14.48	10.00	N24° 13' 15.71"E	13.25
L47	9.11		N17° 15' 52.57"W	
C28	12.97	10.00	N54° 25' 30.93"W	12.08
L48	9.22		S88° 24' 49.50"W	
C29	11.31	10.00	N59° 11' 40.79"W	10.71
L49	7.94		N26° 48' 09.19"W	
C30	28.58	20.00	N14° 08' 18.80"E	26.21
L50	3.36		N55° 30' 24.81"E	
C31	20.44	10.00	N6° 43' 32.42"W	17.06

TRIBUTARY 2 UPSTREAM				
LINE #/ CURVE#	LENGTH	RADIUS	LINE/CHORD DIRECTION	CHORD LENGTH
L51	11.71		N65° 17' 30.65"W	
C32	15.23	25.00	N47° 50' 29.17"W	14.99
L52	6.03		N30° 23' 28.85"W	
C33	12.18	10.00	N4° 29' 17.20"E	11.44
L53	7.66		N39° 22' 04.79"E	
C34	22.24	10.00	N24° 21' 07.78"W	17.93
L54	5.78		N88° 04' 22.61"W	
C35	26.11	10.00	N13° 16' 10.36"W	19.30
L55	0.40		N61° 32' 01.88"E	
C36	14.77	10.00	N19° 13' 09.98"E	13.46
L56	18.25		N23° 05' 41.91"W	
C37	12.71	127.22	N22° 15' 51.60"W	12.70
L153	33.80		N20° 14' 03.60"W	
C38	6.71	16.01	N32° 13' 50.55"W	6.66
L57	18.86		N44° 13' 37.50"W	
C39	10.73	10.00	N5° 27' 34.38"W	10.22
L58	23.47		N27° 00' 01.64"E	
C40	25.75	10.00	N35° 37' 42.88"W	19.20
L59	9.08		S70° 36' 58.29"W	
C41	14.66	10.00	N67° 23' 27.35"W	13.38
L154	17.98		N25° 23' 53.00"W	
C42	14.06	10.00	N14° 53' 08.47"E	12.93
L155	9.90		N55° 10' 11.87"E	
C43	24.93	10.00	N16° 14' 41.78"W	18.96

TRIBUTARY 2 UPSTREAM				
LINE #/ CURVE#	LENGTH	RADIUS	LINE/CHORD DIRECTION	CHORD LENGTH
L156	16.41		N87° 39' 35.43"W	
C44	25.15	10.00	N15° 36' 39.81"W	19.03
L157	9.84		N56° 26' 15.81"E	
C45	13.48	10.04	N17° 52' 48.61"E	12.49
L158	9.57		N24° 05' 24.39"W	
C46	31.24	30.00	N53° 55' 23.53"W	29.85
L159	9.97		N83° 45' 22.66"W	
C47	22.55	10.00	N19° 10' 07.65"W	18.06
L160	12.49		N45° 25' 07.37"E	



KEYMAP

PROJECT LEGEND:

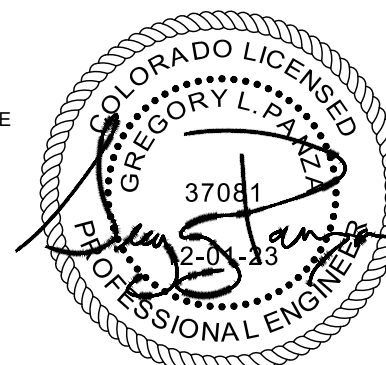
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|--|---------------------------------------|
| | PROPERTY LINE |
| | ROAD CENTERLINE |
| | RIGHT-OF-WAY LINE |
| | SECTION LINE |
| | EXISTING EASEMENT |
| | EXISTING FENCE |
| | PROPOSED MAJOR CONTOUR |
| | PROPOSED MINOR CONTOUR |
| | EXISTING MAJOR CONTOUR |
| | EXISTING MINOR CONTOUR |
| | CONSTRUCTION EASEMENT |
| | FLOW ARROW |
| | LIMITS OF CONSTRUCTION |
| | LIMITS OF DISTURBANCE |
| | PROPOSED 100-YR FLOODPLAIN |
| | EFFECTIVE 100-YR FLOODPLAIN |
| | EXISTING WETLANDS - JURISDICTIONAL |
| | EXISTING WETLANDS - NONJURISDICTIONAL |
| | PROPOSED MAINTENANCE TRAIL |

NOTES:


1. BASIS OF BEARINGS: THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.
2. DESIGNATION = F # 24
PID = JK0240
DESCRIPTION = DISK ON TOP OF CONCRETE MONUMENT
CONTROL POINT COORDINATE SYSTEM: NAVD88
NORTHING: 1421049.80
EASTING: 3273631.55
ELEVATION: 6866.33



1-800-922-1987
Utility Notification
Center of Colorado



DRAWN BY:	ACH	JOB DATE:	11/29/2023
APPROVED:	GLP	JOB NUMBER:	201662.03
CAD DATE:	11/30/2023		
CAD FILE:	J:\2020\201662.03\CAD\DWG\SC\GRADING		

BAR IS ONE INCH ON
OFFICIAL DRAWINGS.
0  1"
IF NOT ONE INCH,
ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION



HR GREEN - DENVER
5613 DTC PARKWAY SUITE 950
DENVER CO 80111
PHONE: 720.602.4999
FAX: 713.965.0044

GRANDVIEW RESERVE
DR HORTON
FALCON, COLORADO

CONSTRUCTION DOCUMENTS
TRIBUTARY 2 BANKFULL GRADING

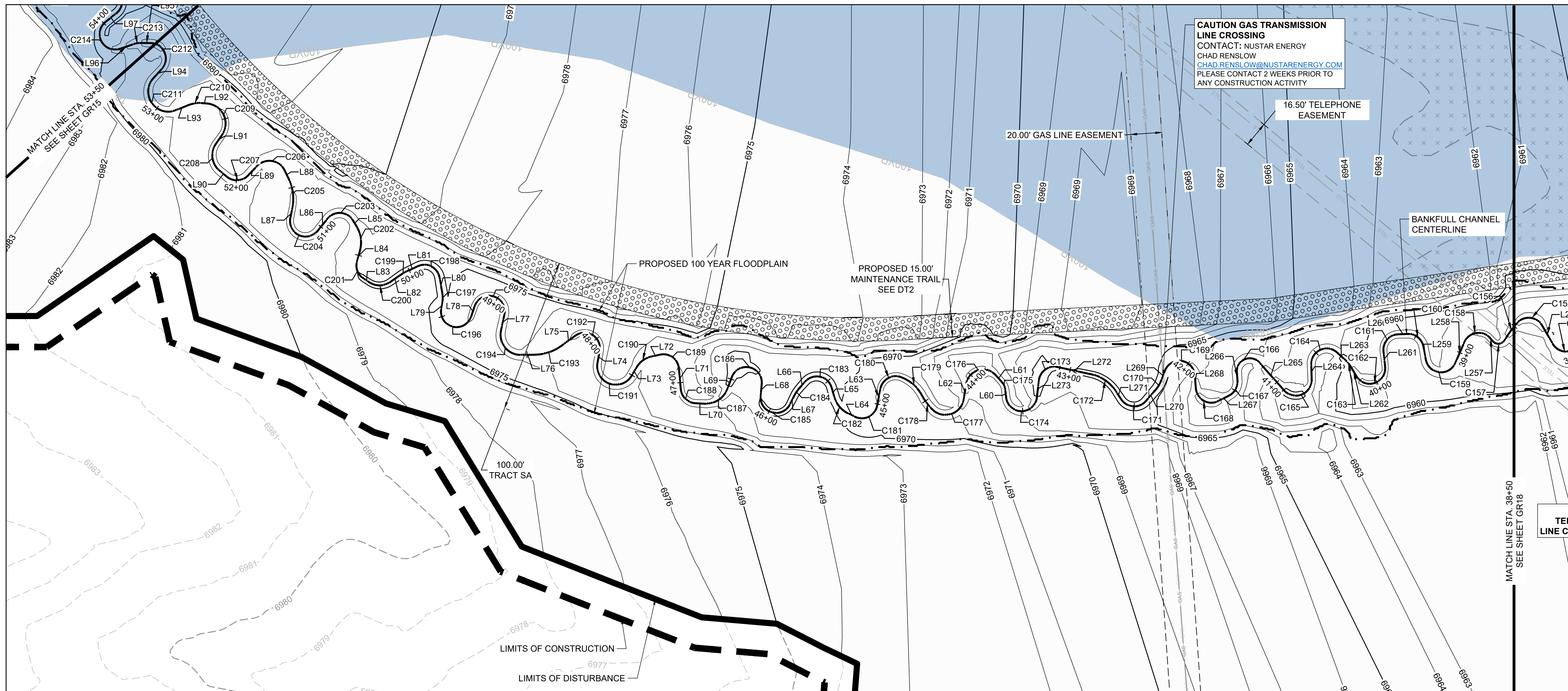
SHEET
GR14

18

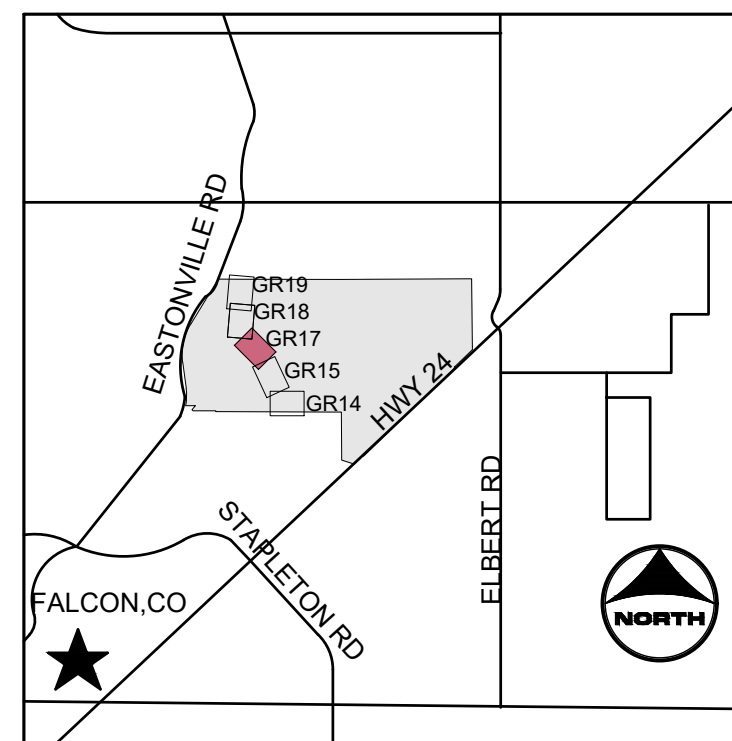
TRIBUTARY 2 UPSTREAM				
LINE #/ CURVE#	LENGTH	RADIUS	LINE/CHORD DIRECTION	CHORD LENGTH
L198	8.42		S55° 56' 54.65"W	
C89	28.81	10.00	N42° 05' 55.64"W	19.80
L199	11.78		N34° 20' 04.33"E	
C90	15.51	10.00	N23° 13' 49.14"W	14.00
L200	6.19		N67° 40' 08.01"W	
C91	11.33	16.00	N87° 56' 47.26"W	11.09
L201	7.09		S71° 46' 34.90"W	
C92	27.69	10.00	N28° 53' 42.24"W	19.65
L202	9.02		N50° 26' 00.63"E	
C93	28.01	10.00	N29° 47' 55.09"W	19.71
L203	8.04		S69° 58' 09.20"W	
C94	6.98	20.00	S79° 57' 45.60"W	6.94
L204	5.17		S89° 57' 22.00"W	
C95	23.02	10.00	N24° 05' 19.37"W	18.26
L205	7.78		N41° 51' 59.26"E	
C96	31.93	13.77	N38° 11' 39.40"W	25.24
L206	7.23		S70° 00' 05.78"W	
C97	9.28	20.00	S80° 05' 30.29"W	9.20
L207	3.27		N86° 36' 32.66"W	
C98	27.37	13.00	N26° 17' 21.36"W	22.59

NOTES:

- BASIS OF BEARINGS:** THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.
- BENCHMARK:**
DESIGNATION = F 24
PID = JK0240
DESCRIPTION = DISK ON TOP OF CONCRETE MONUMENT
CONTROL POINT COORDINATE SYSTEM:
NAD83
NORTHING: 1421049.80
EASTING: 3273631.55
ELEVATION: 6866.33



TRIBUTARY 2 UPSTREAM					TRIBUTARY 2 UPSTREAM					TRIBUTARY 2 UPSTREAM					TRIBUTARY 2 UPSTREAM					TRIBUTARY 2 UPSTREAM				
LINE #/ CURVE#	LENGTH	RADIUS	LNE/CHORD DIRECTION	CHORD LENGTH	LINE #/ CURVE#	LENGTH	RADIUS	LNE/CHORD DIRECTION	CHORD LENGTH	LINE #/ CURVE#	LENGTH	RADIUS	LNE/CHORD DIRECTION	CHORD LENGTH	LINE #/ CURVE#	LENGTH	RADIUS	LNE/CHORD DIRECTION	CHORD LENGTH	LINE #/ CURVE#	LENGTH	RADIUS	LNE/CHORD DIRECTION	CHORD LENGTH
C156	15.76	60.71	S82° 15' 15.94"W	15.72	L267	7.77		N72° 04' 21.48"W		C180	18.49	10.13	N71° 44' 52.25"W	16.03	C191	33.50	12.00	N24° 33' 51.04"W	23.63	C202	16.30	20.00	N36° 52' 50.66"E	15.85
C157	9.19	4.73	N48° 26' 22.95"W	7.81	C168	19.62	10.00	N15° 51' 06.52"W	16.62	L63	11.09		S55° 49' 10.23"W		L74	7.78		N55° 24' 57.68"E		L85	4.49		N13° 32' 20.24"E	
L257	3.58		N3° 04' 06.31"E		L268	8.77		N40° 22' 08.43"E		C181	18.28	10.00	N71° 48' 07.40"W	15.84	C192	23.85	10.00	N12° 54' 52.85"W	18.59	C203	19.05	10.00	N41° 02' 37.80"W	16.30
C158	19.37	10.00	N58° 30' 53.78"W	16.48	C169	26.96	10.00	N36° 52' 20.72"W	19.51	L64	4.96		N19° 25' 23.80"W		L75	10.97		N81° 14' 45.25"W		L86	10.38		S84° 22' 24.17"W	
L258	14.86		S68° 36' 16.40"W		L269	6.80		S65° 53' 08.80"W		C182	14.36	17.00	N4° 47' 00.04"E	13.94	C193	18.57	30.00	N63° 30' 39.38"W	18.28	C204	26.57	10.00	N19° 30' 04.19"W	19.42
C159	24.92	10.00	N36° 46' 43.51"W	18.95	C170	6.95	20.00	S75° 50' 02.38"W	6.91	L65	6.32		N28° 59' 23.88"E		L76	8.89		N45° 46' 33.52"W		L87	6.39		N56° 37' 27.46"E	
L259	8.54		N34° 36' 24.38"E		L270	9.62		S85° 46' 55.98"W		C183	21.42	10.00	N32° 22' 59.06"W	17.56	C194	23.32	13.00	N5° 36' 50.04"E	20.32	C205	19.50	30.00	N38° 00' 21.14"E	19.16
C160	14.25	10.00	N6° 12' 38.24"W	13.07	C171	18.49	10.00	N41° 14' 28.08"W	15.97	L66	6.17		S86° 14' 36.82"W		L77	10.63		N57° 00' 13.60"E		L88	6.02		N19° 23' 14.34"E	
L260	6.03		N47° 01' 39.20"W		L271	6.51		N11° 44' 07.86"E		C184	5.15	20.00	S78° 51' 55.74"W	5.14	C195	30.29	10.00	N29° 45' 29.57"W	19.97	C206	21.26	11.00	N35° 59' 34.23"W	18.10
C161	16.43	10.00	S85° 53' 35.89"W	14.65	C172	19.46	25.00	N10° 33' 42.42"W	18.97	L67	6.44		S71° 29' 13.91"W		L78	6.95		S63° 28' 48.34"W		L89	8.40		S88° 37' 37.20"W	
L261	9.89		S38° 48' 50.97"W		L272	22.46		N32° 51' 32.70"W		C185	27.69	10.00	N29° 11' 46.10"W	19.65	C196	29.92	10.00	N30° 47' 54.08"W	19.94	C207	14.93	10.00	N48° 36' 10.78"W	13.58
C162	27.21	10.00	N63° 13' 46.48"W	19.56	C173	16.69	10.00	N80° 40' 16.27"W	14.82	L68	7.92		N50° 07' 13.89"E		L79	4.15		N54° 55' 22.26"E		L90	6.08		N5° 49' 58.75"W	
L262	6.59		N14° 43' 35.02"E		L273	11.08		S51° 30' 58.83"W		C186	28.76	10.00	N32° 16' 01.93"W	19.82	C197	6.25	18.00	N44° 58' 12.97"E	6.22	C208	19.45	13.00	N37° 02' 16.06"E	17.69
C163	6.02	20.00	N6° 06' 03.29"E	6.00	C174	29.21	10.00	N44° 47' 38.64"W	19.88	L69	7.91		S65° 20' 42.25"W		L80	10.16		N35° 01' 04.53"E		L91	6.84		N79° 54' 30.86"E	
L263	7.20		N2° 31' 29.50"W		L60	4.58		N38° 53' 43.89"E		C187	19.07	15.00	N78° 14' 01.44"W	17.81	C198	18.41	10.00	N17° 43' 12.15"W	15.92	C209	27.37	13.00	N19° 35' 19.50"E	22.59
C164	23.46	10.00	N69° 43' 47.95"W	18.44	C175	6.28	10.00	N20° 54' 02.58"E	6.18	L70	5.88		N41° 48' 47.05"W		L81	8.03		N70° 27' 28.82"W		L92	3.27		N40° 43' 51.79"W	
L264	9.75		S43° 03' 53.60"W		L61	5.56		N2° 54' 21.27"E		C188	14.23	10.00	N1° 03' 38.55"W	13.06	C199	5.01	30.06	N75° 00' 38.36"W	5.00	C210	9.28	20.00	N54° 01' 48.85"W	9.20
C165	25.51	10.26	N64° 27' 12.24"W	19.43	C176	24.70	11.00	N61° 25' 29.35"W	19.83	L71	13.81		N39° 41' 29.96"E		L82	7.48		N79° 47' 19.86"W		L93	8.27		N67° 19' 45.91"W	
L265	24.22		N3° 28' 47.39"E		L62	10.86		S54° 14' 40.03"W		C189	16.83	10.01	N10° 00' 57.74"W	14.91	C200	14.10	12.00	N46° 07' 14.40"W	13.31	C211	35.19	13.00	N10° 12' 28.14"E	25.39
C166	20.88	8.44	N74° 30' 03.34"W	15.95	C177	24.08	11.98	N64° 32' 15.25"W	20.23	L72	6.19		N58° 12' 37.69"W		L83	4.63		N12° 27' 08.94"W		L94	7.78		N87° 44' 40.12"E	
L266	4.56		S41° 00' 17.45"W		C178	12.52	34.40	N7° 05' 18.27"E	12.45	C190	11.32	14.00	N81° 22' 38.72"W	11.02	C201	12.68	10.00	N23° 53' 06.07"E	11.85	C212	23.02	10.00	N21° 47' 21.49"E	18.26
C167	11.68	10.00	S74° 27' 57.98"W	11.03	C179	17.56	25.25	N2° 31' 20.35"W	17.21	L73	6.48		S75° 27' 20.25"W		L84	7.35		N60° 13' 21.09"E						



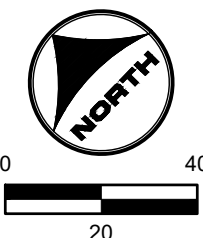
KEYMAP

PROJECT LEGEND:

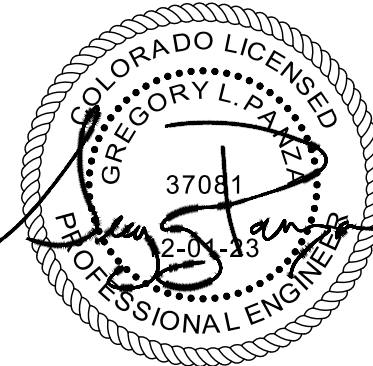
- | | |
|--|---------------------------------------|
| | PROPERTY LINE |
| | ROAD CENTERLINE |
| | RIGHT-OF-WAY LINE |
| | SECTION LINE |
| | EXISTING EASEMENT |
| | EXISTING FENCE |
| | PROPOSED MAJOR CONTOUR |
| | PROPOSED MINOR CONTOUR |
| | EXISTING MAJOR CONTOUR |
| | EXISTING MINOR CONTOUR |
| | CONSTRUCTION EASEMENT |
| | FLOW ARROW |
| | LIMITS OF CONSTRUCTION |
| | LIMITS OF DISTURBANCE |
| | PROPOSED 100-YR FLOODPLAIN |
| | EFFECTIVE 100-YR FLOODPLAIN |
| | EXISTING WETLANDS - JURISDICTIONAL |
| | EXISTING WETLANDS - NONJURISDICTIONAL |
| | PROPOSED MAINTENANCE TRAIL |

NOTES:


1. **BASIS OF BEARINGS:** THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.
2. **BENCHMARK:**
DESIGNATION = F #24
PID = JK0240
DESCRIPTION = DISK ON TOP OF CONCRETE MONUMENT
CONTROL POINT COORDINATE SYSTEM:
NAVD88
NORTHING: 1421049.80
EASTING: 3273631.55
ELEVATION: 6866.33



1-800-922-1987
Utility Notification
Center of Colorado



DRAWN BY:	ACH	JOB DATE:	11/29/2023
APPROVED:	GLP	JOB NUMBER:	201662.03
CAD DATE:	11/30/2023		
CAD FILE:	J:\2020\201662.03\CAD\Drawgs\C\GRADING		

BAR IS ONE INCH ON
OFFICIAL DRAWINGS.
0  1"
IF NOT ONE INCH,
ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION



HR GREEN - DENVER
5613 DTC PARKWAY SUITE 950
DENVER CO 80111
PHONE: 720.602.4999
FAX: 713.965.0044

GRANDVIEW RESERVE
DR HORTON
FALCON, COLORADO

CONSTRUCTION DOCUMENTS

TRIBUTARY 2 BANKFULL GRADING

SHEET
GR17

21

VALLEY CENTERLINE

PROPOSED 15.00' MAINTENANCE TRAIL
SEE DT2

PROPOSED 100 YEAR FLOODPLAIN

100.00' TRACT SA

(4) 8' X 4' CONCRETE BOX CULVERTS 60' LONG WITH 45 DEGREE WING WALLS. REFER TO PP5 FOR PLAN AND PROFILE

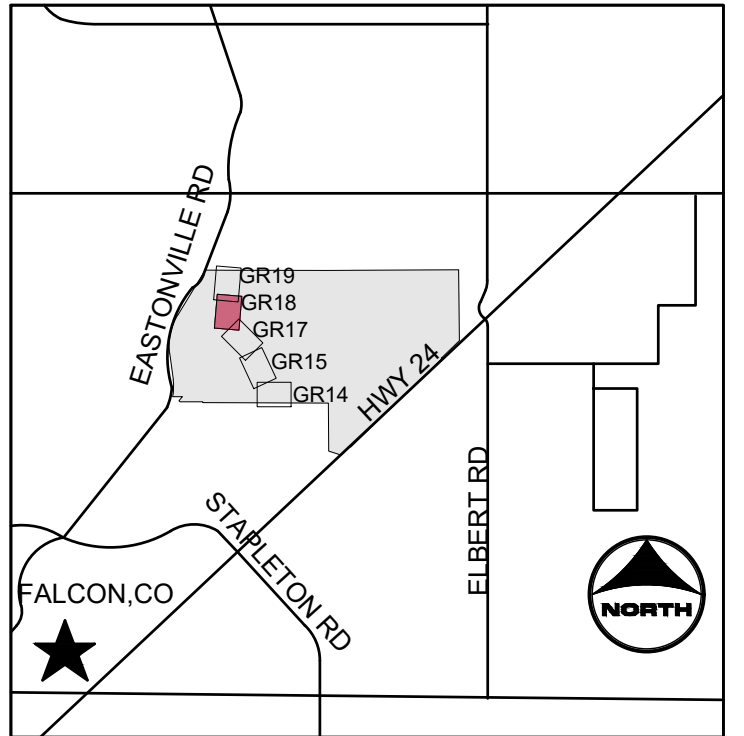
DAWLISH DR

BANKFULL CHANNEL CENTERLINE

MATCH LINE STA. 67+50
SEE SHEET GR19

MATCH LINE STA. 53+50
SEE SHEET GR19

Tributary 2 Upstream					Tributary 2 Upstream					Tributary 2 Upstream					Tributary 2 Upstream					Tributary 2 Upstream				
Line #/ Curve#	Length	Radius	Line/Chord Direction	Chord Length	Line #/ Curve#	Length	Radius	Line/Chord Direction	Chord Length	Line #/ Curve#	Length	Radius	Line/Chord Direction	Chord Length	Line #/ Curve#	Length	Radius	Line/Chord Direction	Chord Length	Line #/ Curve#	Length	Radius	Line/Chord Direction	Chord Length
L95	5.17		N44° 09' 57.14"W		L106	6.69		N78° 59' 36.19"E		L116	8.98		N77° 32' 29.10"W		L127	7.41		N16° 10' 58.09"W		L152	27.44		N26° 46' 26.58"W	
C213	6.98	20.00	N54° 09' 33.54"W	6.94	C224	24.18	10.00	N9° 42' 54.27"E	18.71	C236	13.59	10.00	N38° 36' 17.81"W	12.57	C247	18.38	15.00	N18° 55' 33.27"E	17.25	C258	16.95	10.00	N21° 46' 36.50"E	14.99
L96	8.04		N64° 09' 09.93"W		L107	5.63		N59° 33' 47.65"W		L117	7.25		N0° 19' 53.48"E		L128	6.36		N54° 02' 04.63"E		L138	3.84		N70° 19' 39.57"E	
C214	28.01	10.00	N16° 04' 45.78"E	19.71	C225	24.74	25.02	N32° 09' 09.97"W	23.74	C237	16.68	12.00	N40° 09' 12.75"E	15.37	C248	9.39	20.00	N40° 35' 03.09"E	9.30	C259	14.65	12.00	N35° 21' 09.72"E	13.76
L97	9.02		S83° 41' 18.51"E		L108	6.03		N3° 48' 42.59"W		L118	8.96		N79° 58' 33.23"E		L129	7.15		N27° 08' 01.54"E		L139	16.46		N0° 22' 41.14"E	
C215	27.69	10.00	N16° 58' 58.63"E	19.65	C226	12.18	10.00	N31° 04' 04.22"E	11.44	C238	21.88	12.00	N27° 44' 22.92"E	18.97	C249	20.51	10.00	N31° 37' 14.85"W	17.10					
L98	7.09		N62° 20' 44.23"W		L109	7.66		N65° 56' 51.04"E		L119	8.16		N24° 29' 46.28"W		L130	9.76		S89° 37' 28.76"W						
C216	11.33	16.00	N42° 04' 06.40"W	11.09	C227	15.54	10.00	N21° 25' 50.86"E	14.02	C239	11.91	25.00	N38° 08' 52.11"W	11.80	C250	27.90	10.00	N10° 27' 09.67"W	19.69					
L99	6.19		N21° 47' 27.14"W		C228	9.09	18.00	N8° 36' 52.18"W	9.00	L120	7.82		N51° 47' 57.21"W		L131	11.50		N69° 28' 12.96"E						
C217	15.51	10.00	N22° 38' 51.73"E	14.00	L110	73.49		N5° 51' 24.97"E		C240	26.65	13.48	N1° 49' 28.09"E	22.51	C251	17.33	12.00	N28° 06' 25.18"E	15.86					
L100	11.78		N80° 12' 45.19"E		C229	18.19	25.00	N26° 42' 11.88"E	17.79	L121	15.08		N66° 02' 17.32"E		L132	8.67		N13° 15' 22.59"W						
C218	28.61	10.00	N3° 46' 45.22"E	19.80	C230	54.03	30.00	N4° 02' 38.02"W	47.02	C241	9.50	10.00	N29° 12' 46.81"E	9.14	C252	9.13	10.00	N39° 24' 31.73"W	8.82					
L101	8.42		N78° 10' 24.49"W		L111	8.57		N55° 38' 14.84"W		L122	8.34		N2° 00' 28.98"E		L133	17.18		N77° 27' 43.71"W						
C219	28.24	10.00	N2° 43' 43.88"E	19.75	C231	24.53	10.00	N14° 38' 23.93"E	18.83	C242	31.18	25.00	N33° 43' 31.88"W	29.20	C253	25.62	10.00	N9° 01' 06.61"E	19.17					
L102	10.54		N83° 37' 52.24"E		L112	12.12		N84° 55' 01.43"E		L123	7.80		N69° 27' 32.74"W		L134	9.39		N82° 24' 48.02"E						
C220	14.48	10.00	N42° 08' 43.05"E	13.25	C232	26.99	10.00	N7° 35' 33.85"E	19.51	C243	25.58	10.00	N3° 49' 59.88"E	19.16	C254	26.62	10.00	N6° 09' 26.70"E	19.43					
L103	9.11		N0° 39' 32.79"E		L113	8.04		N69° 43' 52.36"W		L124	9.62		N77° 07' 32.51"E		L135	4.72		N70° 05' 54.62"W						
C221	12.97	10.00	N36° 30' 06.87"W	12.08	C233	6.99	12.00	N53° 02' 49.83"W	6.89	C244	12.73	10.00	N40° 39' 52.64"E	11.89	C255	2.40	10.00	N76° 59' 14.73"W	2.40					
L104	9.22		N73° 39' 45.15"W		L114	4.55		N36° 21' 48.50"W		L125	4.77		N4° 12' 10.94"E		L136	7.28		N83° 52' 34.84"W						
C222	11.31	10.00	N41° 16' 14.49"W	10.71	C234	31.01	15.00	N22° 51' 23.94"E	25.77	C245	16.25	10.00	N42° 20' 24.85"W	14.52	C256	28.51	10.00	N2° 12' 50.31"W	19.79					
L105	7.94		N8° 52' 43.84"W		L115	8.57		N82° 04' 36.38"E		L126	7.68		N88° 53' 00.63"W		L137	0.10		N79° 26' 54.22"E						
C223	30.67	20.00	N35° 03' 26.18"E	27.75	C235	27.86	10.00	N2° 16' 03.64"E	19.68	C246	12.69	10.00	N52° 31' 59.36"W	11.85	C257	18.54	10.00	N26° 20' 13.82"E	16.00					



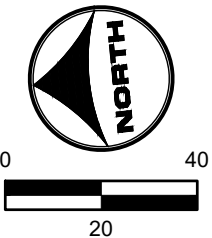
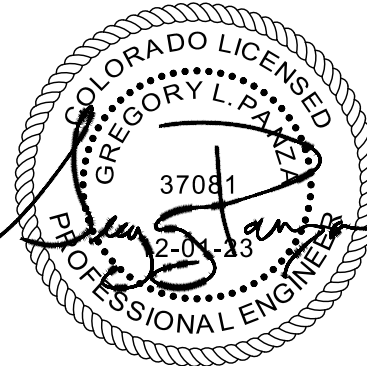
PROJECT LEGEND:

- | | |
|--|---------------------------------------|
| | PROPERTY LINE |
| | ROAD CENTERLINE |
| | RIGHT-OF-WAY LINE |
| | SECTION LINE |
| | EXISTING EASEMENT |
| | EXISTING FENCE |
| | PROPOSED MAJOR CONTOUR |
| | PROPOSED MINOR CONTOUR |
| | EXISTING MAJOR CONTOUR |
| | EXISTING MINOR CONTOUR |
| | CONSTRUCTION EASEMENT |
| | FLOW ARROW |
| | LIMITS OF CONSTRUCTION |
| | LIMITS OF DISTURBANCE |
| | PROPOSED 100-YR FLOODPLAIN |
| | EFFECTIVE 100-YR FLOODPLAIN |
| | EXISTING WETLANDS - JURISDICTIONAL |
| | EXISTING WETLANDS - NONJURISDICTIONAL |
| | PROPOSED MAINTENANCE TRAIL |


1. **BASIS OF BEARINGS:** THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.
2. **BENCHMARK:**
DESIGNATION = F 24
PID = JK0240
DESCRIPTION = DISK ON TOP OF CONCRETE MONUMENT
CONTROL POINT COORDINATE SYSTEM:
NAVD88
NORTHING: 1421049.80
EASTING: 3273631.55
ELEVATION: 6866.33



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CAD DATE:	11/30/2023		
CAD FILE:	J:\2020\201662.03\CAD\Draws\C\GRADING		

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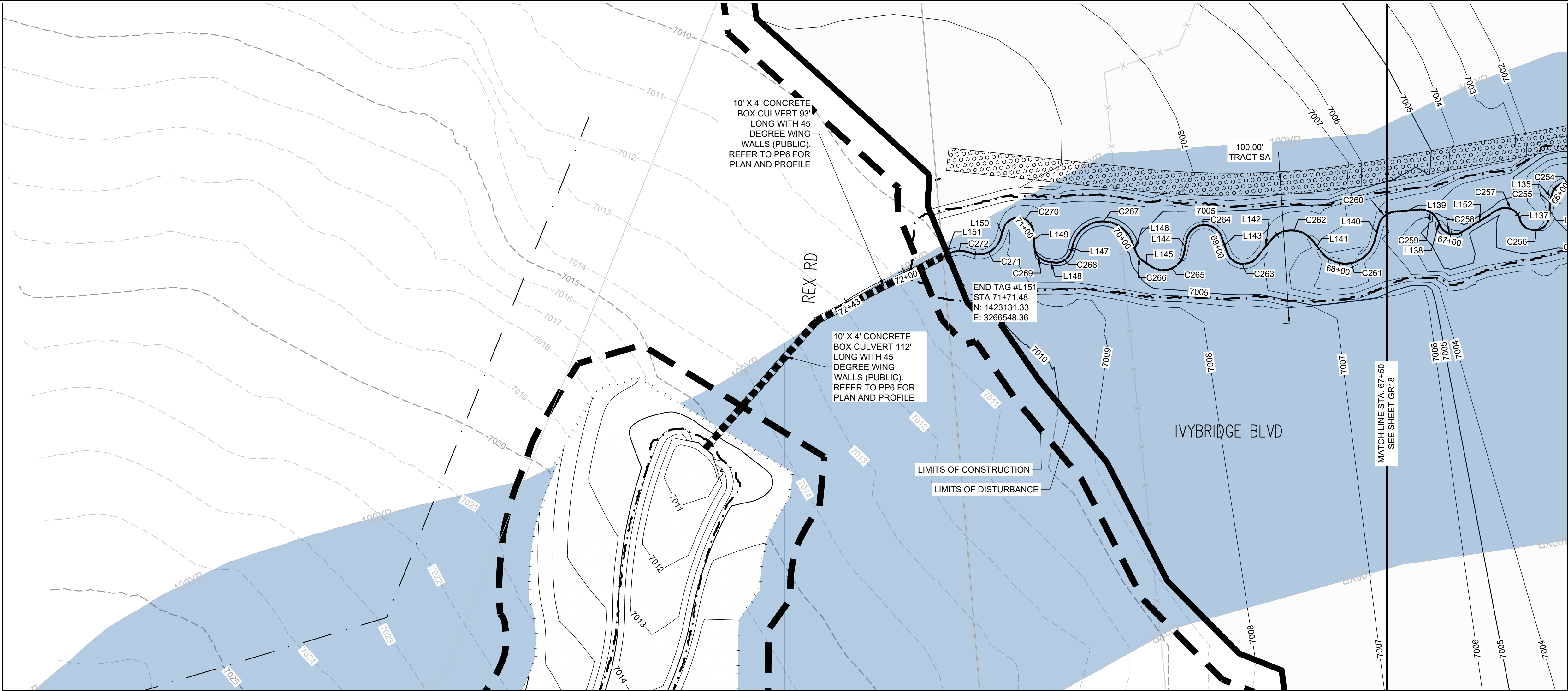
CONSTRUCTION DOCUMENTS

TRIBUTARY 2 BANKFULL GRADING

SHEET
GR18

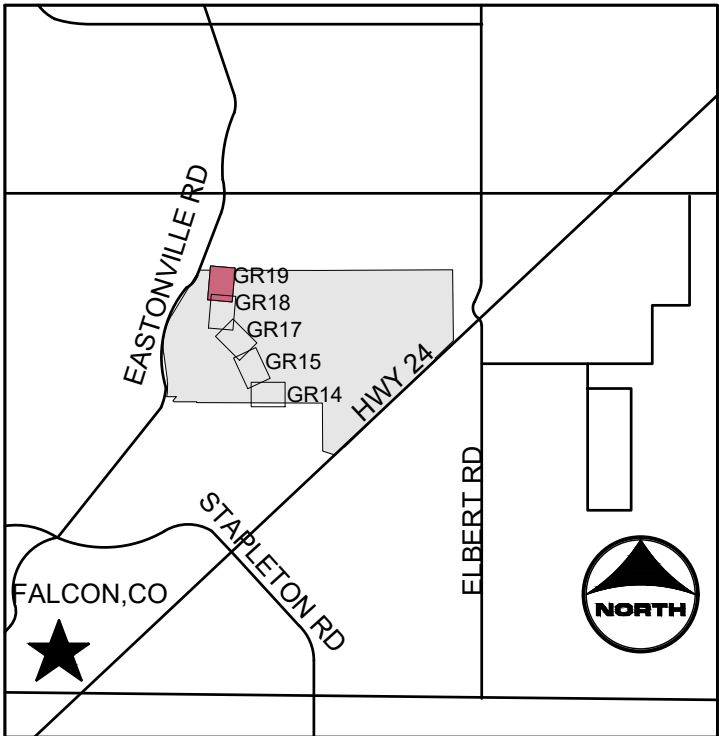
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HR GREEN (xref: xg1 -dht01; GRADING KEY; HRG1_20X_EBbase; xv-dsign; 662; xc-dsign; 662; 10; xc-row; F1-662; 10; xc-row; F1-662; 10; xc-row; F2; xv-dht; 662; xv-row; 662; 10; xc-dsign; F2; xc-dsign; PH2; xc-dsign; PH2; 01-XC-INITIAL-EC; xc-row; PH2; xc-dsign; PH2; 01-XC-channel; 01_XV-Row; 01-XC-PR; 100YR_FP_DELINEATION



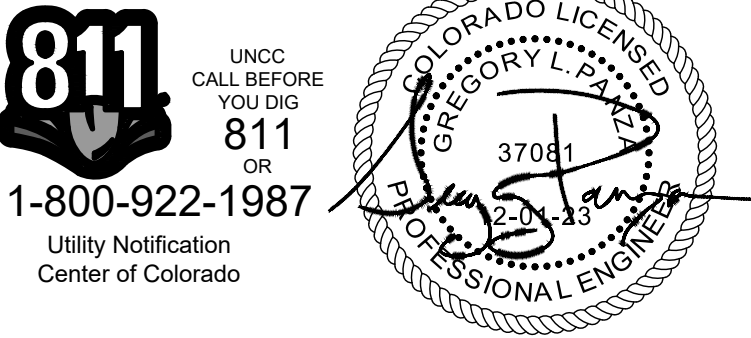
TRIBUTARY 2 UPSTREAM				
LINE #/ CURVE#	LENGTH	RADIUS	LNE/CHORD DIRECTION	CHORD LENGTH
C260	14.80	12.00	N34° 56' 39.85"W	13.88
L140	10.77		N70° 15' 59.85"W	
C261	44.55	20.00	N6° 27' 33.85"W	35.89
L141	8.98		N57° 20' 52.15"E	
C262	29.24	18.00	N10° 48' 15.97"E	26.13
L142	16.23		N45° 31' 56.12"W	
C263	24.34	11.44	N9° 01' 06.38"E	20.00
L143	11.94		N74° 50' 42.15"E	
C264	31.22	12.00	N0° 18' 44.36"E	23.13
L144	8.82		N74° 13' 13.43"W	
C265	27.28	14.00	N18° 24' 07.71"W	23.16
L145	7.63		N38° 57' 54.40"E	
C266	5.69	10.00	N55° 15' 07.16"E	5.61
L146	6.73		N71° 32' 18.85"E	
C267	53.21	20.40	N5° 38' 58.70"E	39.35
L147	5.41		N68° 39' 59.99"W	
C268	14.28	10.00	N27° 44' 59.82"W	13.10
L148	4.50		N13° 10' 00.36"E	
C269	13.50	10.00	N51° 50' 51.43"E	12.50
L149	10.57		S89° 28' 17.51"E	
C270	27.53	10.00	N11° 39' 24.20"E	19.62

TRIBUTARY 2 UPSTREAM				
LINE #/ CURVE#	LENGTH	RADIUS	LNE/CHORD DIRECTION	CHORD LENGTH
L150	7.19		N67° 12' 54.10"W	
C271	24.50	15.00	N20° 25' 45.98"W	21.86
C272	14.98	18.00	N2° 31' 05.79"E	14.55
L151	3.20		N21° 19' 11.62"W	



- KEYMAP**
- PROJECT LEGEND:**
- PROPERTY LINE
 - ROAD CENTERLINE
 - RIGHT-OF-WAY LINE
 - SECTION LINE
 - EXISTING EASEMENT
 - EXISTING FENCE
 - PROPOSED MAJOR CONTOUR
 - PROPOSED MINOR CONTOUR
 - EXISTING MAJOR CONTOUR
 - EXISTING MINOR CONTOUR
 - CONSTRUCTION EASEMENT
 - FLOW ARROW
 - LIMITS OF CONSTRUCTION
 - LIMITS OF DISTURBANCE
 - PROPOSED 100-YR FLOODPLAIN
 - EFFECTIVE 100-YR FLOODPLAIN
 - EXISTING WETLANDS - JURISDICTIONAL
 - EXISTING WETLANDS - NONJURISDICTIONAL
 - PROPOSED MAINTENANCE TRAIL

- NOTES:**
- BASIS OF BEARINGS:** THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.
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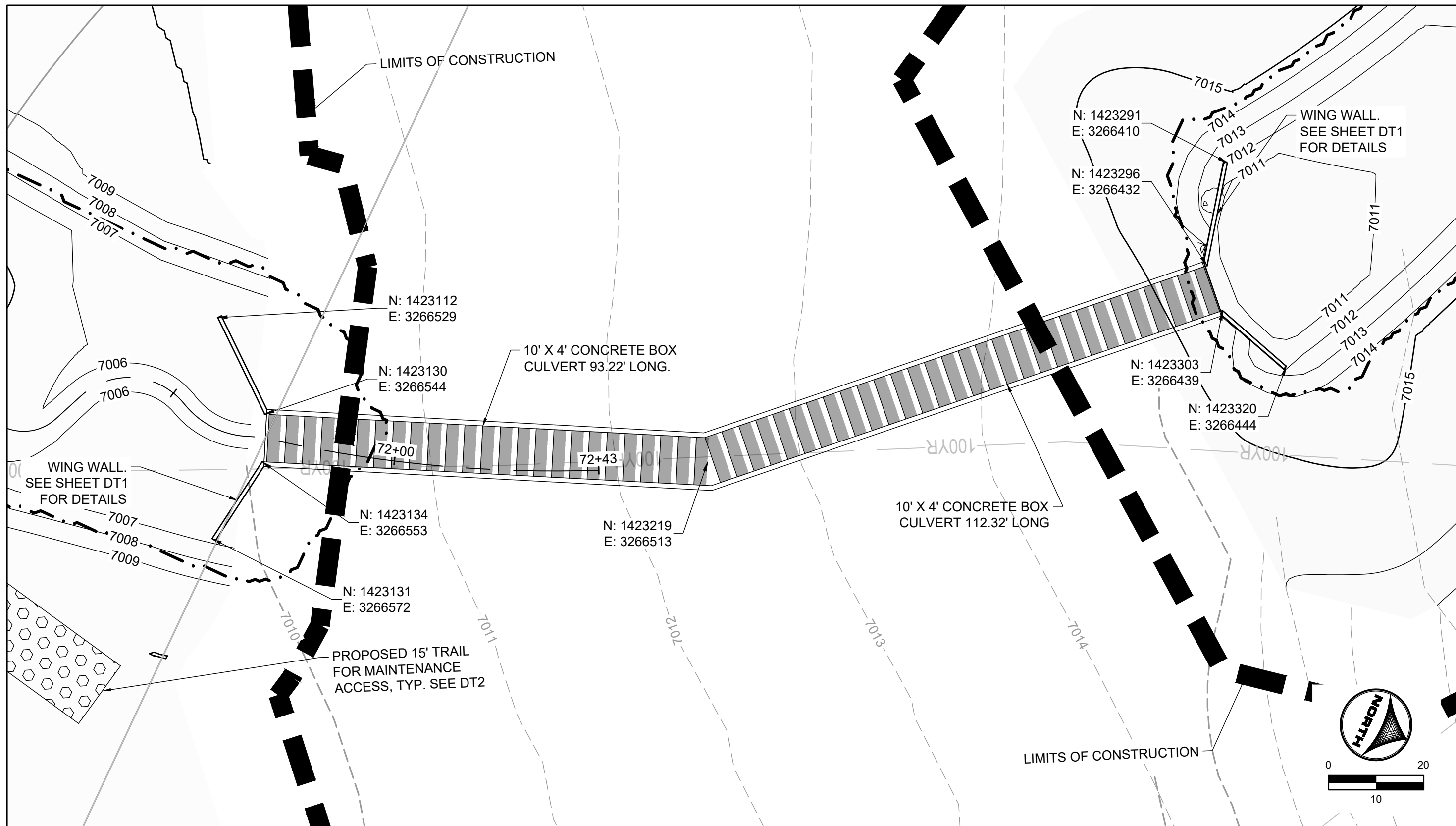


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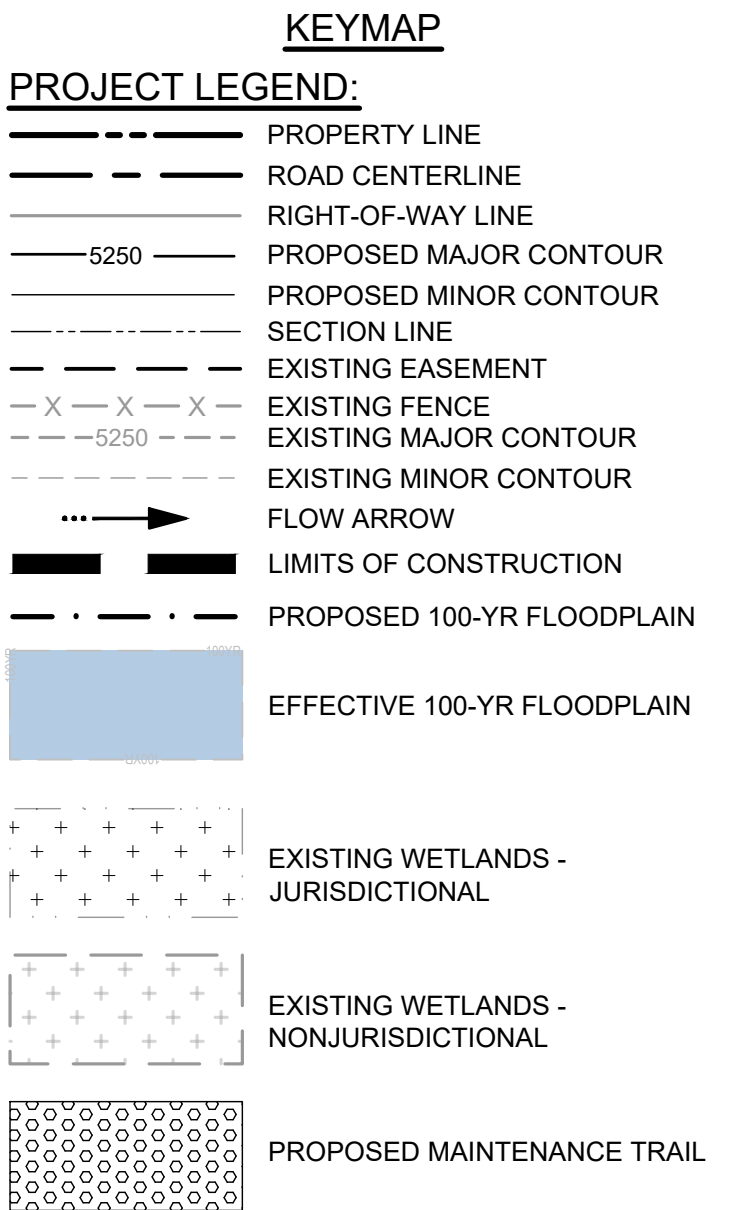
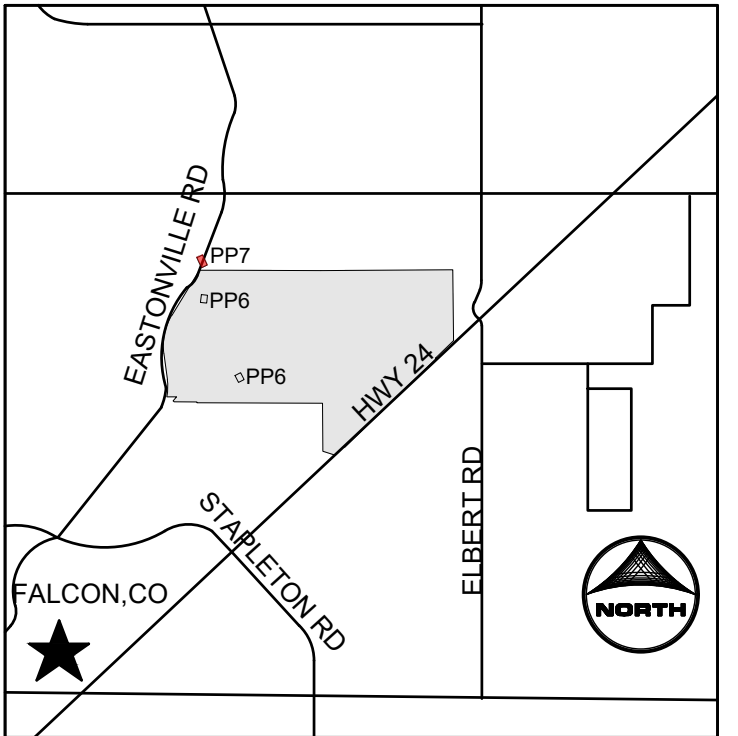
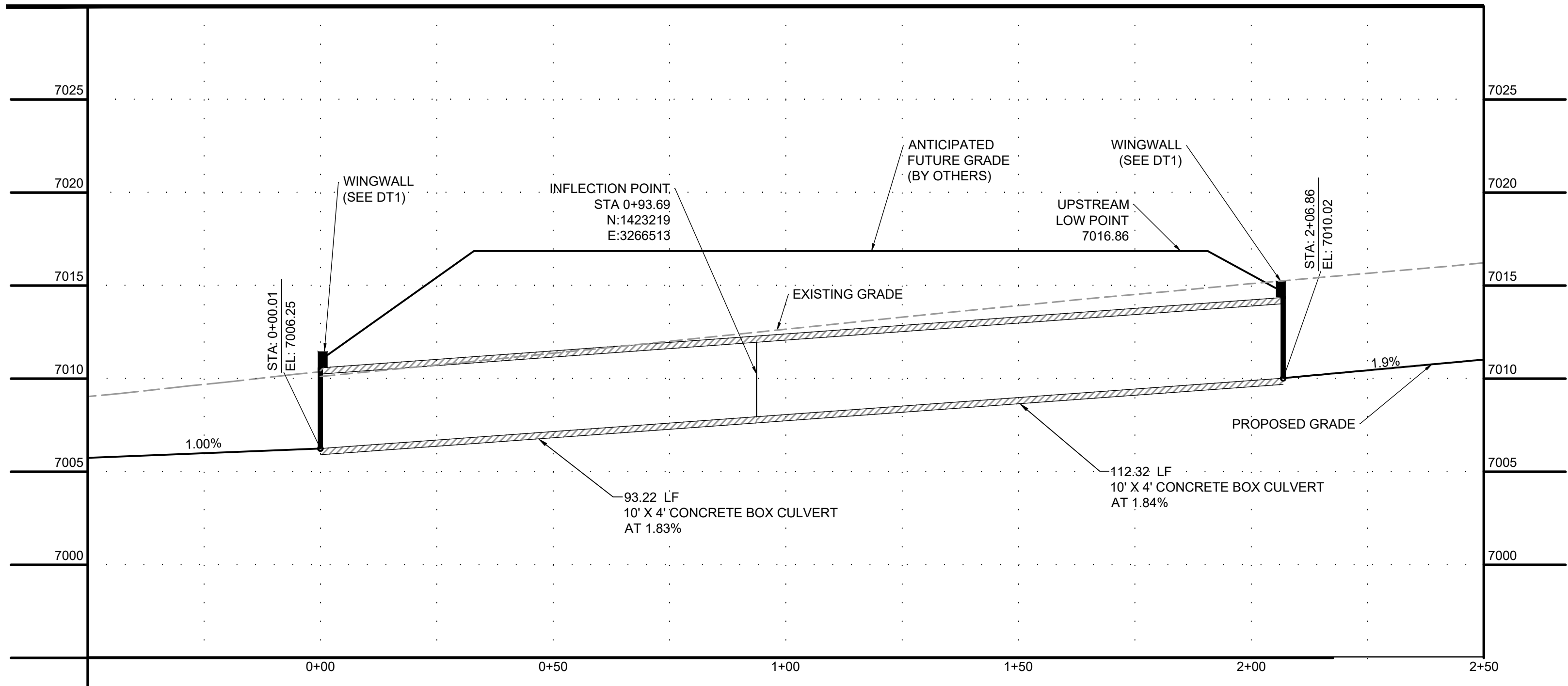
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CONSTRUCTION DOCUMENTS
TRIBUTARY 2 BANKFULL GRADING

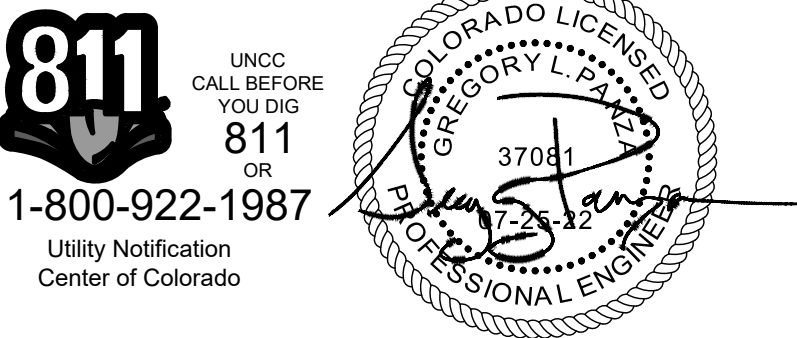
SHEET
GR19
23



REX ROAD CULVERT CROSSING



- NOTES:**
- BASIS OF BEARINGS:** THE EAST LINE OF SECTION 21, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, AND BEING MONUMENTED AT THE NORTHEAST CORNER BY A 3-1/4" ALUMINUM SURVEYOR'S CAP STAMPED "PS INC PLS 30087 1996", BEING APPROPRIATELY MARKED, BEING ASSUMED TO BEAR NORTH 00 DEGREES 52 MINUTES 26 SECONDS WEST, A DISTANCE OF 5290.17 FEET.
 - BENCHMARK:**
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PID = JK0240
DESCRIPTION = DISK ON TOP OF CONCRETE MONUMENT
CONTROL POINT COORDINATE SYSTEM:
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EASTING: 3273631.55
ELEVATION: 6866.33
 - ALIGNMENT NOT FOR USE IN CONSTRUCTION. REFER TO NORTHINGS AND EASTINGS
 - PLAN SET APPROVAL APPLIES TO THE LIMITS OF CONSTRUCTION. PLEASE SEE GRANDVIEW FILING NUMBER 1 PLAN SET FOR GRADING OUTSIDE OF THE CHANNEL LIMITS OF CONSTRUCTION.
 - TRIBUTARY 1 TO BE CONSTRUCTED WITH FILING 1 (AREA SOUTH OF TRIBUTARY 1), TRIBUTARY 2 TO BE CONSTRUCTED WITH FILING 2 (AREA NORTH OF TRIBUTARY 1 AND SOUTHWEST OF TRIBUTARY 2), BOX CULVERTS/CROSSINGS ALONG TRIBUTARY 2 TO BE CONSTRUCTED WITH TRIBUTARY IMPROVEMENTS.



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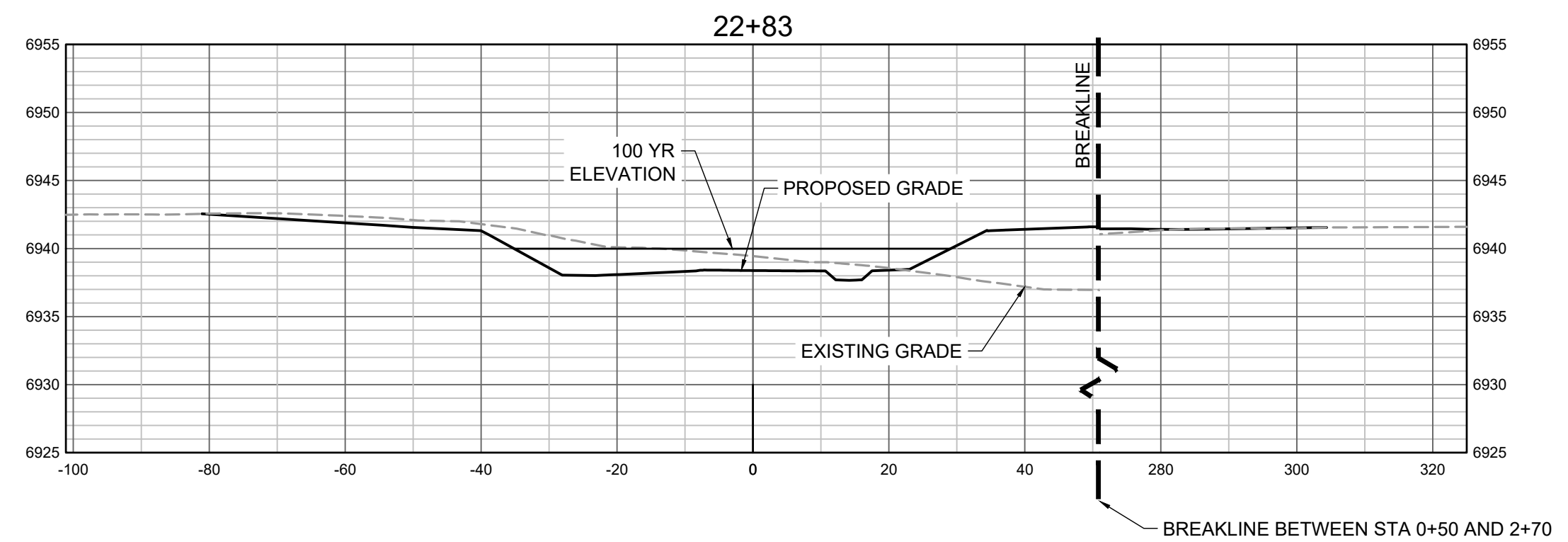
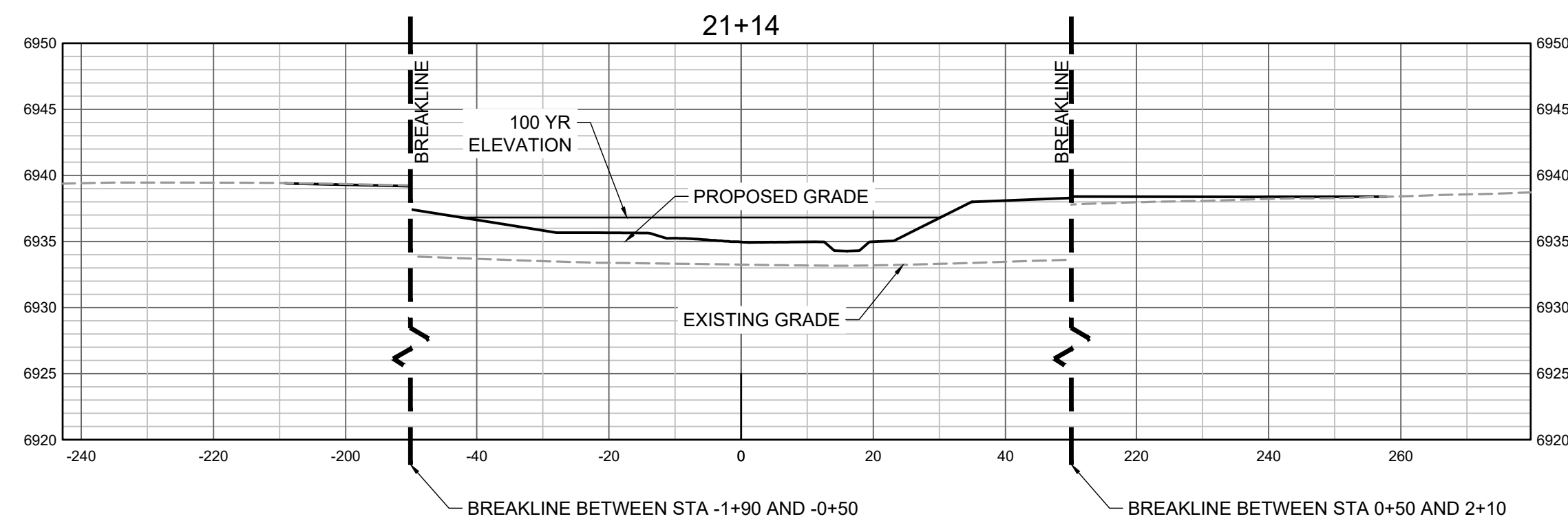
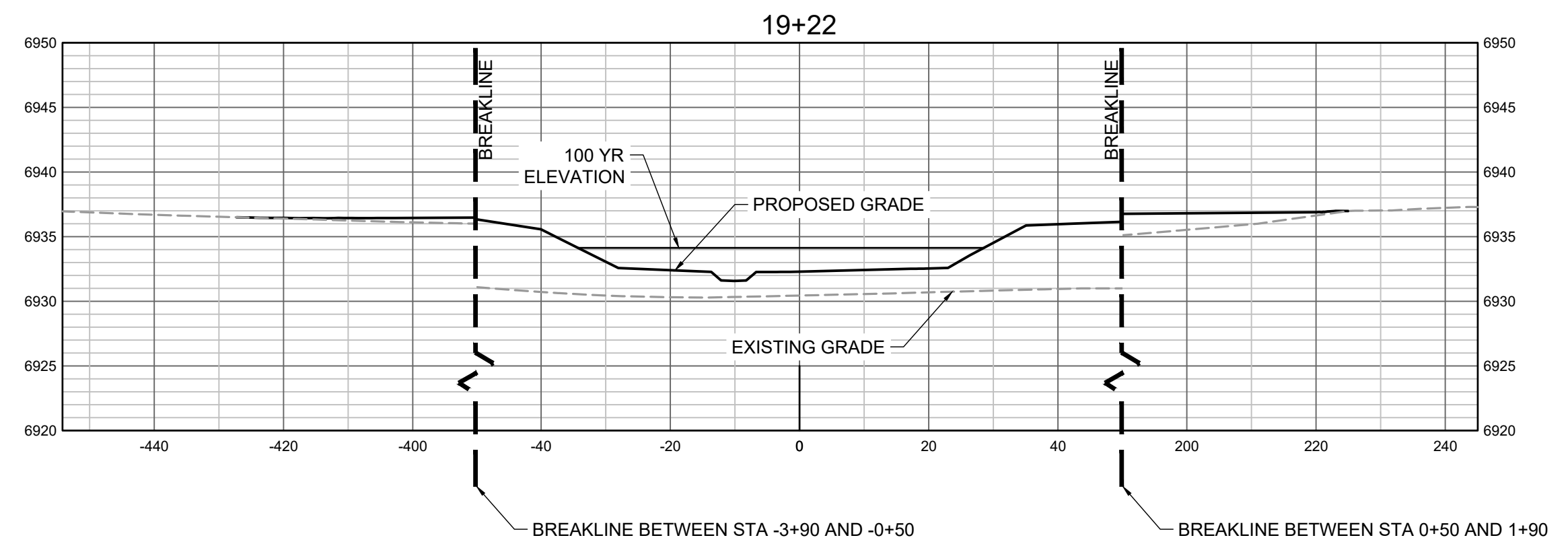
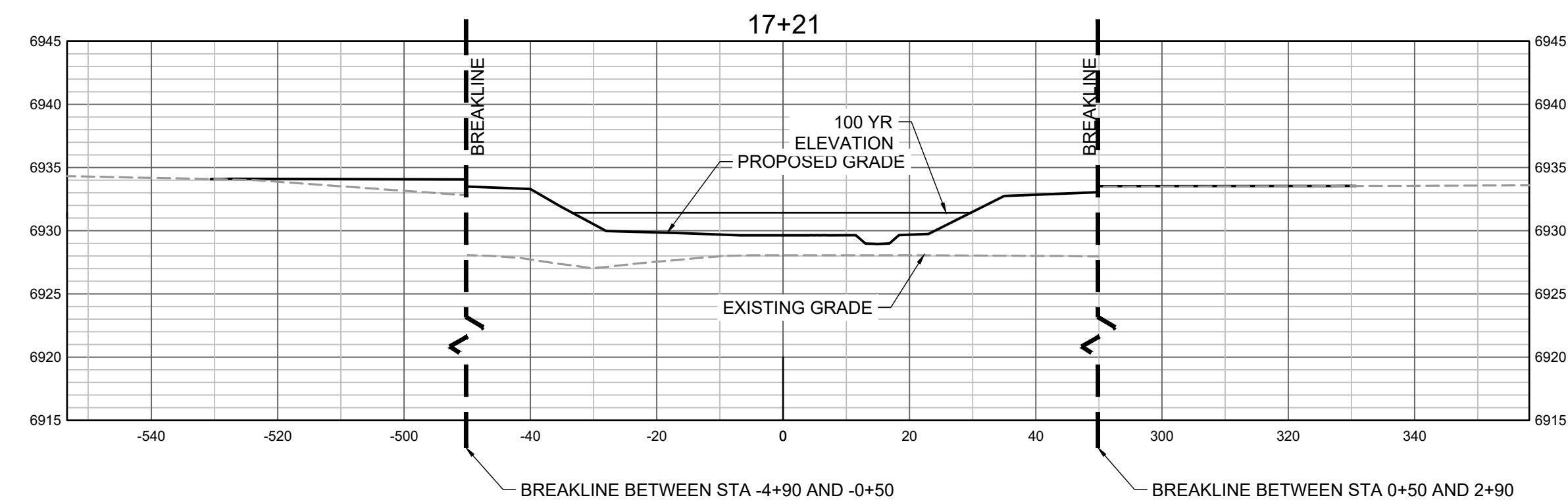
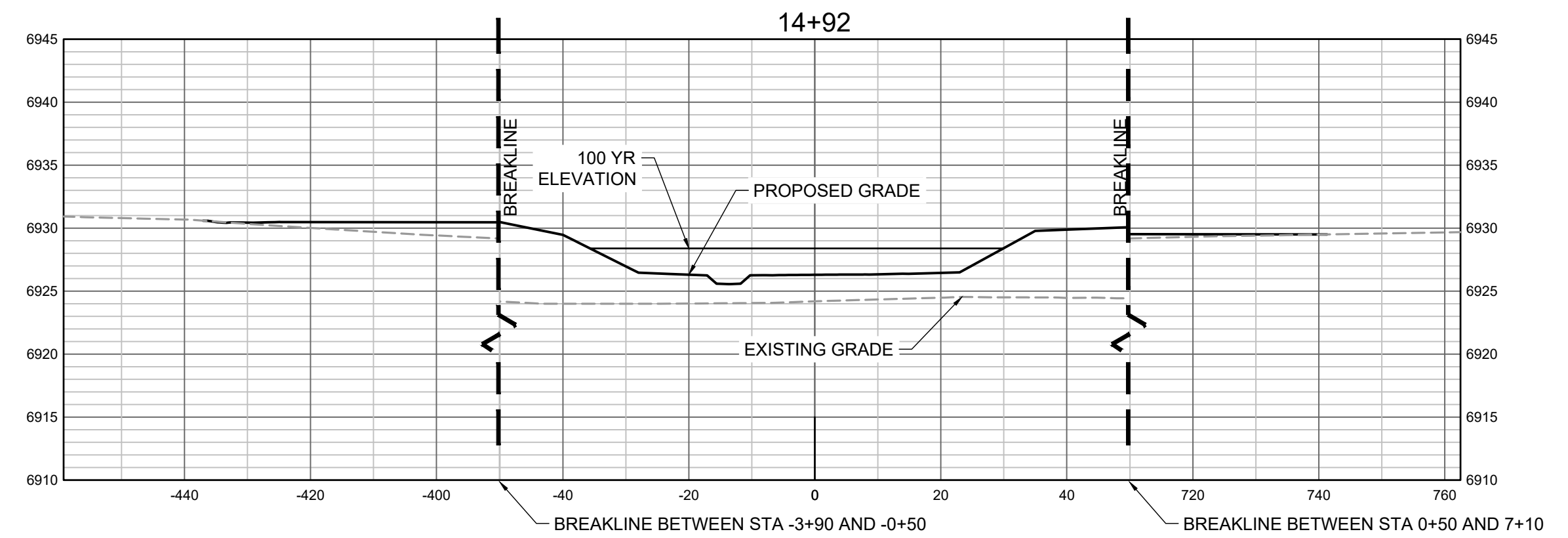
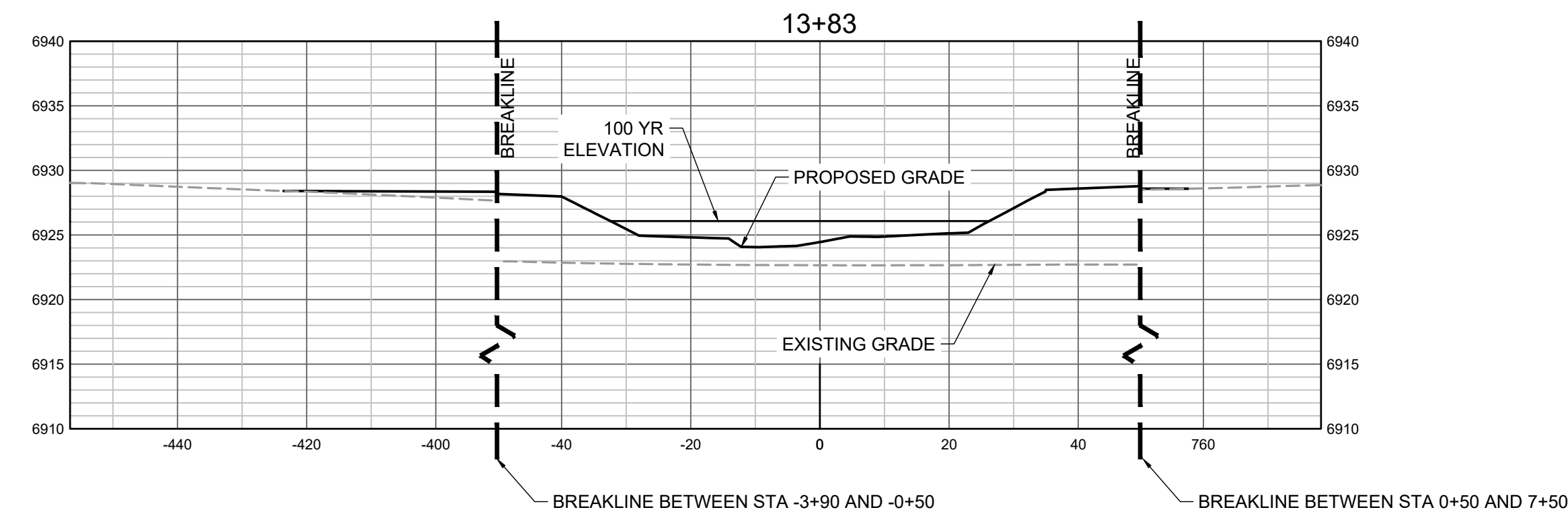
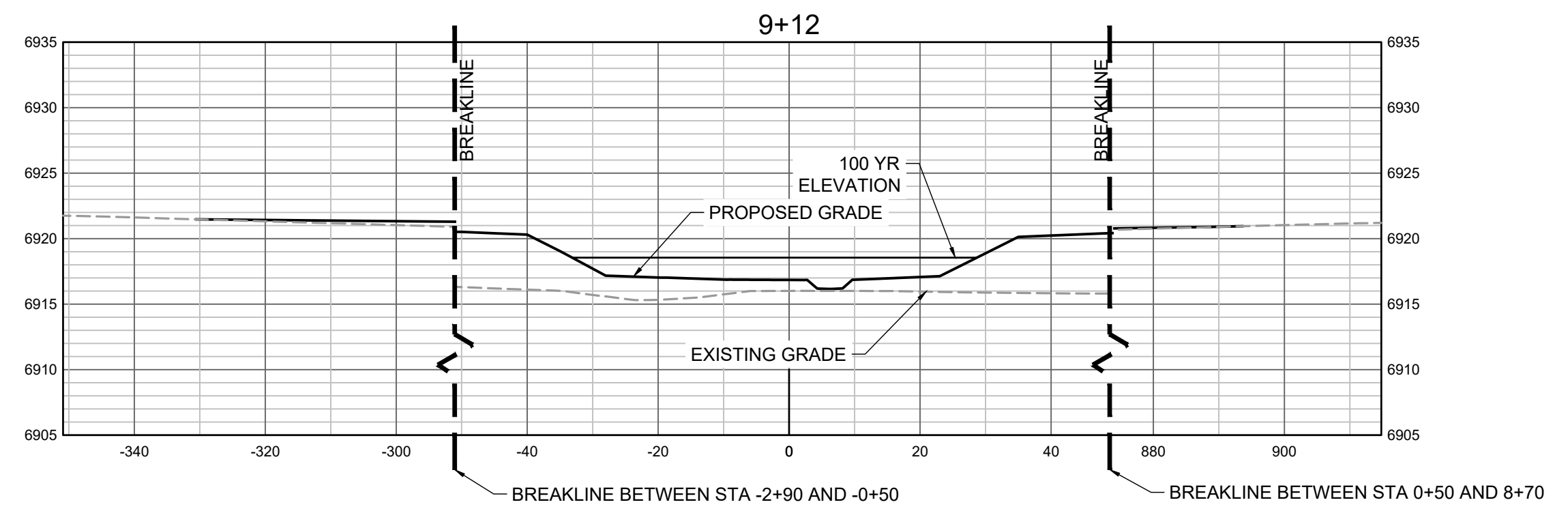
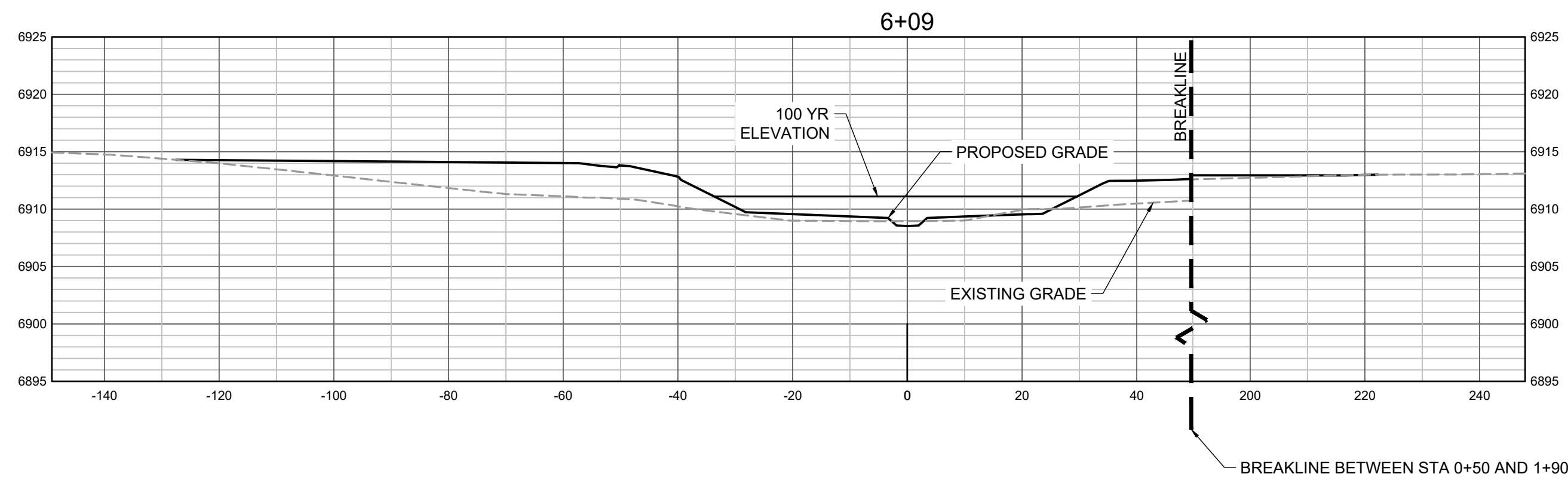


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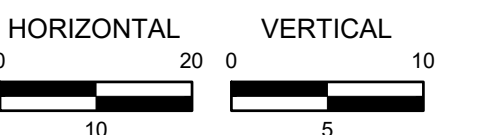
GRANDVIEW RESERVE
DR HORTON
FALCON, COLORADO

CONSTRUCTION DOCUMENTS
DRAINAGE CULVERT PLAN AND PROFILE

SHEET
PP7
36



PROPOSED GRADES TO TIE INTO GRANDVIEW RESERVE FILING 1.
REFER TO THE GRANDVIEW RESERVE FILING 1 PLAN SET FOR
CONTINUATION OF GRADING THAT IS BEING TIED INTO OUTSIDE
OF CHANNEL GRADING LIMITS.



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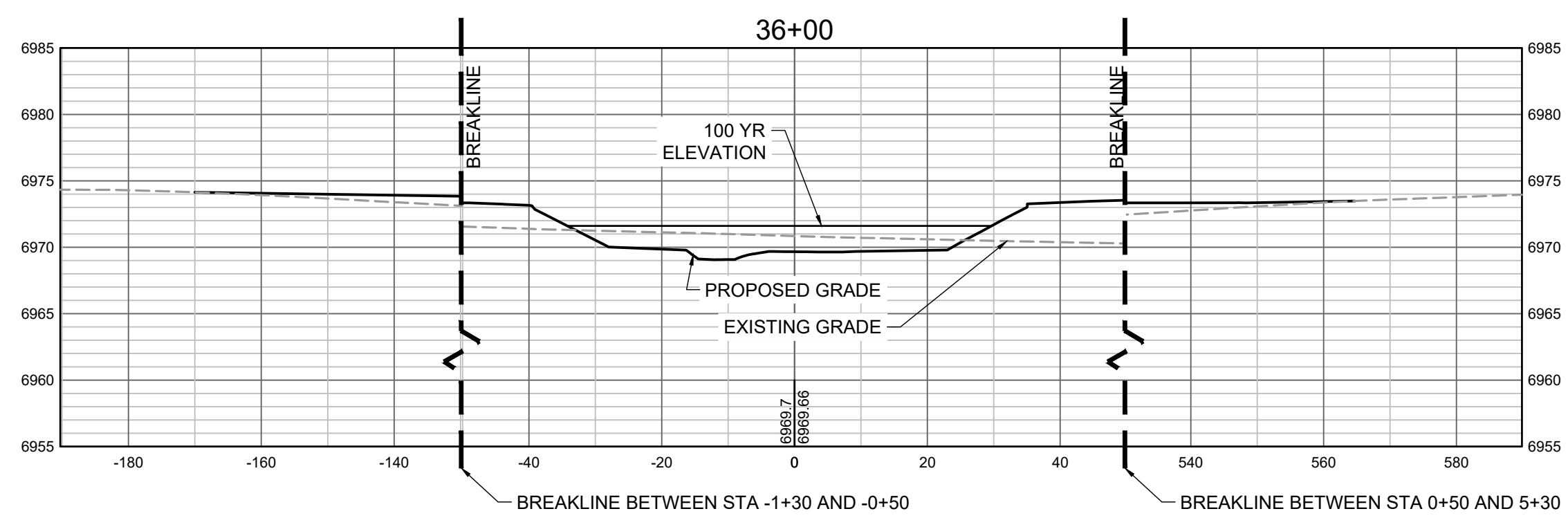
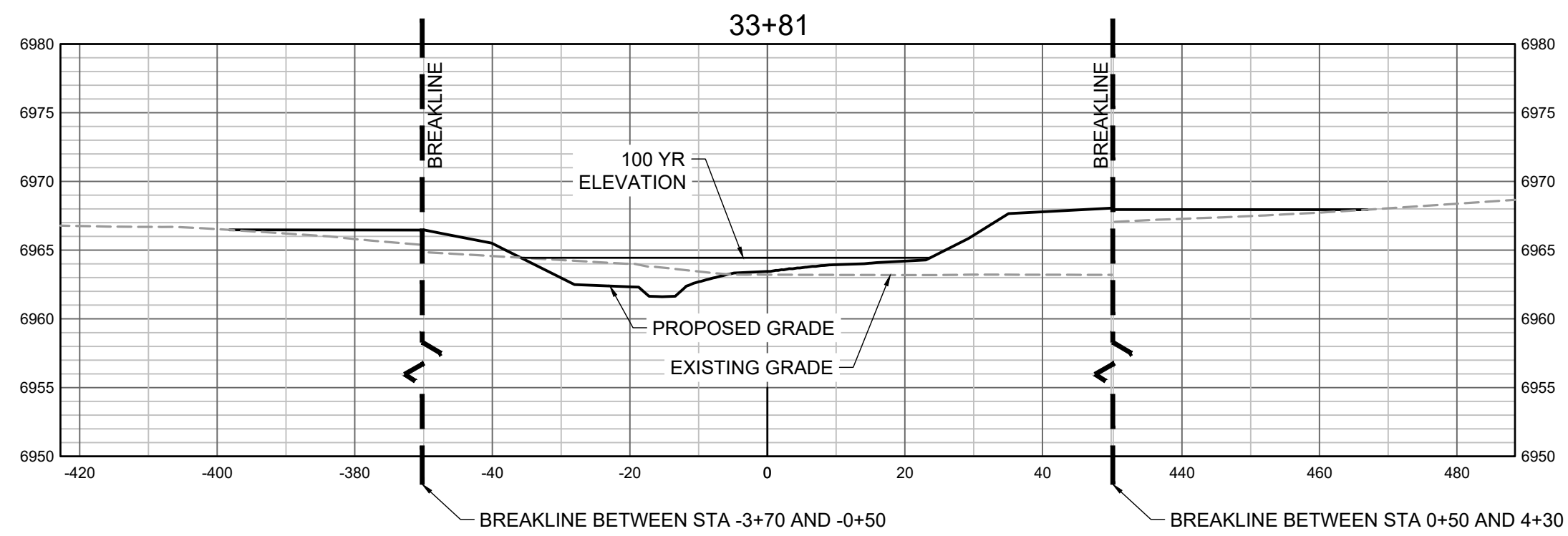
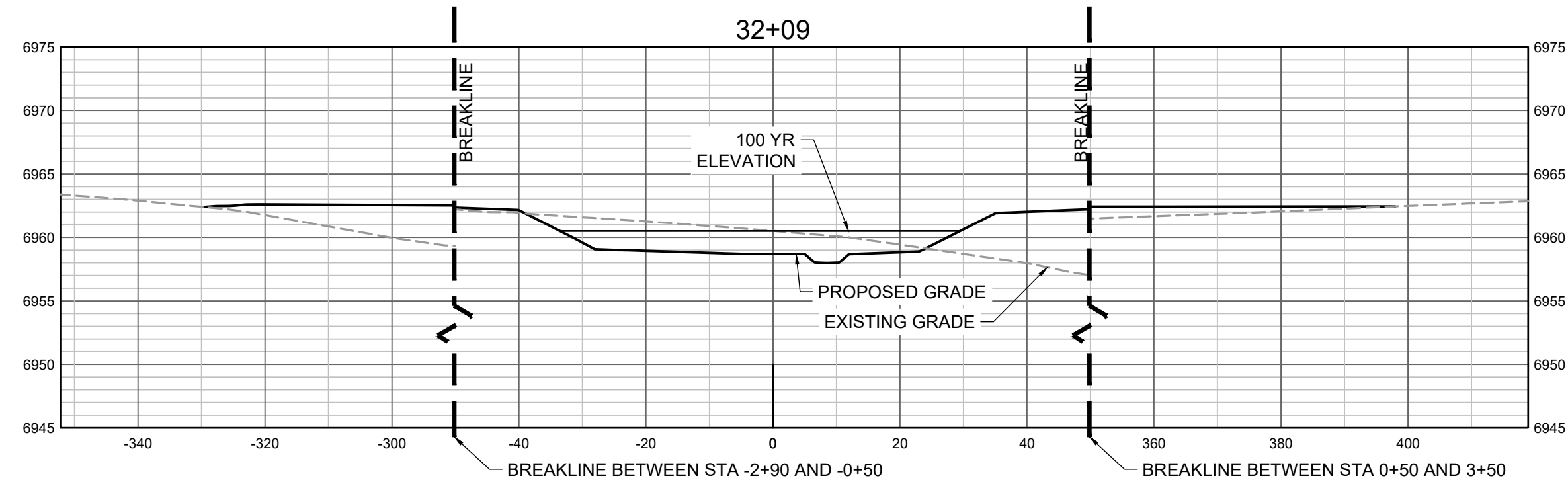
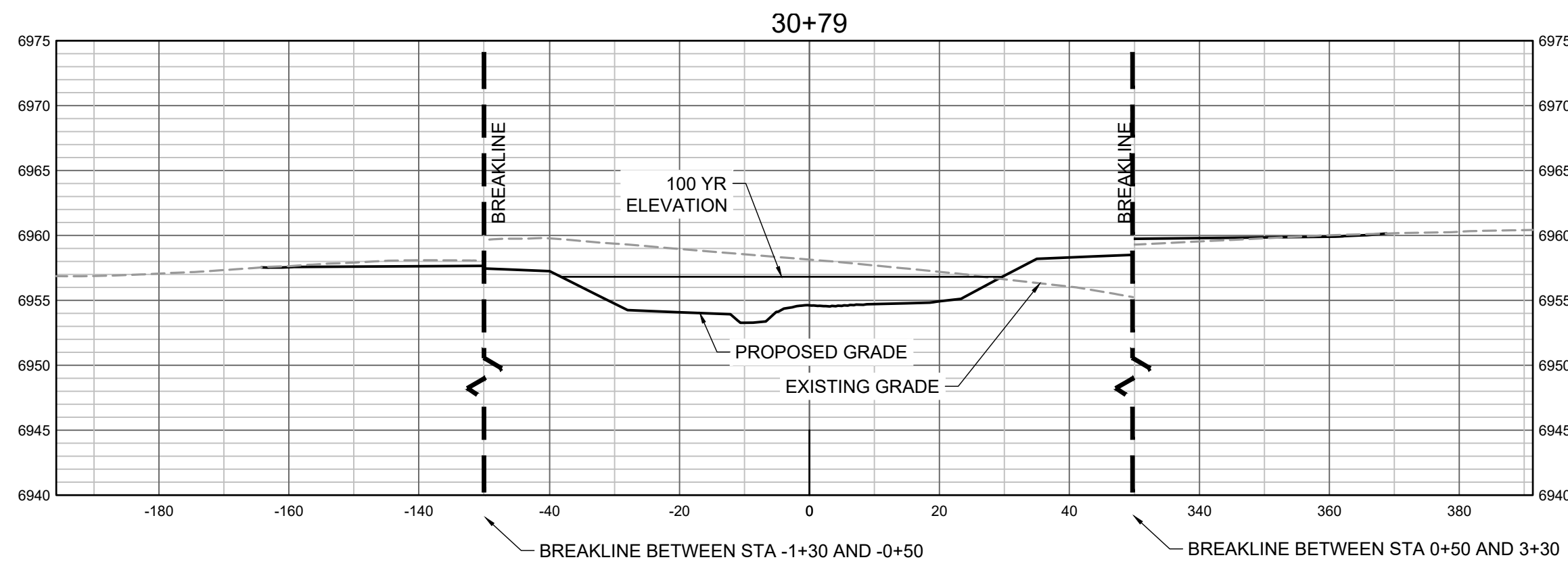
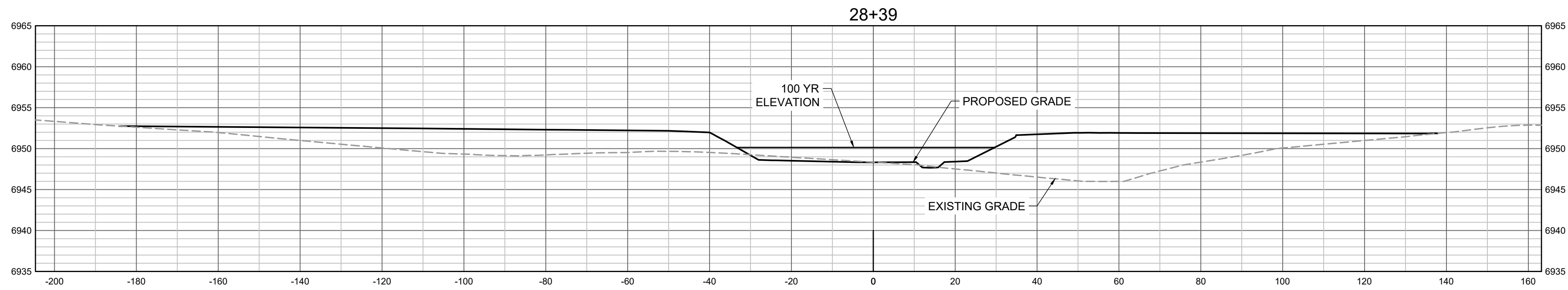
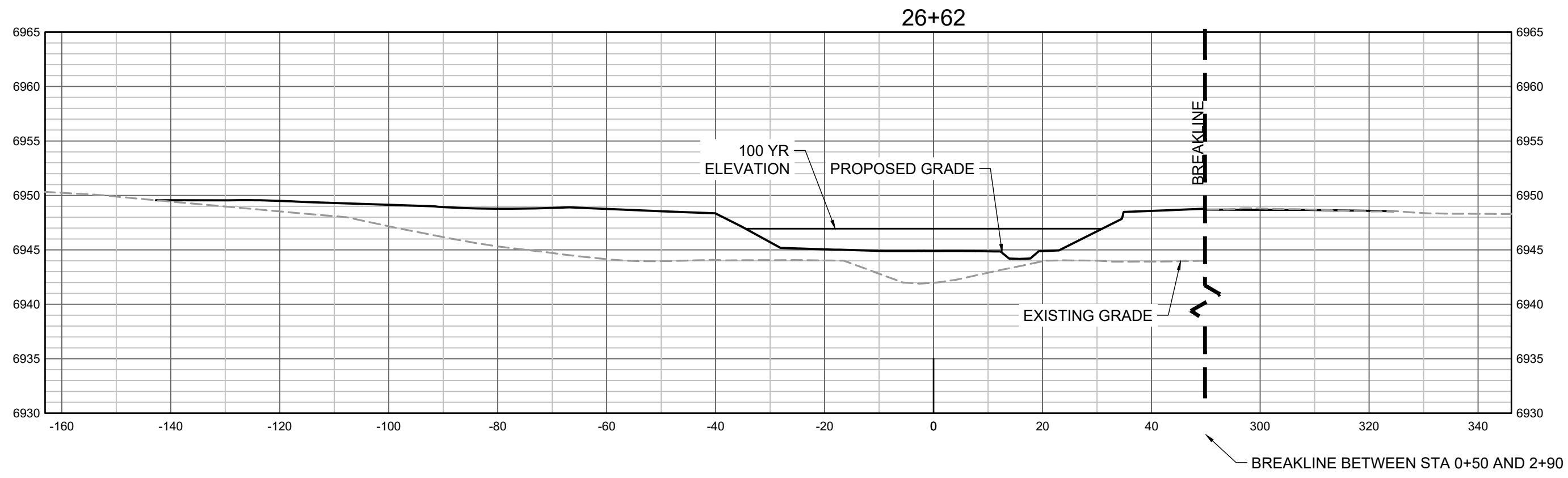
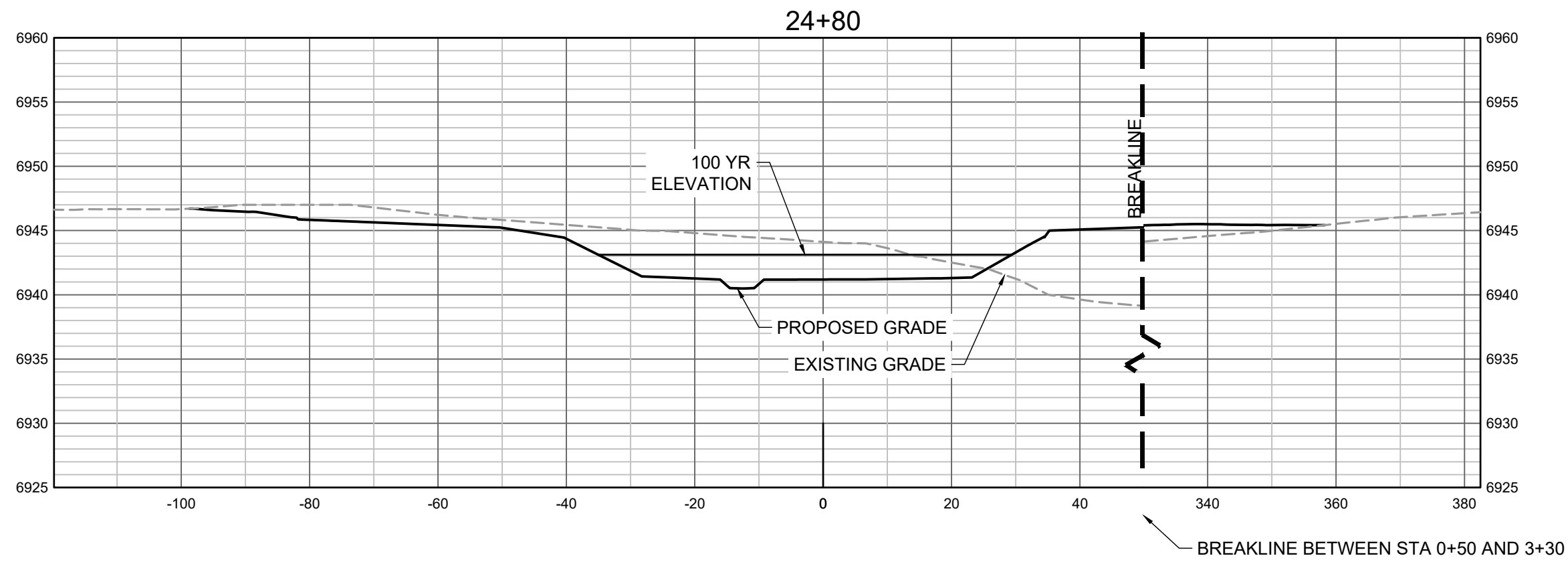
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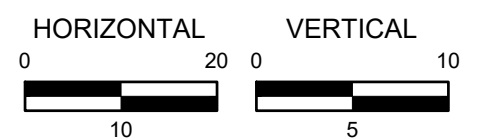
CONSTRUCTION DOCUMENTS
TRIBUTARY 2 CROSS SECTIONS

SHEET
CS1

37



PROPOSED GRADES TO TIE INTO GRANDVIEW RESERVE FILING 1.
REFER TO THE GRANDVIEW RESERVE FILING 1 PLAN SET FOR
CONTINUATION OF GRADING THAT IS BEING TIED INTO OUTSIDE
OF CHANNEL GRADING LIMITS.



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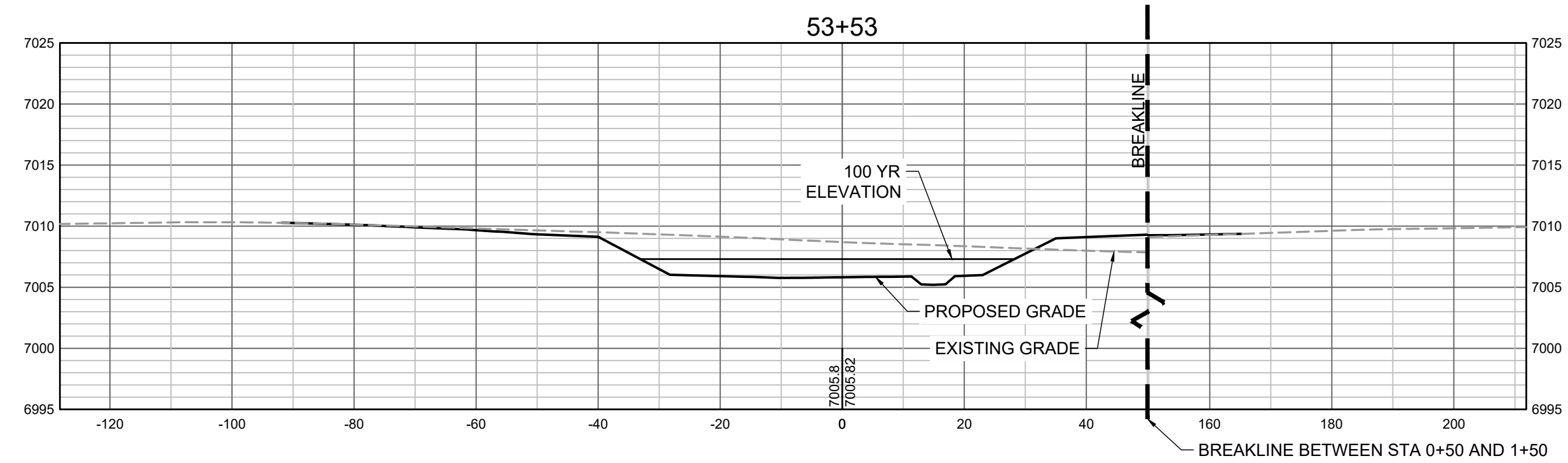
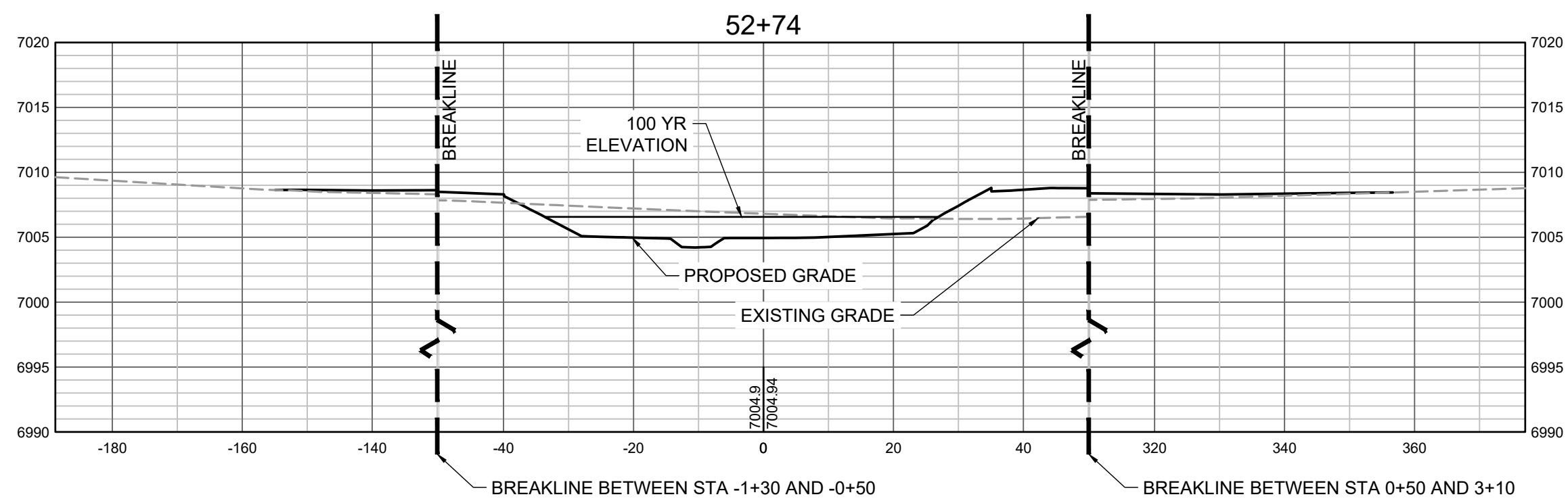
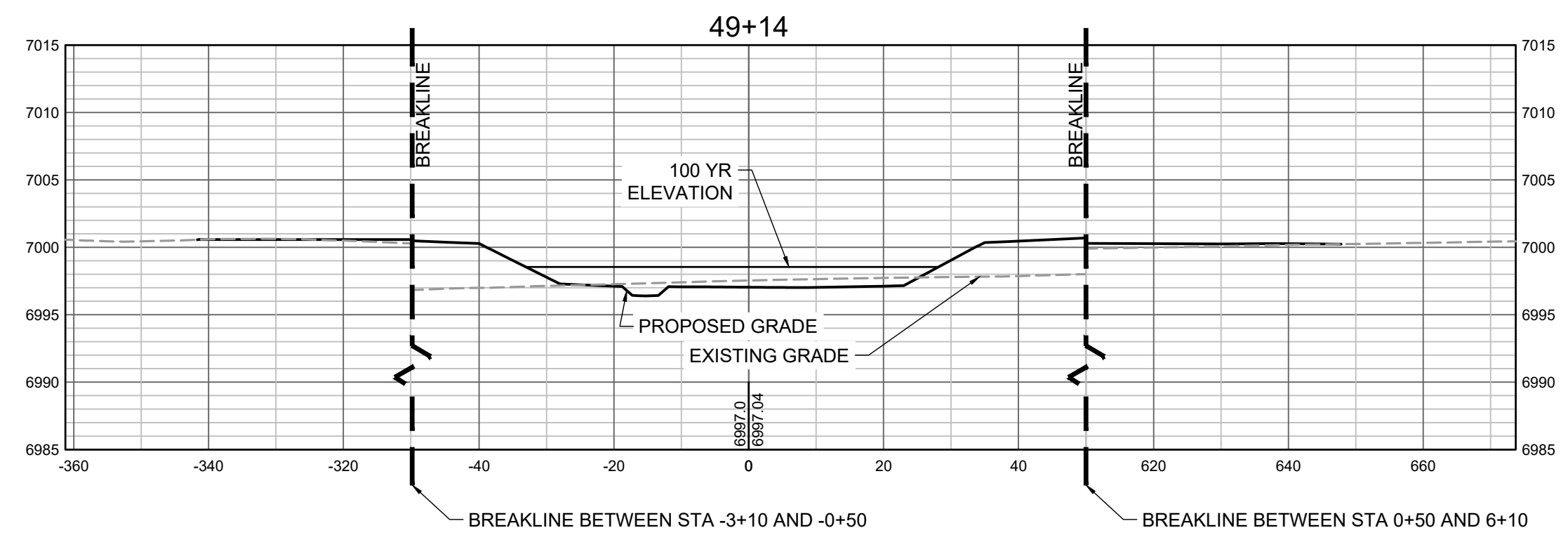
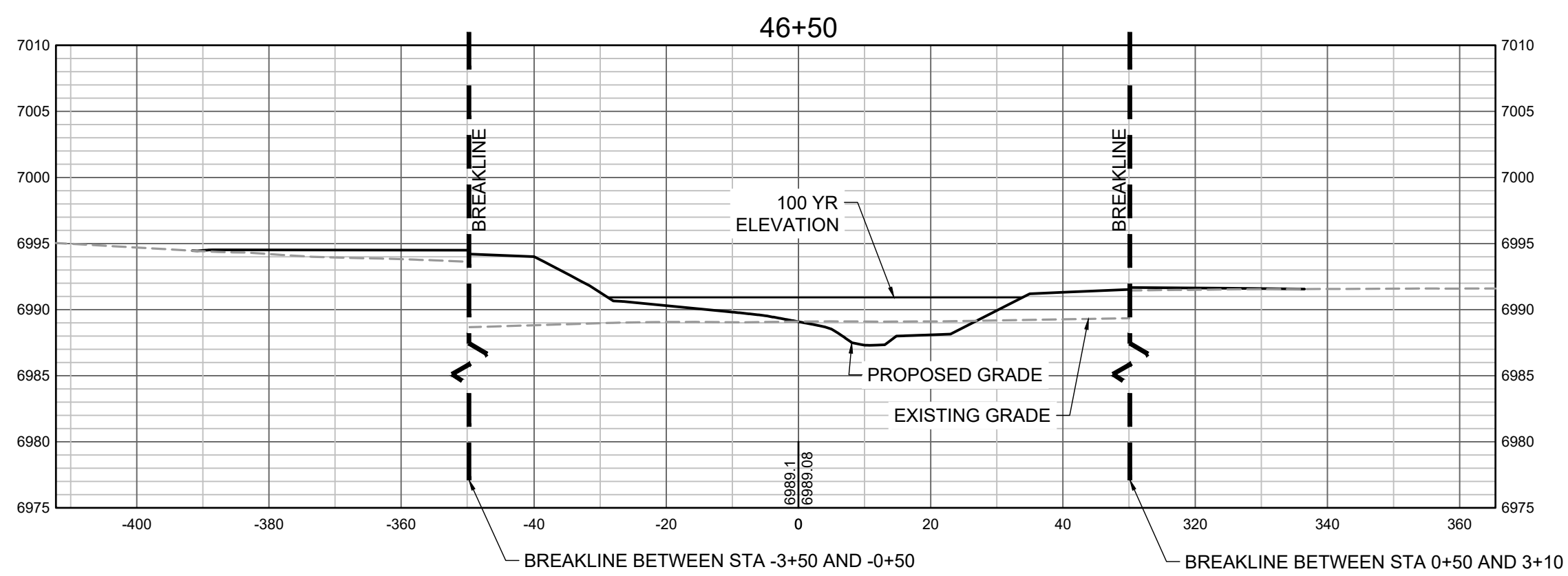
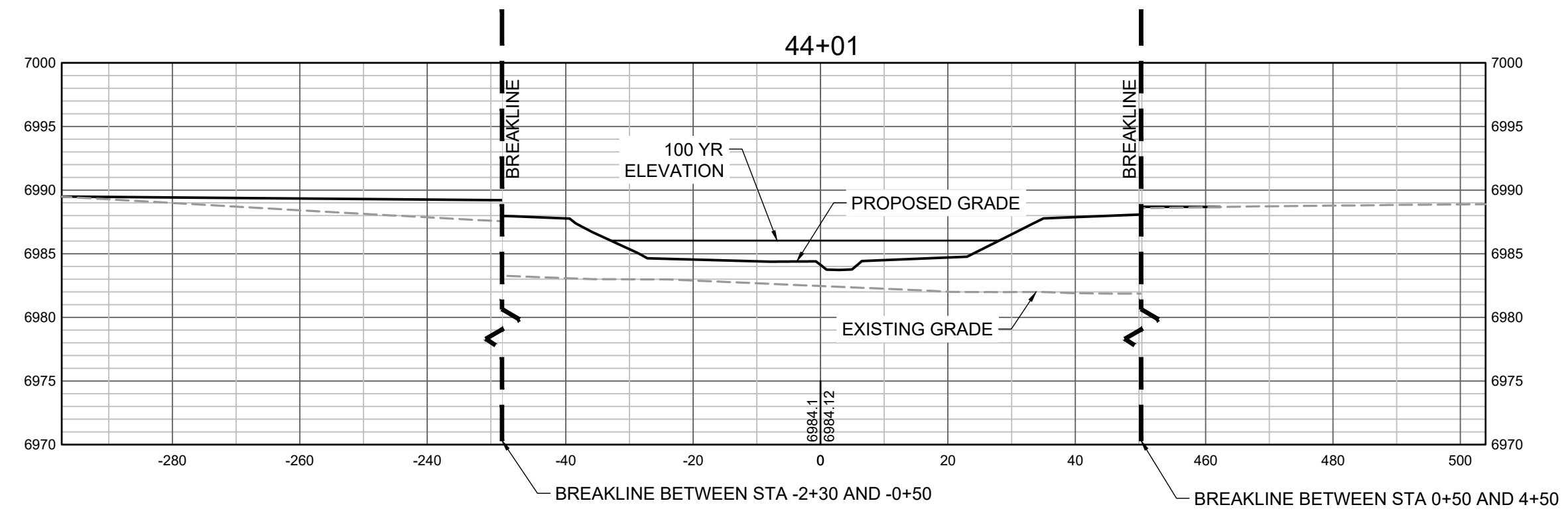
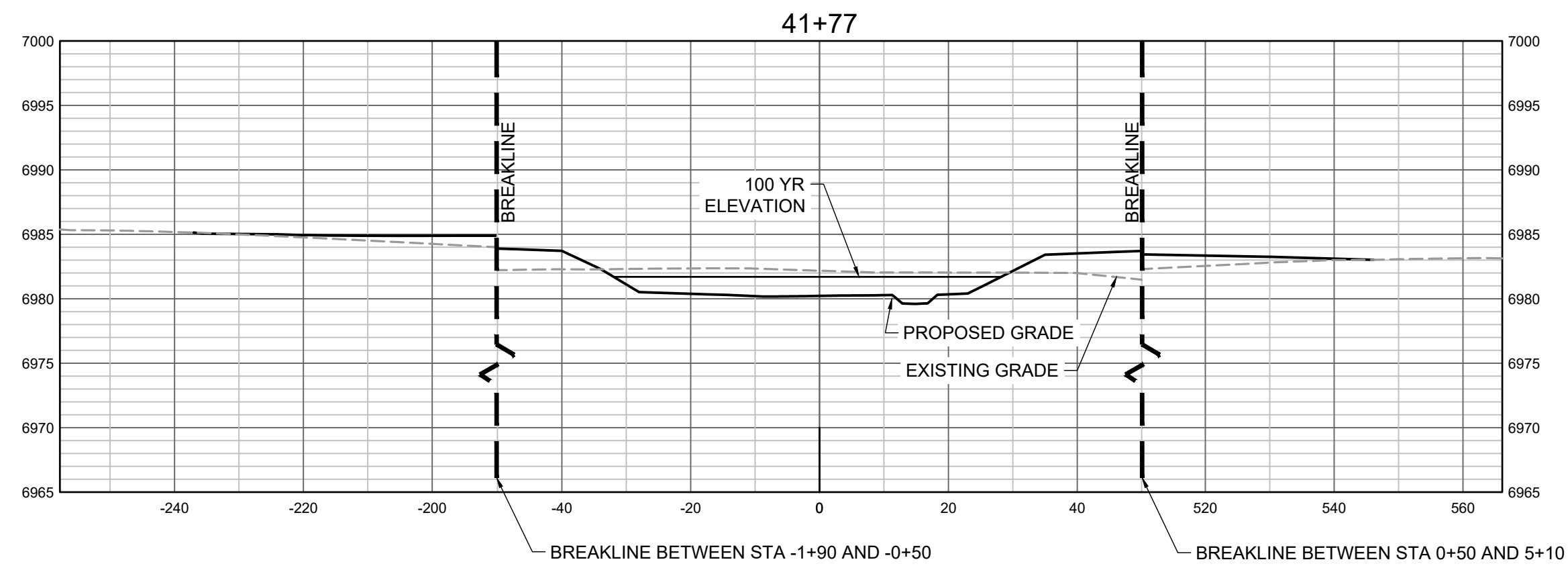
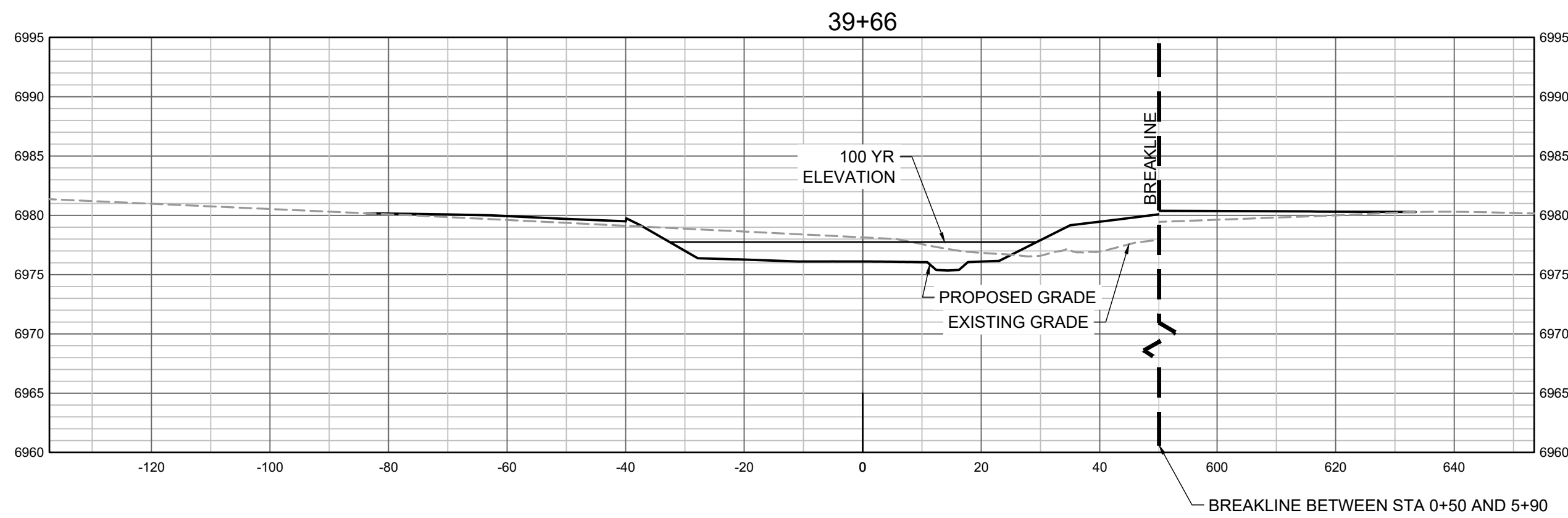
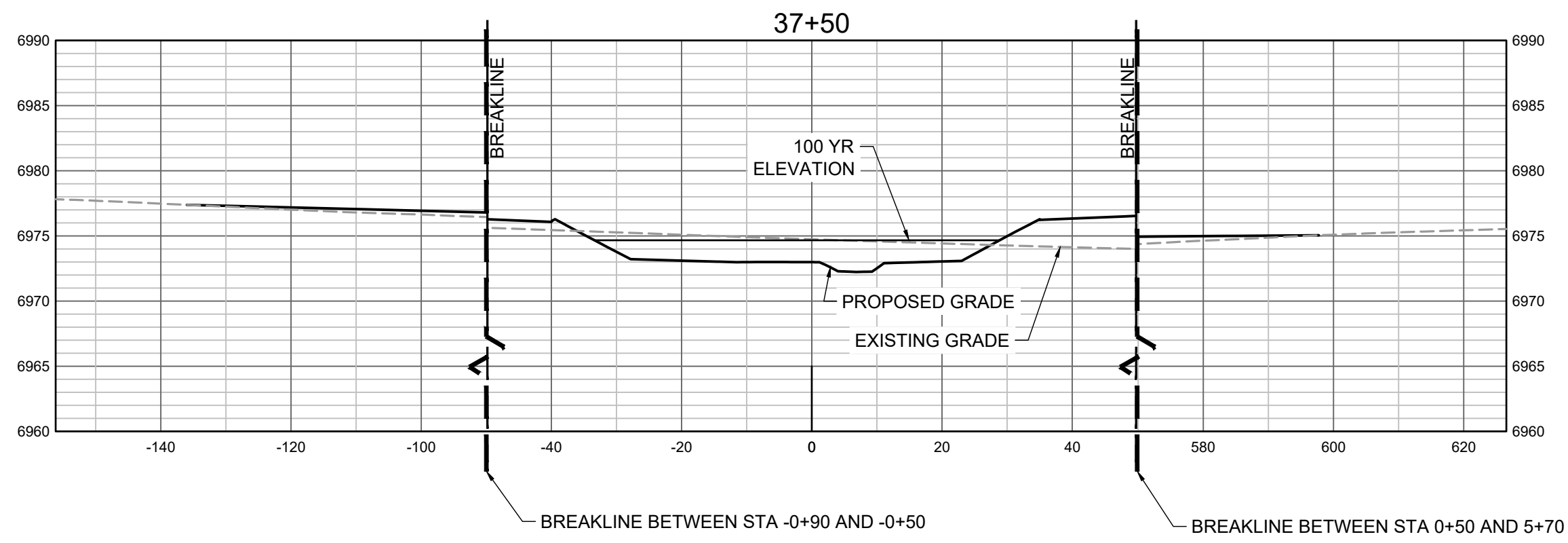
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GRANDVIEW RESERVE
DR HORTON
FALCON, COLORADO

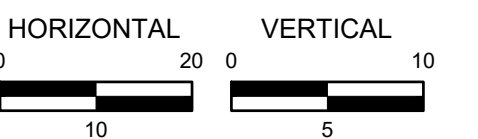
CONSTRUCTION DOCUMENTS
TRIBUTARY 2 CROSS SECTIONS

SHEET
CS2

38



PROPOSED GRADES TO TIE INTO GRANDVIEW RESERVE FILING 1.
REFER TO THE GRANDVIEW RESERVE FILING 1 PLAN SET FOR
CONTINUATION OF GRADING THAT IS BEING TIED INTO OUTSIDE
OF CHANNEL GRADING LIMITS.



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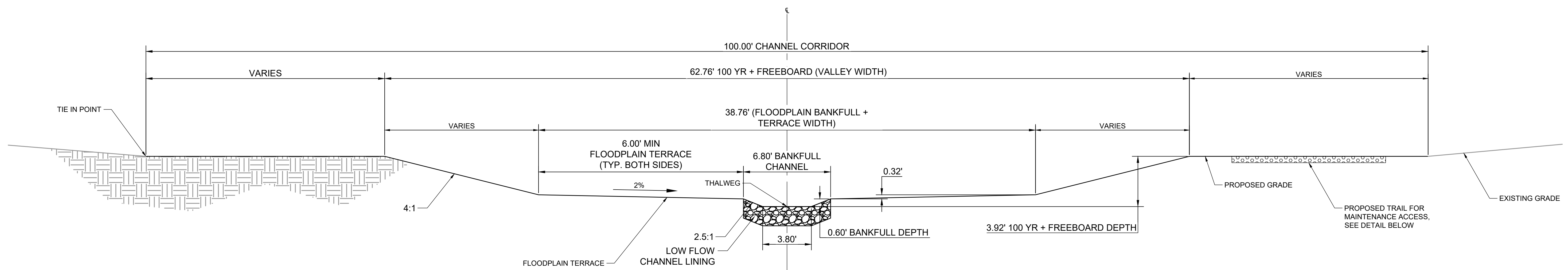
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GRANDVIEW RESERVE
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CONSTRUCTION DOCUMENTS
TRIBUTARY 2 CROSS SECTIONS

SHEET
CS3

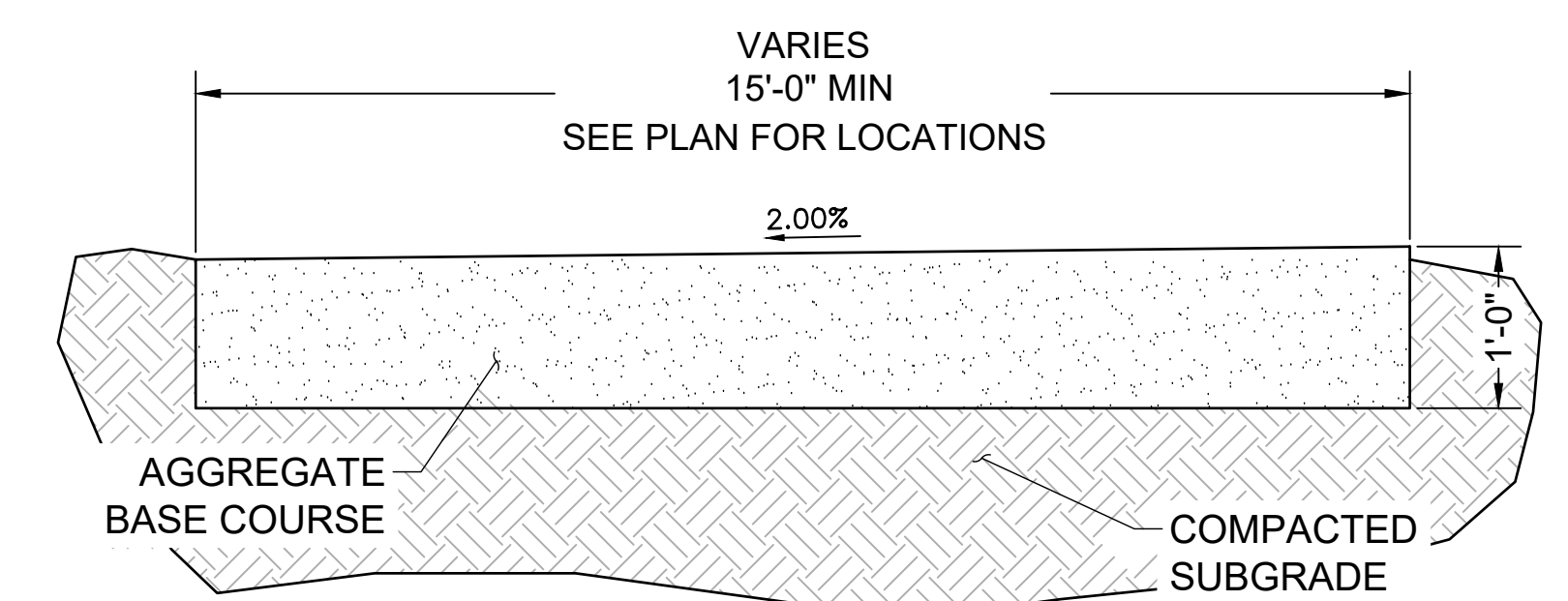
39



TYPICAL CROSS SECTION – TRIBUTARY 2

SCALE: N.T.S.

- NOTES:
1. BANKFULL CHANNEL MAY SHIFT LEFT OR RIGHT WITHIN THE BANKFULL +TERRACE WIDTH SO LONG AS THE MINIMUM FLOOD PLAIN TERRACE WIDTH OF 6' IS MAINTAINED ON BOTH SIDES.
 2. VALLEY WIDTH MAY SHIFT WITHIN THE 100' CHANNEL CORRIDOR.
 3. SEE PROFILES FOR ELEVATION AT THALWEG.



MAINTENANCE ROAD TYPICAL
SECTION
SCALE: NTS

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3-Sided Bridge Section

End Sections Can Be Made To Accommodate Curb, Head Wall, Railing, Sidewalk, or Any Combination

5' or 10' Wide Sections Depending Upon Weight

OPTIONAL Precast Curb

OPTIONAL Precast Wing Walls

Span Varies: 8'-0" - 35'-0"

Rise Varies: 3'-0" - 10'-0"

Note: Additional rise available with use of optional stem wall footing.

Containment/Detention Vault Installation (See Manholes & Drainage, Detention Vault)
Scale: 1/16" = 1'-0"

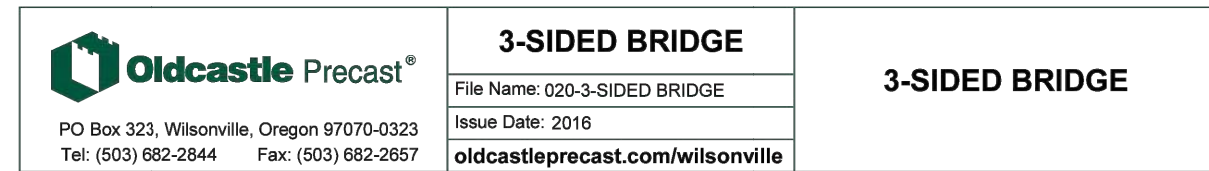
Access Opening(s) as Required

End Wall

OPTIONAL Precast Flat Slab Base

Multiple Cell Installation
Scale: 1/16" = 1'-0"

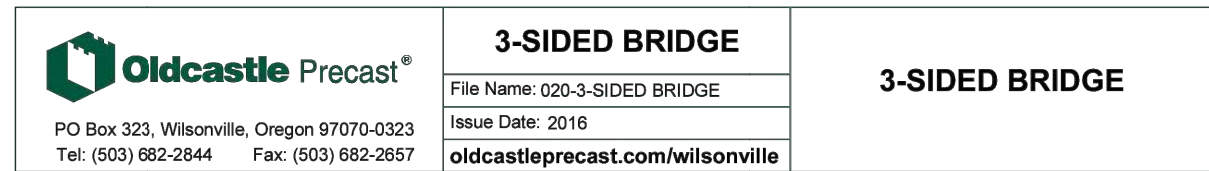
OPTIONAL INSTALLATIONS



1.0

The image contains three technical drawings of bridge components:

- GROUT Detail - Bridge to Footing:** A cross-section showing a precast footing or slab with a 10" gap above it. The gap is filled with "Fill w/ Non-Shrink Grout". A dimension of 1/2" is shown for the grout layer.
- JOINT Detail:** A cross-section of a bridge joint. It shows two concrete slabs separated by a joint. The joint is filled with "Install CS-212 Conwrap Over the Joints" and "Install CS-102 Gasket on Outer Bridge Joints". An "Apply CS-75 Primer" is indicated on the outer surfaces. A "Maximum Gap" dimension is shown.
- Optional Stem Wall Footing Detail:** A cross-section of a stem wall footing. The footing has a "Length Varies" and a "Width Varies". The stem wall has a "1'-8\"



1.1

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PHONE: 720.602.4999
FAX: 713.965.0044

GRANDVIEW RESERVE
DR HORTON
FALCON, COLORADO

CONSTRUCTION DOCUMENTS
DETAILS

SHEET
DT6

45

Appendix E

Property Owner Notifications



▷ 5619 DTC Parkway | Suite 1150 | Greenwood Village, CO 80111
Main 720.602.4999 + Fax 844.273.1057

▷ [HRGREEN.COM](https://www.hrgreen.com)

December 2023

4-Way Ranch Joint Venture LLC

PO Box 50223

Colorado Springs, CO 80949-0223

Re: Notification of establishment in 1-percent-annual-chance water-surface elevations and/or future flood hazard revisions

The Flood Insurance Rate Map (FIRM) for a community depicts the Special Flood Hazard Area (SFHA), the area that has been determined to be subject to a 1-percent or greater chance of flooding in any given year. The FIRM is used to determine flood insurance rates and to help the community with floodplain management.

HR Green, Inc. is applying for a Conditional Letter of Map Revision (CLOMR) from the Federal Emergency Management Agency (FEMA) on behalf of D.R. Horton to revise FIRMs 08041C0552G and 08041C0556G for El Paso County along Geick Ranch Tributary 2. D.R. Horton is proposing to realign and create a creek corridor as part of the Grandview Reserve Development. The proposed project will result in increases in the 1% annual chance (base) water-surface elevations for a portion of Geick Ranch Tributary 2.

Once the project has been completed, a Letter of Map Revision (LOMR) request should be submitted that will, in part, revise the following flood hazards along Geick Ranch Tributary 2.

The SFHA will increase and decrease along Geick Ranch Tributary 2.

This letter is to inform you of the proposed project that may affect flood elevations on your property at Stapleton Dr. This letter is also to inform you of the potential changes to the effective flood hazard information that would result after the project is completed and a LOMR request is submitted to FEMA.

Maps and detailed analysis of the floodway revision can be reviewed at the Pikes Peak Regional Building Department at 2880 International Circle, Colorado Springs, Colorado 80910. If you have any questions or concerns about the proposed project or its effect on your property, you may contact Keith Curtis, CFM, Floodplain Administrator of El Paso County at Keith@pprbd.org from {date TBD} to {date TBD} or Jeff Rice with El Paso County at JeffRice@elpasoco.com from {date TBD} to {date TBD}.

HR GREEN, INC

Greg Panza, PE

Lead Engineer



▷ 5619 DTC Parkway | Suite 1150 | Greenwood Village, CO 80111
Main 720.602.4999 + Fax 844.273.1057

▷ [HRGREEN.COM](https://www.hrgreen.com)

December 2023

JMJK Holdings LLC

3855 Ambrosia St. Ste 304

Castle Rock, CO 80109

Re: Notification of establishment in 1-percent-annual-chance water-surface elevations and/or future flood hazard revisions

The Flood Insurance Rate Map (FIRM) for a community depicts the Special Flood Hazard Area (SFHA), the area that has been determined to be subject to a 1-percent or greater chance of flooding in any given year. The FIRM is used to determine flood insurance rates and to help the community with floodplain management.

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HR GREEN, INC

Greg Panza, PE
Lead Engineer

Appendix F

Endangered Species Act Compliance

Igel, Trevor

From: Grant Gurnee <grant@ecologicalbenefits.com>
Sent: Monday, July 25, 2022 11:32 AM
To: Panza, Gregory
Cc: Jon Dauzvardis
Subject: RE: FEMA TES comment

Importance: High

This email came from outside the HR Green organization. Please use caution when clicking on hyperlinks and opening attachments

Greg –

Perhaps it is best to remind FEMA that the 2020 ESA No Effect Concurrence Request Memo did include all of the information they requested, as Section 4 clearly states that Ecos screened all potential TES in the County as that is what the USFWS IPaC Trust Resources Report provides; and , we provided an Effects Determination in Section 5.

4.0 FEDERAL LISTED SPECIES

A number of species that occur in El Paso County are listed as candidate, threatened or endangered by the USFWS (USFWS, 2018) under the ESA. Ecos compiled the Federally-listed species for the Site in Table 1 based on the Site-specific, USFWS IPaC Trust Resources Report we ran for the Project (Appendix A); and our onsite assessment. Ecos has provided our professional opinion regarding the probability that these species may occur within the Site and their probability of being impacted by the Project.

The likelihood that the Project would impact any of the species listed below is very low to none. Most are not expected occur in the Project area or on the Site; nor will they be affected by the direct or indirect effects of the project.

5.0 EFFECTS DETERMINATION

The Site is not located within any USFWS designated critical habitat or known occupied habitat for federally listed threatened or endangered species. Please refer to the IPaC database (Appendix A) and Table 1.

The Project will have **No Effect** on the following listed species:

- Listed species in Nebraska, as the Site is not located in the North Platte, South Platte or Laramie River basins.
- Greenback cutthroat trout, Mexican spotted owl and North American wolverine, as suitable habitat does not exist on the Site.
- Western prairie fringed orchid, as the Site will not alter or deplete flows to the Platte River system.
- Ute ladies'-tresses orchid is unlikely to occur as the Site is situated between 6,860 and 7,020 feet above mean sea level, which is higher than the 6,500-foot elevation limits documented for the species and recommended for conducting surveys by the USFWS.
- Preble's meadow jumping mouse: This species occurs in the County but is not known to occur on the Site due to:
 - The absence of habitat required to support the life requisites of the species;
 - Negative trapping results (i.e., Trapped – Not Found) reported by USFWS upstream and downstream of the Site on West Kiowa Creek, and east of the Site on Kiowa Creek;
 - 2.5 mile distance from the closest CPW "Potential" Occupied Habitat;

- 6.5 mile distance from the closest USFWS Critical Habitat; and
- The lack of viable habitat connection corridors from known, occupied habitat to the Site.

If the above information does not suffice, please forward FEMA this email.

No Take Statement:

Ecos hereby confirms that “Take” as defined under the Endangered Species Act will not occur to threatened and endangered species present in the county as a result of the project.

Thank you,
Grant

Grant Gurnée, P.W.S.

Owner – Restoration Ecologist – Fish & Wildlife Biologist

ecosystem services LLC

(o): 970-812-ECOS (3267)

(c): 303-746-0091

(w): www.ecologicalbenefits.com

(e): grant@ecologicalbenefits.com



Life is like a river...we all must learn to adapt to the challenges of dynamic equilibrium



Informal Consultation Request

April 10, 2020

Mr. Drue DeBerry
Acting Colorado Field Supervisor
U.S. Fish and Wildlife Service
Colorado Ecological Services Field Office
134 Union Blvd., Suite 670
Lakewood, Colorado 80228

RE: Request for Technical Assistance Regarding the Likelihood of Take of Federally-listed Threatened and Endangered Species resulting from the proposed development of the Grandview Reserve Project in El Paso County, Colorado

Dear Mr. DeBerry:

Ecosystem Services, LLC (ecos) has prepared the enclosed habitat evaluation on behalf of 4 Site Investments to describe the physical/ecological characteristics of the Grandview Reserve site (Site) and evaluate the potential effects of the proposed development project (Project) on the Federally-listed threatened and endangered (T&E) species protected under the Endangered Species Act (ESA).

The El Paso County Environmental Division has completed its review of the Project and has requested that 4 Site Investments provide a "Clearance Letter" obtained from the U.S. Fish and Wildlife Service (USFWS) to the Planning and Community Development Department prior to project commencement "where the project will result in ground disturbing activity in habitat occupied or potentially occupied by threatened or endangered species and/or where development will occur within 300 feet of the centerline of a stream or within 300 feet of the 100 year floodplain, whichever is greater."

At this time there is no Federal action and no Federal agency is making a formal effects determination under Section 7 (a)(2) of the ESA. Therefore, ecos is requesting technical assistance from USFWS regarding 4 Site Investments' (i.e., the non-federal party) responsibilities under the ESA, and specifically the likelihood of the Project (described herein) resulting in take of listed species. If the USFWS concurs with the findings presented herein we request that you issue an informal letter of concurrence for use in the El Paso County Project review process.

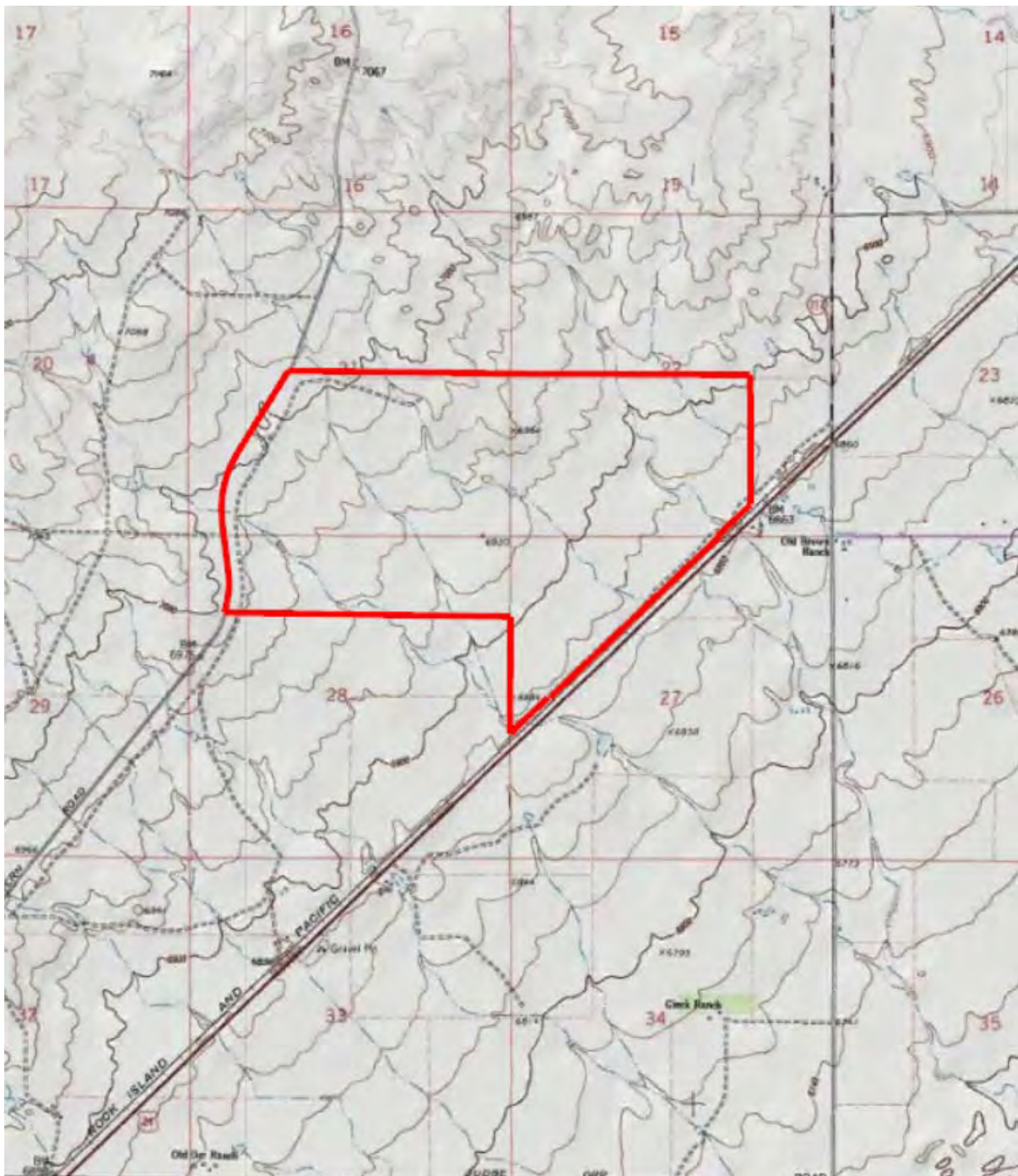
1.0 SITE LOCATION and PROJECT DESCRIPTION

The Site is located in the Falcon/Peyton area of El Paso County and is bounded along the north by 4 Way Ranch Phase I, along the south by Waterbury, along the southeast by Highway 24, and along the west by Eastonville Road. There are no existing structures, roads, or other infrastructure on the Site. The Site is located approximately 4.14 miles southwest of Peyton, 4.16 miles northeast of Falcon and 4.66 miles south of Eastonville, in El Paso County, Colorado. The Site is generally located within the south ½ of Section 21, south ½ of Section 22, the north ½ of Section 27, and the north ½ of Section 28, Township 12 South, Range 64 West in El Paso County, Colorado. The center of the Site is situated at approximately Latitude 38.98541389 north, - 104.55472222 east (refer to Figure 1).

The Applicant proposes to develop the 768.2-acre Site as a mixed use residential and commercial community with the total number of units ranging from 2,496 to 3,261 as summarized below:

Table 1 – Land Use Summary						
Land Use Category	Acreage	Acreage %	Density Units/Acre		Units	
			Min.	Max.	Min.	Max.
Institutions	16.9 acres	2.2%	NA	NA	NA	NA
Low Density Residential	136.4 acres	17.8%	1	2	136	272
Medium Density Residential	258.4 acres	33.6%	3	4	775	1033
Medium-High Density Residential	68.6 acres	8.9%	6	8	411	548
High Density Residential	117.4 acres	15.3%	10	12	1174	1408
Commercial	17.0 acres	2.2%	NA	NA	NA	NA
Open Space ₁	132.5 acres	17.2%	NA	NA	NA	NA
Rex Rd. & Collector	21.0 acres	2.7%	NA	NA	NA	NA
TOTAL	768.2 acres	100%	NA	NA	NA	NA
Note 1: Open Space includes: Detention Ponds, Drainage Corridors, General Open Space & Easements and R.O.W. Buffers of Eastonville Road and Highway 24						

Please refer to Figure 2.



USGS 7.5 min. Quad: Falcon
Latitude: 38.985713°N
Longitude: -104.552854°W
Section 21, 22, 27 & 28, Township 12 South, Range 64 West



Land Use Summary

LAND USE CATEGORY	ACREAGE	ACREAGE %	DU/AC	UNITS
CHURCH	6.2 ac.	0.8%	N/A	N/A
LOW DENSITY	88.8 ac.	11.6%	1.45	129
MEDIUM DENSITY	158.6 ac.	20.7%	3.10	492
HIGH DENSITY	343.4 ac.	44.9%	4.00	1374
COMMERCIAL	17.0 ac.	2.2%	N/A	N/A
SCHOOL	10.7 ac.	1.4%	N/A	N/A
OPEN SPACE	119.1 ac.	15.6%	N/A	N/A
REX & COLLECTOR	21.0 ac.	2.7%	N/A	N/A

*OPEN SPACE INCLUDES: DETENTION, DRAINAGE CORRIDORS, GENERAL OPEN SPACE AND EASEMENTS,AND R.O.W./BUFFER OF EASTONVILLE RD. & HWY 24

Total	764.8 ac.	100%		1995
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LEGEND

- POCKET PARK - APPROXIMATE LOCATION
- DETENTION - APPROXIMATE LOCATION
- PROPOSED TRAIL

SKETCH PLAN - DRAFT 3-25-20

GRANDVIEW RESERVE

FALCON, CO



Based on mapping compiled from best available information. All map data should be considered as preliminary, in need of verification, and subject to change. This sketch is conceptual in nature and does not represent any regulatory approval. Plans are subject to change.

2.0 METHODOLOGY

2.1 Office Assessment

Ecos performed an office assessment in which available databases, resources, literature and field guides on local flora and fauna were reviewed to gather background information on the environmental setting of the Site. We consulted several organizations, agencies, and their databases, including:

- Colorado Department of Agriculture (CDA) Noxious Weed List;
- Colorado Natural Heritage Program (CNHP);
- Colorado Oil and Gas Conservation Commission (COGCC) GIS Online;
- Colorado Parks and Wildlife (CPW);
- El Paso County Master Plan;
- El Paso County, Sub-Area Plan (provided by Client);
- Federal Emergency Management Agency (FEMA);
- Google Earth current and historic aerial imagery;
- Survey of Critical Biological Resources, El Paso County, Colorado;
- Survey of Critical Wetlands and Riparian Areas in El Paso and Pueblo Counties, Colorado;
- U.S. Army Corps of Engineers (USACE) 1987 Corps of Engineers Wetlands Delineation Manual;
- USACE 2010 Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Great Plains Region;
- U.S. Department of Agriculture (USDA) PLANTS Database;
- U.S. Fish and Wildlife Service (USFWS) Region 6;
- USFWS National Wetland Inventory (NWI);
- USFWS IPaC database search; and
- U.S. Geological Survey (USGS).

Ecos also reviewed pertinent, site-specific background data provided by 4 Site Investments and their consulting Team, including topographic base mapping, site development plans, and other data pertinent to the assessment.

2.2 Onsite Assessment

Following the collection and review of existing data and background information, ecos conducted a field assessment of the Site on October 10 and 11, 2018 to identify any potential impacts to natural resources associated with the Project. Field reconnaissance concentrated on identification of wetland habitat, waters of the U.S., wildlife habitat (including habitat suitable to support threatened and endangered wildlife) significant topographic features, noxious weeds and vegetation. Wetland habitat and waters of the U.S. boundaries, wildlife habitat, major vegetation communities, and significant weed stands were sketched on topographic and aerial base maps and located using a hand-held Global Positioning System as deemed necessary. Representative photographs were taken to assist in describing and documenting Site conditions and potential ecological impacts.

3.0 ENVIRONMENTAL SETTING

The Site is located in the Southwestern Tablelands Ecological Region (Chapman et al, 2006), which is primarily comprised of sub-humid grassland and semiarid rangeland. More specifically, the Site is located in the Foothills Grassland sub-region (26j) which contains a mix of grassland types with some small areas of isolated tallgrass prairie species that are more common much farther east. The proximity to runoff and moisture from the Front Range and the more loamy, gravelly, and deeper soils are able to support more tallgrass and midgrass species than neighboring ecoregions. Big and little bluestem, yellow indiagrass and switchgrass occur, along with foothill grassland communities. The annual precipitation of 14 to 20 inches tends to be greater than in regions farther east. Soils are loamy, gravelly, moderately deep, and mesic. Rangeland and pasture are common, with small areas of cropland. Urban and suburban development has increased in recent years, expanding out from Colorado Springs and the greater Denver area.

The Site contains no Colorado Natural Heritage Conservation Areas or Potential Conservation Areas according to the CNHP (CNHP, 2018), and no Wildlife Refuges or Hatcheries according to the USFWS IPaC Trust Resources Report (USFWS, 2016a) (refer to Appendix A).

3.1 Topography

The Site is generally characterized as gently sloping from northwest to southeast with four ephemeral drainages (prairie sloughs) present, two of which are discontinuous and two are tributary to Black Squirrel Creek offsite. Naturally undulating swales drain toward the sloughs, which contain wetlands in low areas and dry areas where alluvial deposits have formed. Site topography ranges from a high elevation of 7020 feet above mean sea level (AMSL) in the northwestern corner to a low elevation of 6860 feet above AMSL where the northeastern tributary exits the Site on the east boundary along Highway 24; for a total elevation drop of 160 feet. An ill-defined and undulating hill, which is likely an eroded remnant bluff, is present in the north-central portion of the Site. Refer to Figure 3.

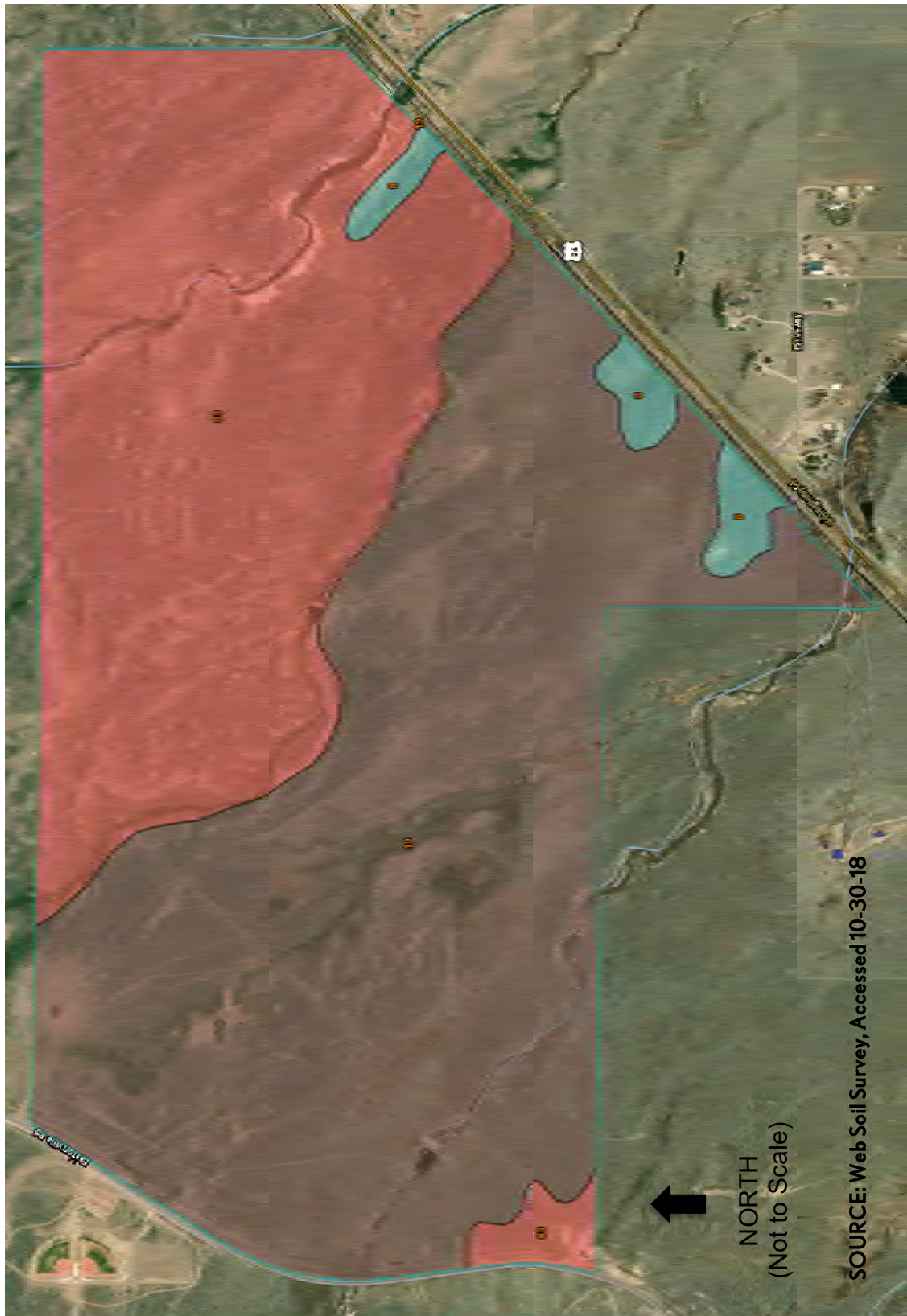
3.2 Soils

Ecos utilized the U.S. Department of Agriculture, Natural Resource Conservation Service Web Soil Survey (USDA, NRCS, 2018) to determine if hydric soils are present within the Site, as this data assist in informing the presence/absence of potential wetland habitat regulated under the Clean Water Act. The soils data were also utilized to supplement the field observations of vegetation, as the USDA provides correlation of native vegetation species by soils types. Please refer to Figure 4, USDA NRCS Soil Map and Appendix A for additional USFWS wetland information.

3.3 Vegetation

The vegetation within the Site is primarily comprised of shortgrass prairie with wetland vegetation in the swales and sloughs (Figure 5). The shortgrass prairie is dominated by little bluestem (*Schizachyrium scoparium*), blue grama (*Bouteloua gracilis*), and buffalograss (*Bouteloua dactyloides*) with occasional associative grass and forb species including western wheatgrass (*Pascopyrum smithii*), yellow Indiagrass (*Sorghastrum nutans*), Canada wildrye (*Elymus canadensis*), needle and thread (*Hesperostipa comata*), switchgrass (*Panicum virgatum*), Western yarrow (*Achillea millefolium*), broom snakeweed (*Gutierrezia sarothrae*), fringed sage (*Artemisia frigida*), Prickly pear (*Opuntia* spp.), and prairie aster spp. (*Symphotrichum* spp.). Occasional patches of snowberry (*Symphoricarpos albus*) and Wood's rose (*Rosa woodsii*) occupy the transitional areas between uplands and wetlands. A few, single plains cottonwood (*Populus deltoides*) occur along the drainages. The Site is heavily impacted by historic and ongoing grazing and there are weeds scattered throughout, including Canada thistle (*Cirsium arvense*), Scotch thistle (*Onopordum acanthium*),

Russian thistle (*Salsola kali*), common mullein (*Verbascum thapsus*), and yellow toadflax spp. (*Linaria vulgaris*). Hydrophytic vegetation (wetland vegetation) is present within the swales and sloughs (refer to Section 3.4.2).



Summary by Map Unit — El Paso County Area, Colorado (CO625)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	Blakeland loamy sand, 1 to 9 percent slopes	17.5	2.3%
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	Columbine gravelly sandy loam, 0 to 3 percent slopes	428.6	55.8%
83	Stapleton sandy loam, 3 to 8 percent slopes	Stapleton sandy loam, 3 to 8 percent slopes	322.2	41.9%
Totals for Area of Interest			768.3	100.0%

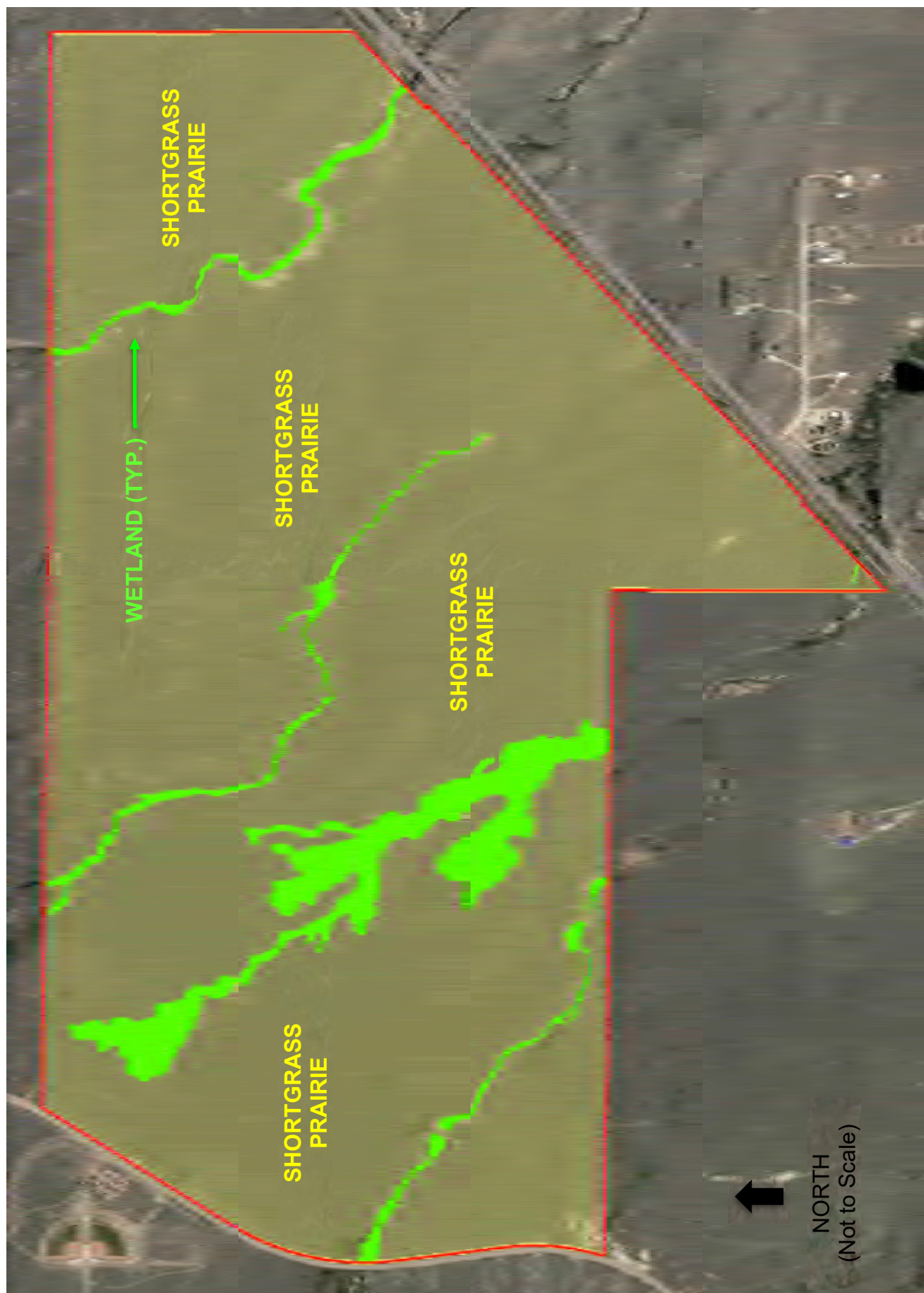


Figure 5

3.4 Wetland Habitat and Waters of the U.S.

3.4.1 Methodology

Ecos utilized the National Wetland Inventory (NWI) Wetlands Mapper (USFWS 2018a); Colorado Wetland Inventory Mapping Tool (CNHP, 2018); historic and current Google Earth aerial photography; USGS 7.5-minute topographic mapping; and detailed Project topographic mapping to screen the Site for potential wetland habitat and waters of the U.S. Additionally, ecos performed a jurisdictional delineation to identify the Waters of the United States (WOUS), including wetlands.

The mapping data above were proofed during the field assessment and a wetland delineation was conducted to determine the presence/absence of potential WOUS, including wetland habitat. Once a feature was verified to be present, ecos determined whether it is a jurisdictional wetland/waters under the Clean Water Act. The U.S. Army Corps of Engineers (USACE), wetland delineation methodology was employed to document the 3 field indicators (parameters) of wetland habitat (i.e., wetland hydrology, hydric soils and a predominance of hydrophytic vegetation as explained in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) and supplemented by the Regional Supplement to the *Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys and Coast Region (Version 2)* (USACE, 2010). The wetland delineation was surveyed by the project team surveyor

Consistent with the NWI and Colorado Wetland Inventory Mapping Tool (Figure 6) and topographic mapping, the wetland/waters delineation revealed the presence of four drainages with the potential to support wetland habitat (Figure 7). Two of the drainages (i.e. northeast Drainage D and southwest Drainage A) were preliminarily determined to be jurisdictional (pending USACE verification) and support predominantly palustrine emergent wetland (PEMC1) habitat with minor occurrences of palustrine scrub-shrub (PSS) and palustrine forested (PFO) species along their fringes. The central Drainage C and south-central Drainage B were investigated found to be discontinuous, prairie sloughs that are non-jurisdiction, “isolated” features. Please refer to Figure 6 for a composite of the NWI and CNHP Wetland and Riparian Areas mapping, Figure 7 for the ECOS Wetland and Waters Sketch Map, and Appendix B for representative photographs.

3.4.2 Field Assessment Findings

The results of the onsite assessment for each of the four onsite drainages is summarized below, with an explanation of the field indicators (parameters) of wetland habitat/waters that were observed, and an explanation as to whether ecos preliminarily determined each feature was jurisdictional or non-jurisdictional under Section 404 of the Clean Water Act. Jurisdictional features are mapped on Figure 7.

1) Jurisdictional wetland habitat and waters of the U.S.

- a. PEMC1 Wetland Habitat – Northeast Drainage D is classified as a Palustrine Emergent, Persistent, Seasonally Flooded wetland (PEMC1). Wetland Area A is tributary to Black Squirrel Creek off of the Site to the southeast. It is dominated by Nebraska sedge, redtop, clustered field sedge, three-square bulrush, swordleaf rush, soft-stem bulrush, poverty rush, Baltic rush, and watercress. Other species were present, including water mint, sporadic patches of sandbar willow, cutleaf evening primrose, fireweed, curly dock, and water milfoil, and snowberry, wild licorice and Wood’s rose along the high banks. Soil samples indicate the presence of field indicators of hydric soils (organic horizon from 0-2 inches, 10YR4/2 clay loam from 2-9 inches, 10YR4/1 clay loam from 9-14 inches, and 10YR5/1 sandy clay from 14-18+ inches). Sustaining hydrology was evident as flowing water is present within a defined channel and saturated soils are present at the surface and throughout the

floodplain, including groundwater driven side-slope seepage. This area meets all 3 parameters for jurisdictional wetland habitat.

- b. PEMC1 Wetland Habitat – Southwest Drainage A is classified as a Palustrine Emergent, Persistent, Seasonally Flooded wetlands (PEMC1 Wetland Area D is tributary to Black Squirrel Creek off of the Site to the southeast. It is dominated by Nebraska sedge, clustered field sedge, swordleaf rush, reedtop, poverty rush, Baltic rush, and pussytoes. Other species were present, including soft-stem bulrush, three-square bulrush, smartweed, saltgrass, foxtail barley, water mint, scouring rush, wild geranium, watercress, narrowleaf cattail, and snowberry, wild licorice and Wood's rose along the high banks. Sporadic occurrences of sandbar willow, crack willow and plains cottonwood were present. Soil samples indicate the presence of field indicators of hydric soils (10YR2/2 loamy clay from 0-6 inches, 10YR4/2 sand from 6-12 inches, 10YR4/1 sand from 12-16 inches, and 10YR4/1 clayey sand from 16-18+ inches). Sustaining hydrology from groundwater seepage was evident as saturated soil is present at or within 8-12 inches of the ground surface. These areas meet all 3 parameters for jurisdictional wetland habitat.

- 2) Non-Jurisdictional, Isolated Wetlands - The central Drainage C and south-central Drainage B were investigated found to be discontinuous, prairie sloughs with reaches that are upland swales; they exhibited upland "breaks" in which they did not exhibit defined bed or bank (Figure 7); and they were also found to be "isolated" as they did not connect with downstream WOUS. Patches of PEMC1 Wetland exists in these drainages that exhibits the same characteristics of other wetlands on site and meets all 3 parameters for jurisdictional wetland habitat. However, they are clearly disconnected from Black Squirrel Creek by uplands that do not exhibit a defined bed or bank. Therefore, these drainages are isolated, non-jurisdictional features and as such were not delineated.

3.4.3 Summary of Jurisdictional and Non-Jurisdictional Wetlands and Waters

Jurisdictional Habitat – Northeast Drainage D and southwest Drainage A (refer to Figure 7) are jurisdictional wetland habitat and WOUS as they are tributary to the jurisdictional habitat in Black Squirrel Creek. These natural features meet the criteria that the USACE uses to assert jurisdiction, as they are:

- Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); and
- Wetlands that directly abut such tributaries.

Non-Jurisdictional Areas – The central Drainage C and south-central Drainage B are considered non-jurisdictional. They do not meet the criteria that the Corps uses to assert jurisdiction, as they are not:

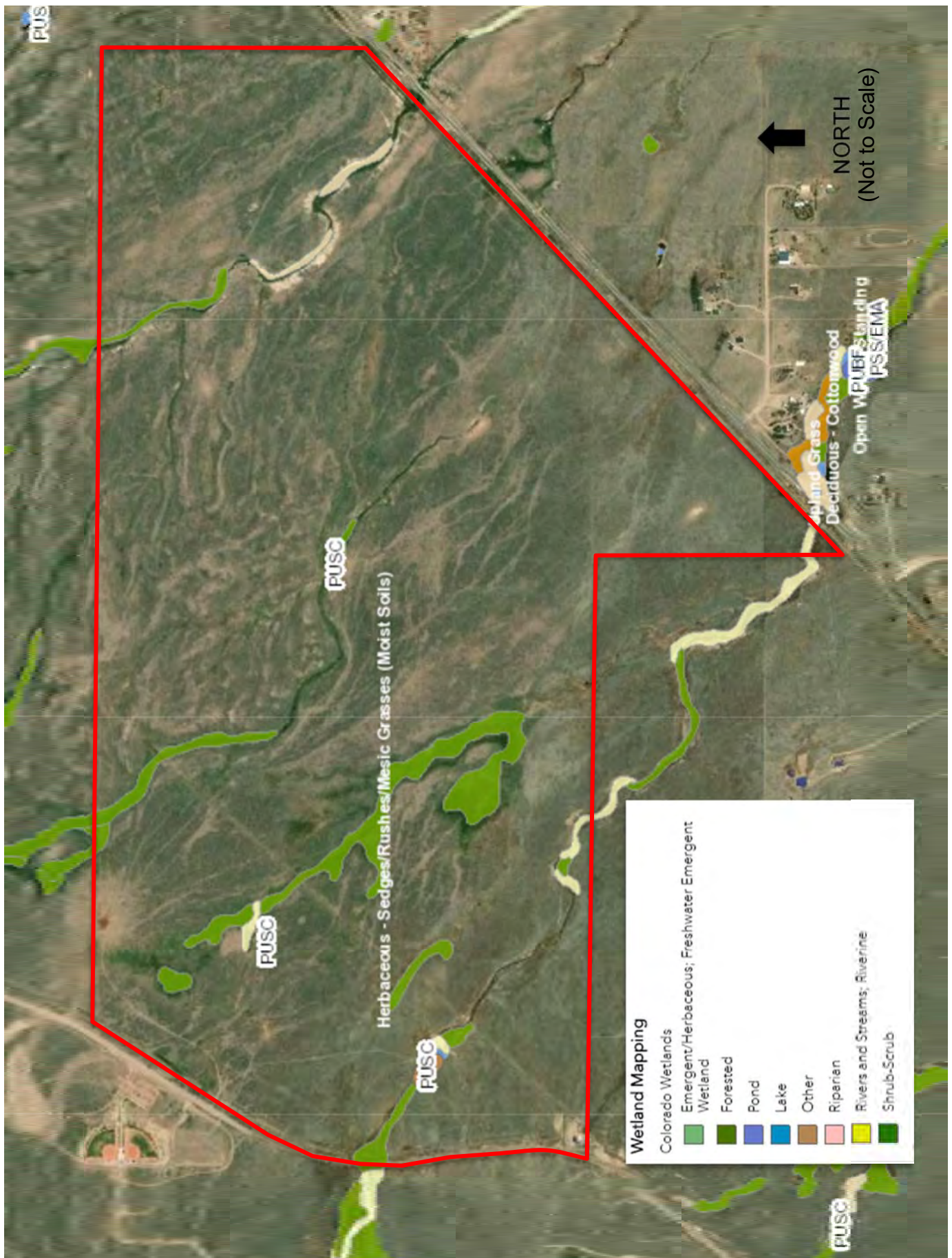
- Traditional navigable waters;
- Wetlands adjacent to traditional navigable waters;
- Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); and
- Wetlands that directly abut such tributaries.

Furthermore, Drainages B and C are not considered "tributaries", as "a tributary includes natural, man-altered, or man-made water bodies that carry flow directly or indirectly into a traditional navigable water." These drainages are ephemeral swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow) over which the Corps does not assert jurisdiction.

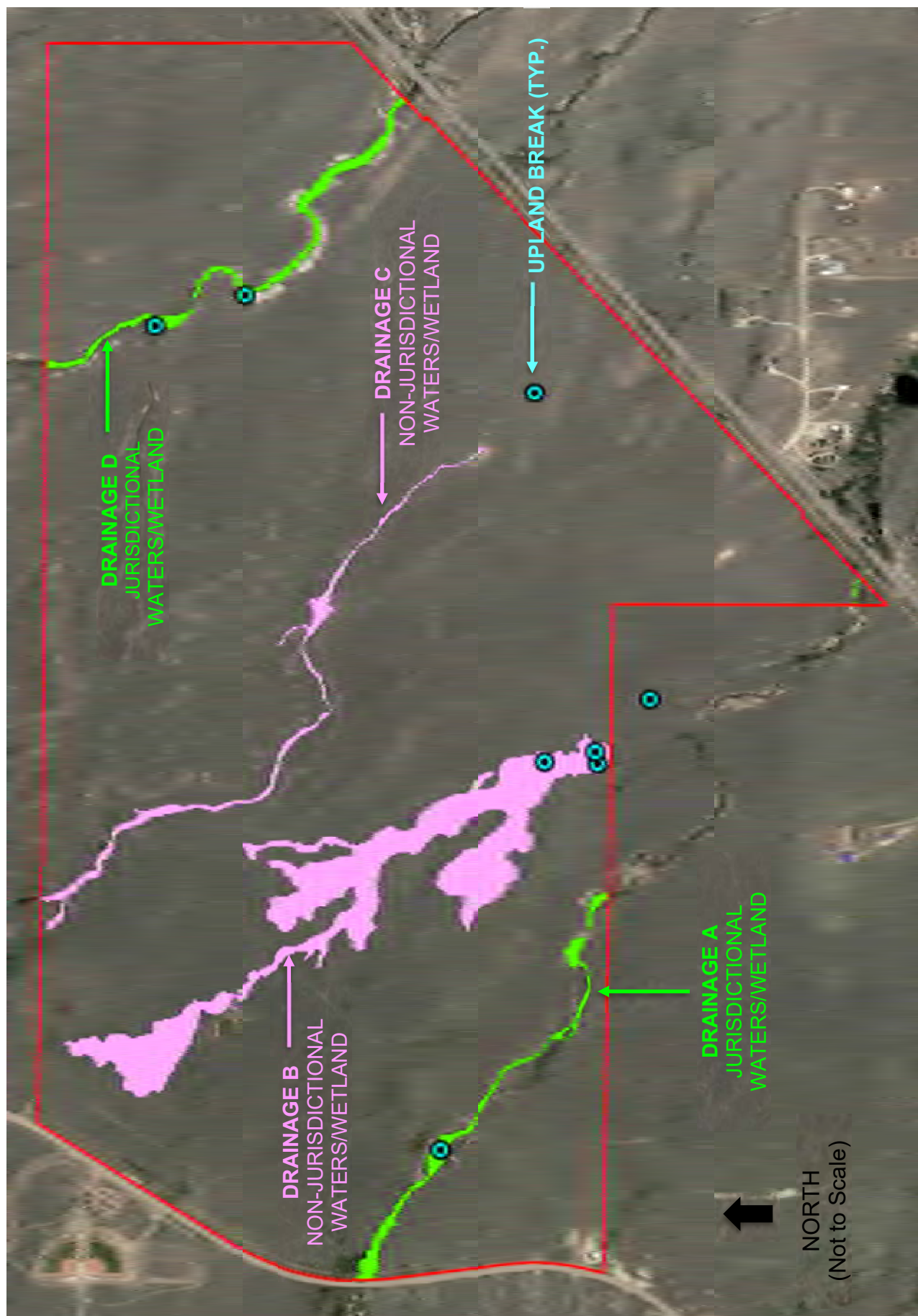
3.4.4 Verification by the U.S. Army Corps of Engineers

On July 5, 2019 the USACE provided an email to Ecos to confirm our findings of non-jurisdiction for Drainages B and C. Note that we did not request a jurisdictional determination of Drainages A and D as we have documented them to be jurisdictional. An excerpt of the USACE response from Tony Martinez, Regulatory Program Manager for the Albuquerque District, Southern Colorado Regulatory Branch of the USACE is copied below, and the original email is contained in Appendix C.

“Based on the information provided in the attached email and our site visit on June 21, 2019 our office concurs with your observations that central Drainage C and south-central Drainage B are isolated and are located entirely upland therefore, we conclude that No permit is required.”



SOURCE: USFWS, National Wetland Inventory & CNHP, Colorado Wetland Inventory



SOURCE: Ecosystem Services, LLC On-site Delineation, 10-11-18

3.5 Wildlife Communities

The stated purpose and intent of the “El Paso County Development Standards” section on wildlife is to ensure that proposed development is reviewed in consideration of the impacts on wildlife and wildlife habitat, and to implement the provisions of the Master Plan (El Paso County, 2018b). Ecos has determined that the wildlife impact potential for development of the Site is expected to be low.

The Site currently provides poor to moderate habitat for wildlife, as illustrated in the representative photographs (Appendix B). There are two primary vegetation types on the Site, including shortgrass prairie and wetland habitat.

The project would develop most of the shortgrass prairie, however the drainages and adjacent short grass prairie would be preserved as Open Space. A noxious weed management plan will be implemented per State and County requirements to improve wildlife habitat; and a native plant re-vegetation plan for the Open Space is recommended to provide additional benefit to wildlife habitat.

The habitat preferences of the observed species are reflective of the habitat on Site. Two species of raptors were observed and appear to either be residents or frequent hunters to this Site: ferruginous hawk (*Buteo regalis*) and great horned owl (*Bubo virginianus*). Sandhill crane (*Grus canadensis*) were observed flying over during their migration, although they are not likely to utilize the Site. Prairie species such as jackrabbit (*Lepus townsendii*), pronghorn (*Antilocapra americana*), black-tailed prairie dog (*Cynomys ludovicianus*) and thirteen-lined ground squirrel (*Ictidomys tridecemlineatus*) were present. The remaining species are considered generalists and included mourning doves (*Zenaida macroura*) and American crows (*Corvus brachyrhynchos*). The Site provides very limited tree nesting habitat for raptors; however, ferruginous hawks may also use ground nests. No existing nest sites for any raptors were noted during the Site visit.

The Site provides habitat for mammals including rodents, antelope, and carnivores. The site provides foraging and breeding habitat for predators such as coyote and fox. The Site also provides habitat for reptiles but limited habitat for amphibians due to the lack of persistent standing and flowing water.

The Site contains no Wildlife Refuges or Hatcheries according to the USFWS IPaC Trust Resources Report (USFWS, 2018b) (Appendix A).

4.0 FEDERAL LISTED SPECIES

A number of species that occur in El Paso County are listed as candidate, threatened or endangered by the USFWS (USFWS, 2018) under the ESA. Ecos compiled the Federally-listed species for the Site in Table 1 based on the Site-specific, USFWS IPaC Trust Resources Report we ran for the Project (Appendix A); and our onsite assessment. Ecos has provided our professional opinion regarding the probability that these species may occur within the Site and their probability of being impacted by the Project.

The likelihood that the Project would impact any of the species listed below is very low to none. Most are not expected occur in the Project area or on the Site; nor will they be affected by the direct or indirect effects of the project.

TABLE 1 - FEDERAL LISTED SPECIES ASSESSED FOR THE PROJECT

Species	Status	Habitat Requirements and Presence	Probability of Impact by Project
FISH			
Greenback cutthroat trout (<i>Oncorhynchus clarki stomias</i>)	Threatened	Cold, clear, gravely headwater streams and mountain lakes that provide an abundant food supply of insects.	None. Suitable habitat does not exist on the Site.
Pallid sturgeon (<i>Scaphirhynchus albus</i>)	Endangered	Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.	None. The proposed Project is not located in the watershed of any of the listed river basins.
REPTILES AND AMPHIBIANS			
BIRDS			
Least tern (<i>Sternula antillarum</i>)	Endangered	Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.	None. The proposed Project is not located in the watershed of any of the listed river basins.
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	Threatened	Mature, old-growth forests of white pine, Douglas fir, and ponderosa pine; steep slopes and canyons with rocky cliffs. The closest USFWS designated Critical habitat is over 15 miles southwest of the Site in mountainous terrain (USFWS, 2018).	None. Suitable habitat does not exist on the Site.
Piping plover (<i>Charadrius melodus</i>)	Threatened	Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.	None. The proposed Project is not located in the watershed of any of the listed river basins.
Whooping crane (<i>Grus americana</i>)	Endangered	Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.	None. The proposed Project is not located in the watershed of any of the listed river basins.
MAMMALS			




TABLE 1 - FEDERAL LISTED SPECIES ASSESSED FOR THE PROJECT

Species	Status	Habitat Requirements and Presence	Probability of Impact by Project
Preble's meadow jumping mouse (<i>Zapus hudsonius preblei</i>)	Threatened	Inhabits well-developed riparian habitat with adjacent, relatively undisturbed grassland communities, and a nearby water source. Well-developed riparian habitat includes a dense combination of grasses, forbs and shrubs; a taller shrub and tree canopy may be present. Has been found to regularly use uplands at least as far out as 100 meters beyond the 100-year floodplain.	None. Not likely to occur on Site due to: 1) the absence of habitat required to support the life requisites of the species (Figure 8 and Appendix B); 2) negative trapping results reported by USFWS adjacent to the Site (Figure 9); 3) 10.22-mile distance from closest CPW "Potential" Occupied Habitat - west/northwest of the Site in Colorado Springs (refer to Figure 8); 4) 6.5-mile distance from closest USFWS Critical Habitat - southwest of the Site along Black Squirrel Creek in Colorado Springs (refer to Figure 8); and 5) lack of habitat connection corridor from known habitat to the Site.
PLANTS			
Ute ladies'-tresses orchid (<i>Spiranthes diluvialis</i>)	Threatened	Primarily occurs along seasonally flooded river terraces, sub-irrigated or spring-fed abandoned stream channels or valleys, and lakeshores. May also occur along irrigation canals, berms, levees, irrigated meadows, excavated gravel pits, roadside borrow pits, reservoirs, and other human-modified wetlands.	Very Low. Unlikely to occur as the Site is situated between 6,860 and 7,020 feet above mean sea level, which is higher than the 6,500-foot elevation limits documented for the species and recommended for conducting surveys by the USFWS.
Western prairie fringed orchid (<i>Platanthera praeclara</i>)	Threatened	Occurs in tallgrass prairie in Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and Oklahoma. Upstream depletions to the Platte River system in Colorado and Wyoming may affect the species in Nebraska.	None. The proposed Project will not alter or deplete flows to the Platte River system.

Figure 8

PMJM Habitat Map

Legend

-  2005 CPW PMJM Potentially Occupied Range
-  2010 USFWS Critical Habitat
-  Grandview Reserve Site

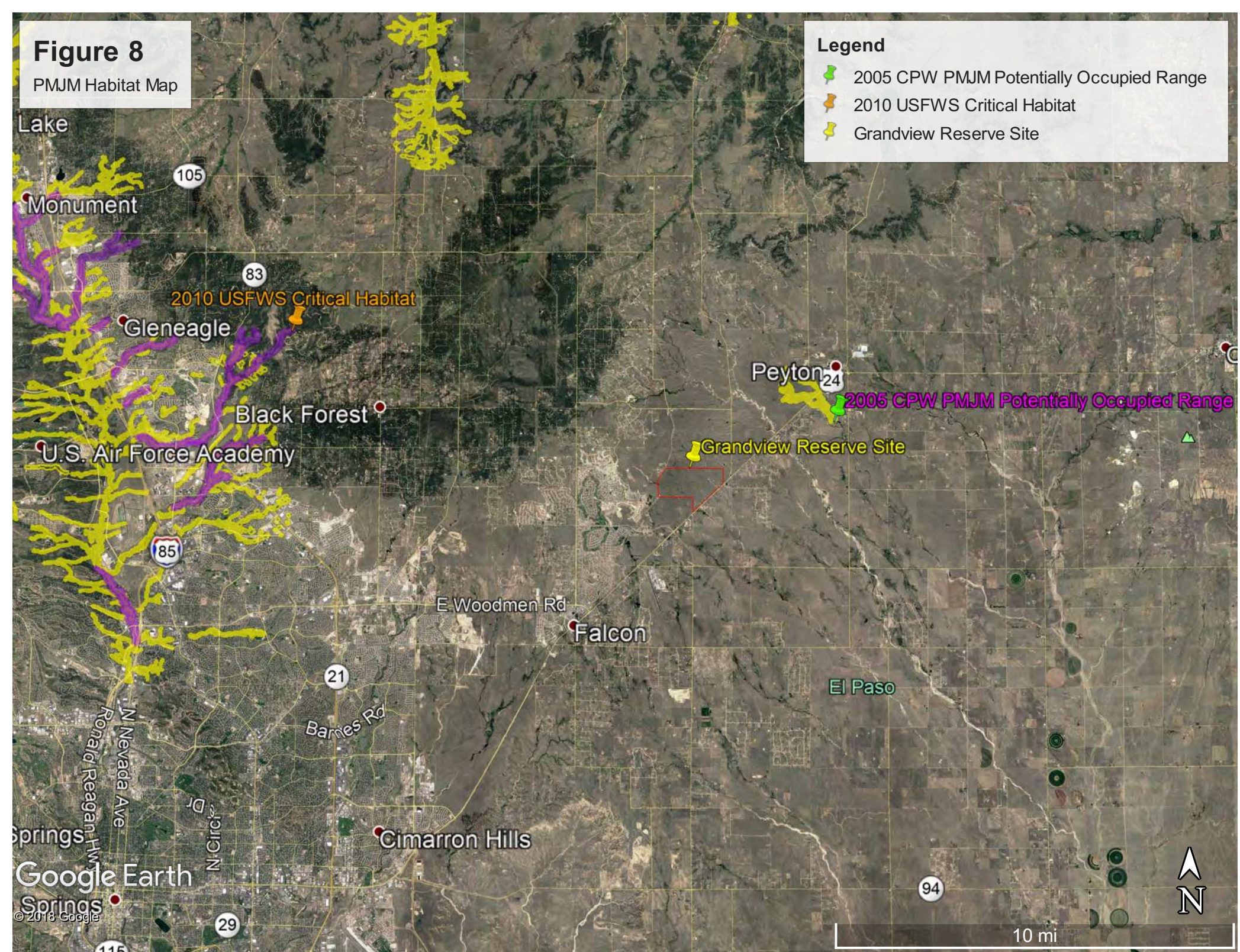


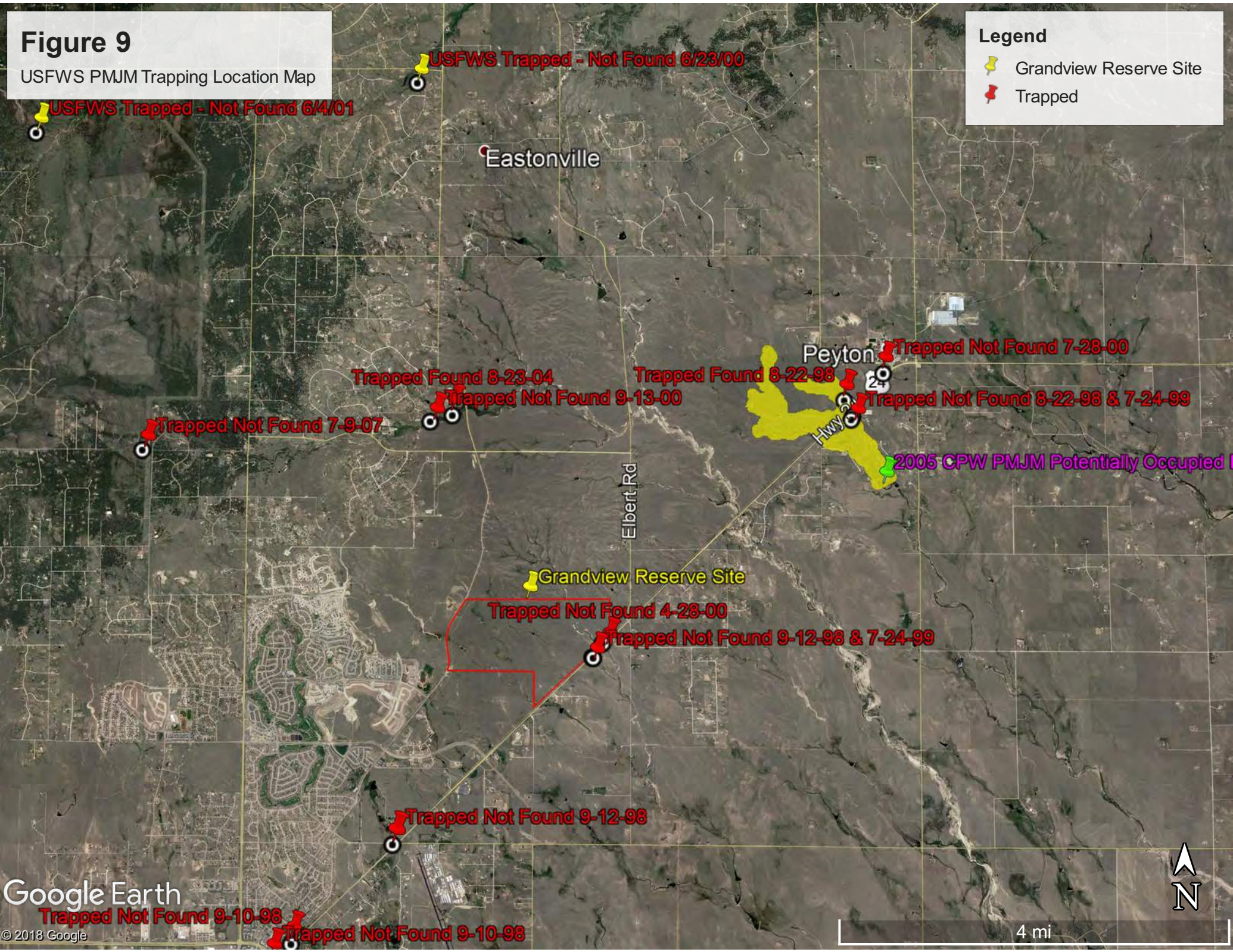


Figure 9

USFWS PMJM Trapping Location Map

Legend

-  Grandview Reserve Site
-  Trapped



5.0 EFFECTS DETERMINATION

The Site is not located within any USFWS designated critical habitat or known occupied habitat for federally listed threatened or endangered species. Please refer to the IPaC database (Appendix A) and Table 1.

The Project will have **No Effect** on the following listed species:

- Listed species in Nebraska, as the Site is not located in the North Platte, South Platte or Laramie River basins.
- Greenback cutthroat trout, Mexican spotted owl and North American wolverine, as suitable habitat does not exist on the Site.
- Western prairie fringed orchid, as the Site will not alter or deplete flows to the Platte River system.
- Ute ladies'-tresses orchid is unlikely to occur as the Site is situated between 6,860 and 7,020 feet above mean sea level, which is higher than the 6,500-foot elevation limits documented for the species and recommended for conducting surveys by the USFWS.
- Preble's meadow jumping mouse: This species occurs in the County but is not known to occur on the Site due to:
 - The absence of habitat required to support the life requisites of the species;
 - Negative trapping results (i.e., Trapped – Not Found) reported by USFWS upstream and downstream of the Site on West Kiowa Creek, and east of the Site on Kiowa Creek;
 - 2.5 mile distance from the closest CPW "Potential" Occupied Habitat;
 - 6.5 mile distance from the closest USFWS Critical Habitat; and
 - The lack of viable habitat connection corridors from known, occupied habitat to the Site.

6.0 CONSERVATION MEASURES

Species that occur in wetland and riparian habitat are expected to benefit from the proposed change in land use. All four onsite drainages will be protected via drainage easements and will also be located in Open Space. Eliminating cattle grazing from the Site would allow for more native herbaceous and woody vegetation to grow along the drainages, thus improving habitat for many wildlife species. A noxious weed management plan will be implemented per State and County requirements to improve wildlife habitat; and a native plant re-vegetation plan for the Open Space is recommended to provide additional benefit to wildlife habitat. Implementation of the stormwater management plan will further assist in protecting water quality in all drainages, provide consistent flows to non-jurisdictional/ephemeral drainages, and ameliorate development impacts on aquatic wildlife species, such as leopard frogs.

The following, additional recommendations are intended to reduce potential impacts to wildlife:

1. Limit the use of herbicides, pesticides, and fertilizers as they can negatively impact aquatic wildlife species.
2. Minimize the installation of fencing. When fencing is needed, use wildlife friendly fences or include specific wildlife crossings along fence lines. Pronghorn are of particular concern because they do not jump over fences and can be injured by barbed-wire fences.
3. Road crossings over the Creek should be designed to enable wildlife underpass and allow use the Creek as a movement corridor to reduce collisions with vehicles.
4. Dogs should be kept in fenced pens and be leashed when on walks. At least one designated off-leash area for dogs should be provided, as this will increase compliance with leash rules in other areas.
5. Cats should not be allowed outdoors because they kill birds and native rodents.

7.0 CONCURRENCE REQUEST

Ecos requests informal concurrence from the USFWS with our No Effects Determination based on the information presented herein. The Project and its direct and indirect environmental effects don't occur in any designated critical habitat. The majority of the ESA-listed species don't occur in the Project area and are absent from all areas where the Project will have direct or indirect environmental effects. Preble's meadow jumping mouse and Ute ladies'-tresses orchid occur in the County but are not known to occur in the Project area and areas where the Project will have direct or indirect environmental effects.

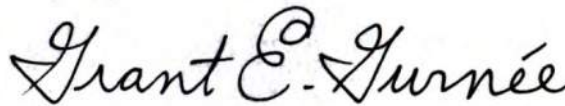
Thank you for your assistance with this project. Please feel free to call ecos (970) 812-3267 if you have any questions.

Sincerely,

Ecosystem Services, LLC



Jon Dauzvardis, P.W.S.
Owner - Restoration Ecologist



Grant E. Gurnée, P.W.S.
Owner - Restoration Ecologist

Cc: *Peter Martz, 4 Site Investments*

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Informal Consultation Request

April 10, 2020

Mr. Drue DeBerry
Acting Colorado Field Supervisor
U.S. Fish and Wildlife Service
Colorado Ecological Services Field Office
134 Union Blvd., Suite 670
Lakewood, Colorado 80228

RE: Request for Technical Assistance Regarding the Likelihood of Take of Federally-listed Threatened and Endangered Species resulting from the proposed development of the Grandview Reserve Project in El Paso County, Colorado

Dear Mr. DeBerry:

Ecosystem Services, LLC (ecos) has prepared the enclosed habitat evaluation on behalf of 4 Site Investments to describe the physical/ecological characteristics of the Grandview Reserve site (Site) and evaluate the potential effects of the proposed development project (Project) on the Federally-listed threatened and endangered (T&E) species protected under the Endangered Species Act (ESA).

The El Paso County Environmental Division has completed its review of the Project and has requested that 4 Site Investments provide a "Clearance Letter" obtained from the U.S. Fish and Wildlife Service (USFWS) to the Planning and Community Development Department prior to project commencement "where the project will result in ground disturbing activity in habitat occupied or potentially occupied by threatened or endangered species and/or where development will occur within 300 feet of the centerline of a stream or within 300 feet of the 100 year floodplain, whichever is greater."

At this time there is no Federal action and no Federal agency is making a formal effects determination under Section 7 (a)(2) of the ESA. Therefore, ecos is requesting technical assistance from USFWS regarding 4 Site Investments' (i.e., the non-federal party) responsibilities under the ESA, and specifically the likelihood of the Project (described herein) resulting in take of listed species. If the USFWS concurs with the findings presented herein we request that you issue an informal letter of concurrence for use in the El Paso County Project review process.

1.0 SITE LOCATION and PROJECT DESCRIPTION

The Site is located in the Falcon/Peyton area of El Paso County and is bounded along the north by 4 Way Ranch Phase I, along the south by Waterbury, along the southeast by Highway 24, and along the west by Eastonville Road. There are no existing structures, roads, or other infrastructure on the Site. The Site is located approximately 4.14 miles southwest of Peyton, 4.16 miles northeast of Falcon and 4.66 miles south of Eastonville, in El Paso County, Colorado. The Site is generally located within the south ½ of Section 21, south ½ of Section 22, the north ½ of Section 27, and the north ½ of Section 28, Township 12 South, Range 64 West in El Paso County, Colorado. The center of the Site is situated at approximately Latitude 38.98541389 north, - 104.55472222 east (refer to Figure 1).

Technical Assistance

Tracking Number: _____

U.S. FISH AND WILDLIFE SERVICE

☒ NO CONCERNS

☐ CONCUR NOT LIKELY TO ADVERSELY AFFECT

☐ NO COMMENT

Liisa Schmoele

DATE

Colorado Assistant Field Supervisor

Remarks:

Appendix G

MT – 2 Checklist

MT-2 REVISION REQUEST SUBMITTAL CHECKLIST

PART A: GENERAL REQUIREMENTS

ELEMENTS	Yes	N/A
NARRATIVE: Please provide a written description about the purpose of the request and the scope of the proposed/as-built project and the methodology used to analyze the project effects.	✗	
MT-2 APPLICATION FORMS: Please provide completed forms applicable to your request. Ensure that MT-2 Form 1 was signed by the requester, certifying engineer, and each community affected by the revision.	✗	
HYDROLOGIC ANALYSIS: If applicable, please provide a FEMA acceptable hydrologic analysis in digital format, drainage area map and associated backup information (e.g., calculations used to determine lag time, CN and loss values as well as landuse and soil maps). FEMA-acceptable models can be accessed at www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/numerical-models-meeting-minimum-requirements .	✗	
HYDRAULIC ANALYSIS: Please provide a FEMA acceptable hydraulic analysis in digital format. FEMA-acceptable models can be accessed at www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/numerical-models-meeting-minimum-requirements .	✗	
CERTIFIED TOPOGRAPHIC WORK MAP: Please provide a certified topographic work map that meets the mapping requirements outlined in MT-2 Form 2. If available, please provide digital Computer-Aided Design (CAD) or Geographic Information System (GIS) data that is spatially referenced.	✗	
ANNOTATED FIRM: Please submit a revised FIRM, at the scale of the effective FIRM, which shows the revised boundary delineation of the base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway and how it ties into the boundary delineation shown on the effective FIRM at the downstream and upstream ends of the revised reach.	✗	
REVIEW FEE PAYMENT: Please include the appropriate review fee payment. The current fee schedule is available on the FEMA Web site at https://www.fema.gov/flood-map-related-fees .		✗
MEET 65.10 REQUIREMENT: If the request intends to show that a berm/levee/flood wall provides flood protection, please submit all of the data requirements outlined in Section 65.10 of the NFIP regulations.		✗
OPERATION AND MAINTENANCE PLAN: If the request involves a berm, levee, flood wall, dam, and/or detention basin project, please submit an officially adopted maintenance and operation plan.		✗
PROPOSED/AS-BUILT PLANS: If applicable, please submit proposed/as-built plans, certified by a registered Professional Engineer, for all the project elements.	✗	
FLOODWAY NOTICE: If the revision result in changing or establishing floodway boundaries, please provide floodway public notice or a statement by your community that it has notified all affected property owners, in compliance with NFIP regulation Subparagraph 65.7(b)(1).		✗
PROPERTY OWNER NOTIFICATION: If the revision result in any widening/shifting/establishing of the base floodplain and/or any BFE increases/establishing BFEs, please provide copy of the individual legal notices sent to all the property owners affected by any increases in the flood hazard information.	✗	

PART B: CLOMR SPECIFIC REQUIREMENTS

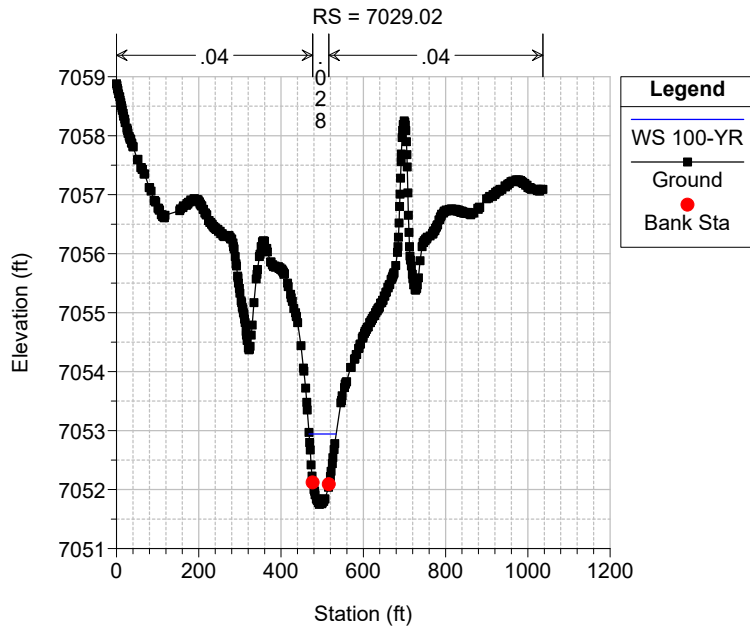
Endangered Species Act COMPLIANCE: Please submit documentation of compliance with the ESA Requirements. To learn more about ESA Compliance, please see the MT-2 Instructions manual.	✗	
65.12 REGULATORY REQUIREMENTS: If the Base (1-percent-annual-chance) Flood Elevation (BFE) increases greater than 0.00 foot as a result of encroachment within a floodway or 1.0 foot within Zone AE that has no floodway/Zone A, between the pre-project (existing) conditions and the proposed conditions as a result of the proposed project. Please submit a). Certification that no structures are affected by the increased BFE; b). Documentation of individual legal notice to all affected property owners, explaining the impact of the proposed action on their property; and c). An evaluation of alternatives that would not result in an increase in BFE.		✗

Note: Applicants are encouraged to submit their revision request using the Online LOMC tool. To learn more about the Online LOMC tool, visit the FEMA website at www.fema.gov/online-lomc.

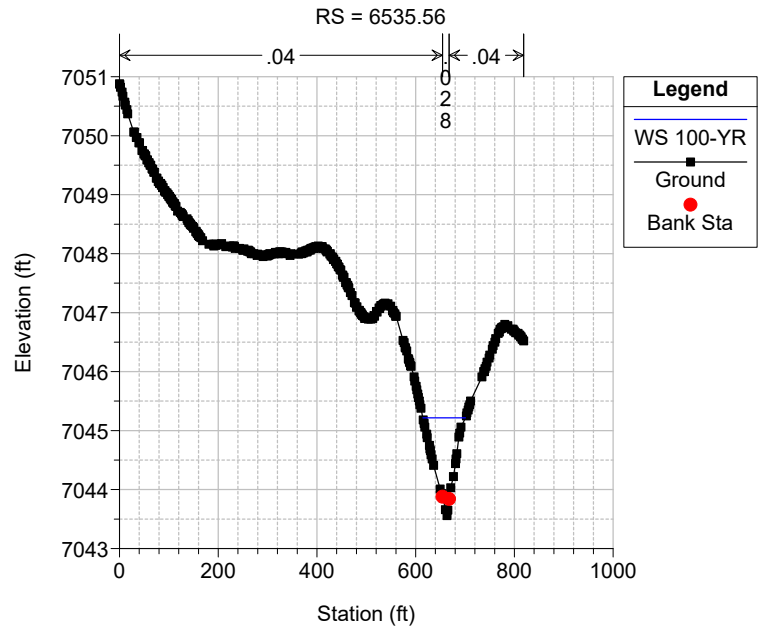
Appendix H

Existing Condition Cross Sections

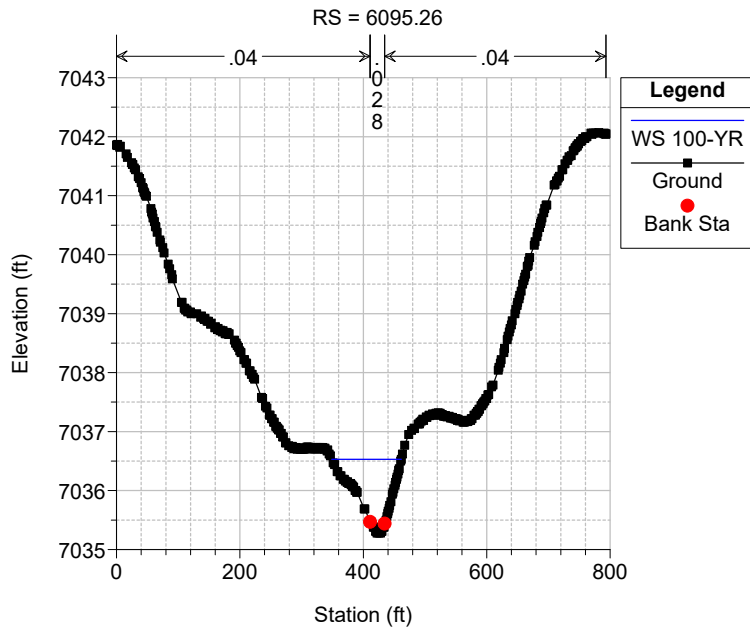
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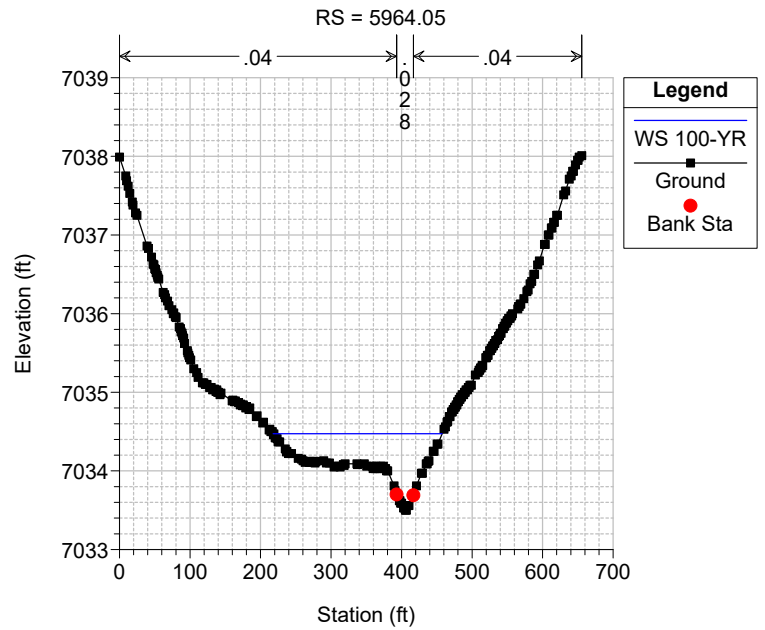
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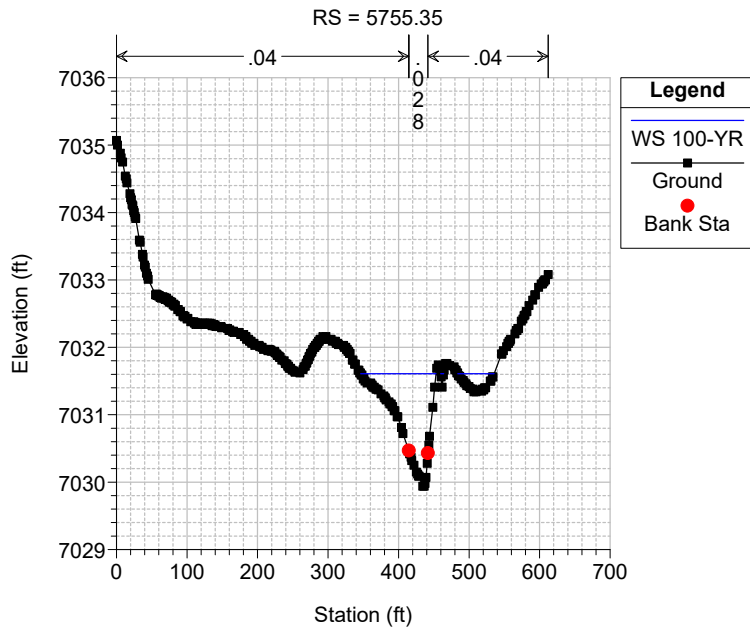
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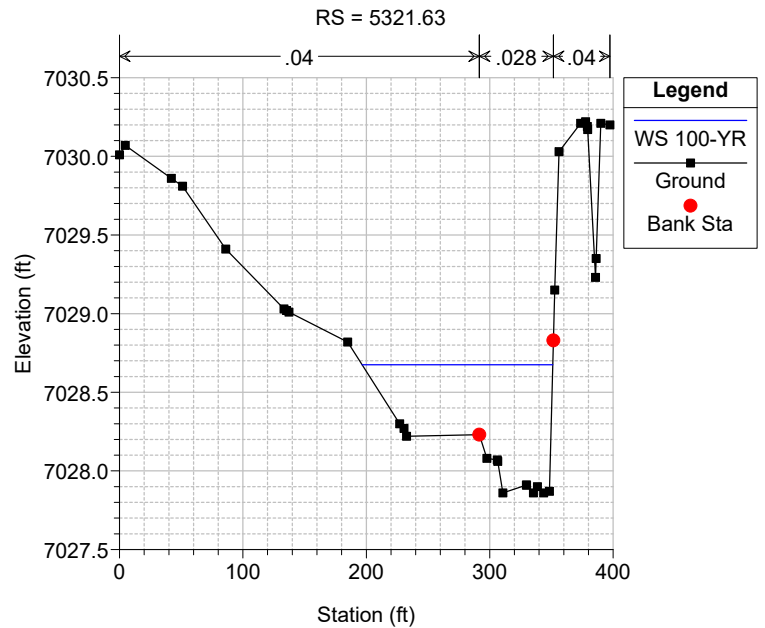
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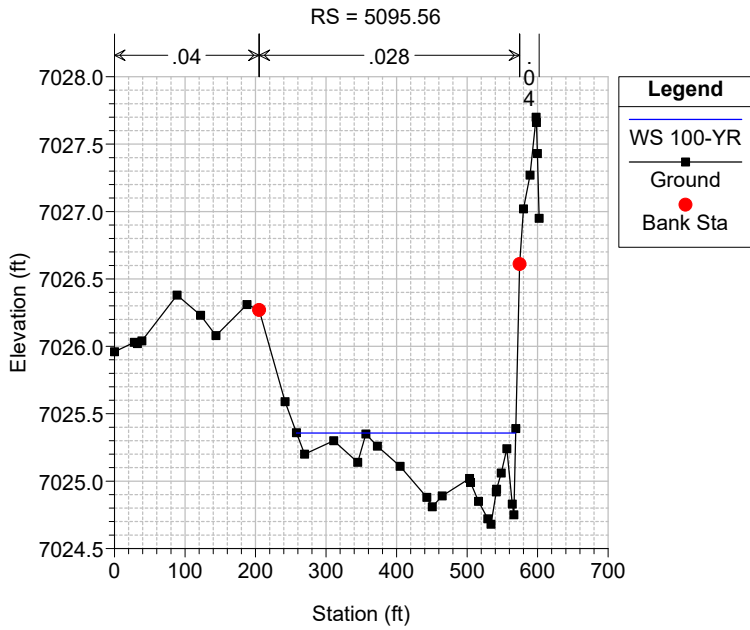
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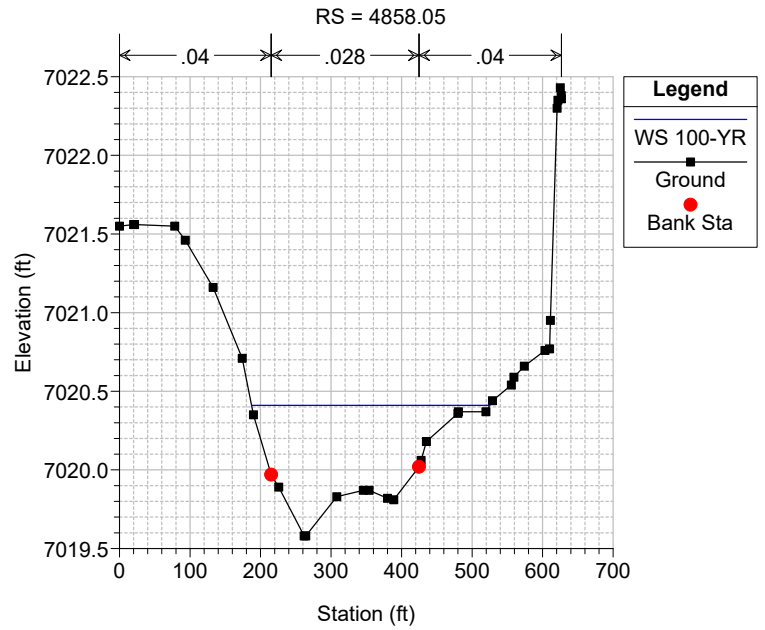
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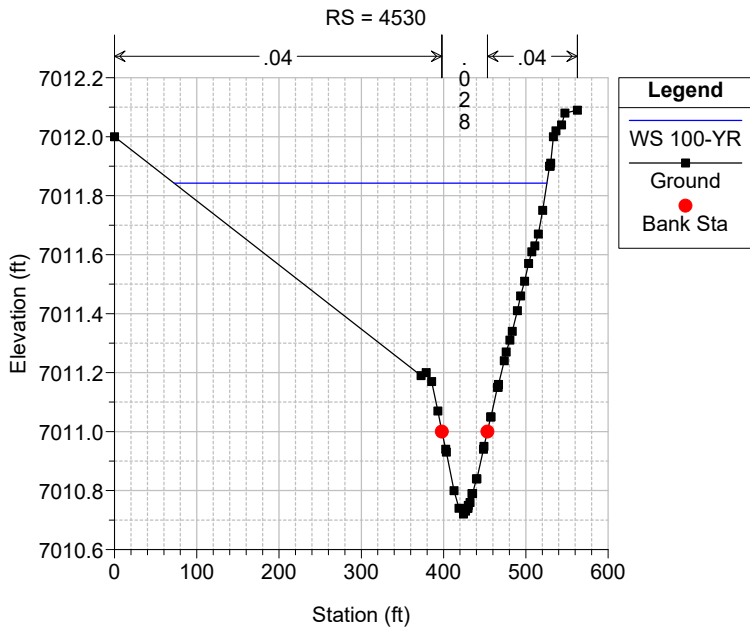
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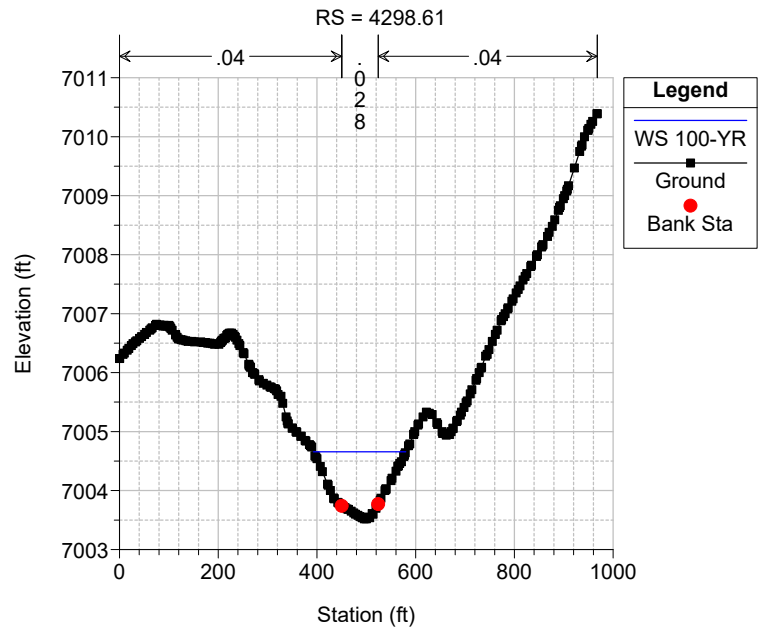
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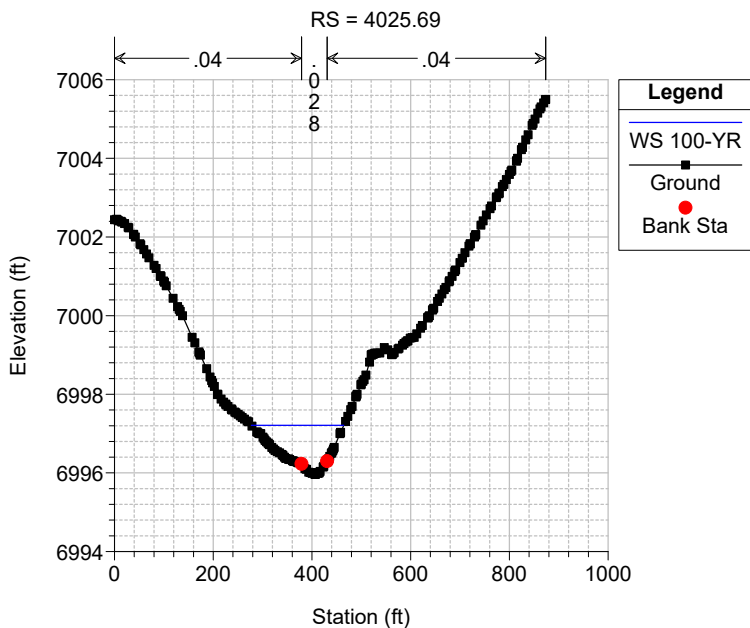
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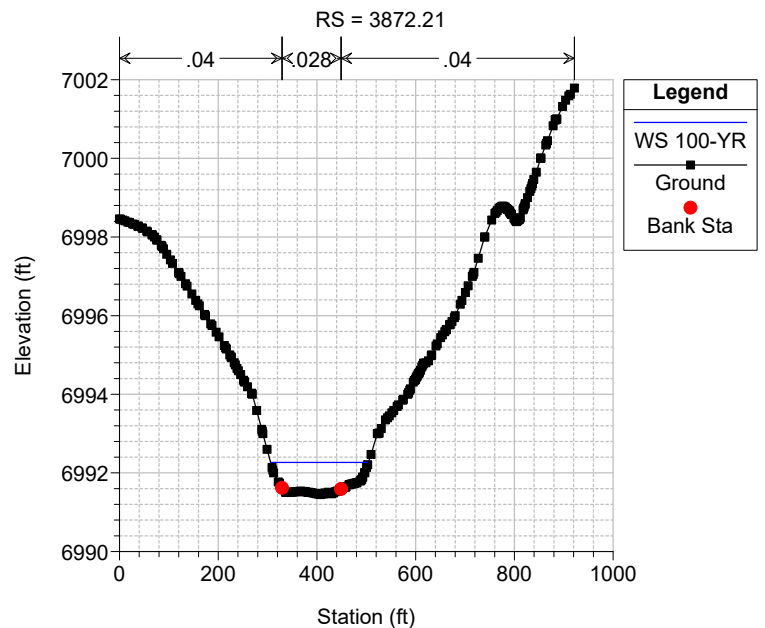
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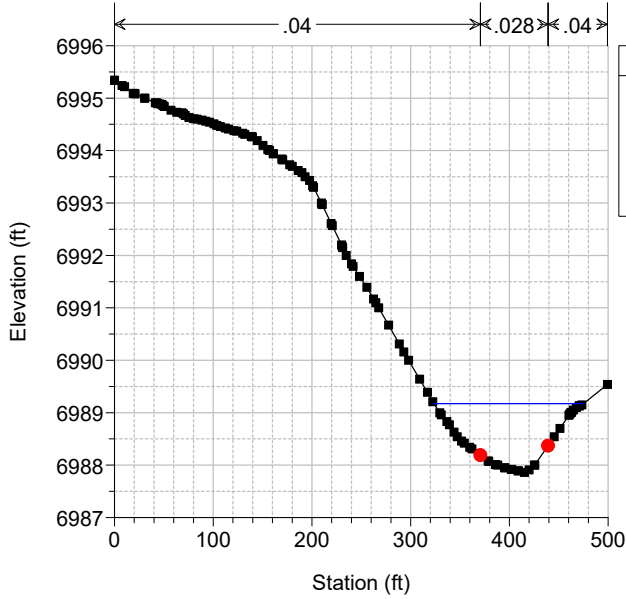


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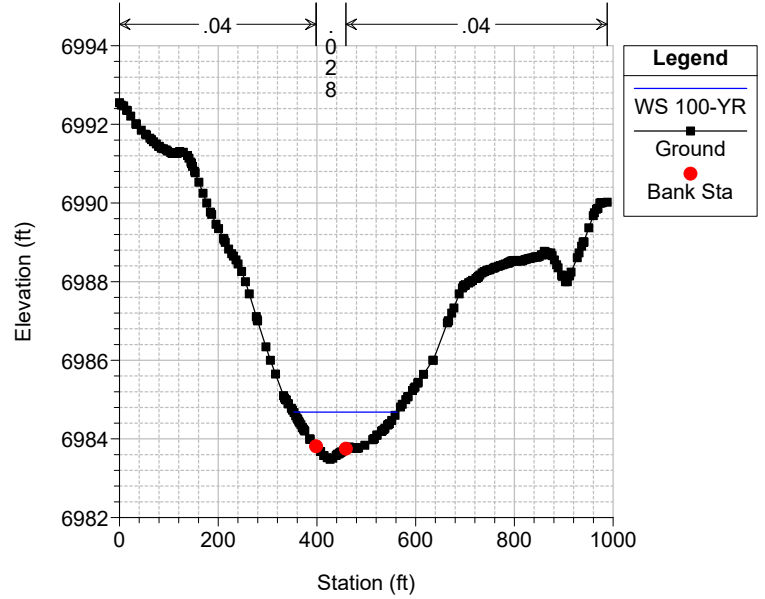
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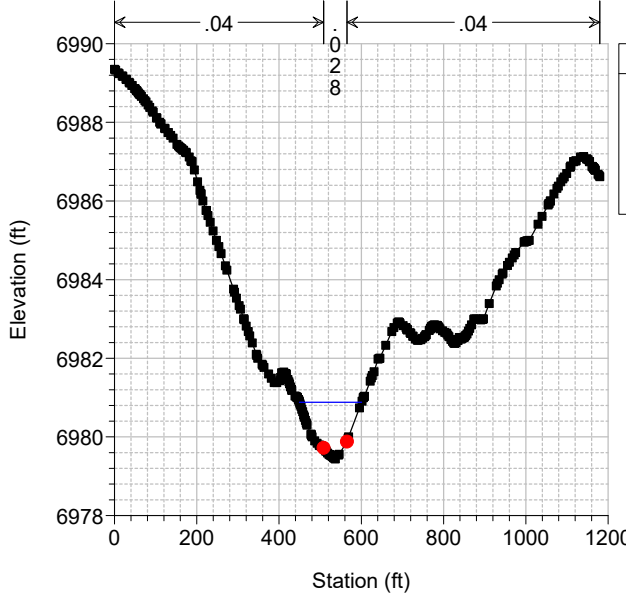
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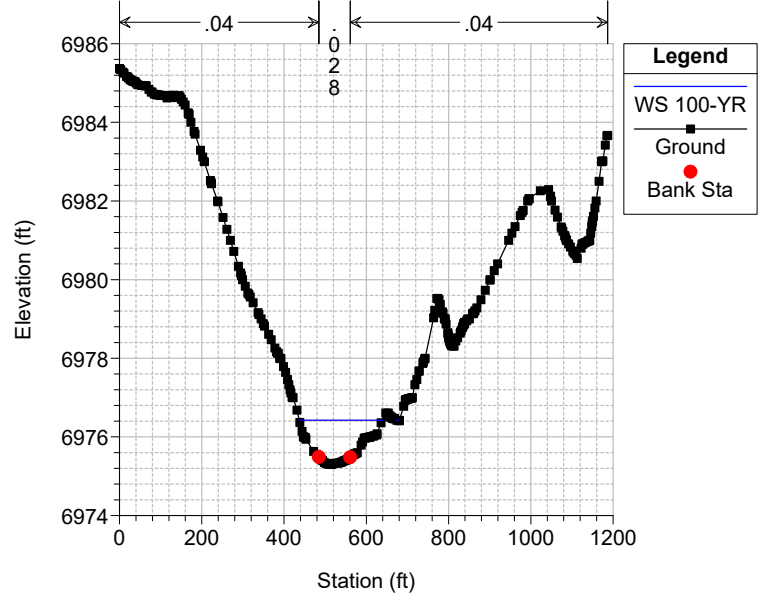
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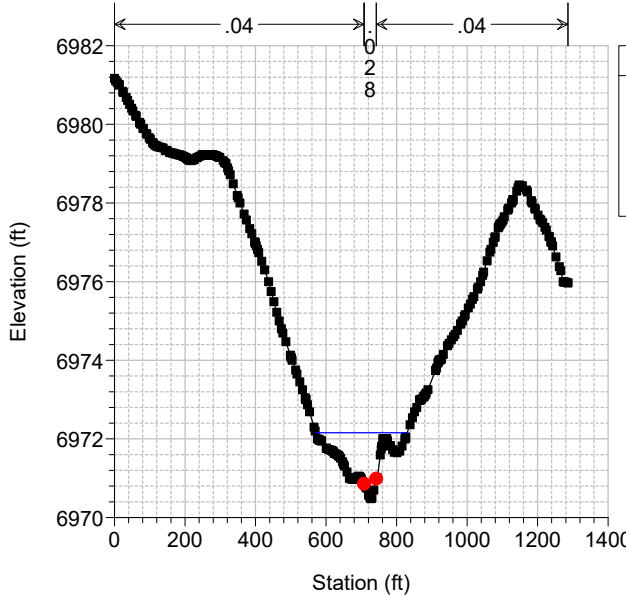
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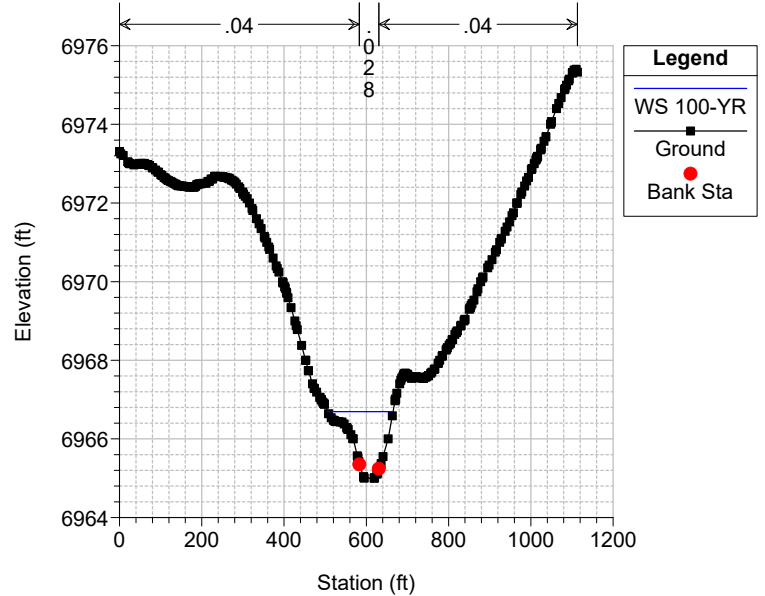
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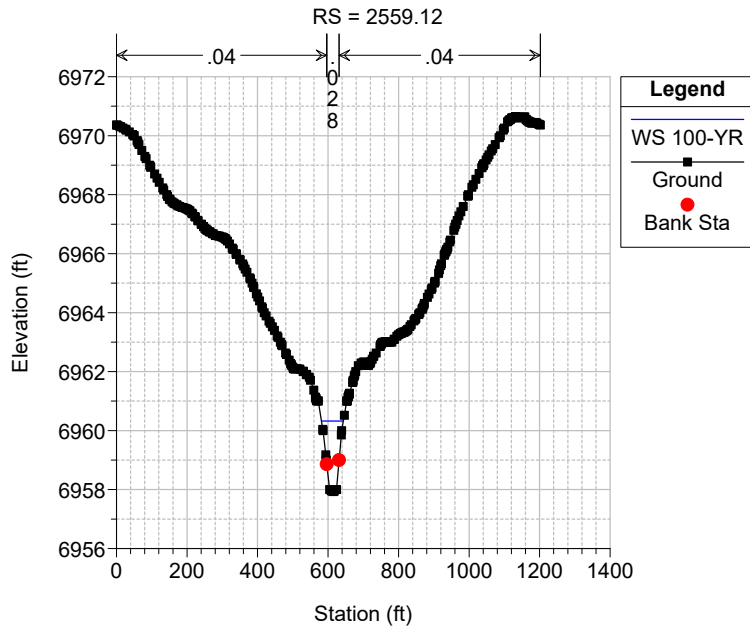


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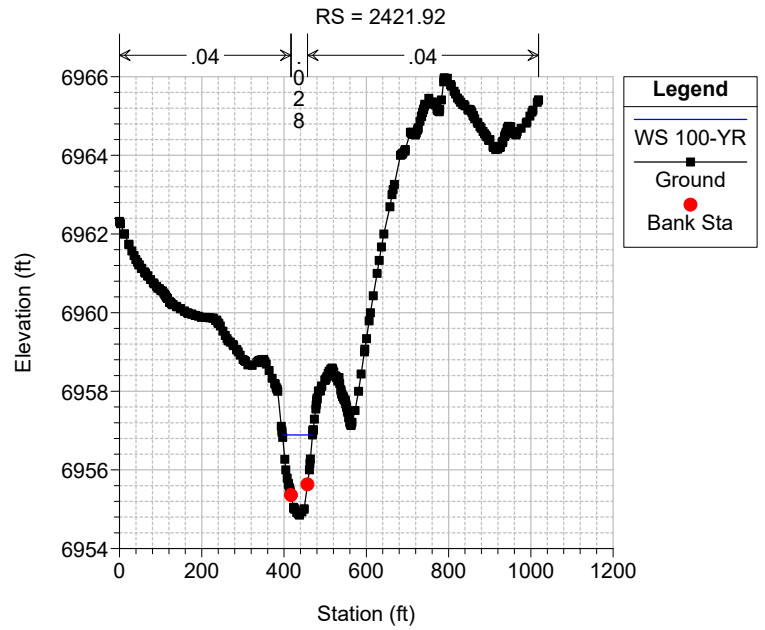
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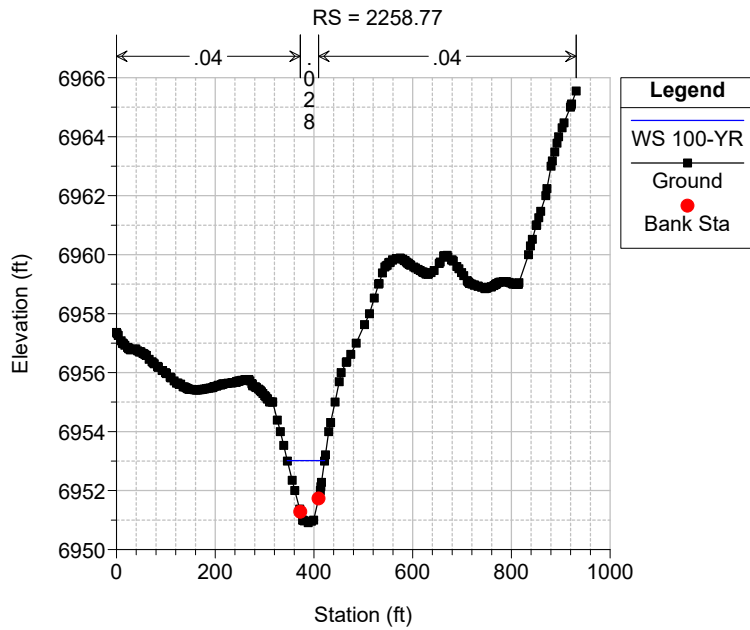
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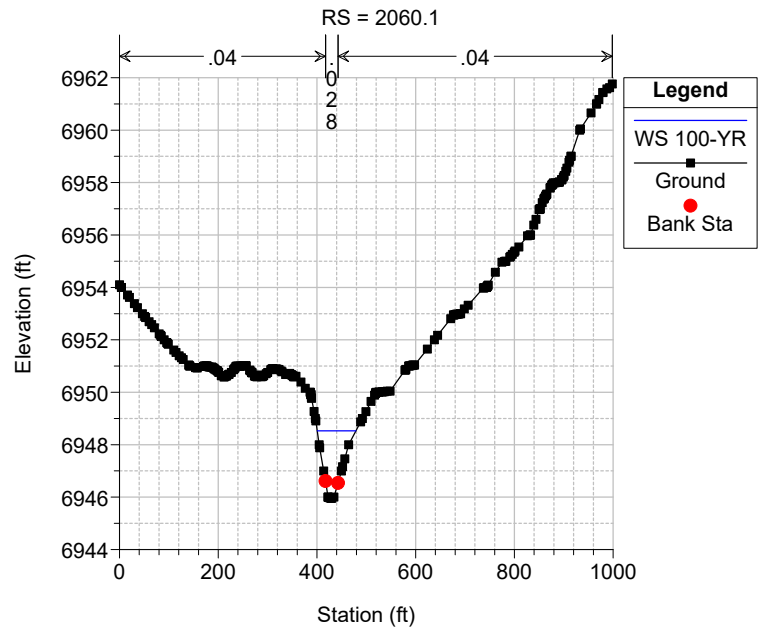
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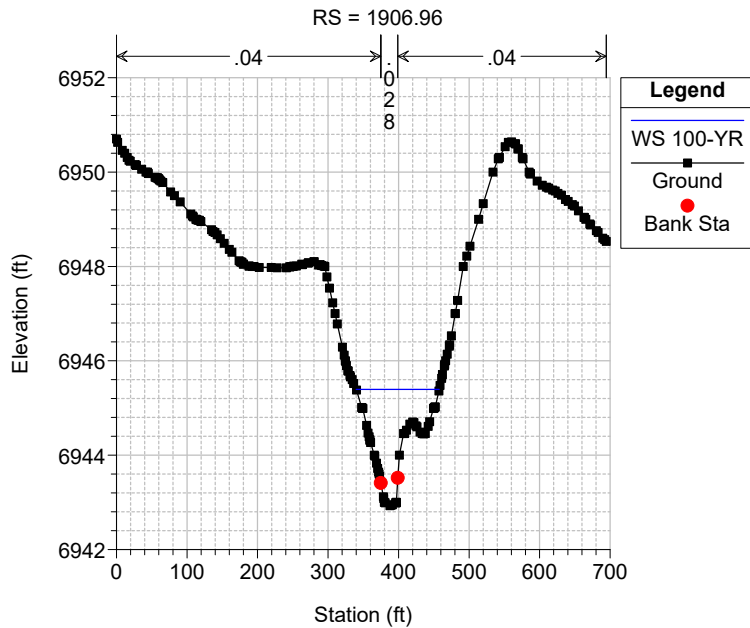
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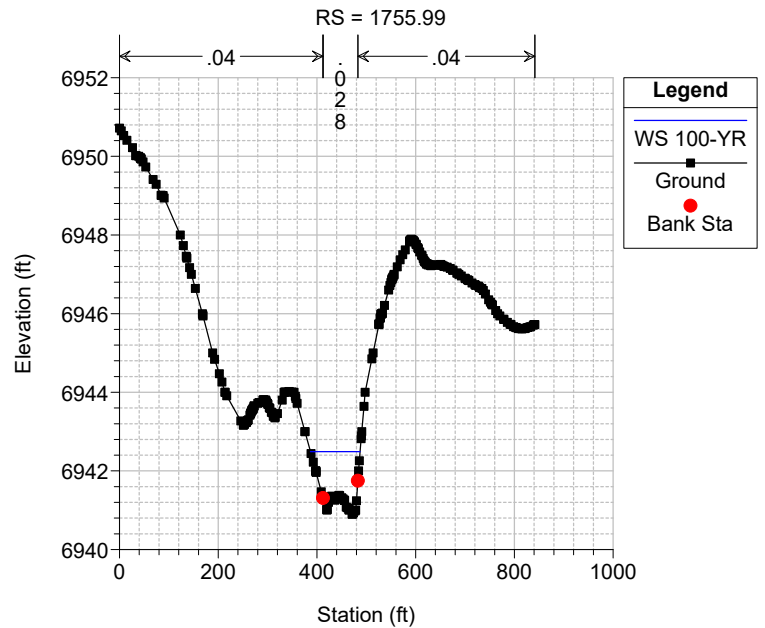
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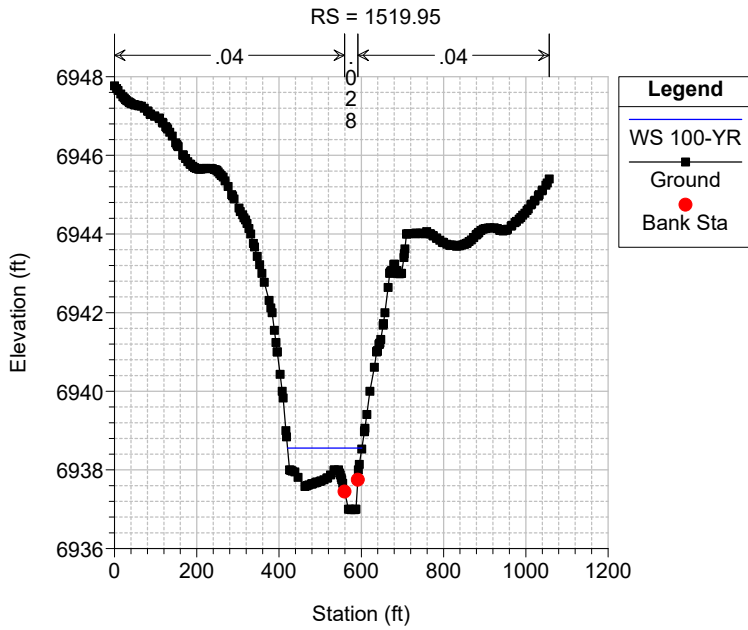
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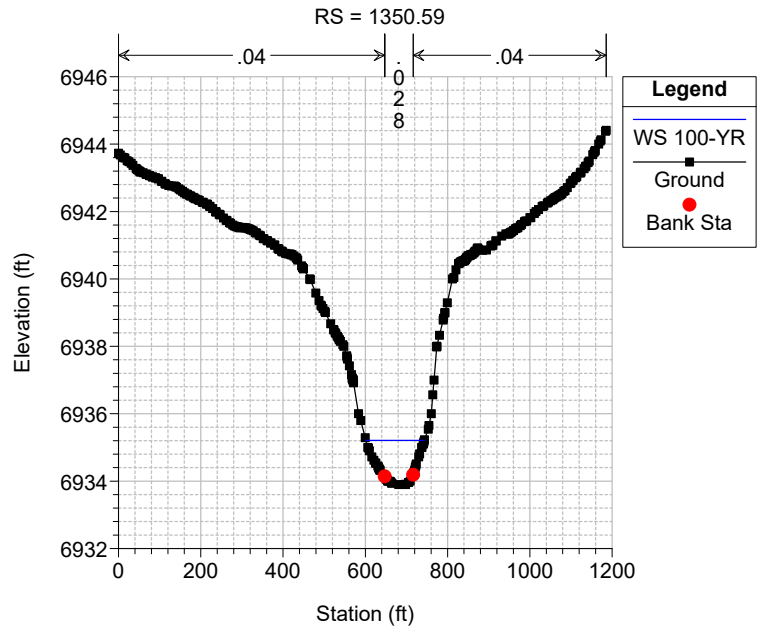
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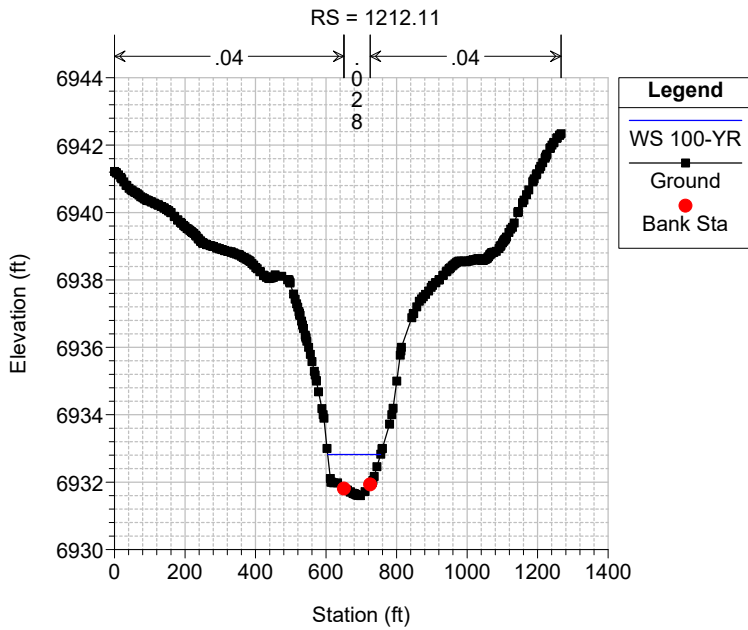
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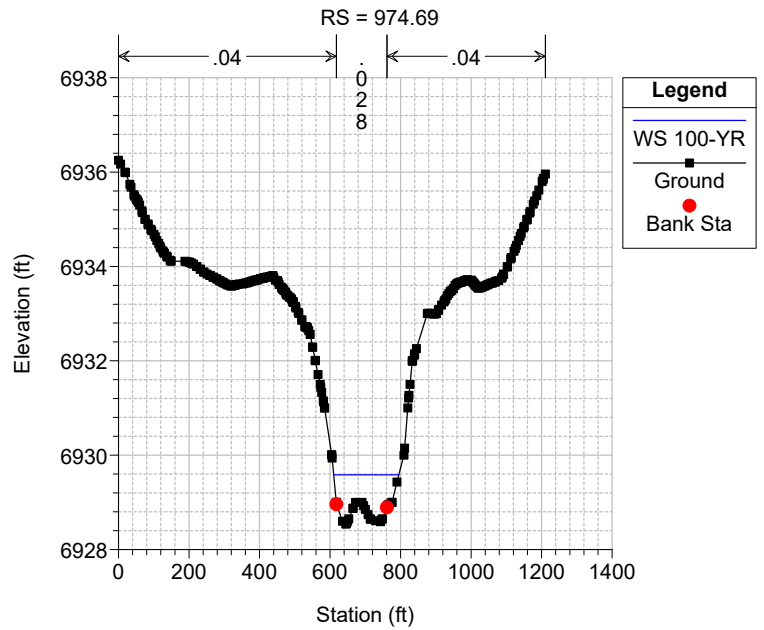
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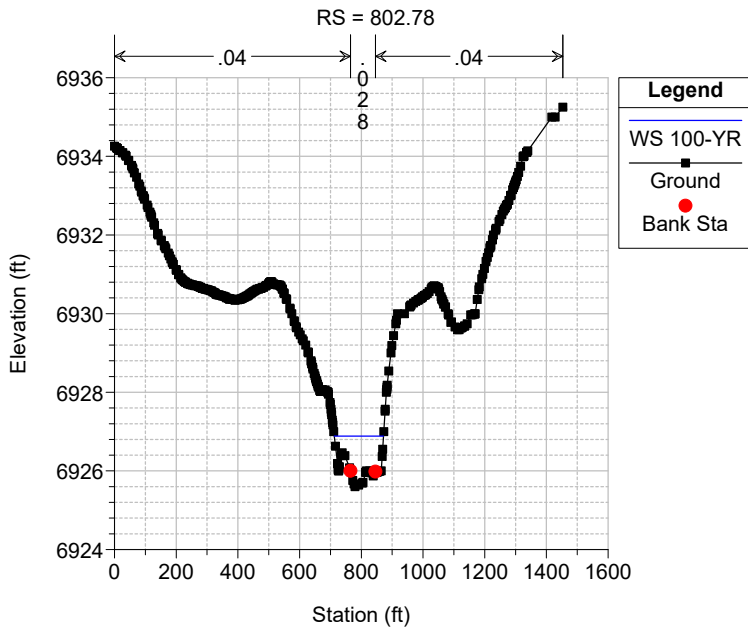
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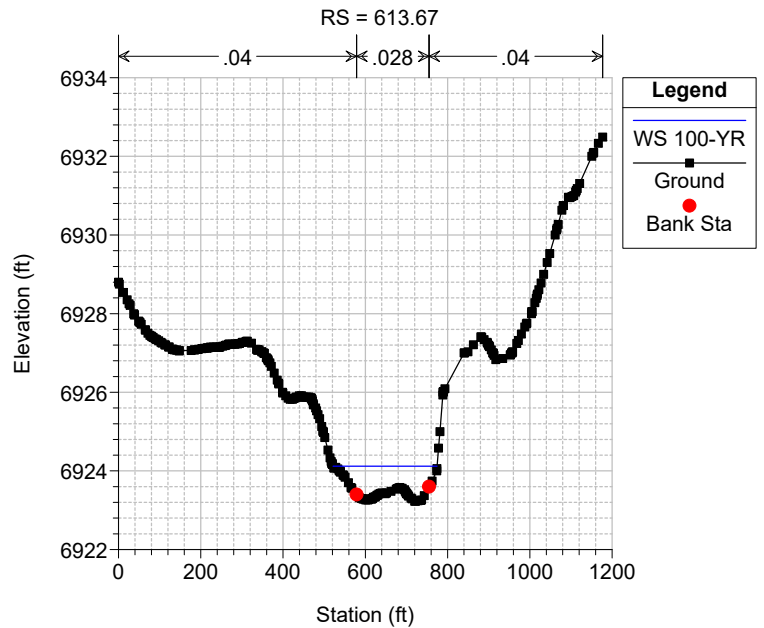
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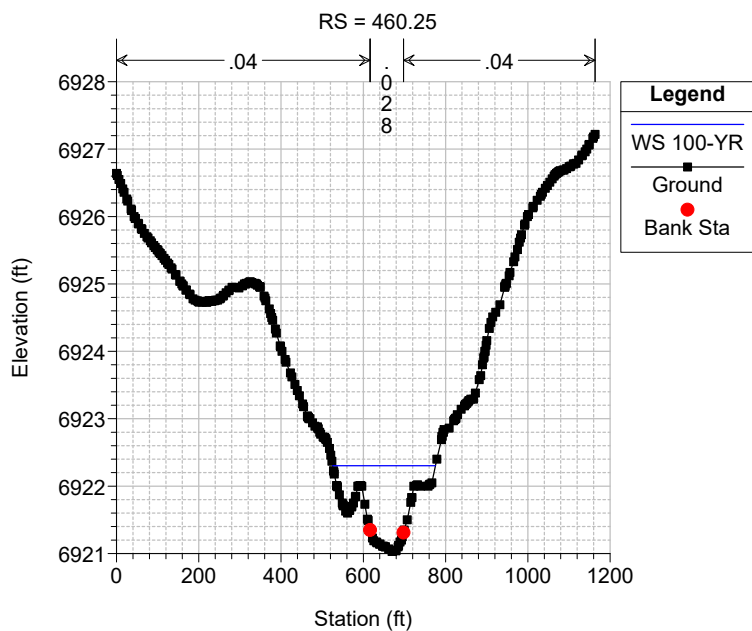
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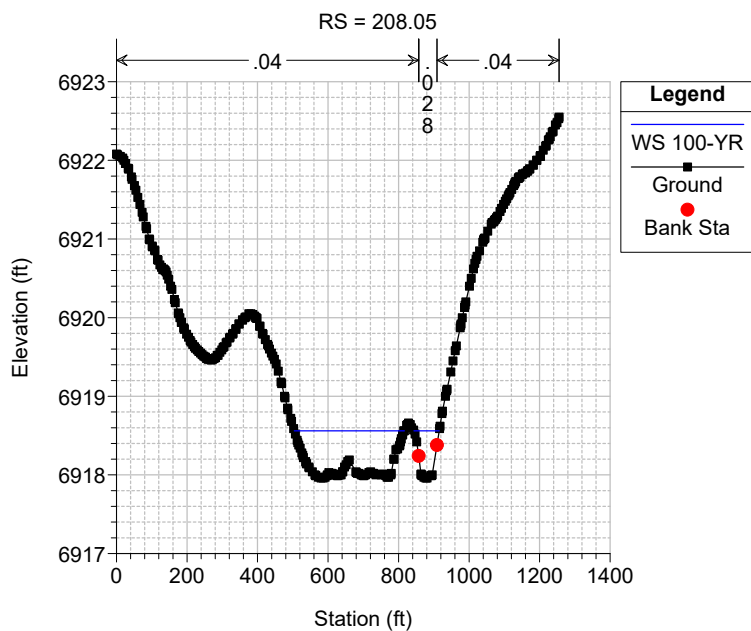
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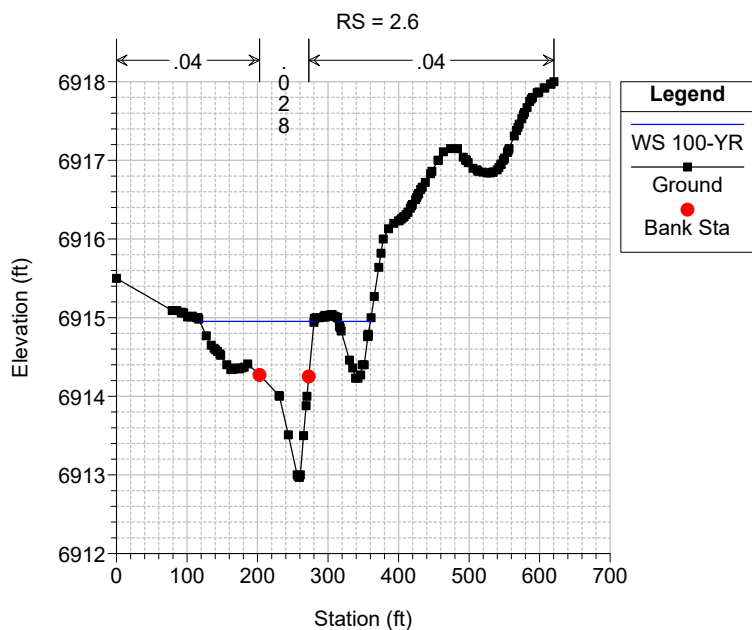
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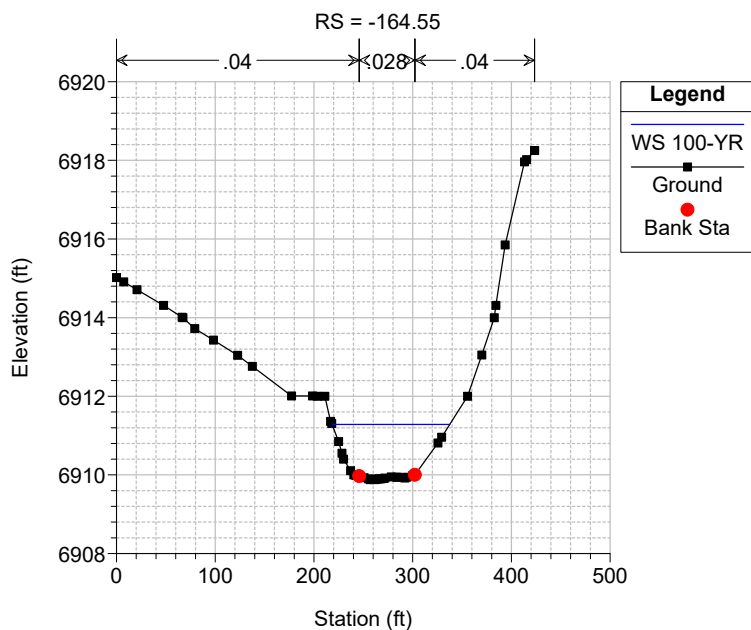
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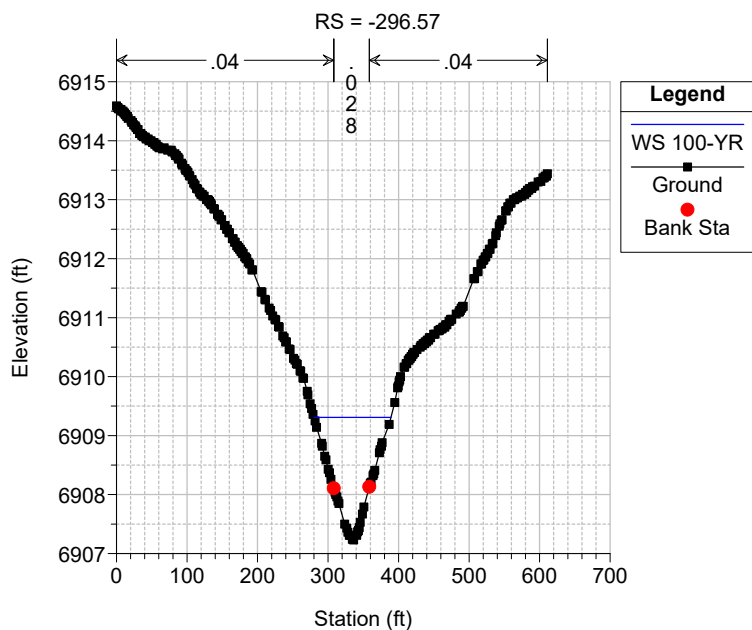
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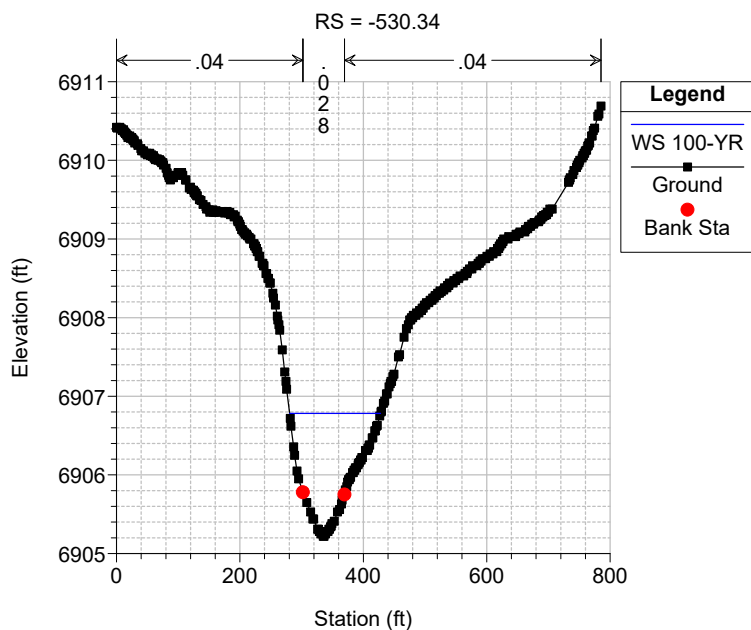
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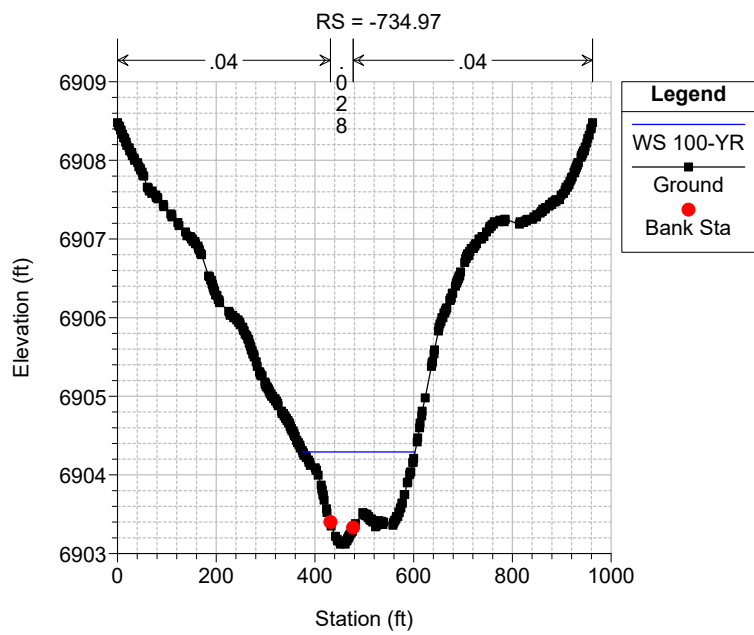


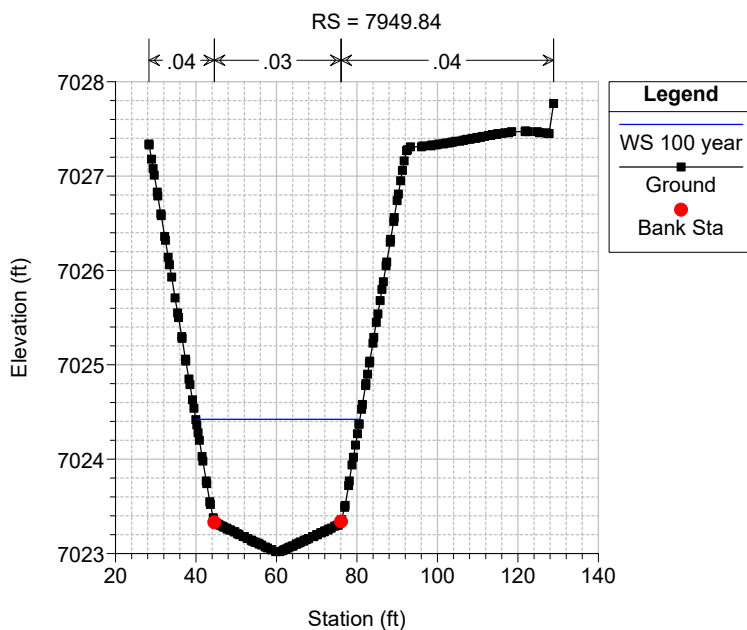
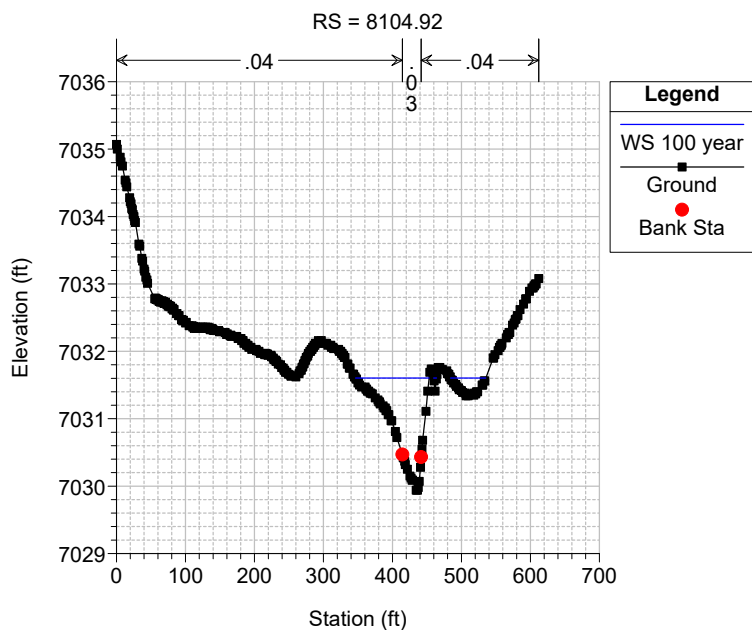
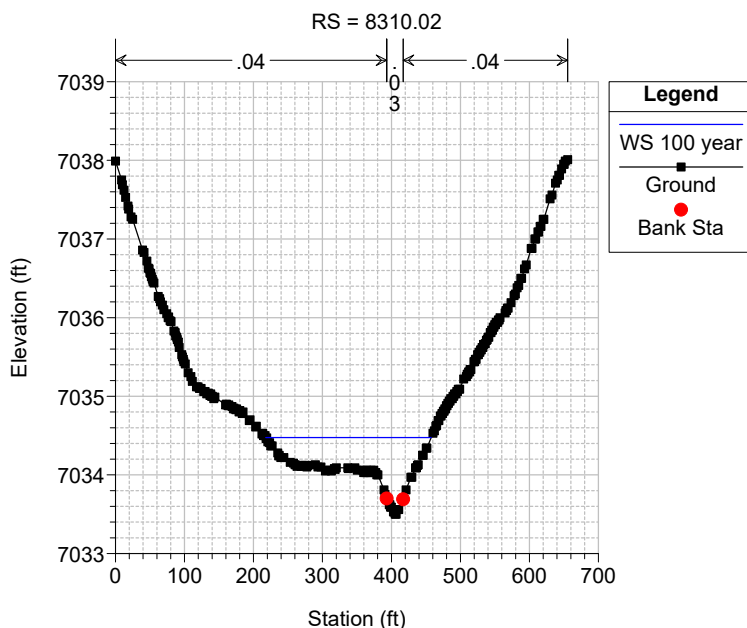
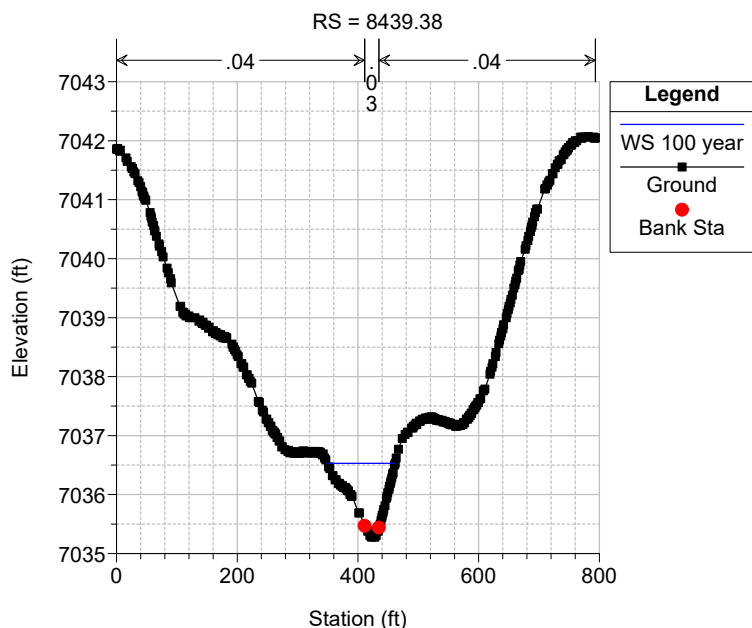
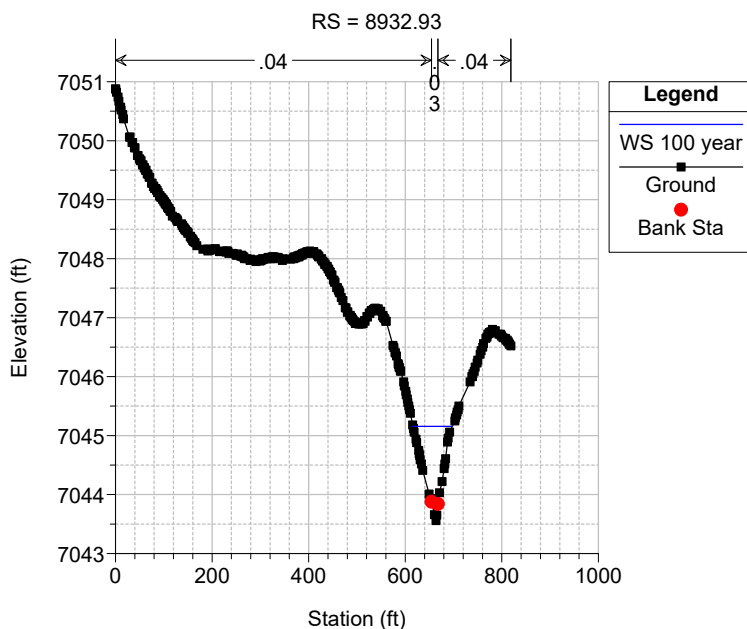
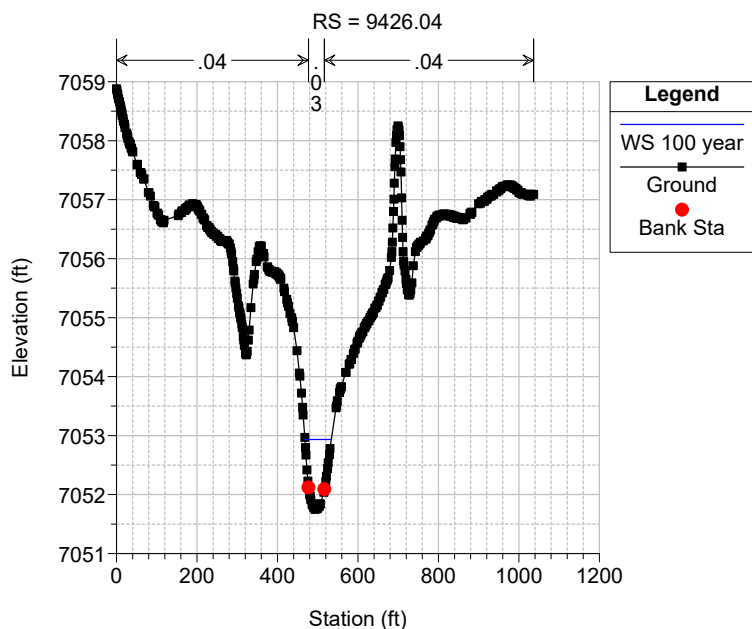
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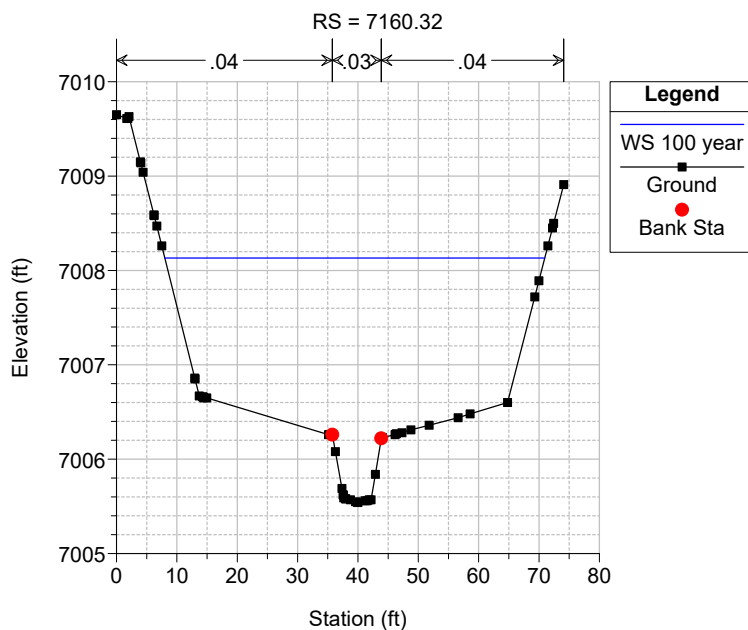
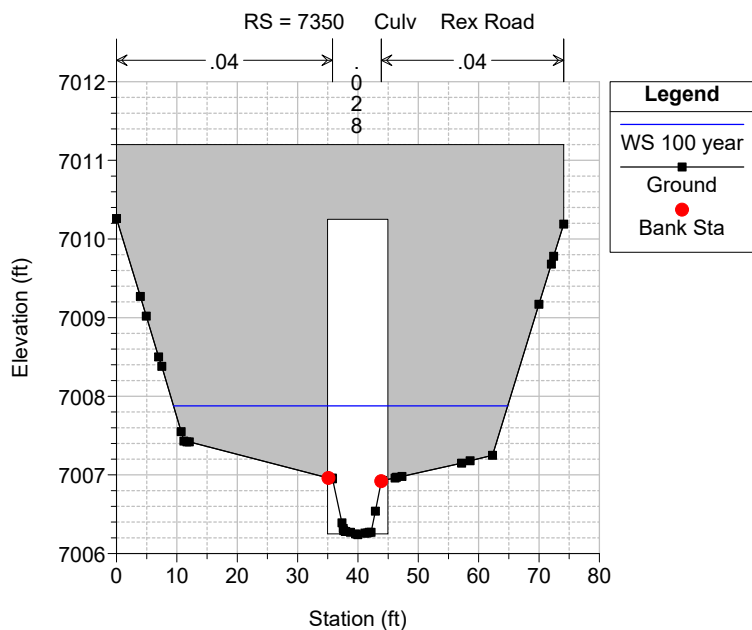
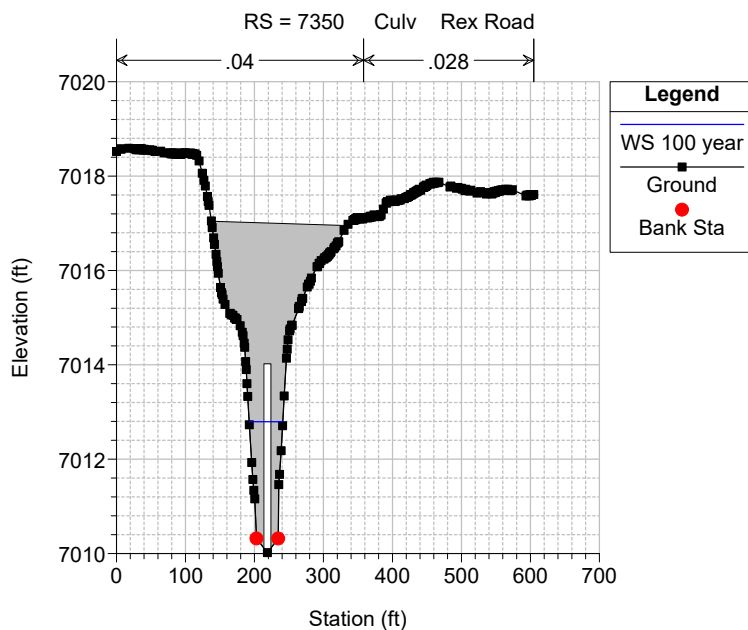
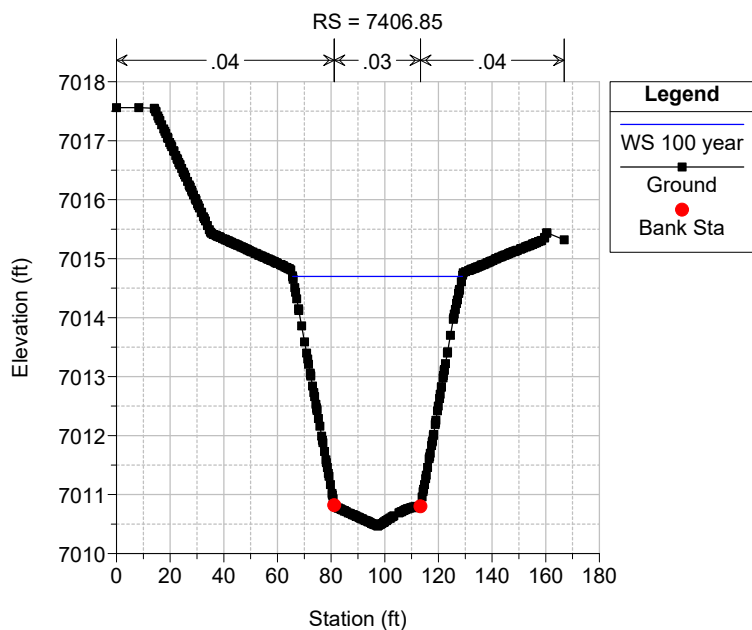
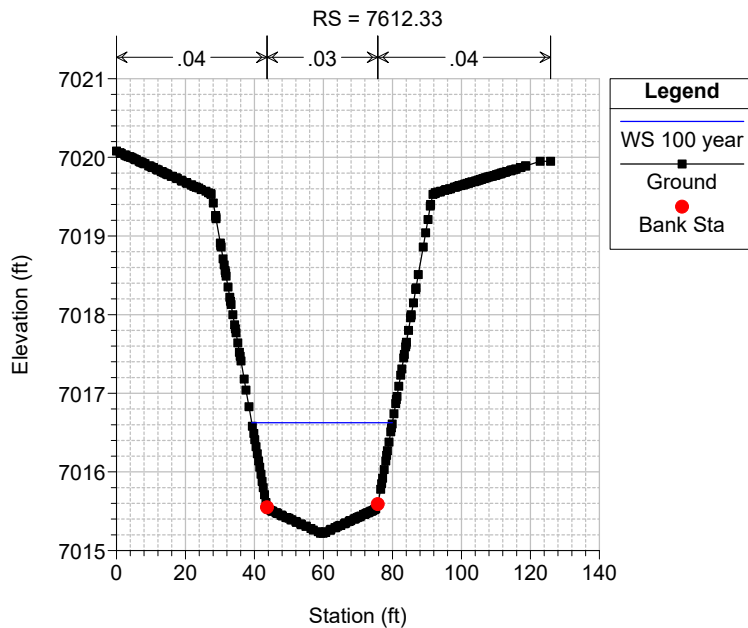
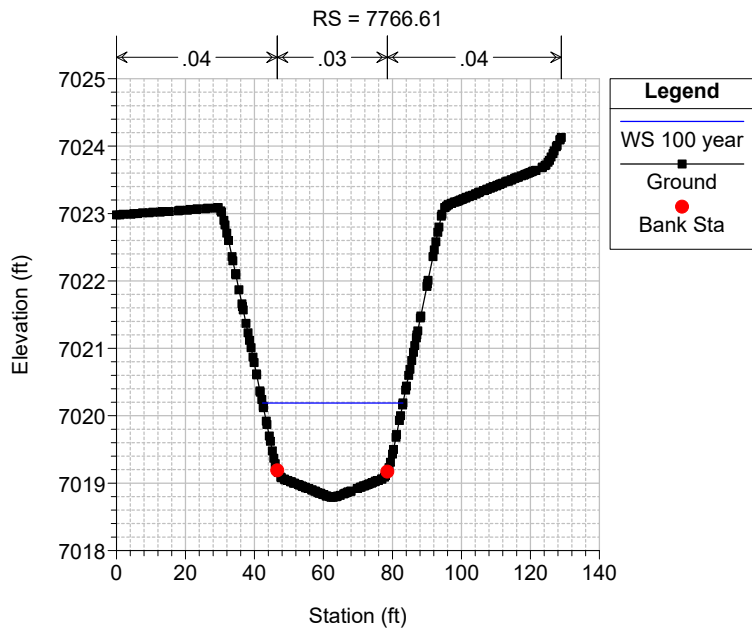


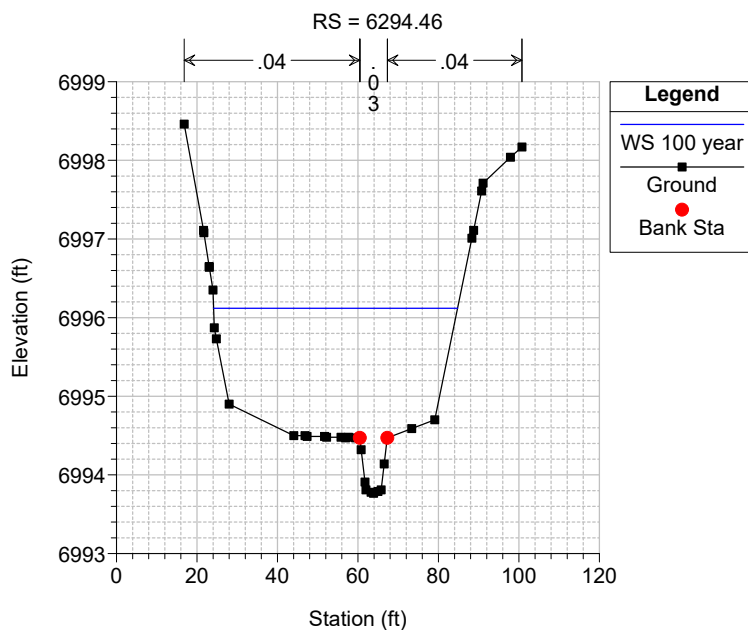
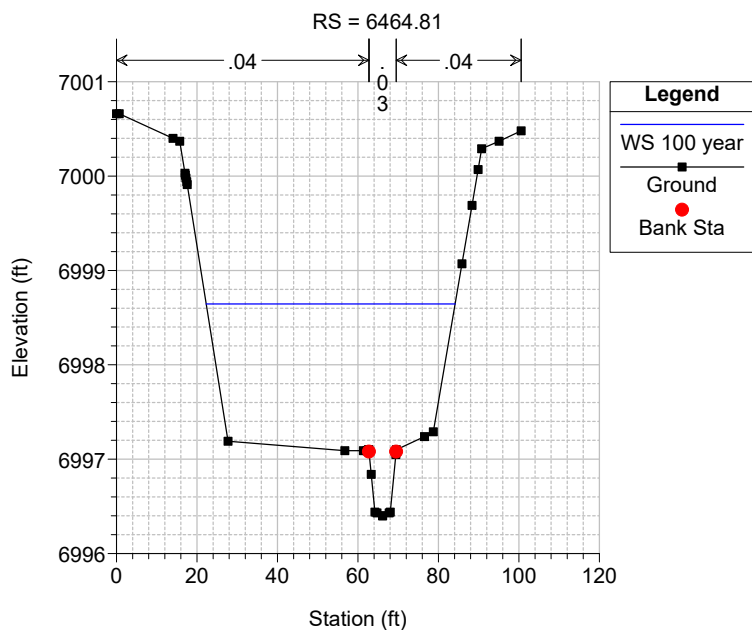
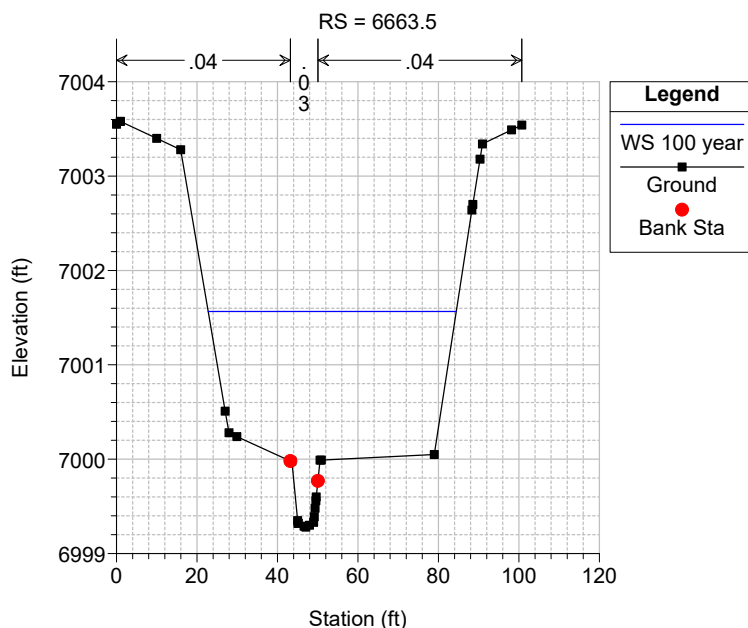
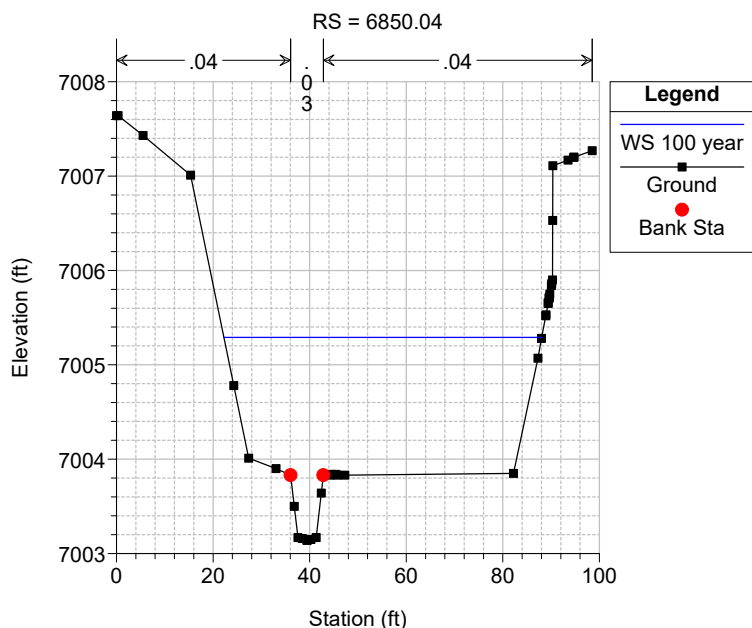
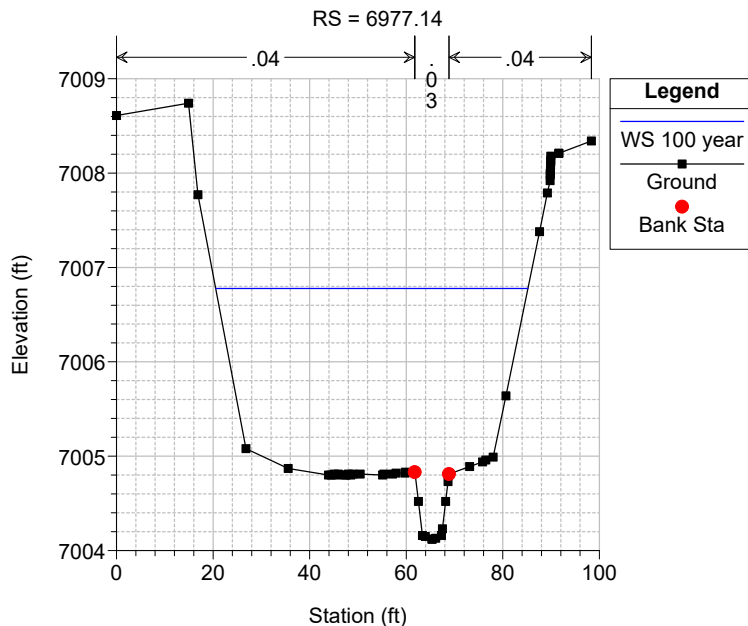
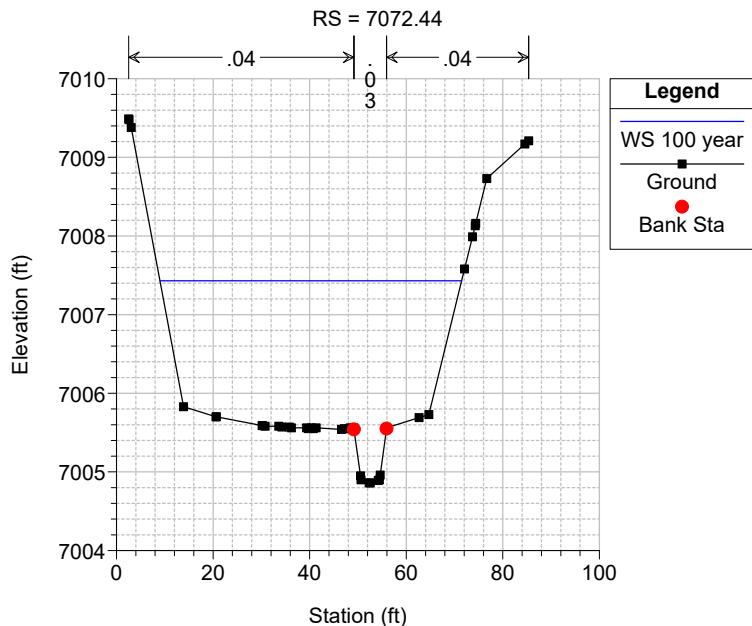
Geick Ranch Tributary 2 Plan: GRT2_Existing 11/29/2023

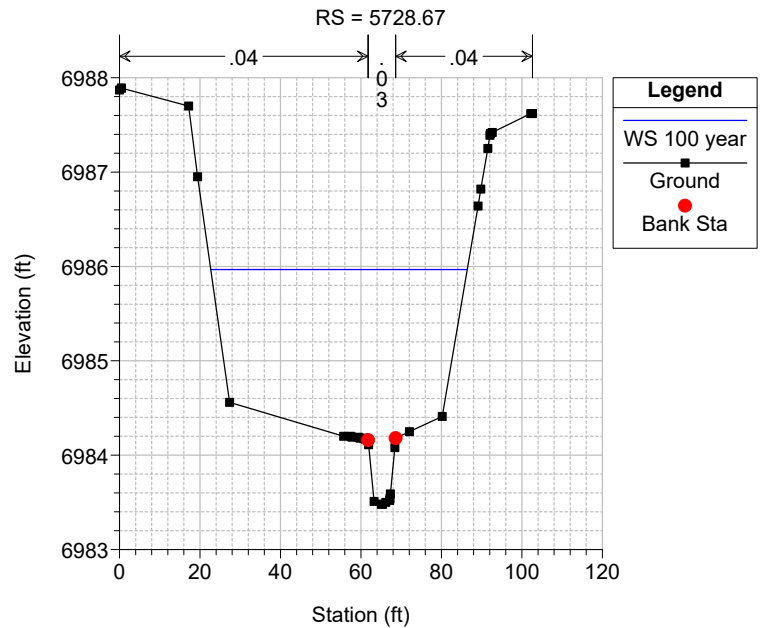
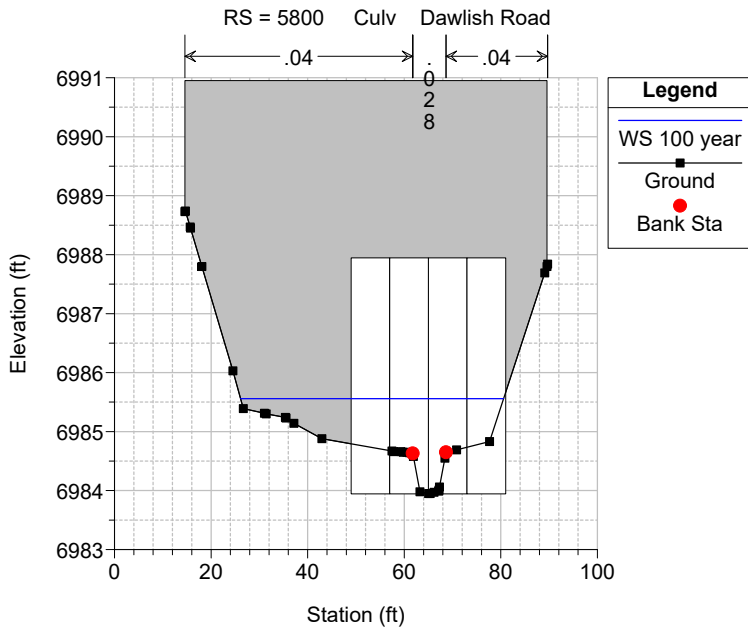
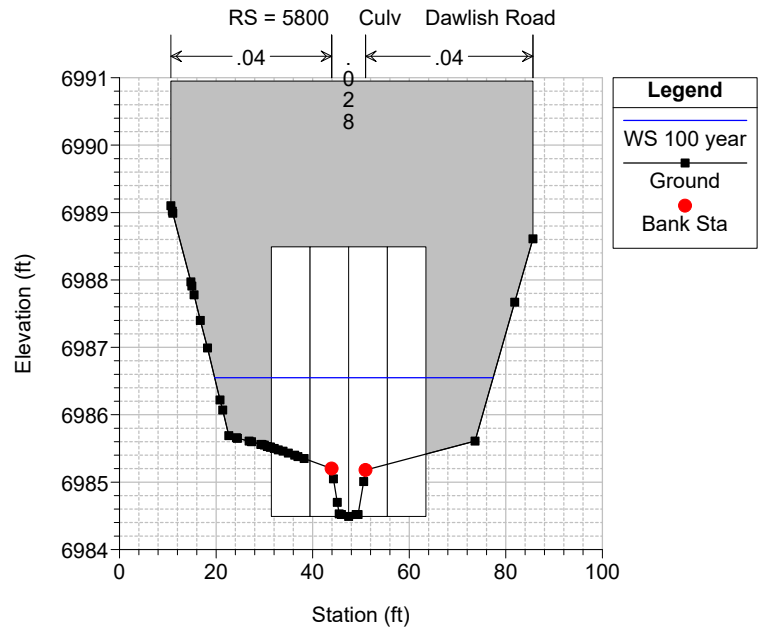
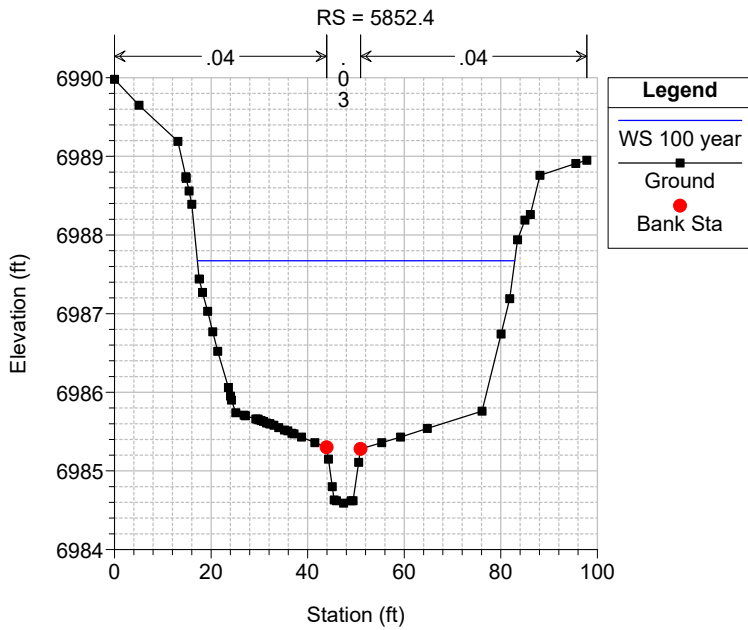
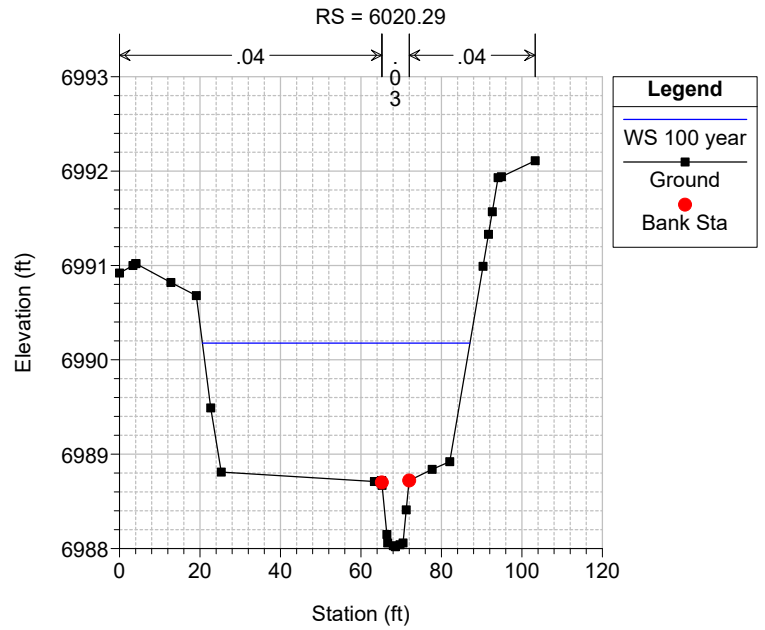
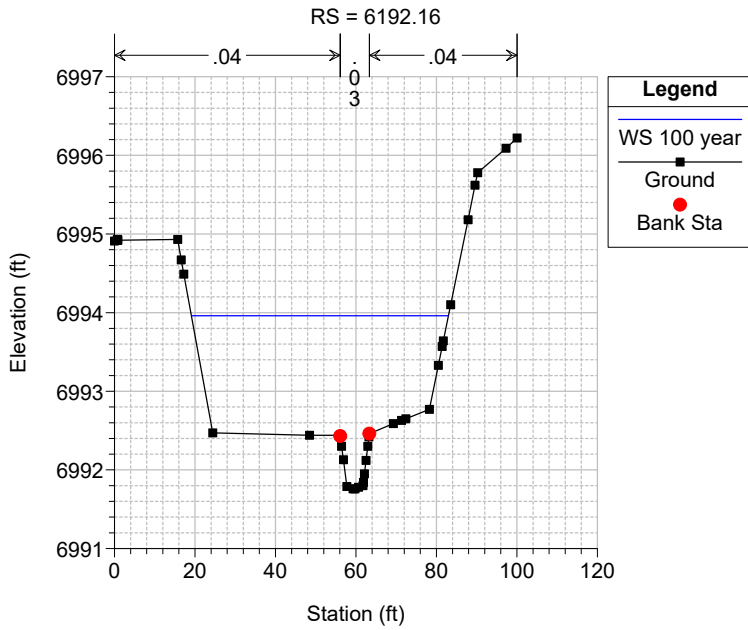


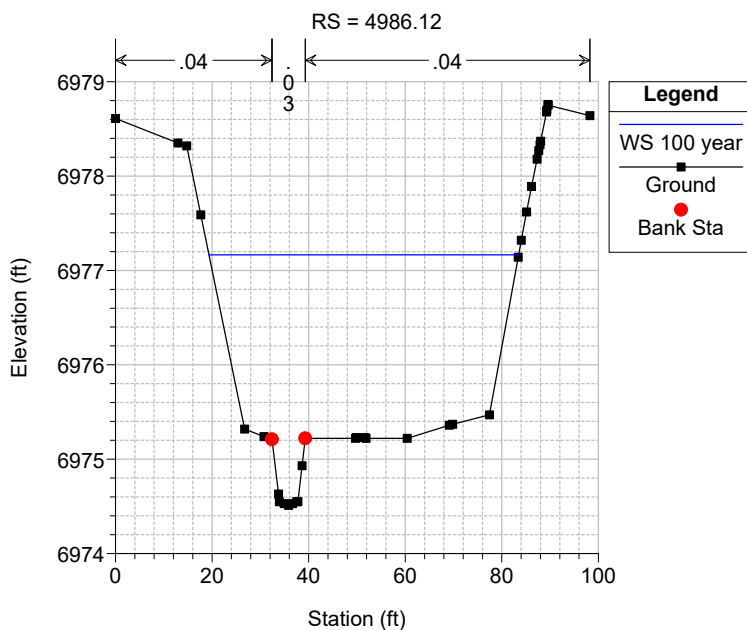
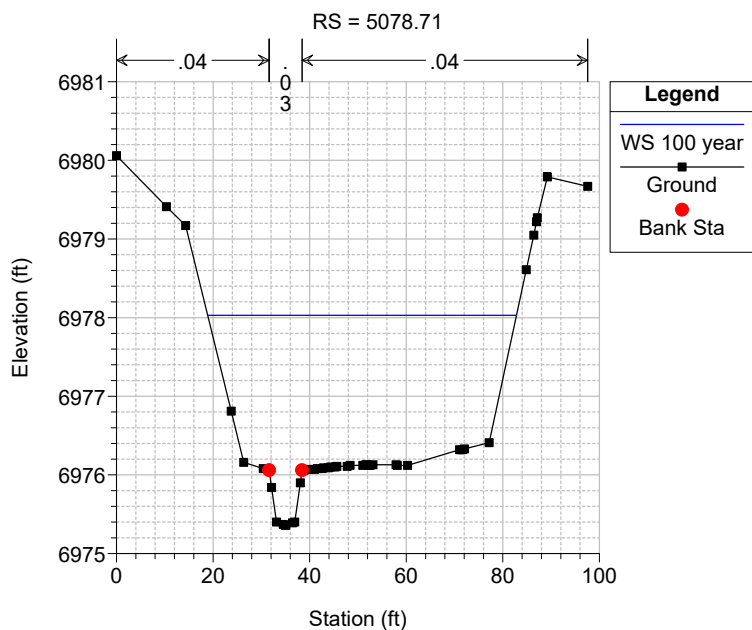
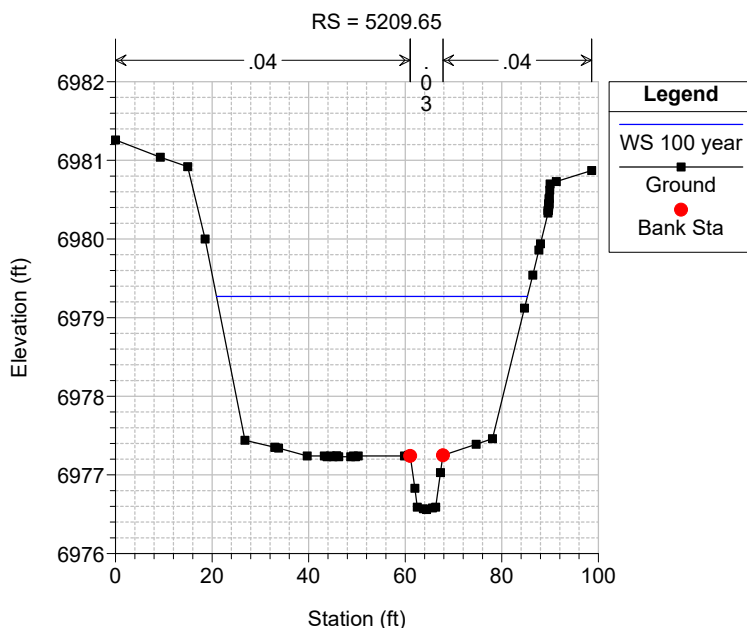
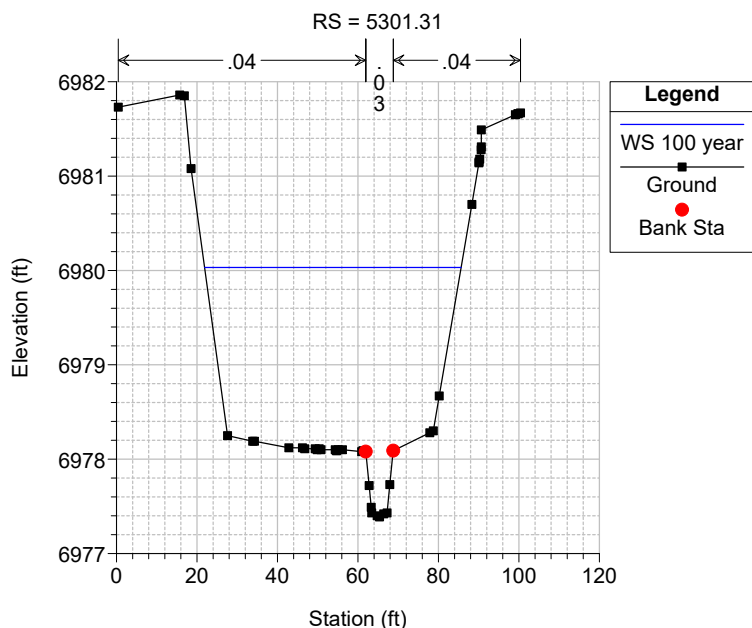
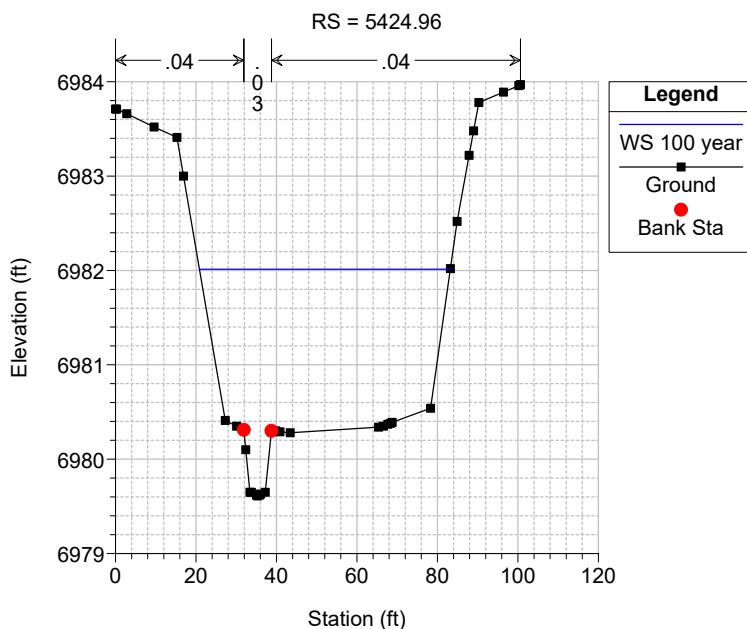
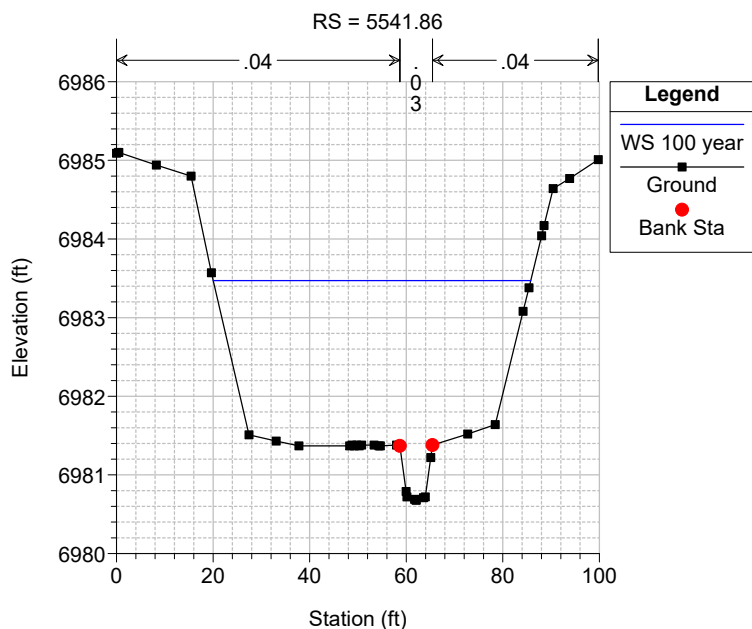


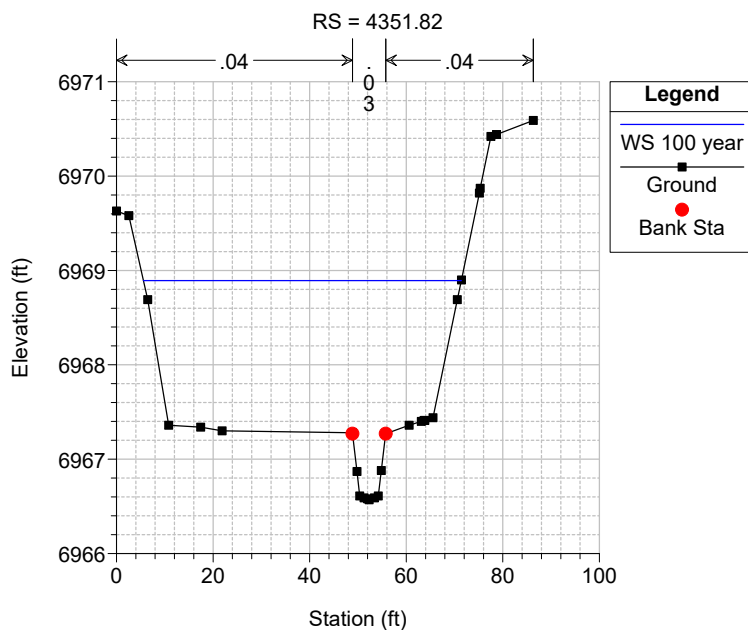
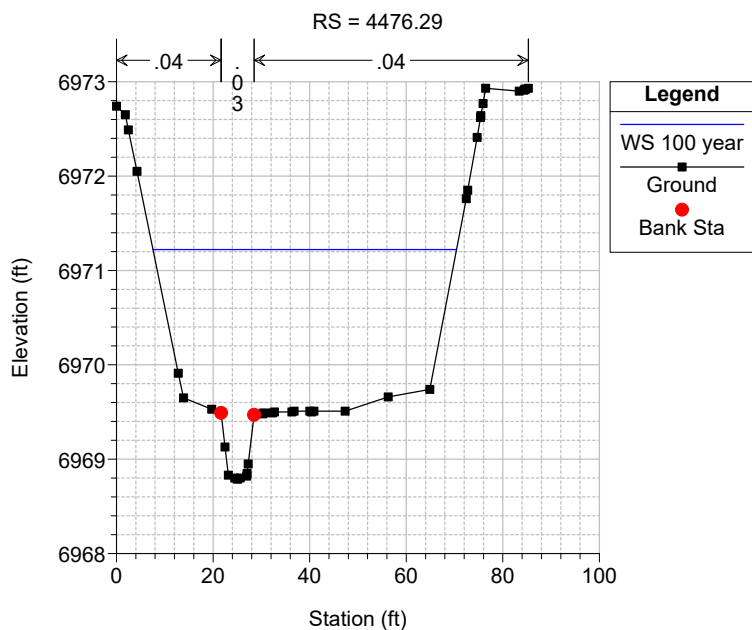
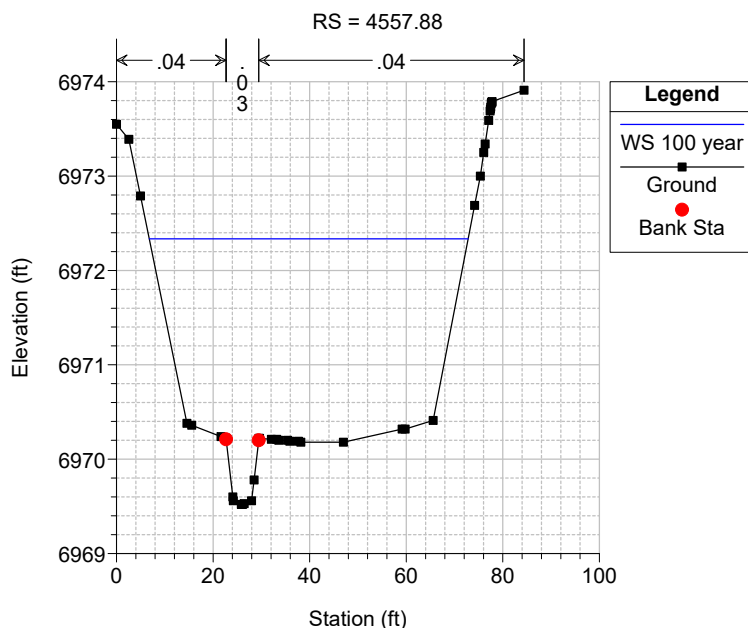
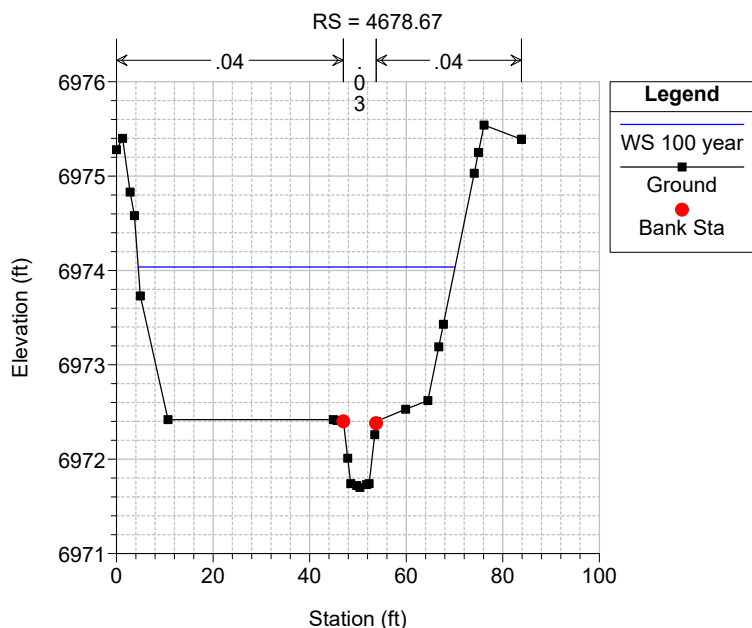
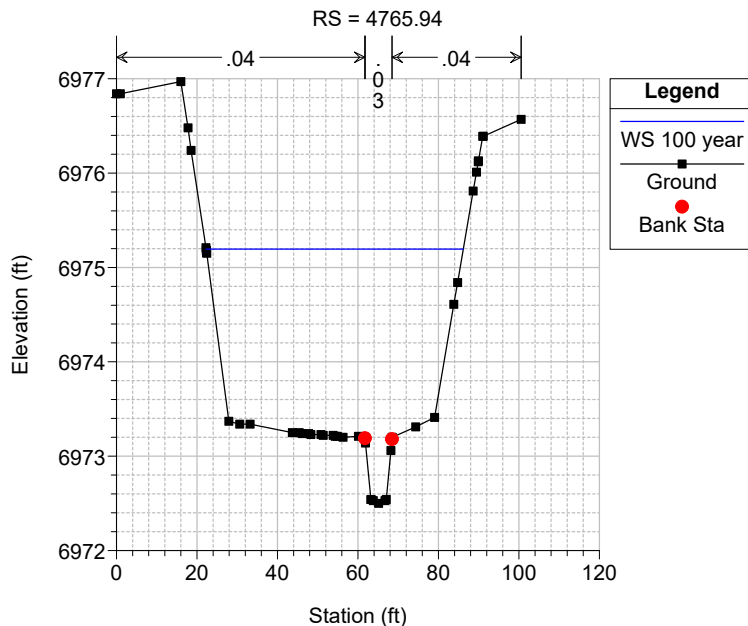
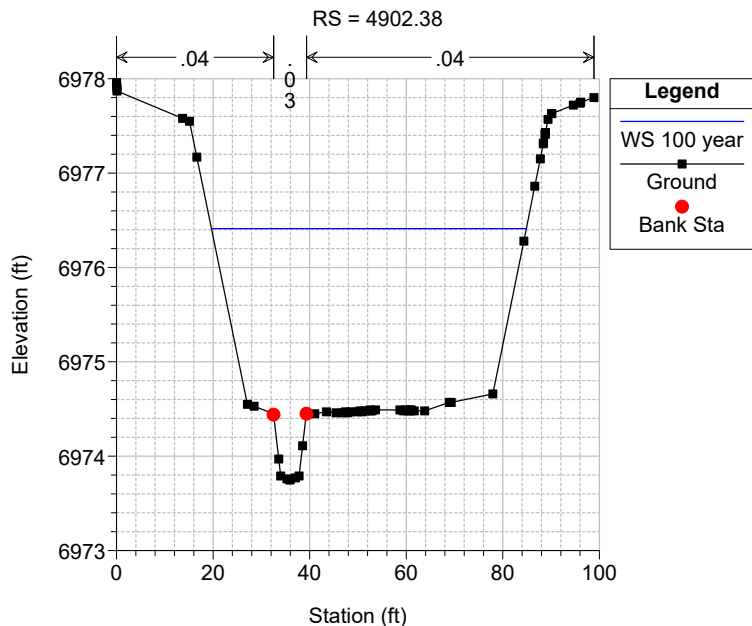


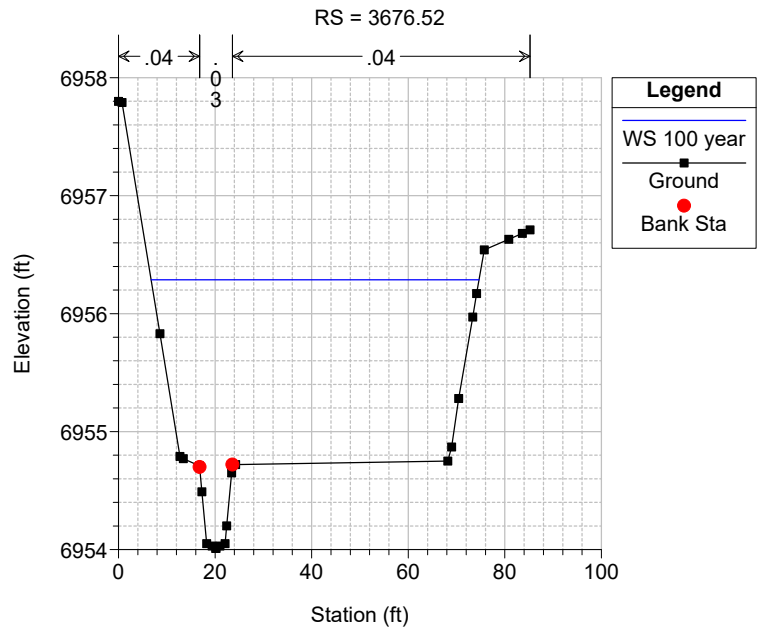
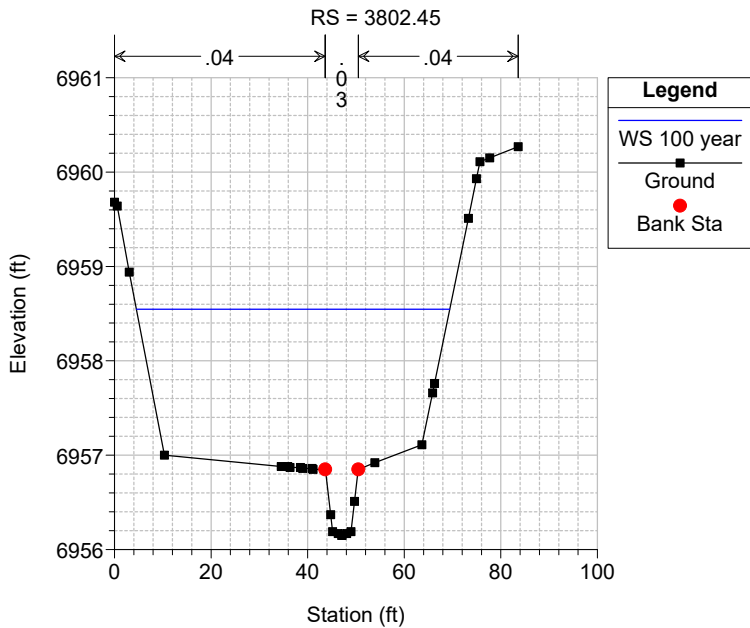
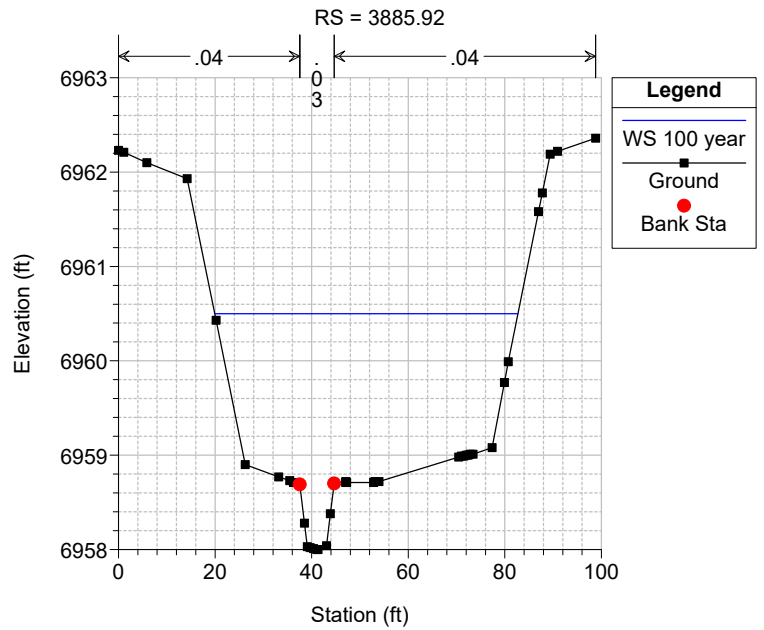
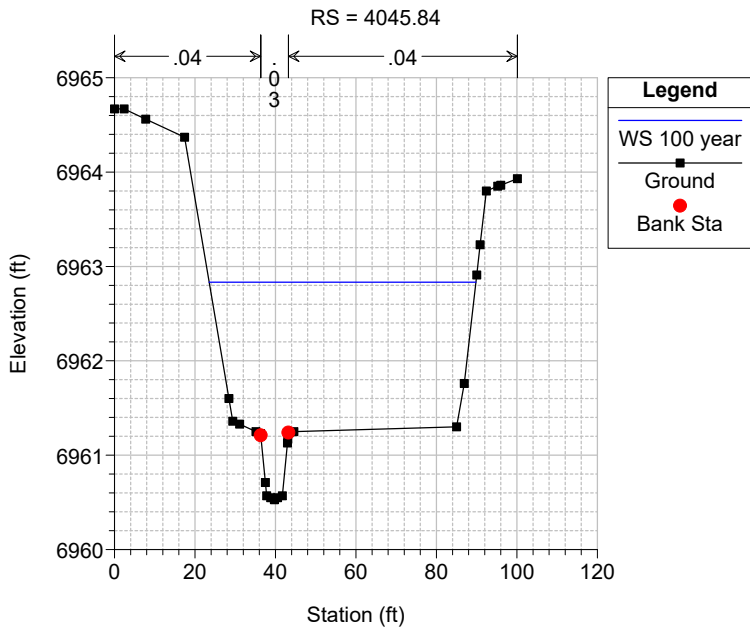
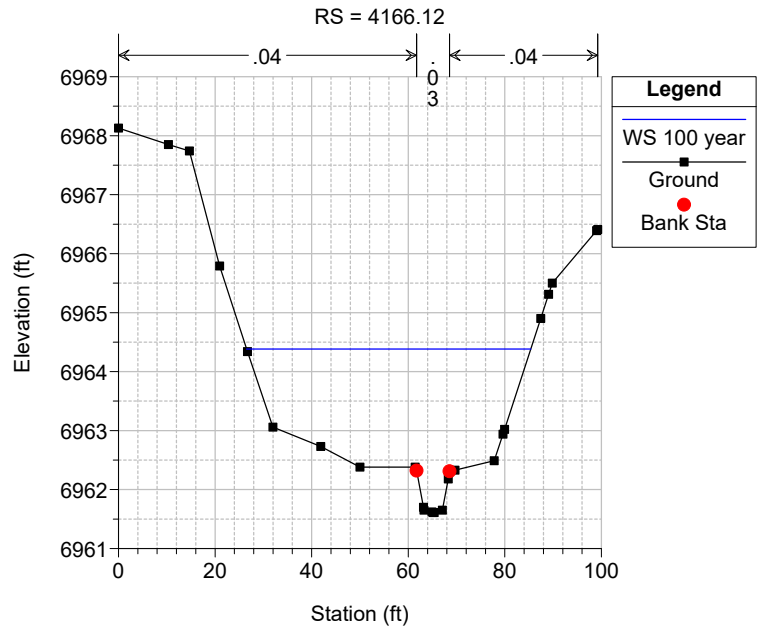
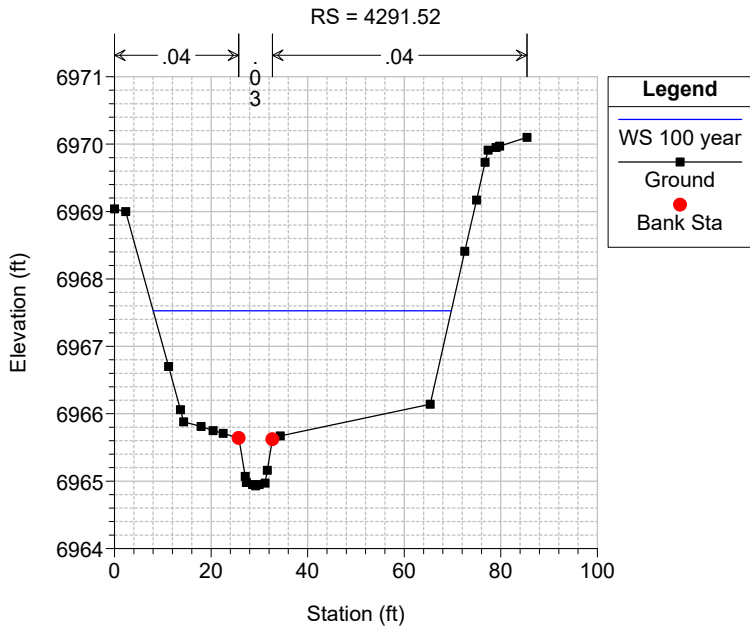


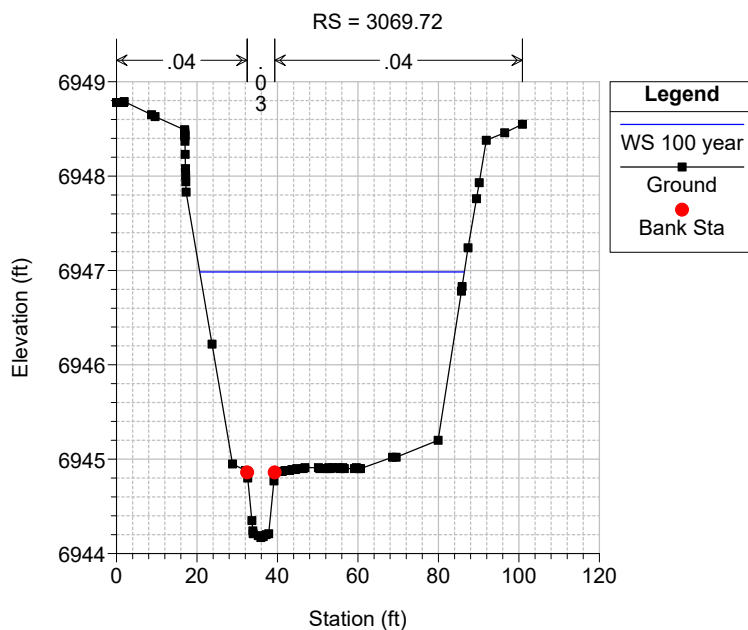
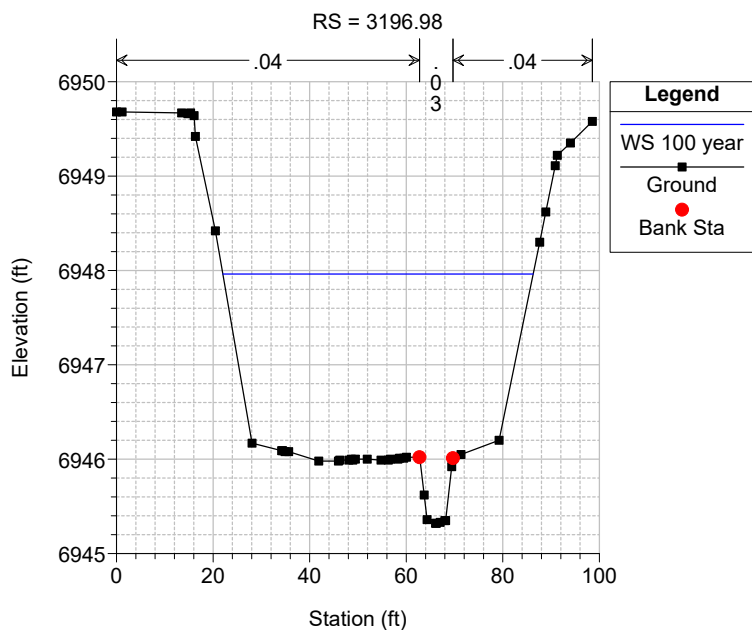
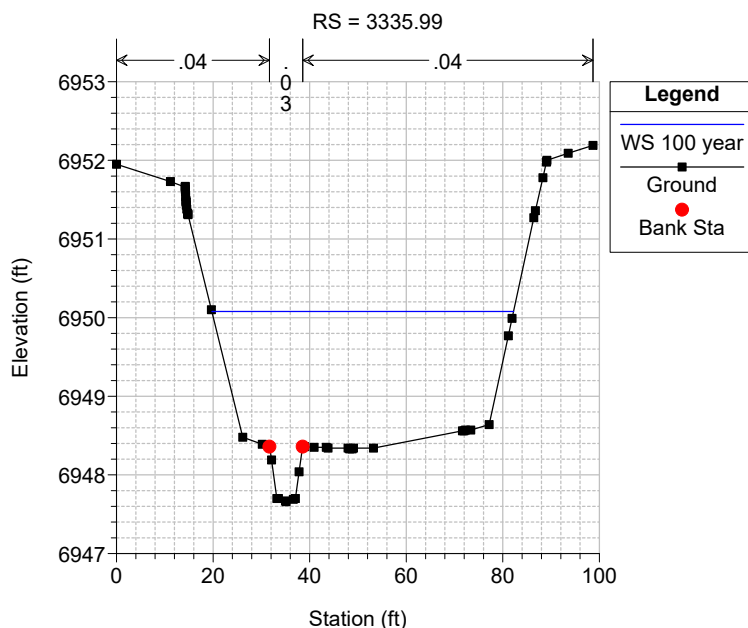
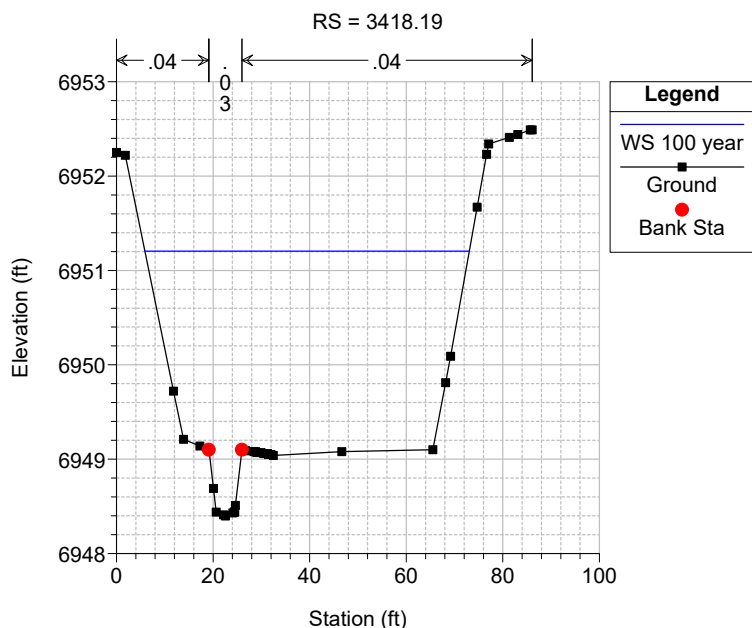
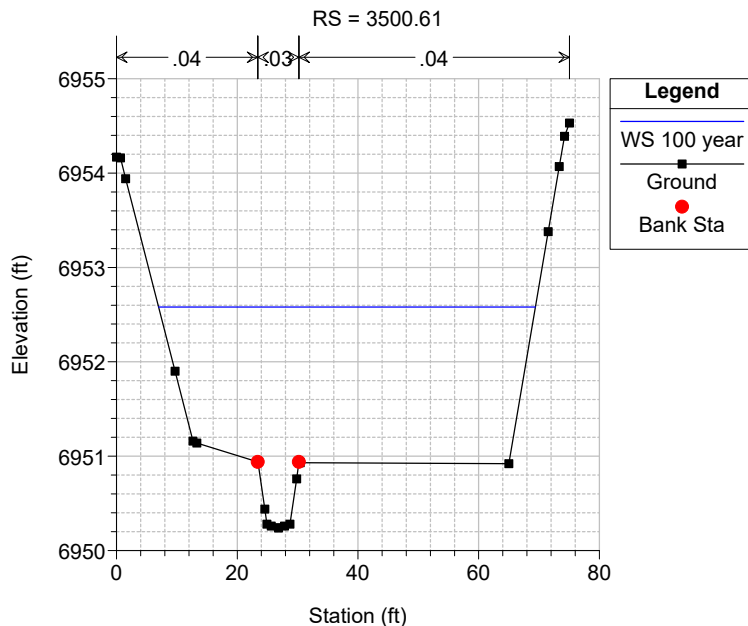
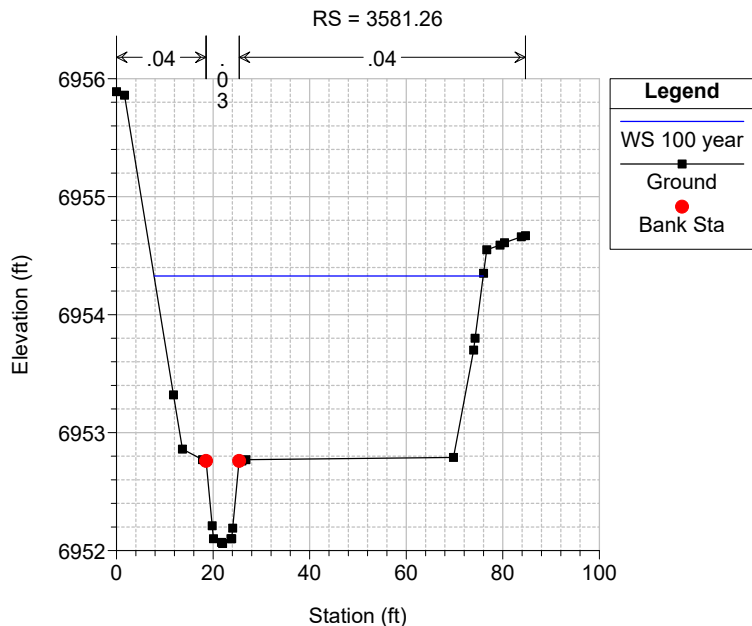


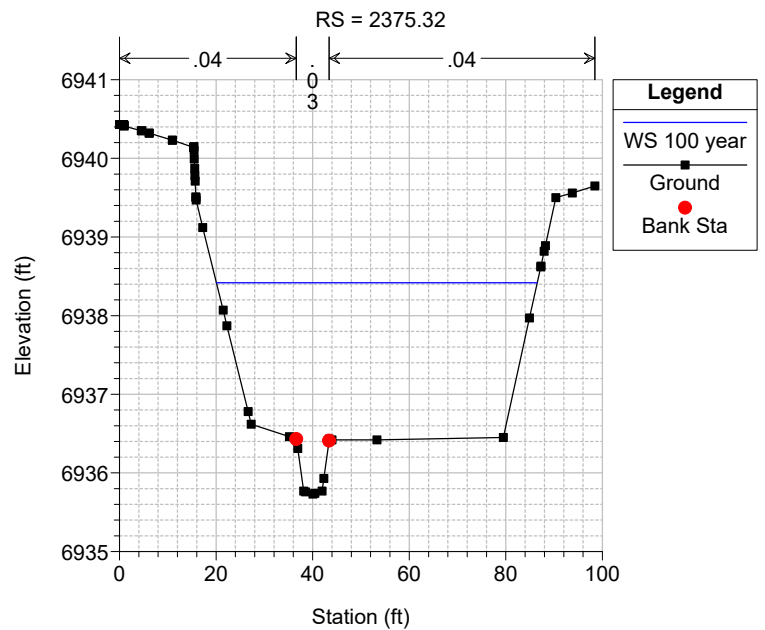
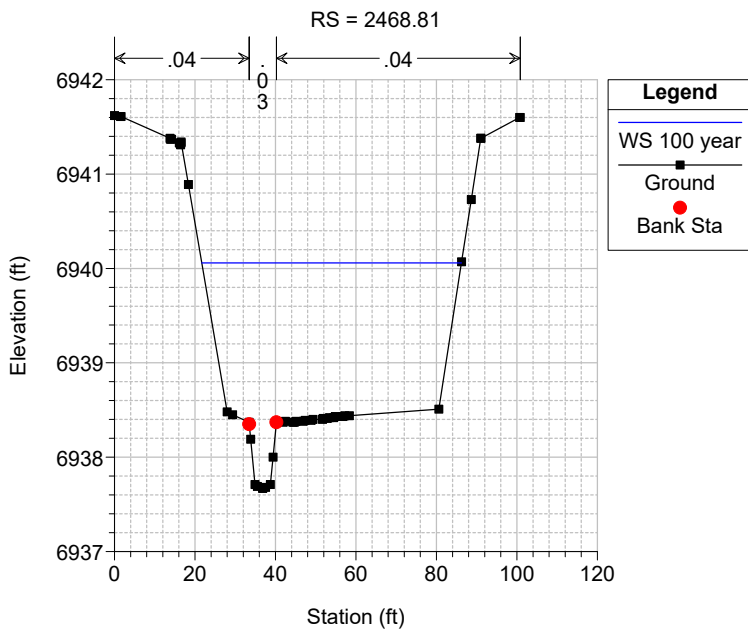
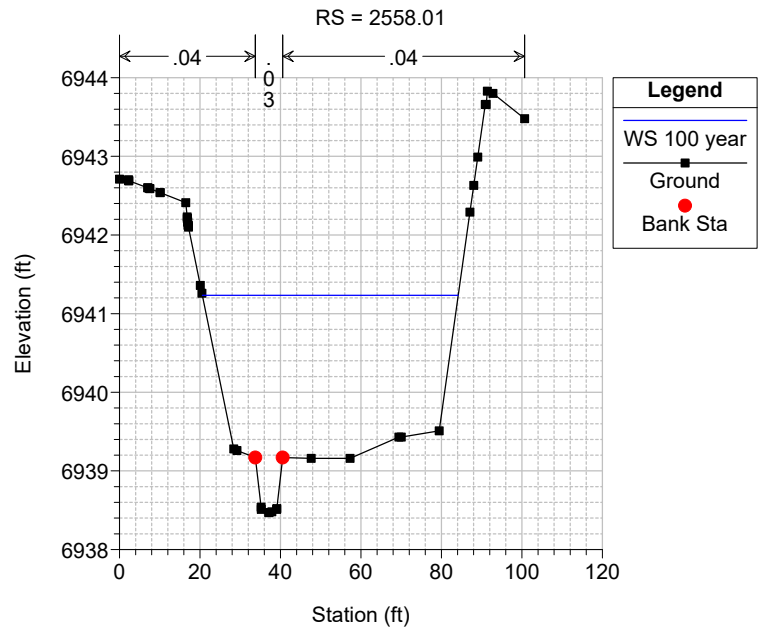
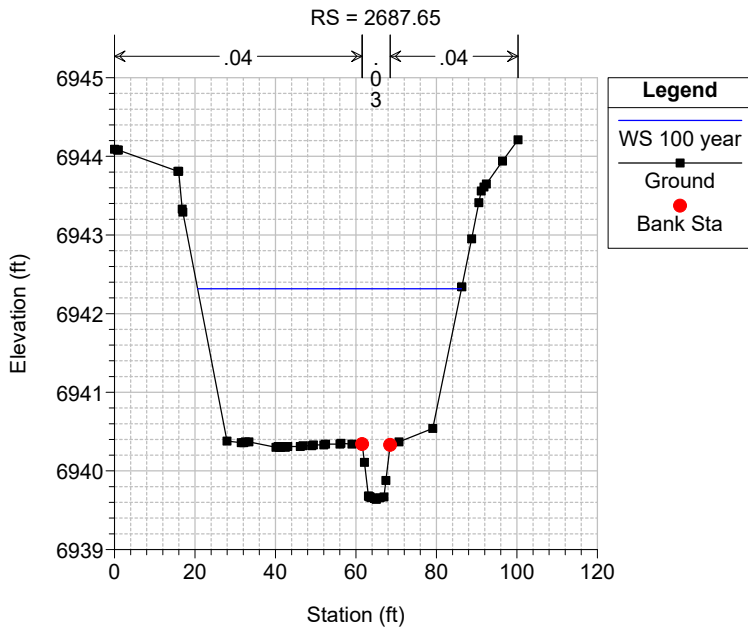
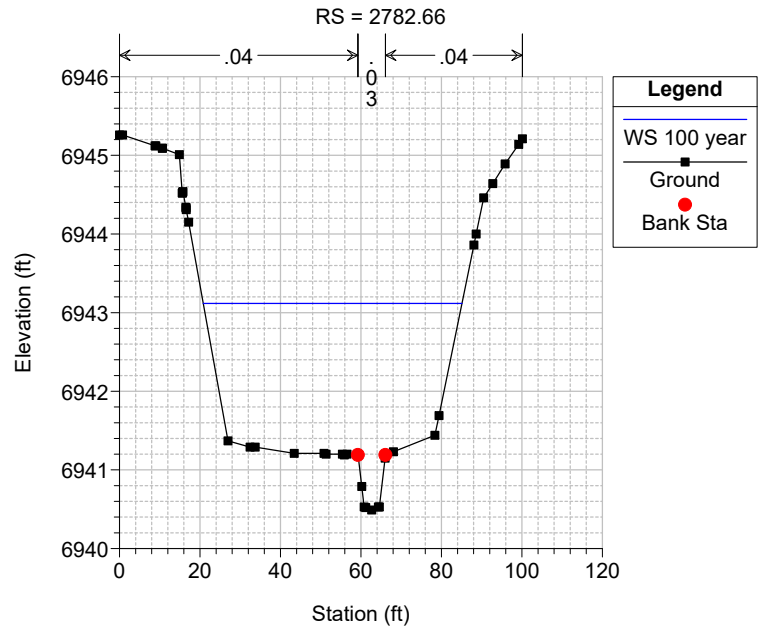
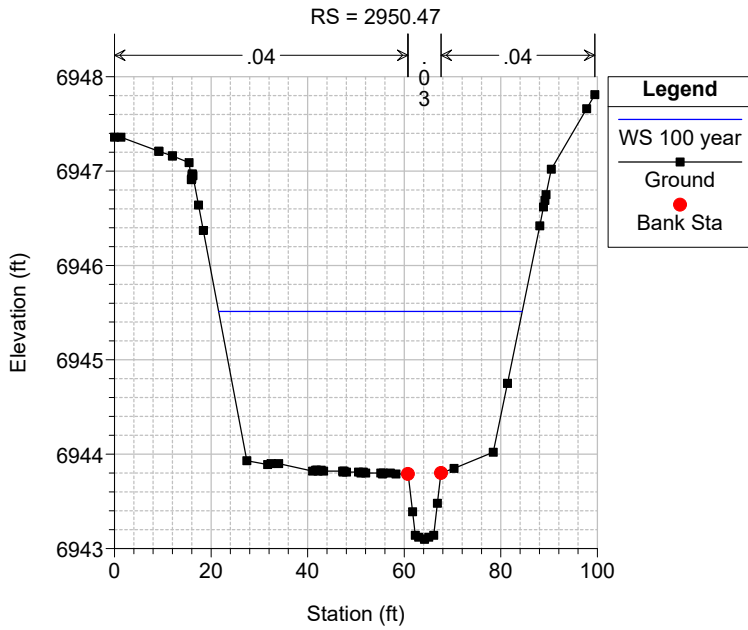


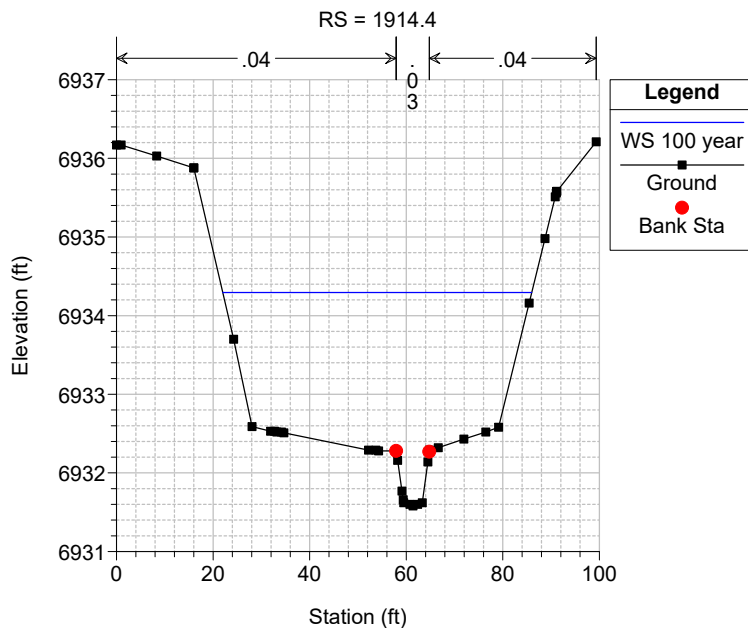
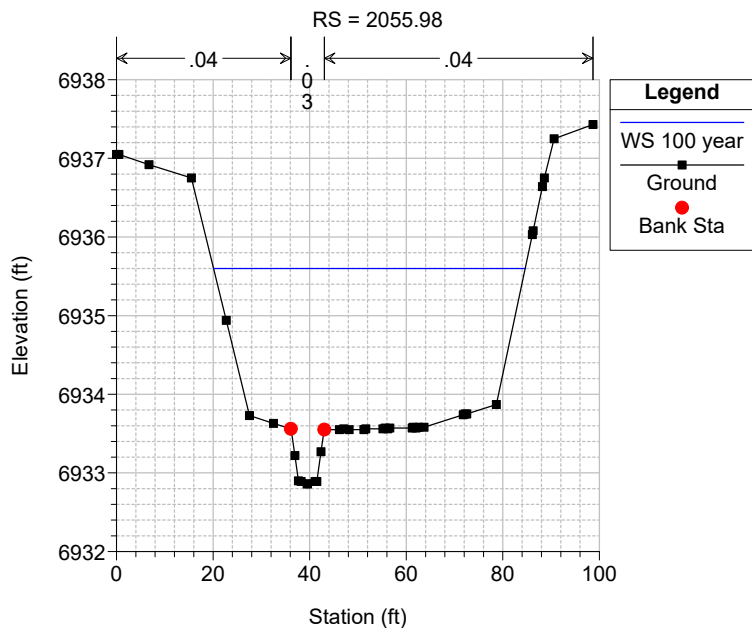
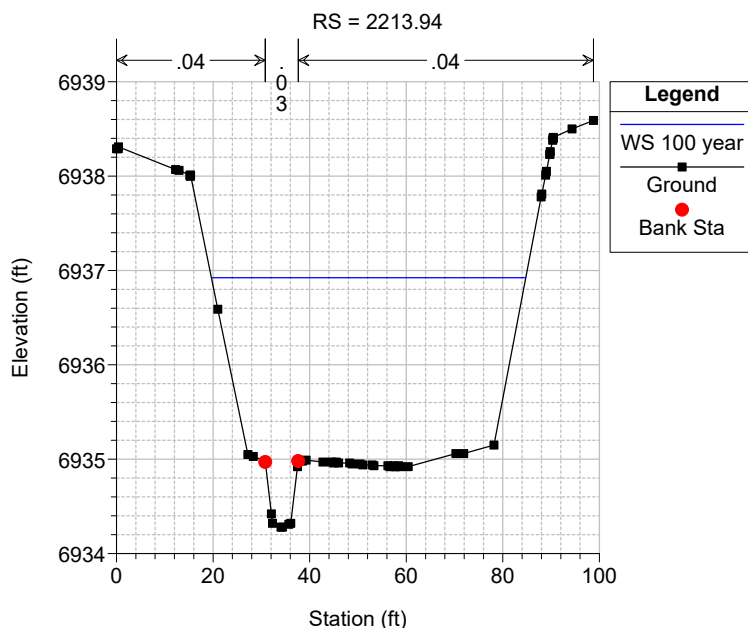
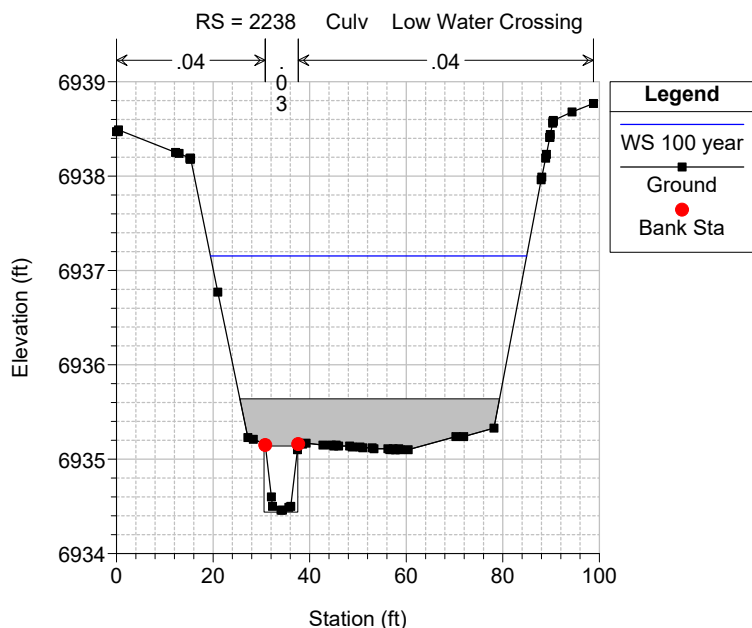
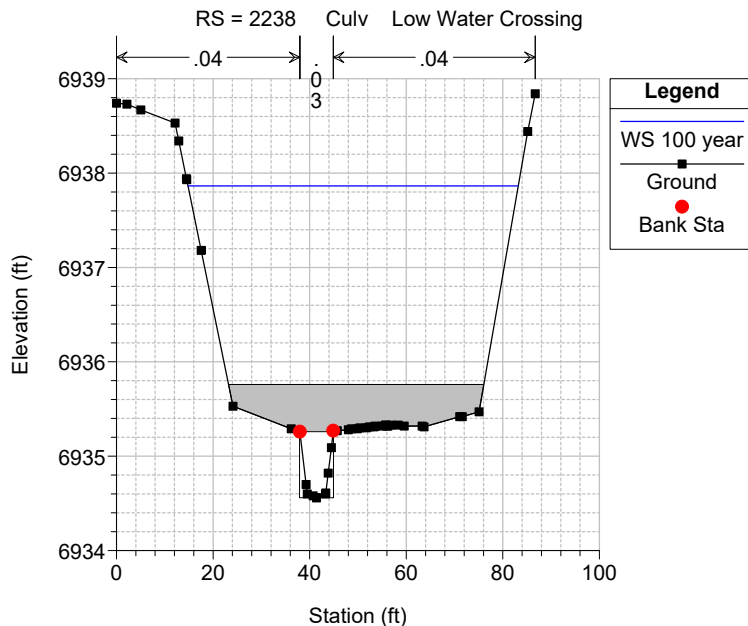
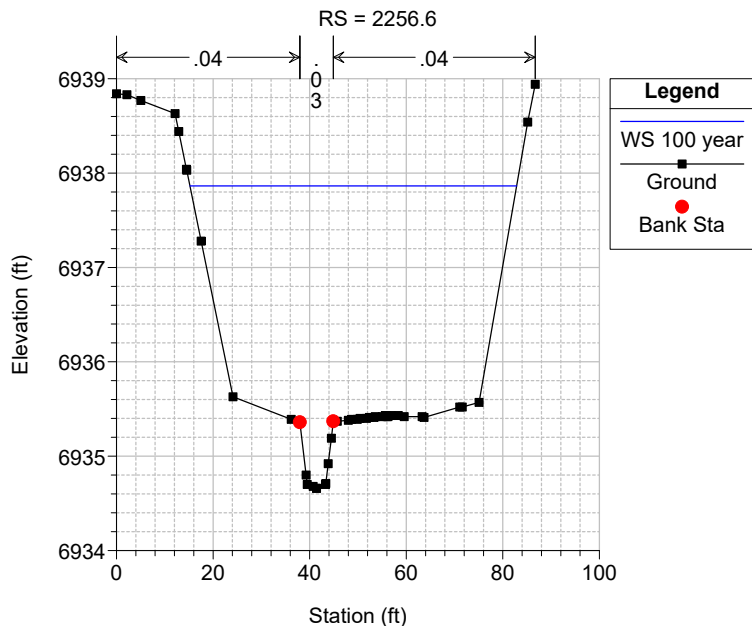


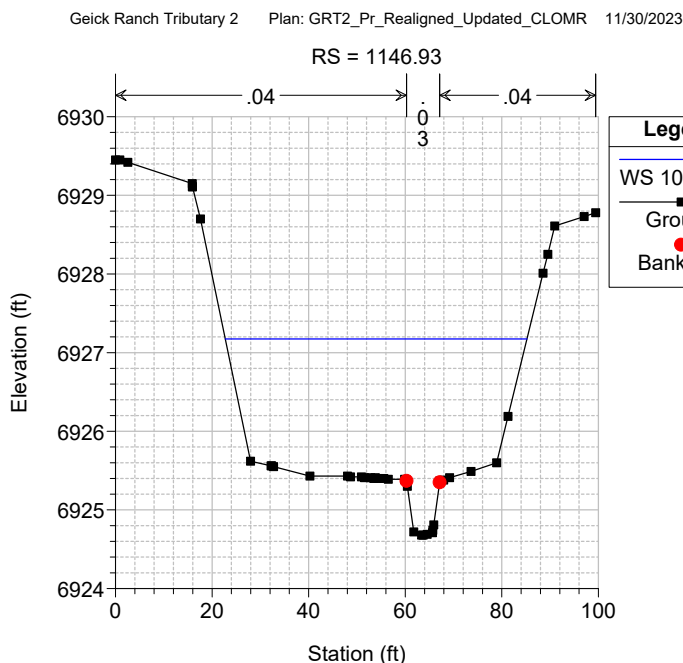
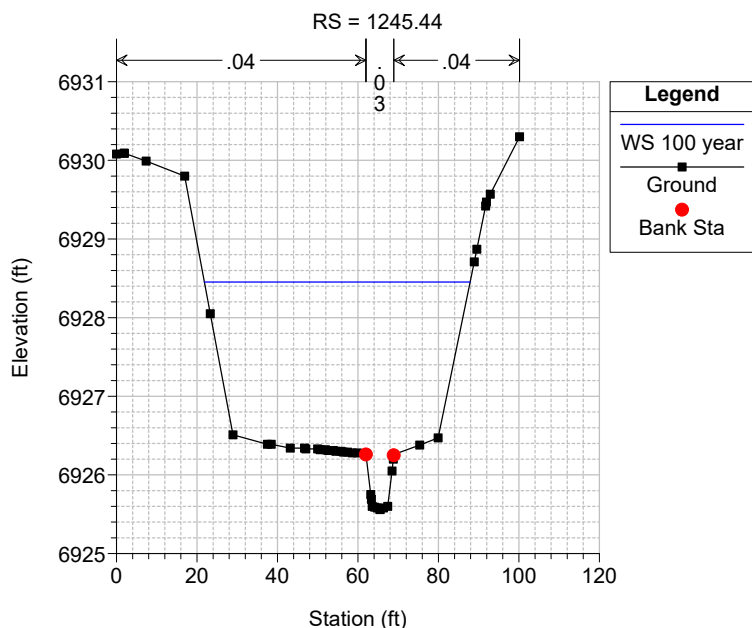
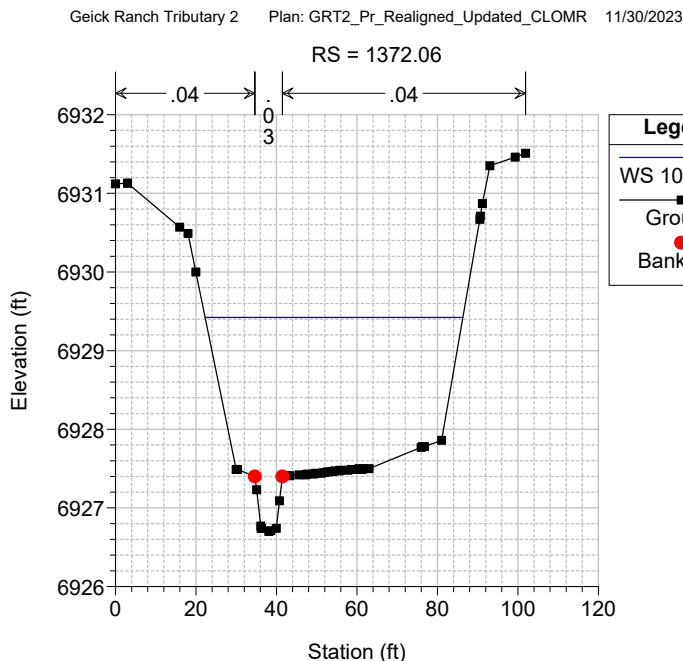
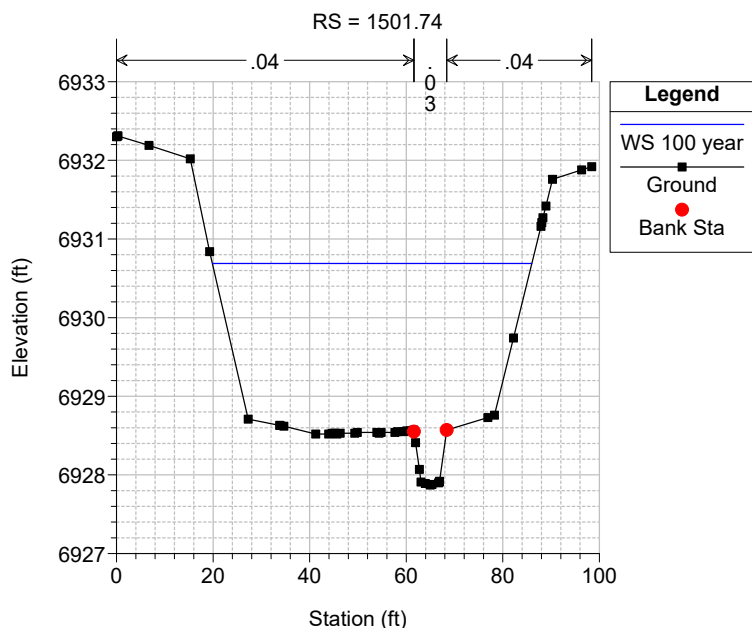
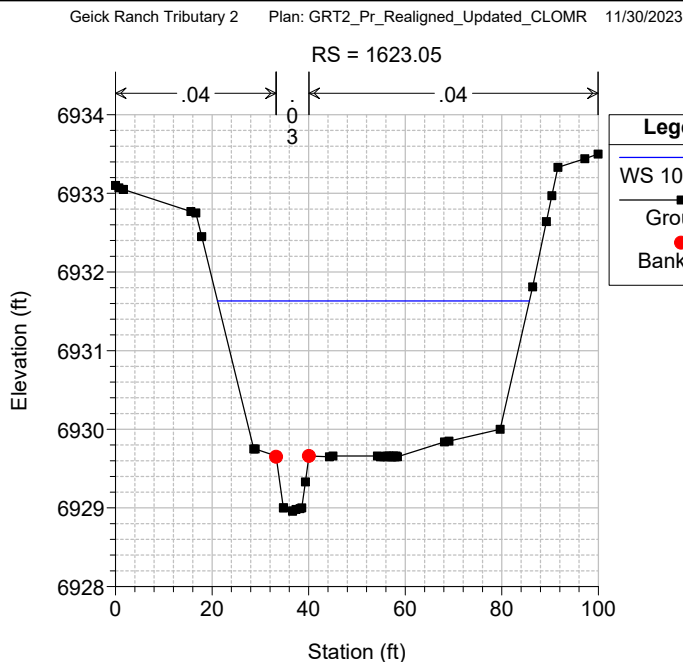
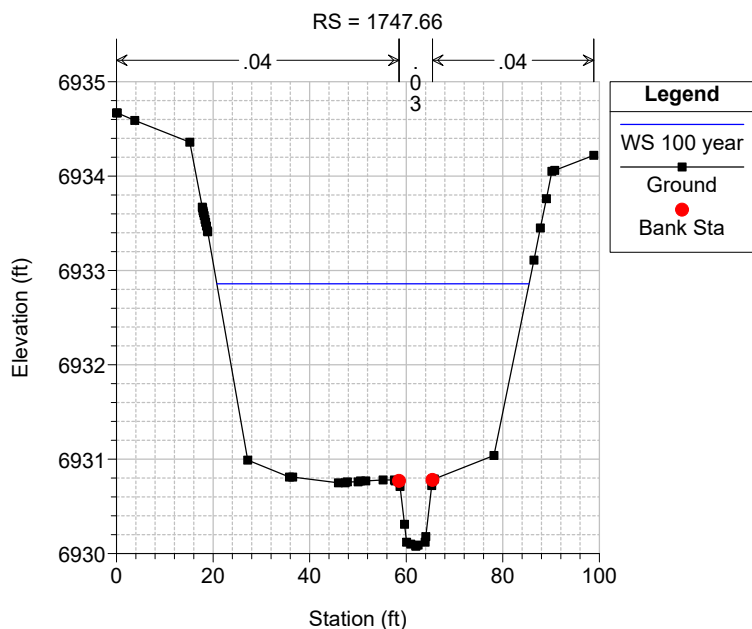


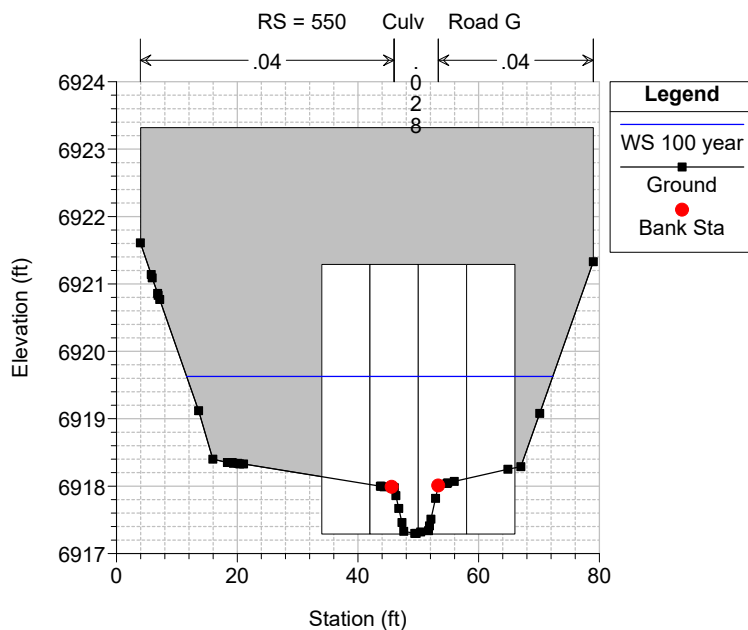
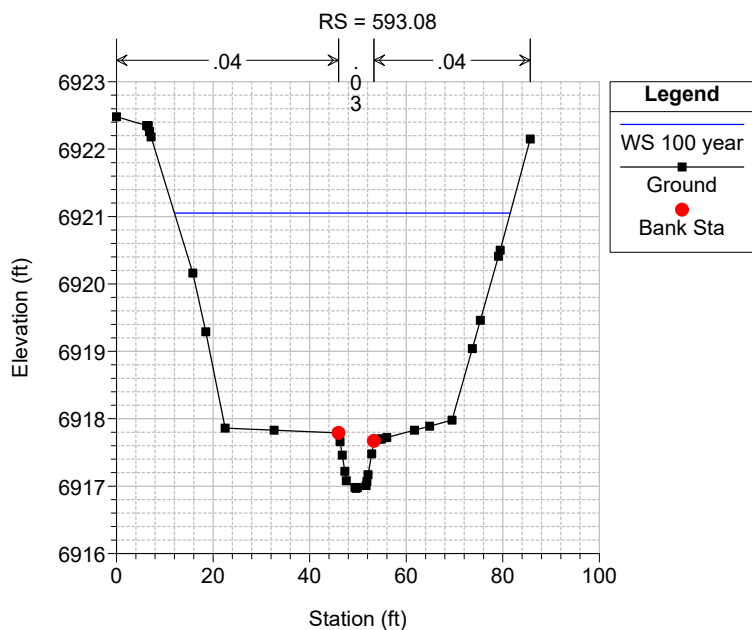
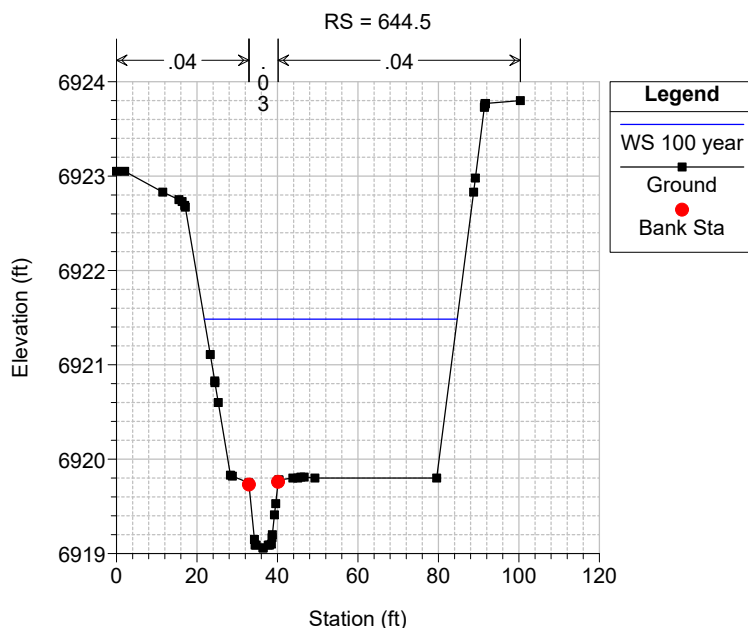
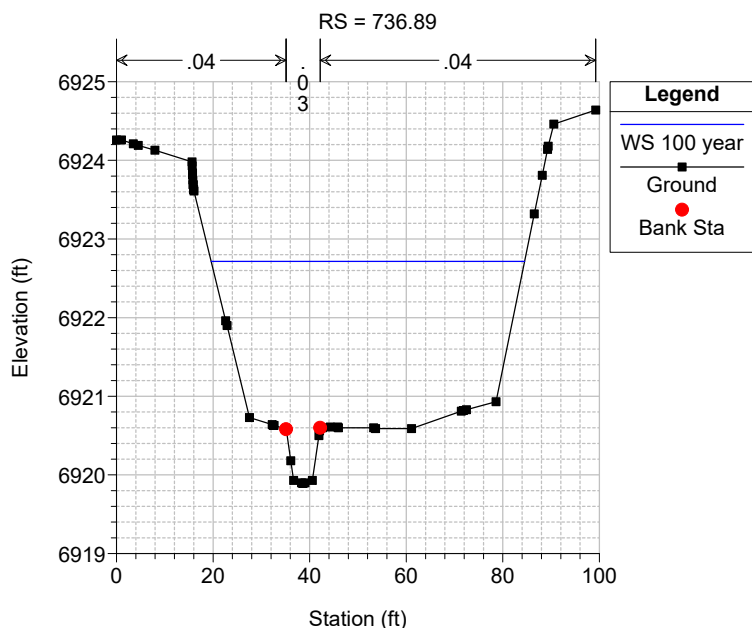
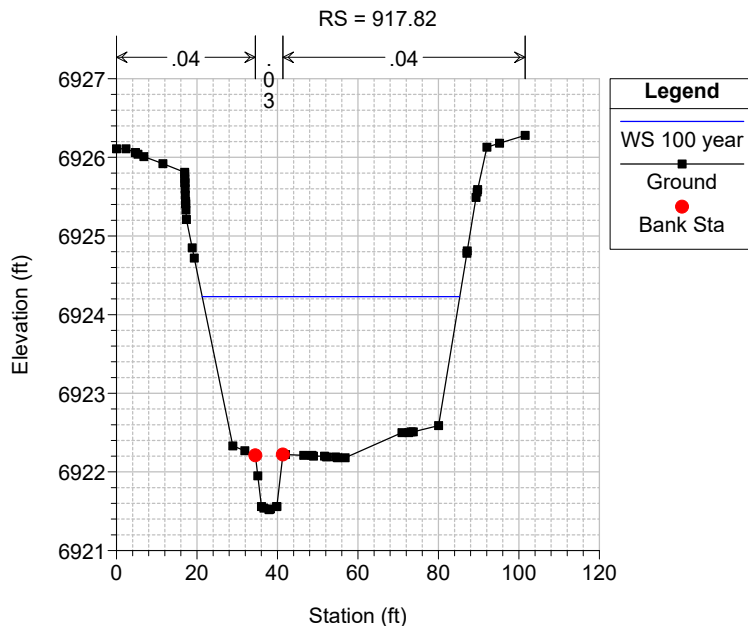
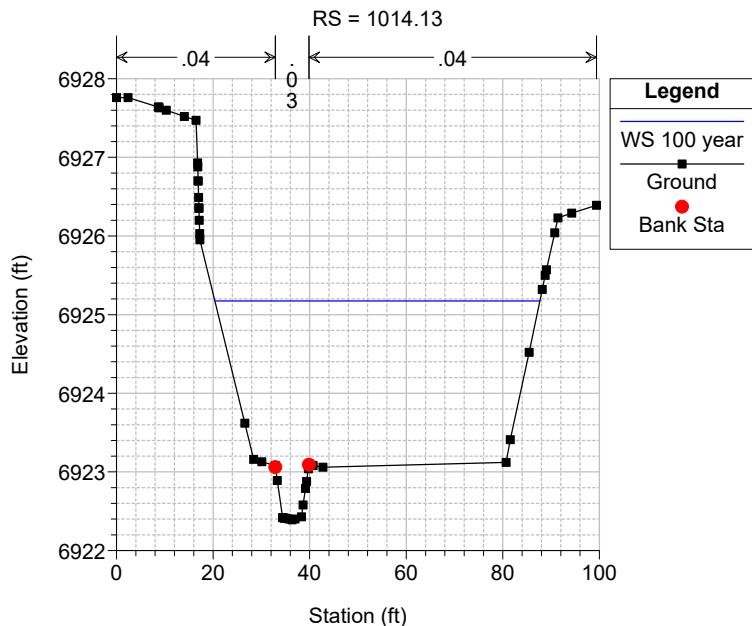


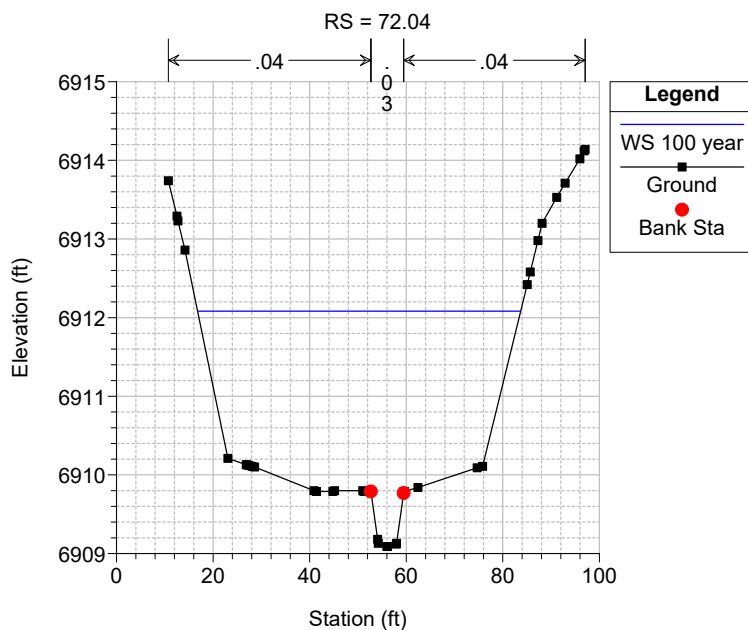
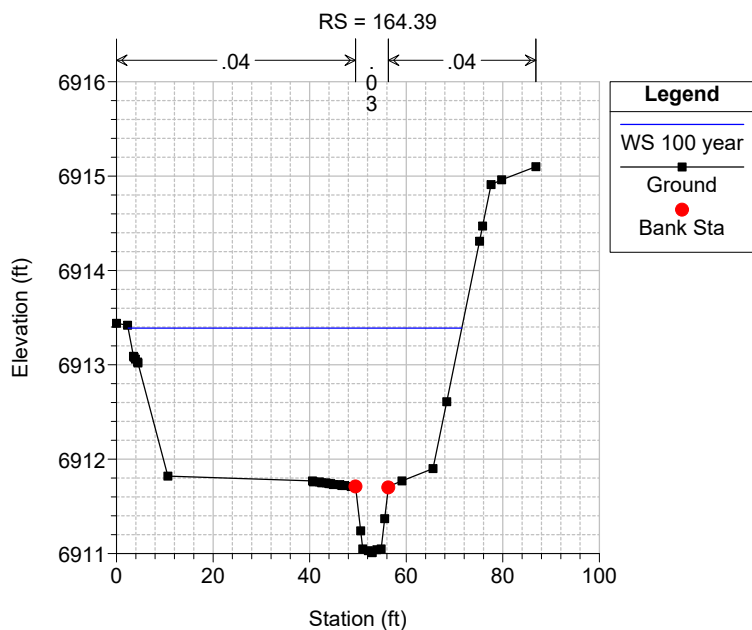
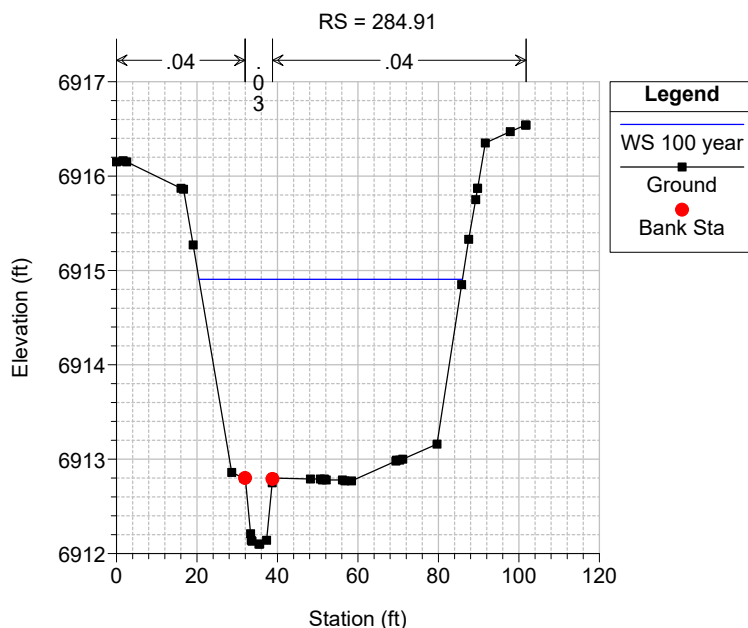
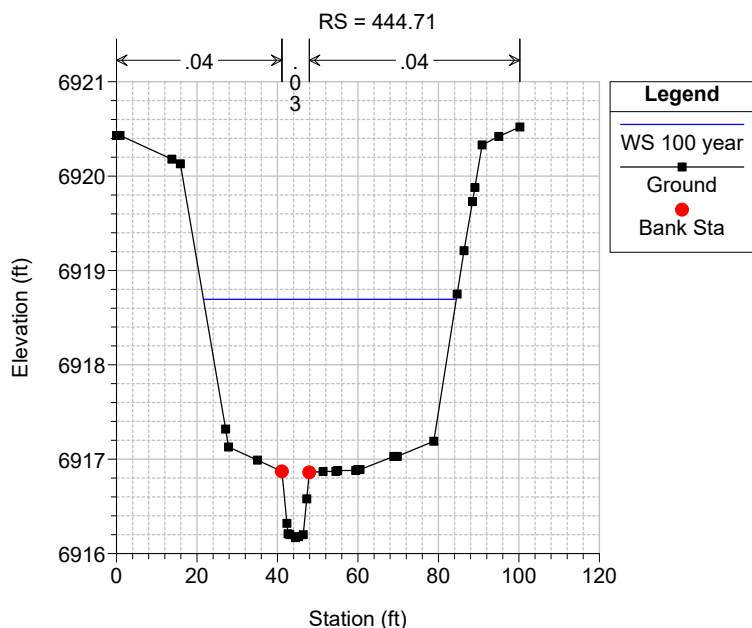
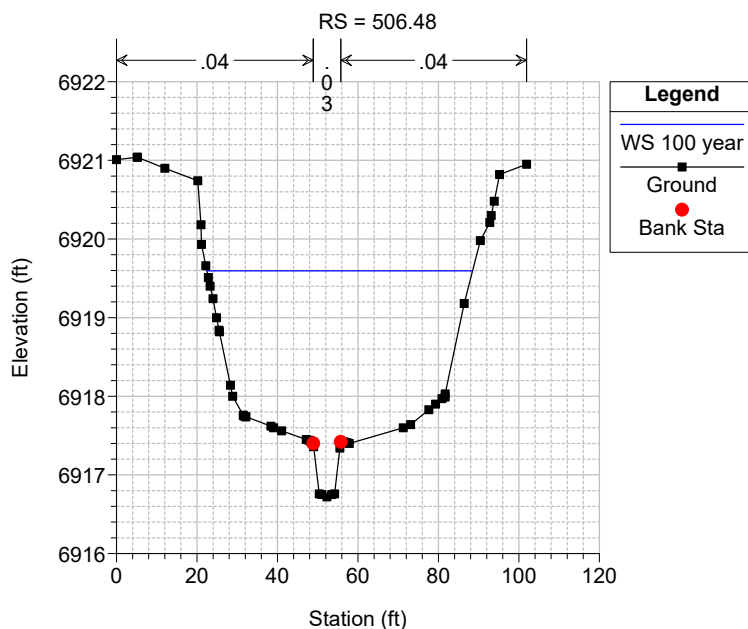
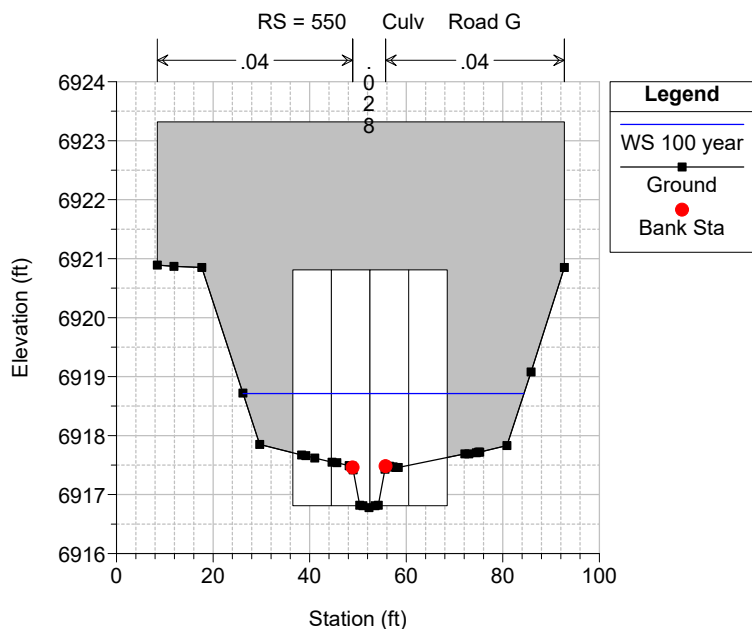


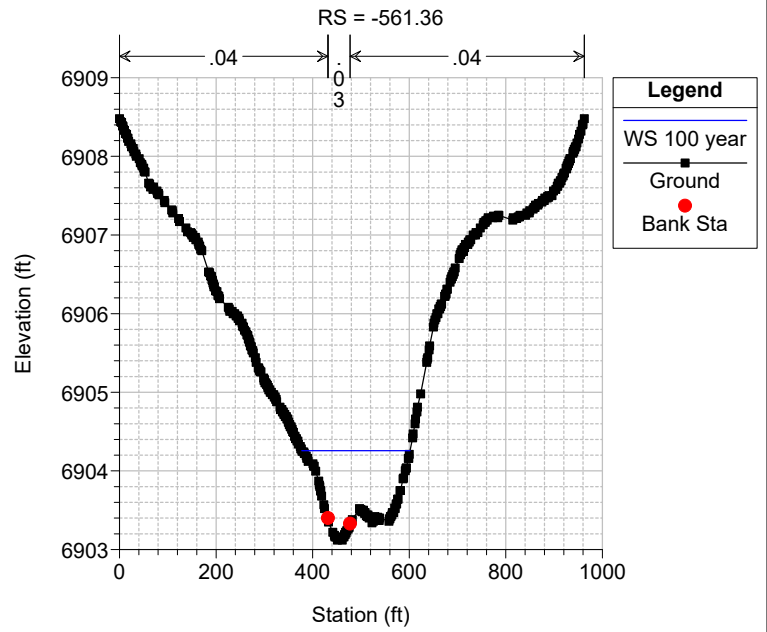
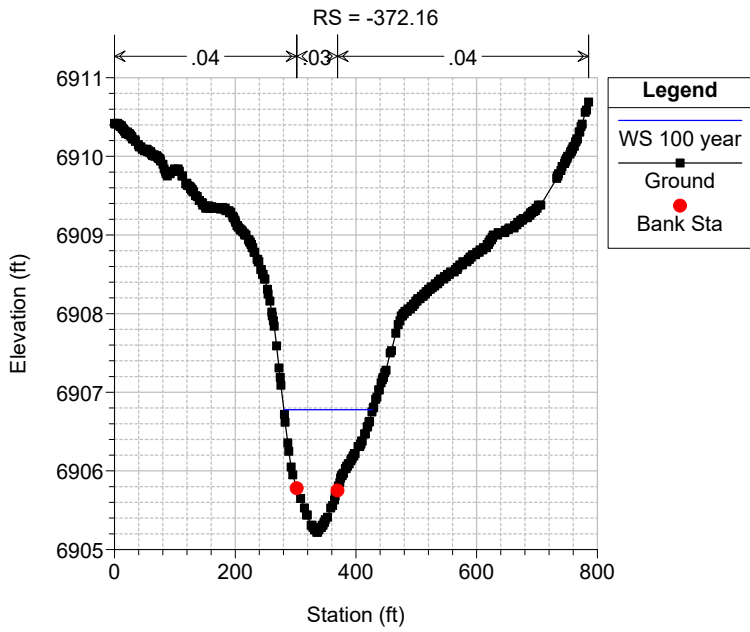
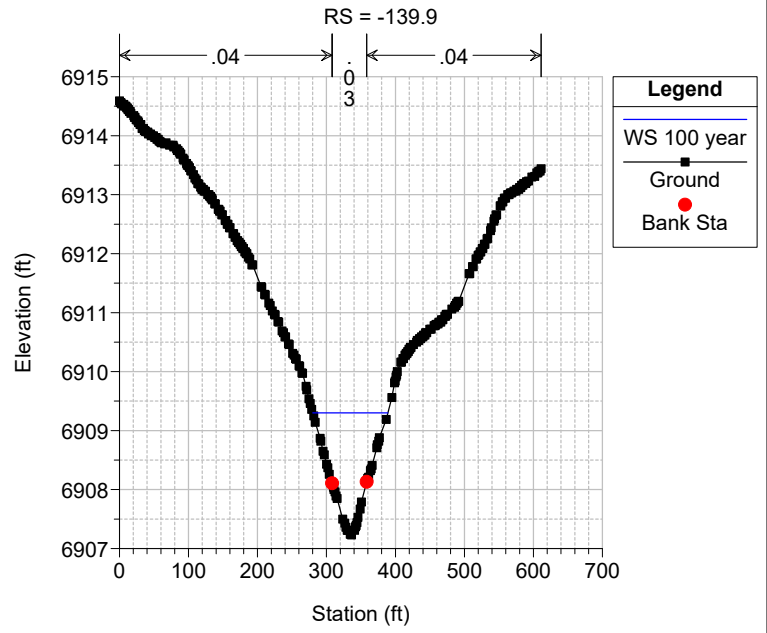
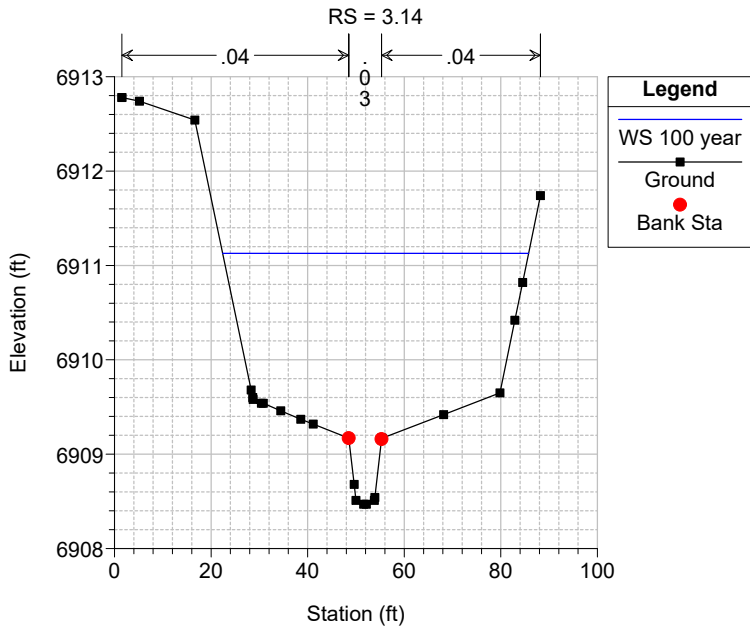


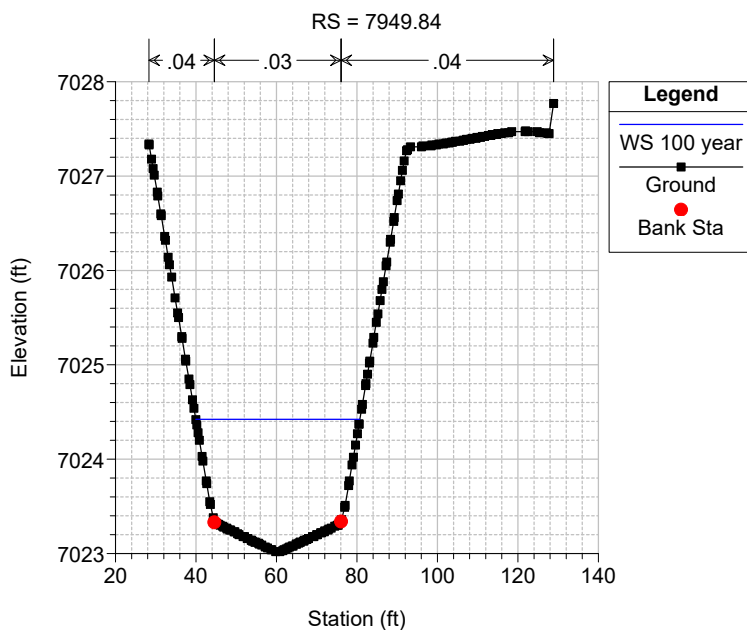
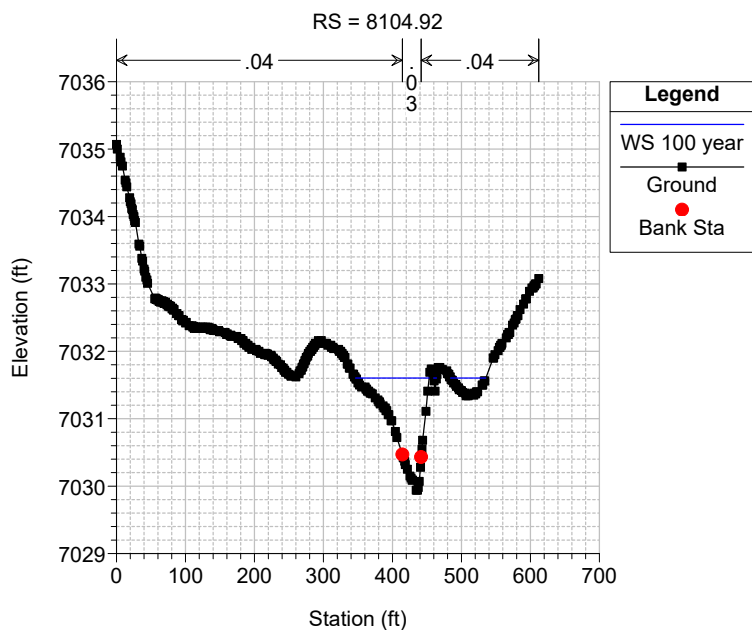
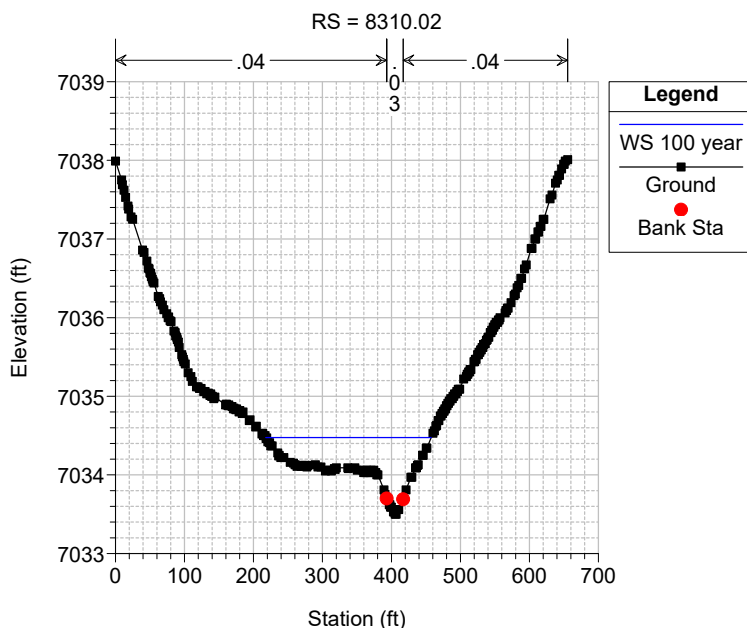
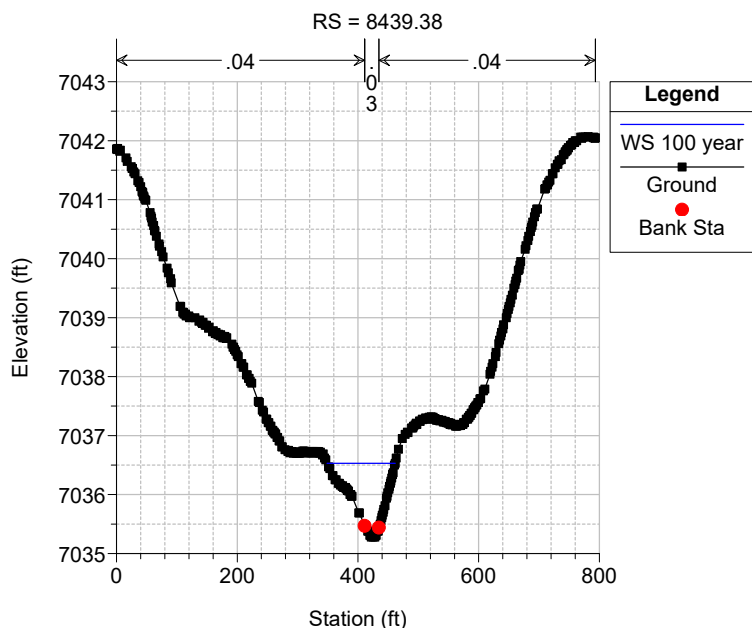
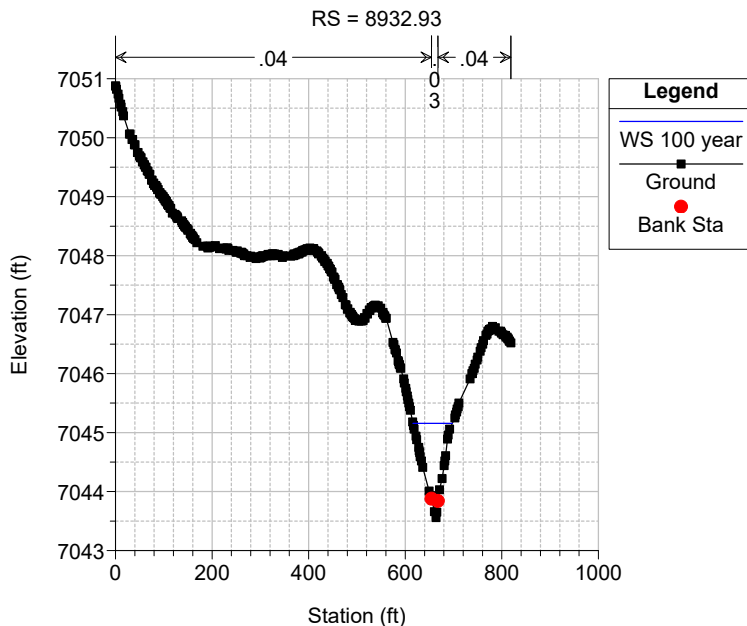
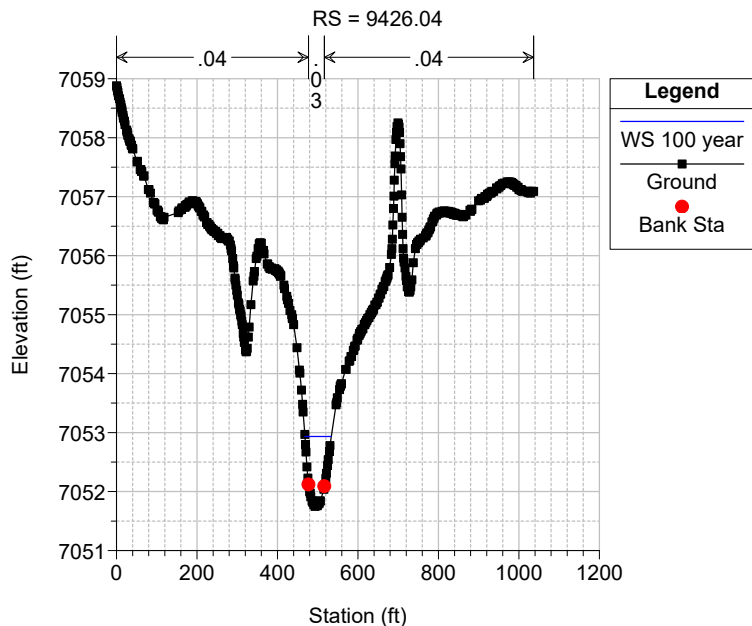


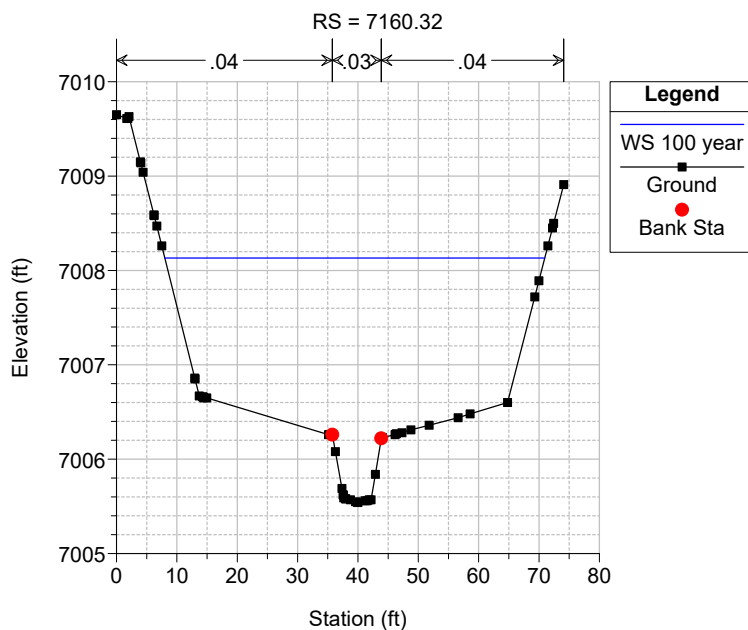
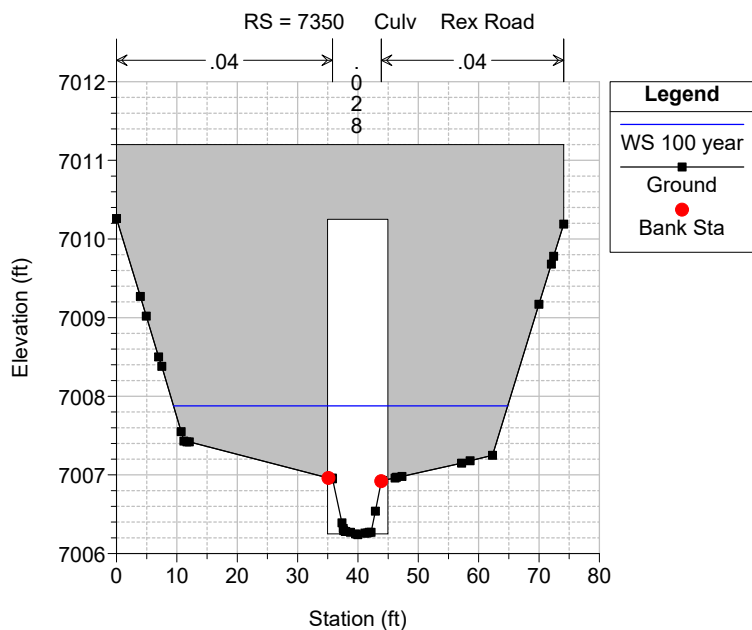
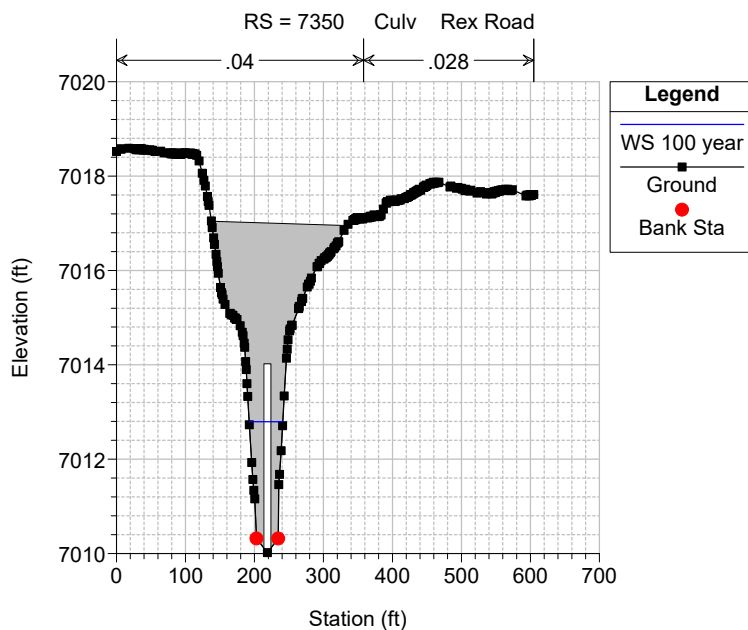
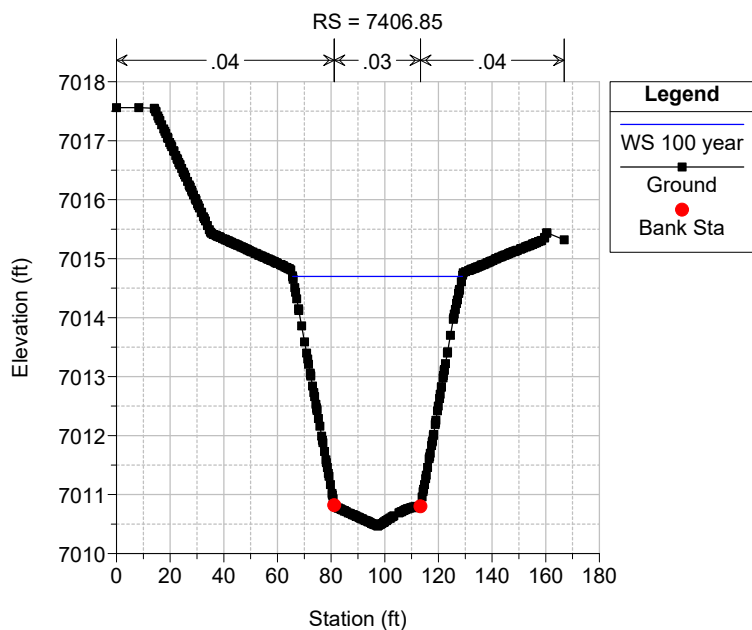
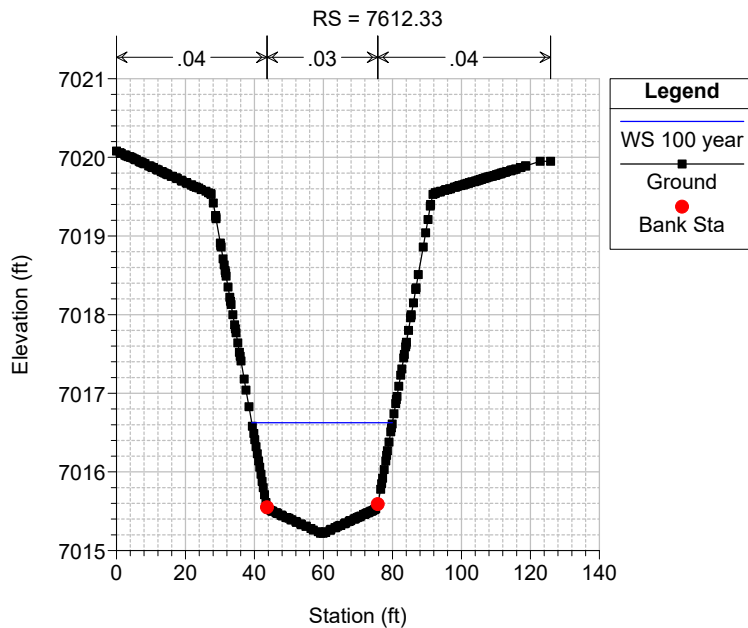
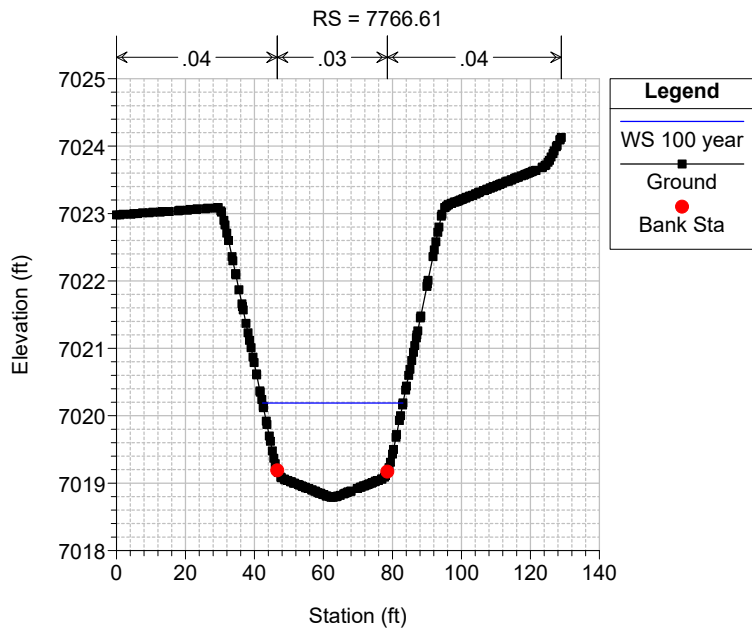


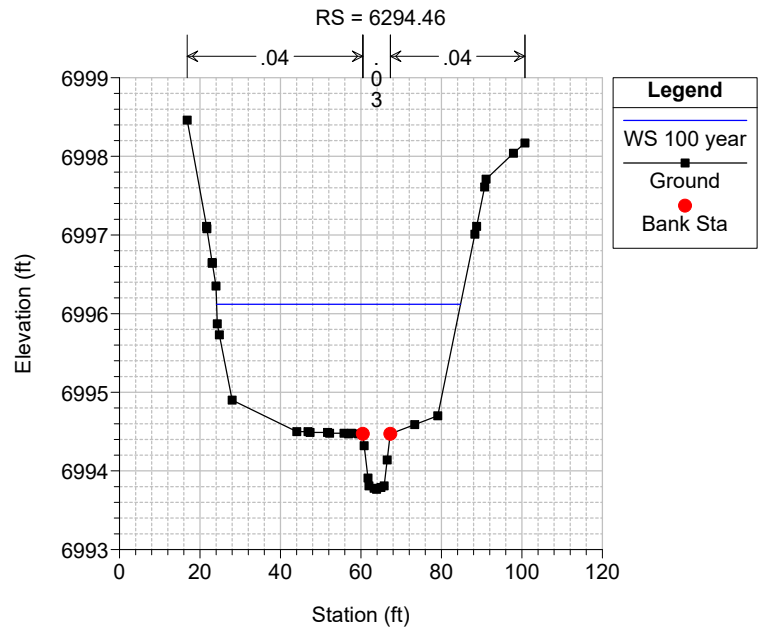
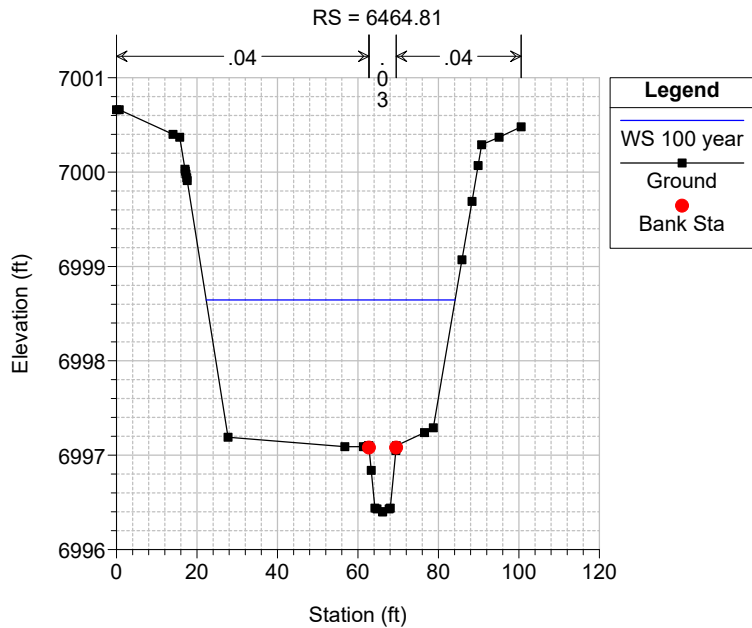
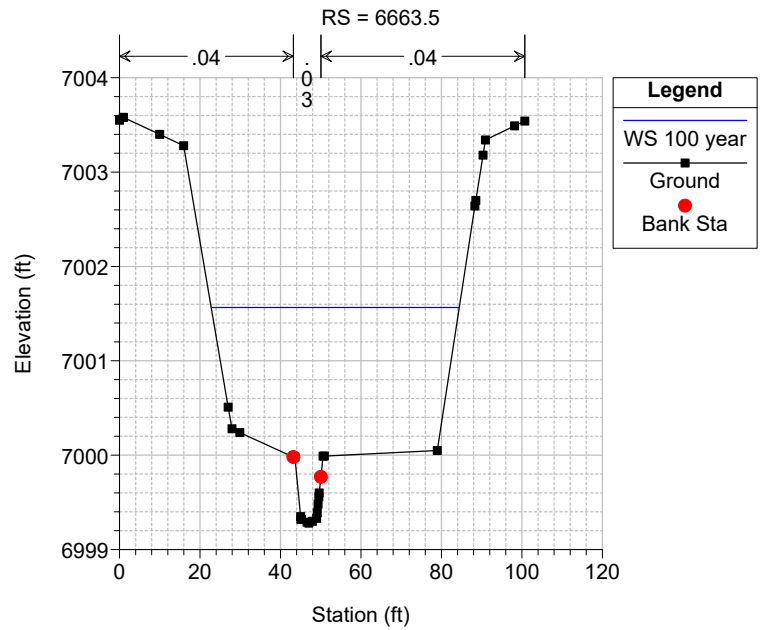
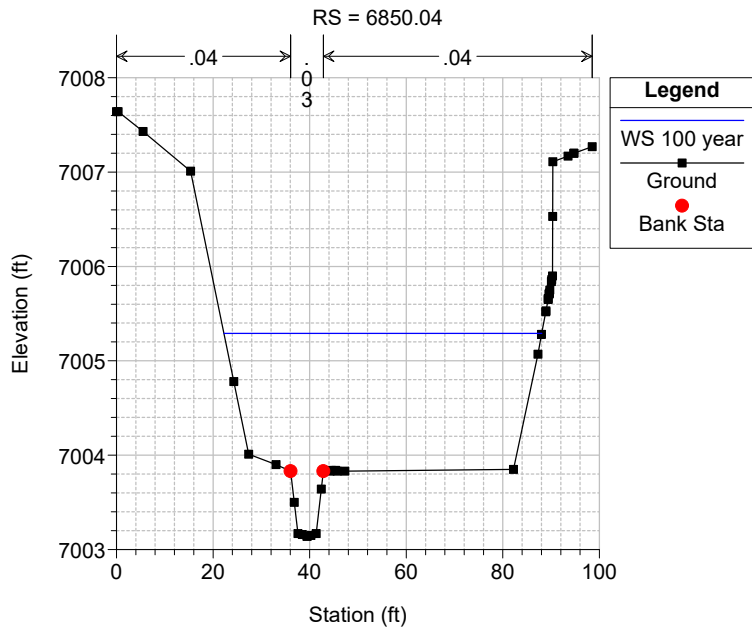
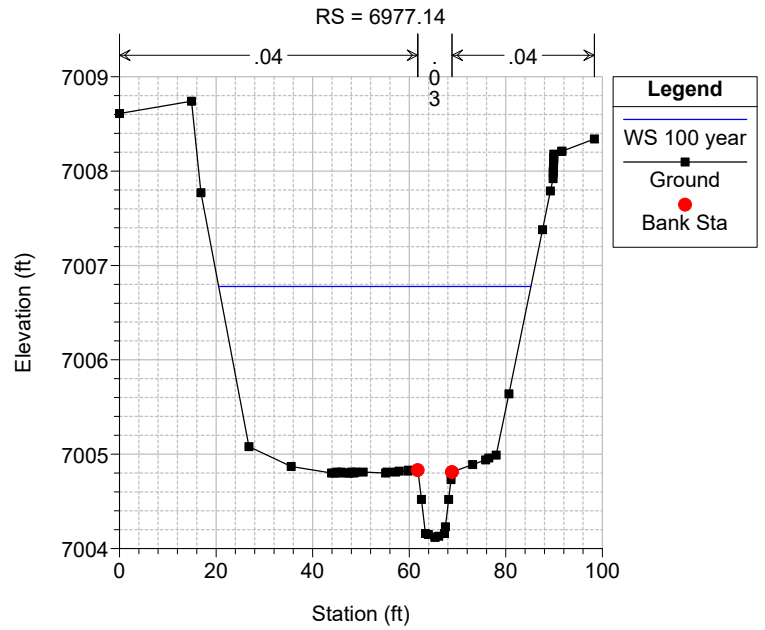
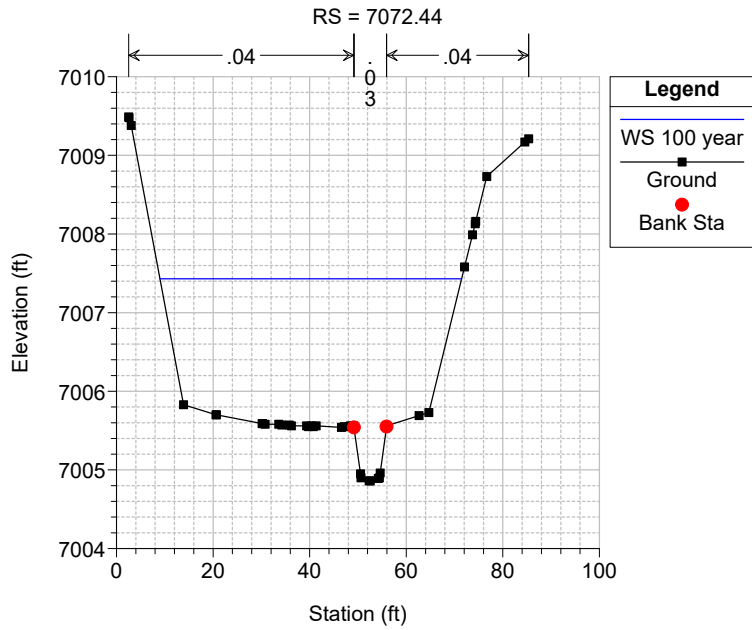


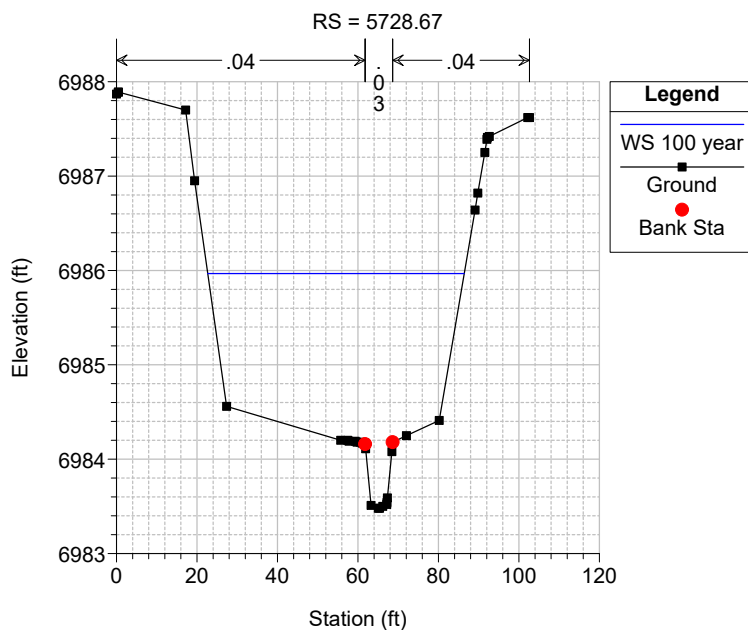
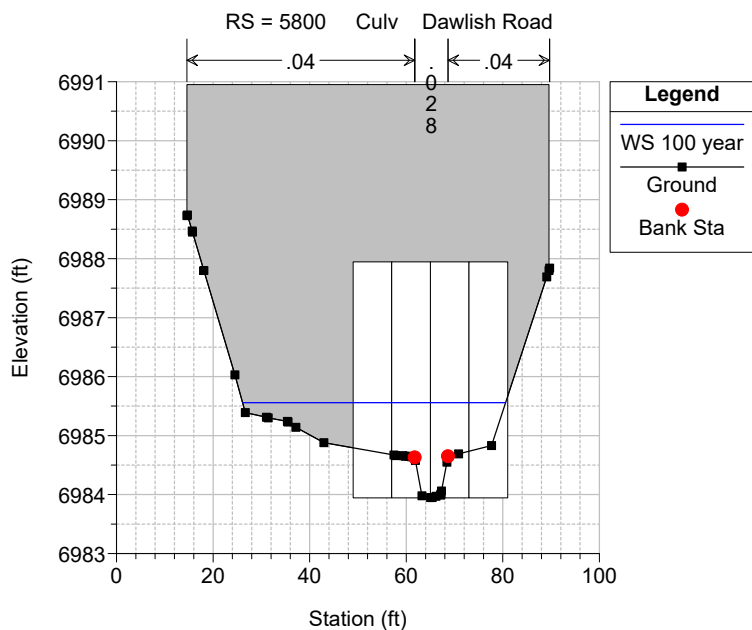
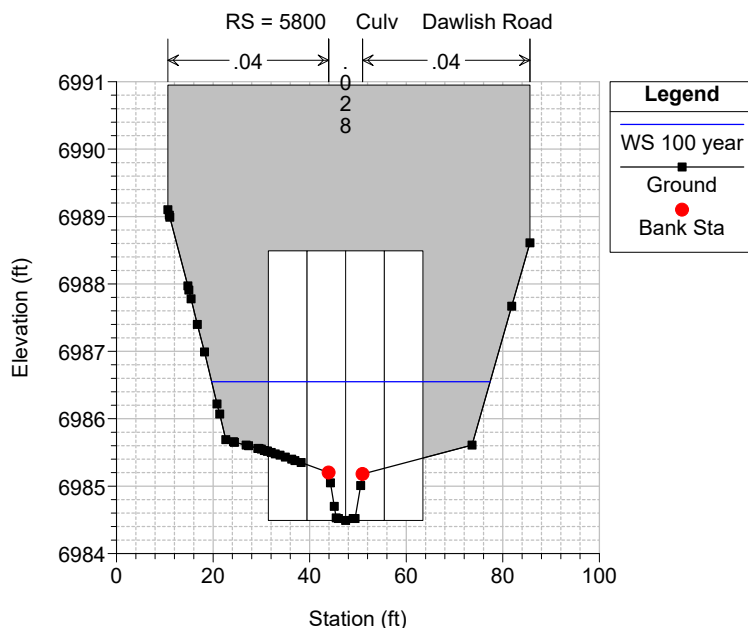
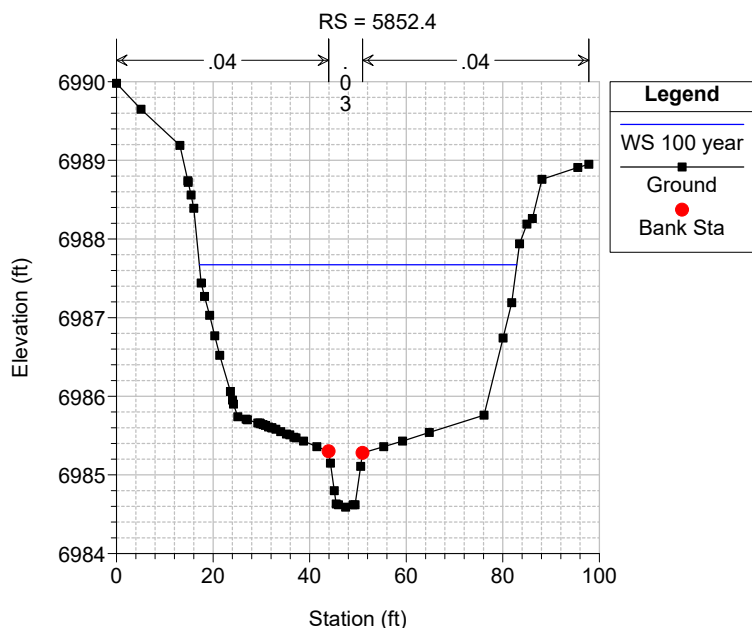
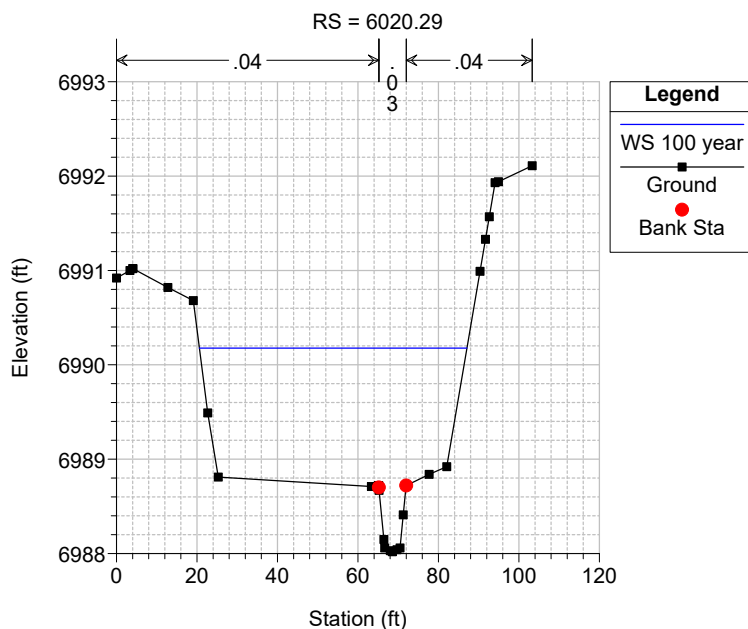
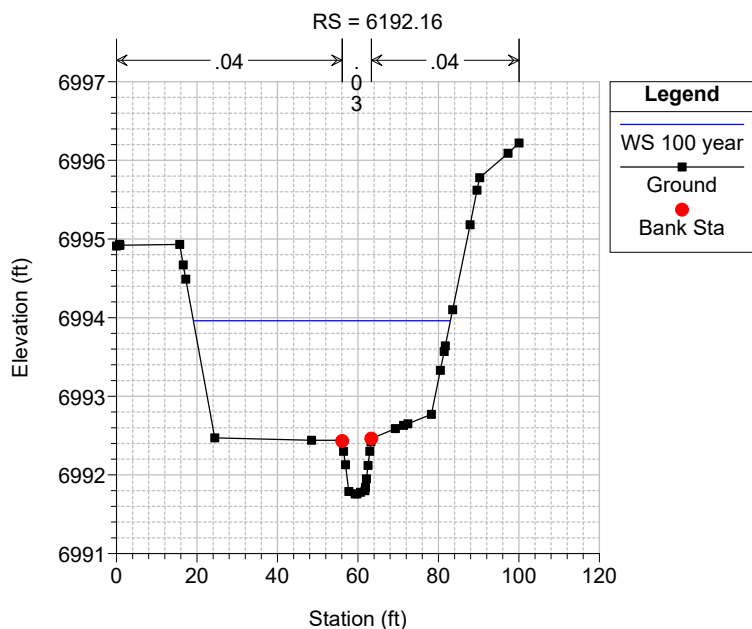


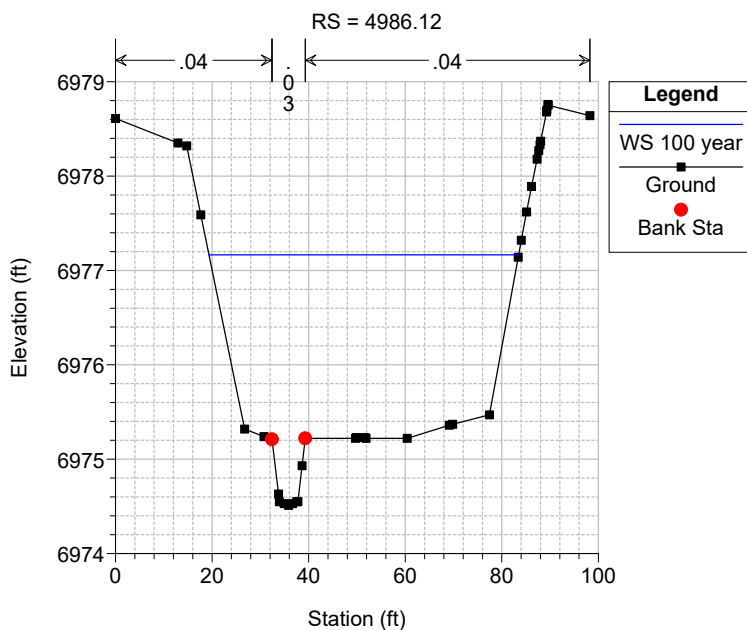
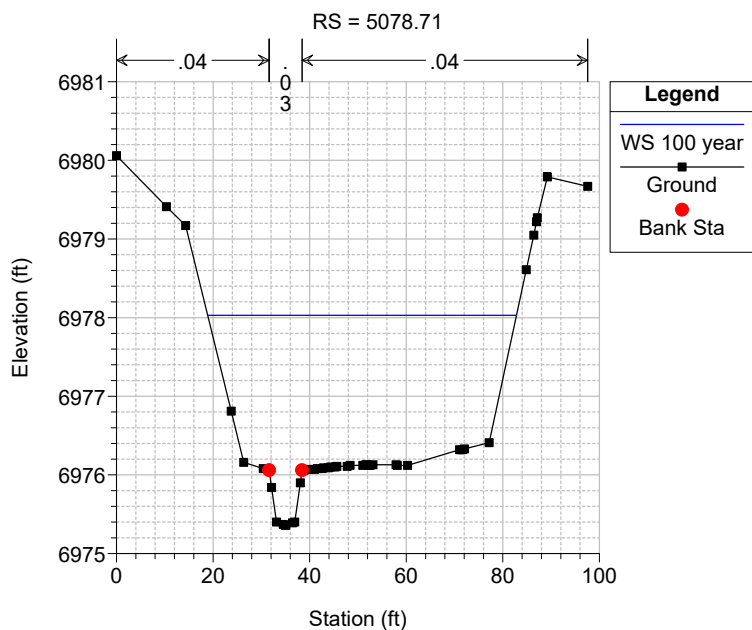
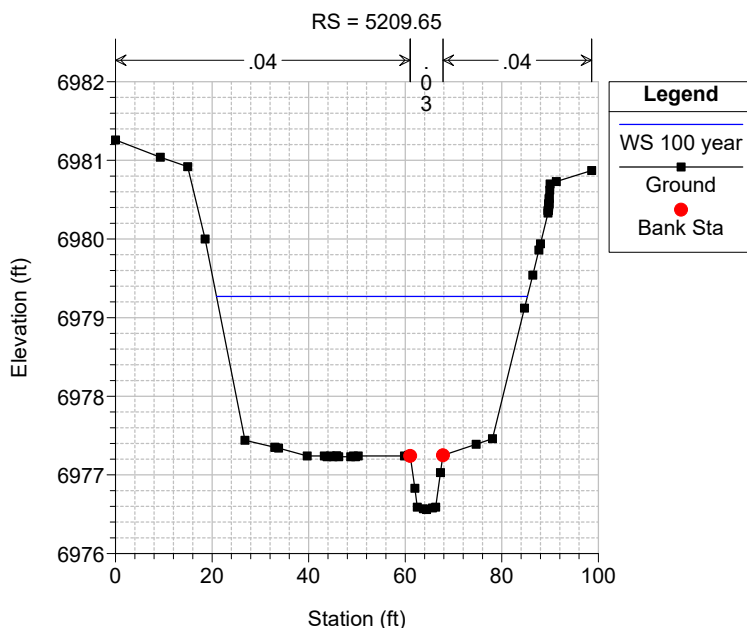
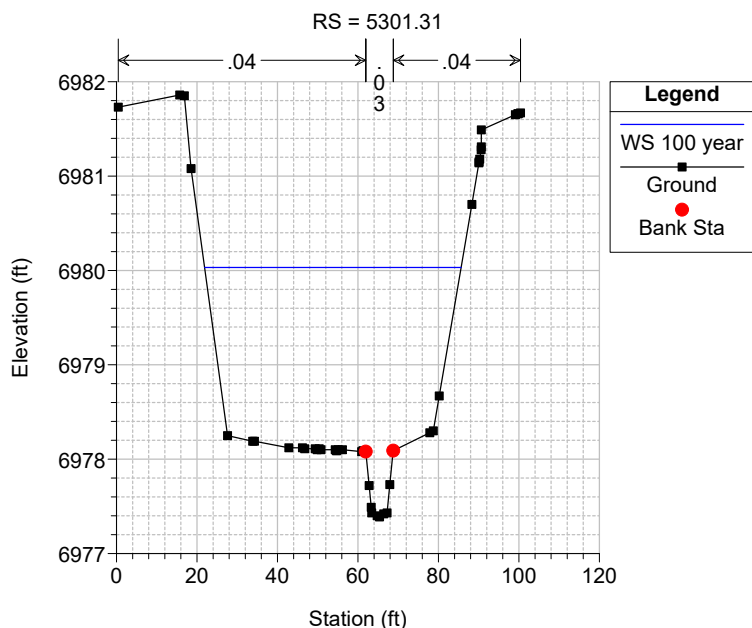
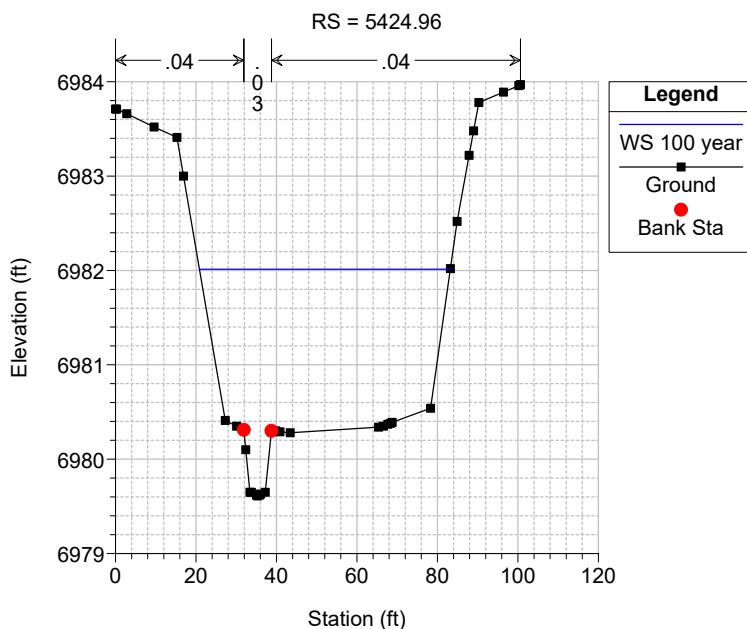
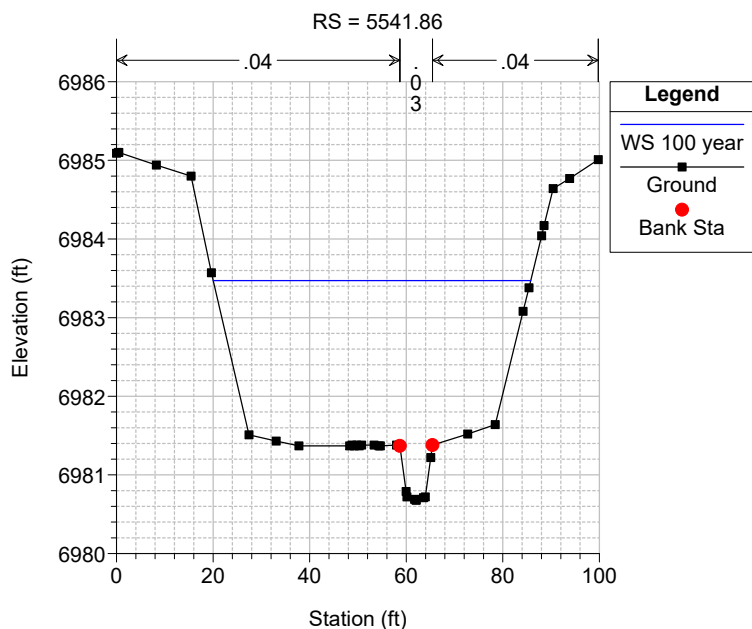


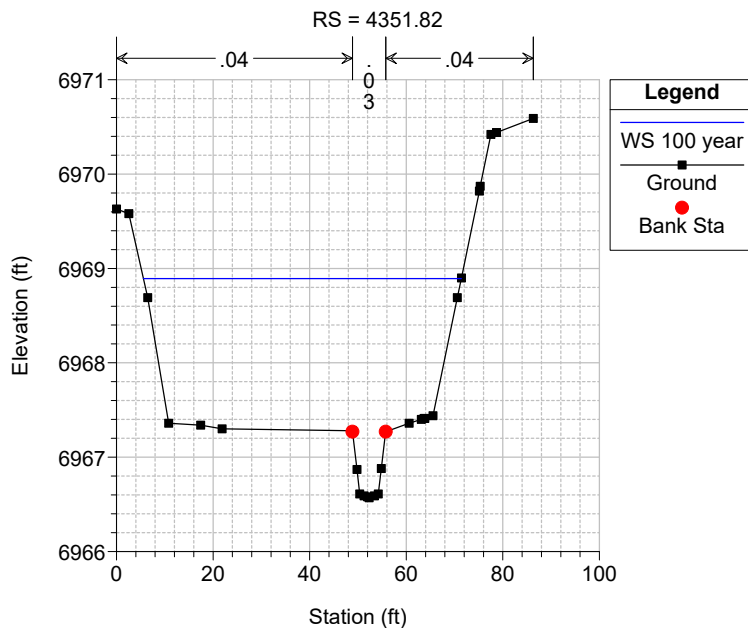
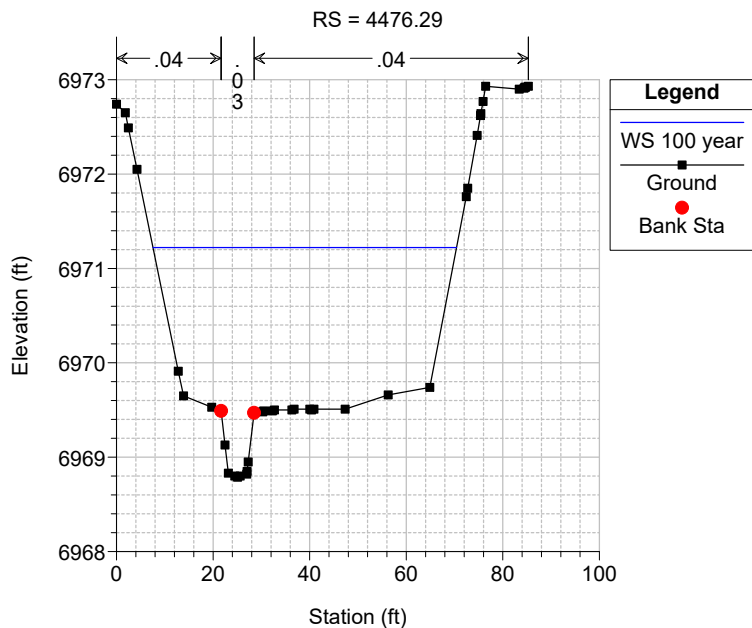
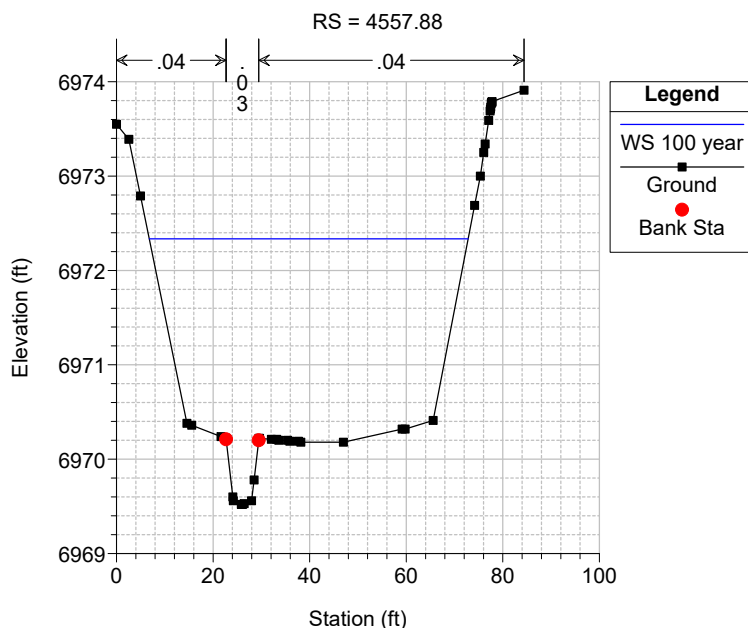
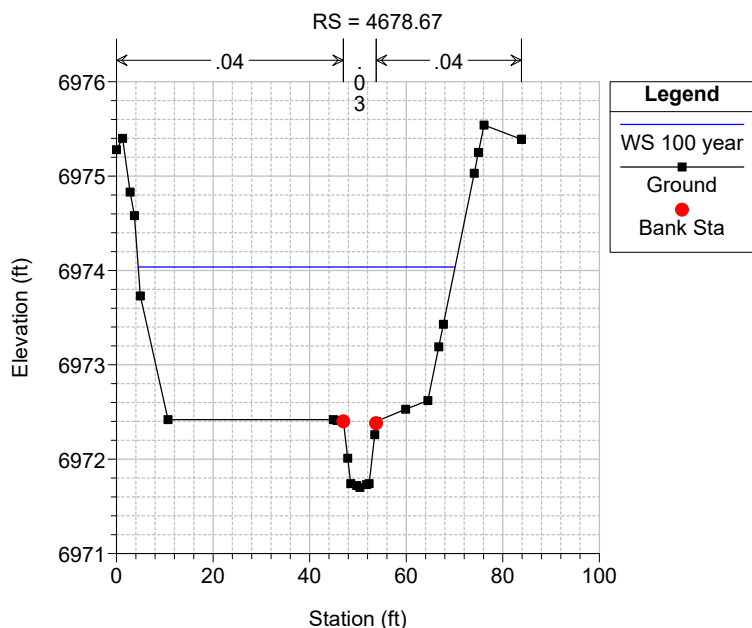
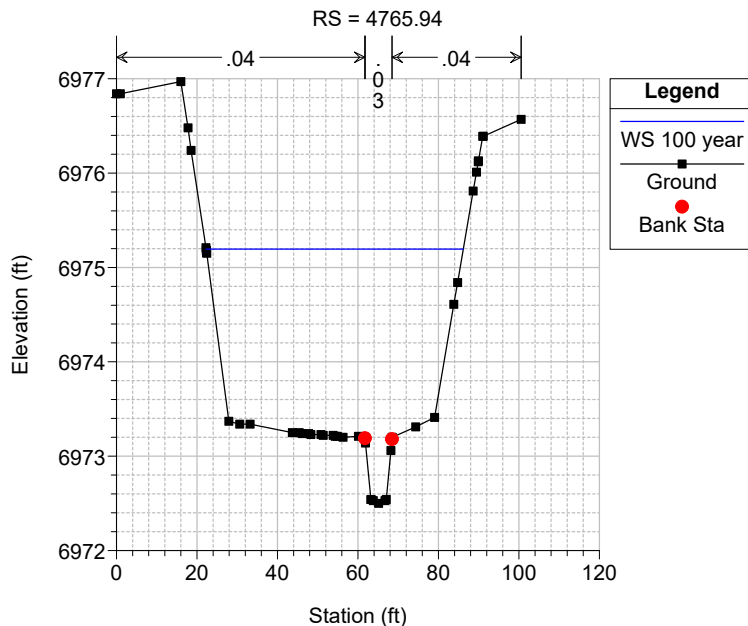
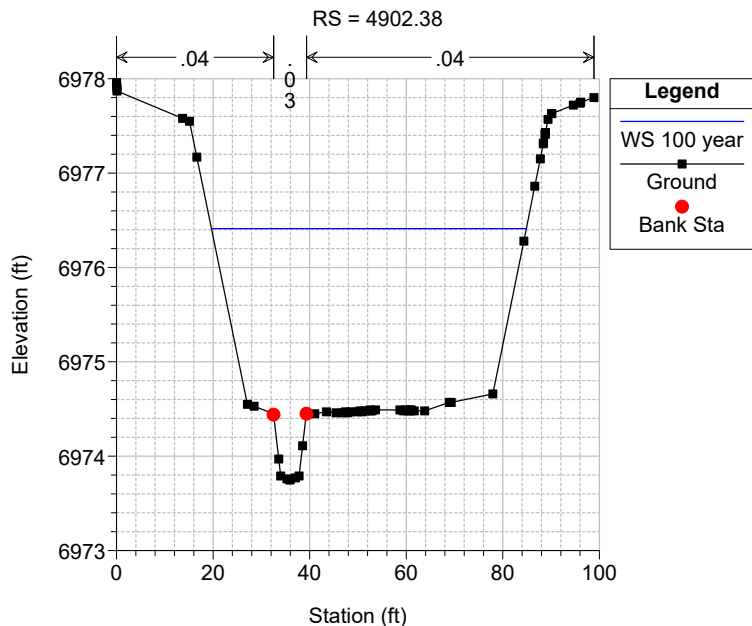


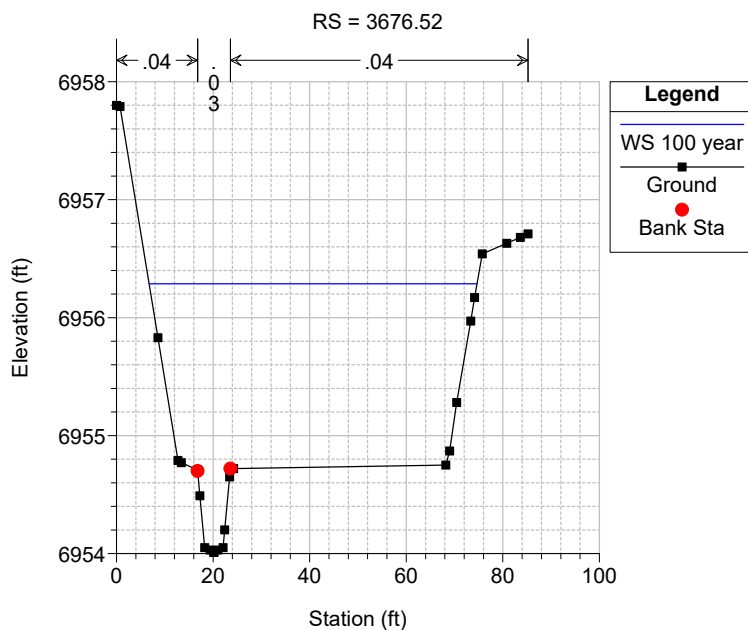
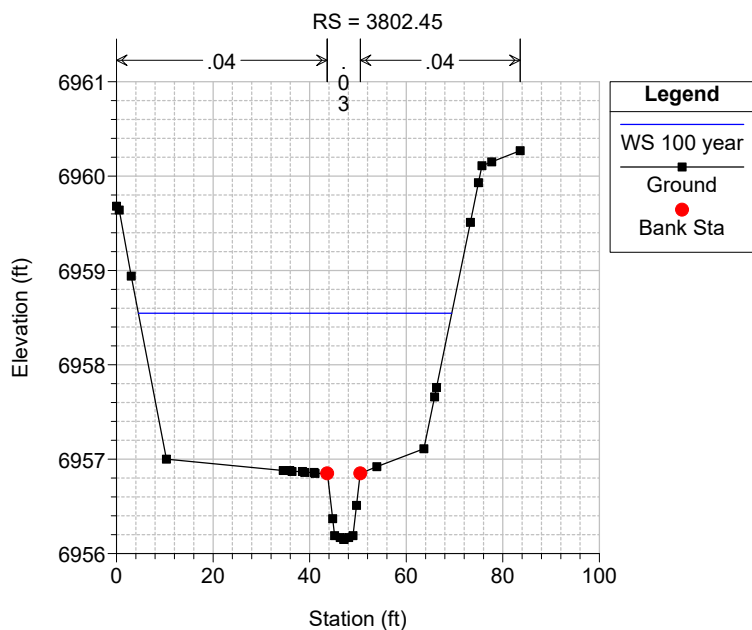
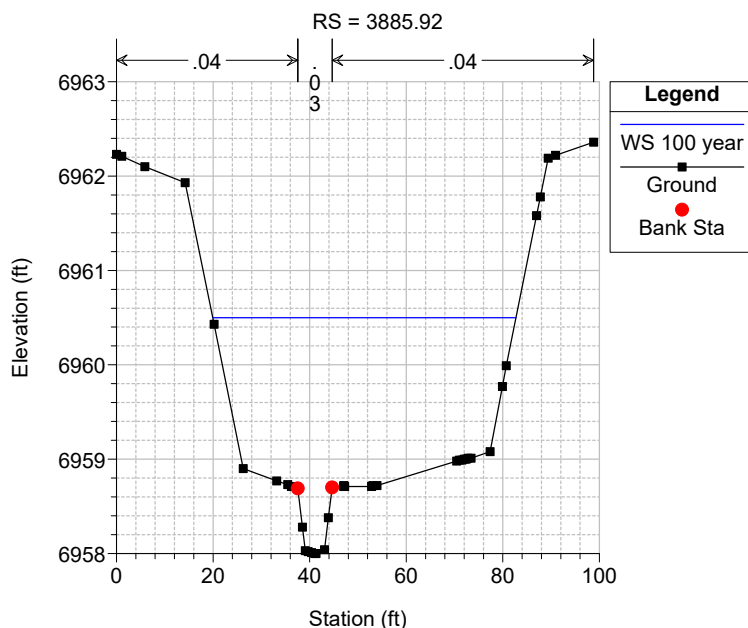
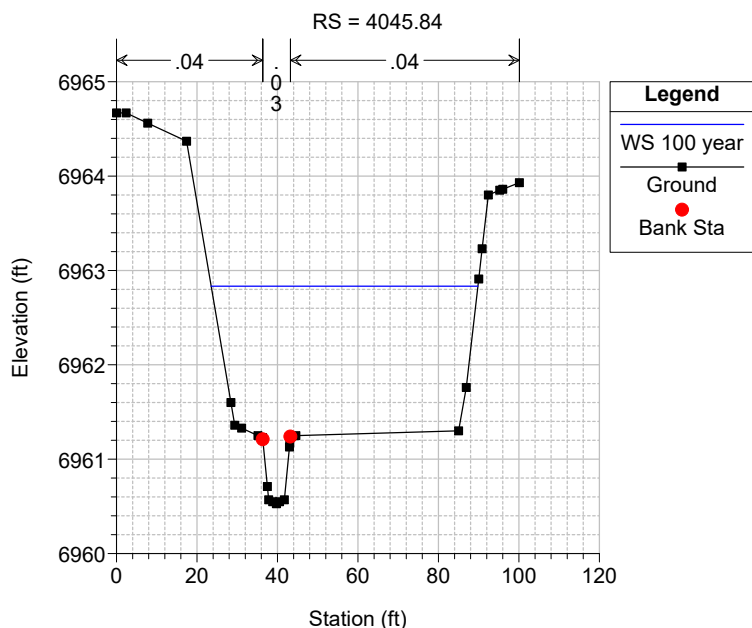
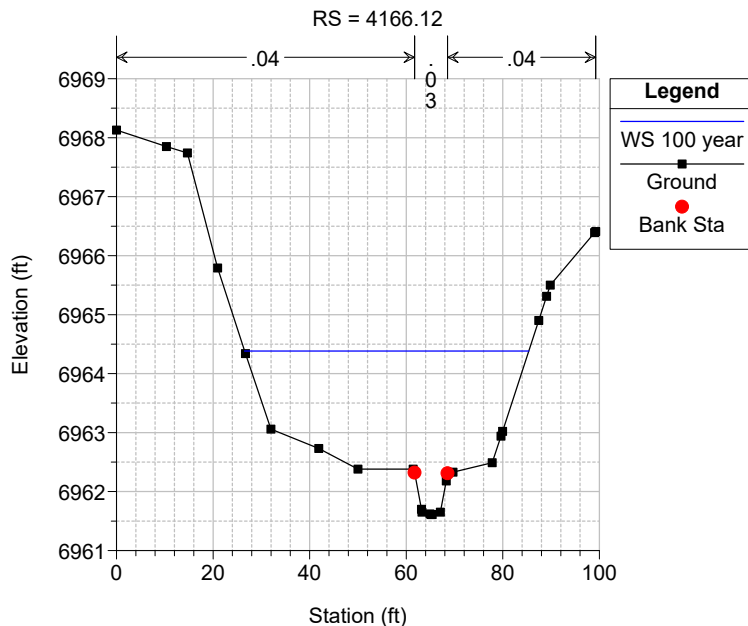
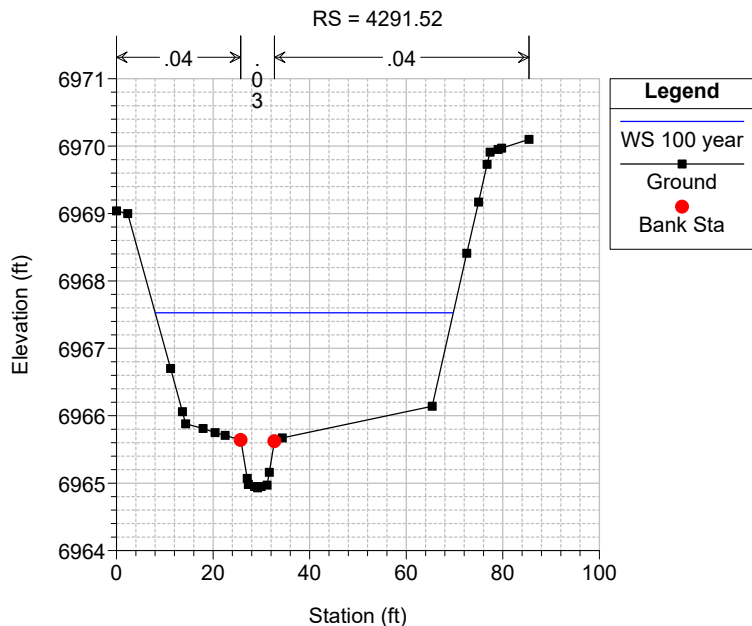


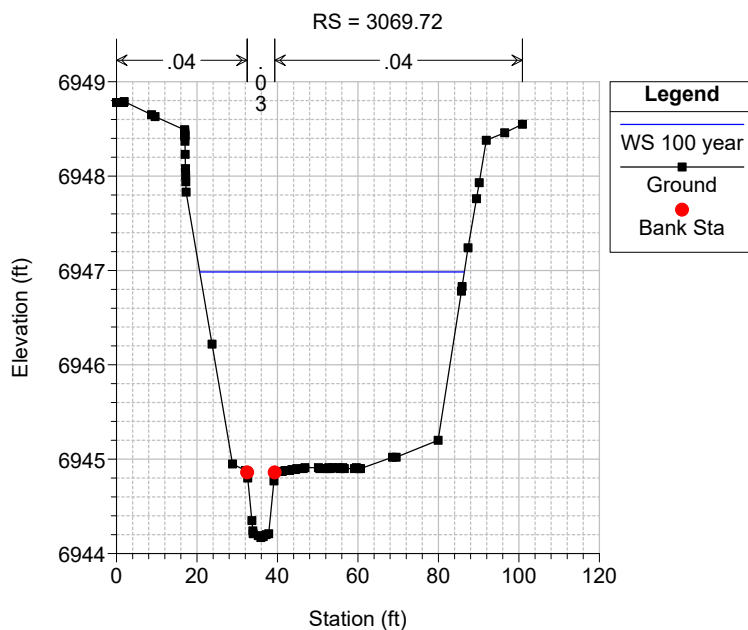
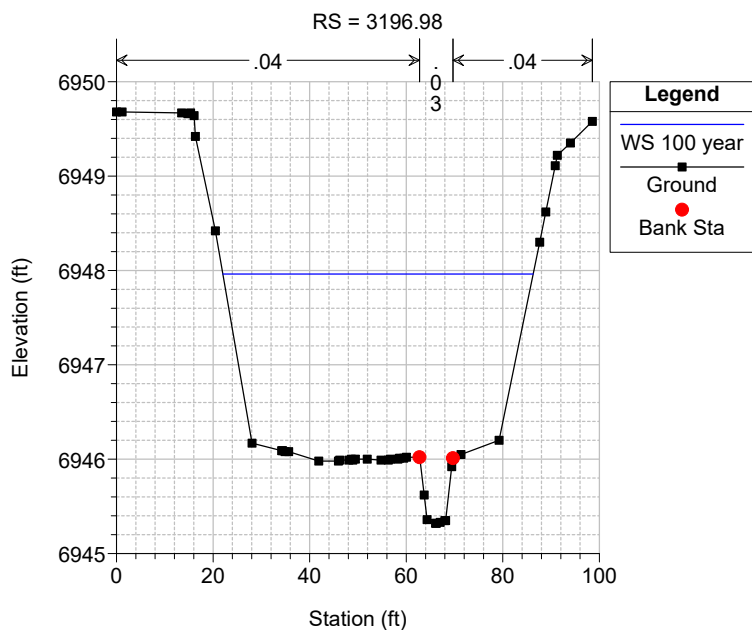
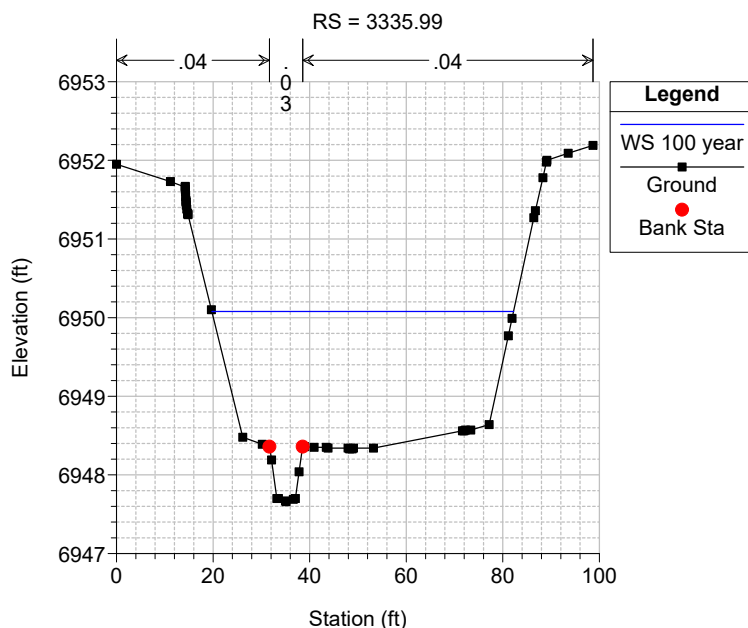
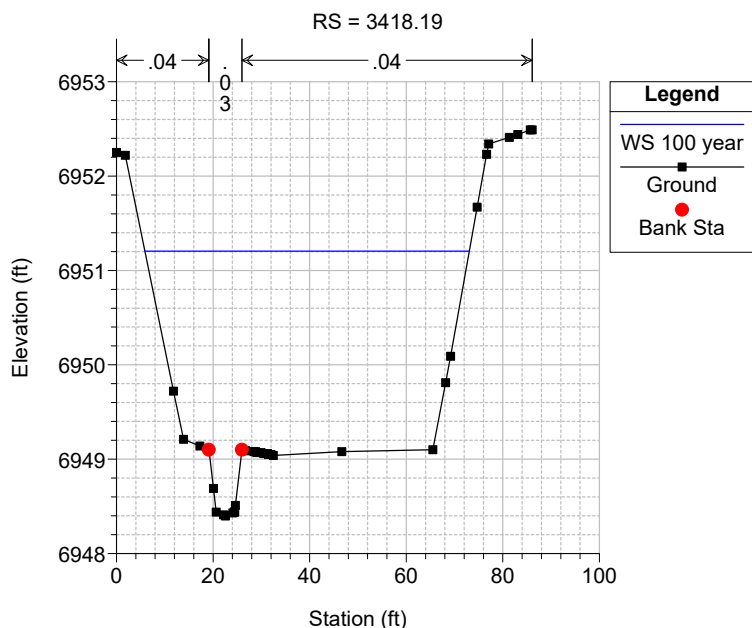
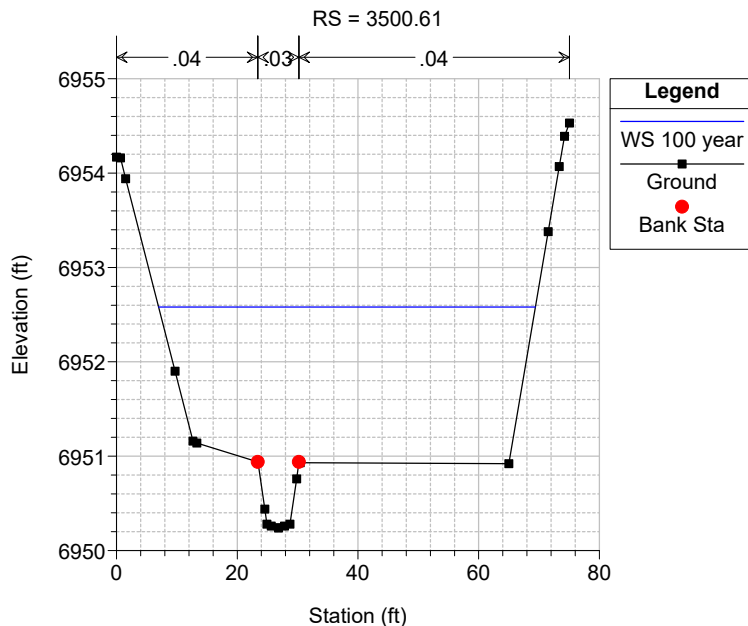
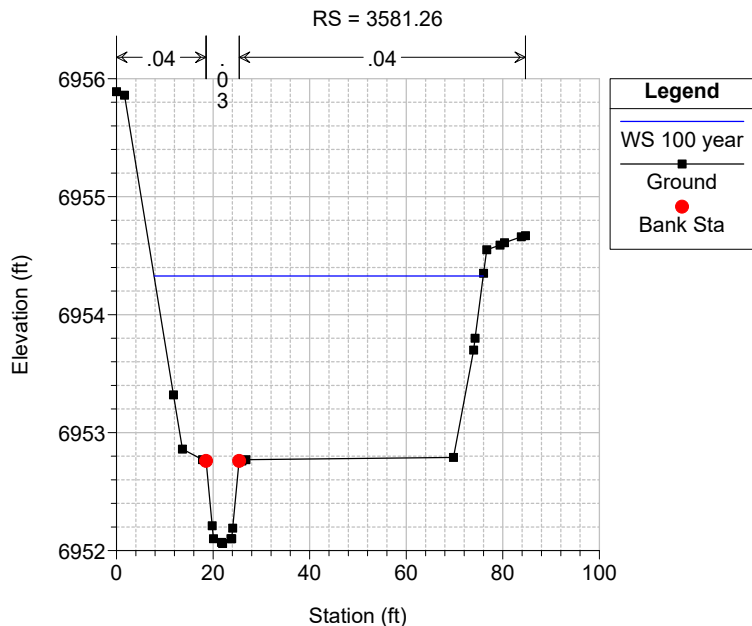


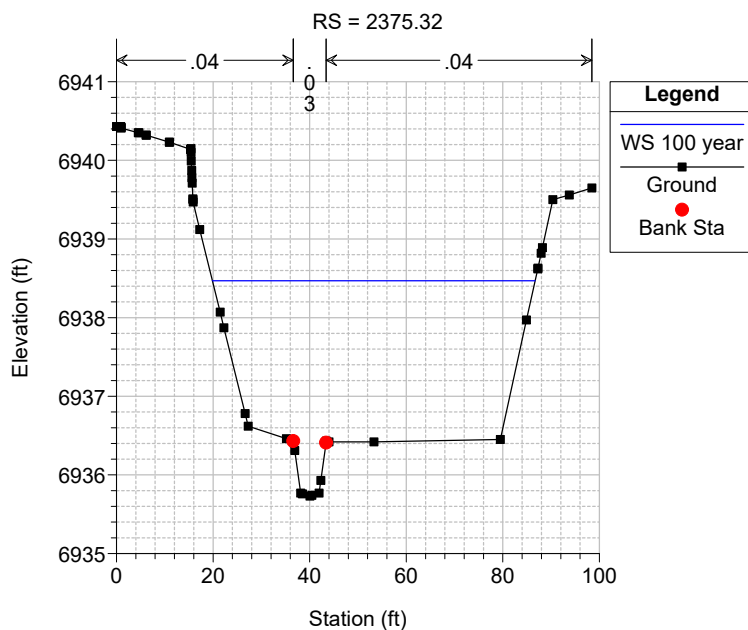
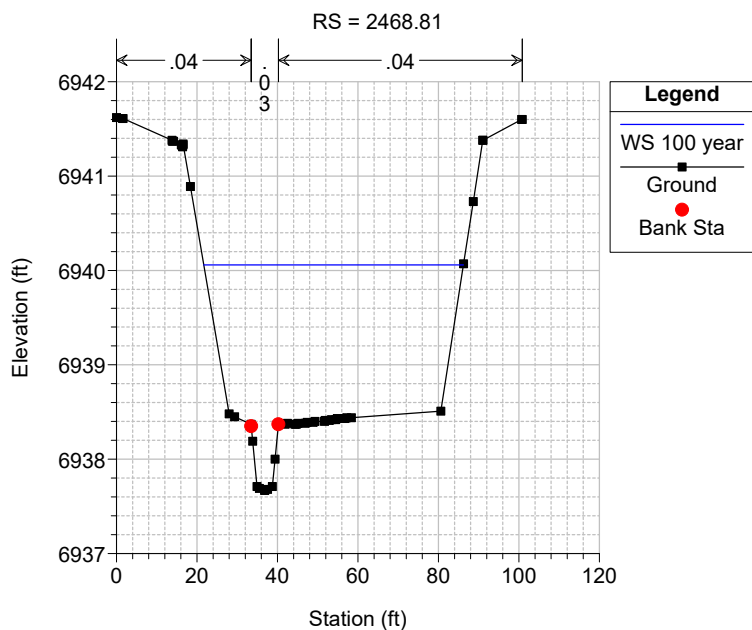
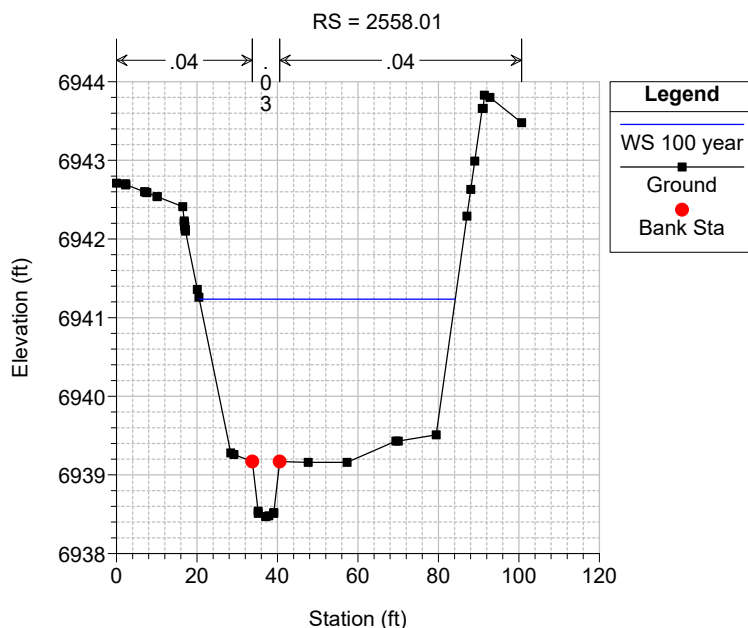
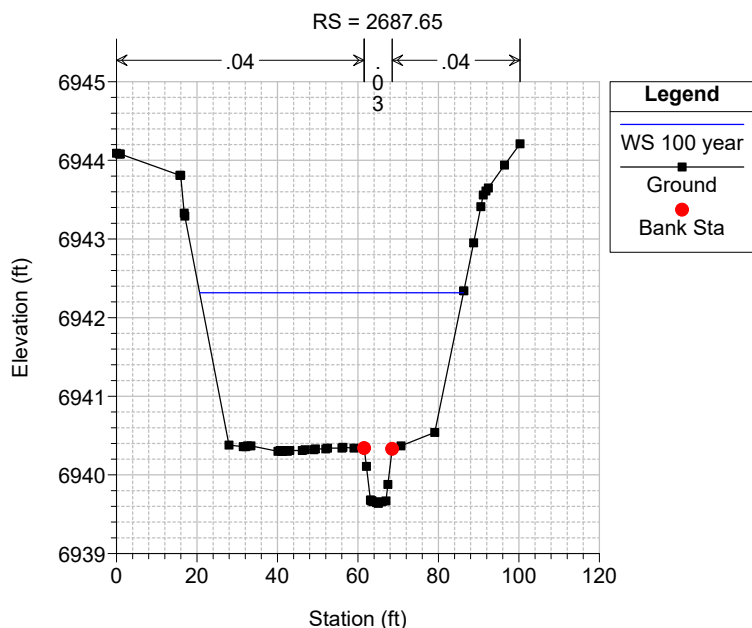
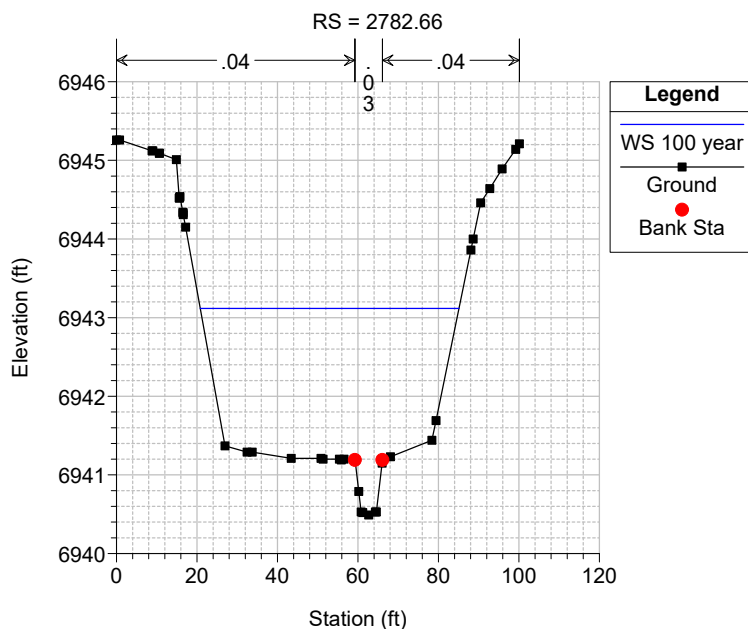
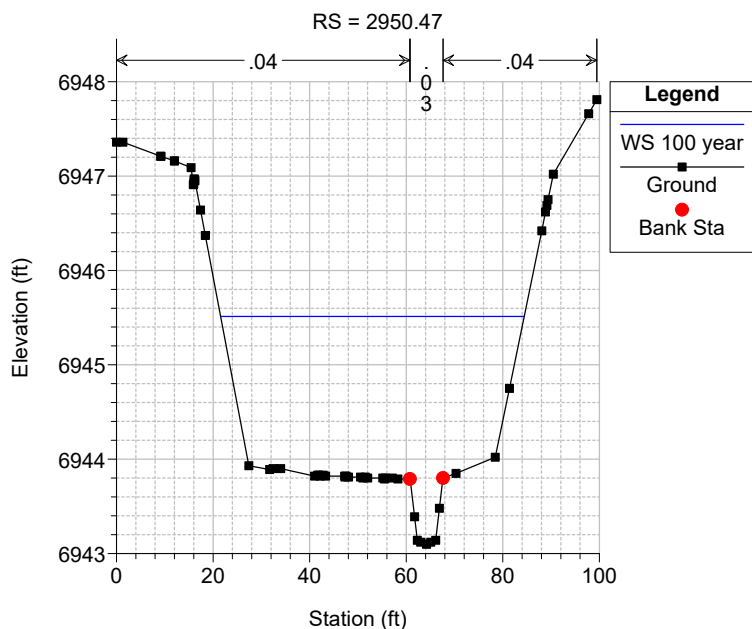


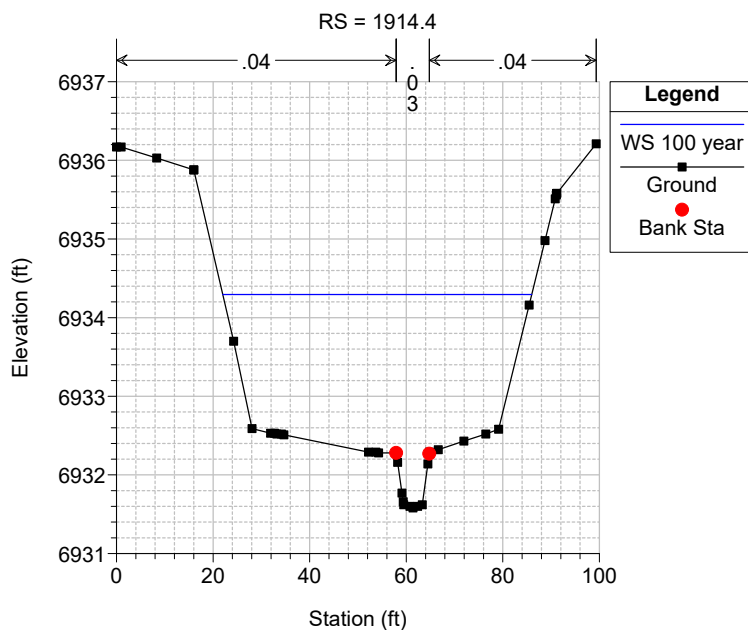
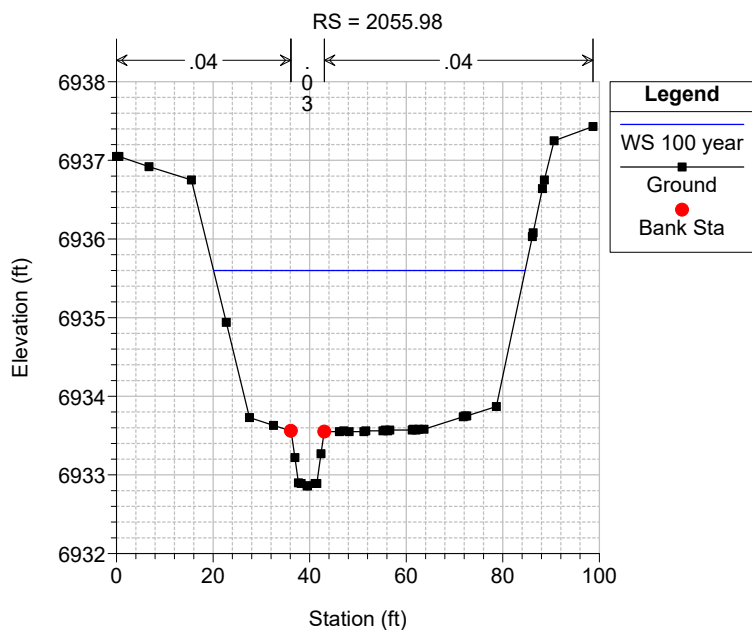
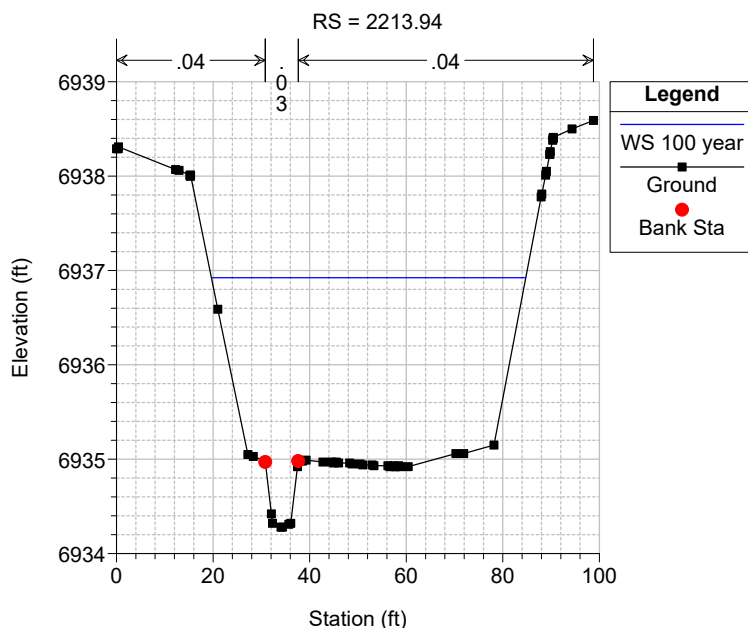
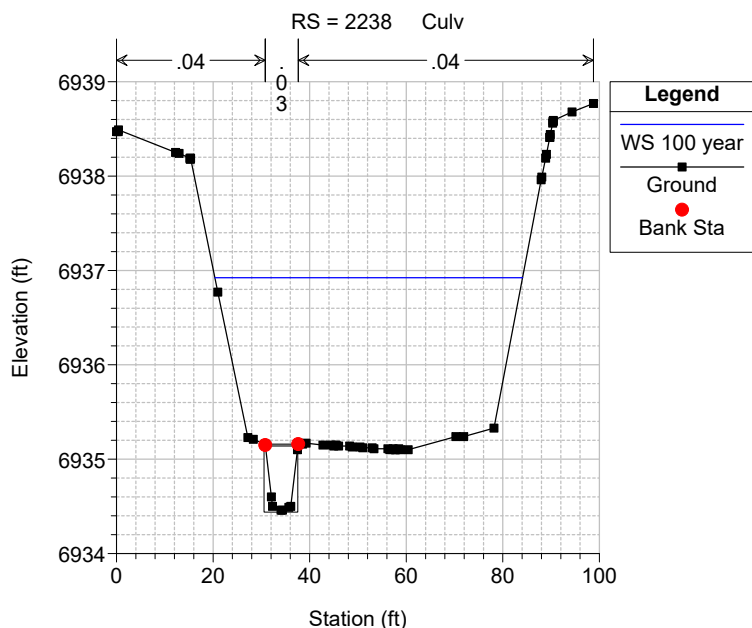
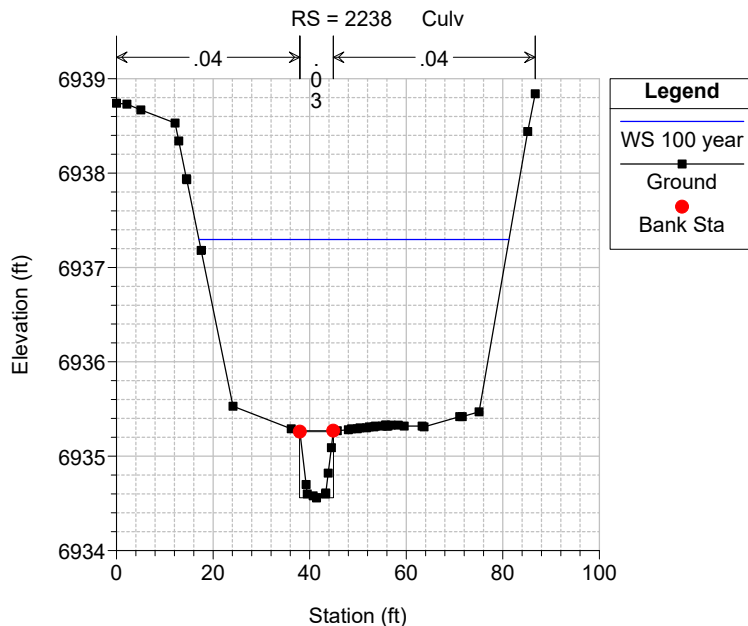
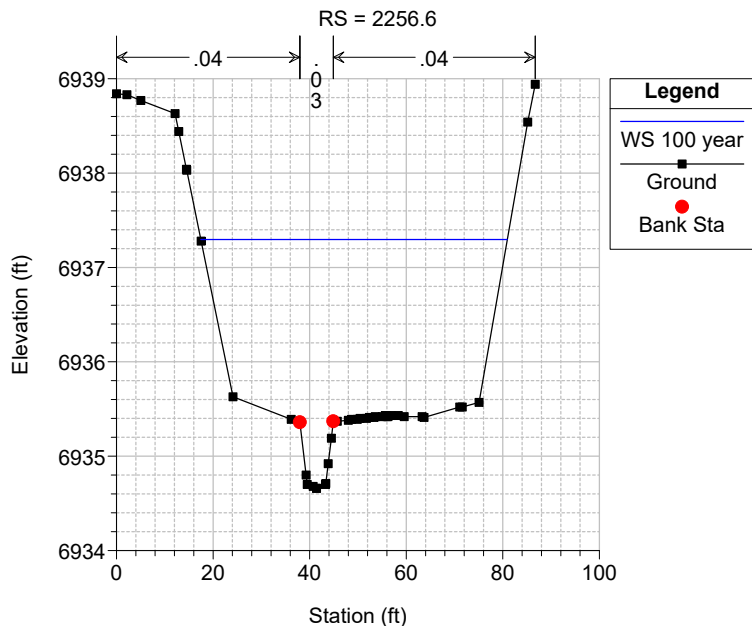


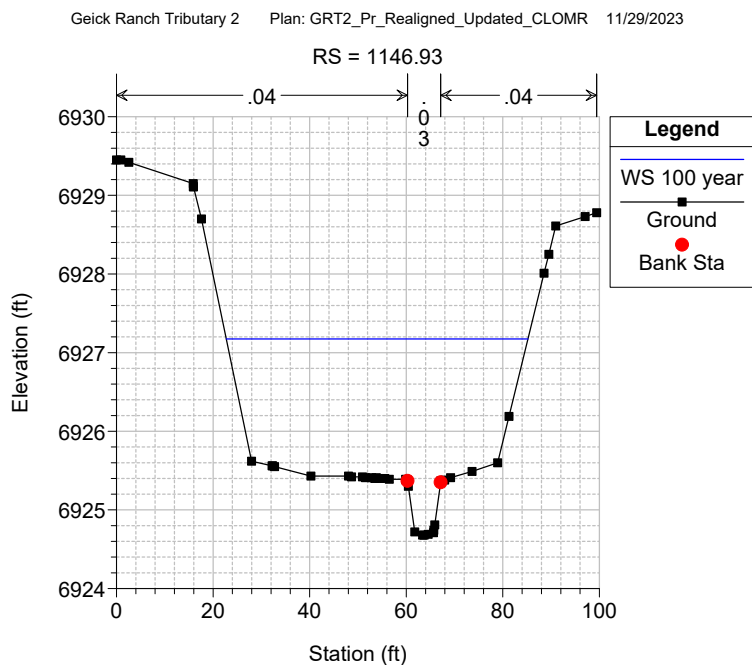
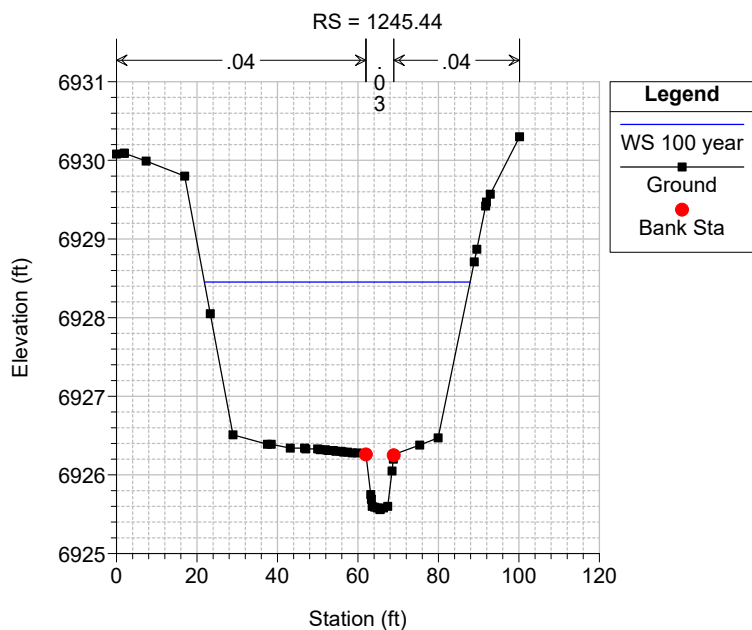
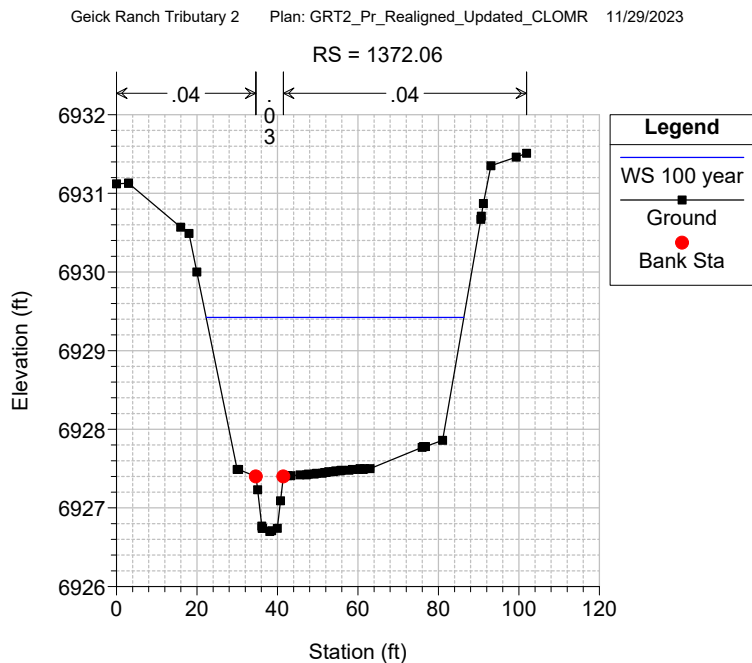
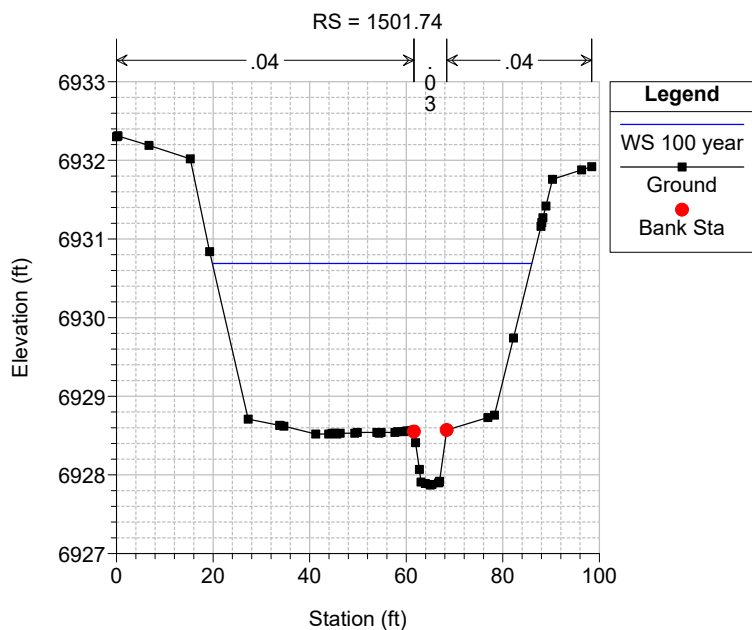
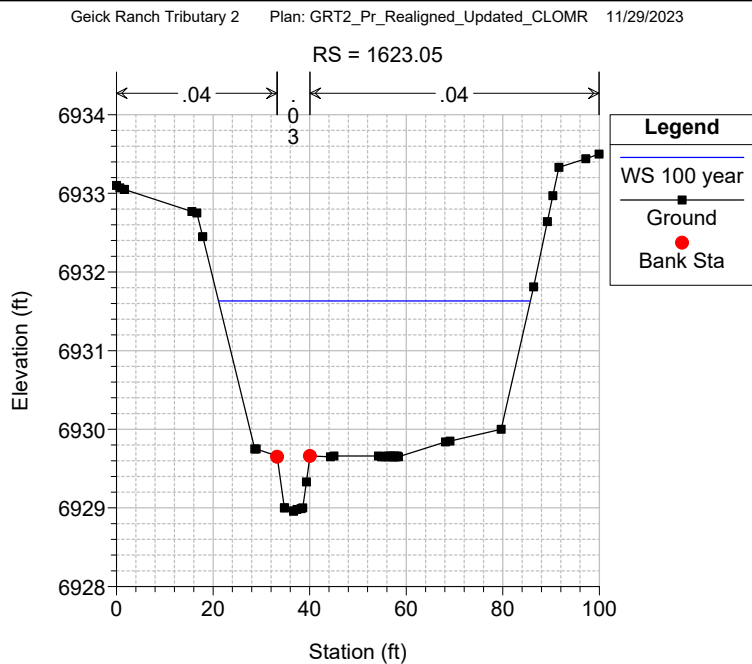
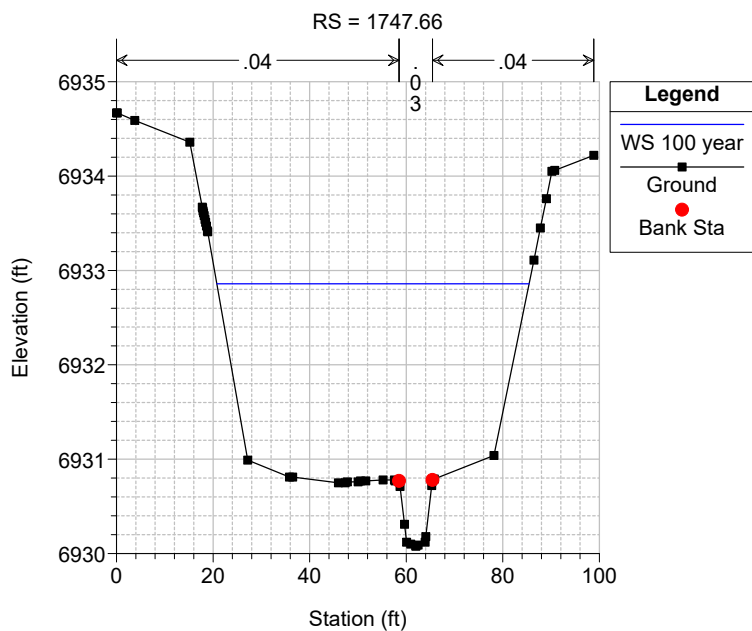


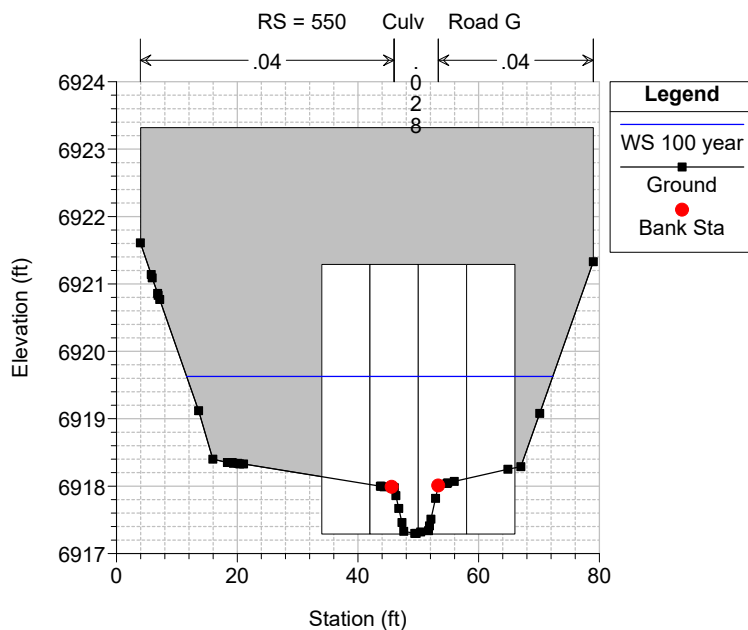
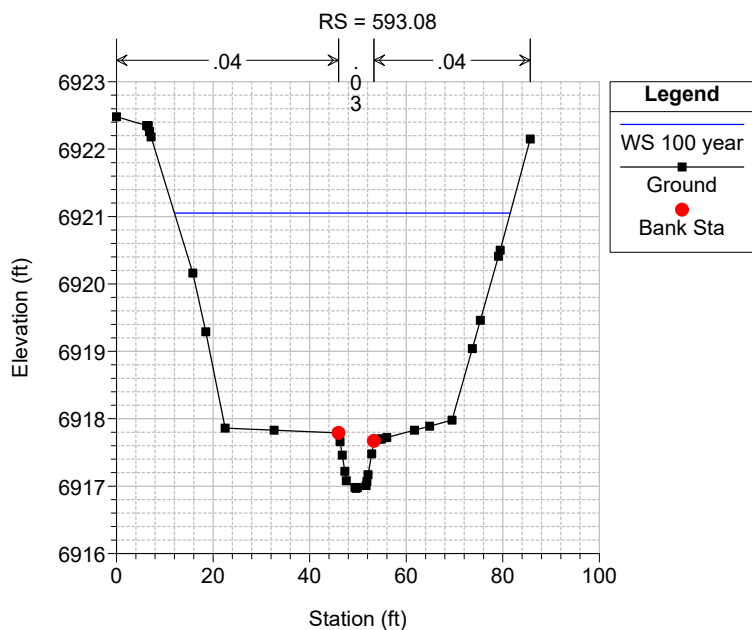
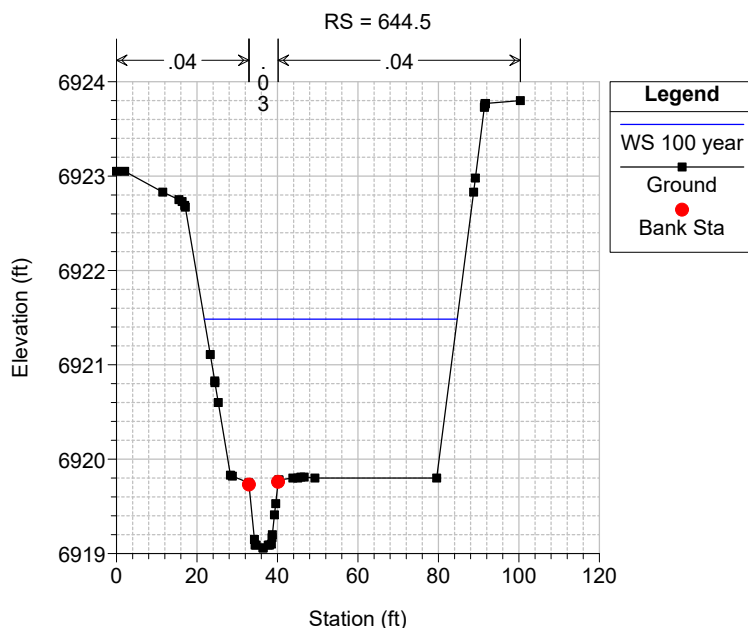
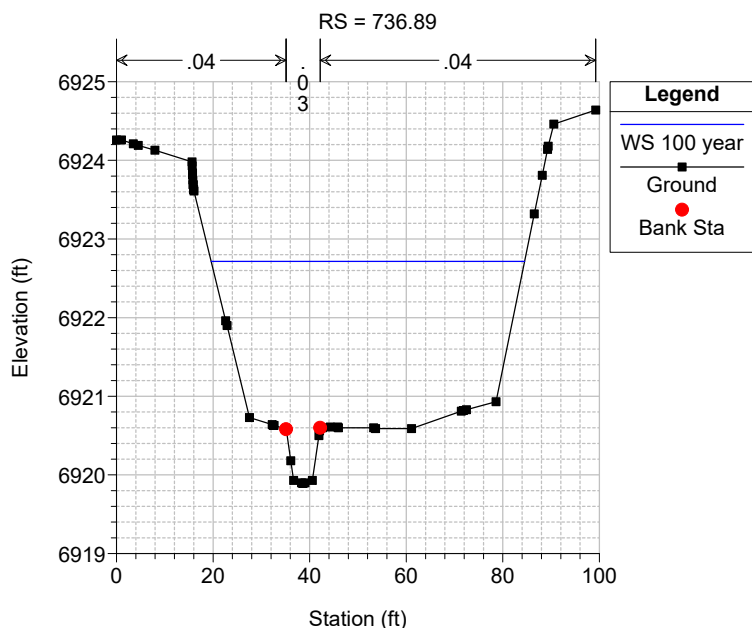
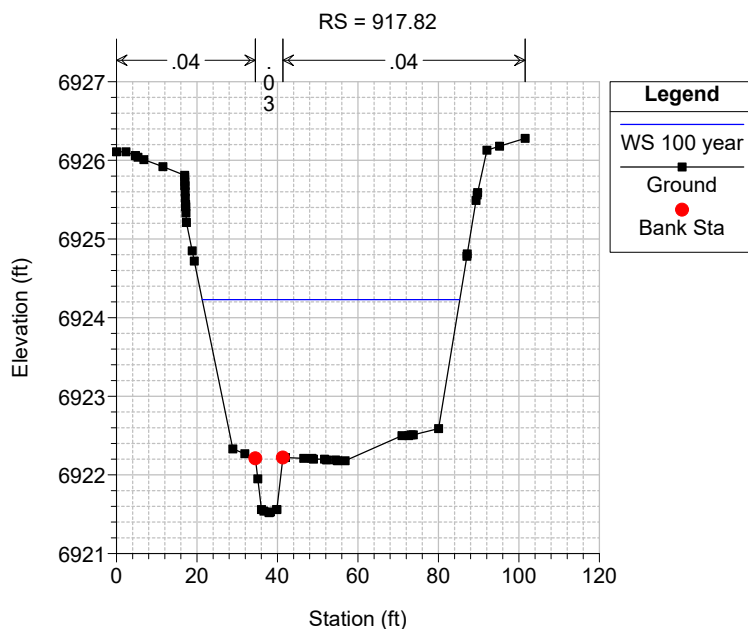
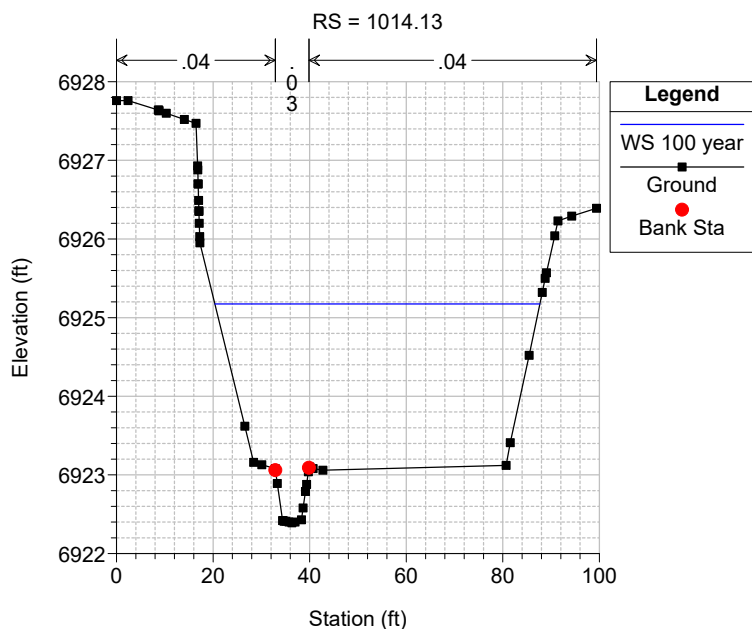


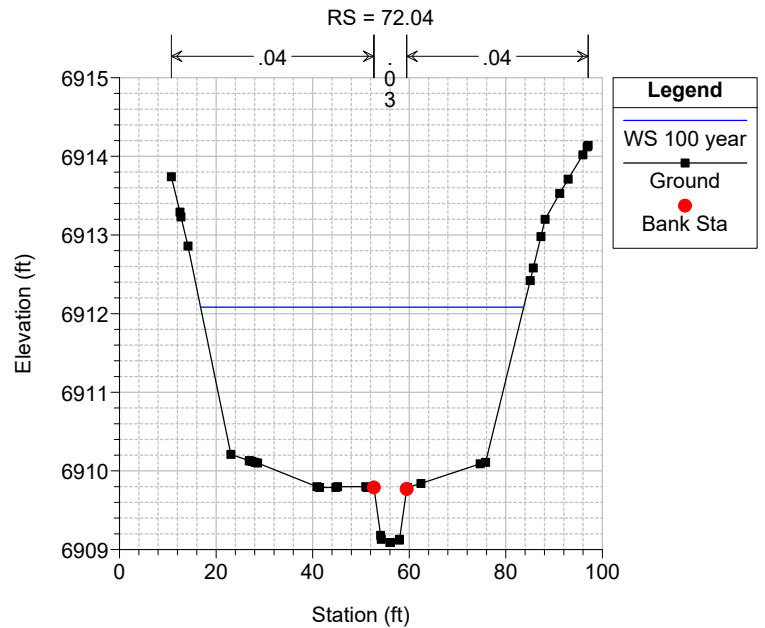
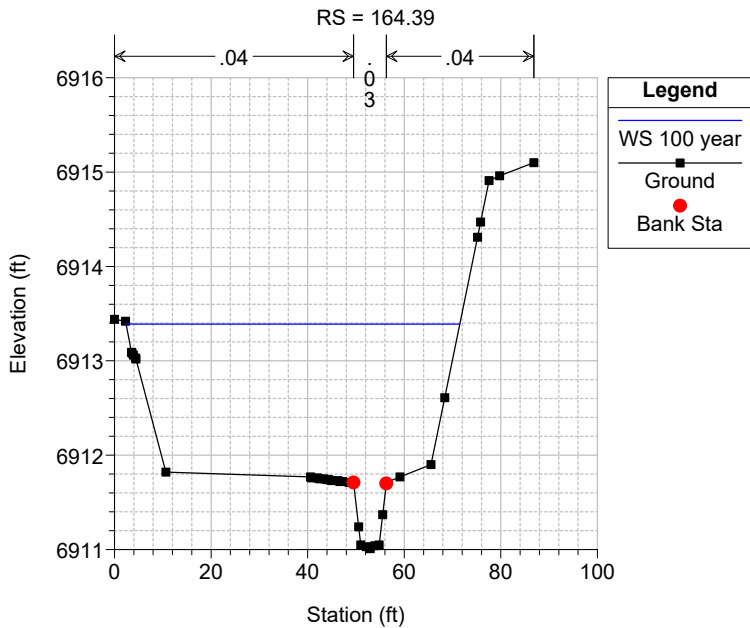
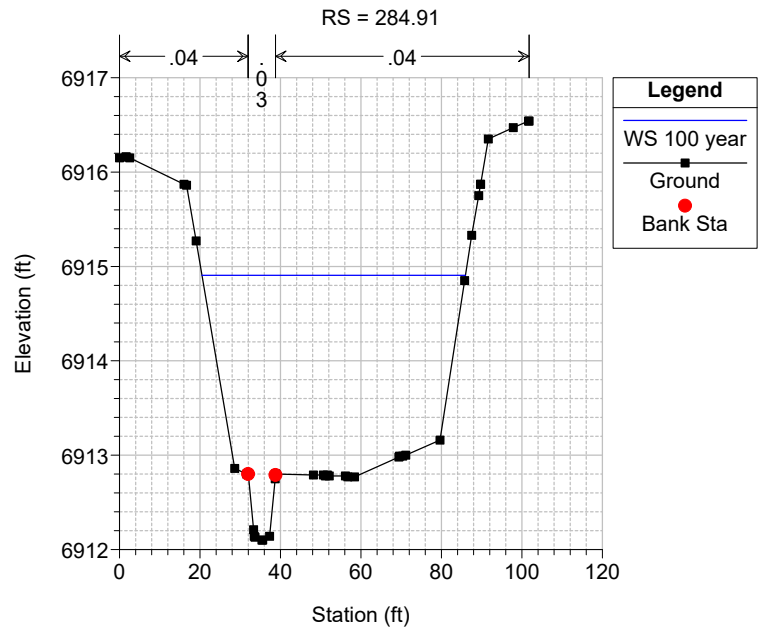
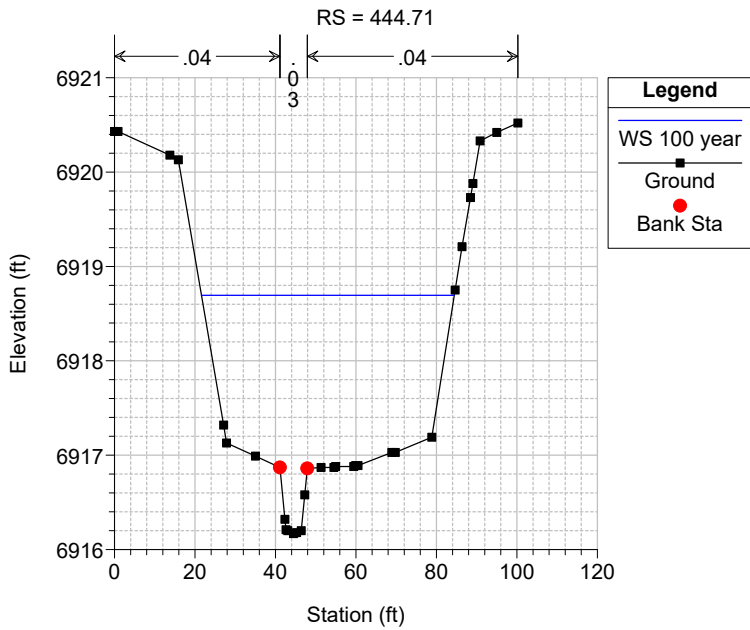
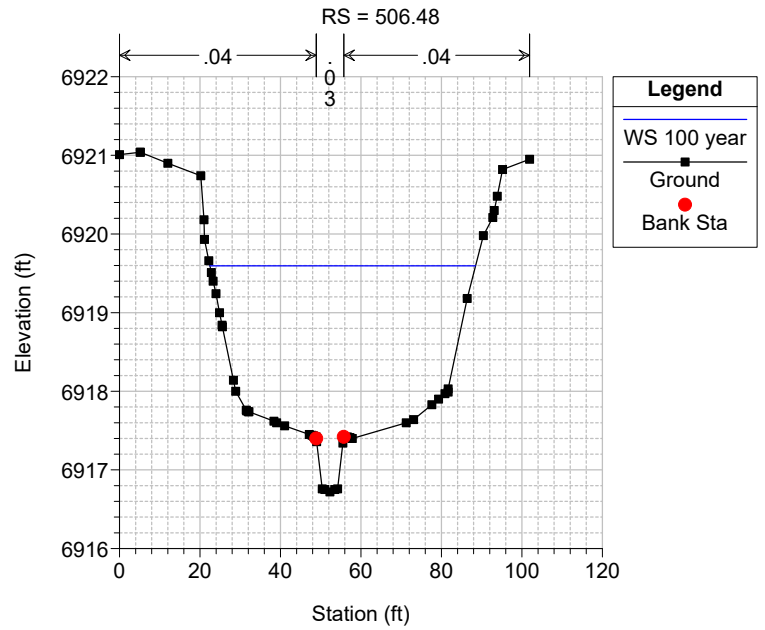
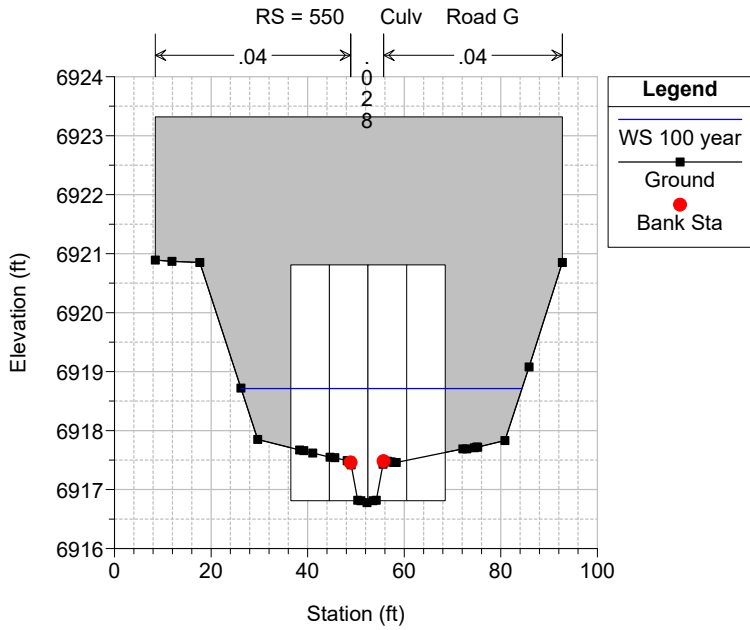


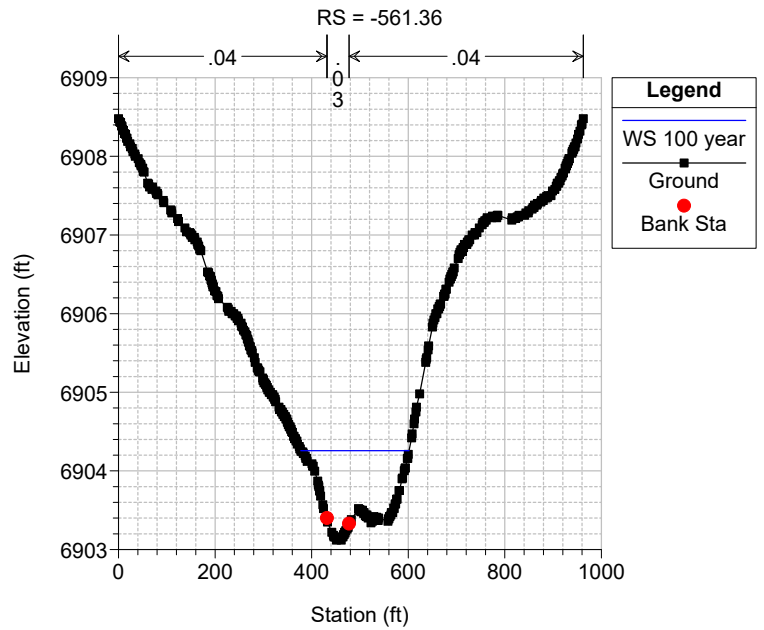
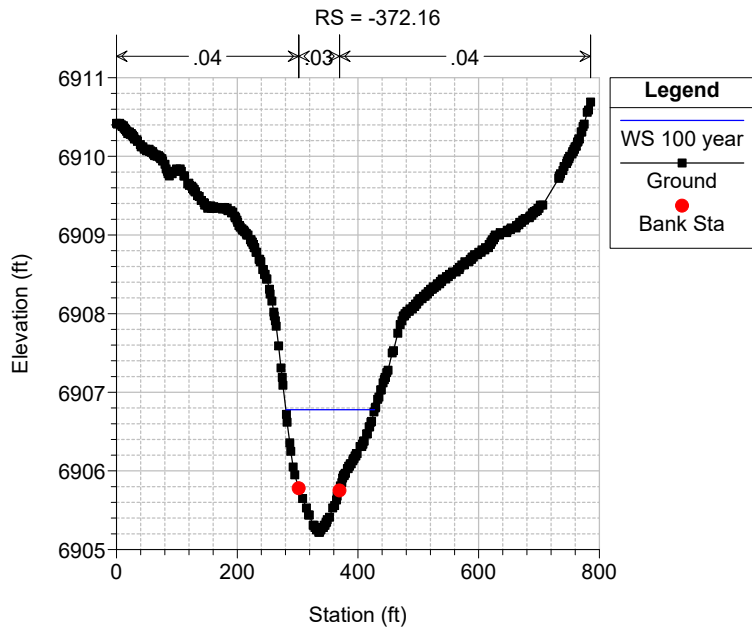
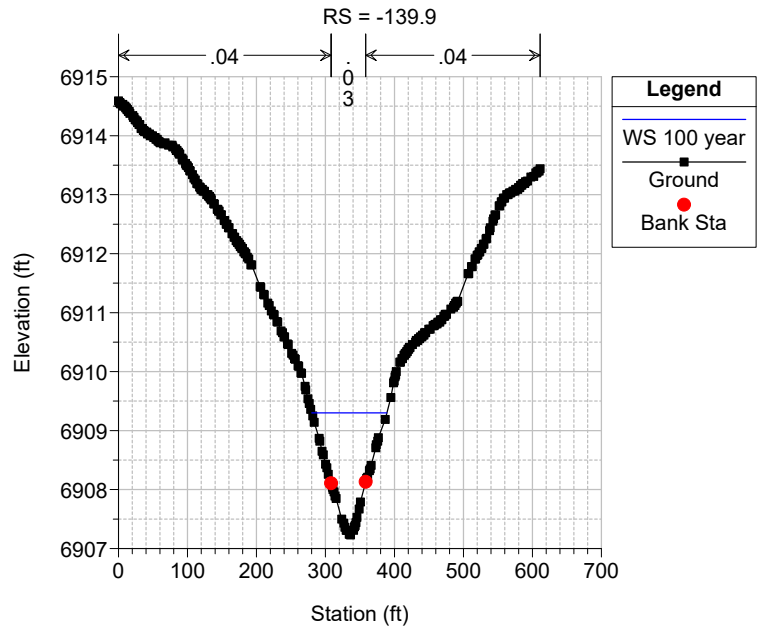
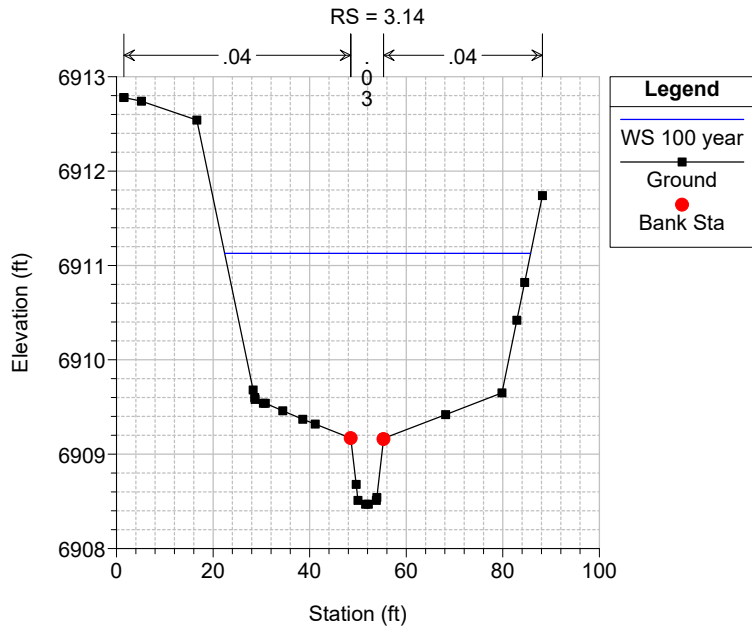












Appendix J

Proposed Hydrology Calculations and Reference Materials



NOAA Atlas 14, Volume 8, Version 2
Location name: Peyton, Colorado, USA*
Latitude: 38.9859°, Longitude: -104.5647°
Elevation: 6982 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffrey Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps & aerals](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.239 (0.189-0.303)	0.291 (0.231-0.370)	0.381 (0.301-0.486)	0.461 (0.361-0.589)	0.576 (0.440-0.768)	0.671 (0.499-0.904)	0.770 (0.554-1.06)	0.875 (0.604-1.24)	1.02 (0.678-1.48)	1.14 (0.733-1.67)
10-min	0.350 (0.277-0.444)	0.426 (0.338-0.542)	0.558 (0.441-0.711)	0.674 (0.529-0.863)	0.844 (0.644-1.12)	0.982 (0.731-1.32)	1.13 (0.811-1.56)	1.28 (0.884-1.81)	1.49 (0.992-2.17)	1.66 (1.07-2.44)
15-min	0.426 (0.338-0.541)	0.520 (0.412-0.660)	0.681 (0.537-0.867)	0.823 (0.645-1.05)	1.03 (0.785-1.37)	1.20 (0.891-1.62)	1.37 (0.988-1.90)	1.56 (1.08-2.21)	1.82 (1.21-2.65)	2.03 (1.31-2.98)
30-min	0.608 (0.482-0.771)	0.740 (0.586-0.940)	0.968 (0.764-1.23)	1.17 (0.916-1.49)	1.46 (1.11-1.94)	1.70 (1.26-2.28)	1.94 (1.40-2.68)	2.20 (1.52-3.12)	2.57 (1.71-3.73)	2.86 (1.84-4.19)
60-min	0.775 (0.615-0.984)	0.933 (0.739-1.18)	1.21 (0.956-1.54)	1.46 (1.15-1.87)	1.84 (1.41-2.47)	2.16 (1.61-2.92)	2.49 (1.80-3.45)	2.85 (1.97-4.05)	3.37 (2.24-4.90)	3.78 (2.44-5.54)
2-hr	0.943 (0.754-1.19)	1.12 (0.898-1.42)	1.46 (1.16-1.84)	1.76 (1.39-2.23)	2.22 (1.72-2.97)	2.62 (1.97-3.52)	3.04 (2.21-4.19)	3.50 (2.45-4.95)	4.16 (2.80-6.03)	4.70 (3.06-6.85)
3-hr	1.03 (0.829-1.29)	1.22 (0.978-1.53)	1.57 (1.25-1.97)	1.90 (1.51-2.40)	2.41 (1.88-3.22)	2.86 (2.17-3.84)	3.34 (2.45-4.60)	3.88 (2.73-5.48)	4.66 (3.15-6.74)	5.29 (3.46-7.69)
6-hr	1.20 (0.968-1.48)	1.40 (1.13-1.74)	1.78 (1.44-2.22)	2.16 (1.73-2.70)	2.76 (2.18-3.66)	3.28 (2.52-4.39)	3.86 (2.86-5.29)	4.51 (3.20-6.34)	5.46 (3.73-7.86)	6.24 (4.12-9.01)
12-hr	1.38 (1.13-1.70)	1.61 (1.31-1.98)	2.05 (1.66-2.53)	2.48 (2.00-3.07)	3.15 (2.51-4.15)	3.74 (2.89-4.96)	4.39 (3.28-5.96)	5.12 (3.66-7.13)	6.17 (4.25-8.82)	7.04 (4.69-10.1)
24-hr	1.60 (1.31-1.95)	1.87 (1.54-2.28)	2.38 (1.94-2.91)	2.85 (2.32-3.51)	3.60 (2.88-4.67)	4.24 (3.29-5.56)	4.94 (3.71-6.63)	5.71 (4.12-7.87)	6.82 (4.73-9.66)	7.73 (5.20-11.0)
2-day	1.85 (1.54-2.24)	2.18 (1.80-2.63)	2.76 (2.28-3.34)	3.29 (2.70-4.01)	4.11 (3.30-5.27)	4.80 (3.76-6.22)	5.54 (4.19-7.36)	6.35 (4.62-8.68)	7.50 (5.25-10.5)	8.44 (5.73-11.9)
3-day	2.03 (1.69-2.44)	2.39 (1.98-2.87)	3.02 (2.50-3.64)	3.60 (2.97-4.36)	4.47 (3.60-5.69)	5.20 (4.08-6.70)	5.98 (4.55-7.90)	6.83 (4.99-9.28)	8.03 (5.65-11.2)	9.00 (6.15-12.7)
4-day	2.18 (1.82-2.61)	2.56 (2.13-3.06)	3.22 (2.68-3.87)	3.82 (3.16-4.62)	4.73 (3.83-6.00)	5.49 (4.33-7.04)	6.30 (4.81-8.30)	7.18 (5.26-9.72)	8.43 (5.94-11.7)	9.43 (6.46-13.3)
7-day	2.58 (2.17-3.07)	2.98 (2.50-3.54)	3.68 (3.08-4.39)	4.32 (3.60-5.18)	5.29 (4.30-6.65)	6.09 (4.84-7.76)	6.96 (5.34-9.09)	7.89 (5.82-10.6)	9.21 (6.55-12.8)	10.3 (7.10-14.4)
10-day	2.93 (2.48-3.47)	3.36 (2.84-3.98)	4.13 (3.47-4.90)	4.81 (4.02-5.74)	5.83 (4.76-7.28)	6.68 (5.32-8.45)	7.58 (5.85-9.86)	8.55 (6.34-11.4)	9.92 (7.08-13.7)	11.0 (7.65-15.4)
20-day	3.91 (3.33-4.58)	4.51 (3.84-5.29)	5.52 (4.68-6.50)	6.39 (5.39-7.55)	7.63 (6.25-9.37)	8.62 (6.90-10.8)	9.64 (7.47-12.4)	10.7 (7.98-14.1)	12.2 (8.74-16.6)	13.3 (9.31-18.4)
30-day	4.70 (4.02-5.47)	5.44 (4.65-6.34)	6.65 (5.66-7.78)	7.66 (6.49-9.00)	9.06 (7.44-11.0)	10.1 (8.15-12.5)	11.2 (8.74-14.3)	12.3 (9.24-16.2)	13.8 (9.98-18.7)	15.0 (10.5-20.6)
45-day	5.67 (4.88-6.57)	6.55 (5.63-7.60)	7.97 (6.82-9.27)	9.12 (7.77-10.7)	10.7 (8.79-12.9)	11.9 (9.56-14.5)	13.0 (10.2-16.4)	14.2 (10.6-18.4)	15.6 (11.3-21.0)	16.7 (11.9-23.0)
60-day	6.48 (5.60-7.48)	7.46 (6.43-8.62)	9.01 (7.74-10.4)	10.3 (8.77-11.9)	11.9 (9.82-14.3)	13.1 (10.6-16.0)	14.3 (11.2-18.0)	15.5 (11.7-20.0)	16.9 (12.3-22.6)	18.0 (12.8-24.6)

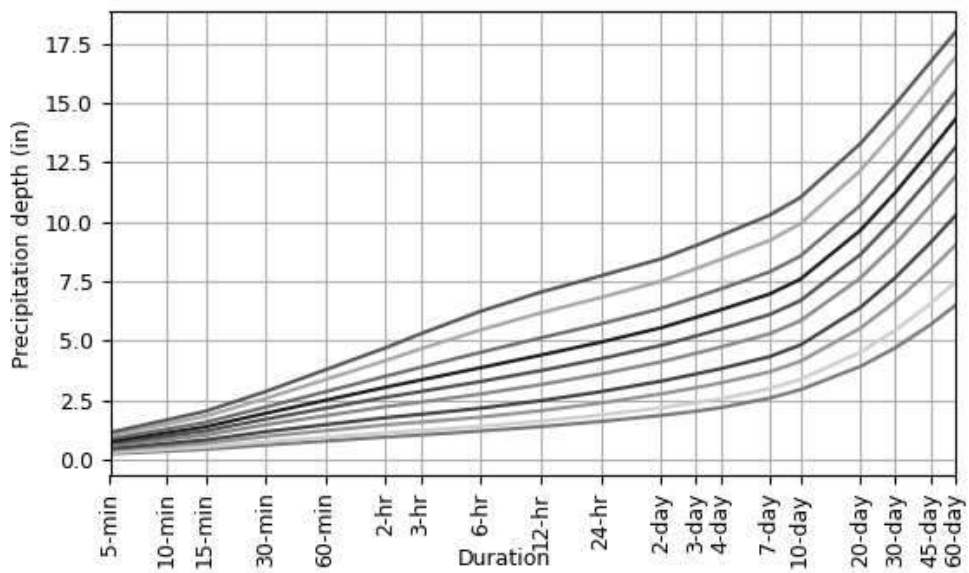
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

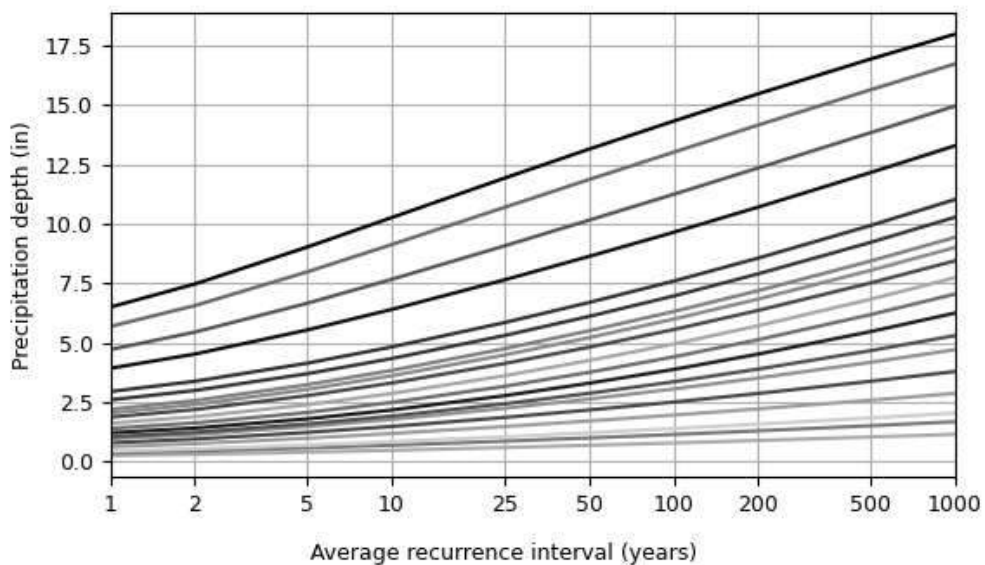
PDS-based depth-duration-frequency (DDF) curves

Latitude: 38.9859°, Longitude: -104.5647°



Average recurrence interval (years)

1
2
5
10
25
50
100
200
500
1000



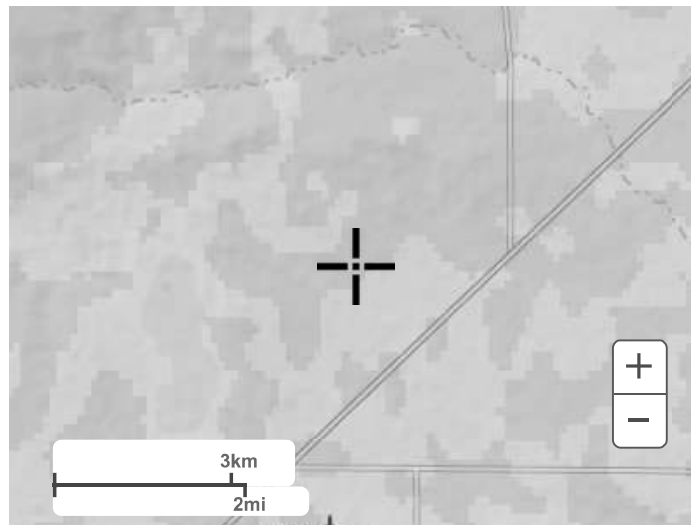
Duration

5-min 2-day
10-min 3-day
15-min 4-day
30-min 7-day
60-min 10-day
2-hr 20-day
3-hr 30-day
6-hr 45-day
12-hr 60-day
24-hr

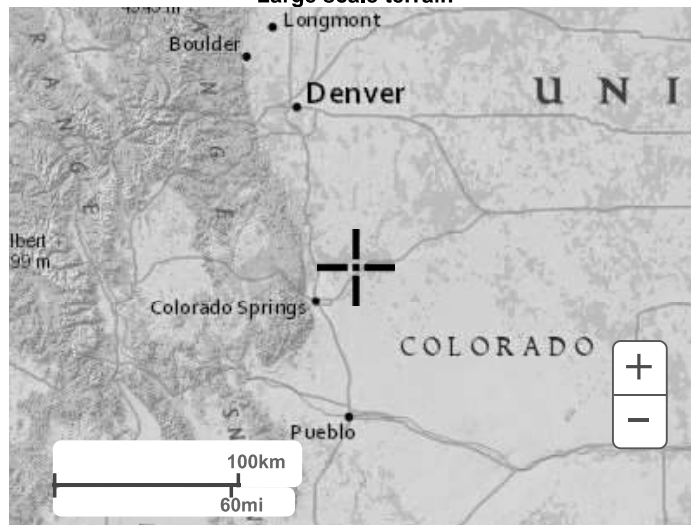
NOAA Atlas 14, Volume 8, Version 2

Created (GMT): Mon Nov 6 00:36:21 2023

[Back to Top](#)**Maps & aerials****Small scale terrain**



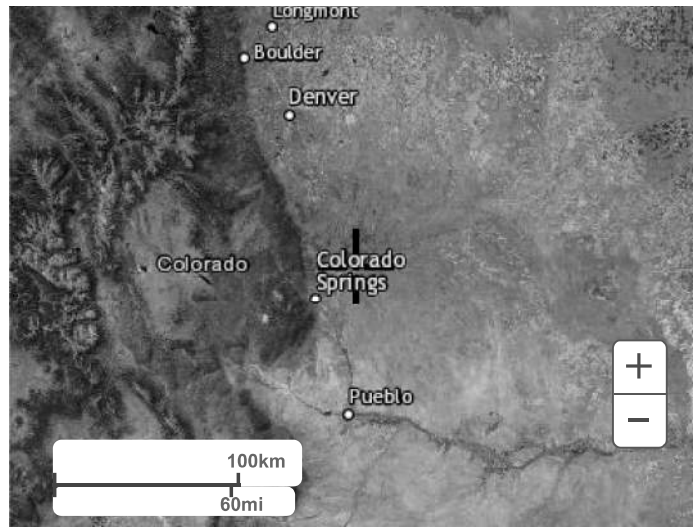
Large scale terrain



Large scale map



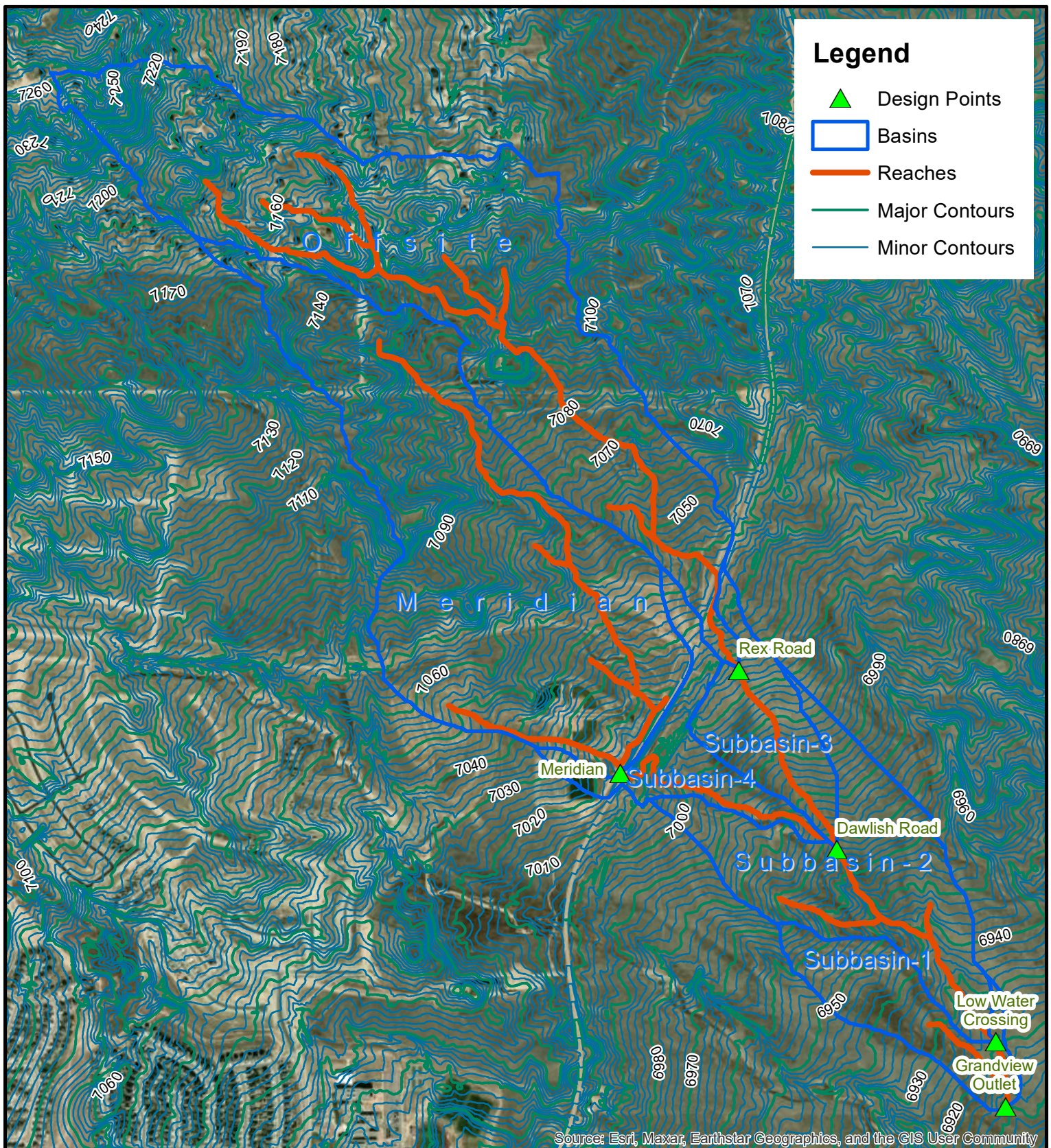
Large scale aerial



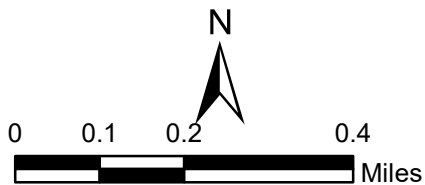
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1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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Grandview Tributary 2 Hydrology



REVISION TO:
MASTER DEVELOPMENT
DRAINAGE PLAN
MERIDIAN RANCH
EL PASO COUNTY, COLORADO



July 2021

Prepared For:

GTL DEVELOPMENT, INC.
P.O. Box 80036
San Diego, CA 92138

Prepared By:
Tech Contractors
11886 Stapleton Drive
Falcon, CO 80831
719.495.7444

PCD Project No. SKP-21003

CERTIFICATIONS

Design Engineer's Statement:

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the applicable master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

Thomas A. Kerby, P.E.
#31429



Owner/Developer's Statement:

I, the owner/developer have read and will comply with all of the requirements specified in this drainage report and plan.

Raul Guzman, Vice President
GTL Development, Inc.
P.O. Box 80036
San Diego, CA 92138

July 8, 2021

Date

El Paso County:

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 & 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

Jennifer Irvine, P.E.
County Engineer / ECM Administrator

APPROVED
Engineering Department

07/15/2021 8:53:01 AM

dsdnijkamp

EPC Planning & Community
Development Department

EXECUTIVE SUMMARY

The purpose of the revision to the following Master Development Drainage Plan is to present updated conceptual drainage improvements for the remaining undeveloped portions of the Meridian Ranch Development based upon the proposed sketch plan amendment and to update data from within the development tributary to area of interest. Runoff quantities and proposed facilities have been calculated using the current City of Colorado Springs/El Paso County Drainage Criteria Manual (DCM) (1994 version) and portions of the City of Colorado Springs Drainage Criteria Manual, Volume 1 (DCM-1) ((2014 version). Concepts presented in this report will be refined and specific improvements addressed during the Final Plat process.

The revisions included within this report include the density increase as proposed with this sketch plan amendment. The previous revision to the MDDP (2017) included the removal of the 40-acre business park near the northwest corner of Stapleton Dr. and Eastonville Rd. and repurposing it to residential land use. The developed calculations reflect the density increase sought in this revision.

The hydrologic calculations within this report follow method outlined in Chapter 6 of the 2014 version of the City of Colorado Springs Drainage Criteria Manual (COSDCM) as adopted by the El Paso County Board of County Commissioners by Resolution 15-042. Chapter 6 addresses the hydrologic calculation methods and includes an updated hydrograph to be used with storm drainage runoff. The Board adopted by the same resolution, Section 3.2.1 of Chapter 13 of the COSDCM referencing Full Spectrum Detention; the concept “provides better control of the full range of runoff rates that pass through detention facilities than the convention multi-stage concept. This section of the COSDCM identifies the necessity to provide full spectrum detention but does not prescribe a methodology to reach such the detention requirements. This report includes hydrologic models from HEC-HMS for the historic and future conditions for the 2-yr, 5-yr, 10-yr, 50-yr, and 100-yr design storm frequencies. The future conditions include detention facilities sized and modeled such that *“frequent and infrequent inflows are released at rates approximating undeveloped conditions.”*

On November 16, 2000 the El Paso County Board of County Commissioners approved the rezoning of the Meridian Ranch project (PUD-00-010) from A-35 to PUD with several conditions. Condition number seven stated in part that “drainage plans shall release and/or retain at approximately eighty percent (80%) of historic rates.” The previous report (2017 MDDP) removed this condition and allow the project to release developed flow at historic rates as outlined in the current City of Colorado Springs/El Paso County Drainage Criteria Manual (DCM) (1994 version) and those portions of the City of Colorado Springs Drainage Criteria Manual, Volume 1 (DCM-1) ((2014 version) adopted by the El Paso County Board of County Commissioners by Resolution No. 15-042.

The original boundary limits of Meridian Ranch encompassed 2620 acre proposed development and is located approximately 12 miles northeast of the City of Colorado Springs, 2.5 miles north of the town of Falcon and immediately north of the Woodmen Hills development.

The Sketch Plan amendment includes all the remaining 197 acres of the undeveloped portion of Meridian Ranch. Of the undeveloped land it is proposed to have 110 acres of residential development, 49 acres of open space, drainage/detention facilities and park sites, and 38 acres of R.O.W.

The calculated developed flow rates greater than the historic discharge flow rates will be mitigated with the use of full spectrum detention facilities to be located within the project and along eastern boundary of the project. The Meridian Ranch Development will not adversely impact the downstream properties.

Subbasin	CN	L [mi]	L [ft]	Y	Y[%]	S	Tc [hr]	Tc [min]	Lag [hr]	Lag [min]
1	79.41	0.52	2727.6	0.023	2.31	2.59	0.79	47.52	0.4752	28.51
2	73.76	0.75	3954.4	0.022	2.21	3.56	1.29	77.24	0.7724	46.35
3	72.81	0.34	1782.5	0.023	2.34	3.73	0.68	40.76	0.4076	24.46
4	70.32	0.42	2238.8	0.027	2.66	4.22	0.82	49.10	0.491	29.46
Meridian	80.16	1.37	7254.6	0.024	2.37	2.48	1.67	100.17	1.0017	60.10
Offsite	78.64	1.76	9293.3	0.027	2.68	2.72	2.01	120.52	1.2052	72.31

Time of Concentration (T_c)

Time taken by a rainfall drop to travel from the farthest point in the watershed to the outlet.

$$T_c = \frac{\ell^{0.8} (S+1)^{0.7}}{1,140 Y^{0.5}} \quad \text{Lag} = 0.6 T_c$$

where:

L = lag, h

T_c = time of concentration, h

ℓ = flow length, ft

Y = average watershed land slope, %

S = maximum potential retention, in

$$S = \frac{1000}{CN} - 10$$

(American Units; 0 < CN < 100)



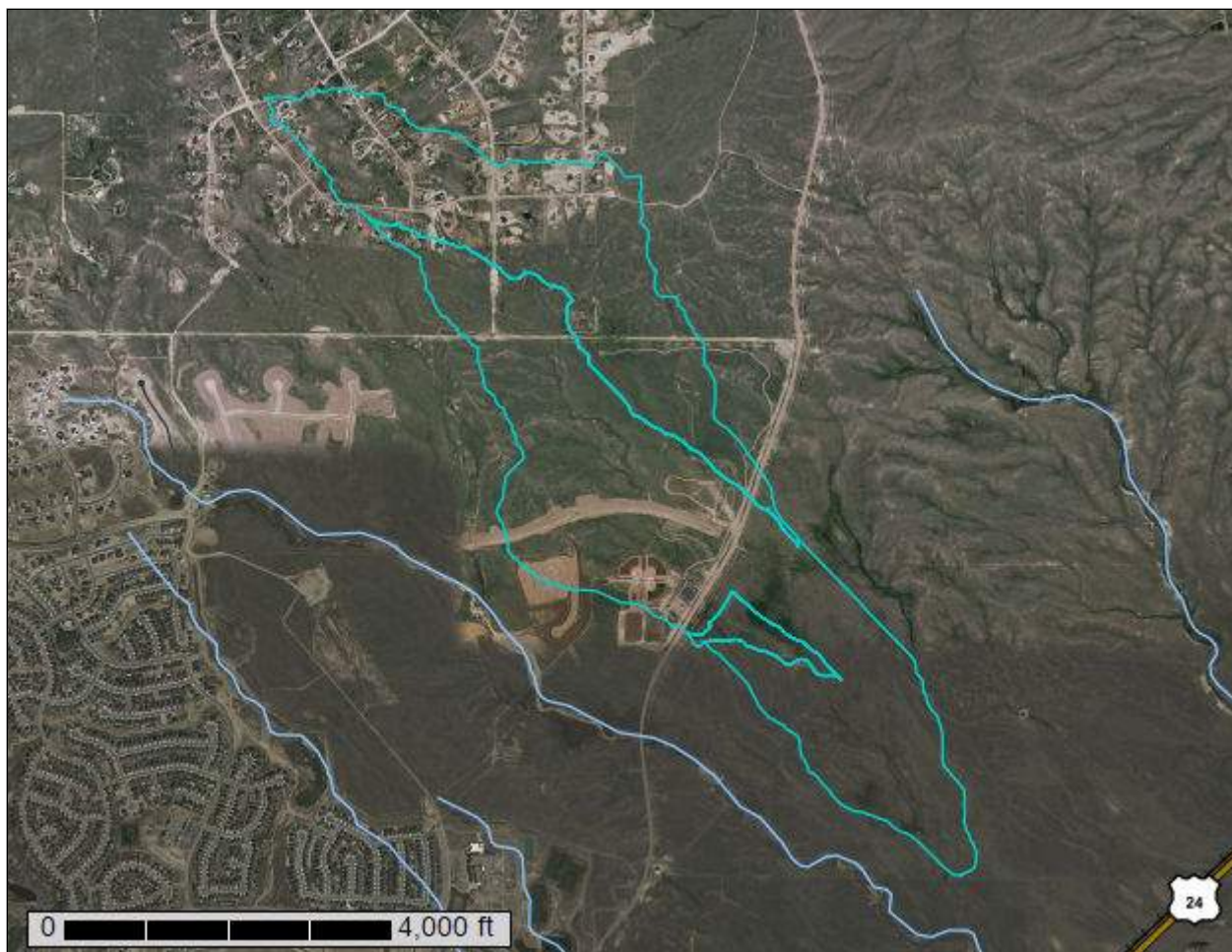
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **El Paso County Area, Colorado**



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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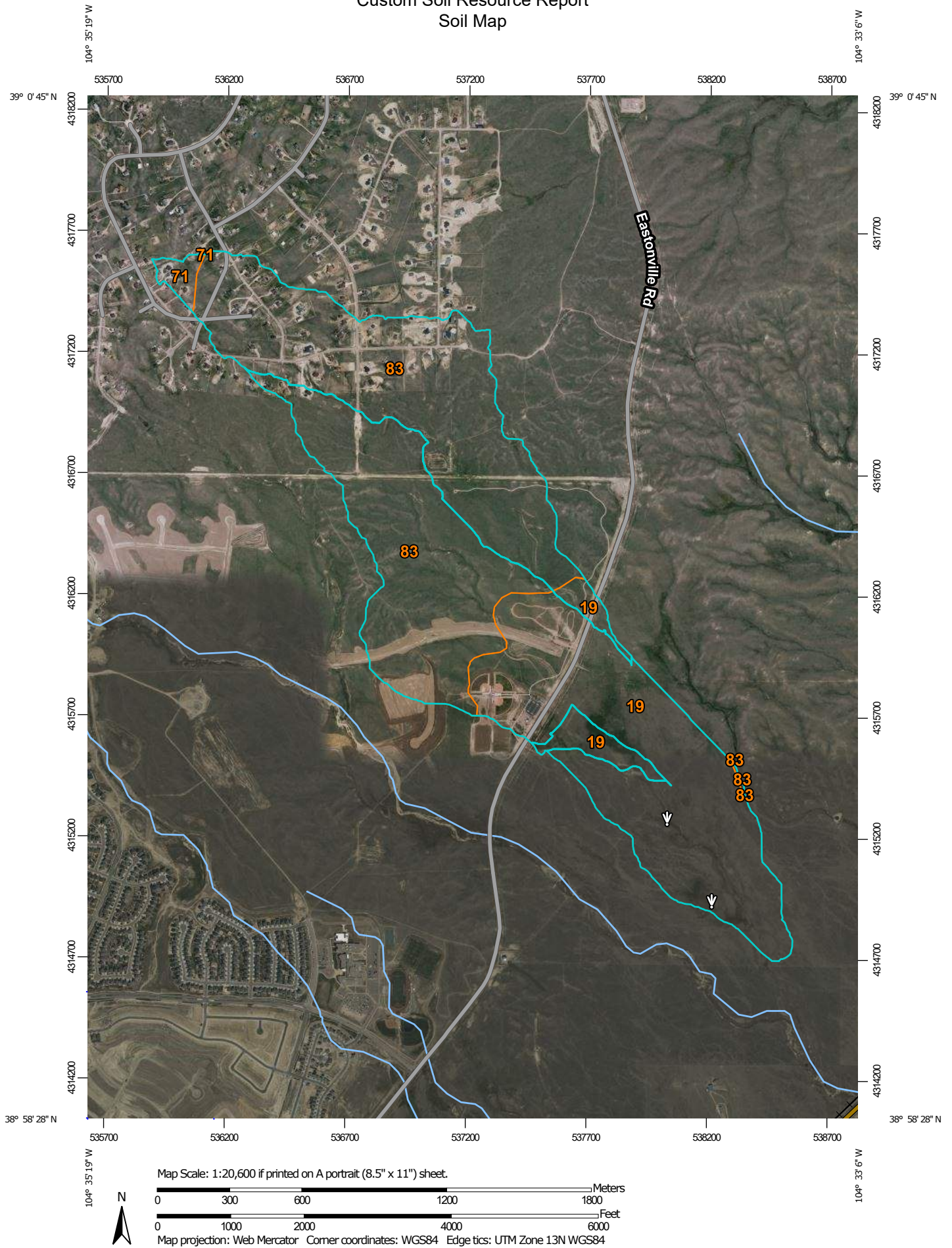
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Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)


Soils


 Soil Map Unit Polygons


 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit


 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop


 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole


 Slide or Slip


 Sodic Spot


 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals


Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 21, Aug 24, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 11, 2018—Jun 12, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	211.4	38.0%
71	Pring coarse sandy loam, 3 to 8 percent slopes	6.5	1.2%
83	Stapleton sandy loam, 3 to 8 percent slopes	338.4	60.8%
Totals for Area of Interest		556.3	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

El Paso County Area, Colorado

19—Columbine gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 367p
Elevation: 6,500 to 7,300 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Columbine and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Columbine

Setting

Landform: Flood plains, fan terraces, fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 14 inches: gravelly sandy loam
C - 14 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XY214CO - Gravelly Foothill
Hydric soil rating: No

Minor Components

Fluvaquentic haplaquolls

Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

Other soils

Percent of map unit: 1 percent
Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

71—Pring coarse sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369k
Elevation: 6,800 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Pring and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pring

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam
C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R048AY222CO - Loamy Park
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Other soils

Percent of map unit:
Hydric soil rating: No

83—Stapleton sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369z
Elevation: 6,500 to 7,300 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Stapleton and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stapleton

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from arkose

Typical profile

A - 0 to 11 inches: sandy loam
Bw - 11 to 17 inches: gravelly sandy loam
C - 17 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Custom Soil Resource Report

Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ecological site: R049XY214CO - Gravelly Foothill

Hydric soil rating: No

Minor Components

Fluvaquentic haplaquolls

Percent of map unit: 1 percent

Landform: Swales

Hydric soil rating: Yes

Other soils

Percent of map unit: 1 percent

Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent

Landform: Depressions

Hydric soil rating: Yes