ATTACHMENT 6

Tally Ho Stream Stabilization Project

Hydraulics Report

prepared for

Coastal San Luis Resource Conservation District
1203 Main Street, Suite B
Marrow Bay, CA 93442

prepared by

WATERWAYS CONSULTING, INC.
509A Swift Street
Santa Cruz, CA 95060

June 16, 2023

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ELECTRONIC ATTACHMENTS

1.0 INTRODUCTION

Waterways Consulting, Inc. (Waterways) has been retained by the Coastal San Luis Resource Conservation District to evaluate the hydraulic effects on Corbett Canyon Creek during a 100-year base flood discharge from a proposed headcut stabilization project in Arroyo Grande, California. The Tally Ho Stream Stabilization Project site is located on Corbett Canyon Creek, approximately 0.4 miles upstream of the confluence with Arroyo Grande Creek in San Luis Obispo County. The proposed stabilization will consist of lowering the channel bed upstream of an existing headcut to reduce the drop over the headcut, stabilizing the remaining drop by installing a boulder weir, and protecting the lowered channel beds and banks upstream of the boulder weir using a combination of engineered streambed material and fabric encapsulated soil lifts. The lowered channel will be constructed at a 2.2 percent grade extending approximately 220 feet upstream of the proposed boulder weir (see Figure 1 and Appendix B). The channel stablilization project is within a FEMA 100-year approximate floodplain (Zone AE) with mapped floodway, as shown on the Flood Insurance Rate Map (FIRM) effective November 16, 2012 (Appendix A).

This report has been prepared to support floodplain development permitting with San Luis Obispo County for the proposed project and presents the hydraulic analysis of existing and proposed conditions for the 100-year flood event along Corbett Canyon Creek within the vicinity of the proposed project.

This report was prepared in accordance with the Code of Federal Regulations Title 44 Section 60.3(d)(3) - Floodway Requirements, which states that a community shall "prohibit encroachments, including fill, new construction, substantial improvements and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base (100-year) flood discharge." This report has been prepared in accordance with the Procedures for "No-Rise" Certification For Proposed Developments in the Regulatory Floodway (FEMA Region X, October 2013). The following sections summarize the methodology and results that support the Engineering No-Rise Certification included at the end of the report.

2.0 HYDRAULIC MODELING METHODOLOGY

2.1 PEAK FLOW HYDROLOGY

The 100-year peak flow for Corbett Canyon Creek is estimated to be 2,600 cubic feet per second (cfs) at the confluence with Arroyo Grande located downstream of the project area and 2,300 cfs upstream at the confluence with Poorman Canyon Creek, as presented in the 2017 Flood Insurance Study (FIS) for San Luis Obispo County (Table 10 of the 2017 FIS Report). The project site is approximately halfway between the two locations where peak flows were determined, so a value of 2,450 cfs was used as the 100-year peak flow (i.e., base flood discharge) for the modeling effort at the project area.

2.2 EXTENT OF ANALYSIS

A one-dimensional hydraulic model of Corbett Canyon Creek extending from FEMA published Section F (River Station 1582) to FEMA published Section I (River Station 2721) (see Figure 1) was prepared using United States Army Corps of Engineers (USACE) Hydraulic Engineering Center River Analysis Software

(HEC-RAS) version 6.3.1. Waterways confirmed through a FEMA Library Data request that the Current Effective Model for the creek was performed using HEC-2 modeling software (see Attachment 1**)**.

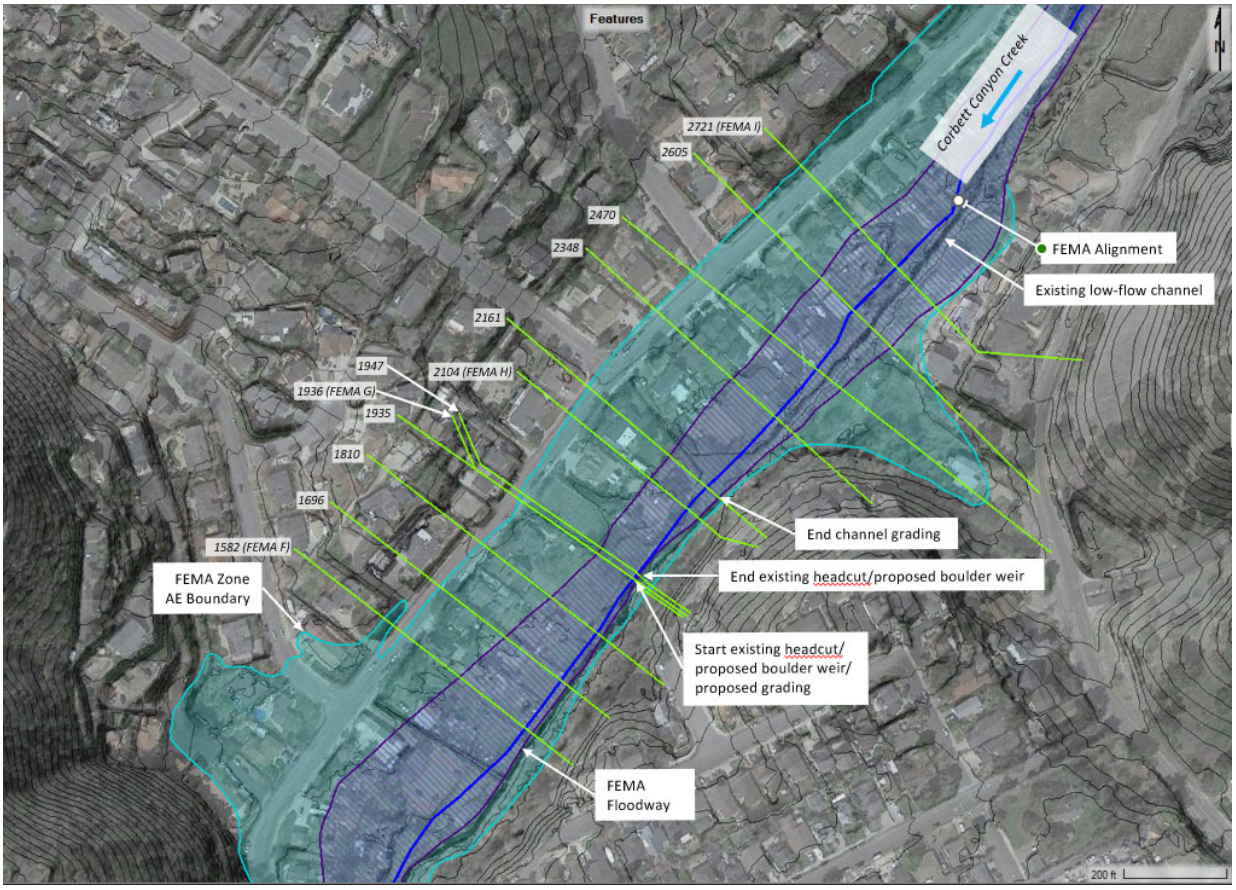


Figure 1. *Hydraulic Model Overview*

According to the Guidance for Flood Risk Analysis and Mapping (FEMA, December 2020), this data serves as the Duplicate Effective Model for this report and no Corrected Effective Model is proposed as part of this analysis.

Two modeling scenarios were developed to evaluate potential changes in the 100-year water surface elevation (i.e. Base Flood Elevation) from the proposed project, these include the Pre-Project Conditions Model ("PCM" is the Plan identifier in the model) and the Revised Conditions Model ("RCM" is the Plan identifier in the model). Figure 1 shows the proposed project location, cross section locations used in the hydraulic analysis, and the effective FEMA floodplain boundaries (FEMA 2012). All elevations are referenced to the NAVD88 vertical datum. Elevations shown on the design drawings in Appendix B are based on an assumed vertical datum (21.76 feet below NAVD 88 vertical datum).

2.3 BOUNDARY CONDITIONS

A known water surface elevation of 123.3 ft. (without floodway) and 124.4 ft. (with floodway) was set as the downstream boundary condition at FEMA published Section F (Table 24, Volume 2 of the 2017 FIS). The model was run using a subcritical flow regime.

2.4 FLOODWAY ENCROACHMENTS

Floodway encroachments were determined for both model scenarios using Method 1, as described in the HEC-RAS Hydraulic Reference Manual. Encroachment stations are set based on where the edge of the floodway is located (Figure 1), and then adjusted to show no more than a 1-foot rise at each cross section. At some cross sections, it was found that the floodway did not correspond with the location of the lowest cross section elevation. At these locations, the encroachment stationing was adjusted to include these areas.

2.5 PRE-PROJECT CONDITIONS MODEL

The pre-project conditions model extends from FEMA published Section F (River Station 1582) to FEMA published Section I (River Station 2721). All published cross sections and additional project specific cross sections were sampled from a terrain surface derived from topographic surveys by Waterways (11/15/2007, 1/16/2017, and 4/20/2023) and LiDAR data from FEMA (Region 9, 2018) (Note: Appendix B includes topography at the project area in an assumed coordinate system).

According to the FIS, the hydraulic roughness values (Manning's n) for the channel and overbank areas vary between 0.025-0.100 and 0.030-.120, respectively. The high end of these ranges was used in the current modeling effort based on visual observations of heavy vegetation in the channel along much of the project reach, development in the floodplain, and published hydraulic roughness values (Chow, 1959), see Table 1.

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

Land Use Type	Manning's 'n'
Channel	0.10
Overbank	0.12

2.6 REVISED CONDITIONS MODEL

The revised conditions model includes all cross sections in the existing conditions model. The existing conditions geometry was updated to include the design geometry where modifications to the channel are proposed (Appendix B). The revised conditions model Manning's n values were not modified from the pre-project values because it is assumed that the post-project revegetation effort will return the vegetation roughness to pre-project conditions.

3.0 RESULTS

Tabular and cross-sectional results of the hydraulic modeling are presented in Appendix D.

3.1 BASE FLOOD ELEVATION AND FLOODWAY ENCROACHMENTS

Table 2 shows the resulting 1% annual chance flood (100-year) water surface elevations with and without the floodway encroachments for the Pre-Project Conditions Model (PCM), and the Revised Conditions Model (RCM). This table shows an equivalent or decrease in the water surface elevation at all cross sections comparing the PCM with the RCM for both the base flood and encroached channel conditions.

Table 3 shows how the encroachment stationing for left and right banks were changed for each cross section when compared to the FIRM. These revised stationing values were duplicated for the PCM and RCM to evaluate the effects of this project on the floodway.

3.2 INUNDATION EXTENTS

The FEMA floodway was measured, and stationing incorporated into the model with encroachment using Method 1. Initial modeling results using the FEMA floodway geometry exceeded the allowable 1-ft rise. In addition, the FEMA channel does not align with the surveyed low flow channel, resulting in floodway stationing that did not encompass the low flow channel at some sections. Stationing was moved towards the left bank in those cases to include the low flow channel, then iteratively adjusted along the left bank (where existing buildings are not present) in the Pre-Project Conditions Model (PCM) until the allowable 1-ft rise was met. The identical encroachment stationing was used in the Revised Conditions Model (RCM). Table 2 table shows an equivalent or decrease in the water surface elevation at all cross sections comparing the PCM with the RCM.

***Table 2**. Base Flood Elevations of Existing and Proposed Conditions*

Cross Section	Section ID (River Station)	Without Encroachment			With Encroachment		
		PCM	RCM	Difference	PCM	RCM	Difference
I	2721	131.60	131.60	0.00	132.51	132.00	-0.51
-	2605	130.48	130.47	-0.01	131.14	131.07	-0.07
-	2470	129.79	129.78	-0.01	130.75	130.71	-0.04
-	2348	129.38	129.36	-0.02	130.33	130.27	-0.06
-	2161	128.42	128.37	-0.05	129.41	129.32	-0.09
H	2104	127.90	127.81	-0.09	128.87	128.71	-0.16
-	1947	125.58	125.57	-0.01	126.31	126.25	-0.06
G	1936	125.27	125.26	-0.01	126.25	126.21	-0.04
-	1935	125.29	125.29	0.00	126.09	126.06	-0.03
-	1810	124.24	124.24	0.00	125.01	125.01	0.00
-	1696	123.64	123.64	0.00	124.56	124.56	0.00
F	1582	123.30	123.30	0.00	124.30	124.30	0.00

***Table 3**. Encroachment Adjustments*

River Station	Left Bank Station			Right Bank Station			Notes
	FEMA	PCM/RCM	Difference	FEMA	PCM/RCM	Difference	
2721	321.71	321.71	0.00	526.92	526.92	0.00	
2605	397.98	397.98	0.00	588.93	588.93	0.00	
2470	510.75	210.75	300.00	679.70	679.70	0.00	Left widened 300 ft
2348	204.09	204.09	0.00	360.61	360.61	0.00	
2161	18.57	68.38	-49.81	243.39	243.39	0.00	Left narrowed to limit of 100yr WSE
2104	131.28	110.7	20.58	250.24	250.24	0.00	Left widened to include left bank
1947	121.03	95.9	25.13	211.10	211.10	0.00	Left widened to include left bank
1936	120.50	66.7	53.80	210.55	210.55	0.00	Left widened to include left bank plus 40 ft offset
1935	114.79	100.4	14.39	205.35	205.35	0.00	Left widened to include left bank
1810	149.74	106.5	43.24	272.35	272.35	0.00	Left widened to include left bank plus 10 ft offset
1696	101.10	60.8	40.30	252.78	252.78	0.00	Left widened to include left bank plus 20 ft offset
1582	99.50	80.4	19.10	275.61	275.61	0.00	Left widened to include left bank

4.0 CONCLUSIONS

4.1 WATER SURFACE ELEVATIONS

The results of the hydraulic analysis indicate there will be no rise in the 100-year water surface elevations for the Revised Conditions Model when compared to the Pre-Project Conditions Model, for both the base flood and the encroached channel. Therefore, the proposed project satisfies the requirement of the City of Arroyo Grande Municipal Code section 16.44.050.G.7.

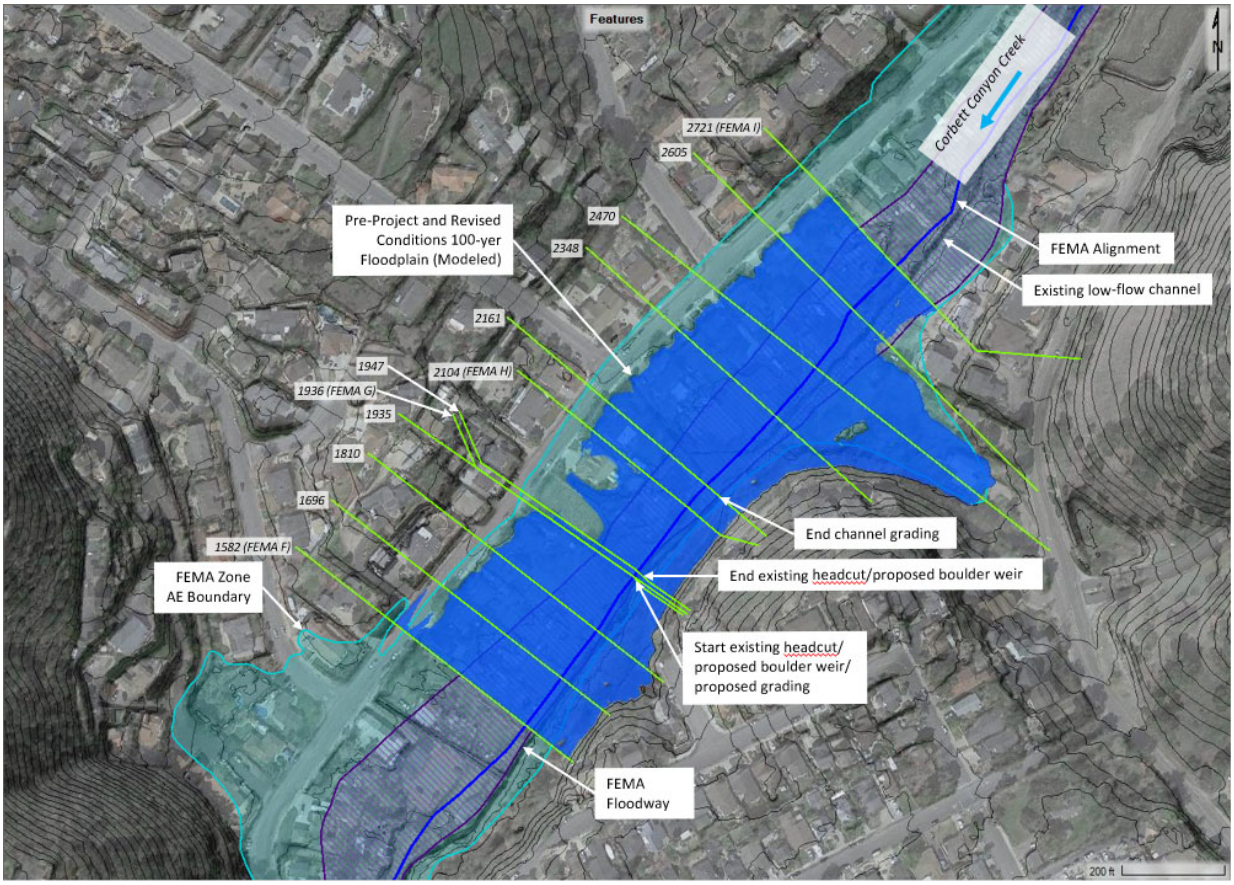


Figure 2. *Modeled Inundation Extents*

4.2 NO-RISE CERTIFICATION

This is to certify that I am a duly qualified engineer licensed to practice in the State of California.

It is to further certify that the technical data summarized in this report supports the fact that the proposed Tally Ho Stream Stabilization Project will not increase the 100-year flood elevations, floodway elevations, and floodway widths on Corbett Canyon Creek at published sections in the Flood Insurance Study for the City of Arroyo Grande, dated May 16, 2017, and will not increase the 100-year flood elevations, floodway elevations, and floodway widths at unpublished cross-sections in the vicinity of the proposed development.

Brent Zacharia, P.E.

Senior Engineer, Waterways Consulting, Inc.

5.0 REFERENCES

Chow, V.T. 1959. Open Channel Hydraulics. McGraw-Hill, New York.

Code of Federal Regulations. 2022. Flood plain management criteria for flood-prone area. 44 C.F.R. § 60.3. Last amended 10/1/2022.

FEMA. 2020. Guidance for Flood Risk Analysis and Mapping. MT-2 Requests. Guidance Document 106. December 2020.

FEMA. 2017. Flood Insurance Study Volumes 1, 2, and 3. San Luis Obispo County, California and Incorporated Areas. FIS Study No. 06079CV001C. Effective May 16, 2017.

FEMA. 2013. Procedures for "No-Rise" Certification For Proposed Developments in the Regulatory Floodway.

FEMA. 2009. Flood Insurance Rate Map. San Luis Obispo County, California and Incorporated Areas. Panel 1364 of 2050. Effective November 16, 2012.

City of Arroyo Grande. Municipal Code. Floodplain management and creek protection district, Chapter 16.44.050.

U.S. Army Corps of Engineers. Hydrologic Engineering Center. Computer Program HEC-RAS Version 6..3.1 Davis, California. March 2019.

U.S. Army Corps of Engineers. Hydrologic Engineering Center. Hydraulic Reference Manual. Version 5.0 Davis, California. February 2016.

Appendix A – FEMA FIRM Panel

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) Zone 10. The **horizontal datum** was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was derived from digital orthophotography collected by the U.S. Department of Agriculture Farm Service Agency under its National Agriculture Imagery Program (NAIP). This imagery was flown in 2010 and was produced with a 1-meter ground sample distance.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO 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 Areas to be protected from 1% annual chance flood event 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.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and 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 987) — Base Flood Elevation value where uniform within zone; elevation in feet*
* Referenced to the North American Vertical Datum of 1988
A — A — Cross section line
23 — 23 — Transect line
97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4275000mE — 1000-meter Universal Transverse Mercator grid values, zone 10
6000000 FT — 5000-foot grid ticks: California State Plane coordinate system, Zone V (FIPSZONE = 405), Lambert 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
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
November 16, 2012 - to update corporate limits, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

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.

MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1364G

FIRM
FLOOD INSURANCE RATE MAP
SAN LUIS OBISPO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 1364 OF 2050

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ARROYO GRANDE, CITY OF	060305	1364	G
SAN LUIS OBISPO COUNTY	060304	1364	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
06079C1364G

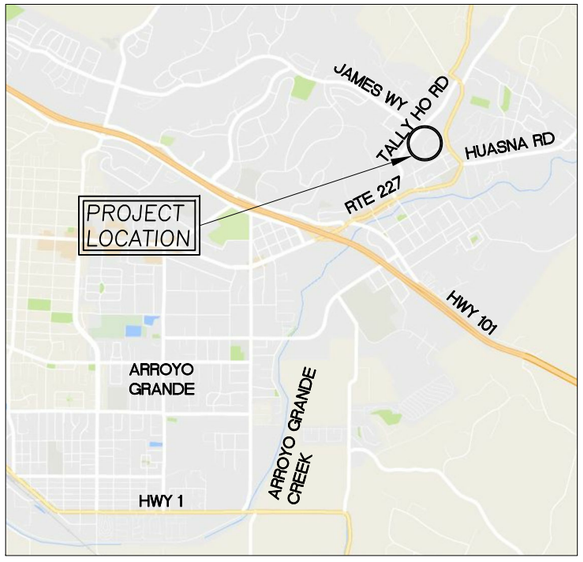
MAP REVISED
NOVEMBER 16, 2012

Federal Emergency Management Agency

Appendix B – 100% Level Design Drawings

TALLY HO
STREAM STABILIZATION PROJECT

100% DESIGN SUBMITTAL



VICINITY MAP
N.T.S. (GOOGLE)

REGIONAL MAP
N.T.S. (GOOGLE)

GENERAL NOTES

1. TOPOGRAPHIC MAPPING WAS PERFORMED BY:
   SWANSON HYDROLOGY + GEOMORPHOLOGY
   500 SEABRIGHT AVENUE, SUITE 202
   SANTA CRUZ, CA 95062
   SURVEY DATE: NOVEMBER 15, 2007.

   WATERWAYS CONSULTING, INC.
   509A SWIFT STREET
   SANTA CRUZ, CA 95060
   SURVEY DATE: JANUARY 16, 2017 AND APRIL 20, 2023.

2. ELEVATION DATUM: AN ASSUMED ELEVATION OF 100.00' WAS ESTABLISHED AT SURVEY CONTROL POINT #1 (½"X24", IRON ROD) SHOWN ON SHT. C2.

3. BASIS OF BEARINGS: BASIS OF BEARINGS BETWEEN POINTS #1 AND #2 IS N00°00'00"E, AS SHOWN ON SHT. C2.

4. CONTOUR INTERVAL IS ONE FOOT. ELEVATIONS AND DISTANCES SHOWN ARE IN DECIMAL FEET.

5. THIS IS NOT A BOUNDARY SURVEY. PROPERTY LINES WERE COMPILED FROM RECORD INFORMATION. THE LOCATION OF THESE LINES IS SUBJECT TO CHANGE, PENDING THE RESULTS OF A COMPLETE BOUNDARY SURVEY.

6. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE 2018 EDITION OF THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS, ISSUED BY THE DEPARTMENT OF TRANSPORTATION (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS").

7. THESE DESIGNS ARE INCOMPLETE WITHOUT THE FINAL STAMPED TECHNICAL SPECIFICATIONS PREPARED BY WATERWAYS CONSULTING, INC. REFER TO TECHNICAL SPECIFICATIONS FOR DETAILS NOT SHOWN HEREON.

** CALL BEFORE YOU DIG **

CONTACT UNDERGROUND SERVICE ALERT (USA)
PRIOR TO ANY CONSTRUCTION WORK 1-800-227-2600

ABBREVIATIONS

AVG.	AVERAGE
CC	CONCRETE
CMP	CORRUGATED METAL PIPE
CY	CUBIC YARDS
DIA.	DIAMETER
E	EXISTING
EG	EXISTING GROUND
ELEV.	ELEVATION
ESL	ENCAPSULATED SOIL LIFT
ESM	ENGINEERED STREAM BED MATERIAL
DI	DRAINAGE INLET
FG	FINISHED GRADE
FT	FEET
HWY	HIGHWAY
INV	INVERT
MIN.	MINIMUM
N	NEW
NIC	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OHW	ORDINARY HIGH WATER
RC	RELATIVE COMPACTION
RD	ROAD
RSP	ROCK SLOPE PROTECTION
RTE	ROUTE
SHT.	SHEET
SPK	SPIKE
SQ.FT.	SQUARE FOOT
T	TREE
T.B.D.	TO BE DETERMINED
TYP.	TYPICAL
UNK	UNKNOWN
WSE	WATER SURFACE ELEVATION
WY	WAY
YR	YEAR

TREE SPECIES

O	OAK
UNK	UNKNOWN
W	WILLOW

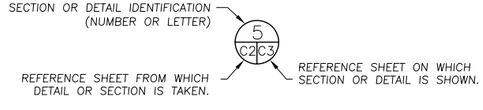
SHEET INDEX

PROJECT DESCRIPTION

THESE DRAWING PROVIDE 100% DESIGN LEVEL DETAILS FOR THE STABILIZATION OF A HEADCUT ALONG CORBETT CREEK IN ARROYO GRANDE, CALIFORNIA.

WORK CONSISTS OF LOWERING THE CHANNEL BED TO REDUCE THE DROP OVER THE HEADCUT, STABILIZING THE REMAINING DROP BY INSTALLING A BOULDER WEIR, AND PROTECTING THE LOWERED CHANNEL BED AND BANKS UPSTREAM OF THE BOULDER WEIR USING A COMBINATION OF ENGINEERED STREAMBED MATERIAL AND FABRIC ENCAPSULATED SOIL LIFTS. DISTURBED AREAS WILL BE REVEGETATED WITH A NATIVE SEED MIX AND LIVE WILLOW STAKES.

SECTION AND DETAIL CONVENTION



WATERWAYS CONSULTING INC.
509A SWIFT ST.
SANTA CRUZ, CA 95060
PH:(831)421-9291 // FAX:(888)819-6847
WWW.WATWAYS.COM

5/4/23
DATE

BRENT M. ZASHARIA
PROFESSIONAL ENGINEER * REGISTERED * STATE OF CALIFORNIA * CIVIL
No. 72809
Exp. 06-30-24

PREPARED AT THE REQUEST OF:
COASTAL SAN LUIS
RESOURCE CONSERVATION
DISTRICT
1203 MAIN STREET, SUITE B
MORRO BAY, CA 93442

COVER SHEET

TALLY HO STREAM
STABILIZATION PROJECT
100% DESIGN SUBMITTAL

DESIGNED BY: BZ/JH
DRAWN BY: DH
CHECKED BY: BZ/MW
DATE: 5/4/2023
JOB NO.: 07-625

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C1

1 OF 6

LEGEND

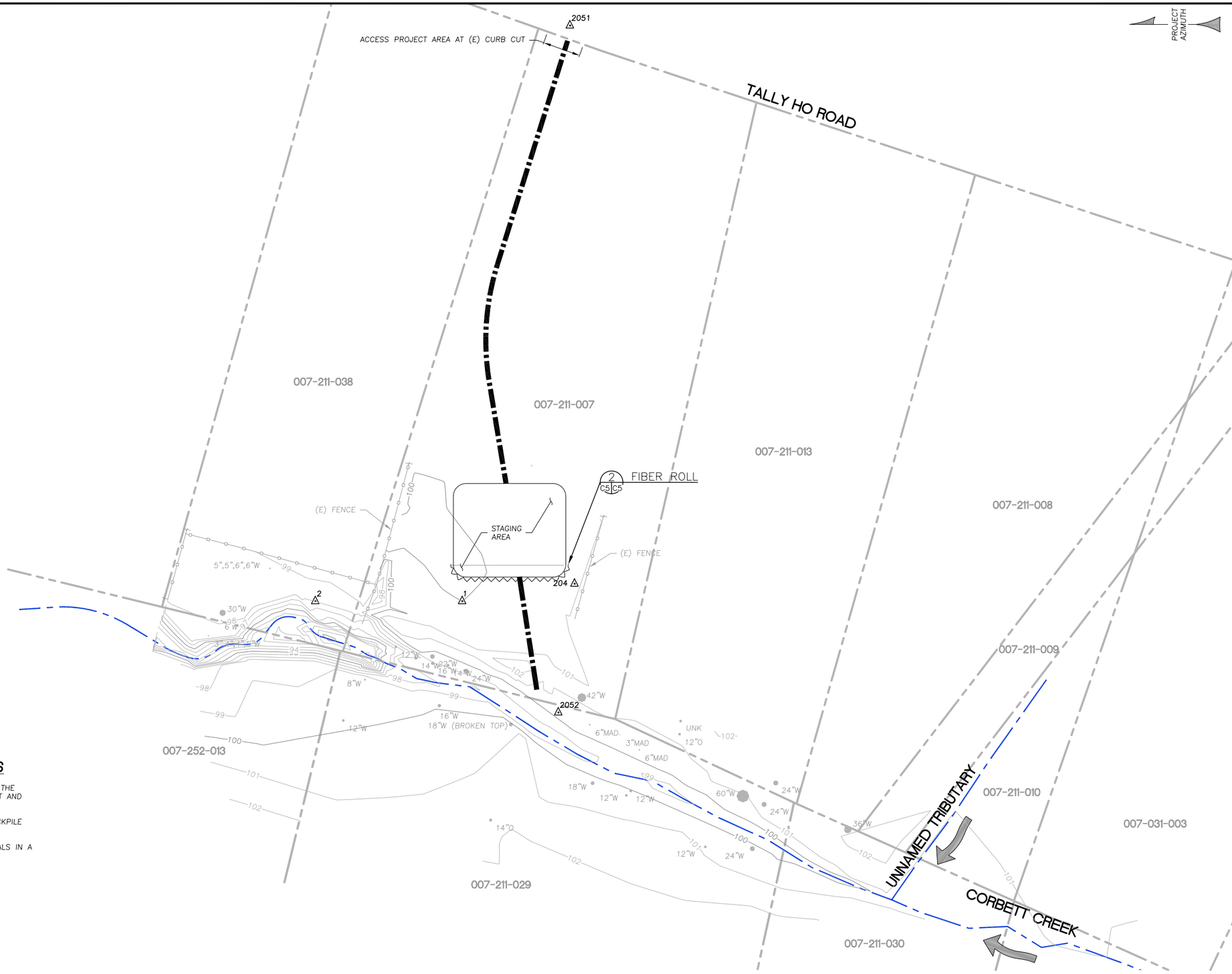
- EXISTING CONTOURS
- PARCEL BOUNDARY
- EXISTING FENCE
- TEMPORARY ACCESS ROUTE
- FIBER ROLL
- SURVEY CONTROL POINT
- EXISTING TREE (SIZE AND TYPE)

CONTROL POINTS

POINT	NORTHING	EASTING	ELEV.	DESC.
1	5000.00	5000.00	100.00	REBAR
2	5057.96	5000.00	98.35	REBAR
204	4955.65	5006.90	100.63	REBAR
2051	4957.46	5227.29	104.78	MAG-NAIL
2052	4962.06	4956.04	100.16	REBAR

ACCESS AND STAGING AREA NOTES

1. USE ONLY THE APPROVED ACCESS POINTS, AS SHOWN ON THE DRAWINGS. STOCKPILE MATERIALS WITHIN AN EXISTING FLAT AND PREVIOUSLY DISTURBED AREA.
2. CONTAIN THE DOWNSLOPE PERIMETER OF STAGING OR STOCKPILE AREAS WITH SILT FENCE.
3. STORE, MAINTAIN AND REFUEL ALL EQUIPMENT AND MATERIALS IN A DESIGNATED PORTION OF THE STAGING AREA.



SITE OVERVIEW AND ACCESS PLAN

SCALE: 1" = 20'

WATERWAYS CONSULTING INC.
509A SWIFT ST.
SANTA CRUZ, CA 95060
PH:(831)421-9291 // FAX:(888)819-6847
WWW.WATWAYS.COM

5/4/23 DATE

PROFESSIONAL ENGINEER BRENT M. ZACHARIA No. 72809 Exp. 06-30-24 CIVIL STATE OF CALIFORNIA

BRENT M. ZACHARIA

PREPARED AT THE REQUEST OF:
COASTAL SAN LUIS
RESOURCE CONSERVATION DISTRICT
1203 MAIN STREET, SUITE B
MORRO BAY, CA 93442

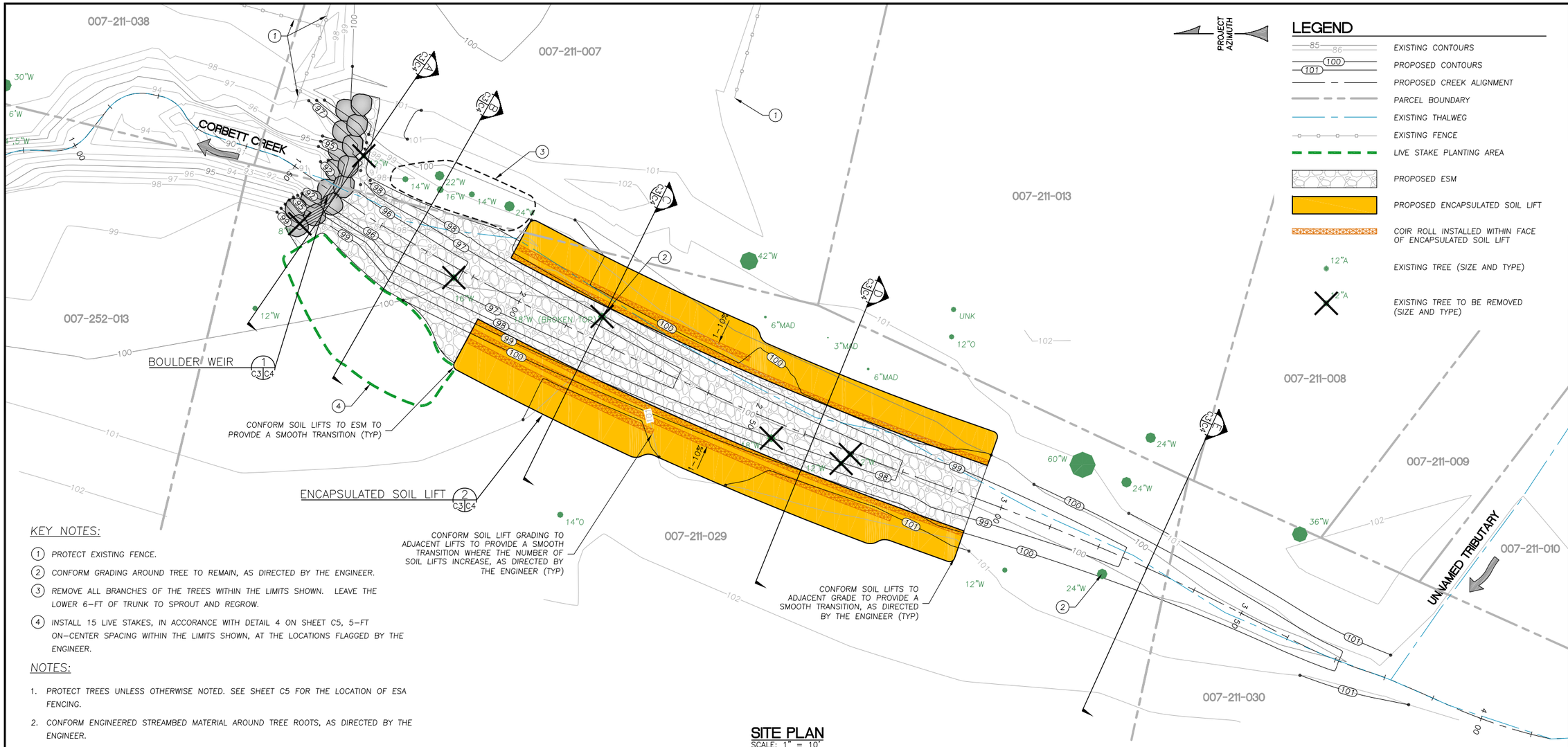
SITE OVERVIEW AND ACCESS PLAN

TALLY HO STREAM STABILIZATION PROJECT
100% DESIGN SUBMITTAL

DESIGNED BY:	BZ/JH
DRAWN BY:	DH
CHECKED BY:	BZ/MW
DATE:	5/4/2023
JOB NO.:	07-625

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C2 | 2 OF 6



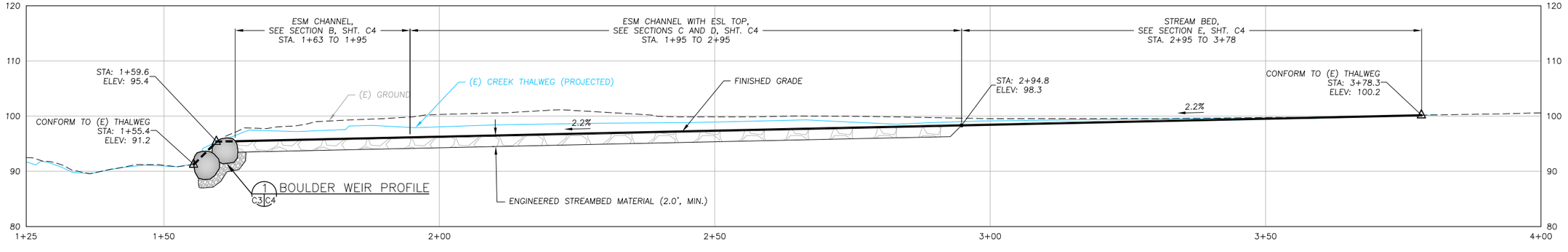
KEY NOTES:

1. PROTECT EXISTING FENCE.
2. CONFORM GRADING AROUND TREE TO REMAIN, AS DIRECTED BY THE ENGINEER.
3. REMOVE ALL BRANCHES OF THE TREES WITHIN THE LIMITS SHOWN. LEAVE THE LOWER 6–FT OF TRUNK TO SPROUT AND REGROW.
4. INSTALL 15 LIVE STAKES, IN ACCORANCE WITH DETAIL 4 ON SHEET C5, 5–FT ON–CENTER SPACING WITHIN THE LIMITS SHOWN, AT THE LOCATIONS FLAGGED BY THE ENGINEER.

NOTES:

1. PROTECT TREES UNLESS OTHERWISE NOTED. SEE SHEET C5 FOR THE LOCATION OF ESA FENCING.
2. CONFORM ENGINEERED STREAMBED MATERIAL AROUND TREE ROOTS, AS DIRECTED BY THE ENGINEER.
3. ACCESS AND WORK SHALL ONLY OCCUR ON PARCELS 007–211–007, 007–211–029, AND 007–211–030.

SITE PLAN
SCALE: 1" = 10'



CHANNEL PROFILE
SCALE: 1" = 10'

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GRADING PLAN AND PROFILE

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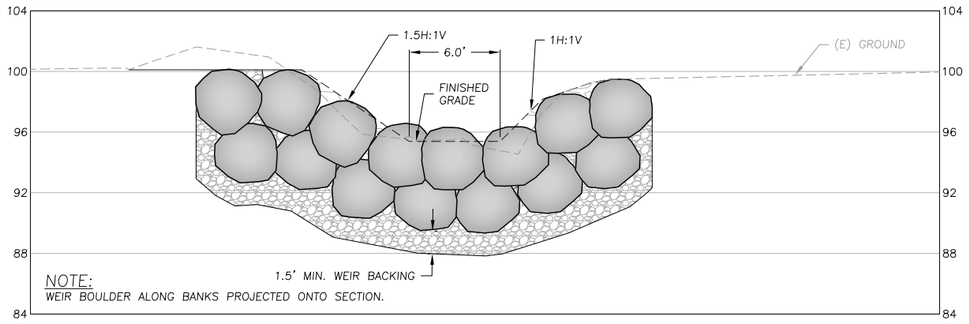
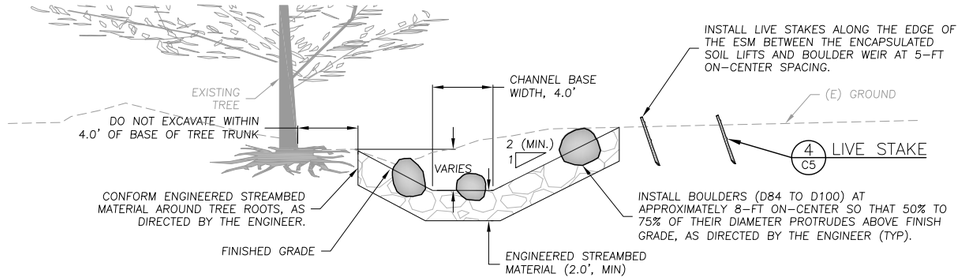
0 1"

C3 | 3 OF 6

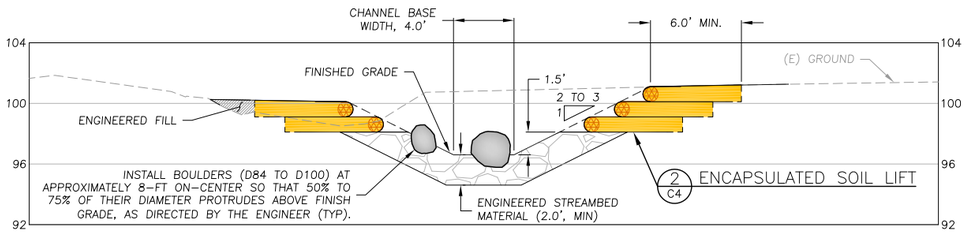


NOTE:
WEIR BOULDER ALONG BANKS PROJECTED ONTO SECTION.

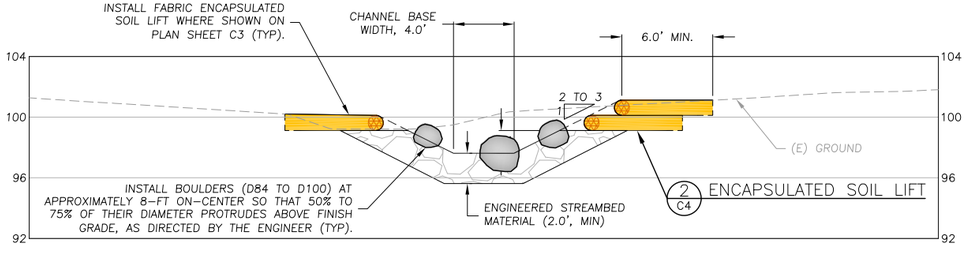
BOULDER WEIR SECTION - STA. 1+60 (A C3|C4)
SCALE: 1" = 5'



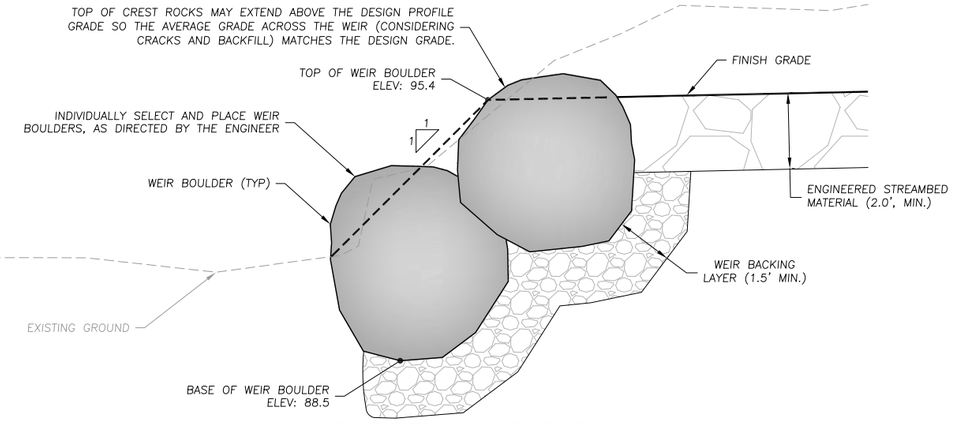
TYPICAL ESM CHANNEL SECTION (B C3|C4)
SCALE: 1" = 5'



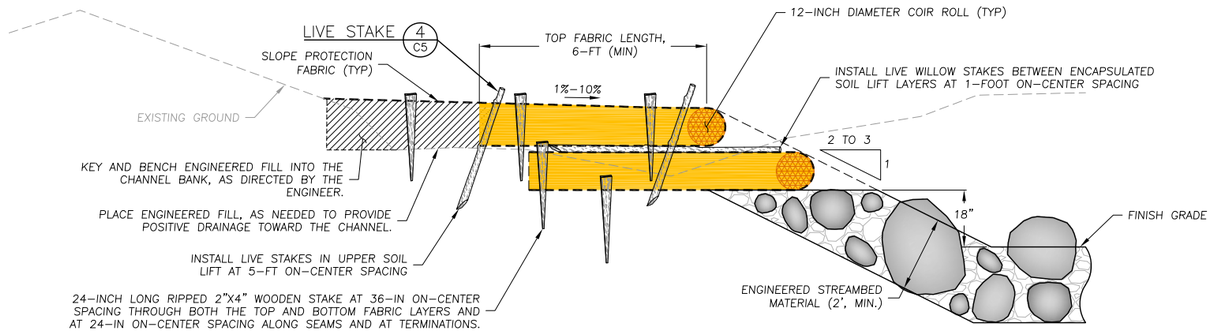
ESM CHANNEL WITH ESL TOP SECTION - STA. 2+16 (C C3|C4)
SCALE: 1" = 5'



ESM BOTTOM WITH ESL BANKS SECTION - STA. 2+62 (D C3|C4)
SCALE: 1" = 5'



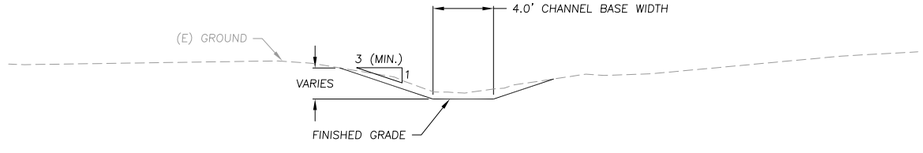
BOULDER WEIR PROFILE (1 C3|C4)
SCALE: 1" = 2'



ENCAPSULATED SOIL LIFT NOTES:

1. ENCAPSULATED SOIL LIFT DESIGNS ARE SHOWN CONCEPTUALLY DUE TO THE INHERENT TOPOGRAPHIC VARIABILITY. THE DESIGN REQUIRES THAT THE ENGINEER OBSERVE CONSTRUCTION TO ENSURE THE INTENT OF THE DESIGN IS ACHIEVED.
2. WRAP SOIL LIFTS WITH 100% BIODEGRADABLE SLOPE PROTECTION FABRIC USING THE DOUBLE LAYER "NORTH AMERICAN GREEN BIONET C700BN" OR APPROVED EQUIVALENT.
3. PREPARE SUBGRADE BY BREAKING DOWN DIRT CLODS IN EXCESS OF 2-INCHES IN DIAMETER AND GRADING LEVEL BEFORE PLACING FABRIC AND INSTALLING THE BASE LIFT. OBTAIN ENGINEER'S APPROVAL OF SUBGRADE PRIOR TO PLACEMENT OF BASE LIFTS.
4. LAYOUT FABRIC ENSURING THERE IS ENOUGH FABRIC EXTENDED BEYOND THE FACE OF THE LIFT TO WRAP THE SOIL LIFT AND ANY GRADED AREA EXTENDING INTO THE CHANNEL BANK. SPREAD THE BOTTOM LAYER OF FABRIC TO REMOVE WRINKLES AND FOLDS AND ANCHOR THE BOTTOM FABRIC TO THE GROUND. BEGIN PLACING FABRIC AT THE UPSTREAM END OF EACH LIFT AND PLACE DOWNSTREAM SECTIONS OF FABRIC A MINIMUM OF 18 INCHES OVER THE UPSTREAM SEGMENTS OF FABRIC TO PROVIDE OVERLAP. THIS WILL RESULT IN THE FABRIC BEING "SHINGLED" IN THE DOWNSTREAM DIRECTION AFTER IT IS FOLDED BACK OVER THE TOP OF THE SOIL LIFT.
5. PLACE THE COIR ROLL ALONG THE FACE OF EACH LIFT WHERE SHOWN ON THE SITE PLAN. ABUT ENDS OF ADJACENT COIR ROLLS TIGHTLY TO ENSURE THERE IS NO VOID SPACE BETWEEN ADJOINING ROLLS. STAKE THE COIR ROLL IN PLACE TO ENSURE IT DOES NOT MOVE WHEN COMPACTING THE SOIL LIFT.
6. BACKFILL THE SOIL LIFT UP TO THE SPECIFIED HEIGHT IN LOOSE LIFTS NOT EXCEEDING 8 INCHES THICKNESS. COMPACT BACKFILL TO 90% MINIMUM RELATIVE COMPACTION, PLACE SEED AS DESCRIBED IN STEP 7 AND COVER THE COMPACTED BACKFILL BY FOLDING THE FABRIC OVER THE COIR ROLL AND TOP OF THE LIFT AND ANCHOR THE FABRIC IN PLACE. ENSURE THE UPSTREAM AND DOWNSTREAM ENDS OF EACH LIFT ARE FULLY ENCASED WITHIN THE FABRIC AND THAT THE FABRIC IS ANCHORED IN PLACE, AS DIRECTED BY THE ENGINEER.
7. PLACE SEED ON THE PORTION OF EACH ENCAPSULATED SOIL LIFT THAT WILL REMAIN EXPOSED (I.E. WILL NOT BE COVERED BY ANOTHER SOIL LIFT) AFTER CONSTRUCTION, PRIOR TO FOLDING THE FABRIC OVER THE TOP OF THE SOIL LIFT AND SECURING.
8. REPEAT STEPS 4 THROUGH 7 FOR EACH SUBSEQUENT LIFT AND STEP 3 FOR EACH BASE LIFT.
9. PLACE LIVES STAKES HORIZONTALLY BETWEEN LIFTS AT EACH LOCATION WHERE TWO OR MORE LIFTS WILL BE CONSTRUCTED,
10. THE MINIMUM SOIL LIFT DEPTH (INTO THE SLOPE) IS 6 FEET.
11. THE MAXIMUM SOIL LIFT THICKNESS (HEIGHT) AT THE FACE OF THE LIFT ADJACENT TO THE COIR ROLL IS 12 INCHES.
12. THE MAXIMUM SOIL LIFT THICKNESS (HEIGHT) AT THE BACK OF THE UPPER LIFT (AWAY FROM THE CHANNEL) IS 18 INCHES.
13. THE MAXIMUM UPPER SOIL LIFT THICKNESS (HEIGHT) AT THE BACK OF THE LIFT TO CONFORM TO EXISTING GROUND MAY BE INCREASED FROM 18 TO 24 INCHES, PENDING APPROVAL OF THE ENGINEER PRIOR TO INSTALLATION.
14. CONFORM ENCAPSULATED SOIL LIFTS TO THE ENGINEERED STREAMBED MATERIAL, TREES TO REMAIN AND EXISTING GRADES AT THE DIRECTION OF THE ENGINEER.

ENCAPSULTATED SOIL LIFT DETAIL (2 C3,C4,C5|C4)
SCALE: 1" = 2'



TYPICAL STREAM BED SECTION (E C3|C4)
SCALE: 1" = 5'

SECTIONS

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SECTIONS AND DETAILS

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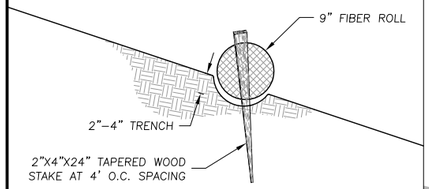
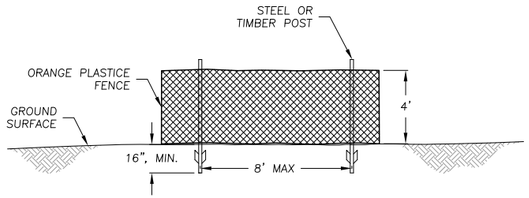
0 1"

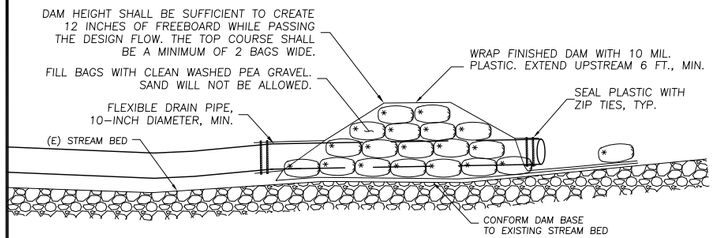
C4 | 4 OF 6



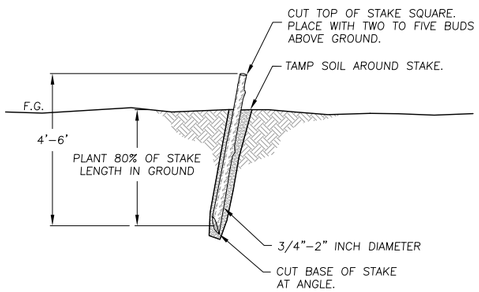
FIBER ROLL DETAIL
SCALE: 1" = 1' — 1 C2,C5 C5



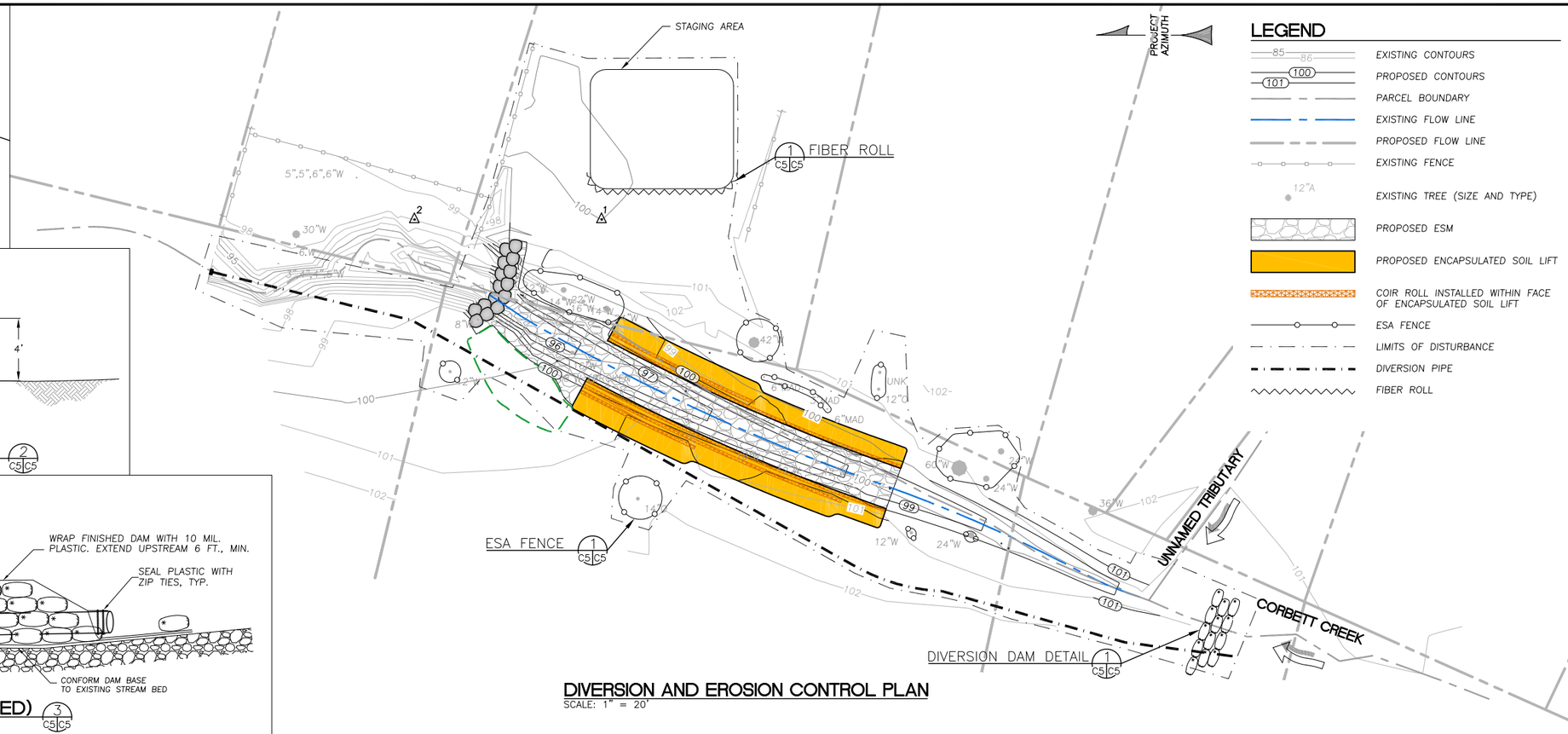
ESA FENCE DETAIL
SCALE: 1"=4' — 2 C5 C5



DIVERSION DAM DETAIL (AS NEEDED)
SCALE: 1"=6' — 3 C5 C5



LIVE STAKE DETAIL
SCALE: 1" = 2' — 4 C3,C4 C5



DIVERSION AND EROSION CONTROL PLAN
SCALE: 1" = 20'

DUST CONTROL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUOUS DUST CONTROL, THROUGHOUT THE CONSTRUCTION, IN ACCORDANCE WITH THE PERMIT CONDITIONS OF APPROVAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REGULAR CLEANING OF ALL MUD, DIRT, DEBRIS, ETC., FROM ANY AND ALL ADJACENT ROADS AND SIDEWALKS, AT LEAST ONCE EVERY 24 HOURS WHEN OPERATIONS ARE OCCURRING.
2. ALL DISTURBED AREAS, INCLUDING UNPAVED ACCESS ROADS OR STORAGE PILES, NOT BEING ACTIVELY UTILIZED FOR CONSTRUCTION PURPOSES, SHALL BE EFFECTIVELY STABILIZED OF DUST EMISSIONS USING WATER, CHEMICAL STABILIZER/SUPPRESSANT, OR VEGETATIVE GROUND COVER.
3. ALL GROUND–DISTURBING ACTIVITIES (E.G., CLEARING, GRUBBING, SCRAPING, AND EXCAVATION) SHALL BE EFFECTIVELY CONTROLLED OF FUGITIVE DUST EMISSIONS UTILIZING APPLICATION OF WATER OR BY PRE–SOAKING.
4. ALL MATERIALS TRANSPORTED OFFSITE SHALL BE COVERED OR EFFECTIVELY WETTED TO LIMIT DUST EMISSIONS.
5. FOLLOWING THE ADDITION OF MATERIALS TO, OR THE REMOVAL OF MATERIALS FROM, THE SURFACES OF OUTDOOR STORAGE PILES, SAID PILES SHALL BE EFFECTIVELY STABILIZED OF FUGITIVE DUST EMISSIONS UTILIZING SUFFICIENT WATER OR CHEMICAL STABILIZER/SUPPRESANT.
6. ONSITE VEHICLE SPEED ON UNPAVED SURFACES SHALL BE LIMITED TO 5 MPH.
7. DISTURBED AREAS SHALL BE SEEDED PRIOR TO OCTOBER 15TH OR EARLIER AS REQUIRED BY THE APPLICABLE PERMIT CONDITIONS.

TABLE 1: SEED MIX

BOTANICAL NAME	COMMON NAME	APPLICATION (LBS/ACRE)
POA SECUNDA	SANDBERG BLUEGRASS	8
BROMUS CARINATUS	CALIFORNIA BROME	8
ELYMUS TRACHYCAULUS SSP. TRACHYCAULUS	SLENDER WHEATGRASS	8
LEYMUS TRITICOIDES	CREEPING WILD RYE	8
HORDEUM BRACHYANTHERUM	MEADOW BARLEY	8
BACCHARIS SALICIFOLIA	MULE FAT	3
LUPINUS BICOLOR	MINATURE LUPINE	2
ACHELLIA MILLEFOLIUM	COMMON YARROW	2
ESCHSHOLZIA CALIFORNICA	CALIFORNIA POPPY	2
ARTEMESIA DOUGLASIANA	MUGWORT	4
	TOTAL	53

EROSION CONTROL NOTES

1. THE EROSION CONTROL PLAN SHOWN IS INTENDED FOR THE SUMMER CONSTRUCTION SEASON (APRIL 15TH TO OCTOBER 15TH). IF THE DRAINAGE FEATURES SHOWN ON THESE DRAWINGS ARE NOT COMPLETED AND DISTURBED AREAS STABILIZED BY OCTOBER 1ST, CONSULT THE ENGINEER FOR ADDITIONAL RAINY SEASON EROSION CONTROL MEASURES.
2. PRIOR TO COMMENCING WORK, PROTECT AREAS TO REMAIN UNDISTURBED WITH ESA FENCING, AS SHOWN ON THE DRAWINGS. ADDITIONAL FENCING MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER.
3. UTILIZE ONLY THE APPROVED HAUL ROADS AND ACCESS POINTS (AS SHOWN ON THE DRAWINGS) FOR TRANSPORT OF MATERIALS AND EQUIPMENT.
4. BETWEEN OCTOBER 15 AND APRIL 15, PROTECT EXPOSED SOIL FROM EROSION AT ALL TIMES. DURING CONSTRUCTION, SUCH PROTECTION MAY CONSIST OF MULCHING AND/OR PLANTING OF NATIVE VEGETATION OF ADEQUATE DENSITY. BEFORE COMPLETION OF THE PROJECT, STABILIZE ALL EXPOSED SOIL AGAINST EROSION.
5. MAINTAIN A STANDBY CREW FOR EMERGENCY WORK AT ALL TIMES DURING THE RAINY SEASON (OCTOBER 15 THROUGH APRIL 15). STOCKPILE NECESSARY MATERIALS AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES.
6. CONSTRUCT TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THIS PLAN AND/OR AS DIRECTED BY THE ENGINEER TO CONTROL DRAINAGE WHICH HAS BEEN AFFECTED BY GRADING AND/OR TRENCHING OPERATIONS.
7. INCORPORATE ADEQUATE DRAINAGE PROCEDURES DURING THE CONSTRUCTION PROCESS TO ELIMINATE EXCESSIVE PONDING AND EROSION.
8. CONSTRUCT AND MAINTAIN EROSION CONTROL MEASURES TO PREVENT THE DISCHARGE OF EARTHEN MATERIALS TO THE CREEK FROM DISTURBED AREAS UNDER CONSTRUCTION AND FROM COMPLETED CONSTRUCTION AREAS.
9. INSTALL ALL PROTECTIVE DEVICES AT THE END OF EACH WORK DAY WHEN THE FIVE–DAY RAIN PROBABILITY EQUALS OR EXCEEDS 50 PERCENT AS DETERMINED FROM THE NATIONAL WEATHER SERVICE FORECAST OFFICE: WWW.SRH.NOAA.GOV.
10. AFTER EACH RAINSTORM, REMOVE ALL SILT AND DEBRIS FROM CHECK BERMS AND SEDIMENT CONTROL DEVICES.
11. THE EROSION CONTROL DEVICES ON THIS PLAN ARE A SCHEMATIC REPRESENTATION OF WHAT MAY BE REQUIRED. EROSION CONTROL DEVICES MAY BE RELOCATED, DELETED, OR ADDITIONAL ITEMS MAY BE REQUIRED DEPENDING ON THE ACTUAL SOIL CONDITIONS ENCOUNTERED, AT THE DISCRETION OF THE ENGINEER.
12. MAINTAIN ALL EROSION CONTROL DEVICES AND MODIFY THEM AS SITE PROGRESS DICTATES.
13. MONITOR THE EROSION CONTROL DEVICES DURING STORMS AND MODIFY THEM IN ORDER TO PREVENT PROGRESS OF ANY ONGOING EROSION.
14. CLEAN DAILY ANY EROSION OR DEBRIS SPILLING ONTO A PUBLIC STREET.
15. CONTACT THE ENGINEER IN THE EVENT THAT THE EROSION CONTROL PLAN AS DESIGNED REQUIRES ANY SUBSTANTIAL REVISIONS.
16. BE FAMILIAR WITH THE CONDITIONS OF APPROVAL OF ALL REQUIRED PROJECT PERMITS AND IMPLEMENT ALL REQUIRED BMP'S PRIOR TO COMMENCING SITE DISTURBING ACTIVITIES.

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DIVERSION AND EROSION CONTROL PLAN

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0 1"

C5 | 5 OF 6

GENERAL NOTES

1. NOTIFY THE ENGINEER AT LEAST 96 HOURS PRIOR TO CONSTRUCTION. THE ENGINEER OR A DESIGNATED REPRESENTATIVE SHALL OBSERVE THE CONSTRUCTION PROCESS, AS NECESSARY TO ENSURE PROPER INSTALLATION PROCEDURES.

2. EXISTING UNDERGROUND UTILITY LOCATIONS:

   A. CALL UNDERGROUND SERVICE ALERT (1-800-642-2444) TO LOCATE ALL UNDERGROUND UTILITY LINES PRIOR TO COMMENCING CONSTRUCTION.

   B. PRIOR TO BEGINNING WORK, CONTACT ALL UTILITIES COMPANIES WITH REGARD TO WORKING OVER, UNDER, OR AROUND EXISTING FACILITIES AND TO OBTAIN INFORMATION REGARDING RESTRICTIONS THAT ARE REQUIRED TO PREVENT DAMAGE TO THE FACILITIES.

   C. EXISTING UTILITY LOCATIONS SHOWN ARE COMPILED FROM INFORMATION SUPPLIED BY THE APPROPRIATE UTILITY AGENCIES AND FROM FIELD MEASUREMENTS TO ABOVE GROUND FEATURES READILY VISIBLE AT THE TIME OF SURVEY. LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND DEPTH OF UNDERGROUND UTILITIES.

   D. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE LOCATION AND/OR PROTECTION OF ALL EXISTING AND PROPOSED PIPING, UTILITIES, TRAFFIC SIGNAL EQUIPMENT (BOTH ABOVE GROUND AND BELOW GROUND), STRUCTURES, AND ALL OTHER EXISTING IMPROVEMENTS THROUGHOUT CONSTRUCTION.

   E. PRIOR TO COMMENCING FABRICATION OR CONSTRUCTION, DISCOVER OR VERIFY THE ACTUAL DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES AND POTHOLE THOSE AREAS WHERE POTENTIAL CONFLICTS ARE LIKELY OR DATA IS OTHERWISE INCOMPLETE.

   F. TAKE APPROPRIATE MEASURES TO PROTECT EXISTING UTILITIES DURING CONSTRUCTION OPERATIONS. CONTRACTOR IS SOLELY RESPONSIBLE FOR THE COST OF REPAIR/REPLACEMENT OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.

   G. UPON LEARNING OF THE EXISTENCE AND/OR LOCATIONS OF ANY UNDERGROUND FACILITIES NOT SHOWN OR SHOWN INACCURATELY ON THE PLANS OR NOT PROPERLY MARKED BY THE UTILITY OWNER, IMMEDIATELY NOTIFY THE UTILITY OWNER AND THE CITY BY TELEPHONE AND IN WRITING.

   H. UTILITY RELOCATIONS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT FACILITIES WILL BE PERFORMED BY THE UTILITY COMPANY, UNLESS OTHERWISE NOTED.

3. IF DISCREPANCIES ARE DISCOVERED BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL LAWS, ORDINANCES, CODES, REQUIREMENTS AND STANDARDS WHICH IN ANY MANNER AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION AND THE MATERIALS USED IN THE CONSTRUCTION.

5. ANY TESTS, INSPECTIONS, SPECIAL OR OTHERWISE, THAT ARE REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS, OR THESE PLANS, SHALL BE DONE BY AN INDEPENDENT INSPECTION COMPANY. JOB SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE AN OFFICIAL INSPECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE REQUIRED TESTS AND INSPECTIONS ARE PERFORMED.

6. PROJECT SCHEDULE: PRIOR TO COMMENCEMENT OF WORK, SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL A DETAILED CONSTRUCTION SCHEDULE. DO NOT BEGIN ANY CONSTRUCTION WORK UNTIL THE PROJECT SCHEDULE AND WORK PLAN IS APPROVED BY THE ENGINEER. ALL CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE ENGINEER SO THAT THE QUALITY OF WORK CAN BE CHECKED FOR APPROVAL. PURSUE WORK IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE A TIMELY COMPLETION OF THE PROJECT.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, PERMITTING, INSTALLATION, AND MAINTENANCE OF ANY AND ALL TRAFFIC CONTROL MEASURES DEEMED NECESSARY.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GENERAL SAFETY DURING CONSTRUCTION. ALL WORK SHALL CONFORM TO PERTINENT SAFETY REGULATIONS AND CODES. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING, AND MAINTAINING ALL WARNING SIGNS AND DEVICES NECESSARY TO SAFEGUARD THE GENERAL PUBLIC AND THE WORK, AND PROVIDE FOR THE PROPER AND SAFE ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE PROVISIONS OF OSHA IN THE CONSTRUCTION PRACTICES FOR ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.

9. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTION LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL. NEITHER THE PROFESSIONAL ACTIVITIES OF CONSULTANT NOR THE PRESENCE OF CONSULTANT OR HIS OR HER EMPLOYEES OR SUB-CONSULTANTS AT A CONSTRUCTION SITE SHALL RELIEVE THE CONTRACTOR AND ITS SUBCONTRACTORS OF THEIR RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND APPLICABLE HEALTH OR SAFETY REQUIREMENTS OF ANY REGULATORY AGENCY OR OF STATE LAW.

10. MAINTAIN A CURRENT, COMPLETE, AND ACCURATE RECORD OF ALL AS-BUILT DEVIATIONS FROM THE CONSTRUCTION AS SHOWN ON THESE DRAWINGS AND SPECIFICATIONS, FOR THE PURPOSE OF PROVIDING THE ENGINEER OF RECORD WITH A BASIS FOR THE PREPARATION OF RECORD DRAWINGS.

11. MAINTAIN THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS. STORE ALL MATERIALS WITHIN APPROVED STAGING AREAS.

12. PROVIDE, AT CONTRACTOR'S SOLE EXPENSE, ALL MATERIALS, LABOR AND EQUIPMENT REQUIRED TO COMPLY WITH ALL APPLICABLE PERMIT CONDITIONS AND REQUIREMENTS.

13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING AND LAYOUT, UNLESS OTHERWISE SPECIFIED.

14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND PRESERVATION OF ALL SURVEY MONUMENTS OR PROPERTY CORNERS. DISTURBED MONUMENTS SHALL BE RESTORED BACK TO THEIR ORIGINAL LOCATION AND SHALL BE CERTIFIED BY A REGISTERED CIVIL ENGINEER OR LAND SURVEYOR AT THE SOLE EXPENSE OF THE CONTRACTOR.

15. TREE DIMENSIONS: TRUNK DIAMETERS SHOWN REPRESENT DIAMETER AT BREAST HEIGHT (DBH), MEASURED IN INCHES. DBH IS MEASURED 4.5 FT ABOVE GROUND FOR SINGLE TRUNKS AND TRUNKS THAT SPLIT INTO SEVERAL STEMS CLOSE TO THE GROUND. THE DBH FOR TREES THAT SPLIT INTO SEVERAL STEMS CLOSE TO THE GROUND MAY BE CONSOLIDATED INTO A SINGLE DBH BY TAKING THE SQUARE ROOT OF THE SUM OF ALL SQUARED STEM DBH'S, UNLESS OTHERWISE NOTED. WHERE TREES FORK NEAR BREAST HEIGHT, TRUNK DIAMETER IS MEASURED AT THE NARROWEST PART OF THE MAIN STEM BELOW THE FORK. FOR TREES ON A SLOPE, BREAST HEIGHT IS REFERENCED FROM THE UPPER SIDE OF THE SLOPE. FOR LEANING TREES, BREAST HEIGHT IS MEASURED ON THE SIDE THAT THE TREE LEANS TOWARD. TREES WITH DBH LESS THAN 8" ARE TYPICALLY NOT SHOWN.

    12"W = 12" DBH WILLOW

16. TREE SPECIES ARE IDENTIFIED WHEN KNOWN. HOWEVER, FINAL DETERMINATION SHOULD BE MADE BY A QUALIFIED BOTANIST. REFER TO THE LEGEND FOR TREE SPECIES SYMBOLS.

17. TREE TRUNK DIMENSIONS MAY BE SHOWN OUT-OF-SCALE FOR PLOTTING CLARITY. CAUTION SHOULD BE USED IN DESIGNING NEAR TREE TRUNKS. THERE ARE LIMITATIONS ON FIELD ACCURACY, DRAFTING ACCURACY, MEDIUM STRETCH AS WELL AS THE "SPREAD" OR "LEANING" OF TREES. REQUEST ADDITIONAL TOPOGRAPHIC DETAIL WHERE CLOSE TOLERANCES ARE ANTICIPATED. INDIVIDUAL TREES ARE NOT TYPICALLY LOCATED WITHIN DRIPLINE CANOPY AREAS SHOWN.

18. ALL STANDARD STREET MONUMENTS, LOT CORNER PIPES, AND OTHER PERMANENT MONUMENTS DISTURBED DURING THE PROCESS OF CONSTRUCTION SHALL BE REPLACED AND A RECORD OF SURVEY OR CORNER RECORD PER SECTION 8771 OF THE PROFESSIONAL LAND SURVEYORS ACT FILED BEFORE ACCEPTANCE OF THE IMPROVEMENTS BY THE CITY OF ARROYO GRANDE. COPIES OF ANY RECORD OF SURVEY OR CORNER RECORDS SHALL BE SUBMITTED TO THE CITY.

19. CONTRACTOR IS REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

20. CULTURAL RESOURCES: IN THE EVENT THAT HUMAN REMAINS AND/OR CULTURAL MATERIALS ARE FOUND, ALL PROJECT-RELATED CONSTRUCTION SHALL CEASE WITHIN A 100-FOOT RADIUS. THE CONTRACTOR SHALL, PURSUANT TO SECTION 7050.5 OF THE HEALTH AND SAFETY CODE, AND SECTION 5097.94 OF THE PUBLIC RESOURCES CODE OF THE STATE OF CALIFORNIA.

EARTHWORK NOTES

1. GRADING SUMMARY:

TOTAL CUT VOLUME =	175 CY
TOTAL FILL VOLUME =	30 CY
OFFHAUL =	145 CY

   THE ABOVE QUANTITIES ARE APPROXIMATE IN-PLACE VOLUMES CALCULATED AS THE DIFFERENCE BETWEEN EXISTING GROUND AND THE PROPOSED FINISH GRADE, PREPARED FOR PERMITTING PURPOSES ONLY. EXISTING GROUND IS DEFINED BY THE TOPOGRAPHIC CONTOURS AND/OR SPOT ELEVATIONS ON THE PLAN. PROPOSED FINISH GRADE IS DEFINED AS THE DESIGN SURFACE ELEVATION OF WORK TO BE CONSTRUCTED. THE QUANTITIES HAVE NOT BEEN FACTORED TO INCLUDE ALLOWANCES FOR BULKING, CLEARING AND GRUBBING, SUBSIDENCE, SHRINKAGE, OVER EXCAVATION, AND RECOMPACTION, UNDERGROUND UTILITY AND SUBSTRUCTURE SPOILS AND CONSTRUCTION METHODS.

   THE CONTRACTOR SHALL PERFORM AN INDEPENDENT EARTHWORK ESTIMATE FOR THE PURPOSE OF PREPARING BID PRICES FOR EARTHWORK. THE BID PRICE SHALL INCLUDE COSTS FOR ANY NECESSARY IMPORT AND PLACEMENT OF EARTH MATERIALS OR THE EXPORT AND PROPER DISPOSAL OF EXCESS OR UNSUITABLE EARTH MATERIALS.

2. PRIOR TO COMMENCING WORK, PROTECT ALL SENSITIVE AREAS TO REMAIN UNDISTURBED WITH TEMPORARY FENCING, AS SHOWN ON THE DRAWINGS, AS SPECIFIED, OR AS DIRECTED BY THE ENGINEER.

3. DO NOT DISTRURB AREAS OUTSIDE OF THE DESIGNATED LIMITS OF DISTURBANCE, UNLESS AUTHORIZED IN WRITING BY THE ENGINEER. THE COST OF ALL ADDITIONAL WORK ASSOCIATED WITH RESTORATION AND REVEGETATION OF DISTURBED AREAS OUTSIDE THE DESIGNATED LIMITS OF DISTURBANCE, AS SHOWN ON THE DRAWINGS, SHALL BE BORN SOLELY BY THE CONTRACTOR.

4. REMOVE ALL EXCESS SOILS TO AN APPROVED DUMP SITE.

5. CLEARING AND GRUBBING, SUBGRADE PREPARATION AND EARTHWORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 19 OF THE STANDARD SPECIFICATIONS, THESE DRAWINGS, AND THE TECHNICAL SPECIFICATIONS.

6. PRIOR TO STARTING WORK ON THE PROJECT, THE CONTRACTOR SHALL SUBMIT FOR ACCEPTANCE BY THE ENGINEER A HAZARDOUS MATERIALS CONTROLS AND SPILL PREVENTION PLAN. THE PLAN SHALL INCLUDE PROVISIONS FOR PREVENTING HAZARDOUS MATERIALS FROM CONTAMINATING SOIL OR ENTERING WATER COURSES, AND SHALL ESTABLISH A SPILL PREVENTION AND COUNTERMEASURE PLAN.

7. UNSUITABLE SOIL OR MATERIALS, NOT TO BE INCLUDED IN THE WORK INCLUDE:

   A. ORGANIC MATERIALS SUCH AS PEAT, MULCH, ORGANIC SILT OR SOD.
   B. SOILS CONTAINING EXPANSIVE CLAYS.
   C. MATERIAL CONTAINING EXCESSIVE MOISTURE.
   D. POORLY GRADED COURSE MATERIAL, PARTICLE SIZE IN EXCESS OF 6 INCHES.
   E. MATERIAL WHICH WILL NOT ACHIEVE SPECIFIED DENSITY OR BEARING.

8. FINE GRADING ELEVATIONS, CONFORMS, AND SLOPES NOT CLEARLY SHOWN ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD TO DIRECT DRAINAGE TO THE CREEK IN A MANNER THAT SUPPORTS THE INTENT OF THE DESIGN. ALL FINAL GRADING SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

9. COMPACT ALL FILL TO A MINIMUM OF 90% MAXIMUM DENSITY AS DETERMINED BY ASTM-D1557.

10. FILL MATERIAL SHALL BE SPREAD IN LIFTS OF APPROXIMATELY 8 INCHES, MOISTENED OR DRIED TO NEAR OPTIMUM MOISTURE CONTENT AND RECOMPACTED. THE MATERIALS FOR ENGINEERED FILL SHALL BE APPROVED BY A REGISTERED CIVIL ENGINEER. ANY IMPORTED MATERIALS MUST BE APPROVED BEFORE BEING BROUGHT TO THE SITE. THE MATERIALS USED SHALL BE FREE OF ORGANIC MATTER AND OTHER DELETERIOUS MATERIALS.

11. ALL CONTACT SURFACES BETWEEN ORIGINAL GROUND AND RECOMPACTED FILL SHALL BE EITHER HORIZONTAL OR VERTICAL. ALL ORGANIC MATERIAL SHALL BE REMOVED AND THE REMAINING SURFACE SCARIFIED TO A DEPTH OF AT LEAST 12 INCHES, UNLESS DEEPER EXCAVATION IS REQUIRED BY THE ENGINEER.

DIVERSION NOTES

THE DIVERSION PLAN SHOWN IS SCHEMATIC. GENERAL REQUIREMENTS ARE PROVIDED BELOW. THE FULL REQUIREMENTS OF THE DIVERSION AND DEWATERING PLAN ARE SPECIFIED IN THE PROJECT TECHNICAL SPECIFICATIONS.

1. GENERAL
   1.1. DEWATER THE PROJECT SITE AS REQUIRED TO FACILITATE IN-STREAM CONSTRUCTION AND REDUCE POTENTIAL IMPACTS TO WATER QUALITY DOWNSTREAM OF THE PROJECT SITE.
   1.2. CONFIRM THAT A FAVORABLE LONG TERM WEATHER FORECAST (1 WEEK, MIN.) IS OBSERVED PRIOR TO PLACEMENT OF DIVERSION STRUCTURES.
   1.3. DIVERT FLOW ONLY WHEN THE DIVERSION CONSTRUCTION IS OTHERWISE COMPLETE. FOLLOWING ENGINEER'S APPROVAL OF THE COMPLETED WORK, REMOVE DIVERSION BEGINNING AT THE DOWNSTREAM LIMIT, IN AN UPSTREAM DIRECTION.

2. DIVERSION SYSTEM
   2.1. INSTALL A SEALED, TEMPORARY DIVERSION DAM CONSTRUCTED USING SAND BAGS FILLED WITH CLEAN WASHED PEA GRAVEL. THE DAM AND METHOD OF SEALING SHALL BE PLACED AT AN APPROPRIATE DEPTH TO CAPTURE SUBSURFACE STREAM FLOW, AS NEEDED TO DEWATER THE STREAMBED. THE USE OF SAND WILL NOT BE ALLOWED. NO OTHER DIVERSION METHOD SHALL BE USED WITHOUT AUTHORIZATION OF THE ENGINEER. IF AN ALTERNATE DIVERSION METHOD IS PREFERRED BY THE CONTRACTOR, THE CONTRACTOR SHALL SUBMIT A PLAN TO THE ENGINEER FOR APPROVAL, DETAILING THE DESIRED DIVERSION METHOD.
   2.2. THE DIVERSION STRUCTURE SHALL BE CONSTRUCTED AS SHOWN ON THE DRAWINGS, OR AS DIRECTED BY THE ENGINEER IN THE FIELD.
   2.3. IN THE EVENT OF A SIGNIFICANT STORM FORECAST, THE CONTRACTOR SHALL BE PREPARED TO TAKE NECESSARY MEASURES TO ENSURE SAFE PASSAGE OF STORM WATER FLOW THROUGH THE PROJECT AREA, WITHOUT DAMAGE TO EXISTING STRUCTURES, OR INTRODUCTION OF EXCESSIVE SEDIMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY EROSION CONTROL B.M.P.'S.

3. DEWATERING OF CONSTRUCTION AREAS
   3.1. THE CONTRACTOR SHALL SUPPLY ALL NECESSARY PUMPS, PIPING, FILTERS, SHORING, AND OTHER TOOLS AND MATERIALS NECESSARY FOR DEWATERING. IF A PUMPED SYSTEM IS RELIED UPON TO ENSURE DOWNSTREAM WATER QUALITY, A BACKUP PUMP OF EQUAL CAPACITY SHALL BE PROVIDED AT ALL TIMES AND THE PUMP MUST BE CONTINUOUSLY MONITORED.
   3.2. DEWATERING ACTIVITIES WHICH MAY BE REQUIRED FOR CONSTRUCTION PURPOSES SHALL COMPLY WITH WATER QUALITY STANDARDS ISSUED BY THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD.
   3.3. DISCHARGE OF WATER FROM THE DEWATERED CONSTRUCTION SITE, EITHER BY GRAVITY OR PUMPING, SHALL BE PERFORMED IN A MANNER THAT PREVENTS EXCESSIVE TURBIDITY FROM ENTERING THE RECEIVING WATERWAYS AND PREVENTS SCOUR AND EROSION OUTSIDE OF THE CONSTRUCTION SITE. PUMPED WATER SHOULD BE PRE-FILTERED WITH A GRAVEL PACK AROUND SUMPS FOR SUBSURFACE FLOWS AND A SILT FENCE AROUND PUMPS FOR SURFACE FLOW. PUMPED WATER SHALL BE DISCHARGED INTO ISOLATED LOCAL DEPRESSIONS, FILTER BAGS, SETTLING (BAKER) TANKS, OR TEMPORARY SEDIMENT BASINS, AS NECESSARY TO MEET WATER QUALITY REQUIREMENTS. WHERE WATER TO BE DISCHARGED INTO THE CREEK WILL CREATE EXCESSIVE TURBIDITY, THE WATER SHALL BE ROUTED THROUGH A SEDIMENT INTERCEPTOR OR OTHER FACILITIES TO REMOVE SEDIMENT FROM WATER.

WATERWAYS CONSULTING INC.
509A SWIFT ST.
SANTA CRUZ, CA 95060
PH:(831)421-9291 // FAX:(888)819-6847
WWW.WATWAYS.COM

5/4/23 DATE

PROFESSIONAL ENGINEER BRENT W. ZASOWSKI No. 73809 Exp. 06-30-24 CIVIL STATE OF CALIFORNIA

BRENT W. ZASOWSKI

PREPARED AT THE REQUEST OF:
COASTAL SAN LUIS
RESOURCE CONSERVATION DISTRICT
1203 MAIN STREET, SUITE B
MORRO BAY, CA 93442

NOTES

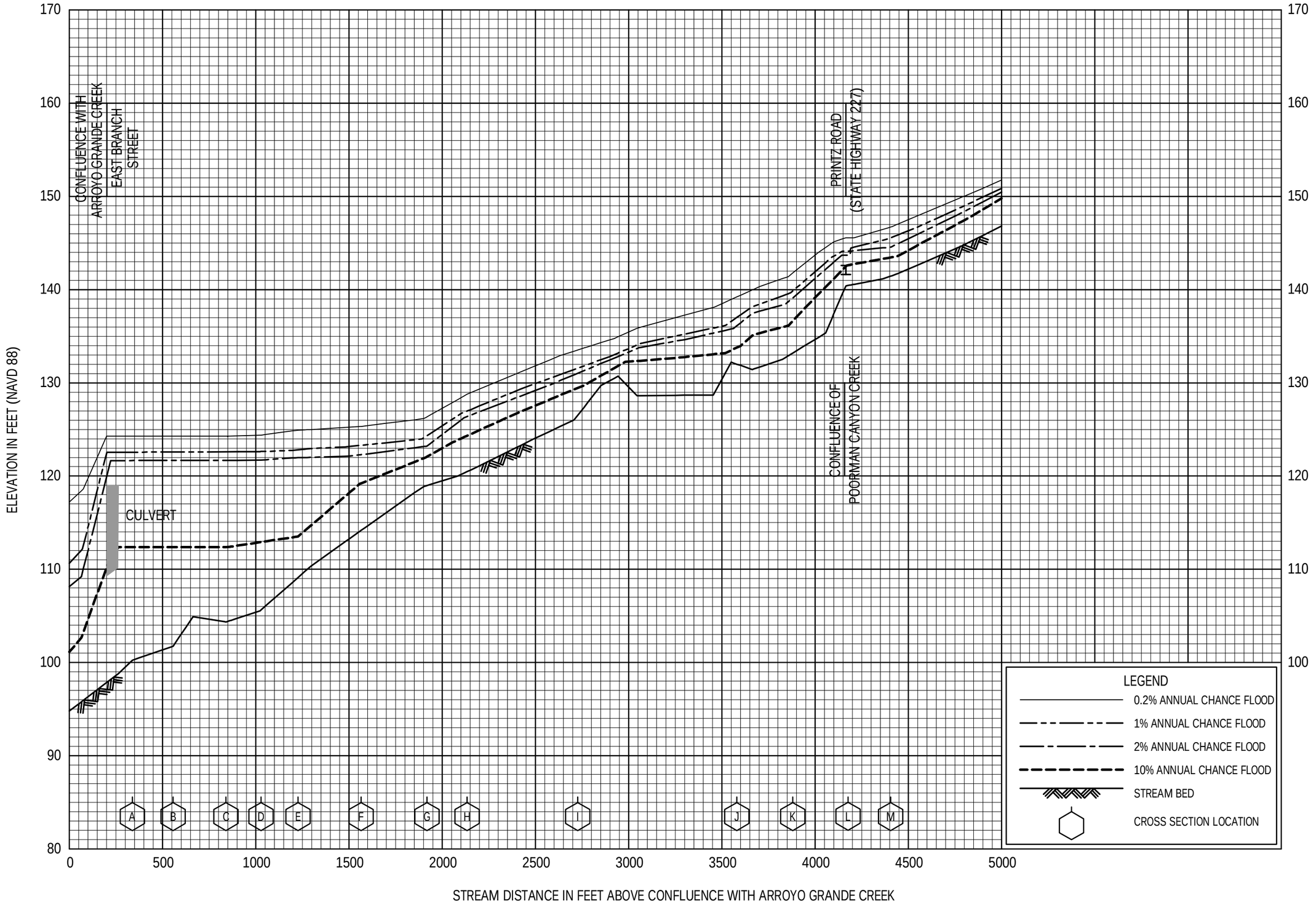
TALLY HO STREAM
STABILIZATION PROJECT
100% DESIGN SUBMITTAL

DESIGNED BY:	BZ/JH
DRAWN BY:	DH
CHECKED BY:	BZ/MW
DATE:	5/4/2023
JOB NO.:	07-625

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C6 | 6 OF 6

Appendix C – FIS Corbett Canyon Creek Flood Profile



FLOOD PROFILES

CORBETT CANYON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

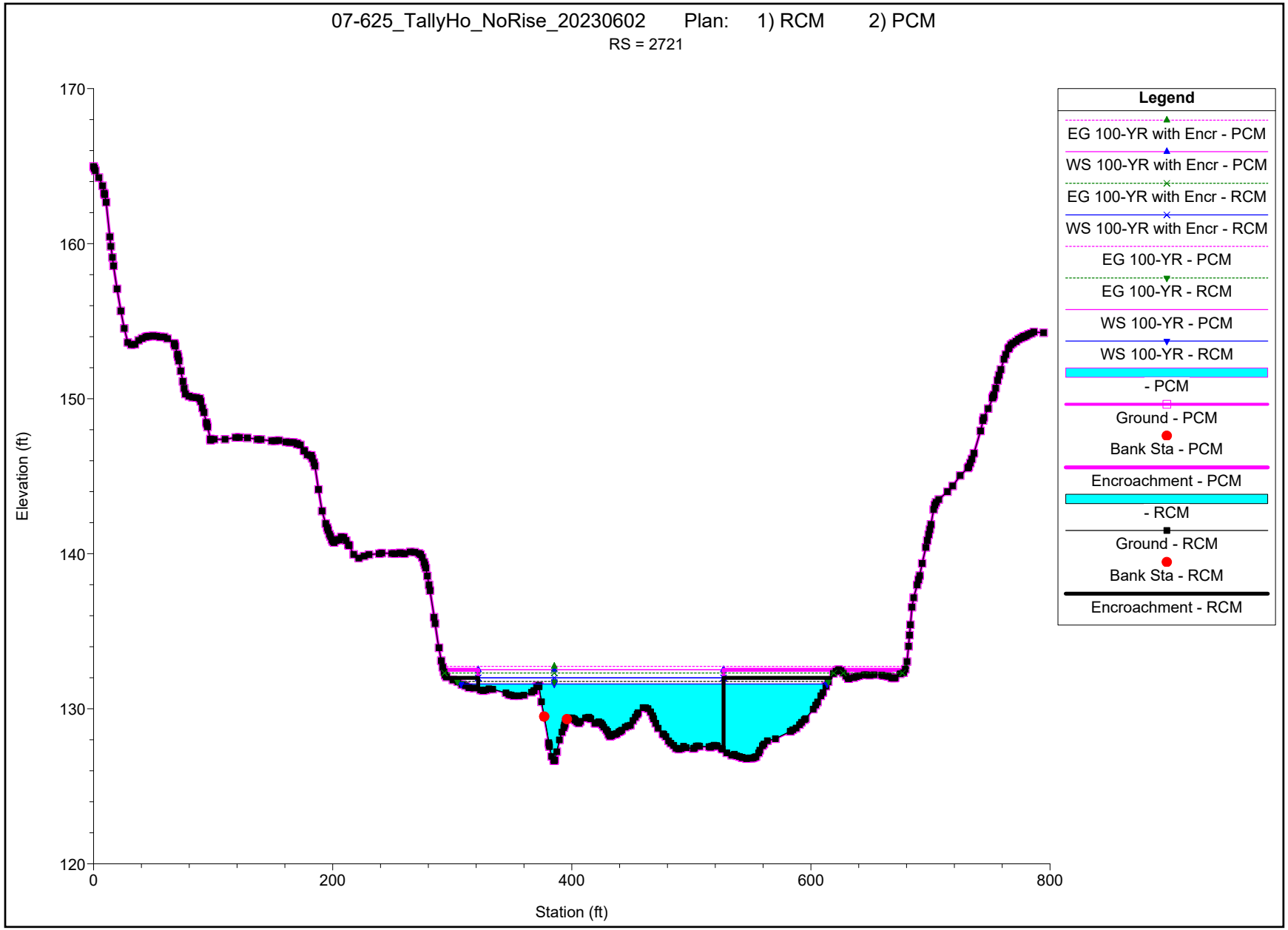
SAN LUIS OBISPO COUNTY, CA

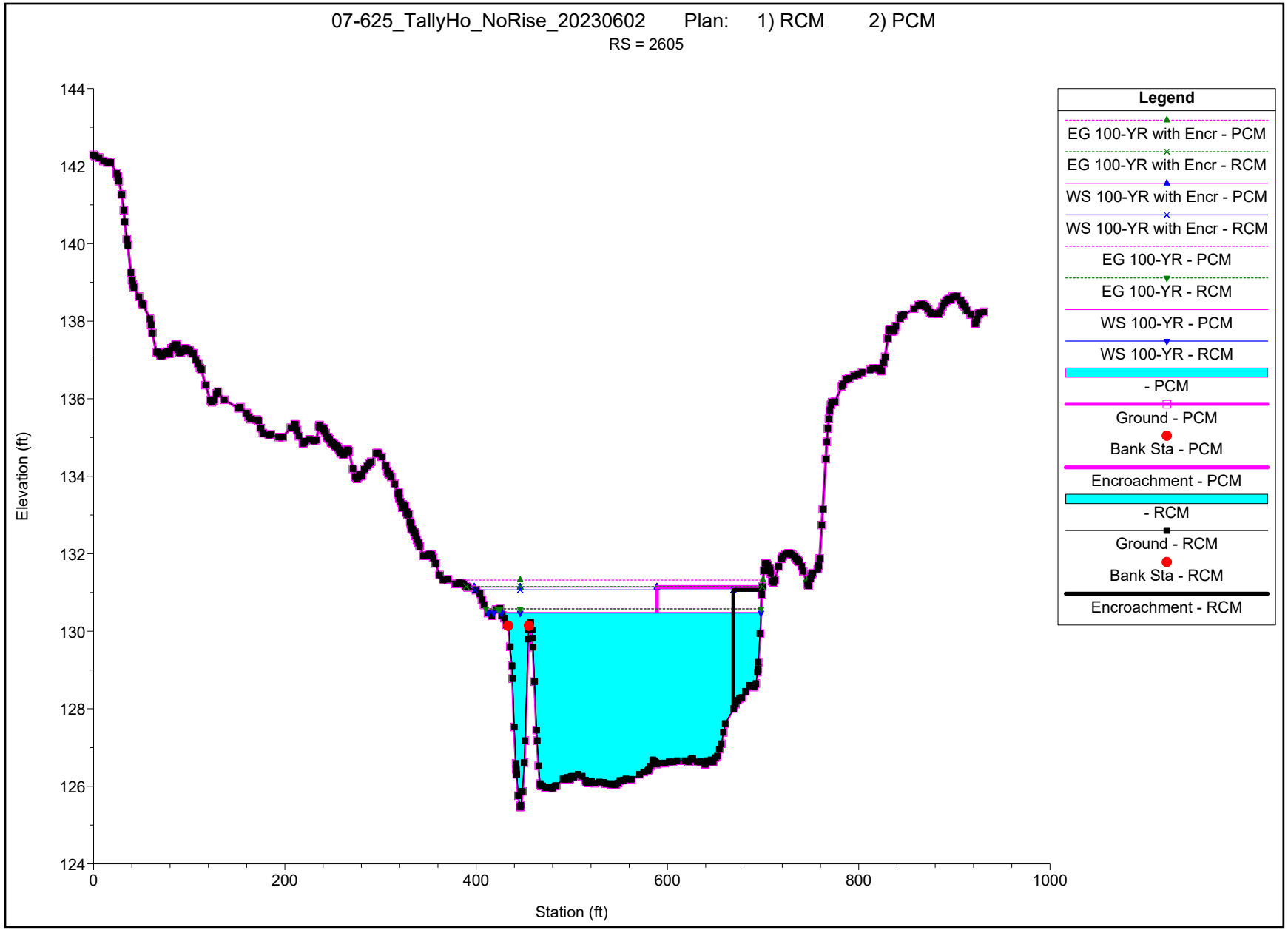
AND INCORPORATED AREAS

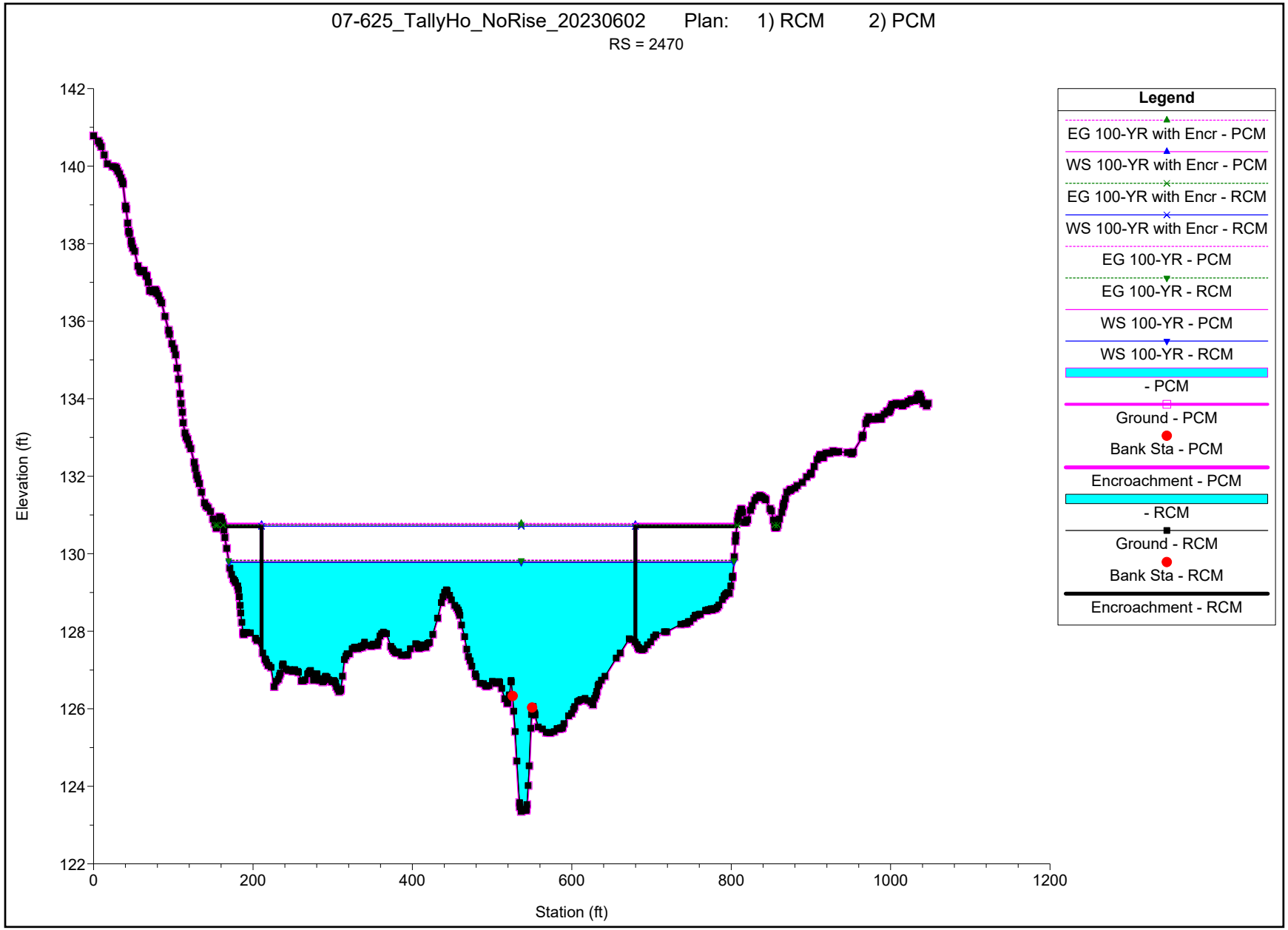
Appendix D – HEC-RAS Model Output Cross Sections and Tables

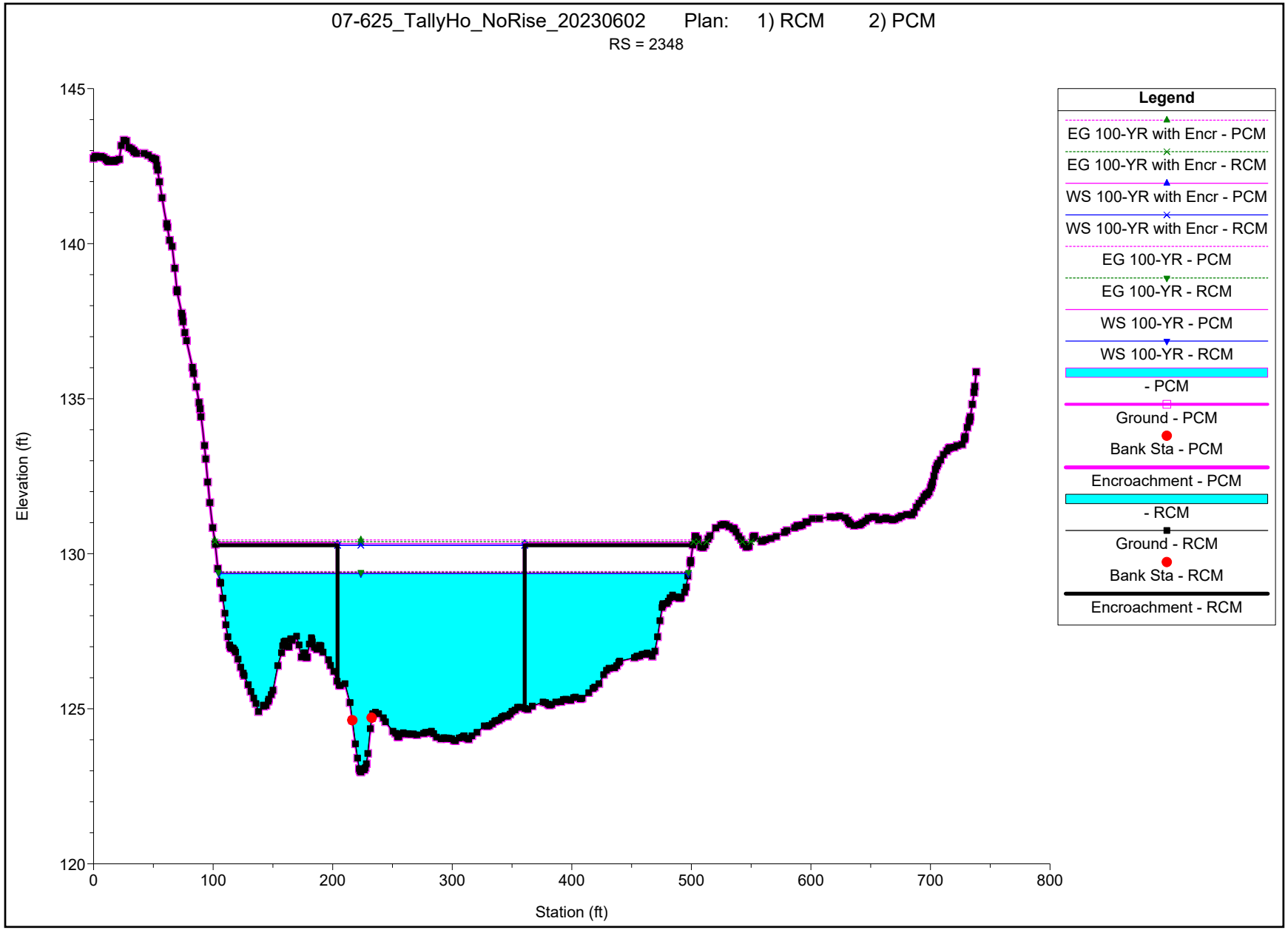
HEC-RAS River: CorbettCanyonCk Reach: Reach 1

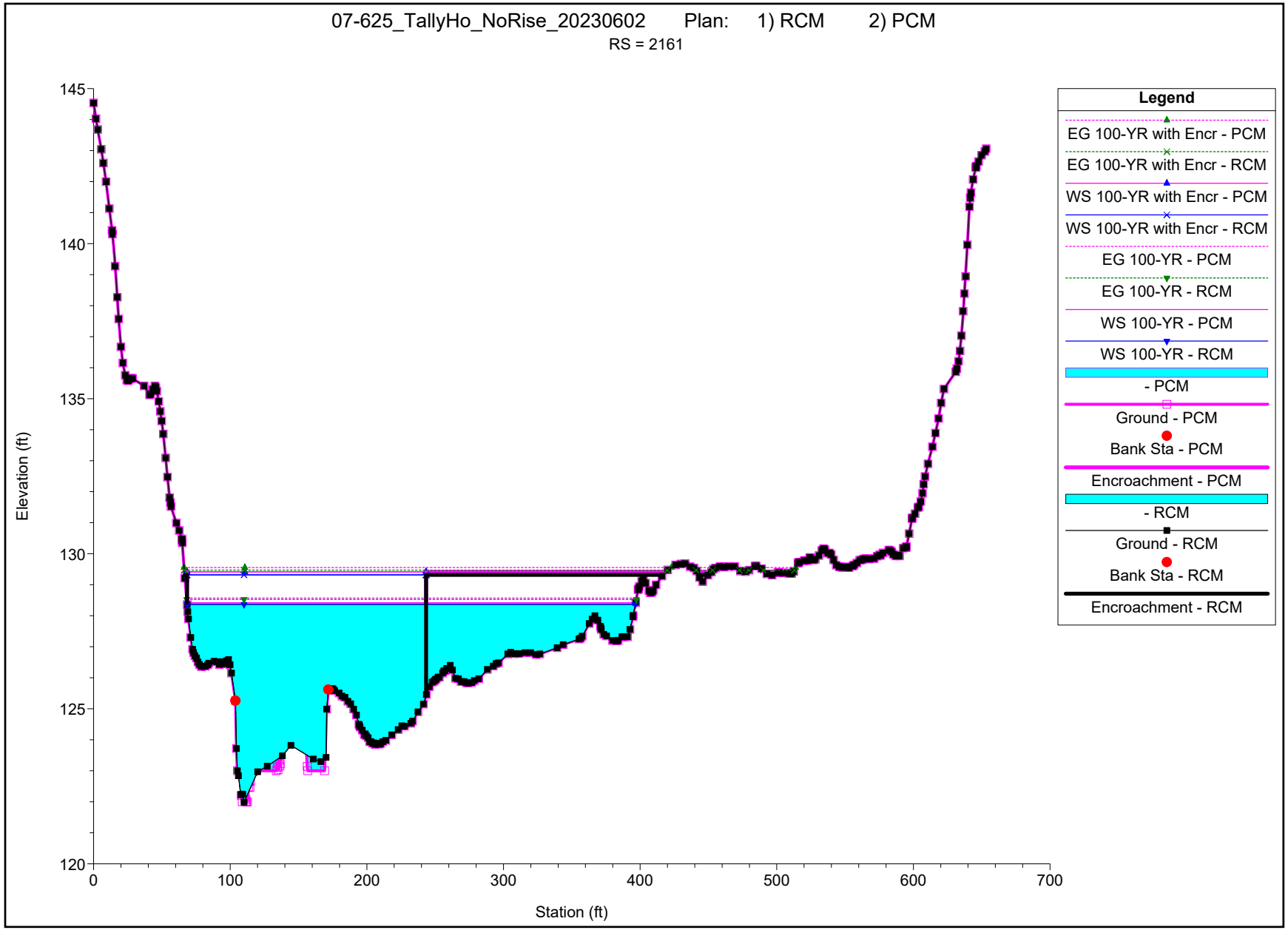
Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	2721	100-YR	PCM	2450.00	126.65	131.60		131.76	0.013781	3.99	789.96	306.12	0.37
Reach 1	2721	100-YR	RCM	2450.00	126.65	131.60		131.76	0.013801	3.99	789.55	306.09	0.37
Reach 1	2721	100-YR with Encr	PCM	2450.00	126.65	132.51		132.73	0.014488	4.75	687.11	205.21	0.39
Reach 1	2721	100-YR with Encr	RCM	2450.00	126.65	132.00		132.31	0.023808	5.62	581.58	205.21	0.49
Reach 1	2605	100-YR	PCM	2450.00	125.47	130.48		130.58	0.007580	2.47	959.31	277.70	0.25
Reach 1	2605	100-YR	RCM	2450.00	125.47	130.47		130.57	0.007619	2.47	957.77	277.36	0.26
Reach 1	2605	100-YR with Encr	PCM	2450.00	125.47	131.14		131.32	0.010124	3.27	732.84	190.95	0.30
Reach 1	2605	100-YR with Encr	RCM	2450.00	125.47	131.07		131.15	0.004951	2.26	1058.18	270.02	0.21
Reach 1	2470	100-YR	PCM	2450.00	123.35	129.79		129.84	0.004003	2.84	1603.28	633.48	0.21
Reach 1	2470	100-YR	RCM	2450.00	123.35	129.78		129.82	0.004081	2.86	1593.49	633.29	0.22
Reach 1	2470	100-YR with Encr	PCM	2450.00	123.35	130.75		130.78	0.001879	2.17	1804.08	468.95	0.15
Reach 1	2470	100-YR with Encr	RCM	2450.00	123.35	130.71		130.74	0.001948	2.20	1783.71	468.95	0.15
Reach 1	2348	100-YR	PCM	2450.00	122.96	129.38		129.43	0.002902	2.54	1476.74	392.93	0.19
Reach 1	2348	100-YR	RCM	2450.00	122.96	129.36		129.40	0.002960	2.56	1467.52	392.69	0.19
Reach 1	2348	100-YR with Encr	PCM	2450.00	122.96	130.33		130.44	0.004280	3.41	929.18	156.52	0.23
Reach 1	2348	100-YR with Encr	RCM	2450.00	122.96	130.27		130.39	0.004414	3.44	920.33	156.52	0.23
Reach 1	2161	100-YR	PCM	2450.00	122.00	128.42		128.57	0.007926	3.79	940.16	328.39	0.29
Reach 1	2161	100-YR	RCM	2450.00	121.99	128.37		128.52	0.008220	3.89	923.46	328.02	0.30
Reach 1	2161	100-YR with Encr	PCM	2450.00	122.00	129.41		129.56	0.005202	3.45	859.78	175.01	0.25
Reach 1	2161	100-YR with Encr	RCM	2450.00	121.99	129.32		129.47	0.005417	3.54	844.53	175.01	0.25
Reach 1	2104	100-YR	PCM	2450.00	121.00	127.90		128.05	0.010748	4.76	896.55	318.95	0.34
Reach 1	2104	100-YR	RCM	2450.00	120.76	127.81		127.98	0.011234	5.25	875.58	318.20	0.37
Reach 1	2104	100-YR with Encr	PCM	2450.00	121.00	128.87		129.11	0.012571	4.80	641.62	139.54	0.32
Reach 1	2104	100-YR with Encr	RCM	2450.00	120.76	128.71		129.00	0.012888	6.14	622.31	139.54	0.40
Reach 1	1947	100-YR	PCM	2450.00	119.00	125.58		125.87	0.018402	5.73	621.84	208.81	0.44
Reach 1	1947	100-YR	RCM	2450.00	117.29	125.57		125.86	0.016389	5.96	640.79	207.24	0.41
Reach 1	1947	100-YR with Encr	PCM	2450.00	119.00	126.31		126.68	0.019325	5.81	518.92	115.20	0.41
Reach 1	1947	100-YR with Encr	RCM	2450.00	117.29	126.25		126.65	0.017522	6.57	528.02	115.20	0.43
Reach 1	1936	100-YR	PCM	2450.00	113.61	125.27		125.66	0.015912	7.23	694.86	271.75	0.40
Reach 1	1936	100-YR	RCM	2450.00	113.61	125.26		125.66	0.014684	7.18	698.35	271.59	0.40
Reach 1	1936	100-YR with Encr	PCM	2450.00	113.61	126.25		126.50	0.008441	5.60	717.28	143.85	0.30
Reach 1	1936	100-YR with Encr	RCM	2450.00	113.61	126.21		126.47	0.008001	5.64	718.83	143.85	0.30
Reach 1	1935	100-YR	PCM	2450.00	113.00	125.29		125.65	0.013298	6.83	727.56	274.63	0.37
Reach 1	1935	100-YR	RCM	2450.00	113.00	125.29		125.65	0.013298	6.83	727.56	274.63	0.37
Reach 1	1935	100-YR with Encr	PCM	2450.00	113.00	126.09		126.48	0.016540	6.24	531.61	104.95	0.33
Reach 1	1935	100-YR with Encr	RCM	2450.00	113.00	126.06		126.45	0.016852	6.30	528.21	104.95	0.33
Reach 1	1810	100-YR	PCM	2450.00	115.09	124.24		124.40	0.007122	4.72	1024.90	379.33	0.30
Reach 1	1810	100-YR	RCM	2450.00	115.09	124.24		124.40	0.007122	4.72	1024.90	379.33	0.30
Reach 1	1810	100-YR with Encr	PCM	2450.00	115.09	125.01		125.21	0.006370	4.76	799.24	165.85	0.29
Reach 1	1810	100-YR with Encr	RCM	2450.00	115.09	125.01		125.20	0.006133	4.67	823.75	175.85	0.28
Reach 1	1696	100-YR	PCM	2450.00	113.36	123.64		123.73	0.004643	3.86	1204.95	370.13	0.23
Reach 1	1696	100-YR	RCM	2450.00	113.36	123.64		123.73	0.004643	3.86	1204.95	370.13	0.23
Reach 1	1696	100-YR with Encr	PCM	2450.00	113.36	124.56		124.66	0.003422	3.55	1058.25	191.98	0.20
Reach 1	1696	100-YR with Encr	RCM	2450.00	113.36	124.56		124.66	0.003422	3.55	1058.25	191.98	0.20
Reach 1	1582	100-YR	PCM	2450.00	113.88	123.30	119.58	123.34	0.002457	2.75	1589.77	423.45	0.17
Reach 1	1582	100-YR	RCM	2450.00	113.88	123.30	119.58	123.34	0.002457	2.75	1589.77	423.45	0.17
Reach 1	1582	100-YR with Encr	PCM	2450.00	113.88	124.30	119.58	124.36	0.002003	1.92	1294.50	195.21	0.11
Reach 1	1582	100-YR with Encr	RCM	2450.00	113.88	124.30	119.58	124.36	0.002003	1.92	1294.50	195.21	0.11

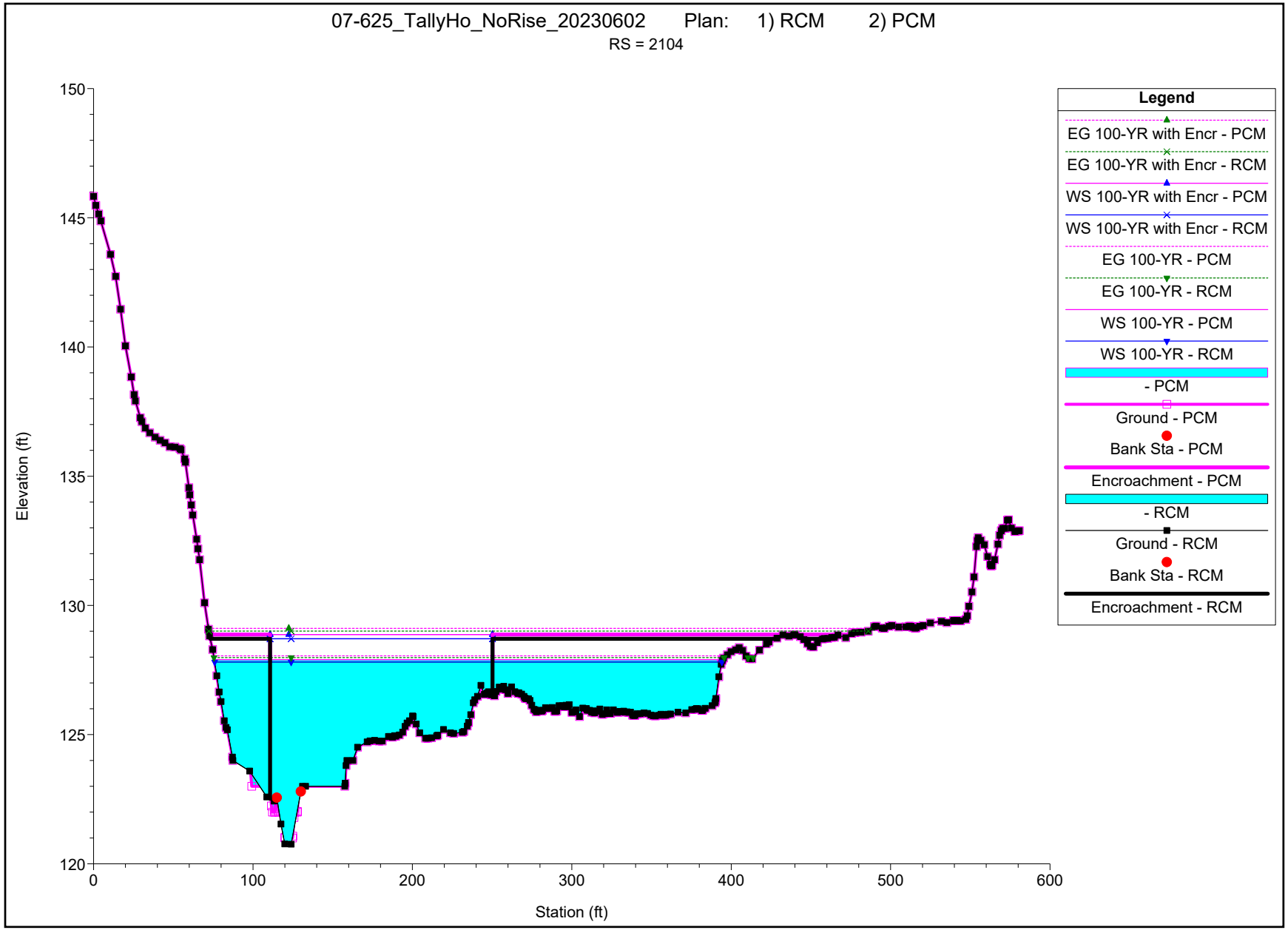

07-625_TallyHo_NoRise_20230602 Plan: 1) RCM 2) PCM
RS = 2721
Elevation (ft)
170
160
150
140
130
120
0
200
400
600
800
Station (ft)
Legend
EG 100-YR with Encr - PCM
WS 100-YR with Encr - PCM
EG 100-YR with Encr - RCM
WS 100-YR with Encr - RCM
EG 100-YR - PCM
EG 100-YR - RCM
WS 100-YR - PCM
WS 100-YR - RCM
- PCM
Ground - PCM
Bank Sta - PCM
Encroachment - PCM
- RCM
Ground - RCM
Bank Sta - RCM
Encroachment - RCM

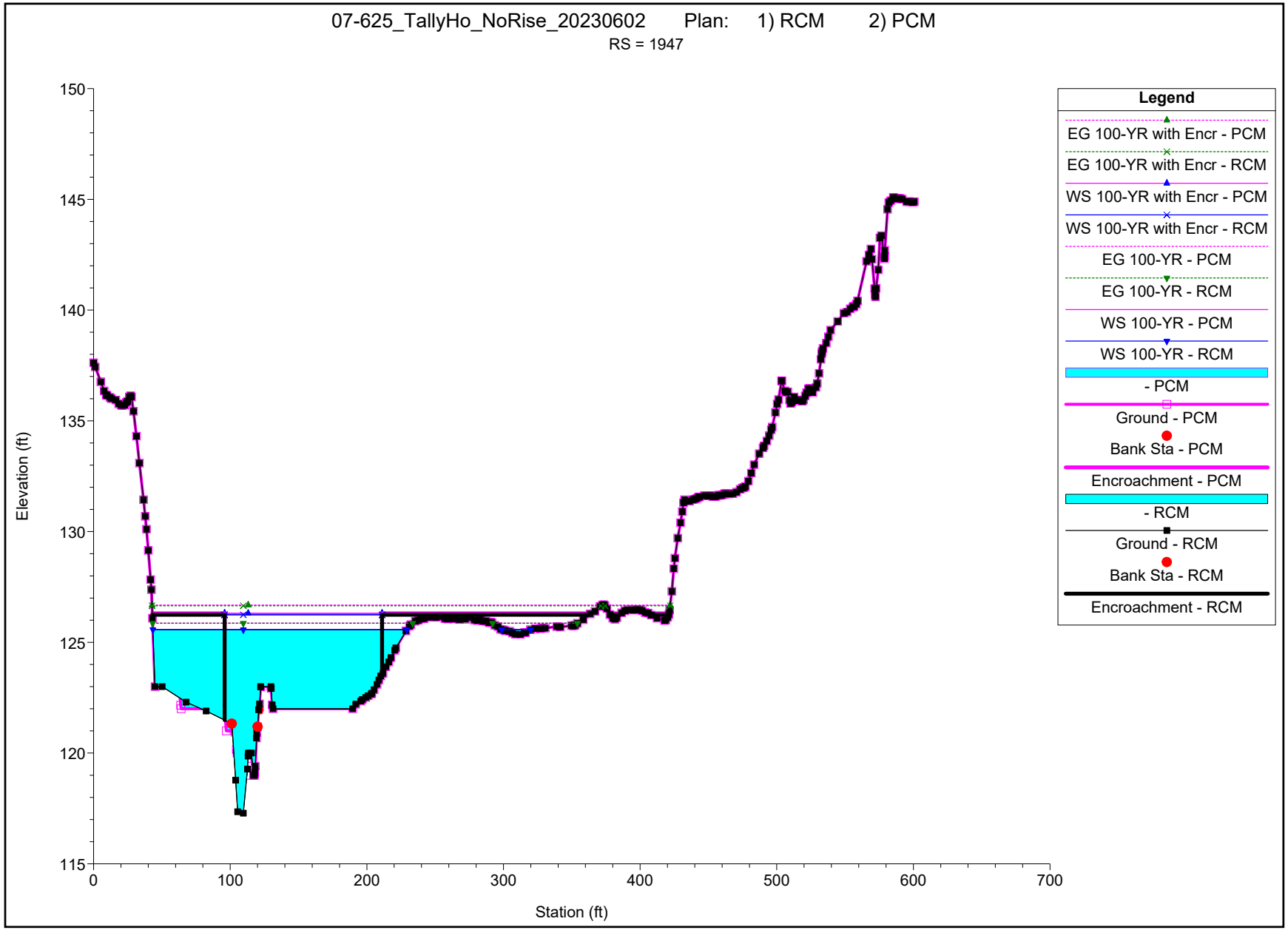

07-625_TallyHo_NoRise_20230602 Plan: 1) RCM 2) PCM
RS = 2605
Elevation (ft)
Station (ft)
144
142
140
138
136
134
132
130
128
126
124
0
200
400
600
800
1000
Legend
EG 100-YR with Encr - PCM
EG 100-YR with Encr - RCM
WS 100-YR with Encr - PCM
WS 100-YR with Encr - RCM
EG 100-YR - PCM
EG 100-YR - RCM
WS 100-YR - PCM
WS 100-YR - RCM
- PCM
Ground - PCM
Bank Sta - PCM
Encroachment - PCM
- RCM
Ground - RCM
Bank Sta - RCM
Encroachment - RCM

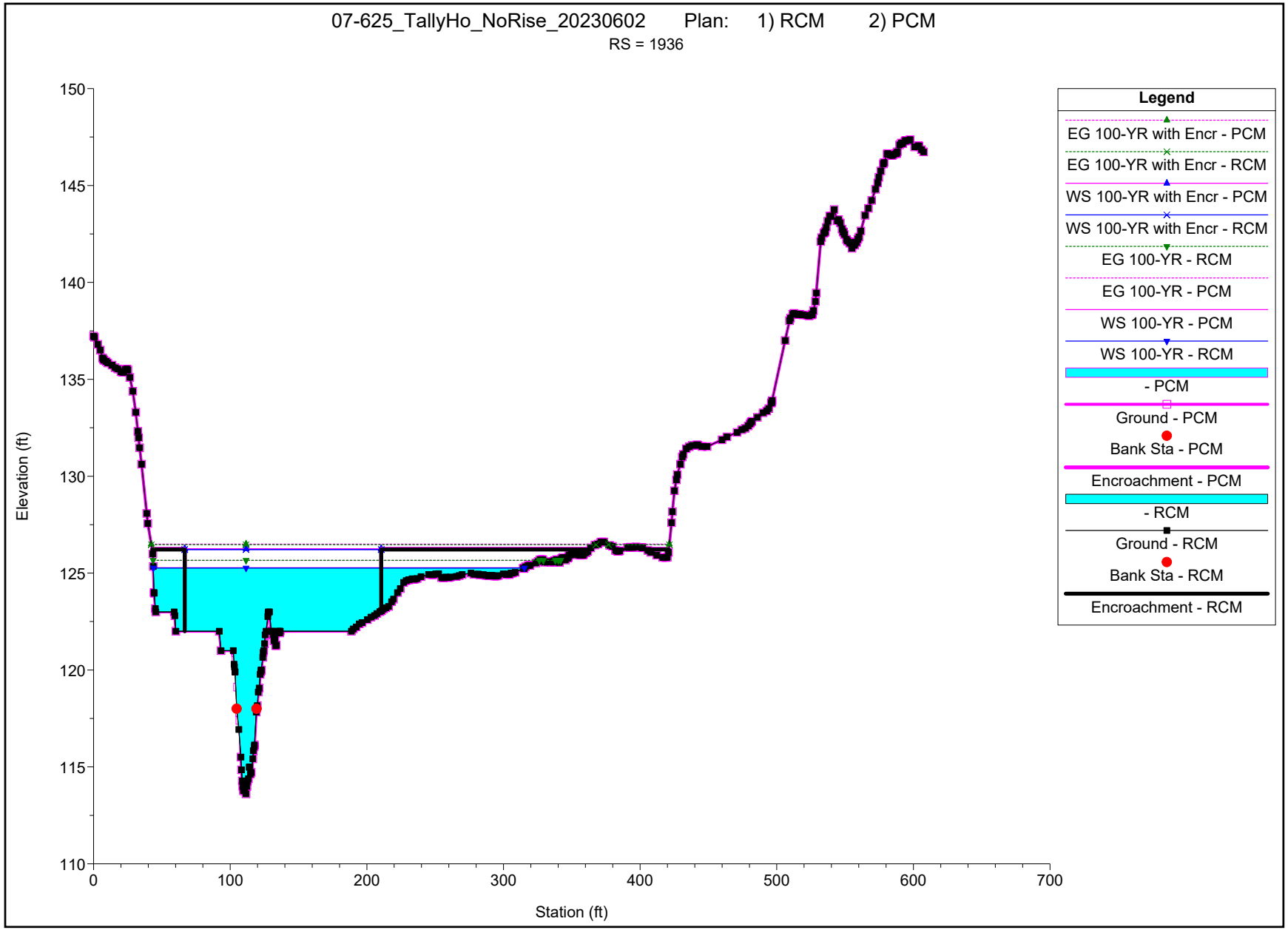

07-625_TallyHo_NoRise_20230602 Plan: 1) RCM 2) PCM
RS = 2470
Elevation (ft)
142
140
138
136
134
132
130
128
126
124
122
0
200
400
600
800
1000
1200
Station (ft)
Legend
EG 100-YR with Encr - PCM
WS 100-YR with Encr - PCM
EG 100-YR with Encr - RCM
WS 100-YR with Encr - RCM
EG 100-YR - PCM
EG 100-YR - RCM
WS 100-YR - PCM
WS 100-YR - RCM
- PCM
Ground - PCM
Bank Sta - PCM
Encroachment - PCM
- RCM
Ground - RCM
Bank Sta - RCM
Encroachment - RCM

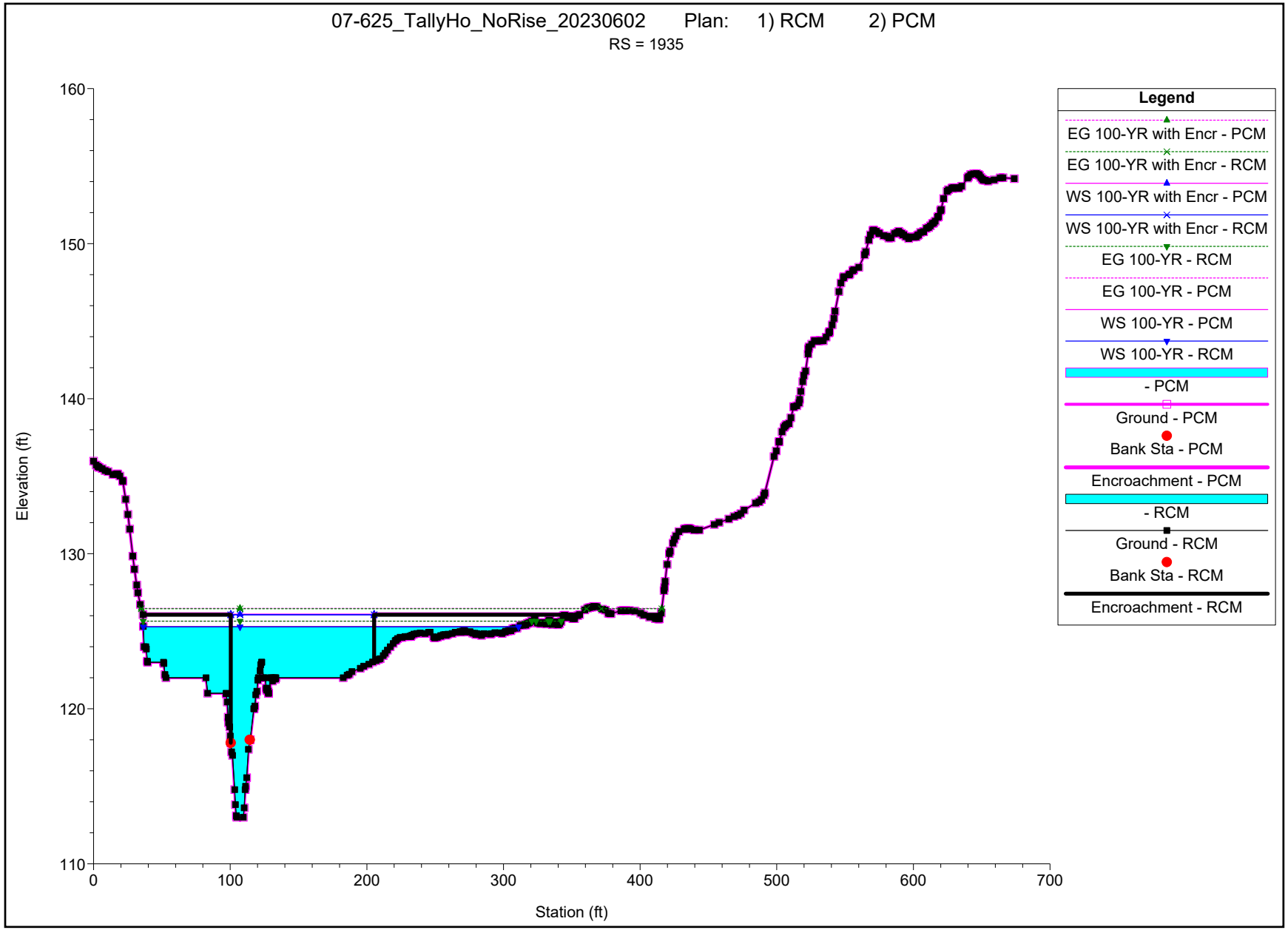

07-625_TallyHo_NoRise_20230602 Plan: 1) RCM 2) PCM
RS = 2348
Elevation (ft)
Station (ft)
145
140
135
130
125
120
0
100
200
300
400
500
600
700
800
Legend
EG 100-YR with Encr - PCM
EG 100-YR with Encr - RCM
WS 100-YR with Encr - PCM
WS 100-YR with Encr - RCM
EG 100-YR - PCM
EG 100-YR - RCM
WS 100-YR - PCM
WS 100-YR - RCM
- PCM
Ground - PCM
Bank Sta - PCM
Encroachment - PCM
- RCM
Ground - RCM
Bank Sta - RCM
Encroachment - RCM

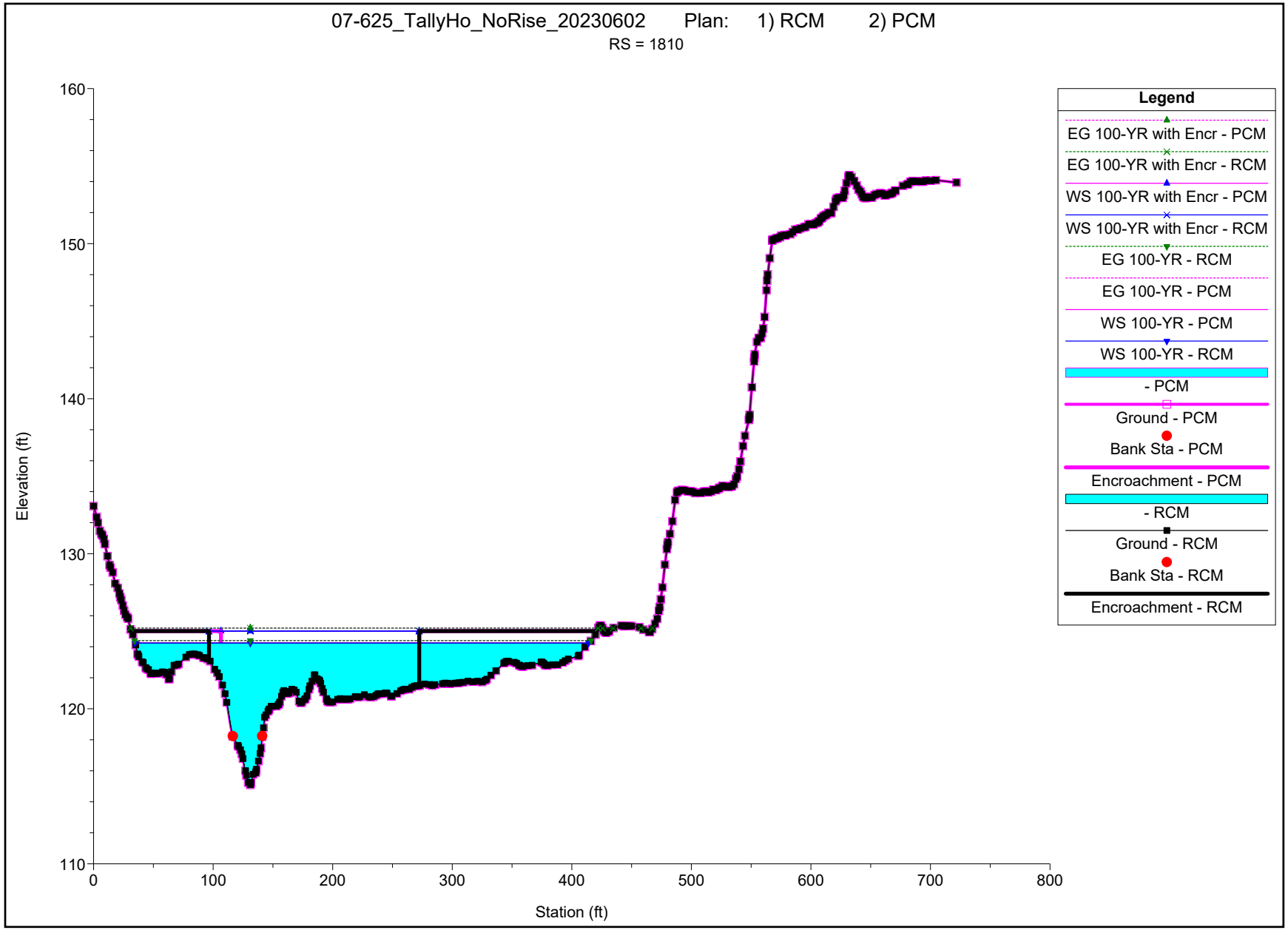

07-625_TallyHo_NoRise_20230602 Plan: 1) RCM 2) PCM
RS = 2161
Elevation (ft)
145
140
135
130
125
120
0
100
200
300
400
500
600
700
Station (ft)
Legend
EG 100-YR with Encr - PCM
EG 100-YR with Encr - RCM
WS 100-YR with Encr - PCM
WS 100-YR with Encr - RCM
EG 100-YR - PCM
EG 100-YR - RCM
WS 100-YR - PCM
WS 100-YR - RCM
- PCM
Ground - PCM
Bank Sta - PCM
Encroachment - PCM
- RCM
Ground - RCM
Bank Sta - RCM
Encroachment - RCM

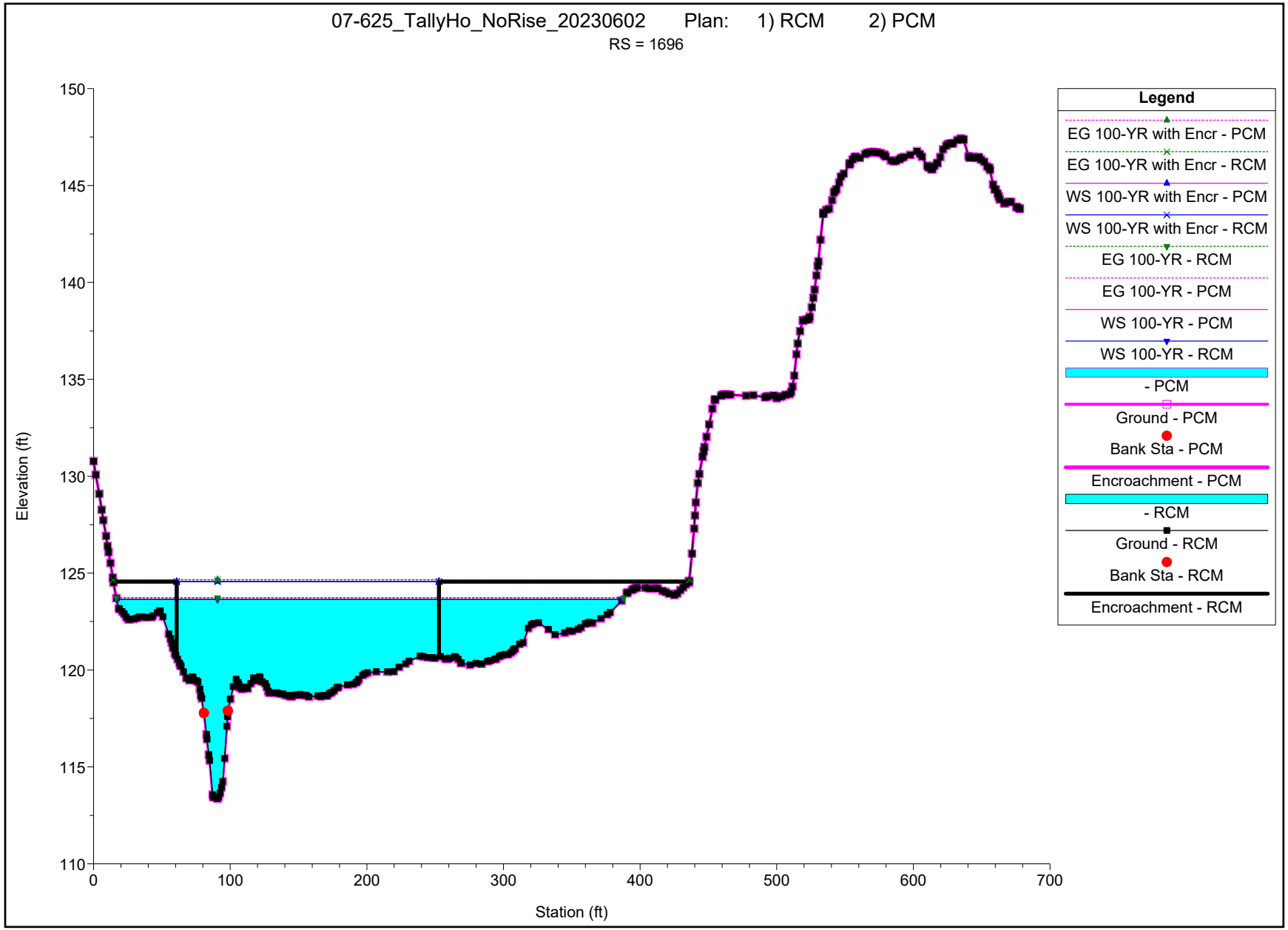

07-625_TallyHo_NoRise_20230602 Plan: 1) RCM 2) PCM
RS = 2104
Elevation (ft)
Station (ft)
150
145
140
135
130
125
120
0
100
200
300
400
500
600
Legend
EG 100-YR with Encr - PCM
EG 100-YR with Encr - RCM
WS 100-YR with Encr - PCM
WS 100-YR with Encr - RCM
EG 100-YR - PCM
EG 100-YR - RCM
WS 100-YR - PCM
WS 100-YR - RCM
- PCM
Ground - PCM
Bank Sta - PCM
Encroachment - PCM
- RCM
Ground - RCM
Bank Sta - RCM
Encroachment - RCM

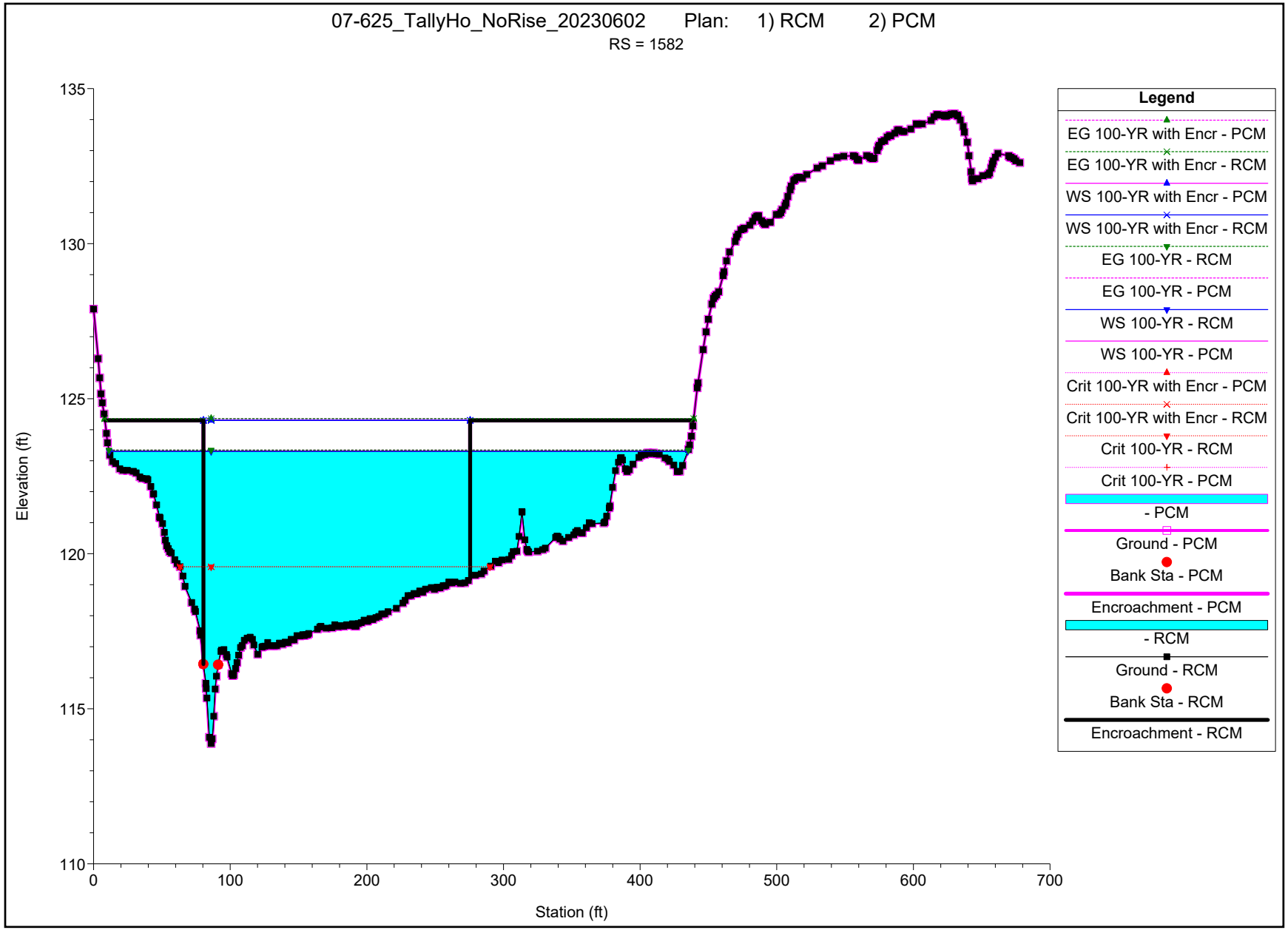

07-625_TallyHo_NoRise_20230602 Plan: 1) RCM 2) PCM
RS = 1947
Elevation (ft)
150
145
140
135
130
125
120
115
0
100
200
300
400
500
600
700
Station (ft)
Legend
EG 100-YR with Encr - PCM
EG 100-YR with Encr - RCM
WS 100-YR with Encr - PCM
WS 100-YR with Encr - RCM
EG 100-YR - PCM
EG 100-YR - RCM
WS 100-YR - PCM
WS 100-YR - RCM
- PCM
Ground - PCM
Bank Sta - PCM
Encroachment - PCM
- RCM
Ground - RCM
Bank Sta - RCM
Encroachment - RCM


07-625_TallyHo_NoRise_20230602 Plan: 1) RCM 2) PCM
RS = 1936
Elevation (ft)
Station (ft)
150
145
140
135
130
125
120
115
110
0
100
200
300
400
500
600
700
Legend
EG 100-YR with Encr - PCM
EG 100-YR with Encr - RCM
WS 100-YR with Encr - PCM
WS 100-YR with Encr - RCM
EG 100-YR - RCM
EG 100-YR - PCM
WS 100-YR - PCM
WS 100-YR - RCM
- PCM
Ground - PCM
Bank Sta - PCM
Encroachment - PCM
- RCM
Ground - RCM
Bank Sta - RCM
Encroachment - RCM


07-625_TallyHo_NoRise_20230602 Plan: 1) RCM 2) PCM
RS = 1935
Elevation (ft)
160
150
140
130
120
110
0
100
200
300
400
500
600
700
Station (ft)
Legend
EG 100-YR with Encr - PCM
EG 100-YR with Encr - RCM
WS 100-YR with Encr - PCM
WS 100-YR with Encr - RCM
EG 100-YR - RCM
EG 100-YR - PCM
WS 100-YR - PCM
WS 100-YR - RCM
- PCM
Ground - PCM
Bank Sta - PCM
Encroachment - PCM
- RCM
Ground - RCM
Bank Sta - RCM
Encroachment - RCM


07-625_TallyHo_NoRise_20230602 Plan: 1) RCM 2) PCM
RS = 1810
Elevation (ft)
160
150
140
130
120
110
0
100
200
300
400
500
600
700
800
Station (ft)
Legend
EG 100-YR with Encr - PCM
EG 100-YR with Encr - RCM
WS 100-YR with Encr - PCM
WS 100-YR with Encr - RCM
EG 100-YR - RCM
EG 100-YR - PCM
WS 100-YR - PCM
WS 100-YR - RCM
- PCM
Ground - PCM
Bank Sta - PCM
Encroachment - PCM
- RCM
Ground - RCM
Bank Sta - RCM
Encroachment - RCM


07-625_TallyHo_NoRise_20230602 Plan: 1) RCM 2) PCM
RS = 1696
Elevation (ft)
Station (ft)
150
145
140
135
130
125
120
115
110
0
100
200
300
400
500
600
700
Legend
EG 100-YR with Encr - PCM
EG 100-YR with Encr - RCM
WS 100-YR with Encr - PCM
WS 100-YR with Encr - RCM
EG 100-YR - RCM
EG 100-YR - PCM
WS 100-YR - PCM
WS 100-YR - RCM
- PCM
Ground - PCM
Bank Sta - PCM
Encroachment - PCM
- RCM
Ground - RCM
Bank Sta - RCM
Encroachment - RCM


07-625_TallyHo_NoRise_20230602 Plan: 1) RCM 2) PCM
RS = 1582
Elevation (ft)
135
130
125
120
115
110
0
100
200
300
400
500
600
700
Station (ft)
Legend
EG 100-YR with Encr - PCM
EG 100-YR with Encr - RCM
WS 100-YR with Encr - PCM
WS 100-YR with Encr - RCM
EG 100-YR - RCM
EG 100-YR - PCM
WS 100-YR - RCM
WS 100-YR - PCM
Crit 100-YR with Encr - PCM
Crit 100-YR with Encr - RCM
Crit 100-YR - RCM
Crit 100-YR - PCM
- PCM
Ground - PCM
Bank Sta - PCM
Encroachment - PCM
- RCM
Ground - RCM
Bank Sta - RCM
Encroachment - RCM