

# Civil Design Appendix - Evaluation of Levee Improvement Options

Little Egbert Multi-Benefit Project

Little Egbert Joint Powers Agency

*Rio Vista, California*

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## Abbreviations

AACE	Association for the Advancement of Cost Engineering
Caltrans	California Department of Transportation
CFR	Code of Federal Regulations
CVFPB	Central Valley Flood Protection Board
DWR	California Department of Water Resources
DWSE	Design Water Surface Elevation
EM	Engineer Manual
ETL	Engineer Technical Letter
EP	Engineering Pamphlet
FEMA	Federal Emergency Management Agency
H:V	Horizontal:Vertical
H&H	Hydrologic and Hydraulic
MBK	MBK Engineers
NOAA	National Oceanic and Atmospheric Administration
Project	Little Egbert Multi-Benefit Project
RD	Reclamation District
ROW	Right-of-Way
Shannon and Wilson	Shannon and Wilson, Inc
TOL	Top of Levee
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WES	Westervelt Ecological Services, Inc
WCS	Water Control Structure
WSE	Water Surface Elevation

# 1 INTRODUCTION AND BACKGROUND

## 1.1 Purpose of this Document

This Civil Design Appendix has been prepared in support of the Little Egbert Multi-Benefit Project (Project) and is intended to serve as an appendix to the Feasibility Study prepared by Westervelt Ecological Services, Inc (WES). The purpose of this document is to evaluate the feasibility of various levee improvement measures, to combine these measures into viable flood control improvements, to provide civil evaluations of selected flood control related improvements, and to compare the costs of those improvements.

Project alternatives considering floods, habitat, and other features are discussed in more detail in the overall Feasibility Study report prepared by WES. Per the Feasibility Study, Alternatives 17, 19, 24, and 26 are being carried forward for further analysis. Flood control measures for these alternatives consist of levee raising, embankment reconstruction, seepage berms, and cutoff walls, all of which are discussed in detail in this document.

## 1.2 Project Site Overview

The Project site, the Little Egbert Tract (see Figure 1), is approximately 3,100 acres located in the Sacramento-San Joaquin River Delta. The site is located just northeast of the City of Rio Vista, California at the southern end of the Yolo Bypass. The site is bordered by Lindsey Slough to the north, Cache Slough to the north and east, State Highway 84 to the southeast, levees to the west and south, and Watson Hollow Slough to the south. The site is also located just upstream of the confluence of Cache Slough, Steamboat Slough, and the Sacramento River.

The Little Egbert Tract is currently under agricultural cultivation and most of the property has a restricted-height levee under flowage easements on the north and east along Cache Slough. The intent of the restricted-height levee is to allow high flows from the Yolo Bypass to enter and pass through the Little Egbert Tract.

## 1.3 Project Overview

There are two primary components driving design development of this Project: (1) Flood Conveyance and (2) Restoration of Floodplain and Aquatic Habitat.

The focus of this document is flood control related features to support improved flood conveyance. The following flood control features are considered:

- Levee improvements to the Reclamation District (RD) 536 Levee, Solano County Levee 44, Mellin Levee Extension, and Mellin Levee – Improvements to levees are planned to protect against flood flow and tidal erosion caused by sea-level rise, prevent levee through- and under-seepage, and address levee penetrations and encroachments.
- Solano County Levee 38 Degrade – The levee is located along the north side of Watson Hollow Slough and will be degraded as a part of this Project.

- Breach openings in the Solano County Levee 28 / RD 2084 Restricted-height Levee – Four breaches including one upstream breach opening, two mid-channel breach openings, and one downstream breach (Highway 84). Breaches are planned to allow flow through the levees at peak flood flows, provide stage reduction on surrounding levees, and have less-than-significant flood velocities on adjacent levees.
- Water Control Structure – Installation of a Water Control Structure (WCS) at the interface of the RD 536 and Solano County 44 levees is planned to: 1) prevent significant Yolo Bypass flood waters from backing up into Watson Hollow Slough and Rio Vista communities, 2) help discharge local community runoff into the Yolo Bypass, and 3) accommodate local agricultural irrigation needs during the regular growing season.
- Decommission Obsolete Infrastructure – Obsolete infrastructure and utilities, such as lift and drain pumps, power poles, and levee penetrations, are planned to be decommissioned and removed. The Project work will include locating and evaluating existing gas wells and pipelines. Using data collected during evaluation, a specific plan will be made for each well and pipeline to avoid, protect-in-place, relocate, remove, or abandon as needed.

Restoration of Floodplain and Aquatic Habitat are discussed in the main feasibility report.

## 2 DESIGN CRITERIA

### 2.1 Project Levees

#### 2.1.1 Design References

Criteria used for levee design are based on published federal and state requirements, regulations, and technical guidance documents. The following will be considered during the development of conceptual designs:

- U.S. Army Corps of Engineers (USACE), Design & Construction of Levees, Engineer Manual (EM) 1110-2-1913.
- USACE, Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures, Engineering Pamphlet (EP) 1110-2-18.
- USACE, Conduits, Culverts, and Pipes, EM 1110-2-2902.
- USACE, Engineering and Design for Civil Works Projects, ER 1110-2-1150.
- Federal Emergency Management Agency (FEMA), Requirements of 44 Code of Federal Regulations (CFR) Section 65.10.
- California Division of Water Resources (DWR) Urban Levee Design Criteria and Urban Level of Flood Protection Criteria.
- California Code of Regulations, Title 23.
- Association for the Advancement of Cost Engineering (AACE) 18R-97 for cost estimates.
- National Oceanic and Atmospheric Administration (NOAA) Fisheries. 2014. Recovery Plan for The Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the DPS of California Central Valley Steelhead.
- U.S. Fish and Wildlife Service (USFWS). 1995. Sacramento-San Joaquin Delta Native Fishes Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon.
- NOAA Fisheries. 2018. Final Recovery Plan for the Southern Distinct Population Segment of North American Green Sturgeon (*Acipenser medirostris*).
- USFWS. 2017. Recovery Plan for the Giant Garter Snake (*Thamnophis gigas*).
- USFWS. 1999. Conservation Guidelines for the Valley Elderberry Longhorn Beetle.
- DWR. 2016. Central Valley Flood Protection Plan Conservation Strategy.

#### 2.1.2 Design Criteria

In general, USACE criteria will be followed for the design of levees including the design criteria for levee geometry (freeboard, slope stability, settlement, seepage), penetrations, and encroachments.

In addition, California Code of Regulations (Title 23) requirements for levees in the California Central Valley have general provisions that will be considered during conceptual design.

USACE Sacramento District publications will also be considered provided that criteria are at least as strict (i.e., conservative) as other USACE publications and Title 23.

It should be noted that for levees to be accredited by FEMA, evidence must be provided that adequate design and operation and maintenance systems are in place to provide reasonable assurance that protection from the base flood with a 1-percent Annual Chance Exceedance (ACE) exists (100-year level of flood protection). These requirements are outlined in 44 CFR Section 65.10.

In 2007, California passed legislation (Senate Bill 5) that will require a 200-year level of flood protection (0.5-percent ACE) as the minimum standard for urban areas in the California Central Valley by 2025.

Design criteria have been established for the following levee system components or features:

- Top of Levee (TOL) crown elevation;
- Levee cross section geometry;
- Freeboard with sea level rise;
- Slope stability;
- Seepage mitigation;
- Pipeline and conduit penetrations;
- Erosion protection;
- Utility poles and supports; and
- Vegetation.

#### 2.1.2.1 Top of Levee Crown Elevation

The TOL crown elevation is established to reduce the risk of overtopping by first determining the Design Water Surface Elevation (DWSE) and then adding the required additional levee height in accordance with applicable criteria.

TOL crown elevations are established at the control line of the existing levee crown (centerline of the levee crown) and measured at the top of the existing aggregate base.

#### 2.1.2.2 Levee Cross Section Geometry

The minimum levee cross section is based on the following USACE documents and guidance:

- USACE EM1110-2-1913, dated April 30, 2000.
- USACE Engineer Technical Letter (ETL) 1110-2-569, dated May 1, 2005.
- USACE Sacramento District Geotechnical Levee Practice, dated April 11, 2008 (Minimum levee crown width of 20 feet, waterside slope 3H:1V (horizontal:vertical) or flatter, landside slope 2H:1V).

- Central Valley Flood Protection Board (CVFPB) CCR Title 23, dated October 30, 1996.
- DWR Urban Levee Design Criteria, dated May 2012.

Geometry corrections are deemed necessary if any of the following conditions are not met:

- Existing crown widths are generally 20 feet.
- Existing land and water side slopes are generally 2H:1V and 3H:1V respectively (2.5H:1V and 3H:1V for the RD 536 Levee - consistent with the as-built plans).
- Existing geometry meets the requirements for freeboard:
  - 1957 DWSE plus 7 feet for the RD 536 Levee.
  - 0.5-percent ACE water surface plus 7 feet for Solano County Levee 44, Mellin Levee Extension, and Mellin Levee.
  - A theoretical levee prism (20 feet wide crown, 3H:1V waterside slope, 2H:1V landside slope) placed at the levee centerline and at the DSWE plus 7 feet fits, in its entirety, within the existing levee geometry.
- Existing geometry meets the requirements for slope stability.

New levees will have 3H:1V land and waterside slopes with 20-foot-wide crown widths.

#### 2.1.2.3 Pipeline and Conduit Penetrations

All existing pipes and conduits beneath or through the levee prism within 10 feet of the toe of the landside levee and/or within 10 feet of the waterside levee toe or projected levee toe will be replaced or modified as necessary to meet the following criteria outlined below:

- USACE EM 1110-2-1913 and EM 1110-2-2902.
- CVFPB CCR Title 23, dated October 30, 1996.

Pressure pipes/conduits crossing beneath or through the levee crown will be redesigned to exist above the DWSE and be placed outside of the slope of the design levee prism, where feasible. Pressure pipes/conduits will be equipped with positive shutoff valves located at the waterside of the levee crown (in a concrete vault).

#### 2.1.2.4 Utility Poles and Supports

Utility poles and supports that encroach into the levee prism or levee rights-of-way (ROW) are considered encroachments and will be relocated outside of the flood control easement. Additionally, utility poles that interfere with levee construction are relocated. It is assumed power pole relocation will occur prior to start of levee construction.

Utility pole foundations within the levee prism or within 20 feet of the landside levee toe and within 15 feet of the waterside levee toe (or projected levee toes) are assumed to be relocated.

#### 2.1.2.5 Vegetation

Per USACE EP 1110-2-18, "Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures" (EP), all trees and vegetation



located along the slope and within 15 feet of the levee toes or appurtenant structures will be removed during construction. Additionally, trees that will be impacted by construction operations outside of the limits described in the EP will be removed.

## 2.2 Transportation

### 2.2.1 Design References

Design criteria used for roadway design are based on published federal, state, and local requirements, regulations, and technical guidance documents. The following will be considered during development of conceptual designs:

- California Department of Transportation (Caltrans) Highway Design Manual
- Caltrans Standard Plans and Specifications, 2018
- California Manual on Uniform Traffic Control Devices, 2014
- Caltrans Roadside Design Guidelines

### 2.2.2 Design Criteria

#### 2.2.2.1 Roads

The Caltrans Highway Design Manual would be used for design of any necessary Highway 84 modifications and for roadway geometrics including lane widths, shoulder widths, and horizontal and vertical geometry constraints. Horizontal and vertical alignments will follow and conform to existing alignments to the greatest extent practical to minimize impacts to the surrounding properties. Metal beam guardrail and all roadway treatments within the clear zone will be completed in accordance with 2018 Standard Plans and Roadside Design Guidelines.

On-site access for recreational features, utilities, and operations and maintenance activities are also considered.

#### 2.2.2.2 Bridges/Culverts

Structural design calculations for retaining walls, culverts, and bridges, if any, would be completed in accordance with current Caltrans Bridge Design Specifications, Bridge Design Aids, and Memos to Designers. Design would be based on the current American Association of State Highway and Transportation Officials Load and Resistance Factor Design Bridge Design Specifications with Interims and Caltrans amendments as well as the 2018 Standard Plans and Specifications. The design would incorporate recommendations from the Geotechnical Levee Design produced by Shannon and Wilson, Inc. (Shannon and Wilson).

## 2.3 Borrow Sources

Levee raises and geometry correction require material to be imported from on-site and/or off-site sources. Borrow material for levees would meet USACE and Title 23 requirements. The following will be considered:

- Zoned embankment construction (clay core and reuse of degrade material for the levee shells).
- Availability and suitability of on-site borrow materials.
- Local sources for borrow.

It is anticipated that all borrow material for levee construction and grading operations would be obtained from on-site sources (from the Powell Property and/or the Little Egbert Tract).

For the purposes of this report, it is assumed there will be a shrinkage and loss factor of the borrow/fill material of 15 percent plus an additional 5 percent for conservatism.

Aggregate base for levee crown and roadway surfacing would be obtained from off-site sources.

## 2.4 Control of Water

Construction activities for the Project include levee degrade operations for 1) cutoff wall construction, 2) removal of materials that do not meet fill requirements for levee embankments, and 3) relocation of levee penetrations. Levee degrade operations are anticipated to be below the DWSE and would impact the current level of flood protection. These types of operations would be limited to the dry season, generally between April 15 and October 31. Additionally, construction documents prepared for this Project will require the contractor to develop a flood contingency plan that details how the contractor would restore the levee in case of a flood emergency.

Localized dewatering may be required to control groundwater within excavations. Dewatering operations would be completed to approximately 2 to 3 feet below bottoms of excavations. Means and methods employed for dewatering would be determined by the construction contractor.

## 3 PERTINENT DATA

### 3.1 Survey and Geomatics

The horizontal datum for this Project is the North American Datum of 1983 (NAD 83). The vertical datum is the North American Vertical Datum of 1988 (NAVD 88). All elevations in this document are based on NAVD 88.

Topographic information was collected and prepared by Laugenour and Meikle and provided to HDR by WES in September 2021 and supplemented with additional survey information in September 2022.

### 3.2 Studies, Reports, and other Data

Previous studies and reports have evaluated the Project area with respect to hydraulics, geotechnical conditions, seepage, erosion protection, stability, and settlement. These reports, including other data such as inspection reports, previous surveys, and as-built plans serve as the basis for this document and are listed in Table 3-1 below.

**Table 3-1. Related Studies and Reports**

Study / Report	Originator and Date
Little Egbert Tract Feasibility Study	Sacramento Area Flood Control Agency, December 31, 2019
Flood Hydrologic and Hydraulic (H&H) Analysis	MBK Engineers (MBK), April 2022
Geotechnical Levee Design	Shannon & Wilson, November 2022
ALTA/NSPS Land Title Survey, Egbert Tract	RFE Engineering, Inc, June 2018
ALTA/NSPS Land Title Survey, Powell Property	RFE Engineering, Inc, February 2019
Inspection and Local Maintaining Agency Report of the Central Valley State-Federal Flood Protection System	DWR, 2021
State Highway Route 84 As-Built Plans	Caltrans, September 9, 1998
Site Visit	HDR, September 2022

## 4 EXISTING CONDITIONS

### 4.1 Project Site

The Project site (Figure 1) is bound by the RD 536 levee, Solano County Levee 44, Mellin Levee Extension, and Mellin Levee to the south and west, Highway 84 to the south, and a restricted-height levee (Solano County 28 / RD 2068) to the east and north.

The site is generally flat with elevations ranging from (-)7 feet in the north to 10 feet in the south. Various ditches and irrigation canals are located throughout the site that convey water through a series of culverts and pumps. Gas wells and power poles are also located throughout the site.

Watson Hollow Slough and Solano County Levee 38 are located near the southern portion of the site between the Little Egbert Tract and the Powell Property. Watson Hollow Slough enters the Project site from the west, between the RD 536 Levee and Solano County Levee 44, then discharges to Cache Slough, just upstream of the confluence with the Sacramento River, via existing culverts under Highway 84. Solano County Levee 38 is located along the north side of Watson Hollow Slough.

Access to the Project site is from an existing gated dirt road via Highway 84. Dirt roads, located throughout the site, provide access to the levees.

### 4.2 RD 536 Levee

The portion of the RD 536 Levee that is part of this Project is located along the west side of the Project site and is bound by Lindsey Slough to the north and Watson Hollow Slough to the south (Figure 1.1). A portion of the RD 536 Levee continues west along the north side of Watson Hollow Slough but is not considered for improvements as a part of this project.

The levee is approximately 18,500 linear feet in length (approximately 3.5 miles – Station 0+00 to Station 184+82). Levee height ranges from approximately 18 feet to 29 feet measured from levee crown to levee landside toe elevations. The levee crown ranges in width but is generally approximately 20 feet, levee water side slopes range from 2.8H:1V to 4H:1V, and landside slopes range from 2.5H:1V to 2.7H:1V. A berm is located along the landside of the levee from approximate station 0+00 to 36+00. The berm is approximately 100 feet wide and 7 feet tall. The levee crown is surfaced with aggregate base for vehicle use and side slopes are vegetated.

Various canals and ditches are located along the land and water sides of the levee but are generally 50 or more feet away from the levee land and water side toes (measured from levee toe to top of ditch).

Refer to Section 5.4 for a discussion regarding known levee encroachments and penetrations.

### 4.3 Solano County Levee 44

The portion of Solano County Levee 44 that is part of this Project is located along the west side of the Project site and is bound by Watson Hollow Slough to the north and ties to the Mellin Levee Extension to the south (Figure 1 and 1.2). A portion of the Solano County 44 Levee continues west

along the south side of Watson Hollow Slough but is not considered for improvements as a part of this Project. The southern portion of the levee is not well defined with intermittent high and low mounds along the levee alignment.

The levee is approximately 3,050 linear feet in length (approximately 0.58 miles – Station 62+00 to Station 92+53). The levee height generally ranges from approximately 13 feet to 18 feet measured from levee crown to levee landside toe elevations (elevations 7 feet to 12 feet). The levee crown ranges in width but is generally approximately 18 feet, and levee land and water side slopes are generally 3H:1V or flatter.

Refer to Section 5.4 for a discussion regarding known levee encroachments and penetrations.

## 4.4 Mellin Levee Extension

The Mellin Levee Extension is located along the west side of the Project site and ties to Solano County Levee 44 to the north and Mellin levee to the south (Figure 1 and 1.2).

The levee is approximately 3,000 linear feet in length (approximately 0.57 miles – Station 32+00 to Station 62+00). Levee height ranges from approximately 10 feet to 15 feet measured from levee crown (elevations 15 feet to 20 feet) to levee landside toe elevations (elevations 5 feet to 10 feet). The levee crown ranges in width between 20 feet and 50 feet. The levee waterside slopes range from 2.5H:1V to 3.0H:1V, and landside slopes range from 3H:1V to 4H:1V.

The Powell Property is located along the waterside of the levee.

Grades along the landside of the levee are irregular with various high and low mounds.

Refer to Section 5.4 for a discussion regarding known levee encroachments and penetrations.

## 4.5 Mellin Levee

The Mellin levee is located along the west side of the Project site and ties to the Mellin Levee Extension to the north and Highway 84 to the south (Figure 1 and 1.2).

The levee is approximately 3,200 linear feet in length (approximately 0.6 miles – Station 0+00 to Station 32+00). Levee height ranges from approximately 7 feet to 11 feet measured from levee crown (elevations 15 feet to 19 feet) to levee landside toe elevations (elevations 6 to 8 feet). The levee crown ranges in width but is generally 20 feet to 30 feet, levee water side slopes are generally 3H:1V, and landside slopes range from 3H:1V to 5H:1V.

Grades along the landside of the levee are irregular with various high and low mounds.

Refer to Section 5.4 for a discussion regarding known levee encroachments and penetrations.

## 4.6 Solano County Levee 28/RD 2084 Levee & Highway 84

Solano County Levee 28 / RD 2084 Levee is located along the east side of the Project site and extends from the Mellin Levee (at the tie-in to Highway 84) to the RD 536 Levee (Figure 1). Cache Slough and Sacramento River are located along the east side of the levee. This levee is designed to overtop during the 25-year flood.

Highway 84 runs along the crown on Solano County Levee 28. West of the ferry, Highway 84 is a two-lane paved roadway located in a Caltrans easement. Watson Hollow Slough discharges to the Sacramento River, under Highway 84, through existing 30-inch corrugated metal pipe culverts. Ryer Island Ferry is located south and east of Highway 84. A drainage pump station and the Baldwin Residence are located along the levee as well.

## 4.7 Solano County Levee 38

Solano County Levee 38 is located toward the southern portion of the site, along the north side of Watson Hollow Slough, and between the Little Egbert Tract and the Powell Property (Figure 1).

## 5 IDENTIFICATION OF LEVEE DEFICIENCIES

Geotechnical, hydraulic, and civil analyses were performed that identified various existing deficiencies for the RD 536 Levee, Solano County Levee 44, Mellin Levee Extension, and Mellin Levee. Analyses considered existing levee surface and subsurface conditions compared to the criteria identified under Section 2 of this document.

Identified deficiencies are summarized in the following sections.

### 5.1 Geotechnical

The geotechnical investigation and analysis program for this Project was completed by Shannon and Wilson (formerly Hultgren-Tillis Engineers). Data from existing and new explorations were used to characterize the site and to perform levee analyses including levee through- and under-seepage, slope stability, settlement, and seismic characteristics. Shannon and Wilson's analyses identified levee deficiencies including freeboard and under- seepage and provided recommendations for remedial measures as summarized in Section 6 of this document.

Shannon and Wilson's report, "Draft Geotechnical Feasibility Investigation, Little Egbert Multi-Benefit Project" dated February 2, 2023, included as Appendix A, serves as a basis for the evaluations completed and summarized in this document.

### 5.2 Hydrology and Hydraulics

H&H modeling for this Project was completed by MBK. MBK prepared a HEC-RAS model of the lower Yolo Bypass and Sacramento River to estimate design water surface elevations for this project. MBK's modeling, and provided DWSEs, serve as a basis for the evaluations completed and summarized in this document.

MBK's report, "Little Egbert Multi-Benefit Project – Flood Hydrology & Hydraulics Analysis," is included as Appendix B.

### 5.3 Levee Geometry

Existing ground topography was used to generate cross sections of the RD 536 Levee, Solano County Levee 44, Mellin Levee Extension, and Mellin Levee. Cross sections were generated at 100-foot intervals then evaluated against the criteria in Section 2 of this document.

Based on the evaluation of existing geometry, it was determined that the RD 536 levee, Solano County Levee 44, Mellin Levee Extension, and Mellin Levee all require geometry corrections:

- The RD 536 Levee generally meets side slope and crown width requirements but does not meet the requirement for freeboard.
- Solano County Levee 44, Mellin Levee Extension, and Mellin Levee do not meet any of the geometry requirements for side slopes, crown widths, and freeboard.

Geometry corrections would be completed as part of addressing levee through- and under- seepage issues.

## 5.4 Levee Encroachments, Utilities, and Penetrations

A preliminary review of encroachments, utilities, and penetrations was completed and is summarized in Table 5-1 below. These were determined based on a review of as-built documents, inspection reports, and a site reconnaissance.

Generally, unpermitted encroachments and penetrations are assumed to be removed as part of construction. Permitted encroachments and penetrations are assumed to be improved to meet current levee design standards.

**Table 5-1. Encroachments, Utilities, and Penetrations**

Levee	Encroachment	Station	Location / Description	Permit	Action
RD 536	1-inch iron pipe	0+04	105 feet waterside from crown	NA	Remove
RD 536	Power Poles (3)	1+00	Water and landsides of levee, approximately 10-20 linear feet away from levee toe	NA	Protect in Place
RD 536	1-inch iron pipe	1+05.98	69 feet landside from crown	NA	Remove
RD 536	1-inch iron pipe	1+19	61 feet landside from crown	NA	Remove
RD 536	1-inch iron pipe	3+37	122 feet waterside from crown	NA	Remove
RD 536	Gate	6+27	Pipe gate on crown	NA	Remove and Replace
RD 536	Power Pole, Overhead Lines	6+72	Power pole 16 feet landside from crown; overhead lines crossing levee	NA	Relocate
RD 536	2-inch iron pipe	11+86	134 feet waterside from crown	NA	Remove
RD 536	1-inch iron pipe	108+10	107 feet waterside from crown	NA	Remove
RD 536	Gas tanks, storage, sheds	89+03	227 feet landside from crown	NA	Remove
RD 536	1-inch iron pipe	108+10	107 feet waterside from crown	NA	Remove
RD 536	2-inch iron pipe	111+21	123 feet landside from crown	NA	Remove
RD 536	Power Pole	111+76	74 feet landside from crown	NA	Relocate
RD 536	2-inch iron pipe	127+81	100 feet waterside from crown	NA	Remove
RD 536	1-inch iron pipe	130+23	100 feet waterside from crown	NA	Remove
RD 536	Pump 7	131+54	157 feet landside from crown	NA	Remove and Replace
RD 536	Pump 11	132+22	155 feet landside from crown	NA	Remove and Replace
RD 536	Power Pole	132+88	130 feet landside from crown	NA	Relocate
RD 536	Power Pole	137+35	65 feet landside from crown	NA	Relocate
RD 536	US Gas Main and Marker	137+81	83 feet landside from crown	NA	Protect in Place
RD 536	Survey Monument	138+11	8 feet landside from crown	NA	Protect in Place
RD 536	1-inch iron pipe	154+80	90 feet waterside from crown	NA	Remove
RD 536	1-inch iron pipe	158+14	92 feet waterside from crown	NA	Remove
RD 536	1-inch iron pipe	174+36	87 feet waterside from crown	NA	Remove
RD 536	1-inch iron pipe	182+69	84 feet waterside from crown	NA	Remove
RD 536	1-inch iron pipe	182+92	154 feet landside from crown	NA	Remove



Levee	Encroachment	Station	Location / Description	Permit	Action
RD 536	18-inch CMP culvert w/Gate	~186+55	Levee penetration / Irrigation pipe	NA	Remove and Replace
Solano County Levee 44	5/8-inch rebar	62+41	171 feet waterside from crown	NA	Remove
Solano County Levee 44	Power Pole, Overhead Lines	63+28	106 feet waterside from crown	NA	Relocate
Solano County Levee 44	Gas Main	67+05	No Data	NA	Protect in Place
Solano County Levee 44	Gas Main	68+31	No Data	NA	Protect in Place
Solano County Levee 44	Power Pole, Overhead Lines	71+05	165 feet waterside from crown, varies	NA	Relocate
Solano County Levee 44	Pump 14	71+53	129 feet waterside from crown	NA	Protect in Place
Mellin Levee Extension	Power Pole	36+41	12 feet waterside from crown	NA	Relocate
Mellin Levee Extension	Gate	53+40	Gate on crown	NA	Remove and Replace
Mellin Levee Extension	Gas Main	56+44	190 feet waterside from crown, varies parallel to levee	NA	Protect in Place
Mellin Levee Extension	Gas Main (Abandoned)	57+12	No Data	NA	Remove
Mellin Levee Extension	Gas Main	57+37	392 feet waterside from crown	NA	Protect in Place
Mellin Levee	Power Pole, Overhead Lines	0+13	41 feet landside from crown	NA	Relocate
Mellin Levee	Gate	0+67	27 feet waterside from crown	NA	Remove and Replace
Mellin Levee	Gas Well (abandoned)	5+73	273 feet waterside from crown	NA	Protect in Place
Mellin Levee	Gate	14+77	Gate on crown	NA	Remove and Replace
Mellin Levee	Culvert	16+72	31 feet waterside from crown	NA	Remove and Replace

NA – Not Available

## 5.5 Summary of Levee Deficiencies

Table 5-2 below summarizes the various levee deficiencies known within the Project extents.

**Table 5-2. Summary of Levee Deficiencies**

Levees	Start Station	End Station	Reach Length (feet)	Levee Deficiencies <sup>1</sup>									
				Freeboard Deficiency <sup>2</sup>	Through-Seepage <sup>3</sup>	Under-seepage <sup>3</sup>	Geometry	Penetrations	Waterside Encroachments	Waterside Vegetation	Landside Vegetation	Landside Encroachments	Erosion
RD 536 <sup>4</sup>	0+00	80+00	8,000	X			X	X	X		X		
RD 536	80+00	180+62	10,062	X		X	X	X	X		X	X	
Solano County 44	62+00	92+53	3,053	X		X	X	X	X			X	
Mellin / Mellin Extension	0+00	62+00	6,200	X			X	X	X			X	

Notes:

- 1) An X signifies the levee deficiency applies to the levee.
- 2) Water surface elevations used for calculating freeboard deficiencies provided by MBK.
- 3) Seepage issues provided by Shannon and Wilson.
- 4) Shannon and Wilson did not identify through-seepage as an issue but provided remediation recommendations. See Section 6 for more information.

## 6 IDENTIFICATION AND EVALUATION OF INDIVIDUAL LEVEE MITIGATION MEASURES

Various levee mitigation measures are available to address deficiencies in levees. Mitigation measures have unique benefits with no single measure addressing all deficiencies. Levee Improvement Options selected to address levee deficiencies, therefore, rely on a combination of mitigation measures that are unique to the Project and address specific Project goals while adhering to Project constraints.

The following sections provide insights into several potential mitigation measures and evaluates and ranks the measures that may be selected for developing Levee Improvement Options.

### 6.1 Potential Mitigation Measures

Table 6-1 summarizes the various mitigation measures available to address identified levee deficiencies. The following sections describe each of the measures listed in Table 6-1 with general descriptions, accomplishments, and drawbacks.

Additional measures are available that are not shown in Table 6-1 below. These include measures such as construction of a full adjacent or a setback levee, canal relocations, or placement of sheet piles for cutoffs. While these measures would address some of the identified levee deficiencies for this Project, they were not considered further as they would either violate Project constraints or are not typically constructed in the California Bay-Delta area.

**Table 6-1. Potential Measures and Issues Addressed**

Potential Measures	Levee Performance Issues								
	Inadequate Freeboard	Through-Seepage	Under-Seepage	Inadequate Slope Stability	Inadequate Levee Geometry	Erosion	Encroachments	Penetrations	Vegetation Compliance
Raise-in-place levee	Yes	Yes	No	Yes	Yes	No	Yes <sup>1</sup>	Yes	Yes <sup>1</sup>
Embankment Reconstruction	Yes	Yes	No	Yes	Yes	Yes	Yes <sup>1</sup>	Yes <sup>1</sup>	Yes <sup>1</sup>
Floodwall	Yes	Yes	No	Yes	Yes	Yes	No	No	No
Cutoff Wall	No	Yes	Yes	Yes	No	No	Yes <sup>1</sup>	Yes <sup>1</sup>	Yes <sup>1</sup>
Seepage Berm	No	No	Yes	No	No	No	Yes <sup>1</sup>	Yes <sup>1</sup>	Yes <sup>1</sup>
Stability Berm	No	Yes	No	Yes	No	No	Yes <sup>1</sup>	Yes <sup>1</sup>	Yes <sup>1</sup>
Relief Wells	No	No	Yes	No	No	No	No	No	No
Landside Toe Drain	No	No	Yes <sup>2</sup>	No	No	No	No	No	No
Encroachment Removal	No	No	No	No	No	No	Yes	No	No
Vegetation Removal	No	No	No	No	No	No	No	No	Yes
Erosion Repair	No	No	No	Yes	Yes	Yes	No	No	No
1. Within footprint of measure. 2. Measure addresses shallow under seepage.									

## 6.1.1 Raise-In-Place Levee

### 6.1.1.1 General Description

A raise-in-place levee measure includes a crown raise and embankment reconstruction utilizing earth fill. The crown of the levee would be raised to the required elevation and embankment reconstruction would typically be along the waterside of the levee. As such, construction of a raise-in-place levee would typically begin at the existing crown land side hinge or at the working platform established for cutoff wall construction. The raise-in-place levee would be design and constructed to meet levee geometry criteria outlined in Section 2 of this document. A typical raise-in-place section is shown on Figure 2.

### 6.1.1.2 Measure Accomplishments

Measure accomplishments include addressing levee freeboard and geometry deficiencies through the placement of a new engineered fill embankment, mitigating the potential for through-seepage by extending the seepage path through the placement the engineered fill, and mitigating slope stability issues due to the flattened slopes. Additionally, indirect benefits include addressing encroachment and mitigating slope stability issues as result of slope flattening (i.e., placement of fill would require removal of encroachments and vegetation within the limits of the fill).

### 6.1.1.3 Measure Drawbacks

A raise-in-place measure would require a larger footprint than what is occupied by the existing levee. This may require the acquisition of additional ROW or the use of existing ROW thereby limiting room and access for operations and maintenance. Additionally, encroachments located within the footprint of the new embankment would be removed, requiring additional coordination with property owners or other agencies, potential delays, and added cost to remove and/or relocate encroachments.

Borrow material would be required and may be imported from on-site or off-site sources. Borrow sources would require additional study to determine the quantity and quality of material available to construct a raise-in-place levee. Additionally, borrow material imported from off-site sources would impact air quality and increasing traffic during hauling operations.

Environmental considerations, such as cultural resources or habitat for protected species may impact room available for a larger levee footprint. Removal of vegetation on the waterside of the levee also has the potential to impact existing wildlife habitats.

In addition, any travel ways located along the crown and/or crossing the levee, public or private, would be impacted during construction and require a traffic rerouting plan.

Other measures would be required in conjunction with a raise-in-place levee to address levee through-seepage and under-seepage and erosion issues. Encroachment, penetration, and vegetation issues outside of the footprint of the raise-in-place levee would also require other measures.

## 6.1.2 Embankment Reconstruction

### 6.1.2.1 General Description

An embankment reconstruction measure includes degrading the existing levee embankment, in part or in whole, then constructing a new levee, utilizing earth fill, meeting freeboard and geometry requirements. Embankment reconstruction may also include slope flattening, without degrading the existing levee, to meet geometry criteria. The new embankment would occupy roughly the same footprint as the existing levee, except for any additional room needed to accommodate a levee raise or slope flattening. The new levee embankment would typically begin at the existing levee landside toe (in case of over steepened landside slope) or the landside crown hinge (if the landside slope meets geometry criteria). The new levee embankment would be designed and constructed to meet levee geometry criteria outlined in Section 2 of this document. A typical section showing embankment reconstruction and slope flattening are shown on Figure 3.

### 6.1.2.2 Measure Accomplishments

Like a raise-in-place measure, embankment reconstruction and slope flattening have several benefits including satisfying geometry requirements, satisfying levee material requirements where existing levee material is deemed insufficient, would reduce the potential for through-seepage by extending the seepage path and the placement of engineered fill, and mitigating slope stability issues as result of slope flattening. Additionally, indirect benefits include addressing encroachment and vegetation within the footprint of the new embankment.

### 6.1.2.3 Measure Drawbacks

Embankment reconstruction and slope flattening measures have the same drawbacks as a raise-in-place measure. Compared to raise-in-place, embankment reconstruction is likely to have a greater need for borrow material (full levee degrade and reconstruction) and for export of unsuitable material (from levee degrade).

Other measures would be required in conjunction with embankment reconstruction to address levee under seepage. Encroachment, penetration, and vegetation issues outside of the footprint of the embankment reconstruction would also require other measures.

Other measures would be required in conjunction with a raise-in-place levee to address levee under seepage and erosion issues. Encroachment, penetration, and vegetation issues outside of the footprint of the levee degrade, required for cutoff wall construction, would also require other measures.

## 6.1.3 Floodwall

### 6.1.3.1 General Description

Floodwalls are vertical cast-in-place concrete walls typically used in areas where space is limited. They can be added to the existing levees or can entirely replace a levee embankment. A typical section showing a floodwall is shown on Figure 4.

### 6.1.3.2 Measure Accomplishments

Floodwalls provide freeboard solutions in a minimal footprint. Comparatively, constructing a 20-foot-tall levee, using earth fill, would require a minimum of 140 feet in width. A similar height floodwall would require less than five feet in width. Floodwalls would also mitigate through-seepage concerns and do not have slope stability concerns.

### 6.1.3.3 Measure Drawbacks

Floodwall measures have a relatively higher cost than earth filled levees. They also limit access and, depending on height, limit visibility during flood fighting operations. Through-seepage concerns would not be mitigated where floodwalls are added to existing levees. Additionally, existing levee geometry issues would require additional mitigation measures.

Floodwalls may also present a physical obstruction limiting access for vehicles, pedestrians, and wildlife.

Other measures would be required in conjunction with flood walls to address levee geometry, stability, through- and under-seepage, penetrations, encroachments, and vegetation.

## 6.1.4 Cutoff Walls

### 6.1.4.1 General Description

Cutoff walls are vertical seepage barriers constructed, typically, through the center of a levee. The two common types of cutoff walls are soil-bentonite and soil-cement-bentonite. The soil-bentonite wall utilizes in situ soil mixed with bentonite slurry and the soil-cement-bentonite wall utilizes in situ soil mixed with cement slurry and bentonite slurry.

There are several methods for constructing cutoff walls including open trench excavation, deep-soil-mixing, cutter soil mixing, and trench remix-deep. The two common methods utilized locally are open trench excavation and deep soil mixing.

Open trench cutoff walls are constructed using an excavator with a long-stick boom capable of digging a trench to a maximum depth of approximately 75 to 85 feet. The cutoff wall trench is typically 36 inches in width. Bentonite slurry is placed in the trench to prevent caving during excavation. Excavated soil is then mixed with bentonite and water, to achieve the required cutoff wall permeability, and then pushed back into the excavated trench to form a seepage barrier.

Deep-soil-mixing walls are constructed using a crane-supported set of three mixing augers set side by side. These augers are drilled through the levee crown and foundation to the required depth (typically deeper than 85 feet). As the augers are inserted and withdrawn, cement slurry and bentonite slurry are injected through the tips and mixed with the native soil. An overlapping series of mixed columns is drilled to create a continuous seepage cutoff wall. Levee degrade for the deep-soil-mixing method is generally similar to that for the open trench method.

Cutoff wall construction requires levees to be degraded to prevent hydraulic fracturing, to provide an adequate working surface, and to ensure stability of the slurry trench and cutoff wall (open trench method). Levee degrade is generally by 1/3 to 1/2 of the levee height. Degrade material is generally side cast then reused for levee reconstruction if it meets, or can be blended to meet, requirements for levee fill.

A typical cutoff wall section is shown on Figure 5.

#### 6.1.4.2 Measure Accomplishments

Cutoff walls, when constructed to the proper depth, can effectively reduce through- and under-seepage. Also, unlike other seepage mitigation measures, cutoff walls add no additional area to the project footprint making them an ideal candidate for seepage mitigation in areas where space is limited.

#### 6.1.4.3 Measure Drawbacks

Levee penetrations make cutoff wall placement difficult as they act as a barrier for placement of the soil-bentonite slurry. Penetrations are typically removed then replaced, if needed, after cutoff wall construction adding to construction costs.

Placement of a cutoff wall into the ground beneath the levee could potentially disrupt groundwater flows within a basin limiting aquifer recharge. An investigation of the potential impacts of a cutoff wall on groundwater and groundwater recharge would be required. Also, drainage and outfalls to rivers may be limited creating locally higher groundwater levels.

Other measures would be required in conjunction with cutoff walls to address levee freeboard, geometry, and stability.

### 6.1.5 Seepage Berms

#### 6.1.5.1 General Description

Seepage berms are wide embankment fills constructed along the landside of the levee. They vary in width from a minimum of four times the levee height to, typically, a maximum of 300 feet. Seepage berm heights are typically a minimum of 5 feet at the levee landside toe and taper to 3 feet at the end of the berm. Seepage berms may be drained or undrained.

Drained seepage berms are constructed of earth fill over a layers of drain rock and filter sand, typically 1 to 2 feet thick in total. A layer of drain rock allows for the drainage of seepage. A layer of filter sand may be needed to prevent soil from migrating from the levee or foundation into the drain rock. Undrained seepage berms are similar to drained seepage berms but do not include a layer of drain rock. A typical cross section of a drained seepage berm is shown on Figure 6.

#### 6.1.5.2 Measure Accomplishments

Seepage berms extend the underseepage path to control exit gradients near the landside toe of the levee. They provide the levee with protection against underseepage and offer additional global stability to the levee. Seepage berms may also provide a source of fill for repairing the levee in an emergency. Seepage berms are also adaptable to future changes in levee criteria or new information.

#### 6.1.5.3 Measure Drawbacks

Seepage berms require a large area, resulting in higher costs associated with real estate acquisition and import of borrow material. Drain rock and filter sand, for drained seepage berms, would also add



cost over undrained seepage berms. In addition, geometry and through-seepage issues would not be addressed and would require additional mitigation measures.

Seepage berms require large areas along the landside of the levee that may be considered habitat for protected species, and that may require removal of existing encroachments or penetrations, and/or removal of vegetation. Encroachments into areas considered habitat may require mitigation. It is possible that, over time, the seepage berm may become habitat for protected species, reducing the ability to provide necessary maintenance or use the berm as a source of fill during an emergency.

Other measures would be required, in conjunction with seepage berms, to address levee freeboard, geometry, stability, and through seepage. Encroachment, penetration, and vegetation issues outside of the footprint of the berm would also require other measures.

## 6.1.6 Stability Berms

### 6.1.6.1 General Description

Stability berms are embankment fills constructed against the landside slope of the levee. Stability berms are generally 1/2 to 2/3 of the levee height, 10 to 12 feet wide at the top, with 2H:1V or flatter side slopes. Stability berms usually include a drainage layer, typically 1 to 2 feet thick, that collects levee through-seepage. A typical stability berm section is shown on Figure 6.

### 6.1.6.2 Measure Accomplishments

Stability berms offer added strength, increase levee slope stability, and improve the structural integrity of the levee. Stability berms, with internal drainage layers, can also address levee through-seepage.

### 6.1.6.3 Measure Drawbacks

Stability berm drawbacks are similar to seepage berm drawback but at a smaller scale. Stability berms have relatively small footprints (on the order of 10 to 20 feet depending on levee height) and, as such, less potential impacts than seepage berms. Unlike seepage berms, however, stability berms do not address levee under seepage issues.

Other measures would be required, in conjunction with stability berms, to address levee freeboard, geometry, and under-seepage. Encroachment, penetration, and vegetation issues outside of the footprint of the stability berm would also require other measures.

## 6.1.7 Relief Wells

### 6.1.7.1 General Description

Relief wells are semi-passive systems constructed near the levee landside toe. Relief wells are constructed using soil boring equipment to bore a hole vertically through fine-grained blanket layers and into the coarse-grained aquifer layers. Pipe casings and gravel/sand filters are installed to allow pressurized groundwater to flow to the surface. Relief wells require a clearly defined blanket layer and underlying coarse-grained aquifer to ensure proper operation making them not suitable in some areas.

Relief wells require a means to discharge water. Depending on the location, existing drainage systems including pipes and canals may be used to convey water away from the levee. In some locations water may be discharged onto a splash pad then into adjacent agricultural fields. Alternatively, a concrete-lined relief well trench would be required to collect and convey water away from the levee. Piezometers, or monitoring wells, are typically installed midway in-between the relief wells to allow monitoring of groundwater levels to ensure the wells are operating as intended. A typical relief well detail is included on Figure 7.

#### 6.1.7.2 Measure Accomplishments

Relief wells provide a path for pressurized groundwater to reach the ground surface thereby relieving pressures beneath a clay blanket. Relief wells can be an effective, space-saving levee under-seepage solution provided they are maintained and operating as designed.

#### 6.1.7.3 Measure Drawbacks

Relief wells required regular inspection (testing and flushing) and maintenance to ensure continued effectiveness. Relief wells not properly maintained can cause the formation of boils or excessive localized seepage. Additionally, water discharged from relief wells adds flow to internal drainage systems, particularly during high water events.

A relief well system, including the wells, relief trench, and access road, generally require an approximate 50-foot-wide strip along the landside of the levee that would have similar drawbacks to a stability berm measure.

Other measures would be required in conjunction with relief wells to address levee freeboard, geometry, stability, through seepage, encroachment, penetration, and vegetation issues.

### 6.1.8 Landside Toe Drain

#### 6.1.8.1 General Description

Landside toe drains are trenches constructed along the landside levee toe that include pervious materials and perforated pipes that collect seepage and convey it away from the levee. Landside toe drains may require multiple layers of filters and transition materials to prevent migration of foundation material into the toe trench. Trench geometry depends on the volume of under-seepage expected but typically varies in width between 2 and 6 feet.

#### 6.1.8.2 Measure Accomplishments

Landside toe drains are an alternative to control relatively shallow under-seepage and protect the area in the vicinity of the landside levee toe. Toe drains may also be used in conjunction with relief well systems; relief wells collect the deeper seepage and toe drains collect the shallower seepage.

#### 6.1.8.3 Measure Drawbacks

Landside toe drains are not effective in areas where the pervious stratum is thick. In addition, the potential for migration of fines into the toe drain trench may require installation of filter fabric or multiple layers of pervious materials. Toe drains are also not favorable from a regulatory acceptance perspective. Additionally, toe drains may require a system to collect and convey discharge away from levees (like relief wells).

Other measures would be required in conjunction with toe drains to address levee freeboard, geometry, stability, through seepage, deeper under seepage, encroachment, penetration, and vegetation issues.

## 6.1.9 Encroachment Removal

### 6.1.9.1 General Description

Encroachments include features such as utilities, fences, structures, swimming pools, retaining walls, driveways, and all features that penetrate a levee prism. Encroachments determined to impact levee performance, increase flood risk, or impede operations, maintenance, and flood fighting would be removed or mitigated.

### 6.1.9.2 Measure Accomplishments

Removing encroachments improves the structural integrity and stability of the levee, removes features that may negatively impact levee performance, allows for easier access for inspection, and would make the levee easier to traverse.

### 6.1.9.3 Measure Drawbacks

Encroachments are typically located on private property. Removal of encroachments on private property requires coordination with property owners and may be viewed as a negative impact to residences. Encroachment removal may also impact existing vegetation and habitat.

Removal of encroachments would not address levee freeboard, through-seepage, or under-seepage issues.

## 6.1.10 Vegetation Removal

### 6.1.10.1 General Description

Vegetation such as tall grasses, shrubs, and trees limit visual inspection of a levee. Additionally, trees may impact structural integrity of a levee. USACE vegetation policies require a vegetation free zone as described in USACE EP 1110-2-18 “Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures”. Vegetation removal would include all unacceptable and/or woody vegetation including root balls and root systems.

### 6.1.10.2 Measure Accomplishments

Removing unacceptable or woody vegetation improves the structural integrity and stability of the levee and allow for easier inspection of levee slopes (access and visibility).

### 6.1.10.3 Measure Drawbacks

Removal of attractive vegetation in residential areas may be viewed negatively and may require coordination with the local community. Vegetation on the waterside slope may also provide resistance to wind and wave erosion, as such, removal of vegetation may require other means of erosion protection. Falling trees are a concern during high water events and may cause localized

erosion. Removal of woody vegetation, especially along the waterside of the levee, may have environmental impacts.

## 6.2 Initial Screening of Mitigation Measures

The potential mitigation measures described above were screened to determine which measures are most suitable for levee rehabilitation. Some measures may be combined (e.g., geometry corrections and cutoff walls, geometry corrections and floodwalls, cutoff walls and floodwalls) and some are required to address specific deficiencies (e.g., geometry corrections, encroachment removal, vegetation removal). The following sections discuss various constraints and how they apply to each evaluated measure.

### 6.2.1 Minimize Environmental Impacts

While environmental impacts cannot be entirely avoided, measures that require a larger footprint, such as seepage berms, would require more environmental mitigation than smaller footprint measures, such as cutoff walls. Environmental mitigation increases project costs and may cause permitting delays.

Measures with smaller overall environmental impacts are considered more desirable.

### 6.2.2 Minimize Long Term Maintenance

Maintenance of levees is required to ensure proper function, continued flood protection, and reduction of flood risks. Some measures have higher maintenance demand than others and would increase long term costs. Measures such as relief wells and landside toe drains require on-going and long-term maintenance while other measures, such as cutoff walls, require little to no maintenance.

Measures with minor to no requirements for on-going and long-term maintenance are considered more desirable.

### 6.2.3 Maximize Flexibility to Changing Criteria

Levee design criteria will be updated as a better understanding is gained about levee seepage and stability, potential levee failure modes, and to address potential climate changes.

Measures such as cutoff walls are not as easily adaptable to changing criteria as earth fill measures. In case of increased flood elevations, it is easier to widen a seepage berm than it is to increase the depth of a cutoff wall. It is also easier to raise an earth fill levee than it is to raise a floodwall. Measures that include earthwork, such levee raises, seepage berms, and embankment reconstruction are easier to build larger and/or higher.

Measure that are more easily adaptable to changing criteria are considered more desirable.

### 6.2.4 Performance

A potential measure's performance is an important factor in its selection as a levee rehabilitation measure. Various rehabilitation measures have been implemented on previous projects that provide long performance histories. Measures such as cutoff walls and seepage berms have a proven long-term performance history whereas measures such a relief wells have relatively unproven performance over long periods of time.

Measure that are proven and have a long history of proper performance are considered more desirable.

### 6.2.5 Regulatory Acceptance

The acceptance of measures to regulatory agencies, including USACE, DWR, CVFPB, and local maintaining agencies, is an important factor in the selection of a levee rehabilitation measure. Experience on multiple projects has shown that these agencies generally do not prefer measures such as flood walls (due to appearance and limiting access), relief wells (due to uncertainty in long-term performance and on-going maintenance), and landside toe drains (due to uncertainty in performance).

Measures that have a history of acceptance from regulatory and maintaining agencies are considered more desirable.

## 6.3 Results of Initial Screening

Potential mitigation measures were assigned a rating of either “Good”, “Moderate”, or “Poor” based on the constraints discussed above. A measure received a “Good” rating where it is considered favorable, a “Moderate” rating where it is considered neutral, and a “Poor” rating where it is considered not favorable. Measure ratings are comparative, so a “Good” rating is considered good relative to other measures that perform the same function. Measure functions are grouped as follows:

- Seepage - Measures that address seepage issues include cutoff walls, seepage berms, stability berms, relief wells, and landside toe drains.
- Freeboard and Geometry - Measures that address freeboard and geometry include levee raises using earth fill (raise-in-place or embankment reconstruction) and floodwalls.

Measures such as removal of encroachments, removal of vegetation, and erosion repair are either required, or not, based on the specific levee deficiency identified (i.e., there are no alternatives and critical issues are addressed). These measures are rated against the specific constraint and are not comparative.

Table 6-2 shows the results of the initial screening of measures. All constraints were weighed equally with ratings assigned a numerical value as follows; Good (+1), Moderate (+0), and Poor (-1). Rating values were summed, and the measures were reordered such that measures with the highest numerical rating, for each function, are at the top of Table 6-2.

Measures that did not fare favorably in this initial screening were dropped from further consideration. For example, the landside toe drain measure and the relief well measure were not considered further as they received negative ratings relative to the other measures.

**Table 6-2. Initial Screening of Measures**

Primary Issue Addressed	Measure	Constraints					
		Minimize Environmental Impacts	Minimize Long Term Maintenance	Maximizing Flexibility	Performance	Regulatory Acceptance	Rating
<b>Seepage</b>	Cutoff Wall	Good (+1)	Good (+1)	Moderate (+0)	Good (+1)	Good (+1)	+4
	Stability Berm	Poor (-1)	Moderate (+0)	Good (+1)	Moderate (+0)	Good (+1)	+1
	Seepage Berm	Poor (-1)	Moderate (+0)	Good (+1)	Good (+1)	Good (+1)	+2
	Relief Wells	Good (+1)	Poor (-1)	Moderate (+0)	Moderate (+0)	Poor (-1)	-1
	Landside Toe Drain	Moderate (+0)	Poor (-1)	Moderate (+0)	Moderate (+0)	Poor (-1)	-2
<b>Freeboard and Geometry</b>	Raise-in-place levee	Moderate (+0)	Moderate (+0)	Good (+1)	Good (+1)	Good (+1)	+3
	Embankment Reconstruction	Moderate (+0)	Moderate (+0)	Good (+1)	Good (+1)	Good (+1)	+3
	Floodwall	Good (+0)	Moderate (+0)	Poor (-1)	Good (+1)	Moderate (+0)	+0
<b>Encroachments</b>	Encroachment Removal	Good (+1)	Good (+1)	Good (+1)	Good (+1)	Good (+1)	+5
<b>Vegetation</b>	Vegetation Removal	Poor (-1)	Good (+1)	Good (+1)	Good (+1)	Good (+1)	+3

Ratings – Criteria equally weighted as follows: Good (+1), Moderate (+0), Poor (-1)

## 6.4 Analysis and Proposed Measures

### 6.4.1 Seepage

Based on the initial screening in Table 6-2, cutoff walls are recommended for inclusion in the Project levees where levee seepage is a concern. Levee seepage may be through- (within the limits of the levee embankment) or under- (below the levee embankment). Cutoff walls are designed to address both through- and under-seepage issues. Seepage berms address under-seepage issues only and are typically combined with stability berms where there are through seepage issues. Relief wells and toe drains address under seepage issues only with toe drains addressing shallow under seepage. Both relief well and toe drain measures are typically combined with other measure to address through-seepage.

Based on the levee deficiencies identified at the Project, the following measures were selected for cost comparison to address seepage concerns:

- Cutoff walls
- Seepage berms

Toe drains were not considered further. The levee issues identified at the Project include under-seepage (not shallow) and through-seepage. Toe drains would require other measures to fully address both issues.

### 6.4.2 Freeboard and Geometry

Freeboard is most often addressed by raising a levee crown. This may be accomplished through earthen fill measures (embankment reconstruction or a raise-in-place) or by constructing a flood wall. A flood wall may be constructed along an existing levee crown (combination levee and floodwall) or by itself.

A combination of raise-in-place and embankment reconstruction have been identified for this Project. A raise-in-place measure would be selected initially unless an embankment reconstruction measure is required. An embankment reconstruction measure would cost more than a raise-in-place measure due to the larger volumes for excavation and fill (particularly for the Project since the borrow source is the adjacent property). Therefore, an embankment reconstruction measure would only be employed where existing levee material is deemed insufficient for use.

Floodwalls require import of concrete and steel, as well as excavation for a foundation. It was determined that the large volume of off-site materials and the earthwork required for installation of a sufficient foundation system would increase costs significantly over earthen measures.

### 6.4.3 Summary of Levee Improvement Options

Two levee improvement options were developed based on a series of explorations and seepage and stability analyses conducted by Shannon and Wilson (November 2022). Based on these analyses, Shannon and Wilson recommended two types of levee rehabilitation measures (Table 6-3). These measures consisted of embankment reconstruction, levee raises, cutoff walls, and seepage berms. The measures are summarized below. Plan and profiles of the alignments are included in Appendix C.

**Table 6-3. Remediation Measures based on Geotechnical Analysis**

Levee	Beg. Station	End Station	Length (feet)	Levee Mitigation	
				Levee Improvement Option 1	Levee Improvement Option 2 / 2B
RD 536	0+00	80+00	8,000	Levee Raise	N/A
RD 536	80+00	180+62	10,062	Levee Raise and Cutoff Wall	Levee Raise and Seepage Berm
Mellin and Mellin Extension	0+00	62+00	6,200	Embankment Reconstruction	N/A
Solano County Levee 44	62+00	92+53	3,053	Levee Raise and Cutoff Wall	Levee Raise and Seepage Berm



## 7 OTHER PROJECT CONSIDERATIONS

### 7.1 Water Control Structure

Watson Hollow Slough is located between the RD 536 and Solano County 44 levees. Watson Hollow serves as a drainage channel, to convey the 100-year flood runoff from the west, and as a source for irrigation water. This Project will close the gap between these two levees and construct a new WCS in the Watson Hollow Slough gap.

The new WCS will include positive closure to prevent Yolo Bypass water from backing up into Watson Hollow Slough (west of the levee).

Construction of a new WCS would include the following:

- Installation of sheet piles or bladders in the vicinity of the gap and dewatering of area within the gap.
- Excavation of the bottom of Watson Hollow and removal of approximately 5 feet of unsuitable material.
- Construction/placement of a new WCS with gates.
- Levee earthwork construction to tie the RD 536 and Solano County 44 levees (match crown elevations). The new levee embankment would match the geometry of the RD 536 levee.
- Seepage mitigation (cutoff wall or seepage berm) would be required through the gap.
- Removal of sheet piles and dewatering equipment.
- Levee crown and side slope surfacing.

Based on preliminary information provided by MBK either eight 48-inch diameter culverts or two 5-foot-high by 15-foot-wide box culverts are needed to convey drainage runoff.

A new levee crossing (gravity pipe) would be needed to maintain irrigation water in Watson Hollow and existing ditches west of the RD 536 levee. The existing irrigation crossing is an 18-inch gated CMP culvert located near Station 186+50. For this analysis, an allowance has been made for one 48-inch irrigation pipe crossing. The crossing would include a gate and appropriate screens on the waterside of the levee. The gate would be manually operated; opened to allow irrigation water into the landside ditches, as needed, and closed to prevent flood and tide waters on the waterside of the levee.

Preliminary material quantities and costs have been developed for both culvert options and for the irrigation crossing. Costs are discussed in more detail in Section 8. Quantities are summarized in Section 11.

### 7.2 Ditches and Canals

Various ditches and canals are located within the project footprint. Ditches and canals impacted by flood control improvements, and located along the landside of the levee, would be relocated as part of this project. Generally, measures such as cutoff walls do not need additional permanent area and would not require relocation of ditches unless specifically identified for relocation (i.e., do not meet exit gradient criteria and present a seepage issue). Measures such as seepage berms need

additional permanent area and may require relocation of ditches but only if they fall within the new flood control improvement footprint and/or if they are specifically identified for relocation.

An irrigation ditch is located along the landside of the RD 536 levee. The ditch is more than 50 feet away from the levee landside toe, was not identified for relocation by Shannon and Wilson, and does not fall within flood control improvement footprints. Therefore, the ditch was not considered for relocation as part this evaluation.

Ditches and canals located along the waterside of the levee would be relocated as a part of the planned habitat berm grading developed by WES.

## 7.3 Utility Pole Relocations

Utility poles along the levees are identified in Table 5-1 above. Utility poles located within flood control features and/or within flood control ROW would be relocated prior to start of construction. Locations for new poles would be coordinated with utility owners during the design phase.

Table 5-1 identifies utilities that require relocation.

## 7.4 Right-of-Way Acquisition Assumptions

Right-of-Way is an important factor in determining the feasibility of levee improvement measures. Cutoff wall measures do not typically require additional ROW, as compared to seepage berm measures, and would therefore have lower, if any, ROW acquisition requirements.

WES provided preliminary ALTA survey maps for this project (Appendix D). The following information, and subsequent ROW acquisition assumptions, have been made based on a review of these ALTA survey maps:

- RD-536 Levee – The existing levee embankment is in a 180-foot levee easement.
  - A levee cutoff wall option would not modify the levee footprint and, therefore, assumes no ROW acquisition.
  - A seepage berm option would require additional ROW and, therefore, assumes ROW acquisition for improvement that fall beyond existing ROW limits.
- Solano County 44 Levee – The existing levee embankment appears to be on State owned property. No information is provided regarding existing easements. It is assumed that the current levee embankment falls within a prescriptive right.
  - A levee cutoff wall option would not modify the levee footprint and, therefore, assumes no ROW acquisition.
  - A seepage berm option would require additional ROW and, therefore, assumes ROW acquisition for improvements that fall beyond existing ROW limits.
- Mellin and Mellin Extension Levees – Portions of the existing embankments appear to fall within existing Reclamation District boundaries and easements labeled as “Restricted Use

Travel Way”. Portions of embankments outside of these areas are assumed to fall within a prescriptive right.

- A levee cutoff wall option would not modify the levee footprint and, therefore, assumes no ROW acquisition.
- A seepage berm option would require additional ROW and, therefore, assumes ROW acquisition for improvements that fall beyond existing ROW limits.

Acquisition of new ROW is assumed to be via fee for permanent flood control features and would include the following:

- Levee footprint from landside toe to water side toe.
- Seepage berm footprint from levee landside toe to seepage berm toe.
- Provisions for land and waterside access roads (generally assumed to be 20 feet on the landside and 15 feet on the waterside).

Additional ROW related research, boundary surveys, acquisition of title reports and supporting documents, and preparation of ROW maps would be needed to determine project specific ROW acquisition requirements.

## 8 BASIS OF OPINIONS OF PROBABLE CONSTRUCTION COSTS

### 8.1 Introduction

Comparative Opinions of Probable Construction Costs (OPCCs) were prepared for the levee improvement options selected at each reach.

Unit prices and material quantities were calculated considering conditions specific to each levee improvement option. While these OPCCs reflect an understanding of the currently elevated market, it is understood that current market conditions are increasingly volatile, and prices are subject to significant fluctuations. These market conditions are expected to continue through the planned years of Project construction (2024 through 2025).

Other factors, including increasing fuel costs or competition for contractors' bidding similar projects, may further negatively impact the current conditions. Therefore, unit costs include an increase in pricing from current levels. Estimated costs herein are suitable for comparing levee improvement options and estimating future budgets. These OPCCs should be updated as the design progress.

### 8.2 Estimating Method

Task-based estimates were developed for approximately 90 percent of Project costs. Other minor costs are based on historical unit pricing escalated to an equivalent present cost or parametric cost factors. Task-based estimating considers a work breakdown by task, construction method, production rates, equipment types, labor classifications, and material pricing appropriate for the scope of work, site properties, and level of design detail to calculate project costs.

Quantities were calculated based on the current designs with assumptions made for the extent of impact to existing features, utility impacts, stabilization, and other items necessary to quantify the work.

#### 8.2.1 Labor Rates

All labor and fringe rates are based on Davis-Bacon Act wage determinations as available online at [www.wdol.gov](http://www.wdol.gov) for Solano County. Wage determination CA20230007 released 20 Jan 2023 was used all cost calculations. California payroll tax (12.66%), workman's compensation insurance (WCI, 15.45%), and overtime (10%) were applied to all labor rates. The overtime markup assumes 5 10-hour days per week. Note that payroll tax is calculated on the base rate plus fringe benefits, workman's compensation insurance is calculated only on the base rate, and the overtime markup applies to the base rate and payroll tax increase.

#### 8.2.2 Equipment Rates

Equipment rates are based on the 2020 Region 7 Micro-computer Aided Cost Estimating System, Generation II (MII) equipment library which considers USACE EP 1110-1-8 rates. Operating costs were calculated in MII to account for current fuel prices in the project area and a federal cost-of-money rate of 4.0 percent. The overtime facilities capital cost of money discount markup is applied to the total equipment rate after calculating operating costs.

## 8.3 Other Cost Considerations

Construction costs were calculated at a Q1 2023 price level. Escalation to the anticipated midpoint of construction in Q3 2025 was calculated at 6.92 percent per USACE EM 1110-2-1304, September 2022 release. Escalation is applied to all items in the estimate. Cost estimates represent construction costs only. Easement acquisition, permitting, and environmental mitigation are not included. A construction contingency totaling 30 percent of the levee, lands, roads, and relocation costs is included.

The unit rates for construction costs include contractor home office overhead (10%), job office overhead (10%), profit (8%), and bond (2%). The estimates assume a single shift of work, 5 days per week, 10 hours per day. Cutoff wall construction may occur in longer shifts, or double shifts, to meet the Project construction schedule, should it be required. In the designer's experience, additional cutoff wall shifts can be used by a cutoff wall contractor to increase production without increasing the overall cost for the work. Earthwork operations cannot be similarly expanded without impacting the estimated cost.

In accordance with previous project experience within the Sacramento Valley, earthwork quantities include a 15% shrinkage loss factor (plus an additional 5 percent for conservatism) from borrow site to compacted, in-place embankment. As a result, the volume of material included in the line items for borrow site excavation is equal to 120 percent of the quantity required for levee embankment construction.

Utility and encroachment relocation costs are estimated based on known information described in Section 5.4.

## 8.4 Earthwork

Earthwork costs include excavation of on-site borrow material, hauling, moisture conditioning, placement, and compaction. Borrow quantities for levee improvements would be sourced on-site, from the Little Egbert site within an approximately 1- to 1.5-mile radius of the midpoint of a levee reach. Earthwork material would be hauled, moisture conditioned, placed, and finally compacted and graded. A \$2 per cubic yard use fee is included in the imported levee fill costs. An allowance is made for haul road construction and improvement.

## 8.5 Contingency

While the estimate is considered comprehensive of the current project scope at the conceptual design level, a 30 percent contingency is included to represent potential cost risks. These risks may include:

- Increased material pricing for construction materials.
- Revisions to levee design grades.
- Requirements from interested parties (DWR, Solano County Water Agency, USACE).

## 8.6 Construction Contracting Plan

Contracting methods and work packaging could impact the total construction cost for the project. For the purposes of this cost analysis, it is assumed that the work will be bid in a single large construction contract to incorporate economy of scale, contractors' typical maximum bonding capacity, and competition into the bids received.

The current assumed schedule (and construction cost estimate) anticipates one construction contract let in year 2024.

## 8.7 Line-Item Descriptions

Project costs are presented according to a schedule of line items that comprise the work, quantities, and costs necessary to construct the levee improvement options described herein. A description of each line item is provided below.

### 8.7.1 Mobilization and Demobilization

This line item is for transporting heavy construction equipment to and from the Project site and furnishing, installing, and removing temporary construction equipment. This item may include other costs unallocated by the remaining line items. Costs include all materials, equipment, and labor.

### 8.7.2 Traffic Control

This line item is for work associated with roadway detours, signage, personnel, and all other work necessary to provide sufficient safety and site access. Costs include all materials, equipment, and labor.

### 8.7.3 Storm Water Pollution Control

This line item is for installing, maintaining, and removing stormwater management devices and inspection and reporting in compliance with the Stormwater Pollution Prevention Plan. Costs include all materials, equipment, and labor.

### 8.7.4 Project Fencing

This line item is for installing, maintaining, removing, and disposing of project fencing around the project area to limit public access. Costs include all materials, equipment, and labor.

### 8.7.5 Clearing and Grubbing

This line item is for excavating, loading, hauling, and disposing of organic or other deleterious materials. Material(s) are assumed to be hauled and disposed of at an off-site location(s). Costs include all labor, equipment, and disposal fees.

### 8.7.6 Remove Existing Aggregate Surfacing

This line item is for removing and disposing of the existing aggregate surfacing on the levee crown. The material is assumed to be respread on-site (not levee surfaces). Costs include all labor, equipment, and disposal fees.

### 8.7.7 Topsoil Stripping

This line item is for excavating and disposing of the upper six inches of material from the levee slopes, the footprint of project fills, and approximately five feet beyond those limits. The material is assumed to be respread on-site (not levee surfaces). Costs include all labor and equipment.

### 8.7.8 Levee Excavation (Levee Degrade, Key Trench and Cutoff Trench)

This line item is for all levee excavation, not counted in the stripping volume, for removal of the existing Mellin Levee, degrading levee embankments to establish a cutoff wall working surface, excavation for cutoff wall trenches, and excavation for inspection trenches under project fills. The material is assumed to be respread on-site (not levee surfaces). Costs include all labor and equipment.

### 8.7.9 Soil-Bentonite Cutoff Wall

This line item is for installing a 3-foot-wide soil-bentonite slurry cutoff. The cutoff wall is assumed to be constructed via open trench excavation methods. Costs include all materials, labor, and equipment.

### 8.7.10 Levee Embankment Fill (Soil Type 1)

This line item is for placement of the levee center core and cutoff wall cap for cutoff wall measures and includes excavation from borrow, haul to the levee, placement, moisture conditioning, compaction, grading, and testing. Costs include all materials, labor, and equipment.

### 8.7.11 Levee Embankment Fill (Soil Type 2)

This line item is for placement of all levee material, not counted in the Levee Embankment Fill (Soil Type 1) volume, such as levee raises, embankment reconstruction, inspection trench backfills, and any material required to meet the design grades and includes excavation from borrow, haul to the levee, placement, moisture conditioning, compaction, grading, and testing. Costs include all materials, labor, and equipment.

### 8.7.12 Seepage Berm Fill

This line item is for placement of seepage berm material and includes excavation from borrow, haul to the levee, placement, moisture conditioning, compaction, grading, and testing. Costs include all materials, labor, and equipment.

### 8.7.13 Class 2 Aggregate Surfacing

This line item is for Class 2 Aggregate Base placed on the reconstructed levee crown and includes materials, import from off-site borrow source(s), moisture conditioning, placement, and compaction. Costs include all materials, labor, and equipment.

### 8.7.14 Rock Slope Protection

This line item is for Rock Slope Protection placed on the reconstructed levee water side slopes and includes materials, import from off-site borrow source(s), placement, and testing. Costs include all materials, labor, and equipment.

### 8.7.15 Erosion Control Seeding

This line item is for hydroseed levee slopes and the tops of seepage berms and includes all materials, labor, and equipment.

### 8.7.16 Relocate Power Pole

This line item is for on-site relocation of power poles outside the proposed levee footprint, seepage berms, and access roads. Work is assumed to be completed by Pacific Gas & Electric. Costs include all materials, labor, and equipment.

### 8.7.17 Relocate Gate

This line item is for relocation of on-site gates and includes removal of existing gates, storing of existing gates, excavation for footings, concrete for footings, installation of gates, and required testing. Costs include all materials, labor, and equipment.

### 8.7.18 Relocate Pump 7

This line item is for relocation of Pump 7 outside the proposed levee footprint, seepage berms, and access roads and includes excavation, placement, and associated testing. Costs include all materials, labor, and equipment.

### 8.7.19 Relocate Pump 11

This line item is for relocation of Pump 11 outside the proposed levee footprint, seepage berms, and access roads and includes excavation, placement, and associated testing. Costs include all materials, labor, and equipment.

### 8.7.20 Relocate Culvert

This line item is for removal and replacement of the culvert of unknown diameter crossing the Mellin Levee at approximately station 16+72 and includes excavation, import, placement of pipe and bedding, and associated testing. Costs include all materials, labor, and equipment.

### 8.7.21 Demolish Existing Pipe (1- to 2-inch Dia.)

This line item is for the removal and disposal of abandoned 1- to 2-inch-diameter pipes in the existing levee embankments and includes excavation, removal, and disposal. Costs include all labor and equipment.

## 8.8 Water Control Structure

This line item is for the construction of new WCS in Watson Hollow at the intersection of the RD 536 and Solano County Levee 44 and includes excavation, import of materials, box culverts, concrete, rebar, forms, pipe, bedding, placement, import, and associated testing. Costs include all labor and equipment.



## 8.9 Right-of-Way Acquisition Approach and Cost

Project specific ROW acquisition costs are not currently available; however, general costs are available from various sources that can be used to inform overall levee rehabilitation option costs.

The ROW acquisition costs used in this assessment were developed based on the following:

- A property value of \$24,000 per acre is used based on information from a variety of sources as follows:
  - Information provided by WES – Per acre costs for adjacent property is between \$16,000 and \$20,000. This is based on recent comparable sales.
  - Based on information from [www.acrevalue.com](http://www.acrevalue.com) (on-line database of property sales and values), farmland property values in Solano County are approximately \$23,000 per acre.
  - Based on information from [www.landandfarm.com](http://www.landandfarm.com) (on-line listings of farmland currently for sale during the development of this document), average per acre farmland costs in Solano County is between \$17,000 and \$24,000 per acre.
- Valuation and acquisition of ROW is a complex process that requires coordination with real estate and property acquisition specialists, legal input, State and local entities, and property owners and would include items such as damages, farming losses, remnants, relocations, and other soft costs. Based on information provided by WES a cost of \$15,000 per acre has been added to land costs to approximate ROW costs associated with the ROW acquisition process.
- Costs for temporary construction easement are not considered. For comparative costs, it is assumed that similar temporary construction easement would be required for each levee improvement option and that cost differences would be negligible.
- A contingency of 30 percent has been added consistent with the contingency for construction costs.
- ROW acquisition cost =  $(\$24,000 + \$15,000) \times 1.3 = \$50,700$  per acre.

The information listed above is preliminary and is only intended to supplement levee rehabilitation costs such that levee rehabilitation options that do not require ROW acquisition can be compared to levee rehabilitation options that require ROW acquisition. Additional ROW related research, acquisition of title reports and supporting documents, preparation of ROW maps, and property acquisition and appraisal specialists are needed to determine project specific ROW related acquisition requirements and costs.

## 9 FORMULATION OF LEVEE IMPROVEMENT OPTIONS

### 9.1 Criteria for Plan Formulation

The USACE Planning Community Toolbox Principles and Guidelines provides a means for formulating alternative plans and was used as a tool to develop and evaluate levee improvement options for this project. The USACE planning guidelines outline four specific criteria to be used in the formulation of alternatives plans (levee improvement options). These criteria include:

- **Completeness** – The extent to which the alternative plan provides and accounts for all necessary investments or other actions to ensure the realization of the planning objectives, including actions by other Federal and non-Federal entities.
- **Efficiency** – The extent to which an alternative plan is the most cost-effective means of achieving the objectives.
- **Effectiveness** – The extent to which the alternative plan contributes to achieve the planning objectives.
- **Acceptability** – The extent to which the alternative plan is acceptable in terms of applicable laws, regulations, and public policies.

The levee improvement options discussed below were developed considering these criteria. Levee improvement options are further evaluated in Section 10 against Project specific criteria.

### 9.2 Levee Improvement Option 1

#### 9.2.1 Flood Control Features

Levee Improvement Option 1 includes construction of soil bentonite cutoff walls for all areas where seepage is a concern. The cutoff walls will be a minimum 3 feet wide and extend at least 5 feet into the clay layer beneath the levee. Option 1 also consist of levee geometry corrections by raising the levee and grading the slopes as required, and, in the case of Mellin Levee and Mellin Levee Extension, completely degrading the existing levee and constructing a new levee in its place.

Levee Improvement Option 1 is summarized in Table 9-1 below.

**Table 9-1. Levee Improvement Option 1 Summary**

Levee	Station	Rehabilitation Methods	Cutoff Tip Elevation
RD 536	0+00 to 80+00	Levee Raise	NA
RD 536	80+00 to END	Levee Raise Cutoff Wall	-65 feet
Mellin / Mellin Levee Extension	0+00 to 62+00	Levee Degrade and Reconstruction	NA
Solano County Levee 44	62+00 to END	Levee Raise Cutoff Wall	-70 feet

## 9.3 Levee Improvement Option 2

### 9.3.1 Flood Control Features

Levee Improvement Option 2 includes the construction of seepage berms for all areas where seepage is a concern. Seepage berms will be approximately 5 feet tall at the landside toe of the levee and extend 80 feet to the landside. The berm will have a gradual slope of approximately 2 percent away from the levee.

Levee Improvement Option 2 includes the same levee geometry corrections as Levee Improvement Option 1 by raising the levee and grading the slopes as required, and, in the case of Mellin Levee and Mellin Levee Extension, completely degrading the existing levee and constructing a new levee in its place. Levee Improvement Option 2 assumes that existing levee alignments will be maintained and that new berms will be constructed along the landside requiring acquisition of new ROW.

Levee Improvement Option 2 is summarized in Table 9-2 below.

**Table 9-2. Levee Improvement Option 2 Summary**

Levee	Station	Rehabilitation Methods	Seepage Berm Width
RD 536	0+00 to 80+00	Levee Raise	NA
RD 536	80+00 to END	Levee Raise Seepage Berm	80 feet
Mellin / Mellin Extension	0+00 to 62+00	Levee Degrade and Reconstruction	NA
Solano County Levee 44	62+00 to END	Levee Raise Seepage Berm	80 feet

## 9.4 Levee Improvement Option 2B

### 9.4.1 Flood Control Features

Levee Improvement Option 2B includes the construction of seepage berms, similar to Option 2, with the primary difference being the alignment of the flood control levee. Levee Improvement Option 2B shifts flood control feature alignment waterward to avoid the need for ROW acquisition. This will significantly decrease land acquisition costs; however, it will result in an increase in earthwork costs.

**Table 9-3. Levee Improvement Option 2B Summary**

Levee	Station	Rehabilitation Methods	Seepage Berm Width
RD 536	0+00 to 80+00	Levee Raise	N/A
RD 536	73+00 to END	Levee Seepage Berm	80 feet
Mellin / Mellin Extension	0+00 to 62+00	Levee Degrade and Reconstruction	N/A
Solano County Levee 44	62+00 to END	Levee Raise Seepage Berm	80 feet

## 9.5 Project Plan Formulation Criteria

Levee improvement options were evaluated against the formulation criteria specified under Section 9.1; completeness, efficiency, effectiveness, and acceptability and ranked as Favorable (+1), Neutral (0), or Unfavorable (-1). A total score was then calculated for each levee improvement option. The intent of this evaluation and ranking is to determine if, and how well, each levee improvement option meets the USACE planning guidelines.

### 9.5.1 Completeness

Levee Improvement Options 2 and 2B have larger footprints and would therefore have more ROW acquisition requirements than Levee Improvement Option 1. Acquisition of ROW is beyond the control of the project team (i.e., property owners may not be willing to sell). As such, Levee Improvement Option one ranks as Favorable (+1). Levee Improvement Option 2 requires acquisition of ROW from adjacent landside property, which may be more difficult than acquiring the necessary ROW from the Little Egbert Tract. As such, Levee Improvement Option 2 is ranked as Poor (-1) and Levee Improvement Option is ranked as Neutral (0).

### 9.5.2 Efficiency

All three option meet project objectives however, Levee Improvement Option 2 is the most cost-effective and ranks Favorable (+1). Levee Improvement Option 1 is the most expensive and ranks as Poor (-1). Levee Improvement Option 2B ranks as Neutral (0).

### 9.5.3 Effectiveness

All three levee improvement options include proven seepage mitigation measures with long performance histories. As such, all three are ranked Favorable (+1).

### 9.5.4 Acceptability

All three levee improvement options are acceptable seepage mitigation measures. However, Option 1 has the smallest footprint and would, therefore, have less right-of-way and environmental impacts thereby being more acceptable. Options 2 and 2B have larger footprints and more impacts so may be viewed less favorably. As such, Option 1 is ranked Favorable (+1) and Options 2 and 2B are ranked Neutral (0).

### 9.5.5 Summary of Rankings

Table 9-4 below provides a summary of the ranking scores against USACE planning criteria. It should be noted that ranking is relative to each alternative.

**Table 9-4. Summary of Ranking Against Plan Formulation Criteria**

Levee Improvement Options		Plan Formation Criteria				
		Completeness	Efficiency	Effectiveness	Acceptability	Score
1	Option 1	Favorable (+1)	Unfavorable (-1)	Favorable (+1)	Favorable (+1)	2
2	Option 2	Unfavorable (-1)	Favorable (+1)	Favorable (+1)	Neutral (0)	1
2	Option 2B	Neutral (0)	Neutral (0)	Favorable (+1)	Neutral (0)	1

Considering USACE guidelines for plan formulation, Levee Improvement Option 1 is considered more favorable than Options 2 and 2B. However, all three levee improvement options meet plan formulation criteria and are considered viable.

## 10 COMPARISON OF LEVEE IMPROVEMENT OPTIONS AND RECOMMENDATIONS

Levee improvement options presented in Section 9 provide viable levee rehabilitation options that can all achieve the required level of flood protection. Individual levee rehabilitation measures used for all three options were previously evaluated and screened as discussed under Section 6 of this report.

The following sections provide additional qualitative assessments of the three levee improvement options relative to the screening criteria discussed in Section 6, specifically, environmental and ROW impacts, long term maintenance, maximizing flexibility, performance, regulatory agency acceptance, schedule, and community impacts.

### 10.1 Environmental Impacts

Levee Improvement Option 1 typically follows the alignment of the existing embankment minimizing environmental impacts, potential take of sensitive habitat, and limiting needs for vegetation management. Levee Improvement Option 2 also typically follows the alignment of the existing embankment; however, it includes the construction of an 80-foot-wide landside berm that will require vegetation management limiting potential habitat. The increased Project footprint will also increase the potential for take of sensitive species habitat. The overall construction footprint will be wider and will require additional fill and more truck trips than that for Levee Improvement Option 1.

Levee Improvement Option 2B follows a similar alignment to the existing embankment; however, in some cases, it is shifted waterward to avoid take of property. Levee Improvement Option 2B includes the construction of an 80-foot-wide landside berm that will require vegetation management limiting potential habitat. The increased Project footprint will also increase the potential for take of sensitive species habitat. The alignment shift waterward will further increase the potential for take of sensitive species habitat. The overall construction footprint will be wider than Levee Improvement Option 1 and will require additional fill and more truck trips.

For the reasons stated above, Levee Improvement Option 1 is considered more favorable than Levee Improvement Options 2 and 2B. Levee Improvement Option 2 is considered more favorable than Levee Improvement Option 2B.

Relative to Environmental impact, levee improvement options rank as follows:

- Levee Improvement Option 1 ranks as Good when compared against Levee Improvement Options 2 and 2B.
- Levee Improvement Option 2 ranks Moderate when compared against Levee Improvement Options 1 and 2B.
- Levee Improvement Option 2B ranks as Poor when compared against Levee Improvement Options 1 and 2.

## 10.2 Right-of-Way Impacts

Like Environmental Impacts, Levee Improvement Option 1 has the smallest footprint and would be constructed within existing levee ROW thereby reducing, or eliminating, ROW acquisition need and cost as compared to Levee Improvement Options 2 and 2B. Acquisition of new ROW also has the potential to delay project implementation making Levee Improvement Option 2 less favorable than Levee Improvement Option 1. For this same reason, Levee Improvement Option 2 is considered less favorable than Levee Improvement Option 2B.

Relative to ROW impacts, levee improvement options rank as follows:

- Levee Improvement Option 1 ranks as Good when compared against Levee Improvement Options 2 and 2B.
- Levee Improvement Option 2 ranks Poor when compared against Levee Improvement Options 1 and 2B.
- Levee Improvement Option 2B ranks as Moderate when compared against Levee Improvement Options 1 and 2.

See additional discussion on ROW acquisition costs under Section 10.2.2. Relative cost of ROW acquisition is factored into the ranking above.

## 10.3 Long Term Maintenance

Levee Improvement Option 1 requires little to no additional maintenance as compared to Options 2 and 2B. When constructed properly, cutoff walls generally do not require any maintenance to function as seepage barriers. Options 2 and 2B will require long term maintenance such as vegetation control and grading. For these reasons, Levee Improvement Option 1 is considered more favorable than Levee Improvement Options 2 and 2B.

Relative to long term maintenance, levee improvement options rank as follows:

- Levee Improvement Option 1 ranks as Good when compared against Levee Improvement Options 2 and 2B.
- Levee Improvement Option 2 ranks Moderate when compared against Levee Improvement Options 1 and 2B.
- Levee Improvement Option 2B ranks as Moderate when compared against Levee Improvement Options 1 and 2.

## 10.4 Maximizing Flexibility, Performance, and Regulatory Acceptance

Maximizing flexibility, performance, and regulatory agency acceptance are discussed in detail under Section 6 of this report. Cutoff walls were previously ranked as Moderate (+0) and seepage berms previously ranked as Good (+1) in relation to maximizing flexibility. Cutoff walls and Seepage berms were both ranked as Good (+1) in relation to Performance and Regulatory Acceptance. The selected levee improvement options are either all cutoff walls or all seepage so would rank the same as the individual measures. Refer to Section 6 for a more detailed discussion regarding maximizing flexibility.

## 10.5 Construction Schedule and Community Impacts

All three levee improvement options have similar construction schedules and similar construction related impacts to surrounding communities. Also, all three levee improvement options have also been widely used and are accepted by regulatory agencies.

Construction schedule and community impacts are not considered further.

## 10.6 Probable Costs

Construction cost is another factor relevant to selection of levee improvement measures. OPCCs were prepared for all three levee improvement options. The methods used for developing construction costs is discussed in Section 8 of this report. Detailed cost estimates are included in Appendix E.

### 10.6.1 Opinions of Probable Construction Costs

Table 10-1 provides a summary of construction costs for each levee improvement option and by reach. This includes levee improvements, seepage mitigation, rock slope protection, and other ancillary items. Rock slope protection quantities and unit costs were prepared by WES.

**Table 10-1. Levee Improvement Options OPCC Summary by Reach**

Reach	Sta	Option 1		Option 2		Option 2B	
		Measure	Cost	Measure	Cost	Measure	Cost
RD 536	0+00 to 80+00	Levee Raise	\$17.95M	Levee Raise	\$17.95M	Levee Raise	\$17.95M
RD 536	80+00 to END	Levee Raise Cutoff Wall	\$41.89	Levee Raise Seepage Berm	\$27.23M	Levee Raise Seepage Berm	\$41.36M
Mellin / Mellin Extension	0+00 to 62+00	Levee Reconstruction	\$12.37M	Levee Reconstruction	\$12.37M	Levee Reconstruction	\$12.37M
Solano County Levee 44	62+00 to END	Levee Raise Cutoff Wall	\$12.02M	Levee Raise Seepage Berm	\$8.45M	Levee Raise Seepage Berm	\$11.08M
<b>TOTALS:</b>			<b>\$84.23M</b>		<b>\$66.00M</b>		<b>\$82.76M</b>

### 10.6.2 Water Control Structure

Table 10-2 provides a summary of construction costs for each WCS option. Two OPCCs were developed for each levee improvement (one for box culverts and one for pipe culverts).

**Table 10-2. Water Control Structure OPCC**

Levee Improvement Option		Cost	
		Box Culverts	Pipe Culverts
1	Levee Improvement Option 1	\$4.45M	\$2.05M
2	Levee Improvement Option 2	\$6.07M	\$2.17M
3	Levee Improvement Option 2B	\$6.07M	\$2.17M



Costs for the box culvert option are significantly higher than the pipe culvert option. For this analysis, it has been assumed that the pipe culvert option will be implement as it would meet Project goals and is more cost effective.

### 10.6.3 Right-of Way Acquisition Cost

Exact ROW acquisition costs are not available. However, a comparative assessment can be performed comparing and ranking levee improvement options based on ROW acquisition needs.

Levee Improvement Option 1 includes placement of cutoff wall and reconstruction of levees. Some levee alignment smoothing has been incorporated (to reduce unnecessary angles and potential erosion points). Levee smoothing shifts alignments into the project footprint. It has been assumed, for the purpose of this analysis, that shifting flood control features into the project footprint would not incur ROW acquisition costs. Additionally, levee smoothing is required for all three levee rehabilitation options so ROW acquisition costs would be comparable (i.e., would not change the results of a comparative cost estimate).

Levee Improvement Option 2 includes construction of seepage berms and requires acquisition of approximately 44 acres of land, in fee, to accommodate permanent flood control features (seepage berms and access roads). This acreage is a preliminary comparison of required ROW vs existing ROW (from preliminary ALTA surveys). Based on this acreage and per acre ROW acquisition costs from Section 8, Levee Improvement Option 2 would have a comparative ROW acquisition cost of \$2.23 million (M).

Levee Improvement Option 2B shifts flood control features to fall entirely within the Project footprint. It has been assumed, for this analysis, that shifting flood control features into the project footprint would not incur ROW acquisition costs.

### 10.6.4 Total Levee Rehabilitation Option Costs

Total levee rehabilitation option costs include construction costs, ROW acquisition costs, and environmental related mitigation costs as discussed above. Costs are summarized in Table 10-3 below.

**Table 10-3. Total Levee Rehabilitation Cost**

Levee Improvement Option		Cost				
		OPCC	WCS	ROW	Total	Rating
1	Levee Improvement Option 1	\$84.23M	\$2.05M	\$0	\$86.28M	Poor
2	Levee Improvement Option 2	\$66.00M	\$2.17M	\$2.23M	\$70.40M	Good
3	Levee Improvement Option 2B	\$82.76M	\$2.17M	\$0	\$84.93M	Moderate

Relative to cost, levee improvement options rank as follows:

- Levee Improvement Option 1 ranks as Poor when compared against Levee Improvement Options 2 and 2B.
- Levee Improvement Option 2 ranks Good when compared against Levee Improvement Options 1 and 2B.

- Levee Improvement Option 2B ranks as Moderate when compared against Levee Improvement Options 1 and 2.

## 10.7 Levee Improvement Option Comparison

The same ranking criteria as discussed under Section 6 was used to evaluate and rank Levee Improvement Options against the factors discussed above: Good (+1), Moderate (0), and Poor (-1). The factor discussed above are listed in table 10-4 below along with summary of ranking scores.

**Table 10-4. Levee Improvement Option Ranking**

Comparison Factors		Levee Improvement Options		
		Option 1	Option 2	Option 2B
1	Environmental Impacts	+1	0	-1
2	Right-of-Way Impacts	+1	-1	0
3	Long Term Maintenance	+1	0	0
4	Maximizing Flexibility	0	+1	+1
5	Performance	+1	+1	+1
6	Regulator Acceptance	+1	+1	+1
7	Cost	-1	+1	0
<b>Total Rank (score)</b>		<b>4</b>	<b>3</b>	<b>2</b>

## 10.8 Recommendations

Based on the initial screening, and comparison of levee improvement options, it is recommended that Levee Improvement Option 1 be evaluated further.

Despite its higher cost, Levee Improvement Option 1 is recommended over Levee Improvement Option 2 as it minimizes the need for, and the potential delays associated with, ROW acquisition. Additionally, Levee Improvement Option 1 is recommended over Levee Improvement Option 2 and 2B as it has a smaller overall footprint, would have less environmental impacts, requires less fill and import, would have a lower overall air quality impact, and requires less maintenance.

# 11 SUMMARY OF EARTHWORK QUANTITIES

Earthwork quantities were calculated for levee improvement options 1, 2, and 2B. Quantities were calculated using AutoDesk Civil 3D software, spreadsheets, and hand calculations. The following assumptions were made for calculating quantities and levee borrow requirements:

- The top six inches of the levee crown contains aggregate base material and would be stripped and spoiled on-site.
- The top six inches of levee slopes contain organic material and would be stripped and spoiled on-site.
- Material excavated from the RD-536 levee is 100 percent reusable as levee embankment fill. Material excavated from Mellin, Mellin Levee Extension, and Solano County 44 levees is 0% reusable as levee embankment fill and would be hauled on-site (material may be reused for other site fills not related to levee embankments).
- Levee embankment fill would be obtained from on-site (near Little Egbert Tract) excavation.
- Material not meeting requirements for levee embankments would be spoiled on-site.
- The geotechnical recommendations assume a 15 percent shrink factor between bank and compacted volumes. An additional five percent is included for other potential losses and for conservatism.
- Earthwork import from off-site sources is not needed.

A detailed breakdown of quantities is included in Appendix E. The following table provides a summary of anticipated earthwork quantities for each levee improvement option.

**Table 11-1. Summary of Earthwork Quantities**

Type	Levee Improvement Options		
	Option 1 (CY)	Option 2 (CY)	Option 2B (CY)
Stripping (A)	86,000	101,000	59,000
Excavation (B)	347,800 <sup>1</sup>	190,800 <sup>2</sup>	844,500 <sup>1,2</sup>
Export <sup>3</sup> (C)	206,000	164,000	279,000
Levee Embankment Fill (Type 1) – From Borrow <sup>4</sup> (D)	77,000	NA	NA
Levee Embankment Fill (Type 2) – Total Required <sup>5</sup> (E)	1,053,000	933,000	1,631,600
Levee Embankment Fill (Type 2) – From Excavation (F)	141,800	26,800	565,300
Levee Embankment Fill (Type 2) – From Borrow (G)	913,000	908,000	1,068,000
Seepage Berm Fill – Total Required (H)	NA	325,000	211,000
Seepage Berm Fill – From Borrow (I)	NA	325,000	211,000
<b>Total Borrow Export from Little Egbert Tract (G+D)</b>	<b>990,000</b>	<b>1,233,000</b>	<b>1,279,000</b>
<b>Total Import to Little Egbert Tract (A+C)</b>	<b>292,000</b>	<b>265,000</b>	<b>338,200</b>

1. Include levee degrade, cutoff trench, keyway, and benching after stripping.
2. Includes keyway and benching after stripping.
3. Project excavations that do not meet requirements for levee fill.
4. For levee embankment clay core. Assumes 8-foot-wide core.
5. Includes stripping, excavation, levee raise, berm material (for Options 2 and 2B), and shrink.

## 12 NEXT STEPS

The purpose of this document is to develop and evaluate levee improvement options and provide a recommendation for flood control improvements to the Mellin Levee, the Mellin Extension Levee, the Solano County 44 Levee, and the RD 536 Levee. Levee improvement options would be incorporated into the overall Little Egbert Feasibility Study to develop overall Project Alternatives.

Development of designs for flood control projects is a multi-phased process requiring additional steps and coordination with various agencies prior to issuing design packages for construction. The next steps for this Project would include items such as:

- Selection of a levee improvement option for further design development.
- Development of final geotechnical recommendations.
- Coordination with agencies, property owners, utility owners, and interested parties.
- Development of detailed borrow assessments.
- Development of plans, specifications, and cost estimates.
- Development of environmental documentation.
- Obtaining the applicable Federal and State permits required for construction of levee rehabilitation measures.
- Further development of ROW related information such as boundary and parcel surveys.
- Development of ROW acquisition strategies and costs.

## 13 REFERENCES

### 13.1 U.S. Army Corps of Engineers

#### Engineer Technical Letters

USACE, Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures, ETL 1110-2-571, April 10, 2009.

USACE, Design Guidance for Levee Under-seepage, ETL 1110-2-569, May 1, 2005.

#### Engineer Regulations

USACE, Quality Management, ER 1110-1-12, September 30, 2006.

USACE, Planning Guidance Notebook, ER 1105-2-100, June 30, 2004.

USACE, Engineering and Design for Civil Works Projects, ER 1110-2-1150, August 31, 1999.

USACE, Flood Control Operations & Maintenance Policies, ER 1130-2-530, October 30, 1996.

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USACE, Geotechnical Investigations, EM 1110-1-1804, January 1, 2001.

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#### Other

USACE, Sacramento District, Geotechnical Levee Practice, April 11, 2008.

USACE, Sacramento and San Joaquin River Basins, California, Comprehensive Study Interim Report. December 20, 2002.

USACE, Sacramento and San Joaquin River Basins, California, Comprehensive Study Technical Studies Documentation. December 2002.

USACE, Economic Guidance Memorandum, Federal Interest Rates for Corps of Engineers Projects for Fiscal Year 2010. October 26, 2009.

### 13.2 Other Federal Agencies

FEMA. Requirements of 44 CFR Section 65.10: Mapping of Areas Protected by Levee Systems, March 2007.

FEMA. Title 44 Emergency Management and Assistance. Chapter 1, Federal Emergency Management Agency Part 65 – Identification and Mapping of Special Hazard Areas, October 1, 2002.

FEMA. Guidance on Levee Certification for the National Flood Insurance Program, March 25, 1997.

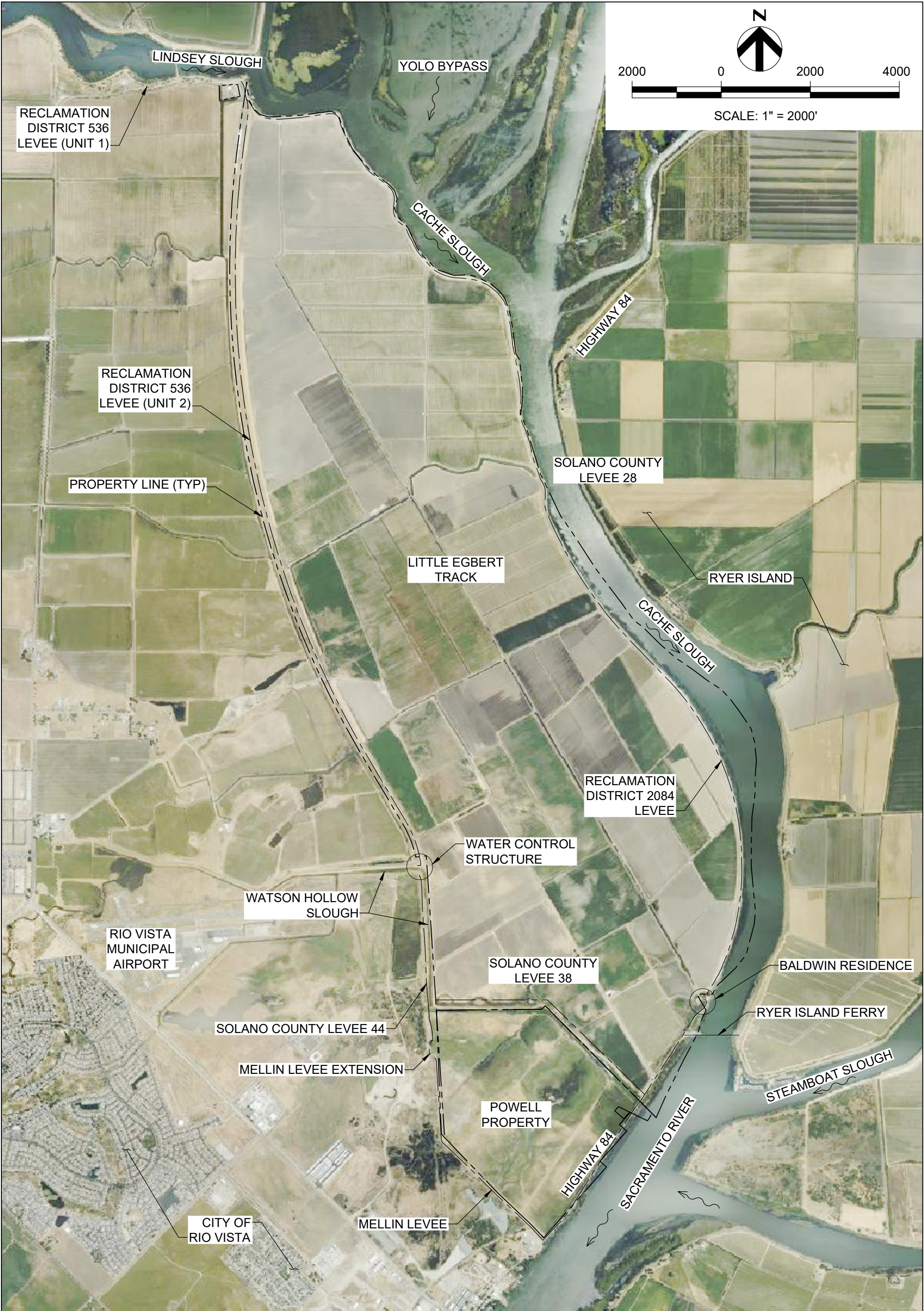
## 13.3 State/County Agencies

California Code of Regulations, Title 23.

DWR, Proposed Interim Levee Design Criteria for Urban and Urbanizing Area State-Federal Project Levees, December 10, 2010, Fourth Draft.

## Figures



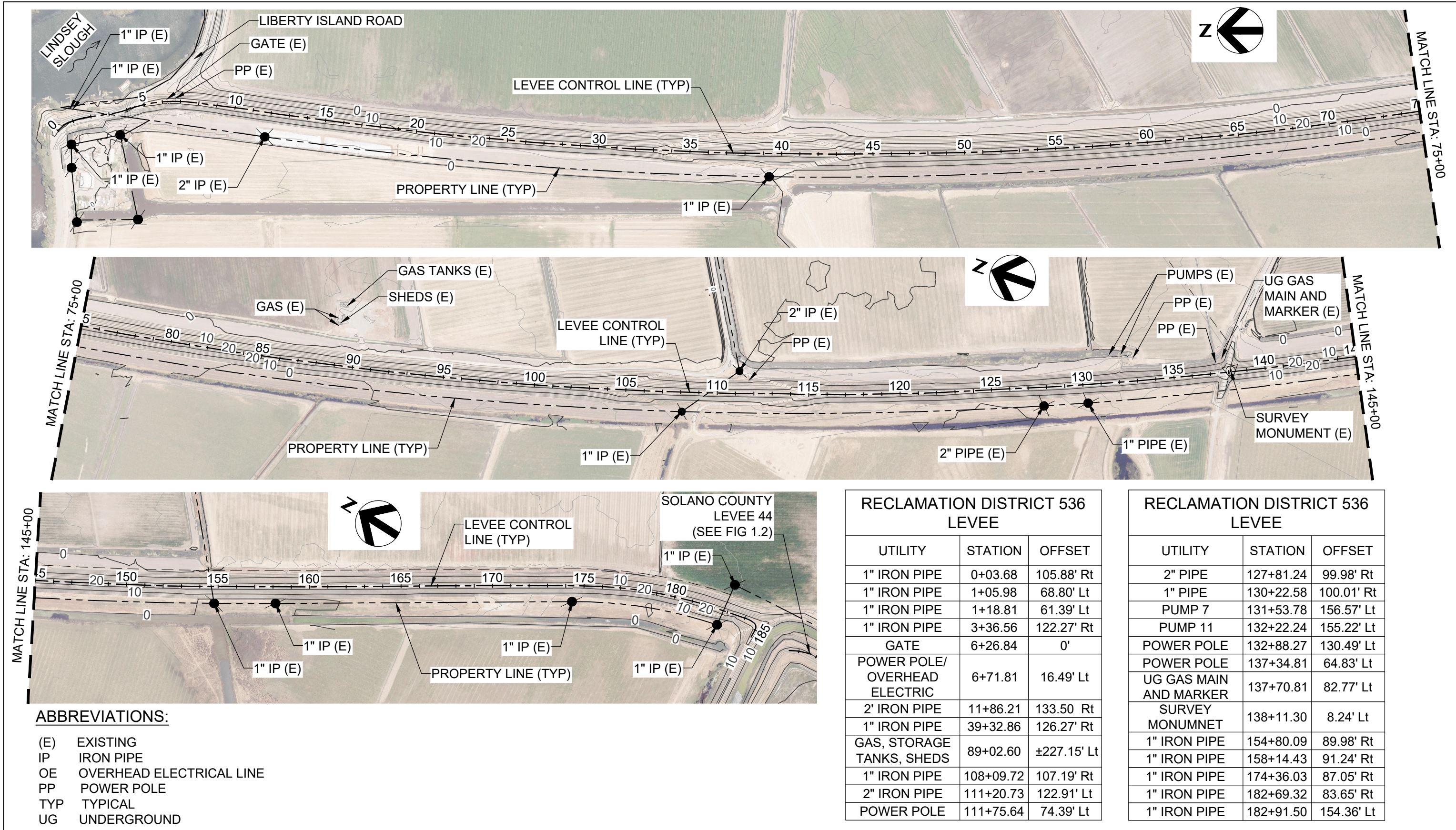


OVERALL SITE PLAN

DATE  
JUN 2023

FIGURE  
1



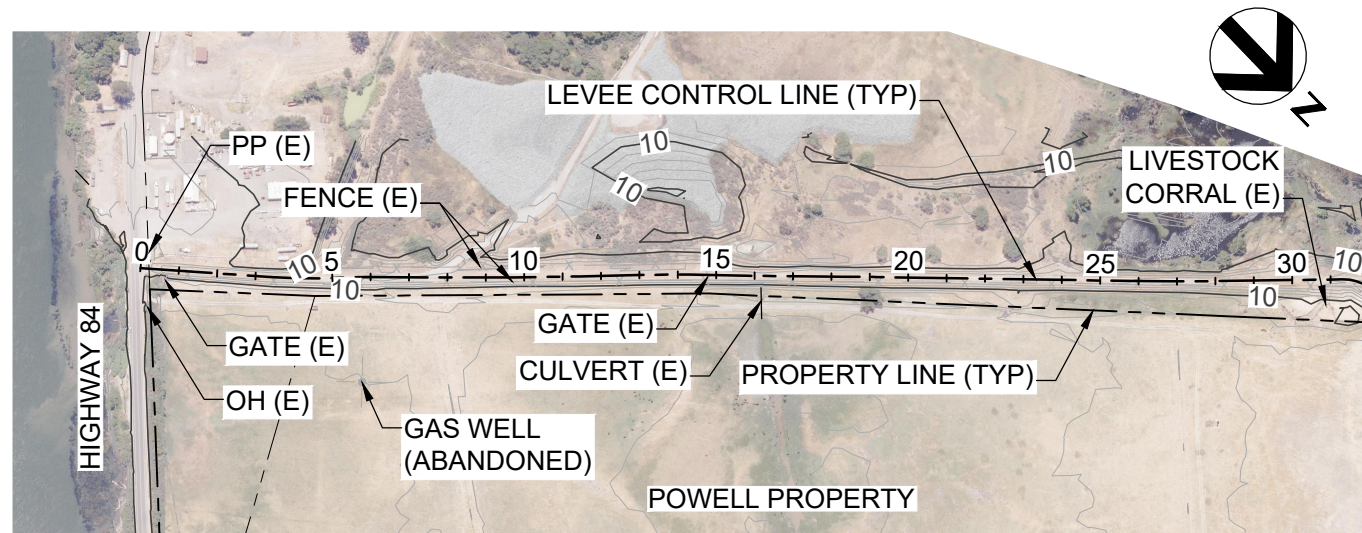


RECLAMATION DISTRICT 536 LEVEE  
SITE PLAN

DATE  
JUN 2023

FIGURE  
1.1



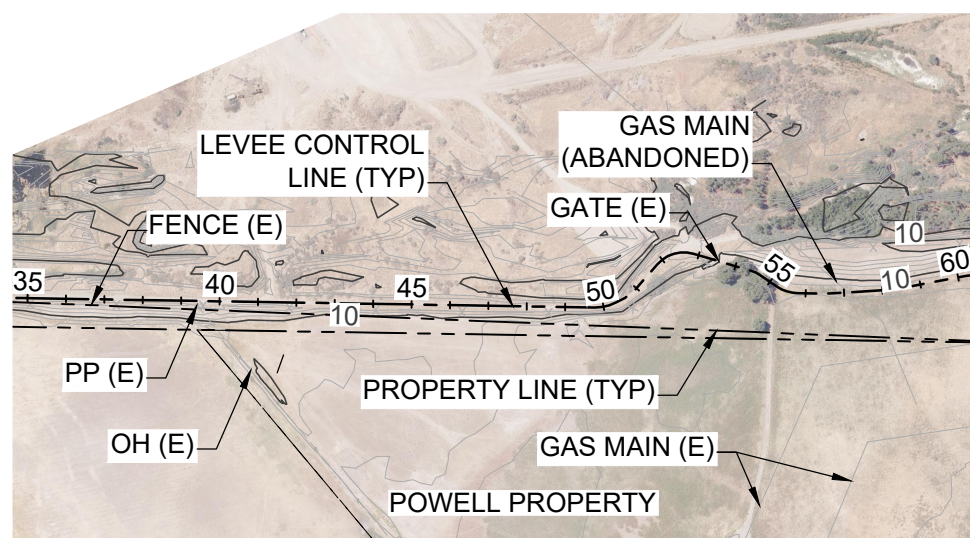


MELLIN LEVEE

MELLIN LEVEE		
UTILITY	STATION	OFFSET
POWER POLE/ OVERHEAD ELECTRIC	0+13.02	41.08' Lt
GATE	0+66.89	27.31' Rt
GAS WELL (ABANDONED)	5+73.22	273.11 Rt
GATE	14+76.81	0'
CULVERT	16+17.51	±31.01' Rt

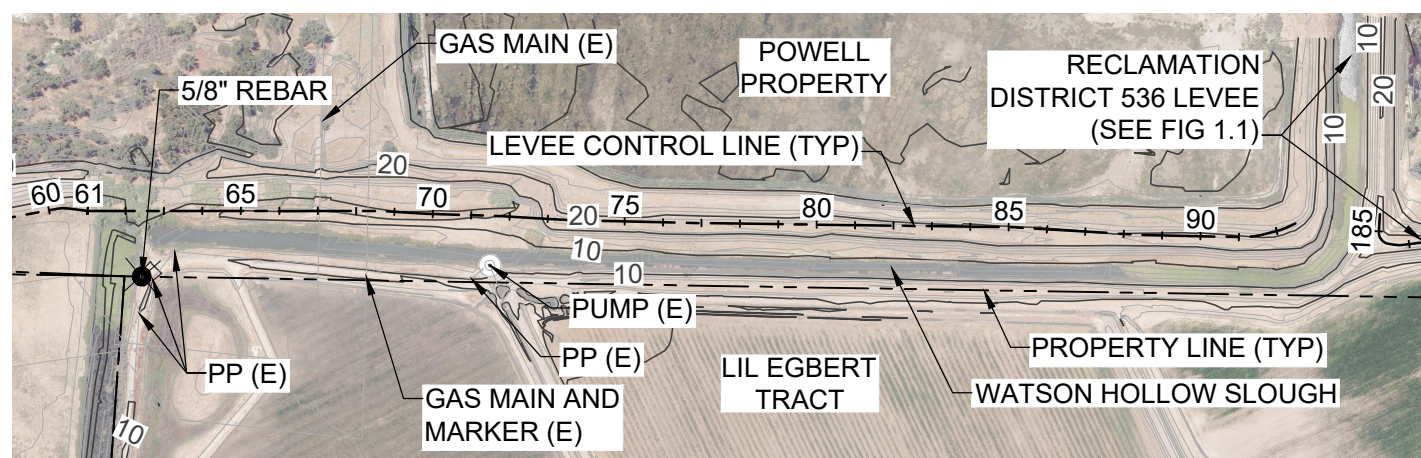
**ABBREVIATIONS:**

(E) EXISTING  
 IP IRON PIPE  
 OE OVERHEAD ELECTRICAL LINE  
 PP POWER POLE  
 TYP TYPICAL  
 UG UNDERGROUND



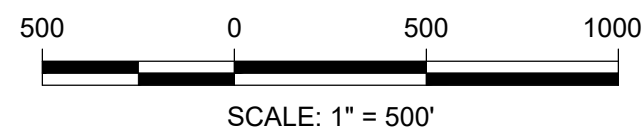
MELLIN LEVEE EXTENSION

MELLIN LEVEE EXTENSION		
UTILITY	STATION	OFFSET
TEST	39+41.40	11.57' Rt
GATE	53+40.40	0'
GAS MAIN	56+44.31	189.50' Rt & VARIES
GAS MAIN (ABANDONED)	57+12.48	0'
GAS MAIN	57+36.97	391.59' Rt & VARIES



SOLANO COUNTY LEVEE 44

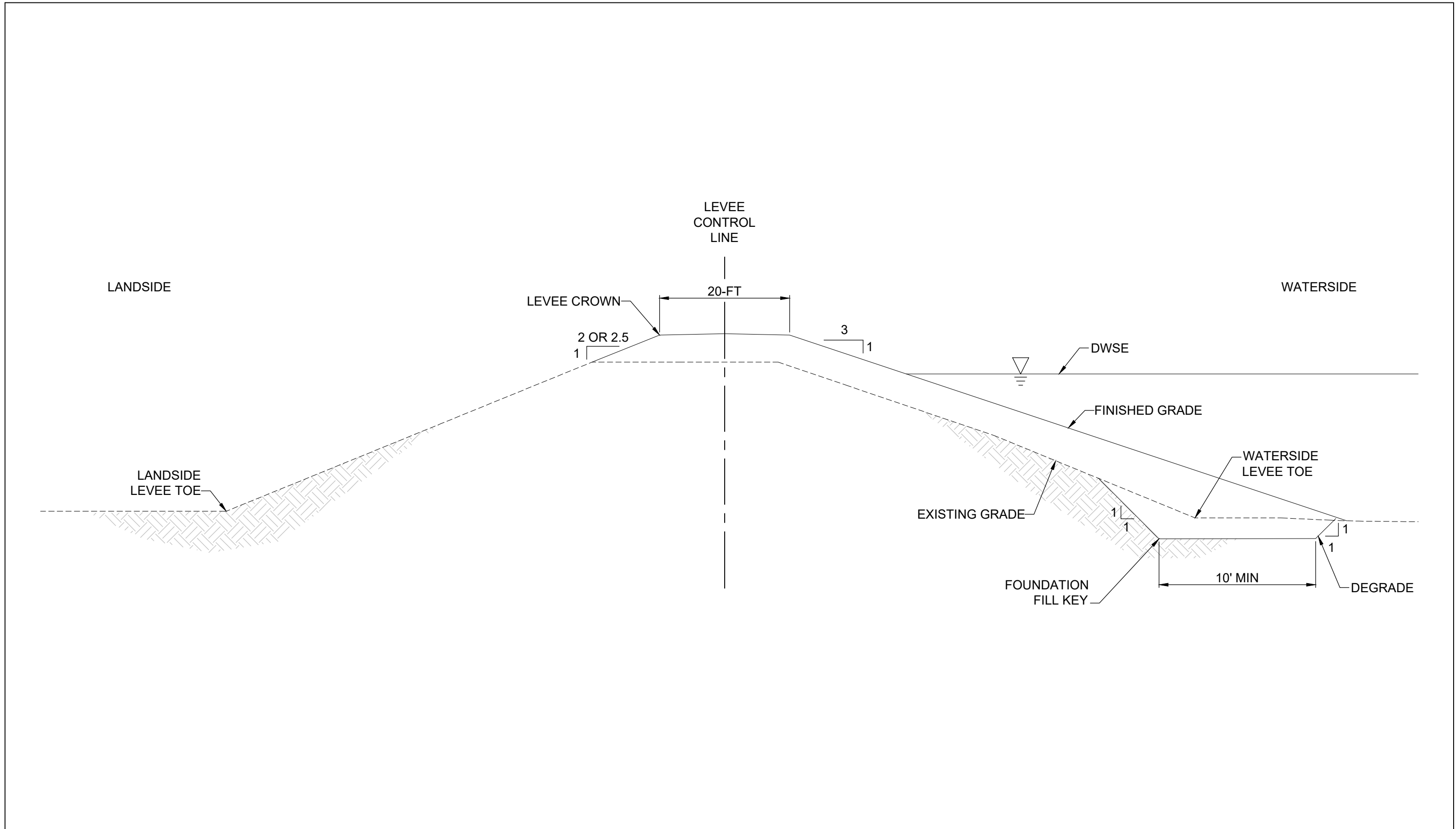
SOLANO COUNTY LEVEE 44		
UTILITY	STATION	OFFSET
5/8" REBAR	62+41.97	170.91' Rt
POWER POLE/ OVERHEAD ELECTRIC	63+27.60	105.91' Rt
GAS MAIN	67+04.92	0'
GAS MAIN	68+30.60	0'
POWER POLE/ OVERHEAD ELECTRIC	71+05.16	164.63' Rt & VARIES
PUMP 14	71+53.06	129.48' Rt



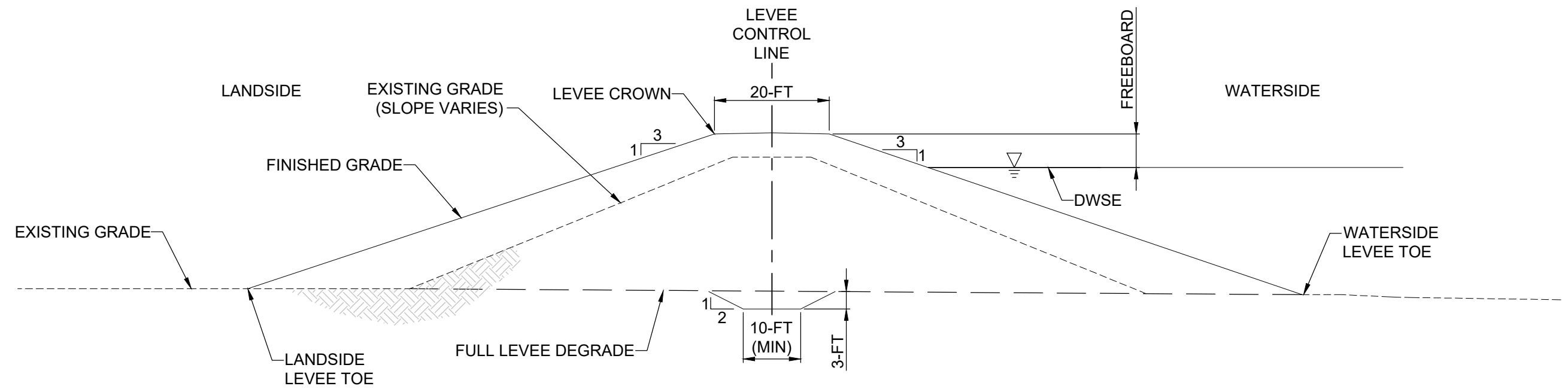
MELLIN LEVEE, MELLIN LEVEE EXTENSION,  
 SOLANO COUNTY LEVEE 44  
 SITE PLAN

DATE  
 JUN 2023

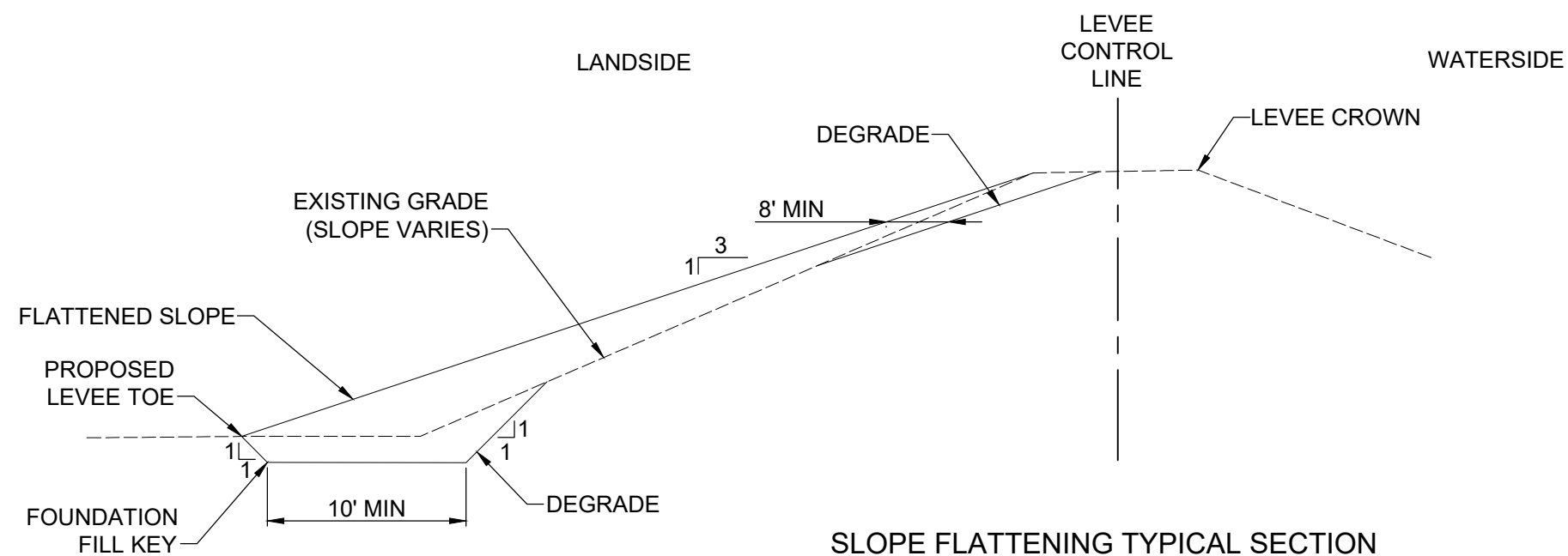
FIGURE  
 1.2



RAISE-IN-PLACE TYPICAL LEVEE SECTION

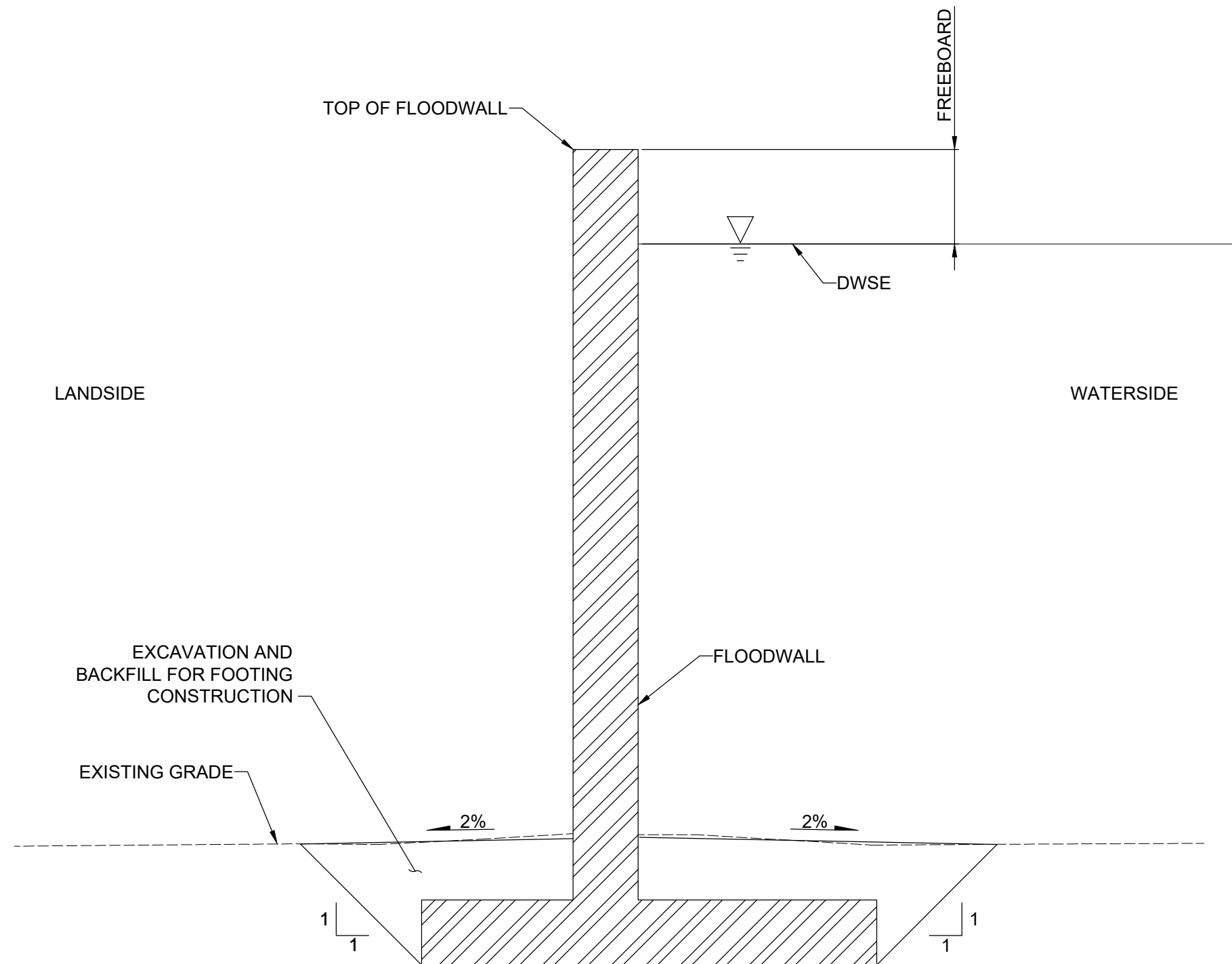


LEVEE DEGRADE AND RECONSTRUCTION TYPICAL SECTION  
NTS

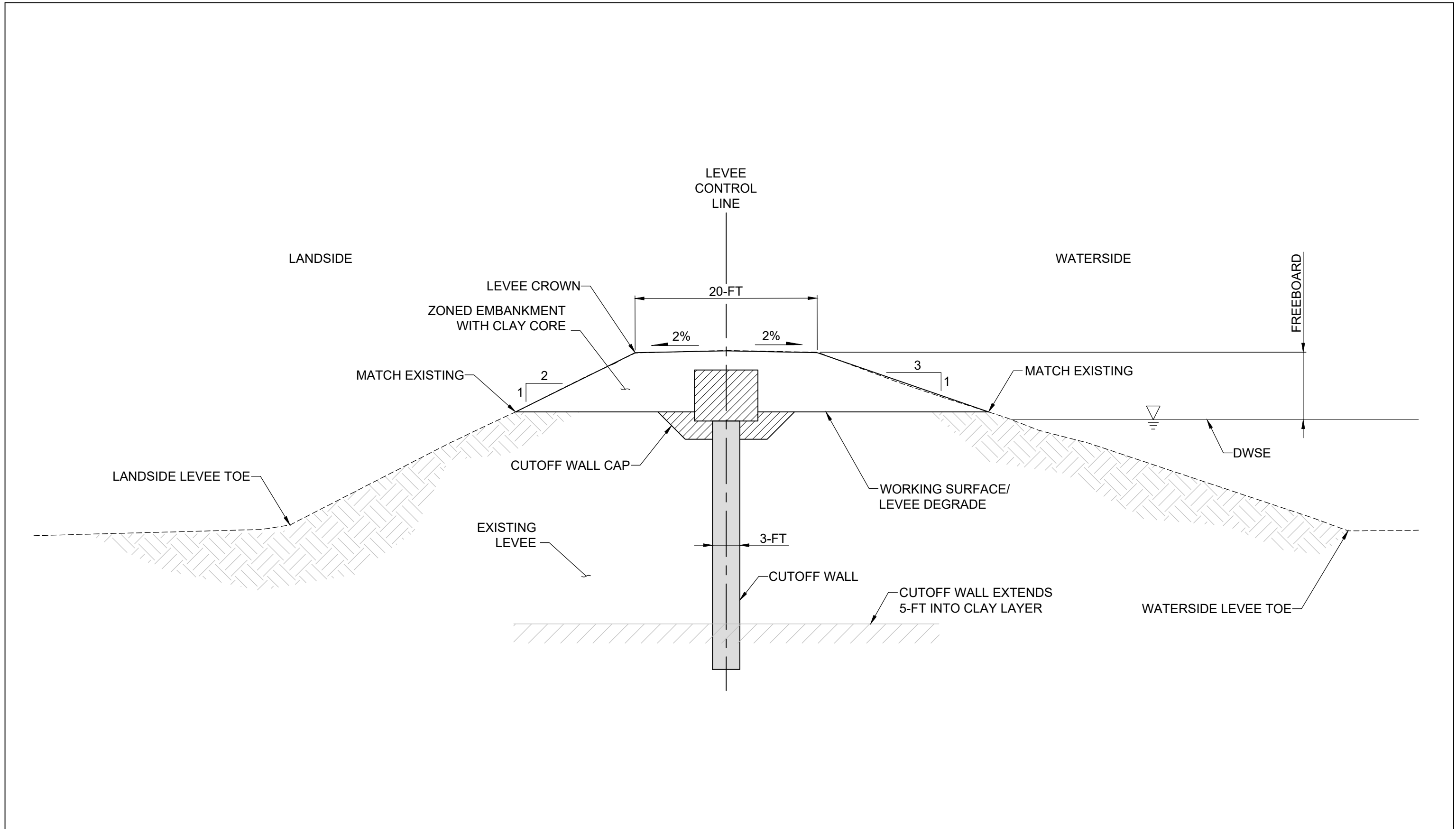


SLOPE FLATTENING TYPICAL SECTION  
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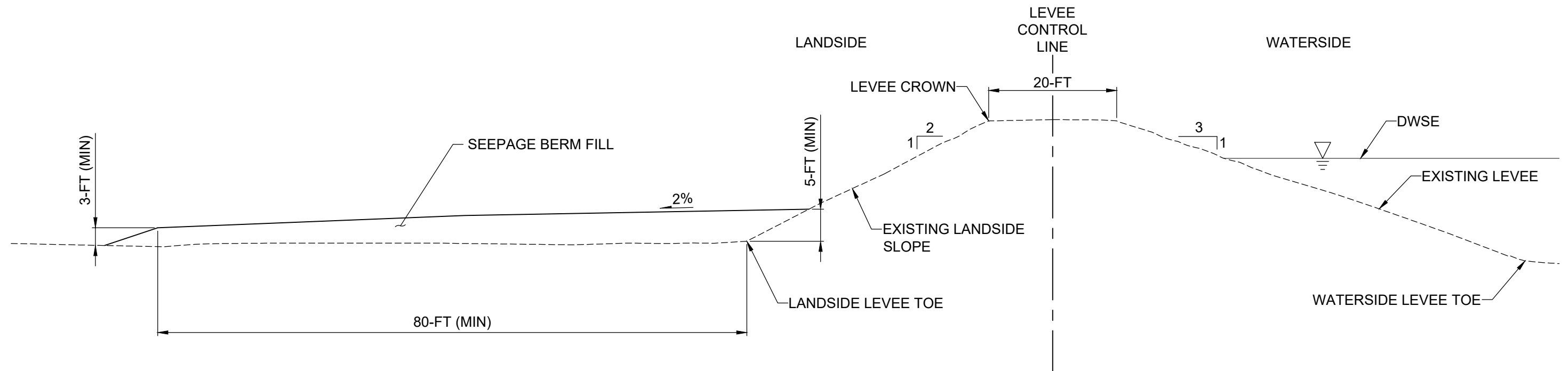




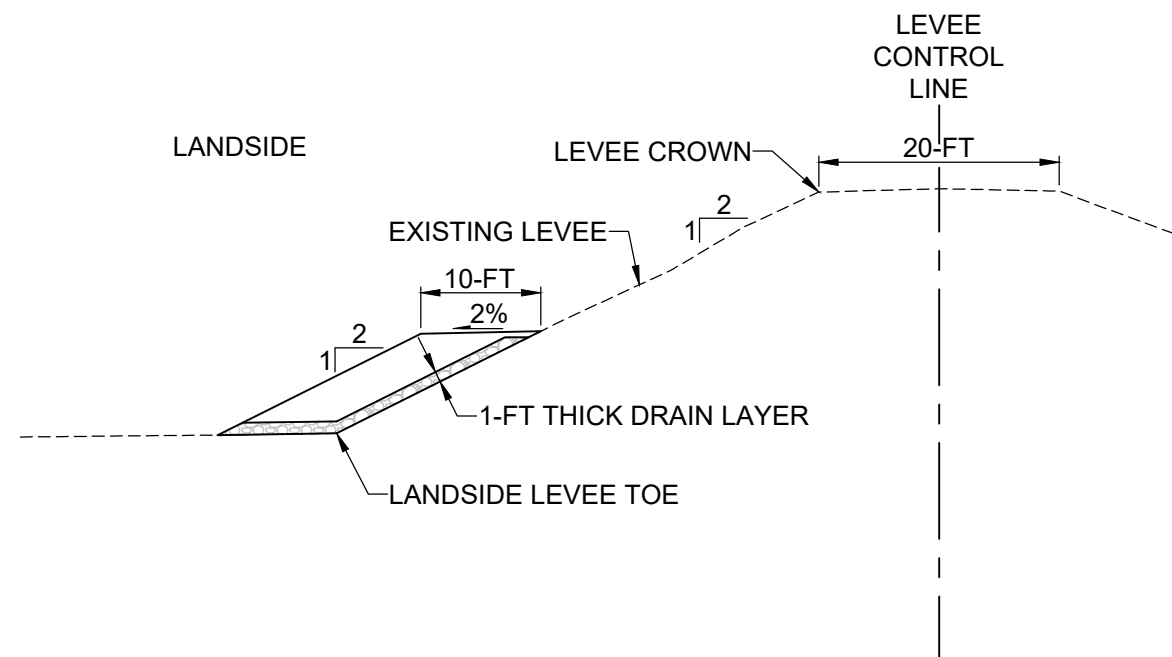
FLOODWALL TYPICAL SECTION



CUTOFF WALL TYPICAL SECTION



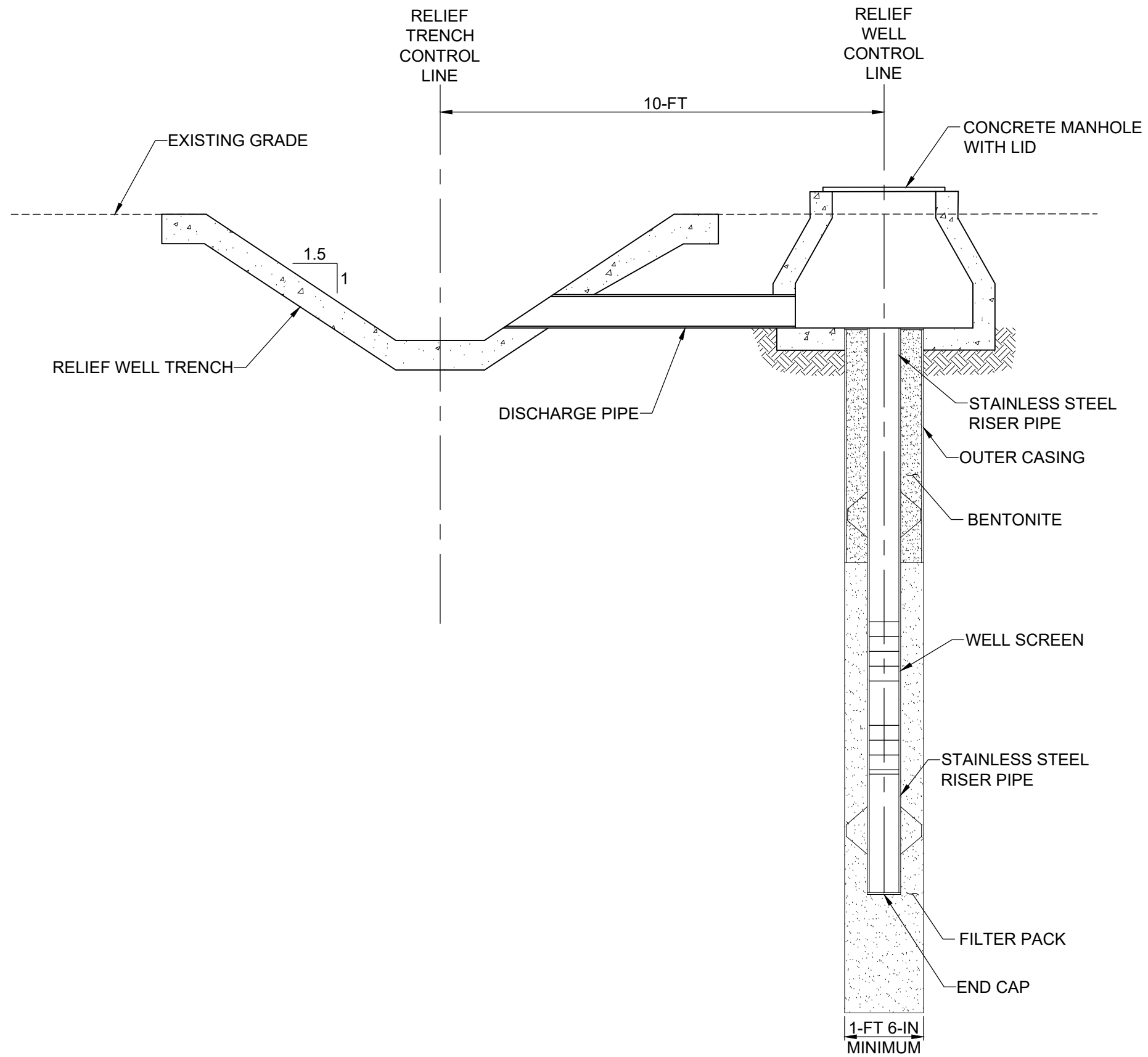
**SEEPAGE BERM TYPICAL SECTION**  
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**STABILITY BERM TYPICAL SECTION**  
NTS



**SEEPAGE BERM AND STABILITY BERM  
TYPICAL DETAIL**



RELIEF WELL DETAIL



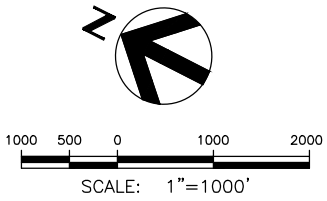
## Appendix A. Geotechnical

## Appendix B. H&H Analysis

## Appendix C. Plan and Profiles

# Option 1

## Plans and Profiles



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CHECKED BY	M. SALMON
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PROJECT NUMBER	10314280

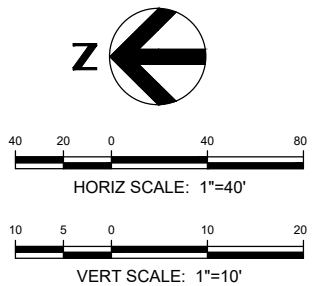
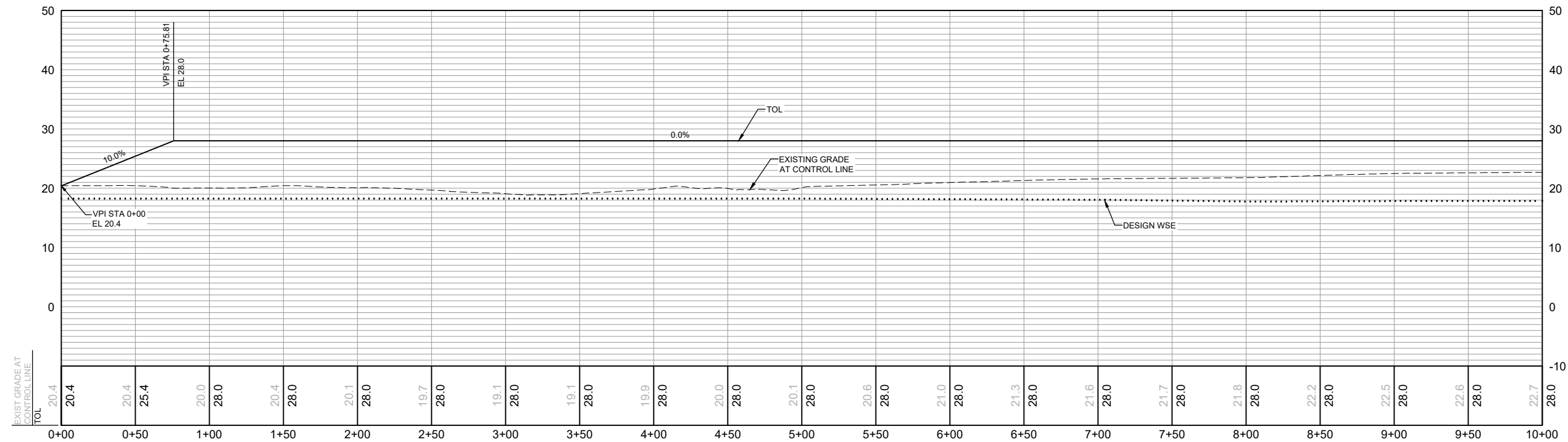
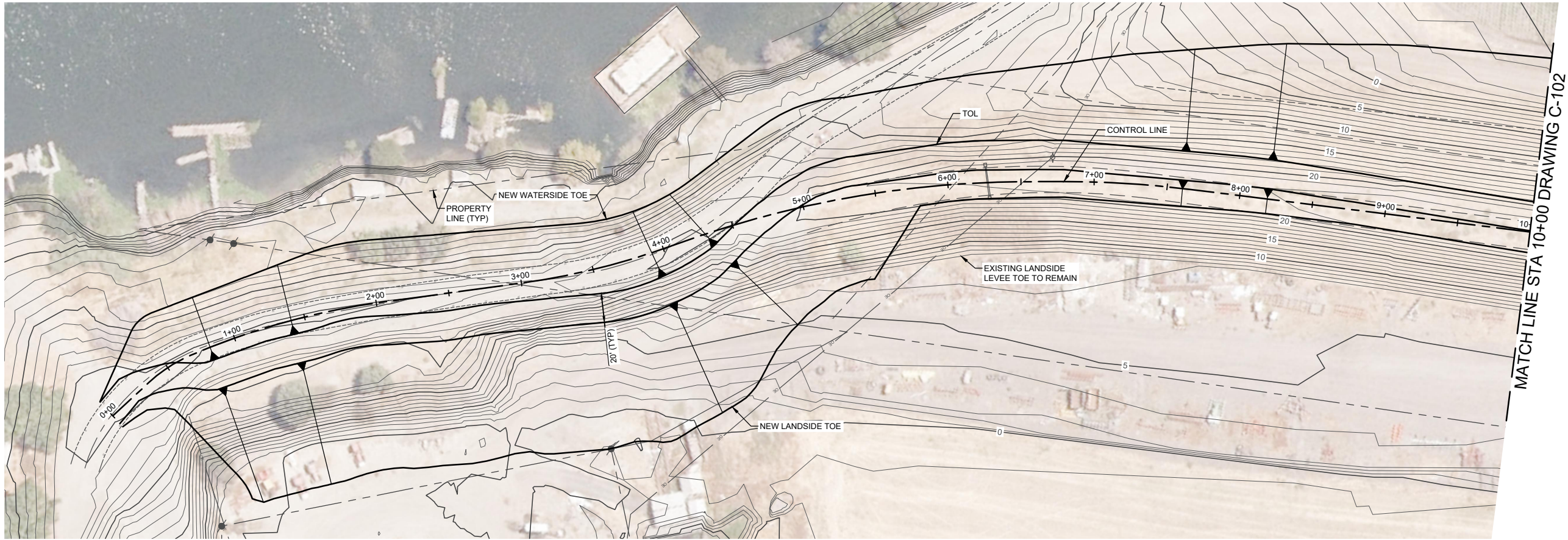
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FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 LEVEE  
OVERALL PLAN AND KEYMAP  
OPTION 1

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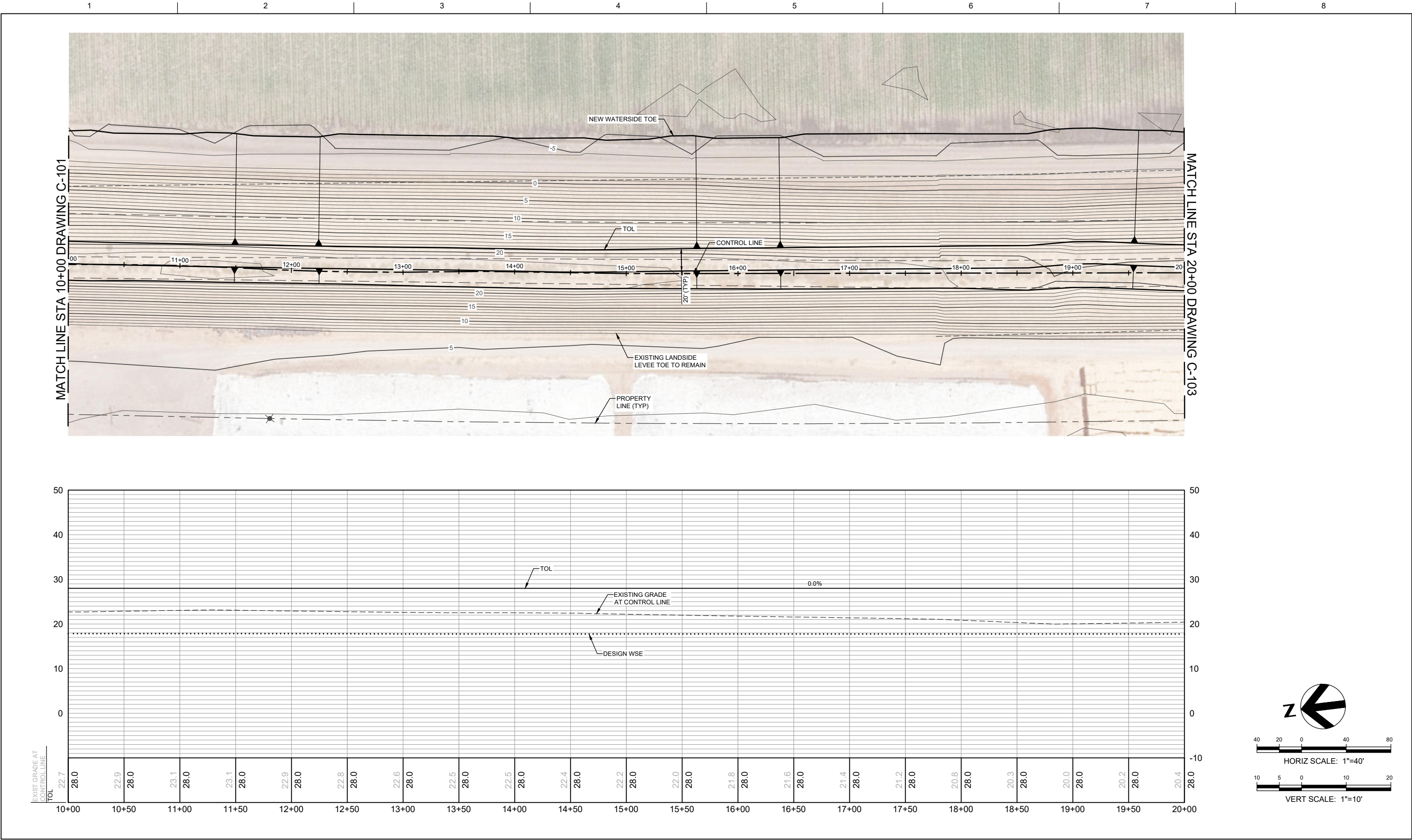
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PLAN AND PROFILE  
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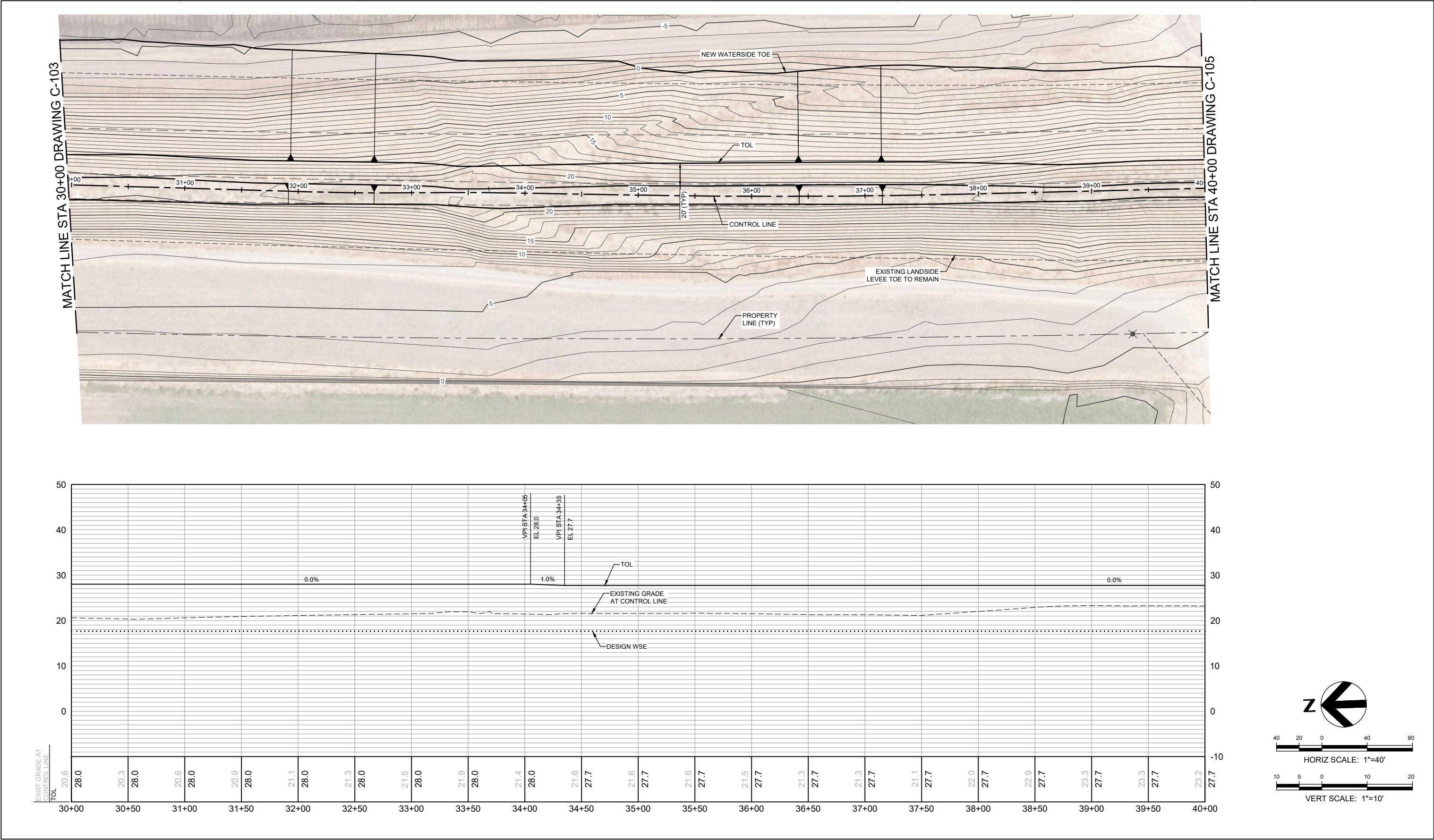
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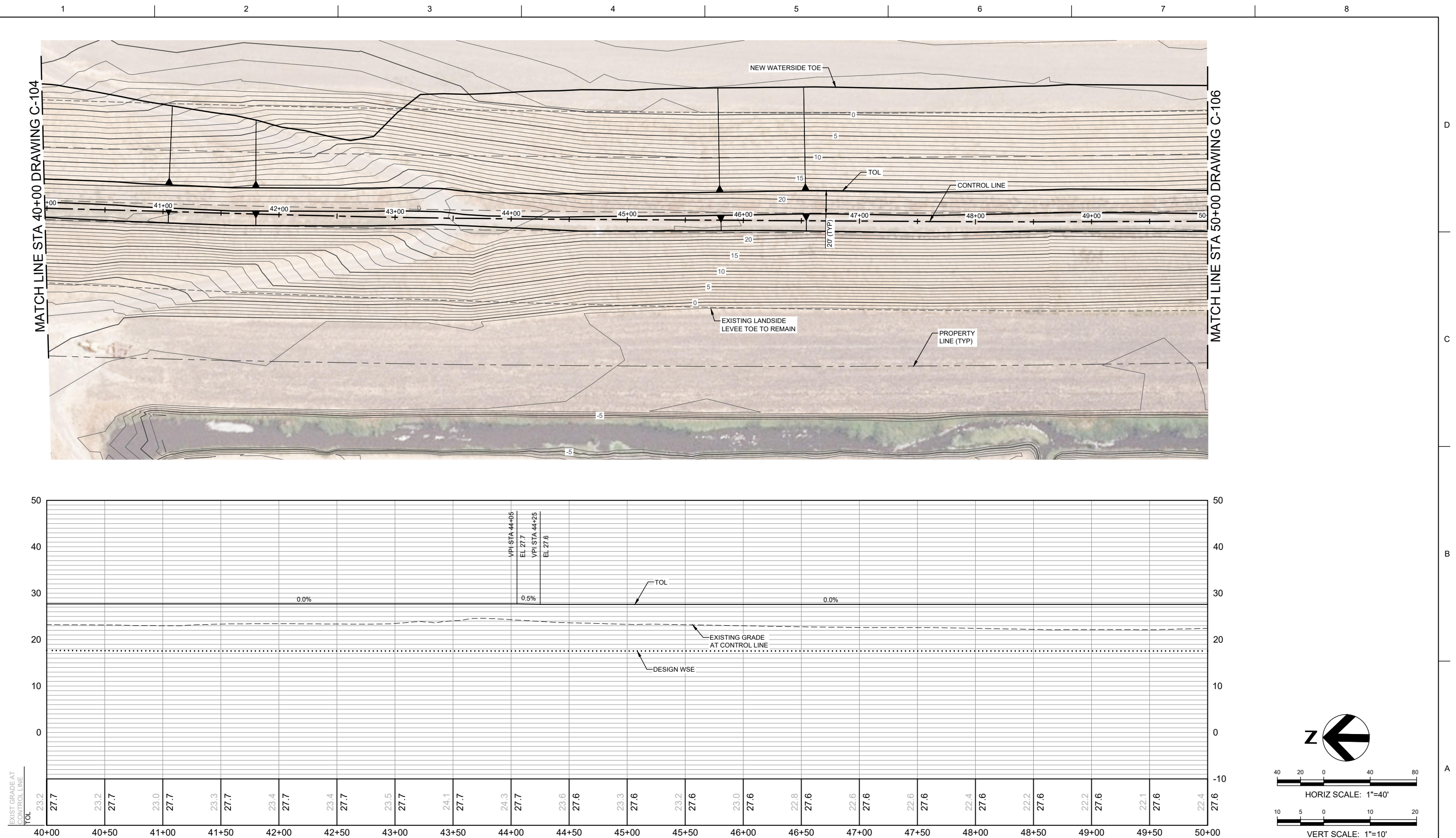
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PLAN AND PROFILE  
STA 30+00 TO 40+00  
OPTION 1

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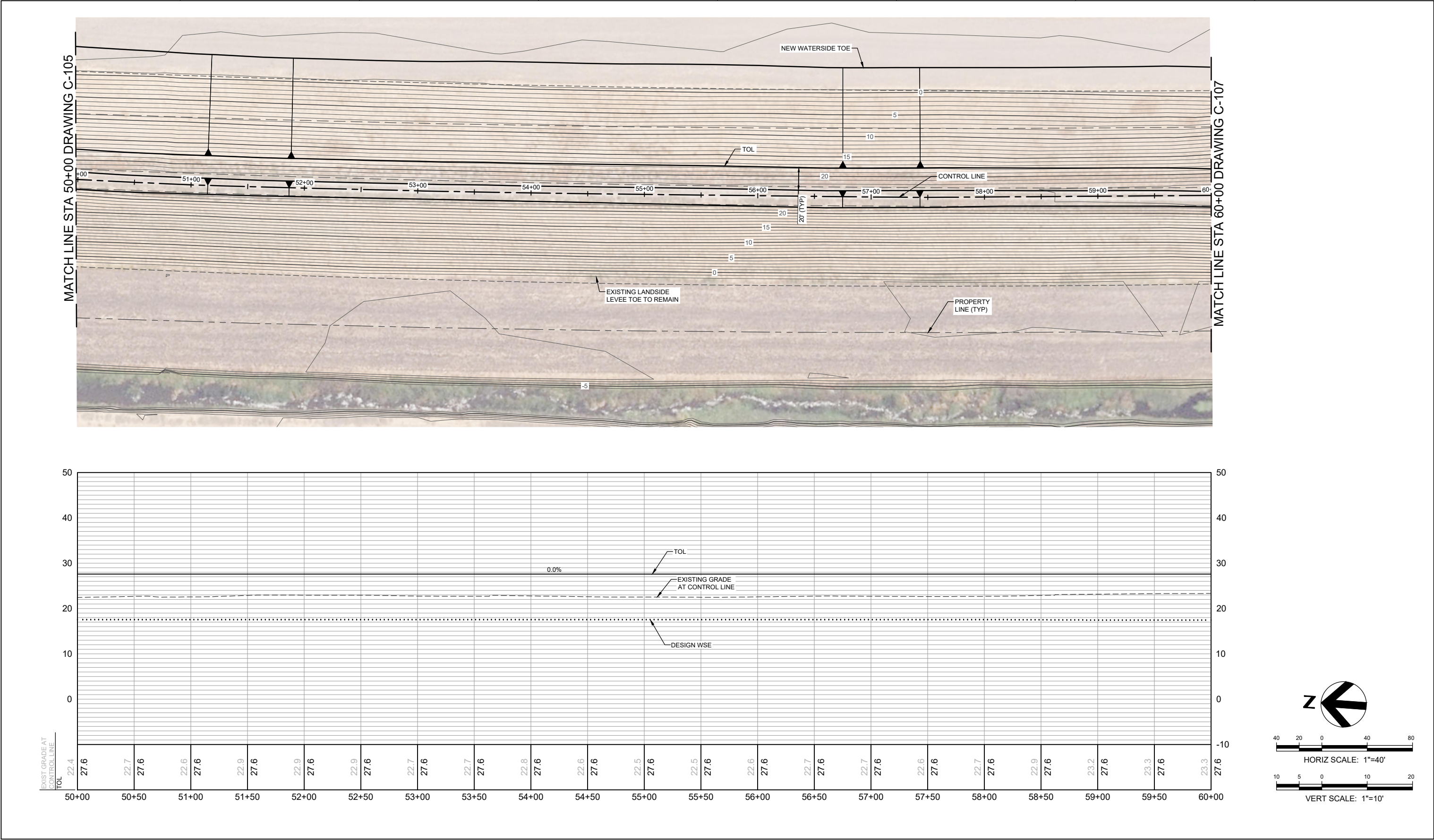
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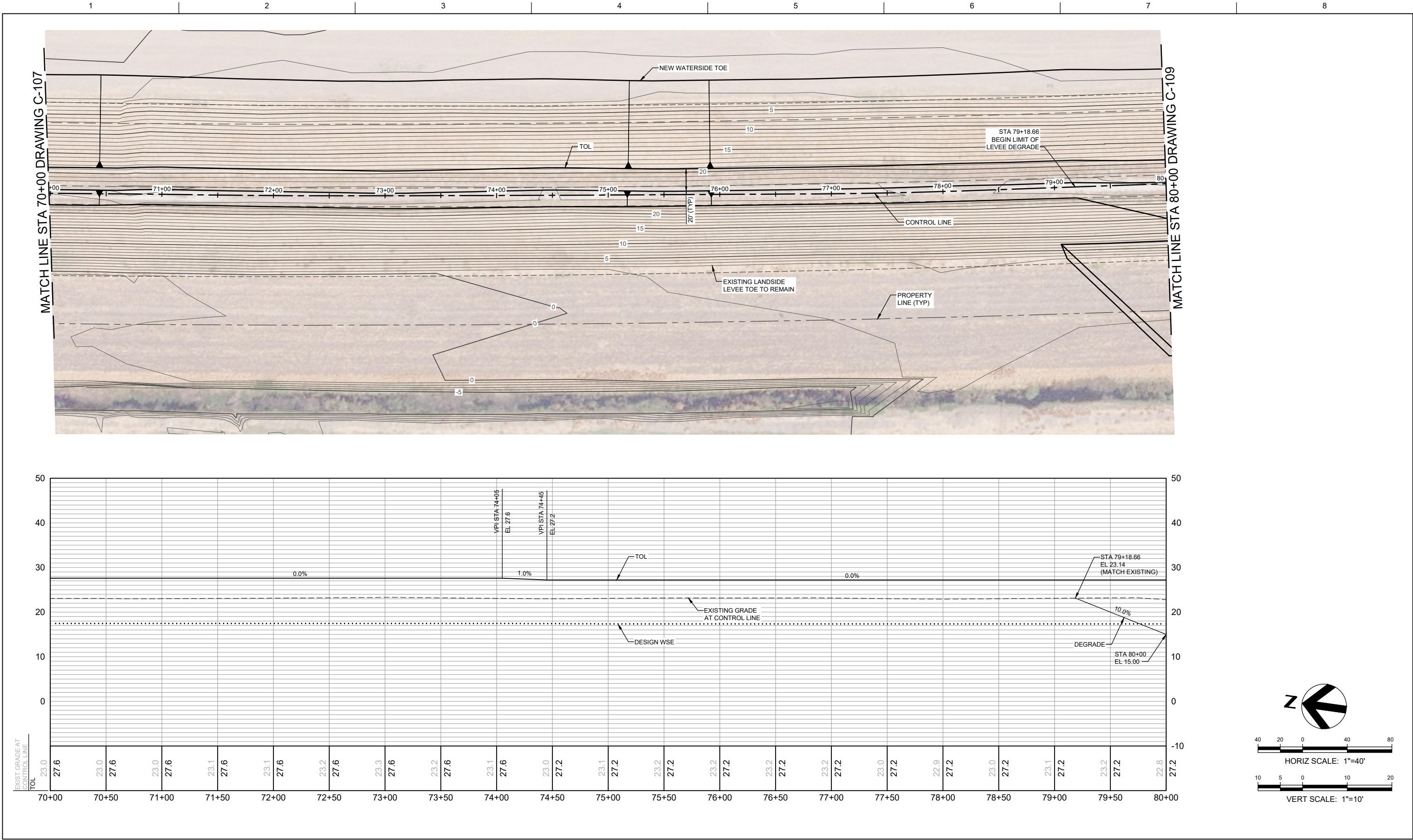
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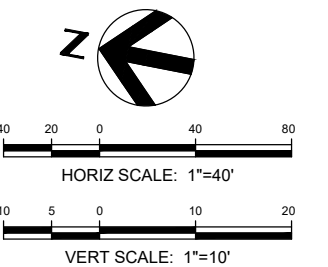
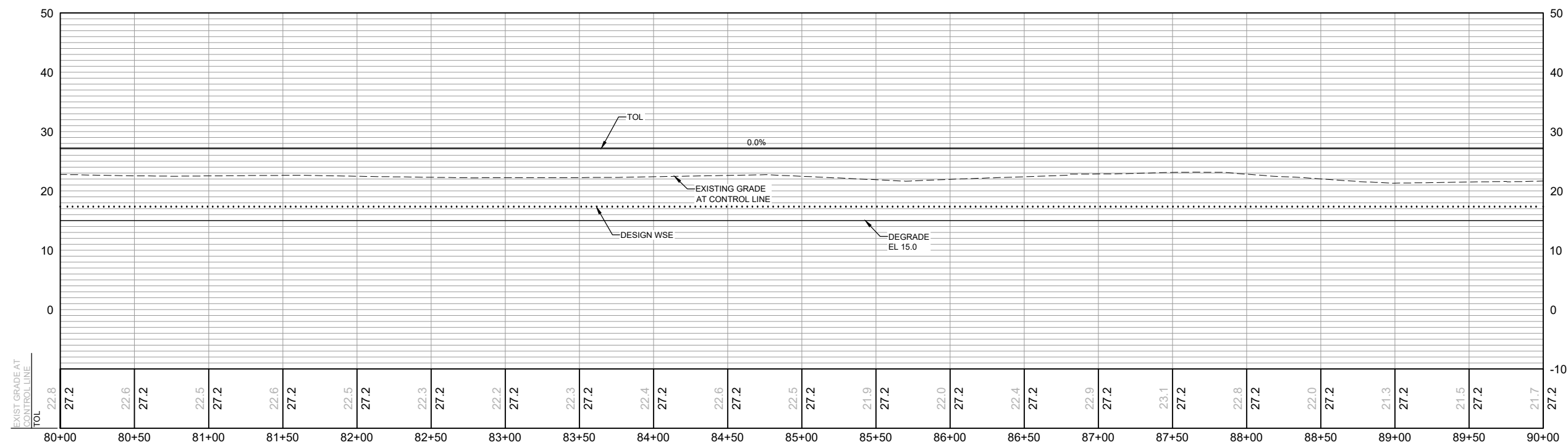
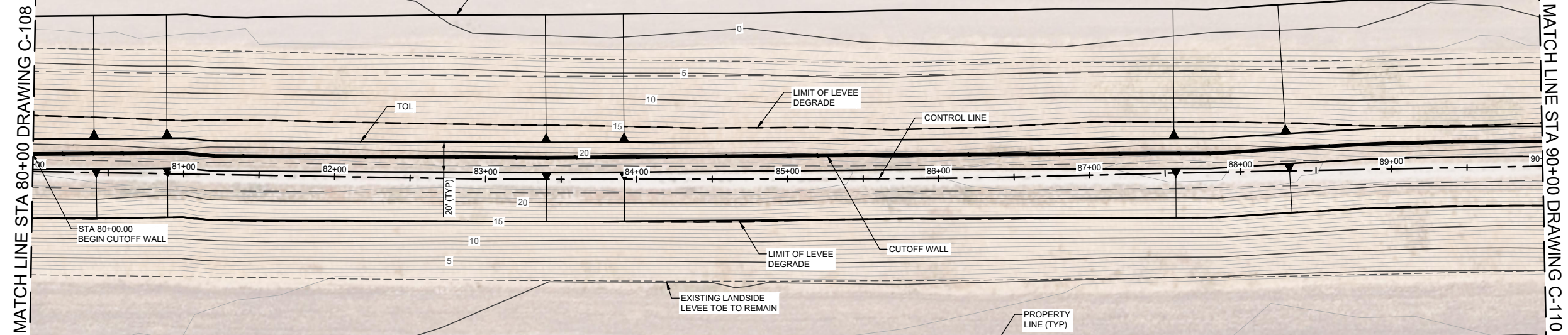
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PROJECT NUMBER	10314280

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FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 LEVEE  
PLAN AND PROFILE  
STA 70+00 TO 80+00  
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			DATE	JUN 2023
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	10314280

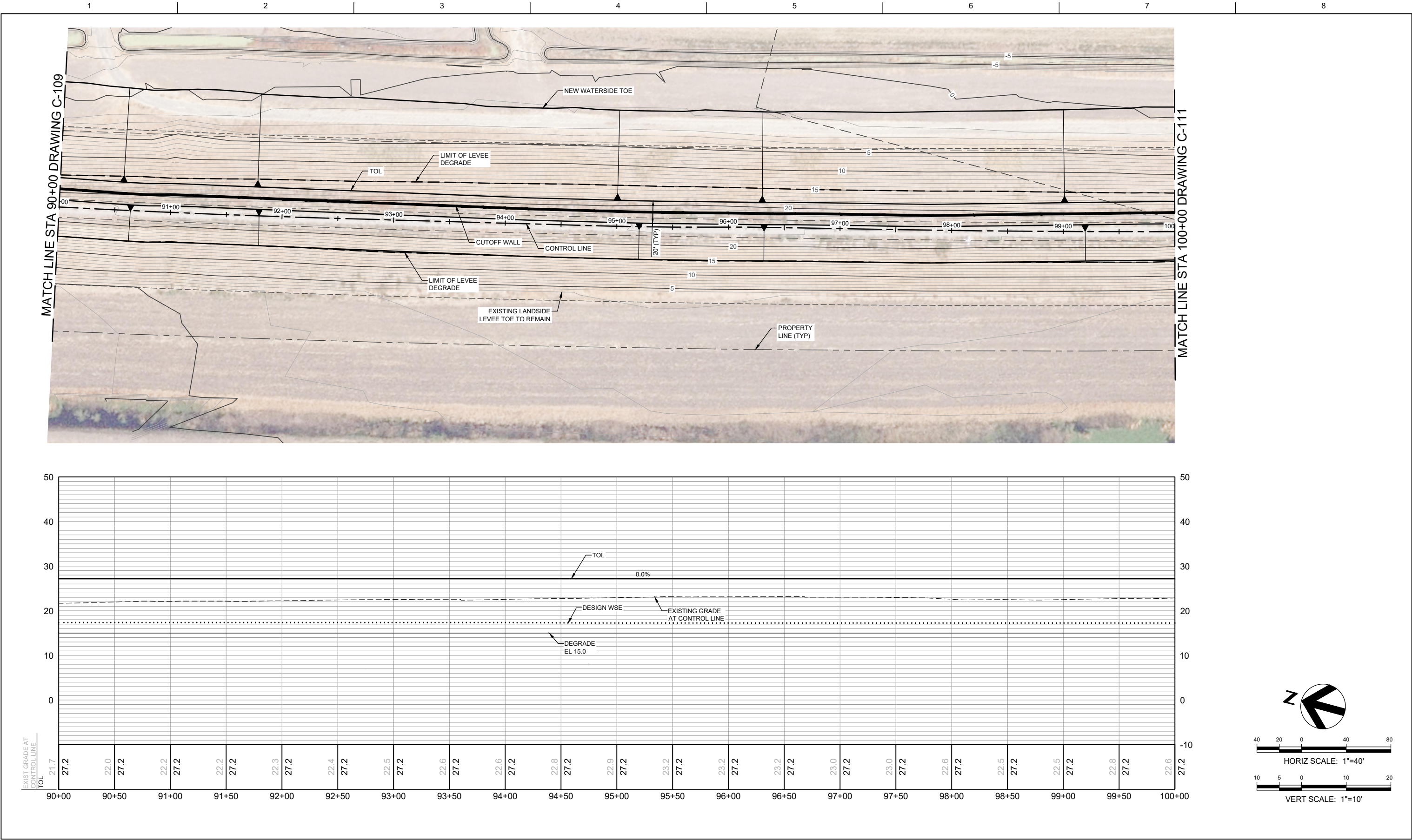
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FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX**

RD 536 LEVEE  
PLAN AND PROFILE  
STA 80+00 TO 90+00  
OPTION 1

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<b>SCALE</b>	AS SHOWN

C-109A





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

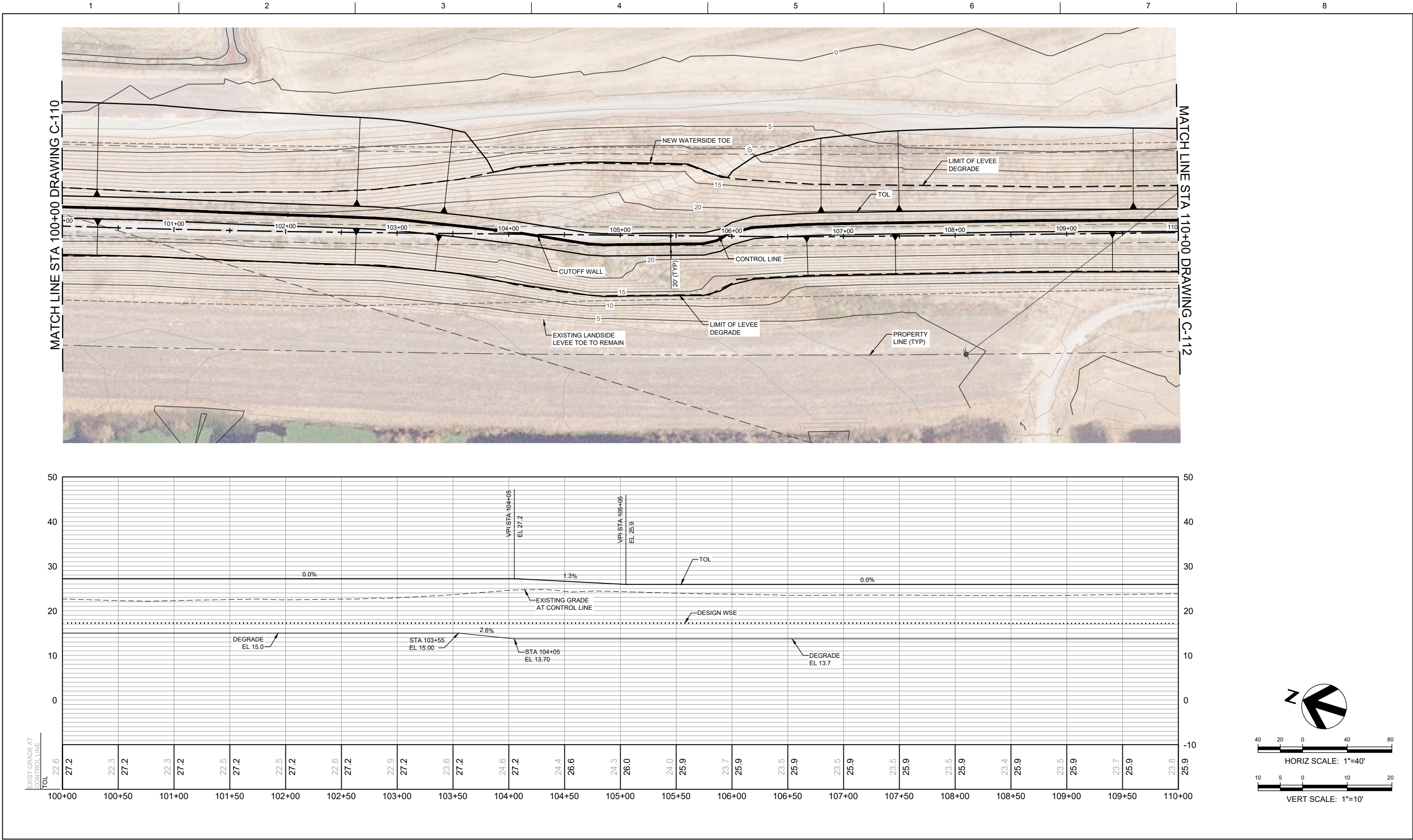
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FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX**

**RD 536 LEVEE  
PLAN AND PROFILE  
STA 90+00 TO 100+00  
OPTION 1**

FILENAME | 10314280C-110A.dwg  
SCALE | AS SHOWN

SHEET  
C-110A





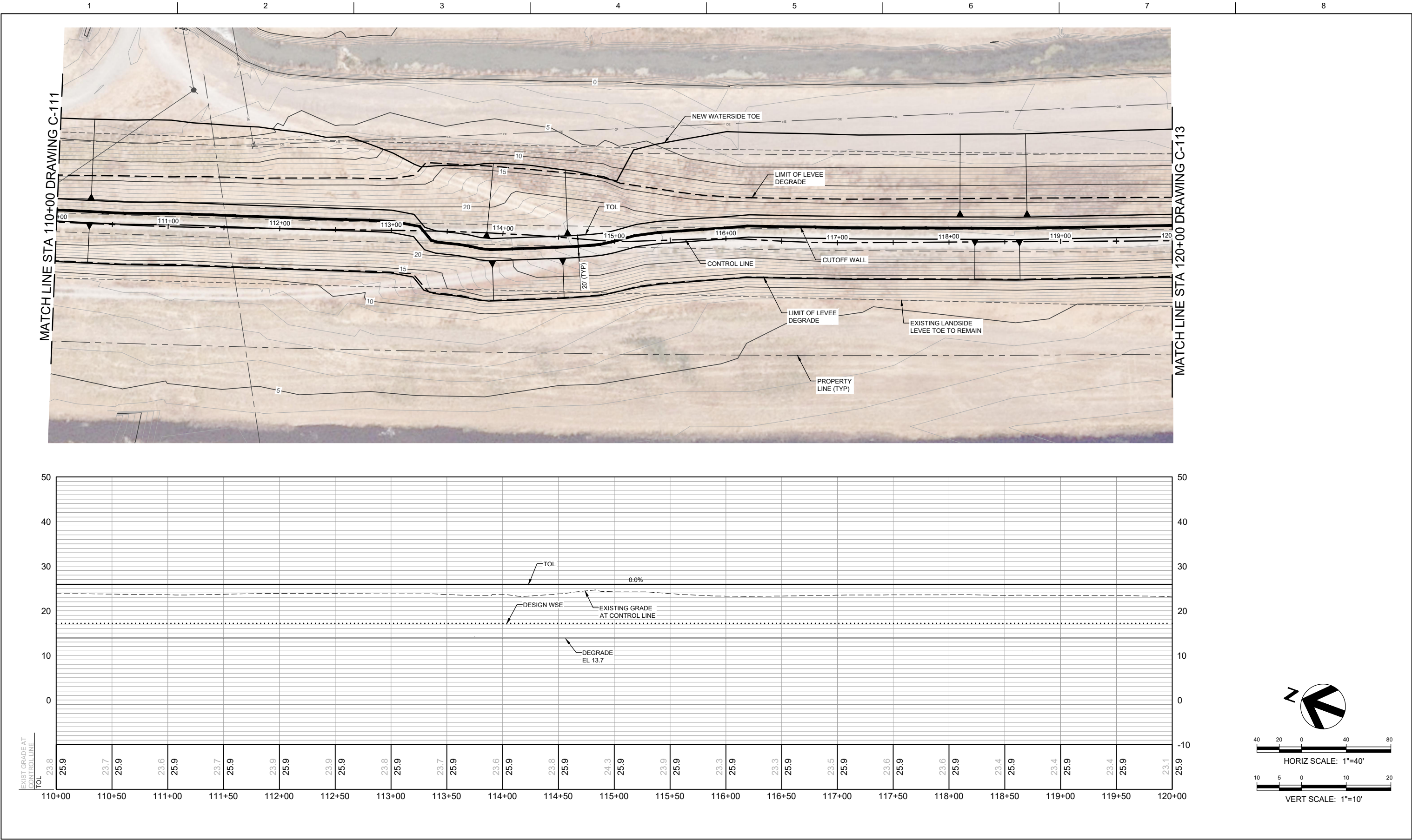
ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 LEVEE PLAN AND PROFILE STA 100+00 TO 110+00 OPTION 1		
FILENAME	10314280C-111A.dwg	SHEET
SCALE	AS SHOWN	C-111A





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

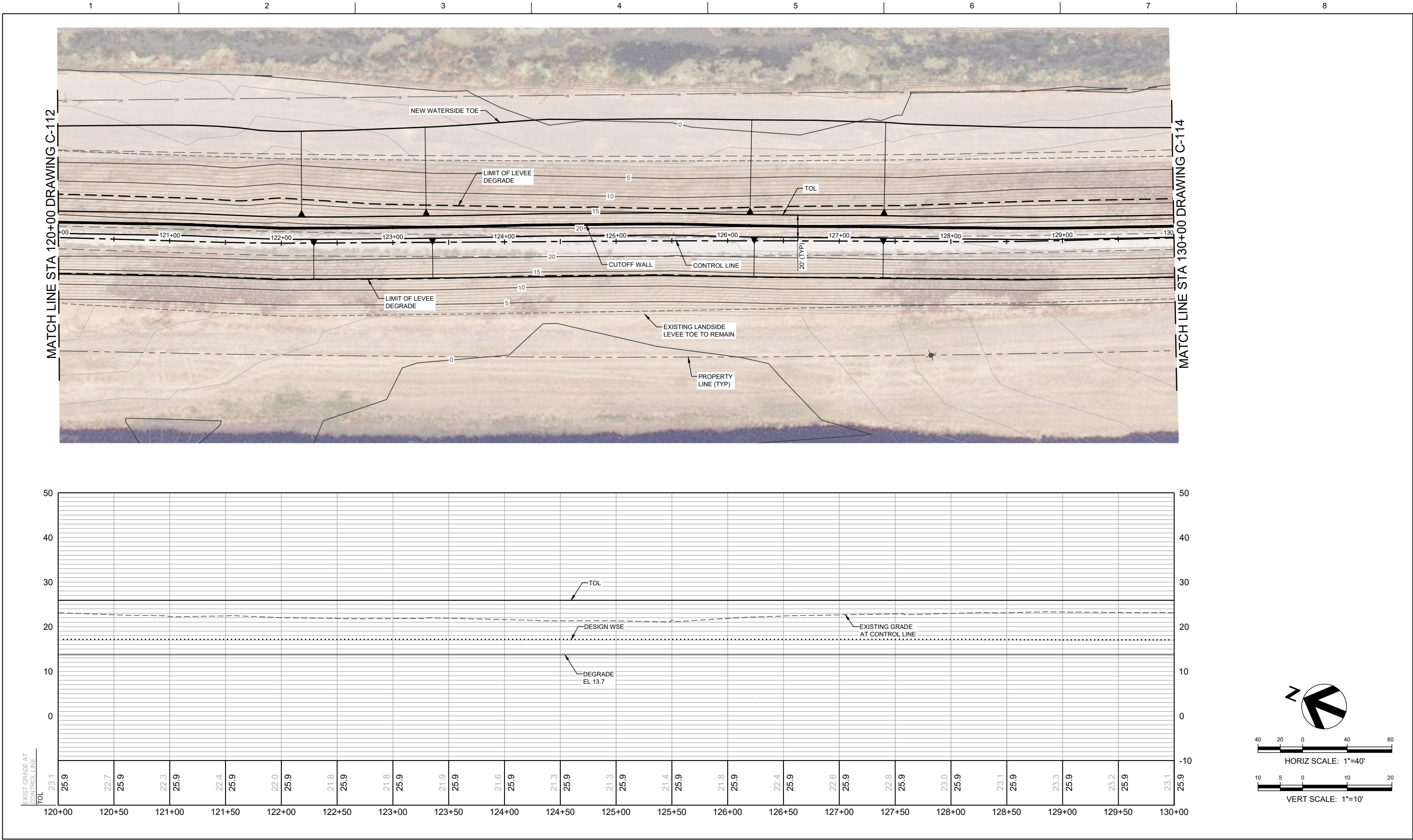
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FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 LEVEE  
PLAN AND PROFILE  
STA 110+00 TO 120+00  
OPTION 1

FILENAME 10314280C-112A.dwg  
SCALE AS SHOWN

SHEET  
C-112A





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 LEVEE  
PLAN AND PROFILE  
STA 120+00 TO 130+00  
OPTION 1

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SCALE | AS SHOWN

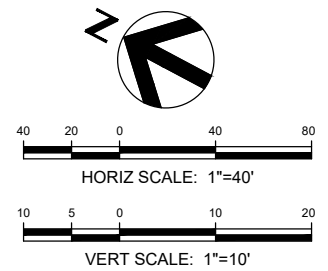
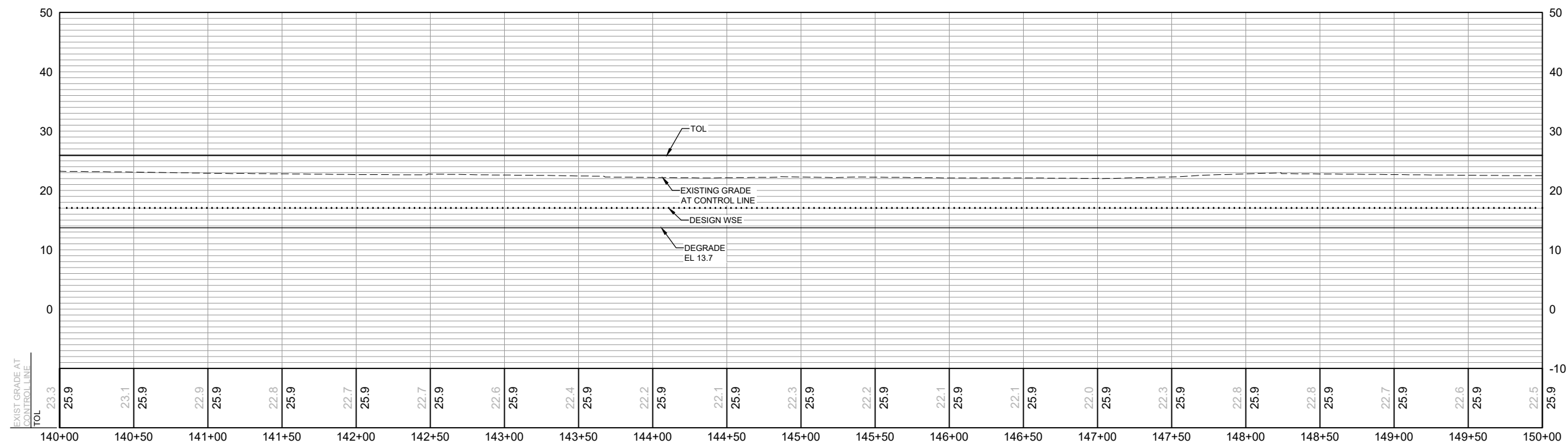
SHEET

C-113A







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PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

**LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX**

RD 536 LEVEE  
PLAN AND PROFILE  
STA 140+00 TO 150+00  
OPTION 1

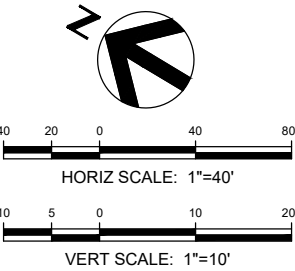
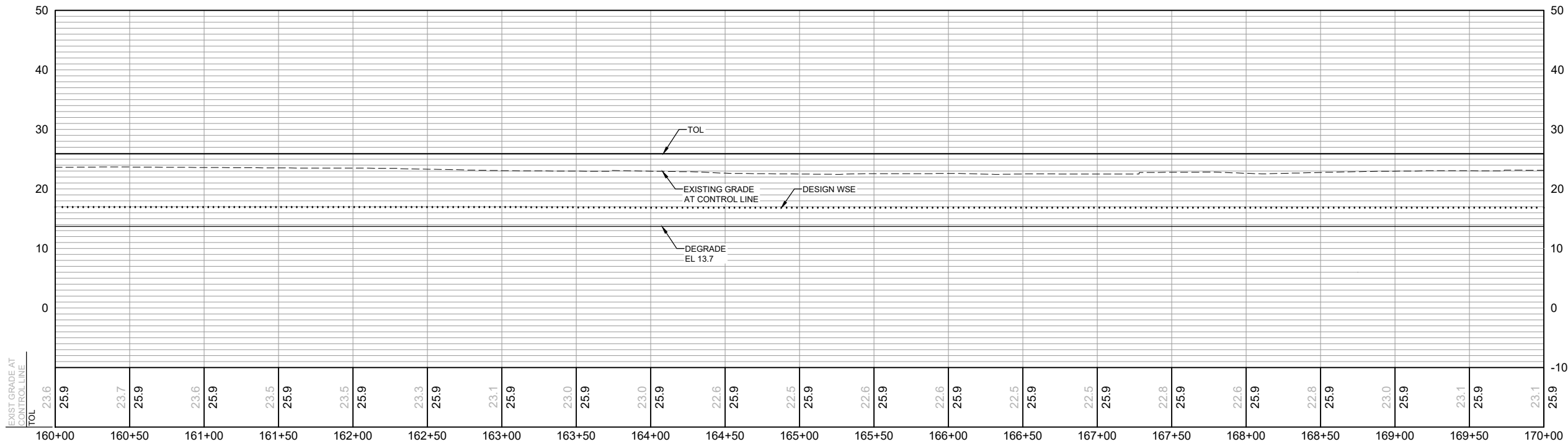
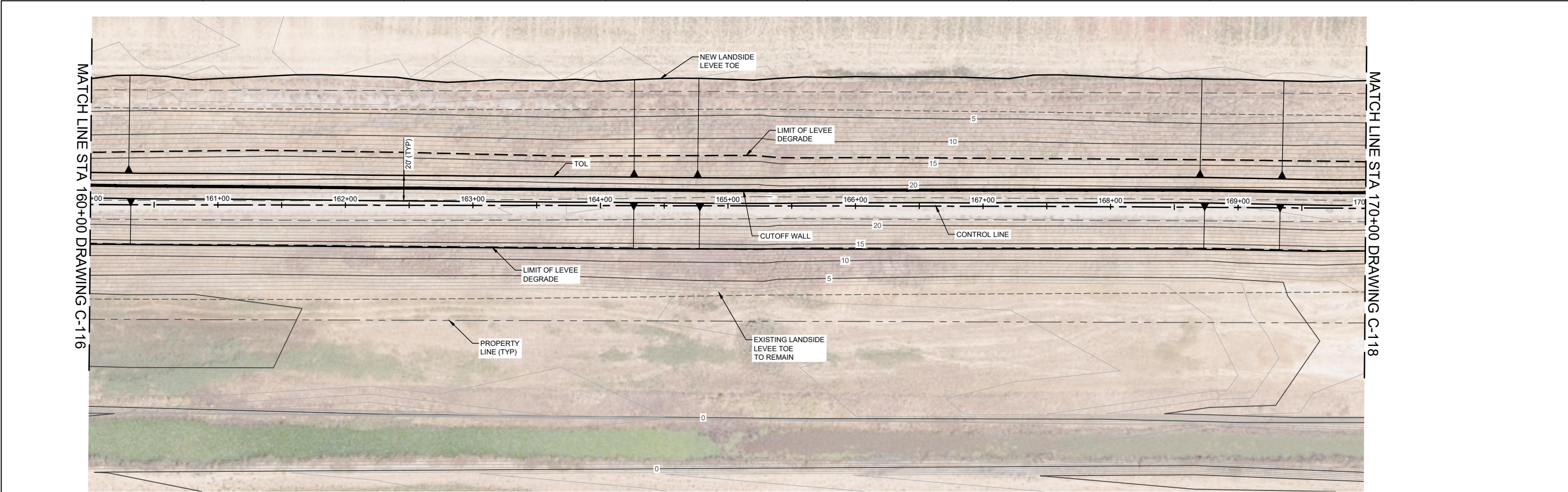
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C-115A









ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 LEVEE  
PLAN AND PROFILE  
STA 160+00 TO 170+00  
OPTION 1

FILENAME 10314280C-117A.dwg  
SCALE AS SHOWN

SHEET  
C-117A

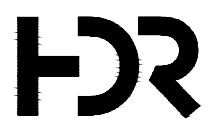
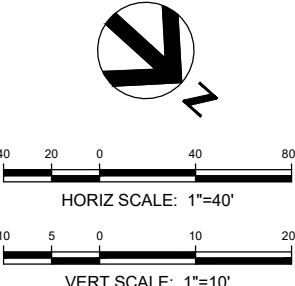
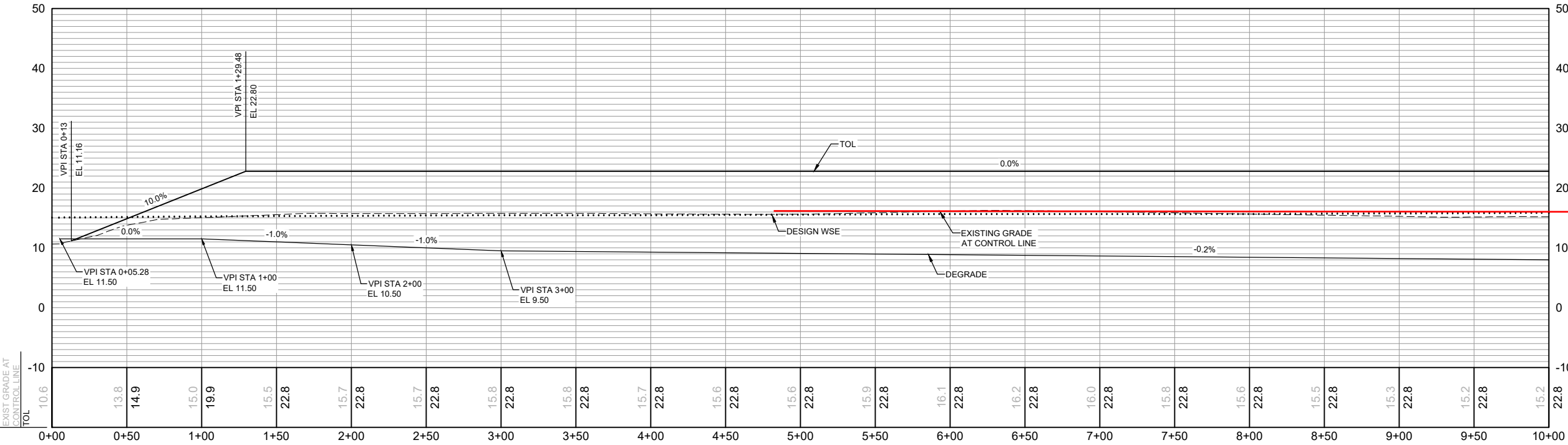
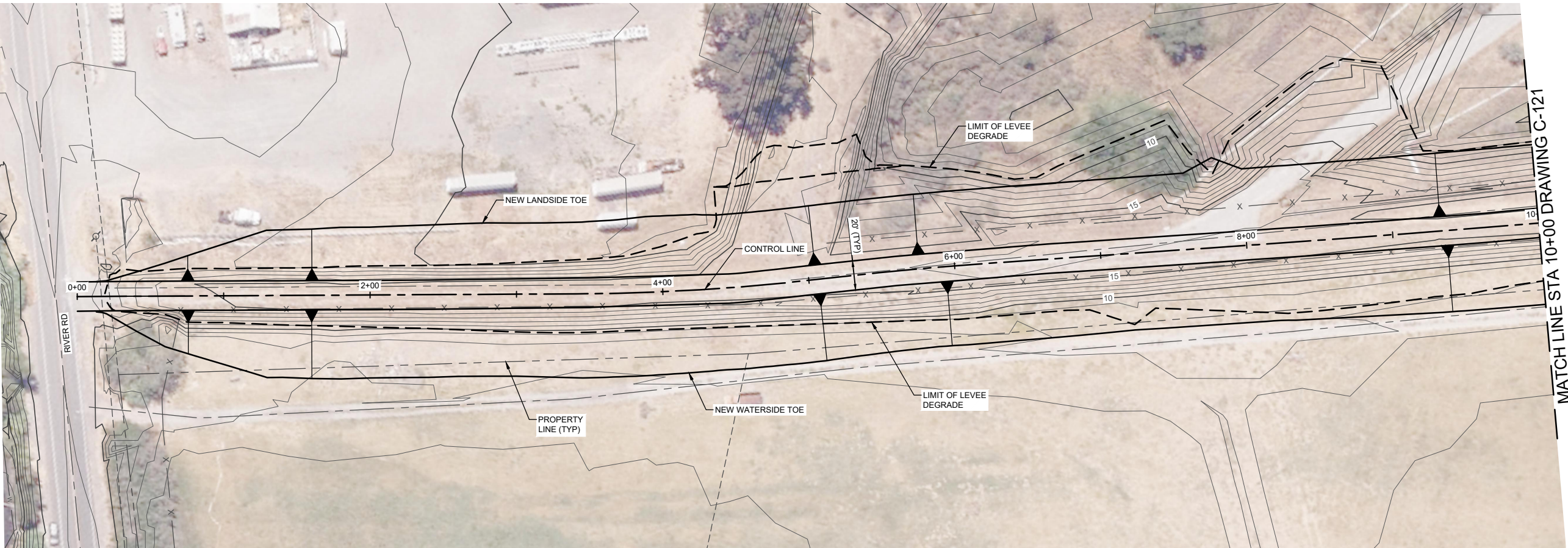












ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

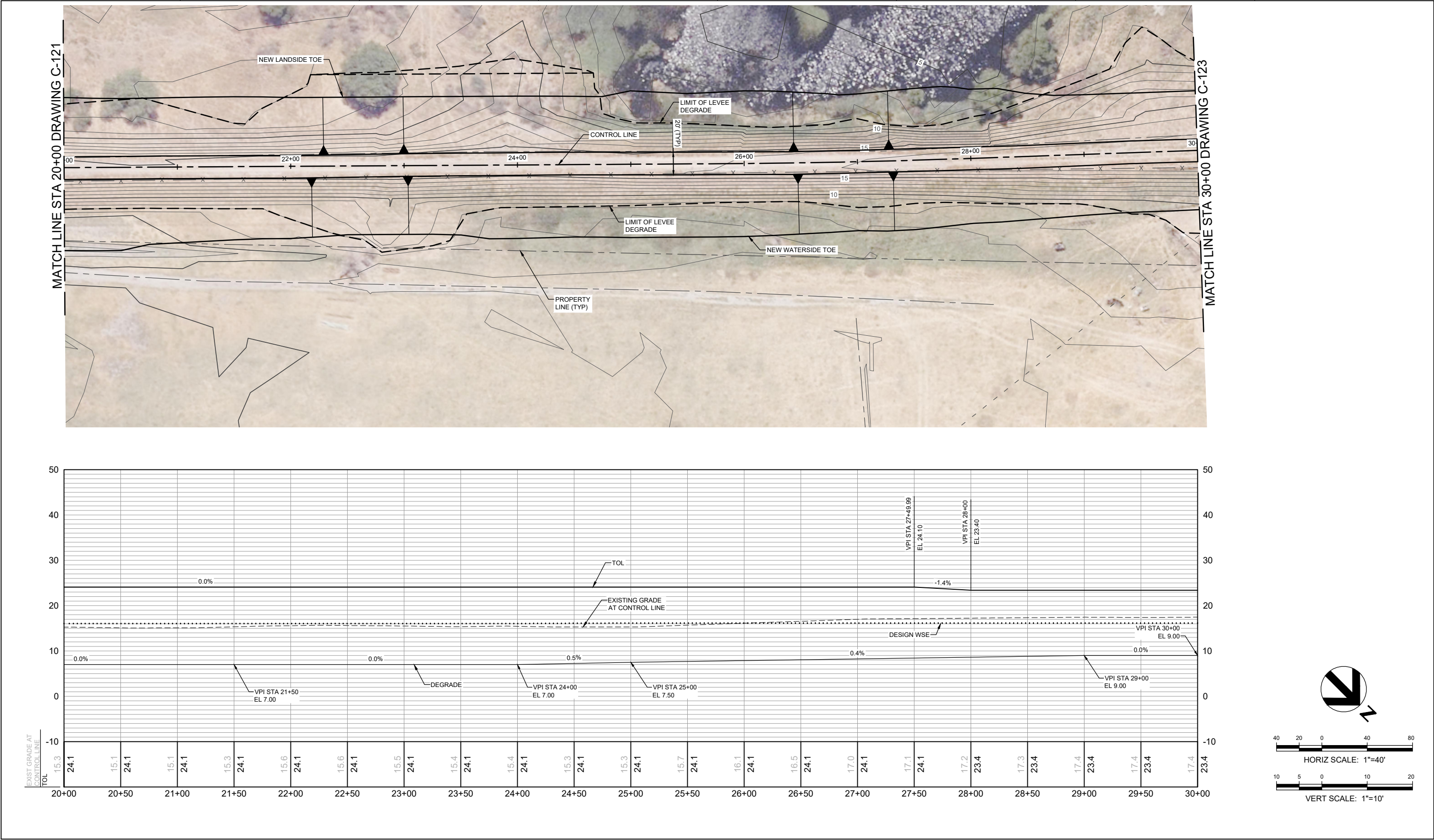
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STA 0+00 TO 10+00  
OPTION 1

FILENAME	10314280C-120.dwg
SCALE	AS SHOWN









ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

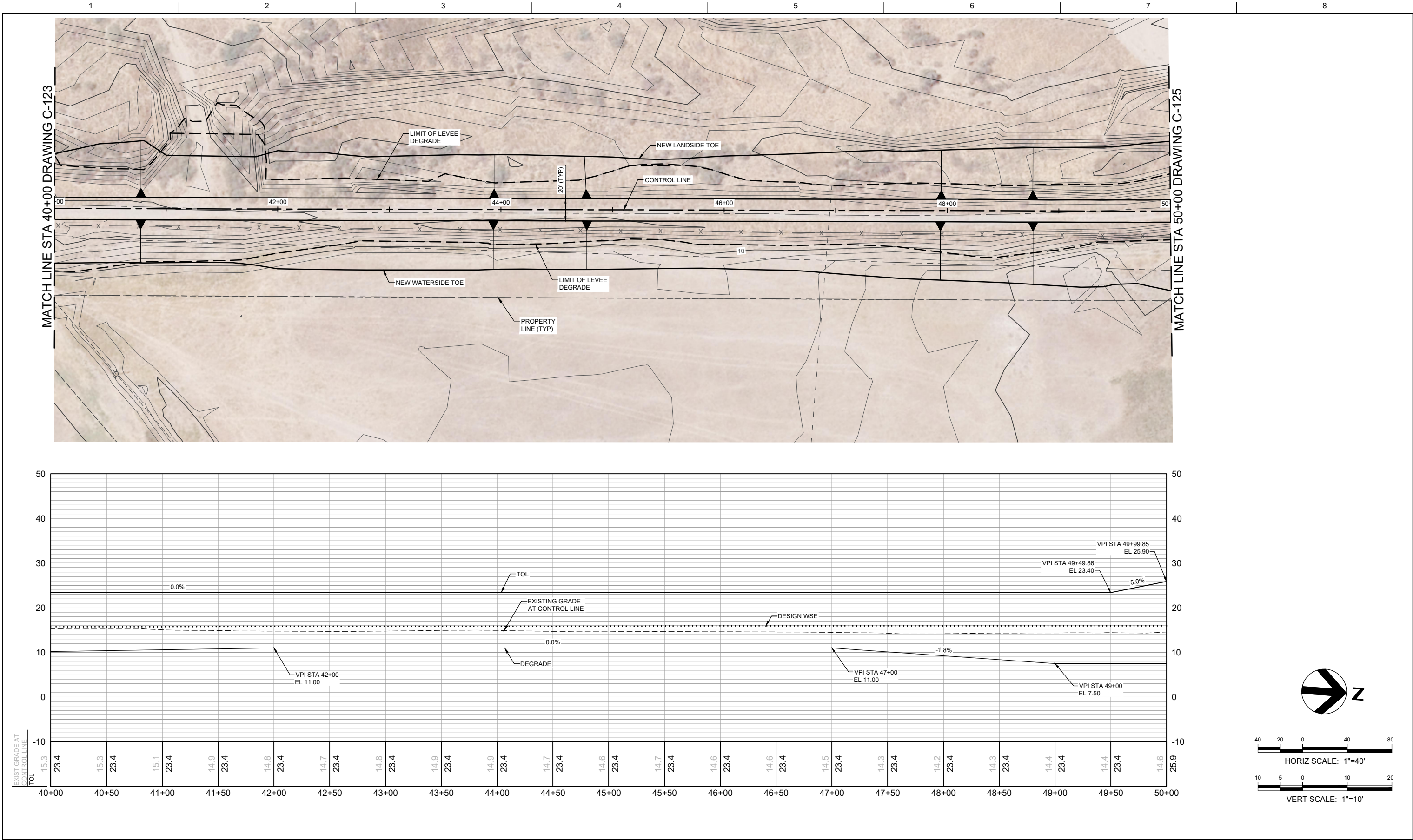
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STA 20+00 TO 30+00  
OPTION 1

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SCALE	AS SHOWN









ISSUE	DATE	DESCRIPTION

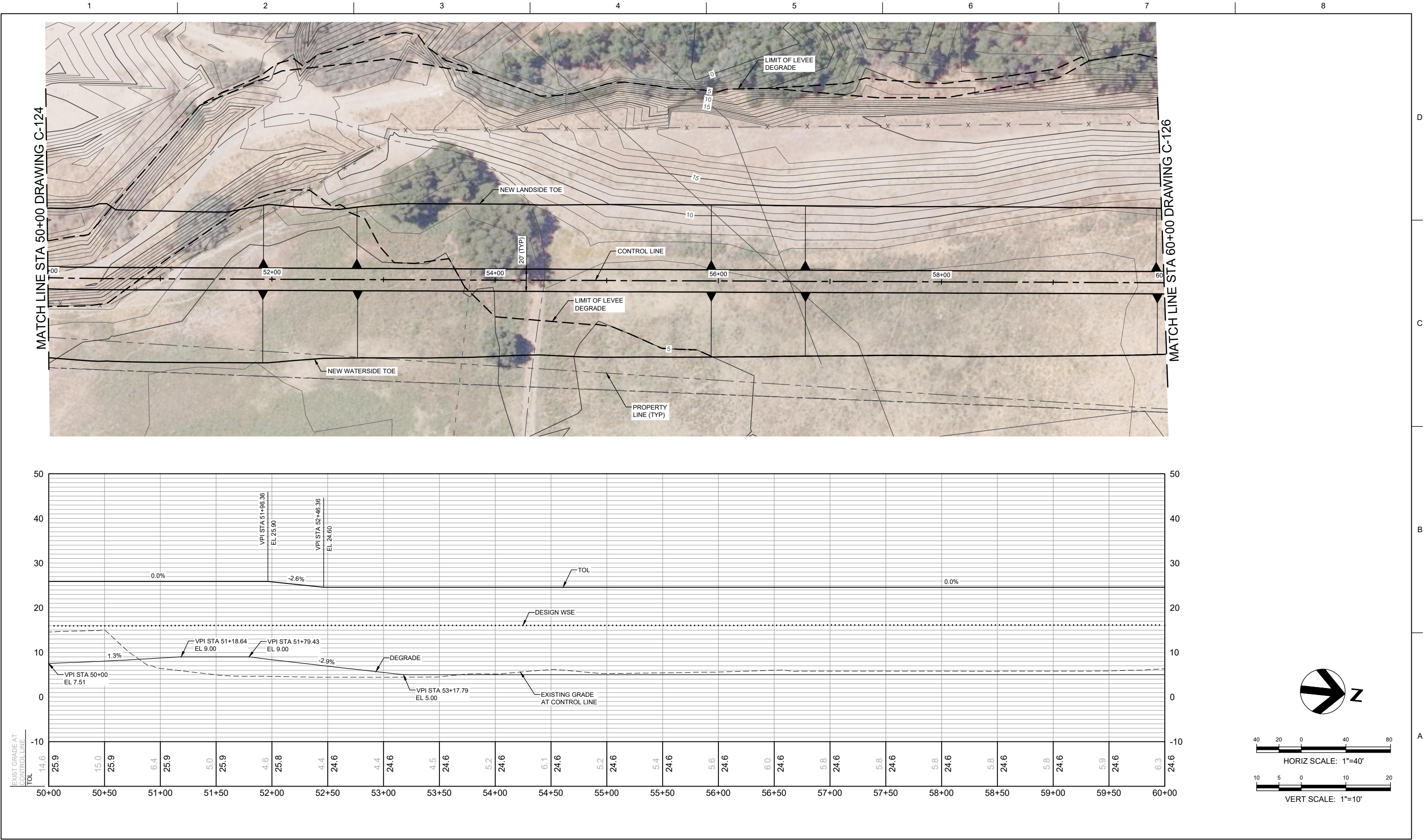
PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

MELLIN LEVEE  
PLAN AND PROFILE  
STA 40+00 TO 50+00  
OPTION 1

FILENAME	10314280C-124.dwg
SCALE	AS SHOWN





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

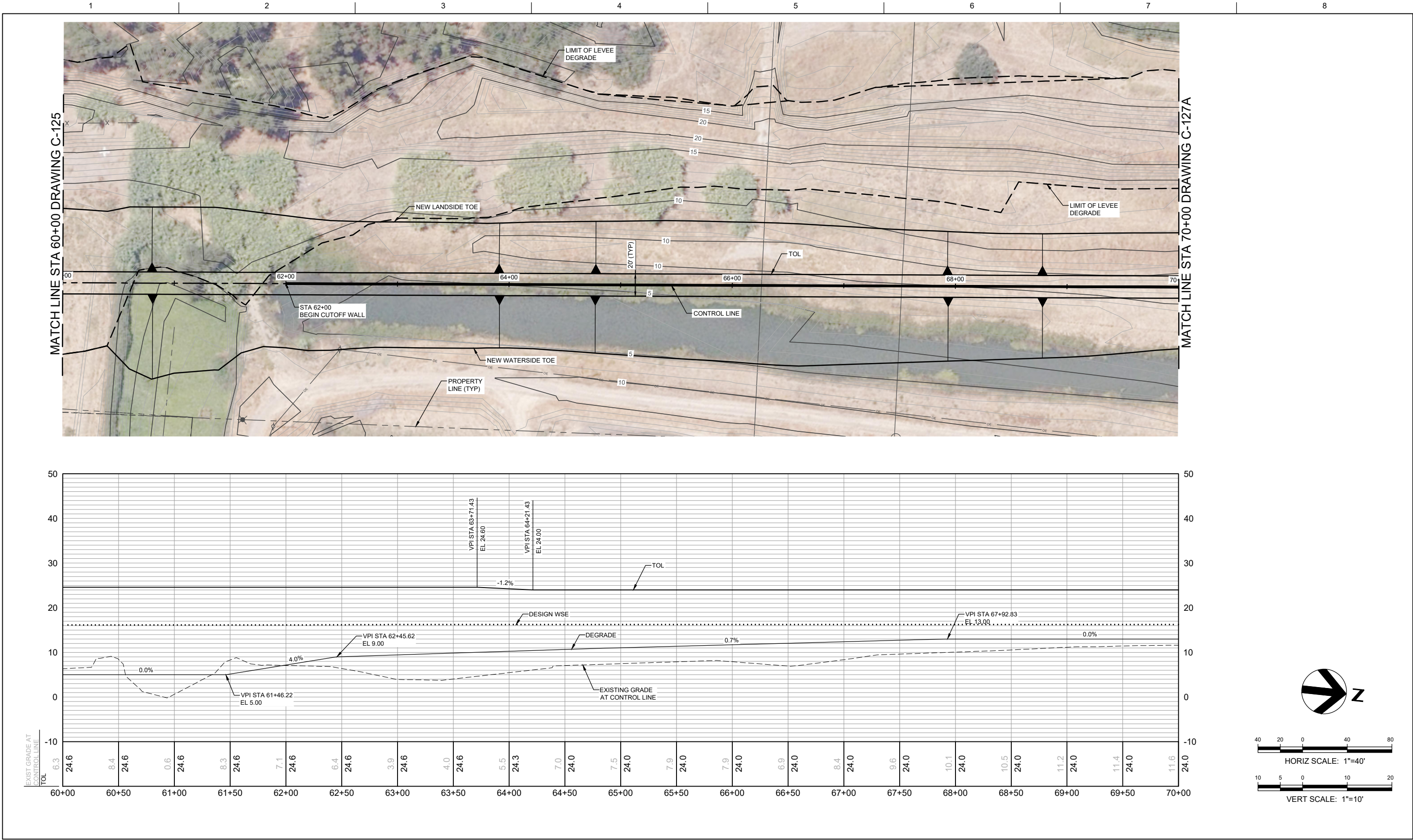
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FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

MELLIN LEVEE  
PLAN AND PROFILE  
STA 50+00 TO 60+00  
OPTION 1

FILENAME	10314280C-125.dwg
SCALE	AS SHOWN

SHEET
C-125





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

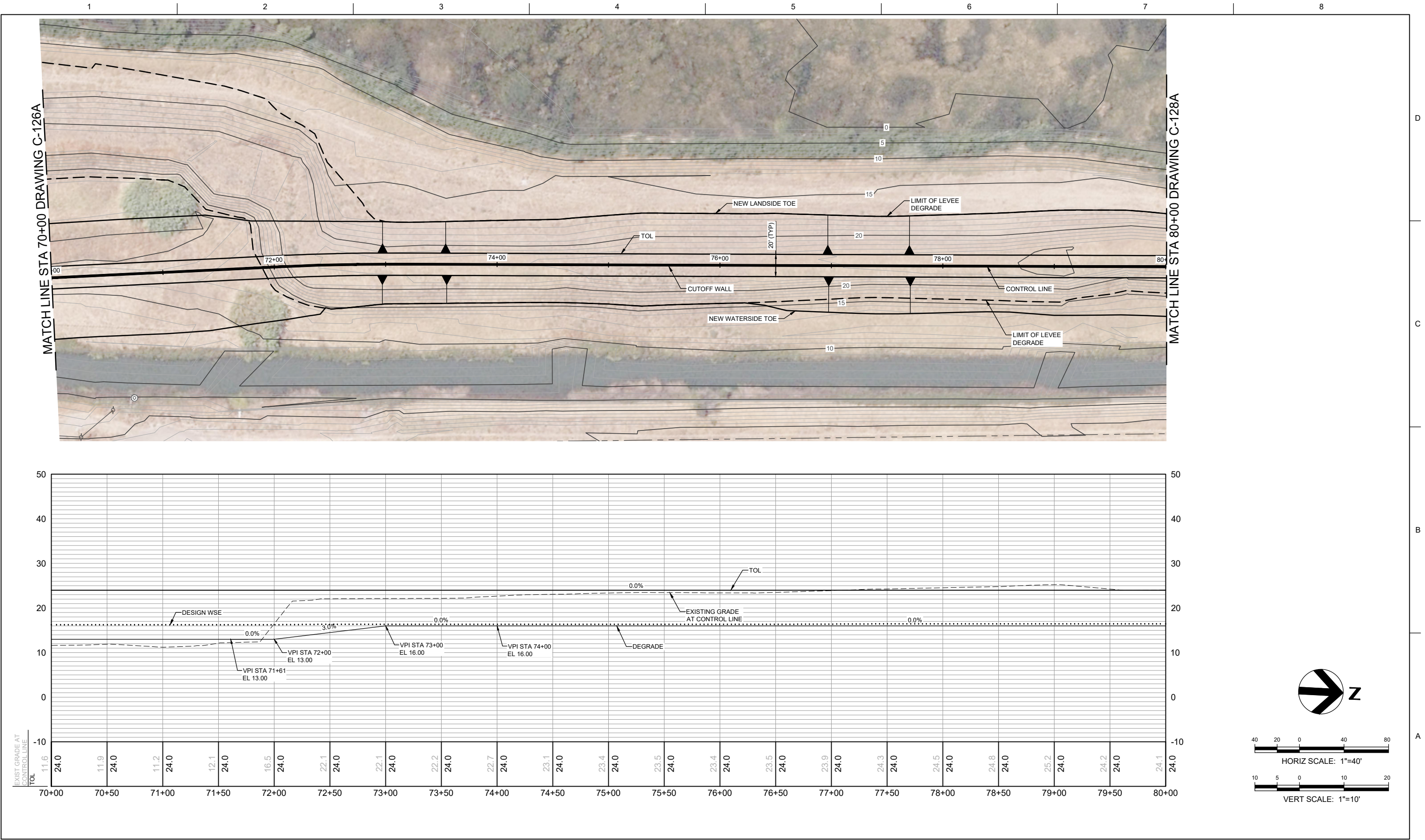
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FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

MELLIN LEVEE  
PLAN AND PROFILE  
STA 60+00 TO 70+00  
OPTION 1

FILENAME	10314280C-126A.dwg
SCALE	AS SHOWN

SHEET	C-126A
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ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

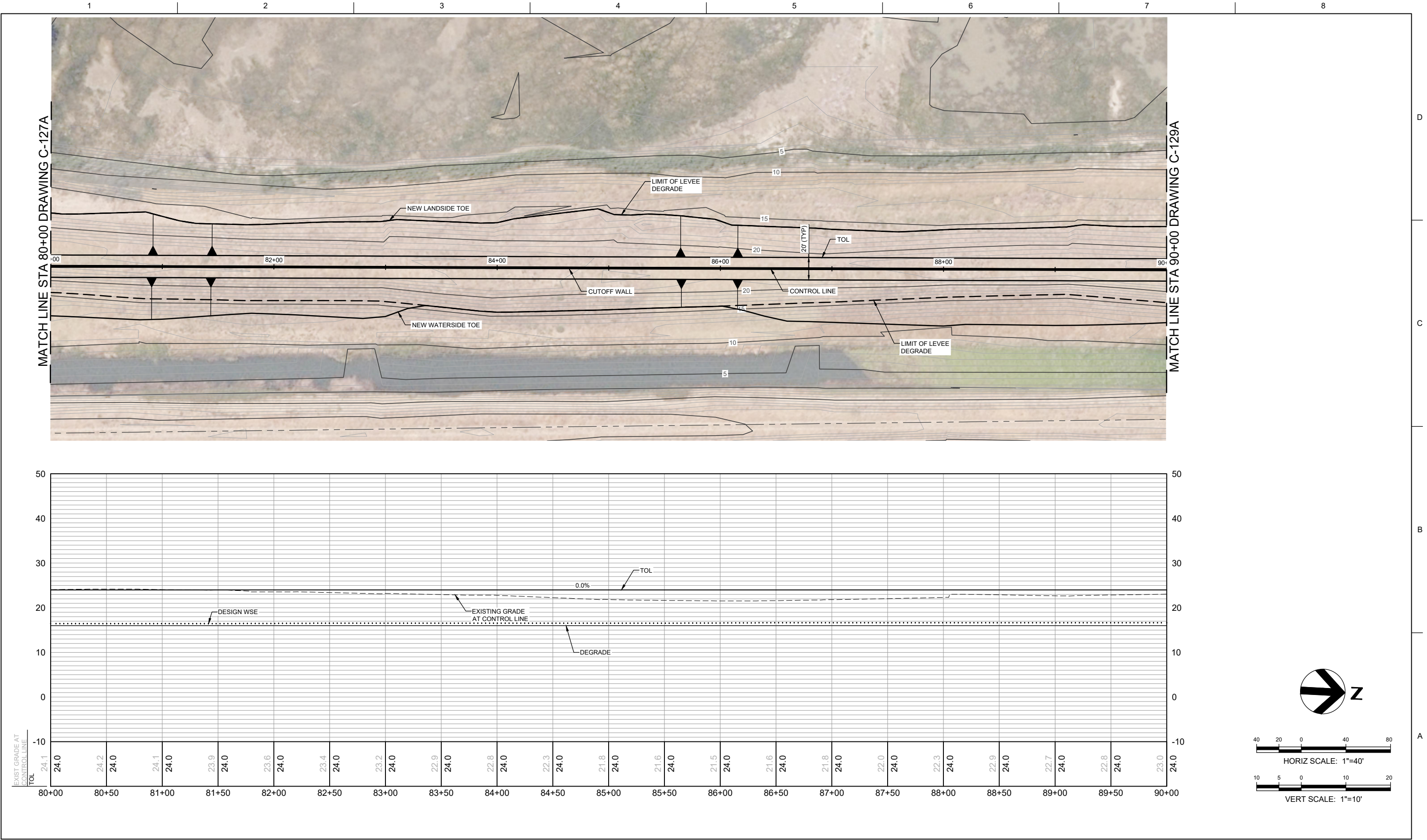
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FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

MELLIN LEVEE  
PLAN AND PROFILE  
STA 70+00 TO 80+00  
OPTION 1

FILENAME | 10314280C-127A.dwg  
SCALE | AS SHOWN

SHEET  
C-127A





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

MELLIN LEVEE  
PLAN AND PROFILE  
STA 80+00 TO 90+00  
OPTION 1

FILENAME	10314280C-128A.dwg
SCALE	AS SHOWN

SHEET	C-128A
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2

3

4

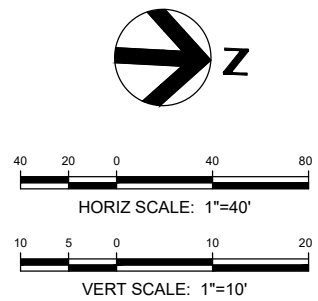
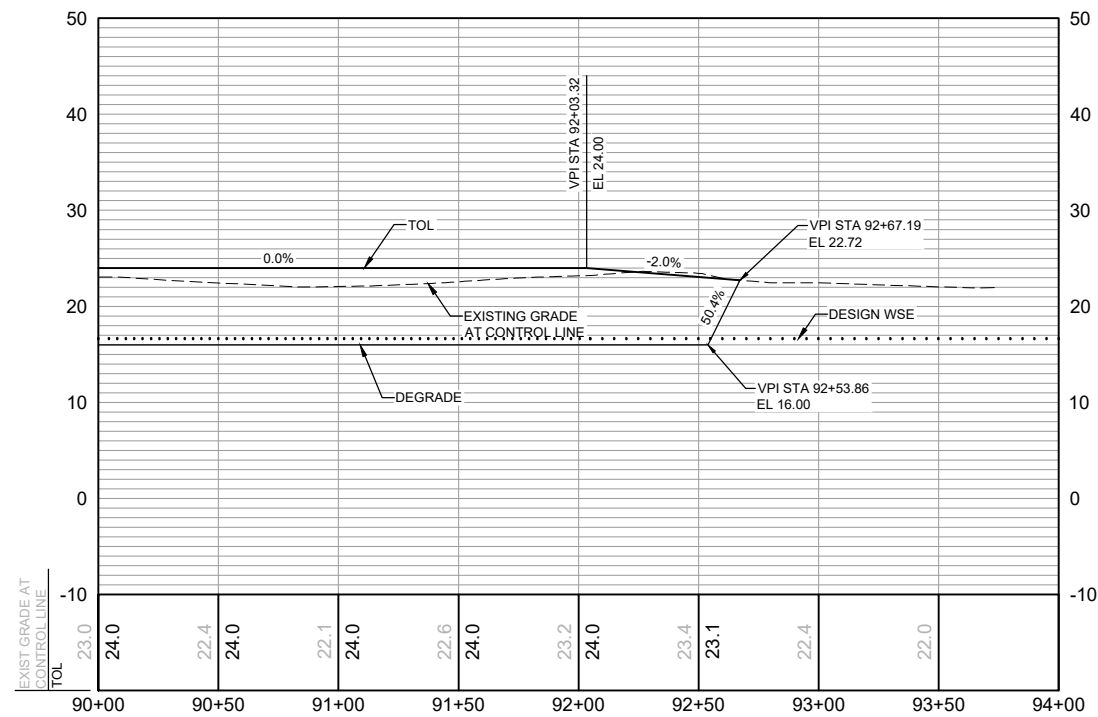
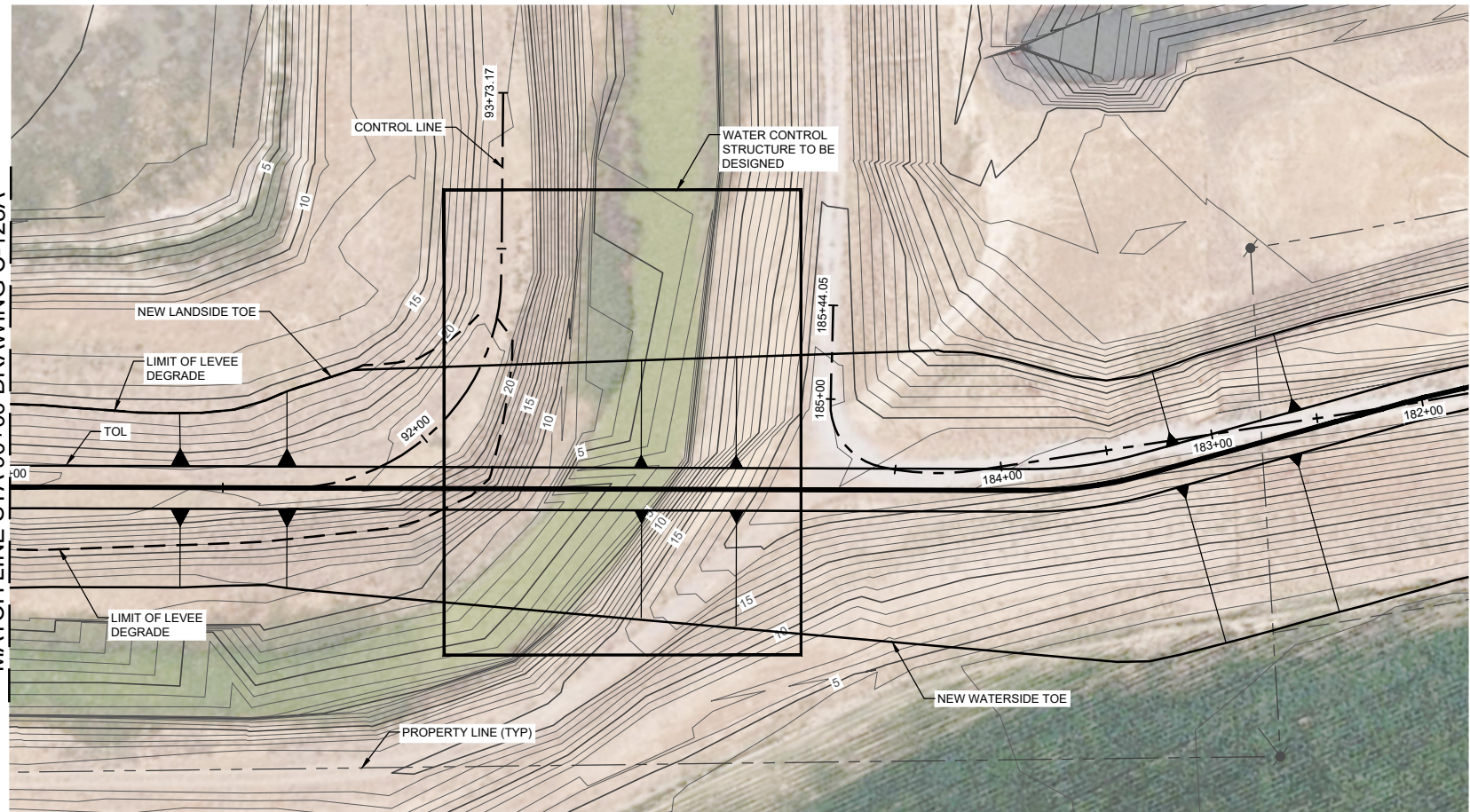
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MATCH LINE STA 90+00 DRAWING C-128A



ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

MELLIN LEVEE  
PLAN AND PROFILE  
STA 90+00 TO 92+67.19  
OPTION 1

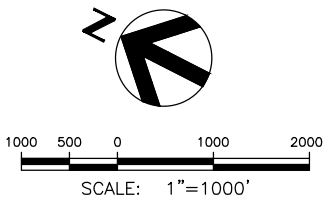
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SHEET
C-129A

# Option 2

## Plans and Profiles





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

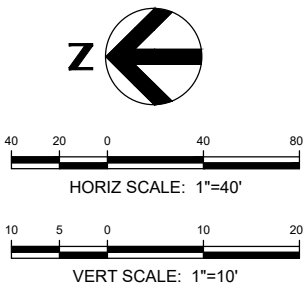
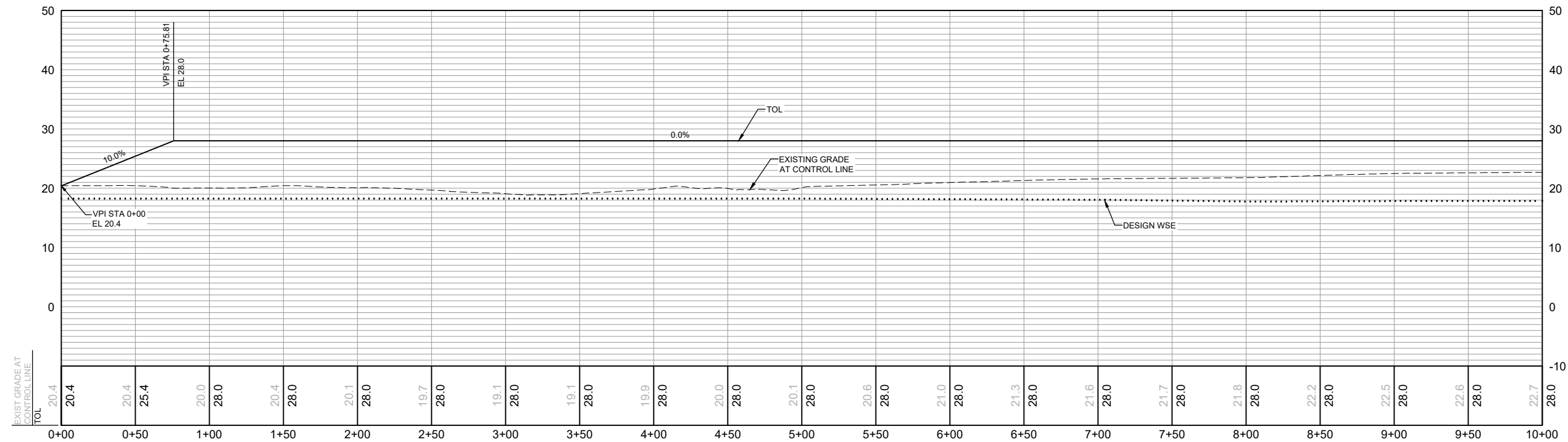
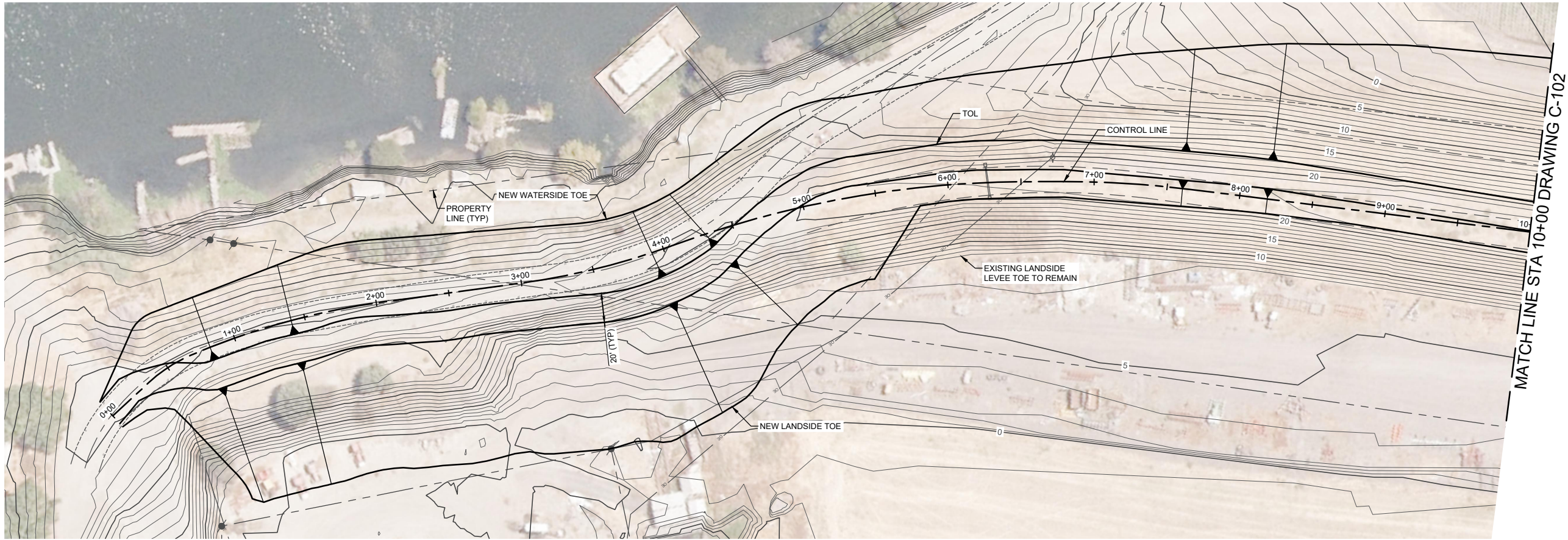
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FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

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OVERALL PLAN AND KEYMAP  
OPTION 2

FILENAME	10314280C-100B.dwg
SCALE	AS SHOWN

SHEET
C-100B





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

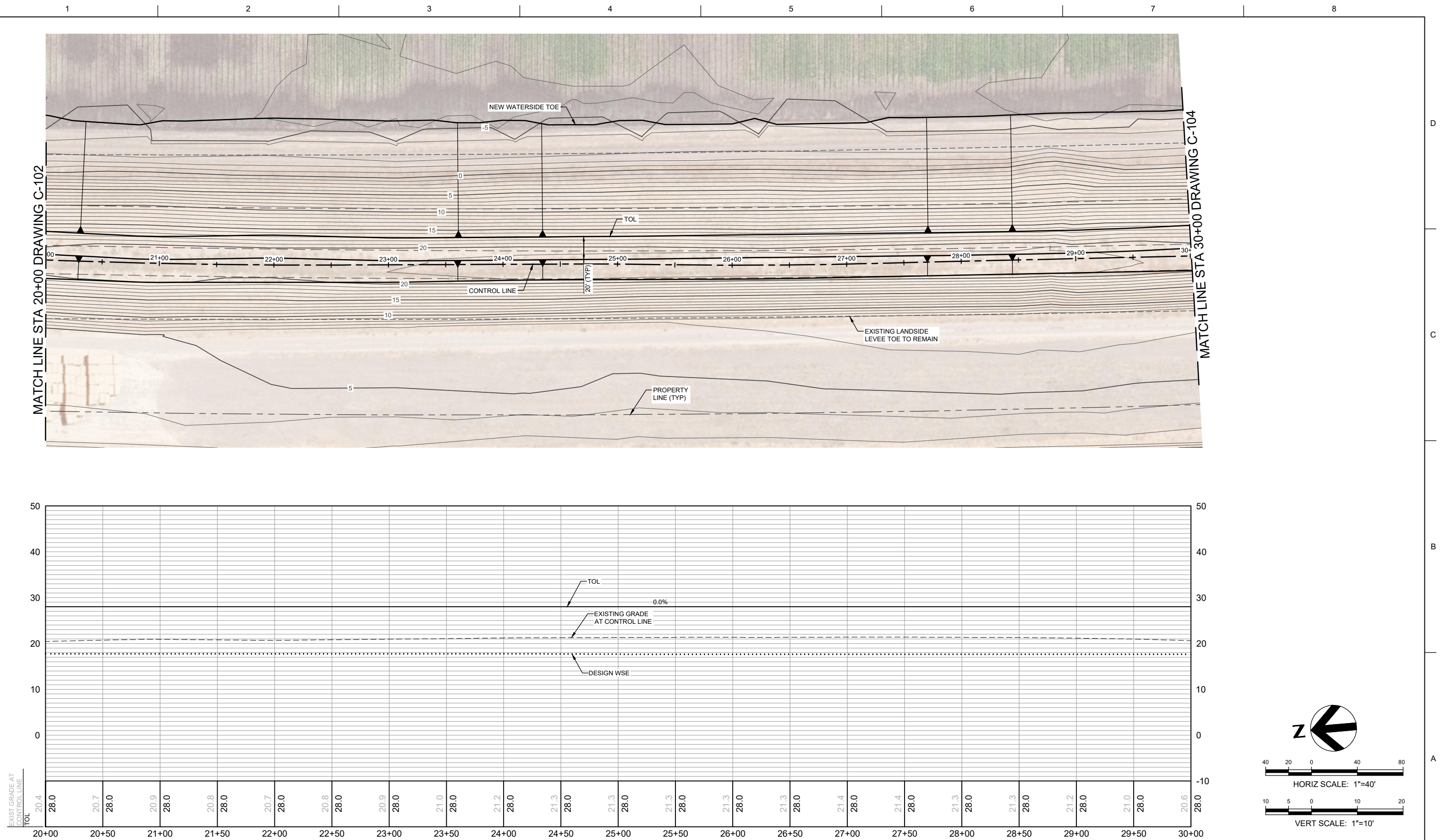
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PLAN AND PROFILE  
STA 0+00 TO 10+00  
OPTION 2

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SCALE | AS SHOWN

SHEET  
C-101





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PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

**LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX**

RD 536 LEVEE  
PLAN AND PROFILE  
STA 20+00 TO 30+00  
OPTION 2

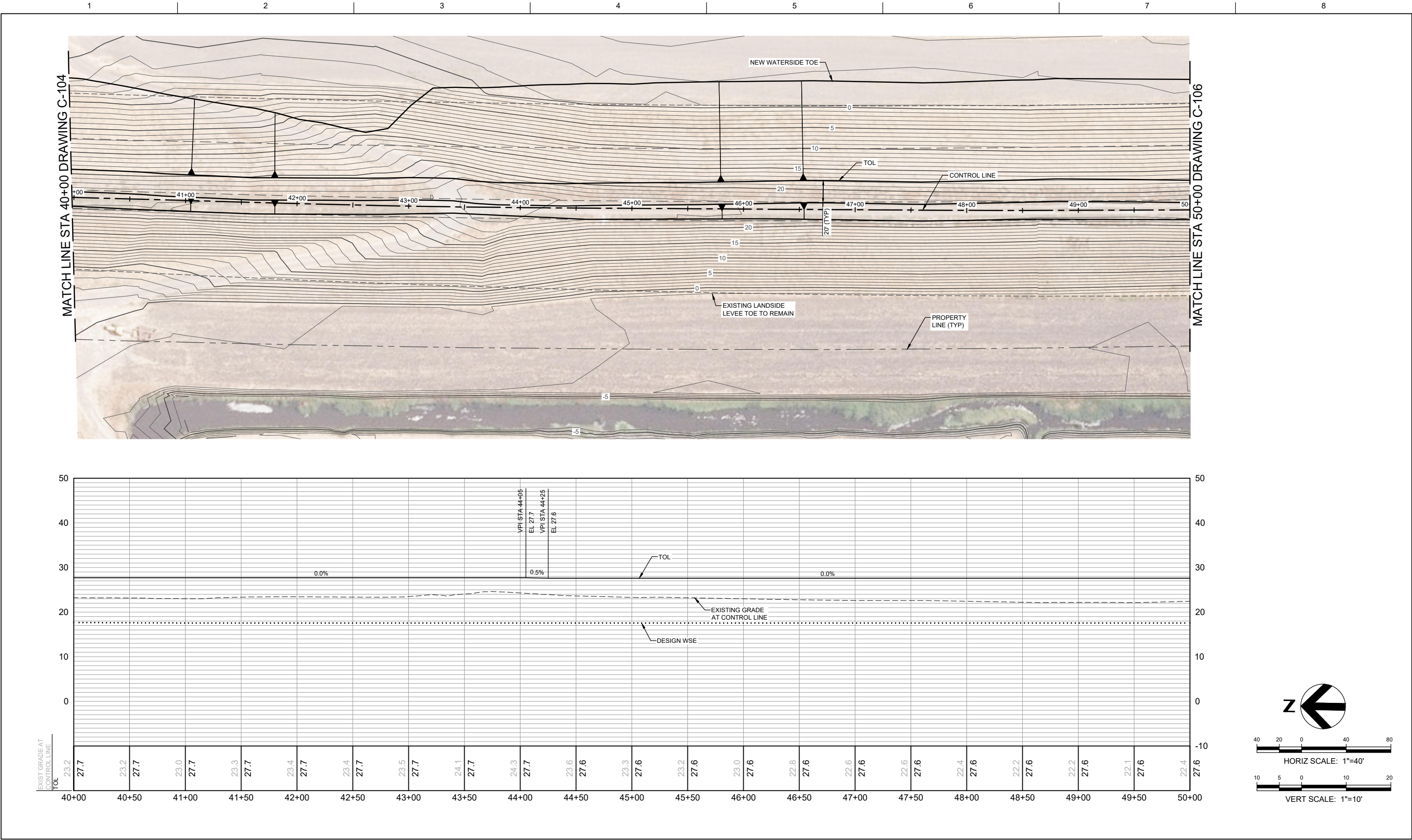
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SHEET

C-103







ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 LEVEE  
PLAN AND PROFILE  
STA 40+00 TO 50+00  
OPTION 2

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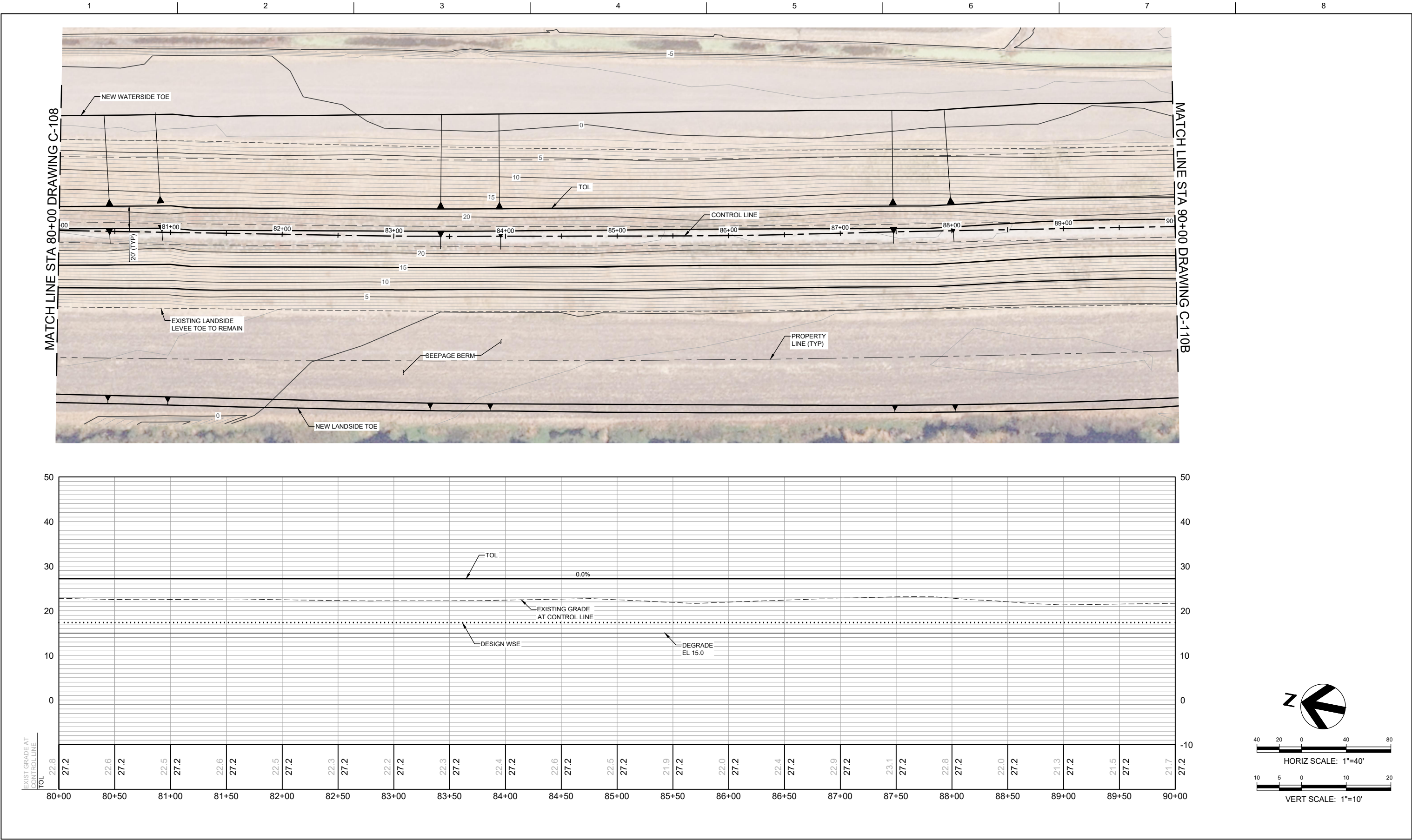












ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

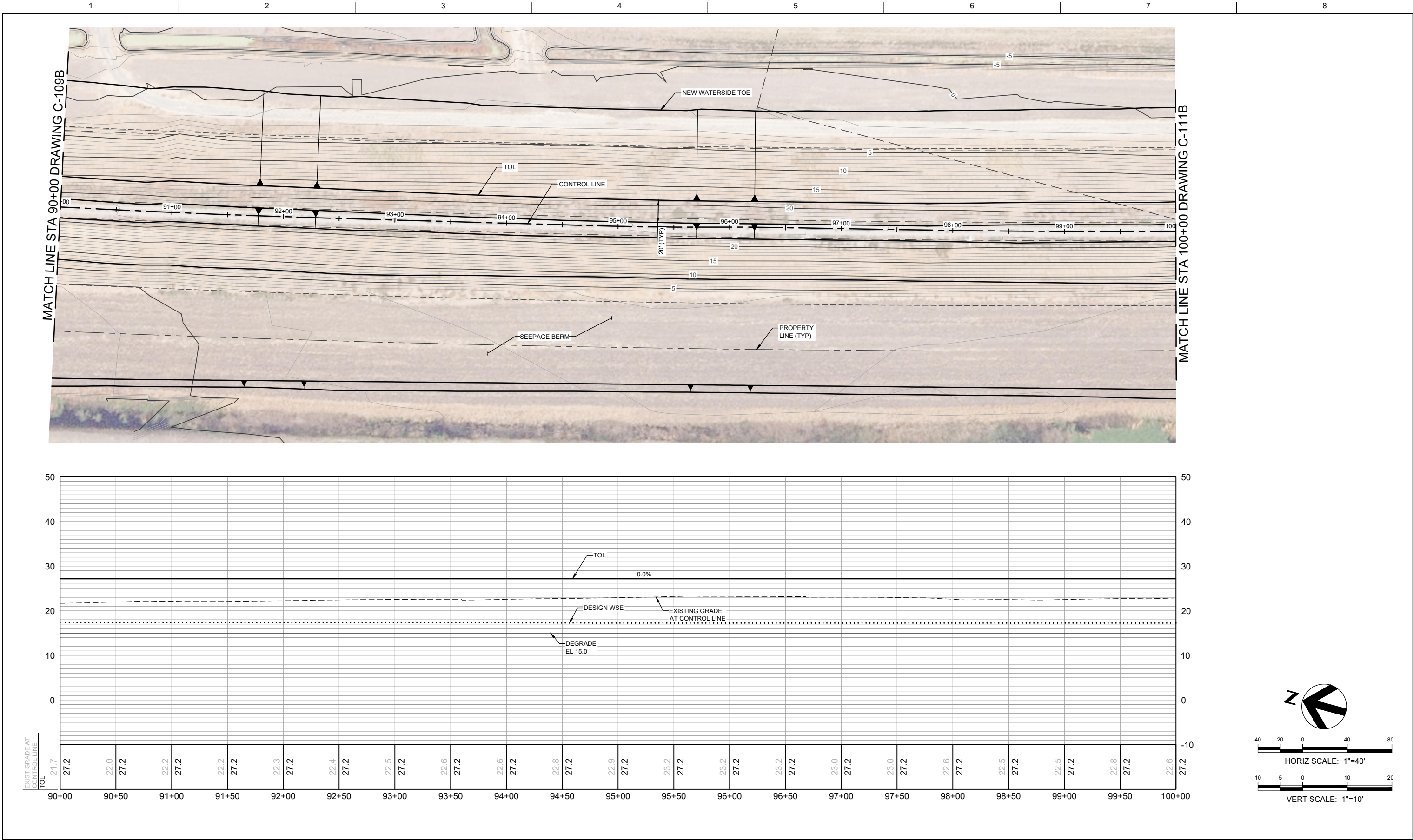
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 LEVEE  
PLAN AND PROFILE  
STA 80+00 TO 90+00  
OPTION 2

FILENAME | 10314280C-109B.dwg  
SCALE | AS SHOWN

SHEET  
C-109B





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

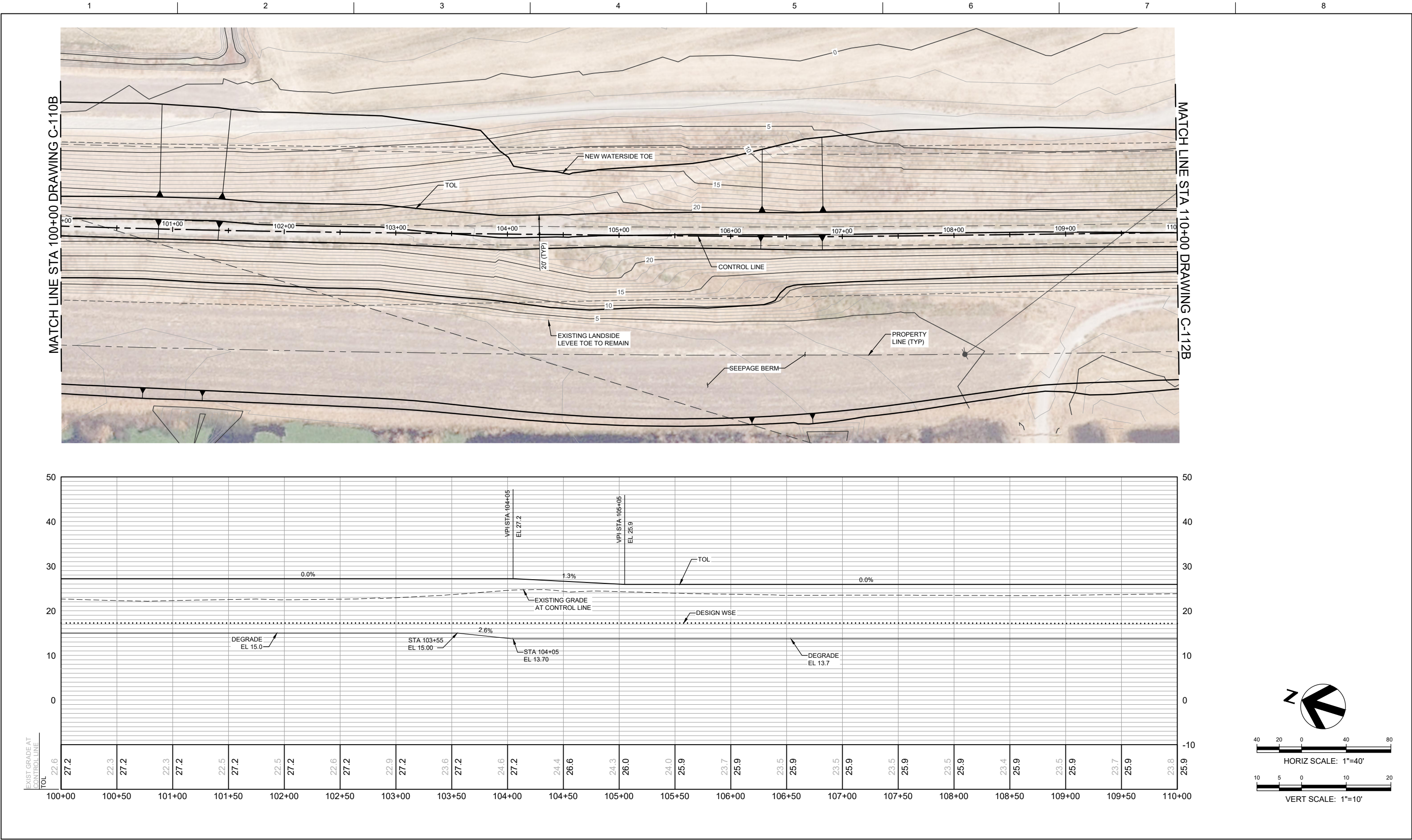
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FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 LEVEE  
PLAN AND PROFILE  
STA 90+00 TO 100+00  
OPTION 2

FILENAME | 10314280C-110B.dwg  
SCALE | AS SHOWN

SHEET  
C-110B





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

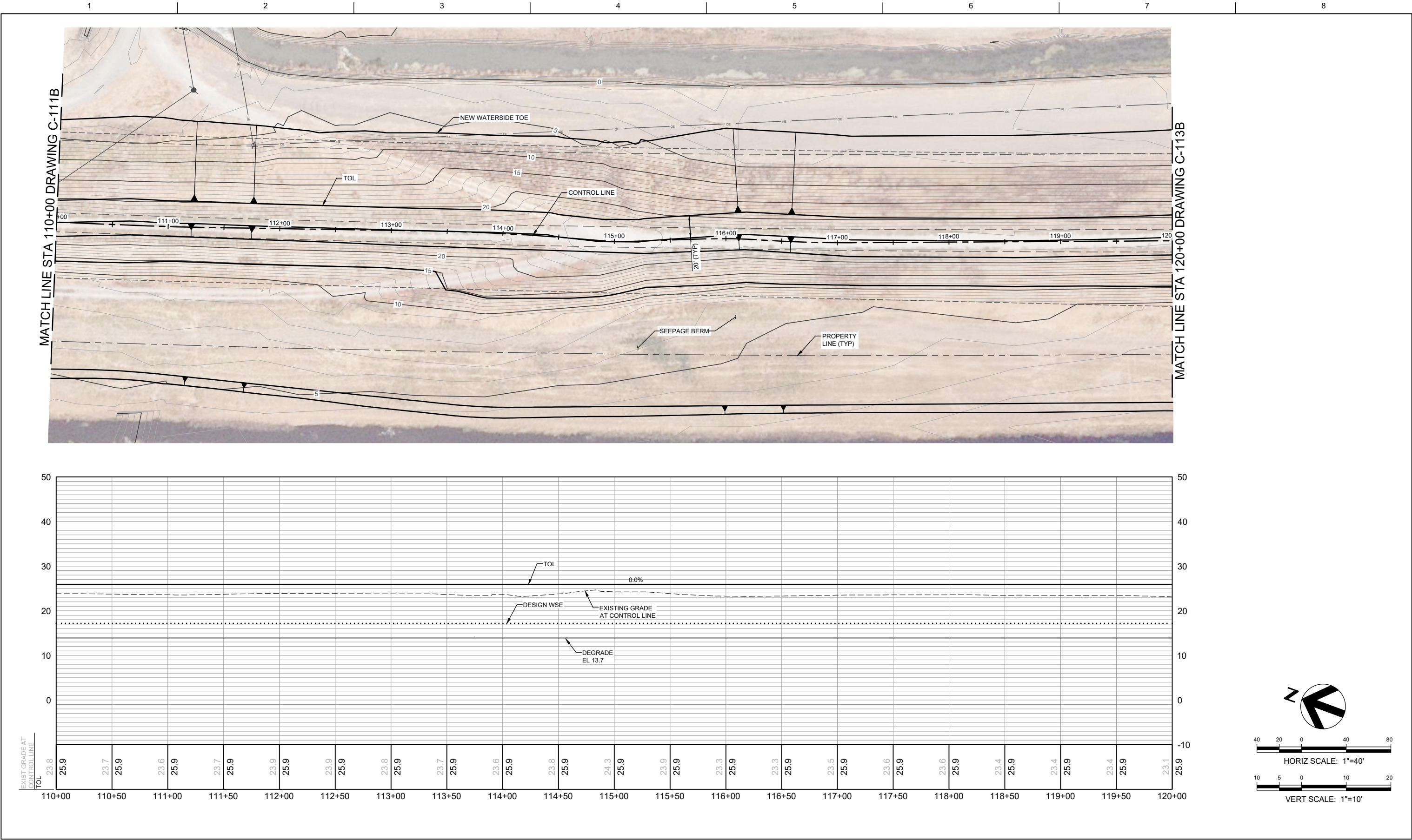
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FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 LEVEE  
PLAN AND PROFILE  
STA 100+00 TO 110+00  
OPTION 2

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SCALE	AS SHOWN

SHEET	C-111B
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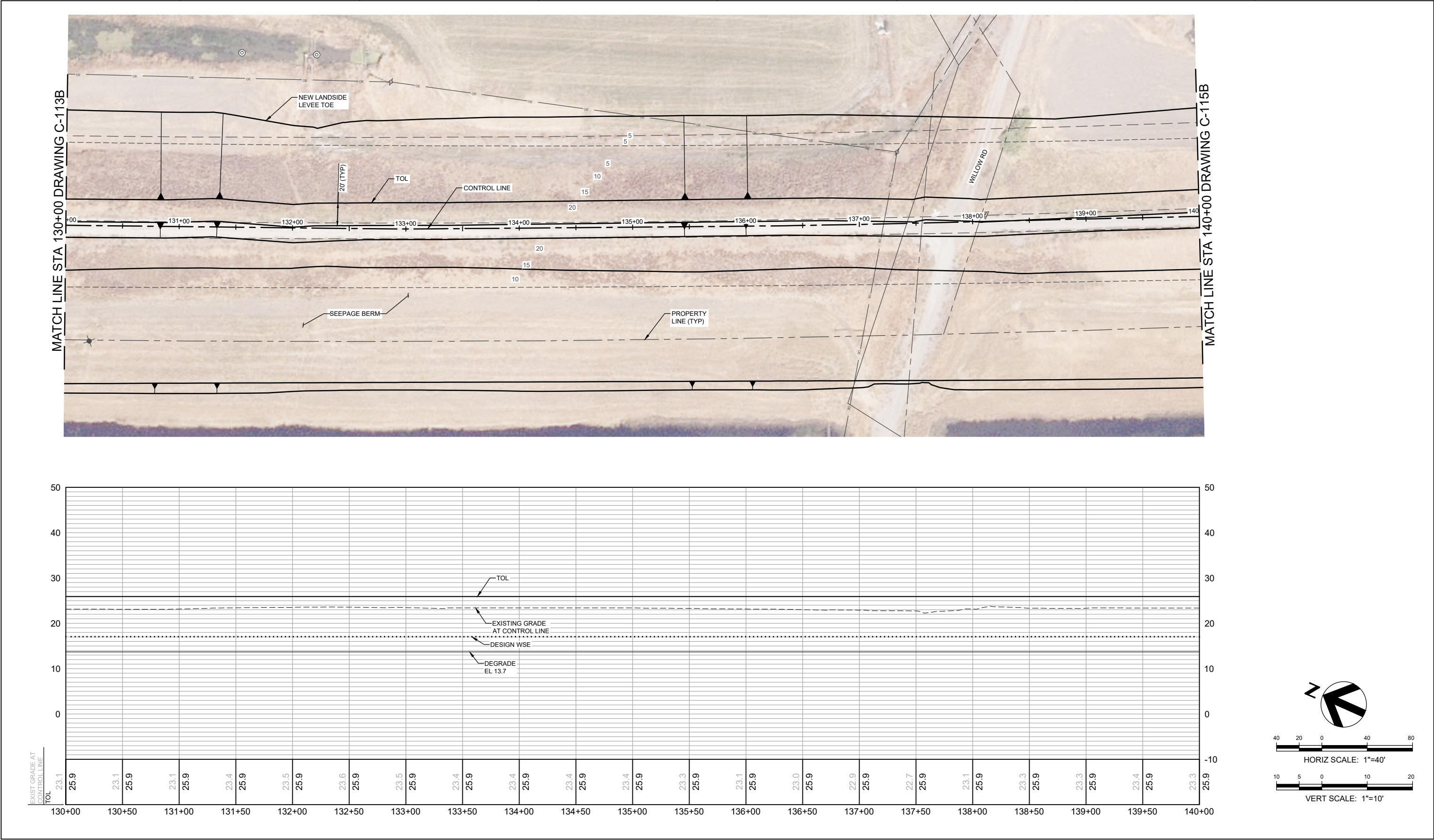
ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX







ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

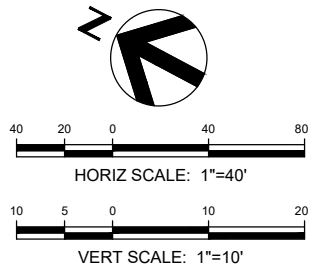
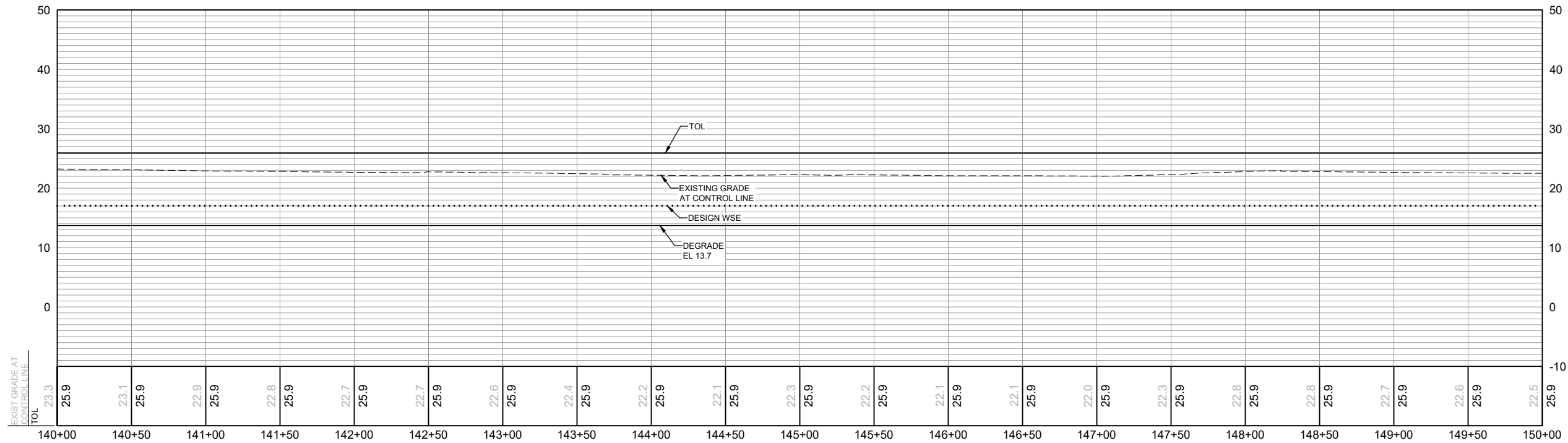
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PLAN AND PROFILE  
STA 130+00 TO 140+00  
OPTION 2

FILENAME 10314280C-114B.dwg  
SCALE AS SHOWN

SHEET  
C-114B



1 2 3 4 5 6 7 8



ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

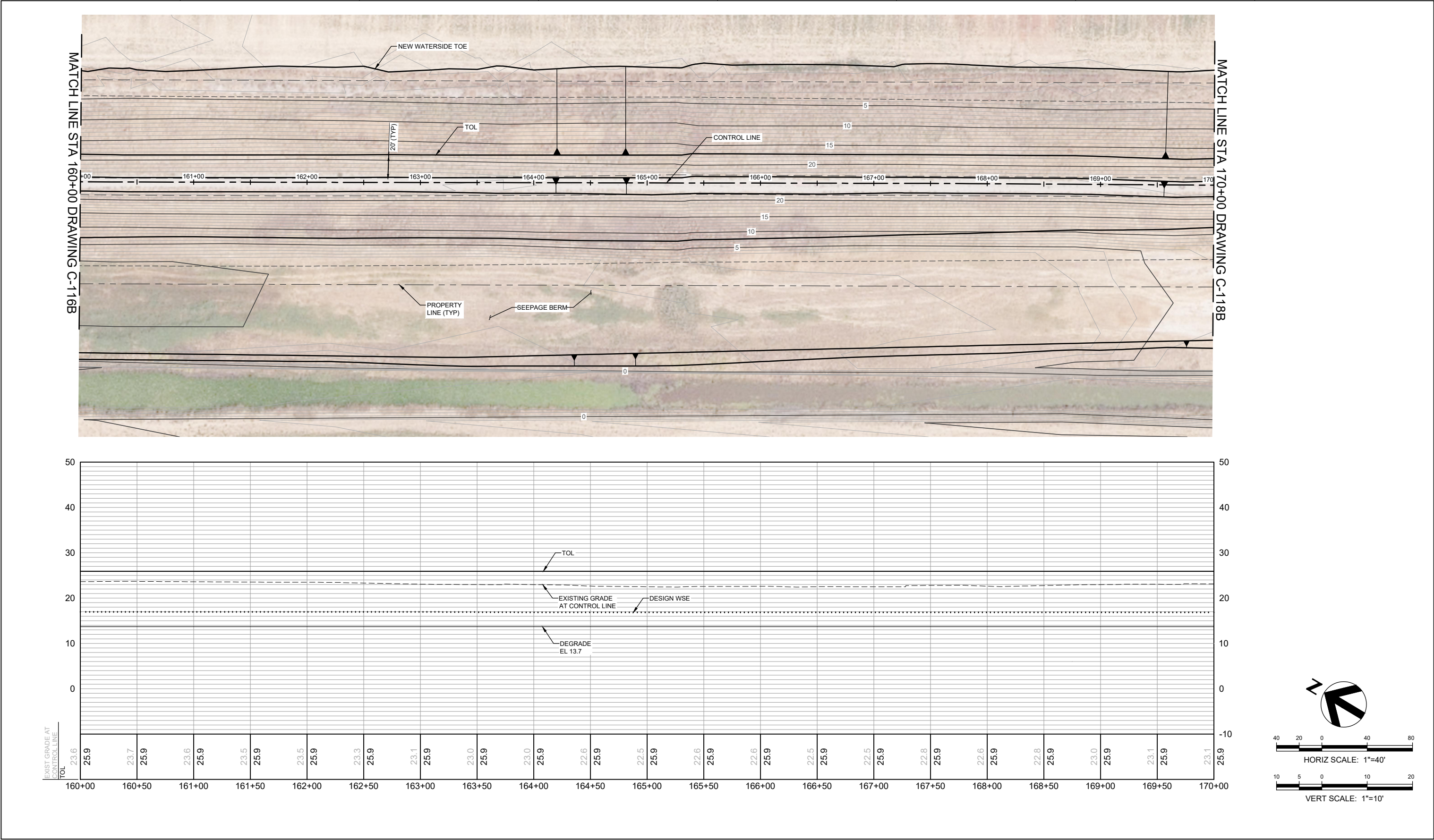
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FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 LEVEE PLAN AND PROFILE STA 140+00 TO 150+00 OPTION 2		
FILENAME	10314280C-115B.dwg	SHEET
SCALE	AS SHOWN	C-115B









ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

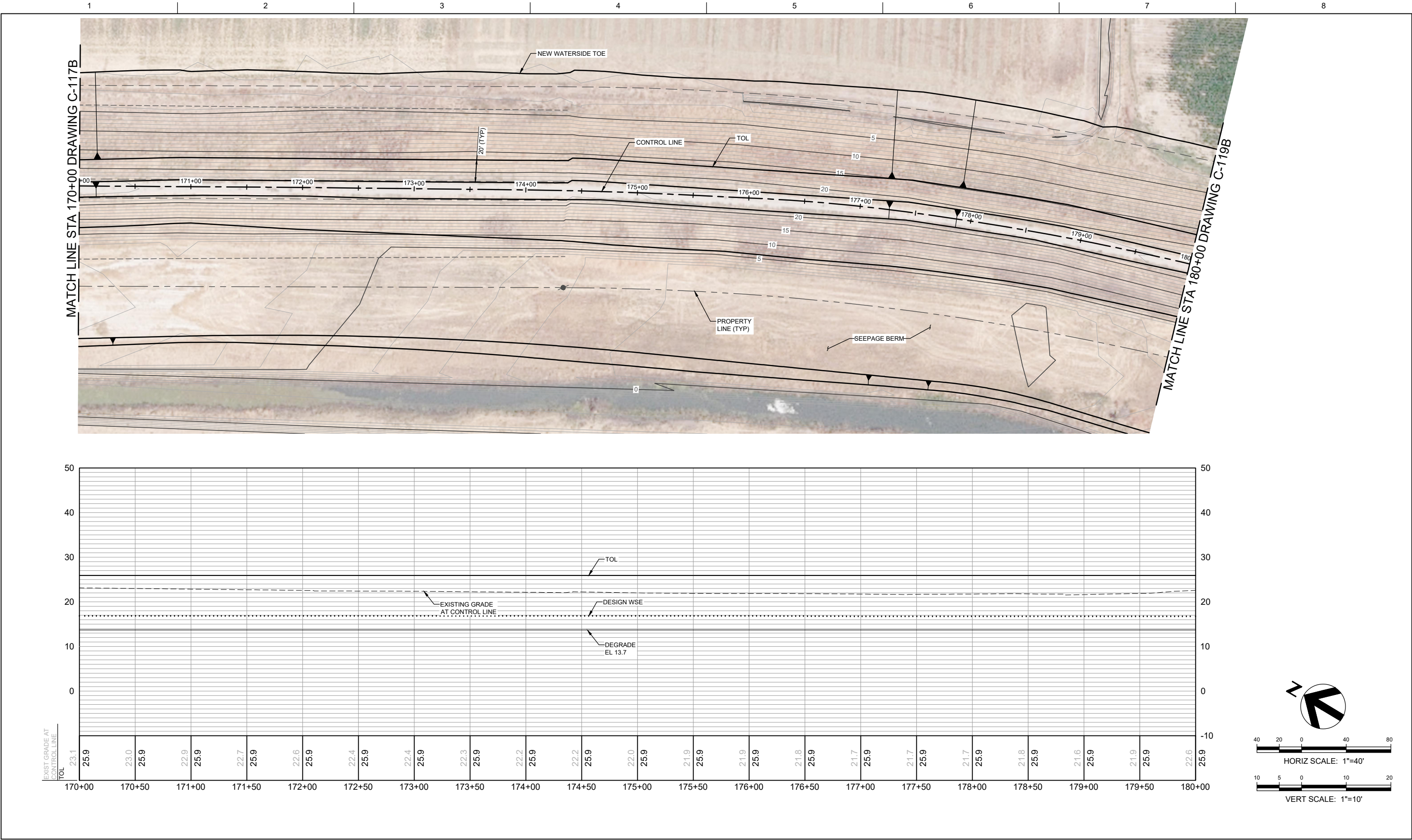
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CIVIL DESIGN APPENDIX

RD 536 LEVEE  
PLAN AND PROFILE  
STA 160+00 TO 170+00  
OPTION 2

FILENAME	10314280C-117B.dwg
SCALE	AS SHOWN

SHEET	C-117B
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ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

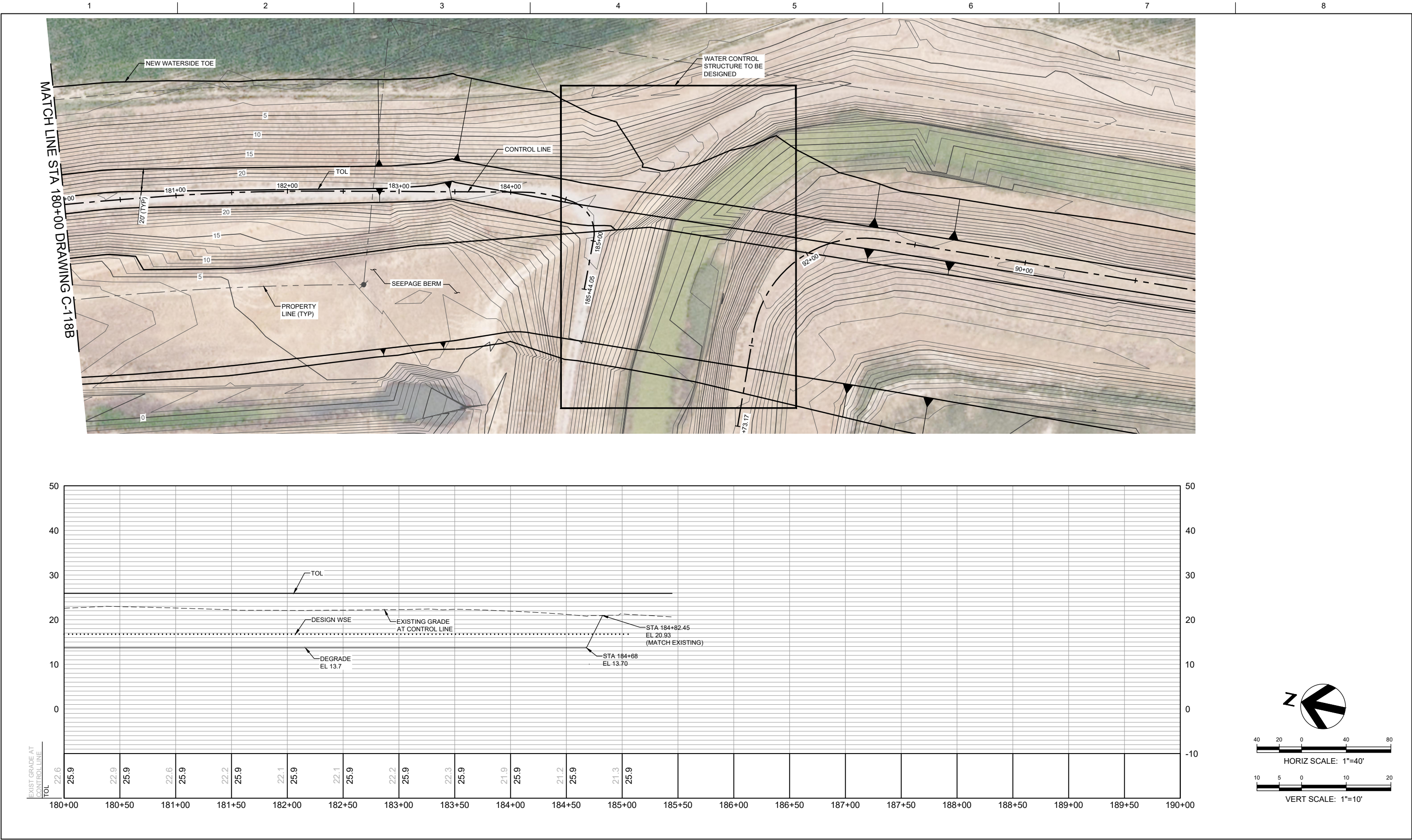
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FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 LEVEE  
PLAN AND PROFILE  
STA 170+00 TO 180+00  
OPTION 2

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SCALE	AS SHOWN

SHEET	C-118B
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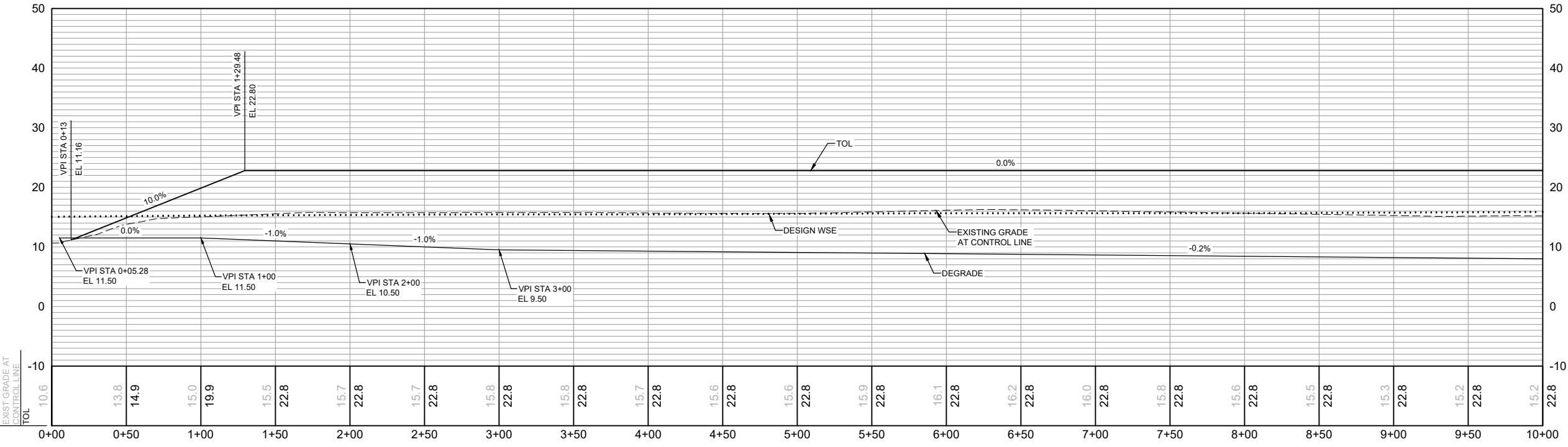
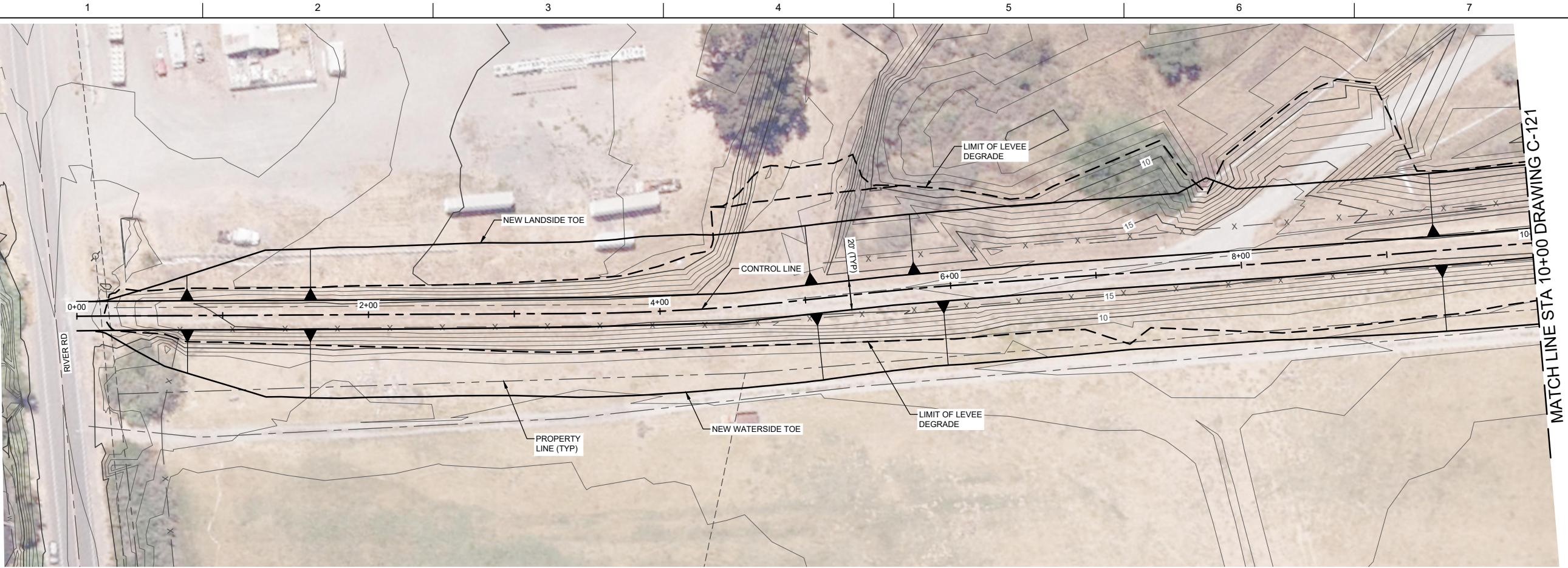


ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

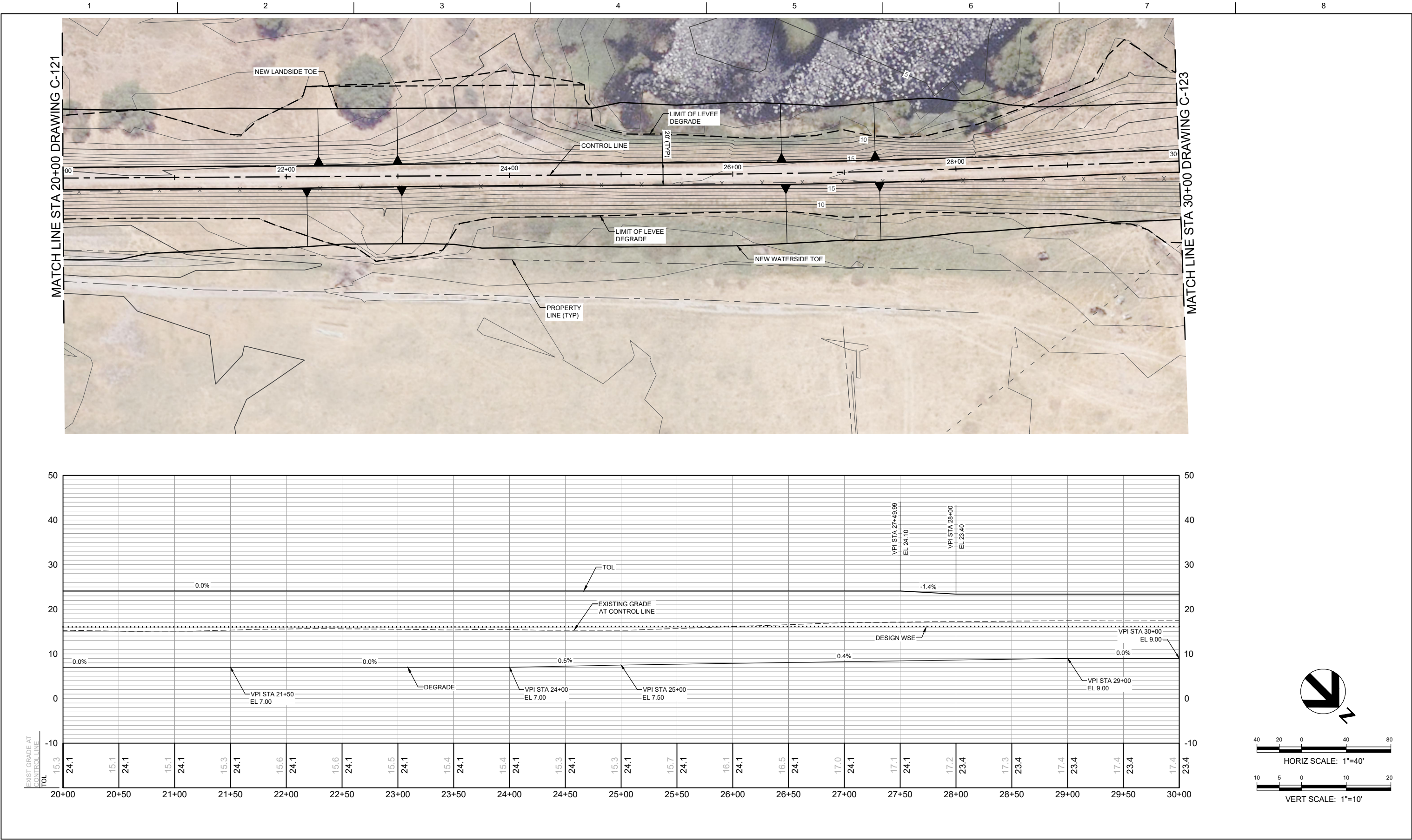
MELLIN LEVEE  
PLAN AND PROFILE  
STA 0+00 TO 10+00  
OPTION 2

FILENAME	10314280C-120.dwg
SCALE	AS SHOWN









ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

MELLIN LEVEE  
PLAN AND PROFILE  
STA 20+00 TO 30+00  
OPTION 2

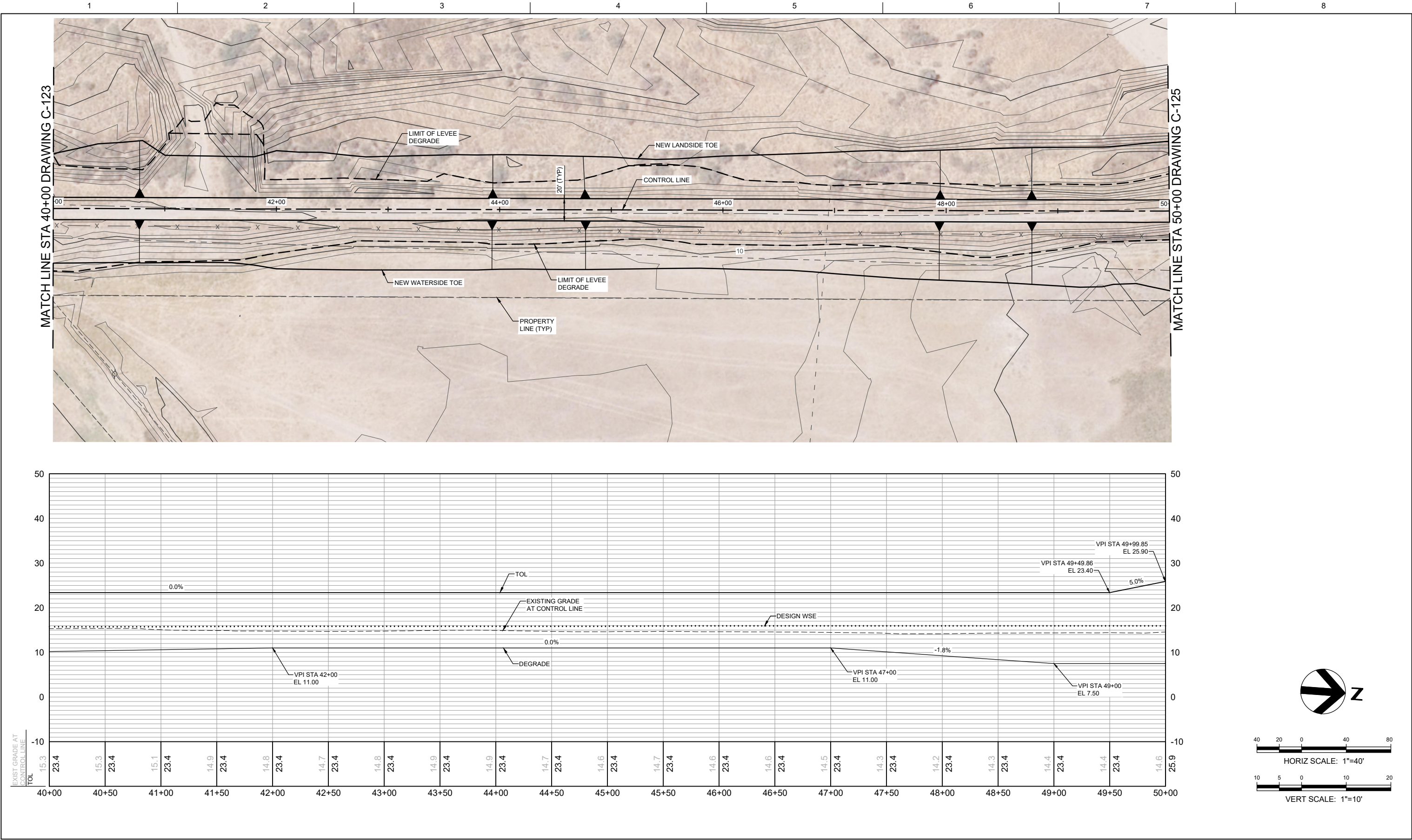
FILENAME	10314280C-122.dwg
SCALE	AS SHOWN

SHEET
C-122









ISSUE	DATE	DESCRIPTION

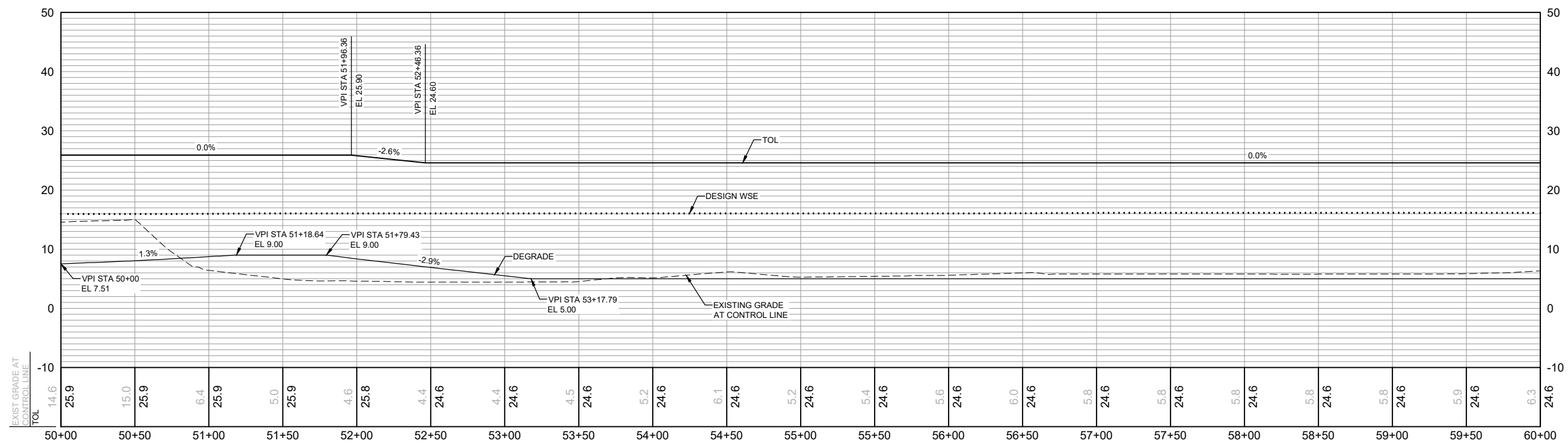
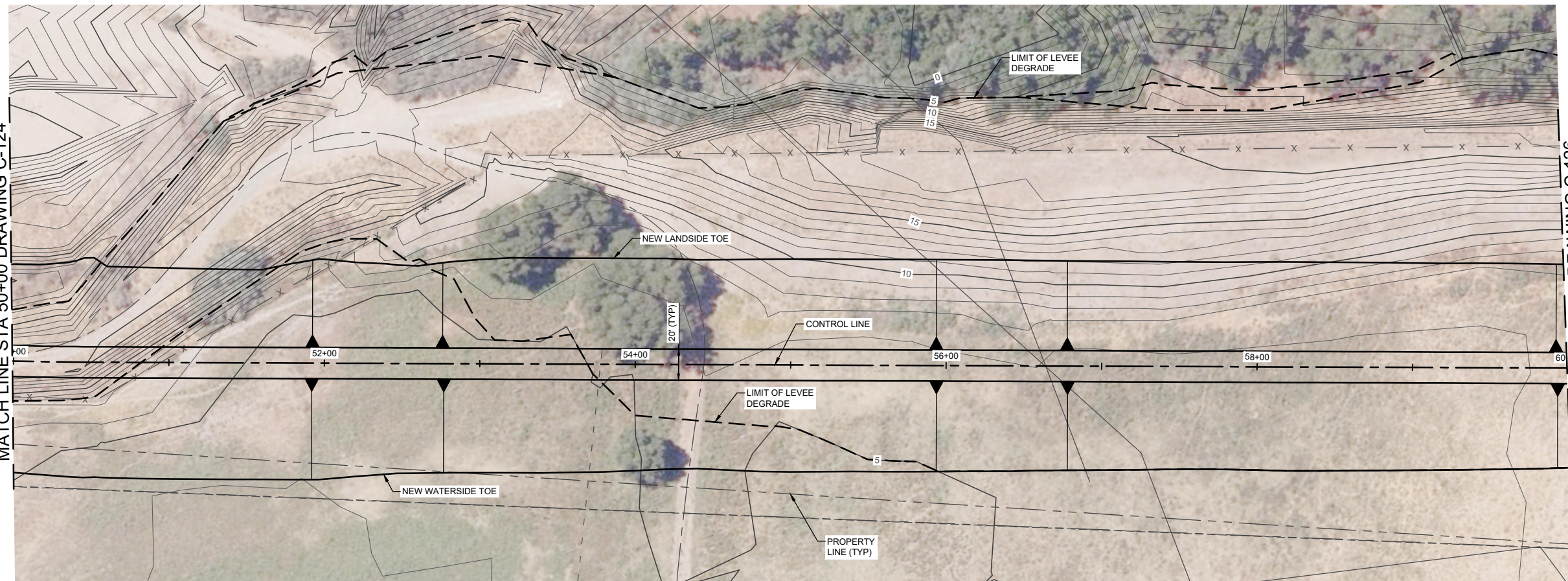
PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

MELLIN LEVEE  
PLAN AND PROFILE  
STA 40+00 TO 50+00  
OPTION 2

FILENAME	10314280C-124.dwg
SCALE	AS SHOWN





HORIZ SCALE: 1"=40'

VERT SCALE: 1"=10'

[illegible]

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

**LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX**

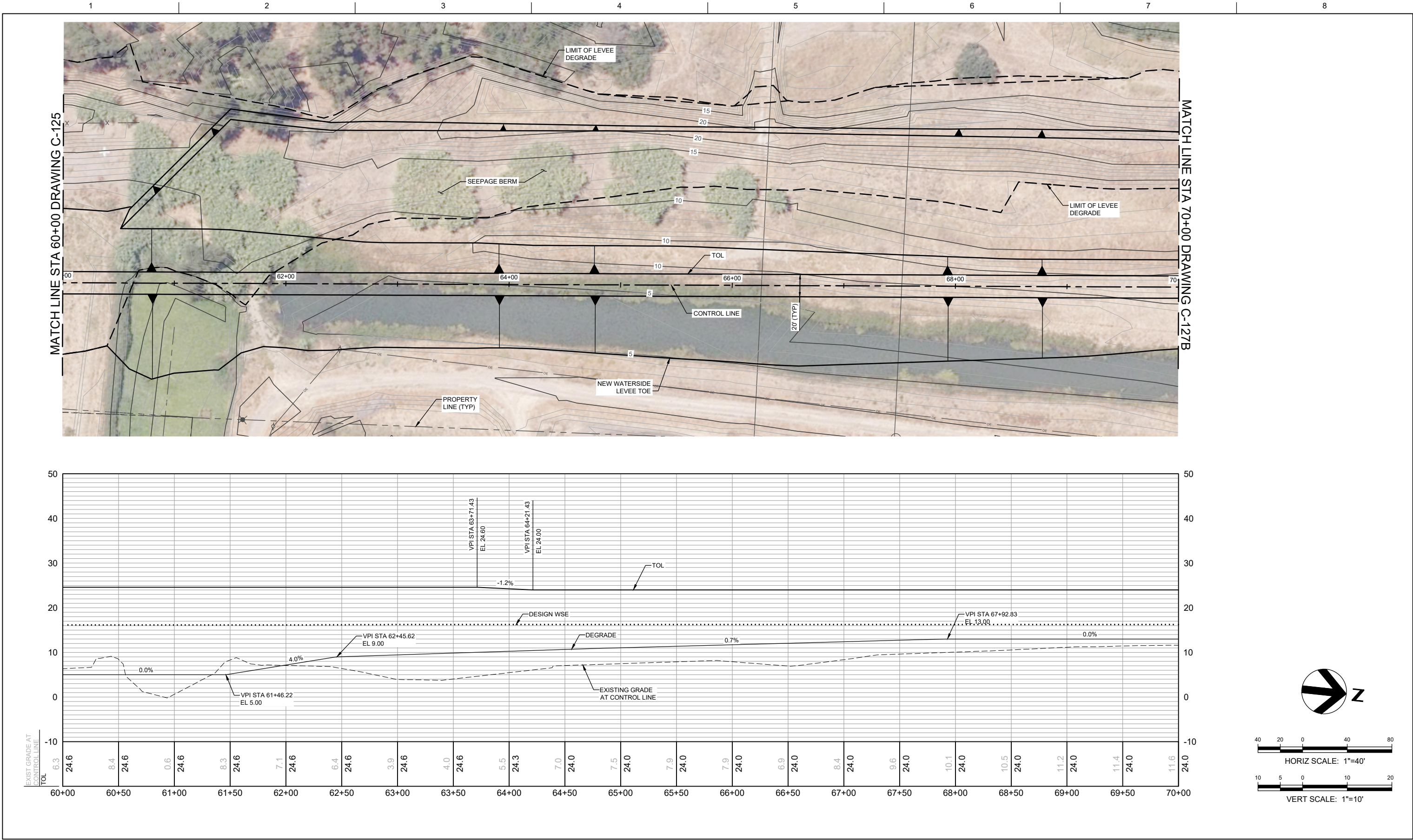
MELLIN LEVEE  
PLAN AND PROFILE  
STA 50+00 TO 60+00  
OPTION 2

<b>FILENAME</b>	10314280C-125.dwg
<b>SCALE</b>	AS SHOWN

SHEET

C-125





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

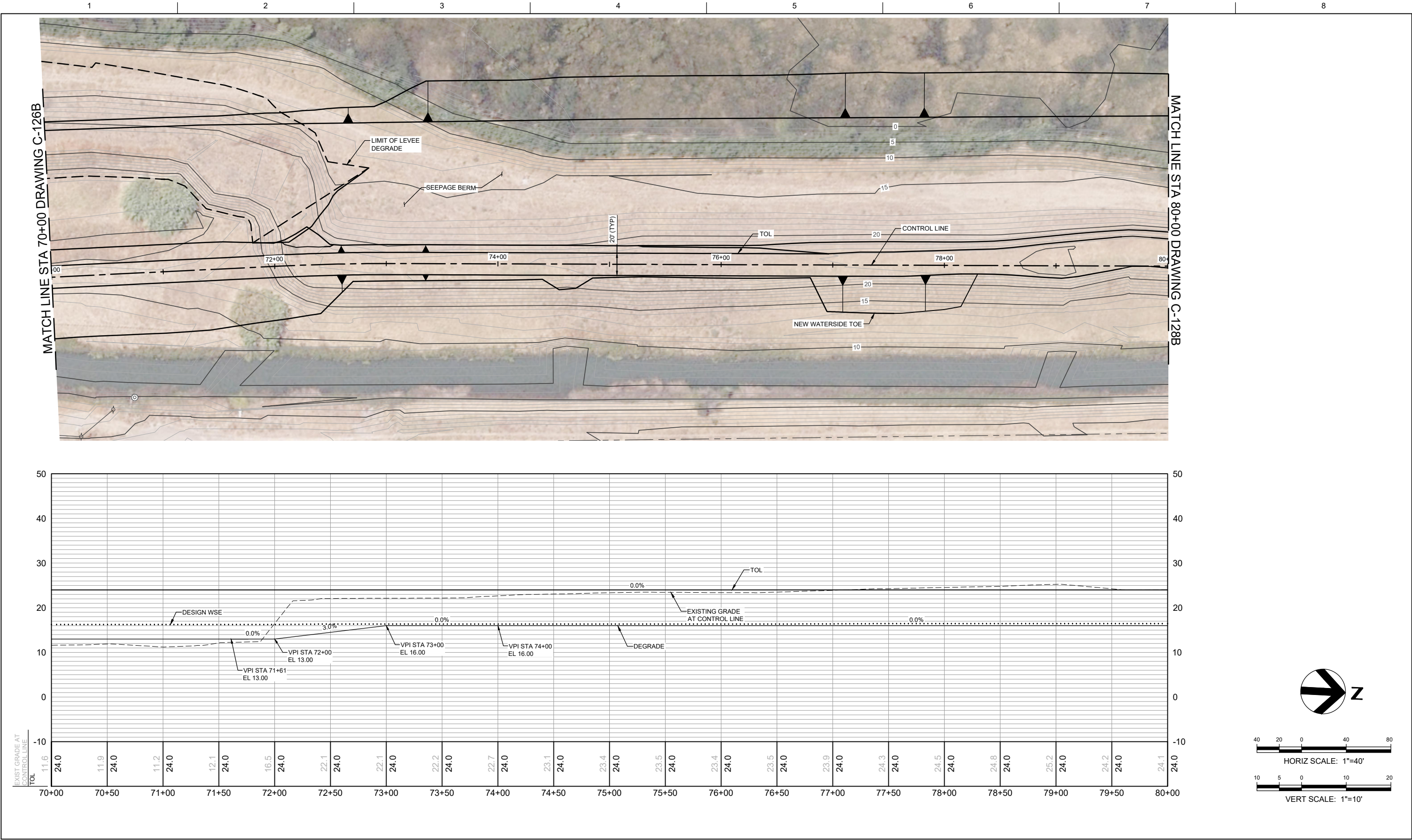
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

MELLIN LEVEE  
PLAN AND PROFILE  
STA 60+00 TO 70+00  
OPTION 2

FILENAME 10314280C-126B.dwg  
SCALE AS SHOWN

SHEET  
C-126B





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

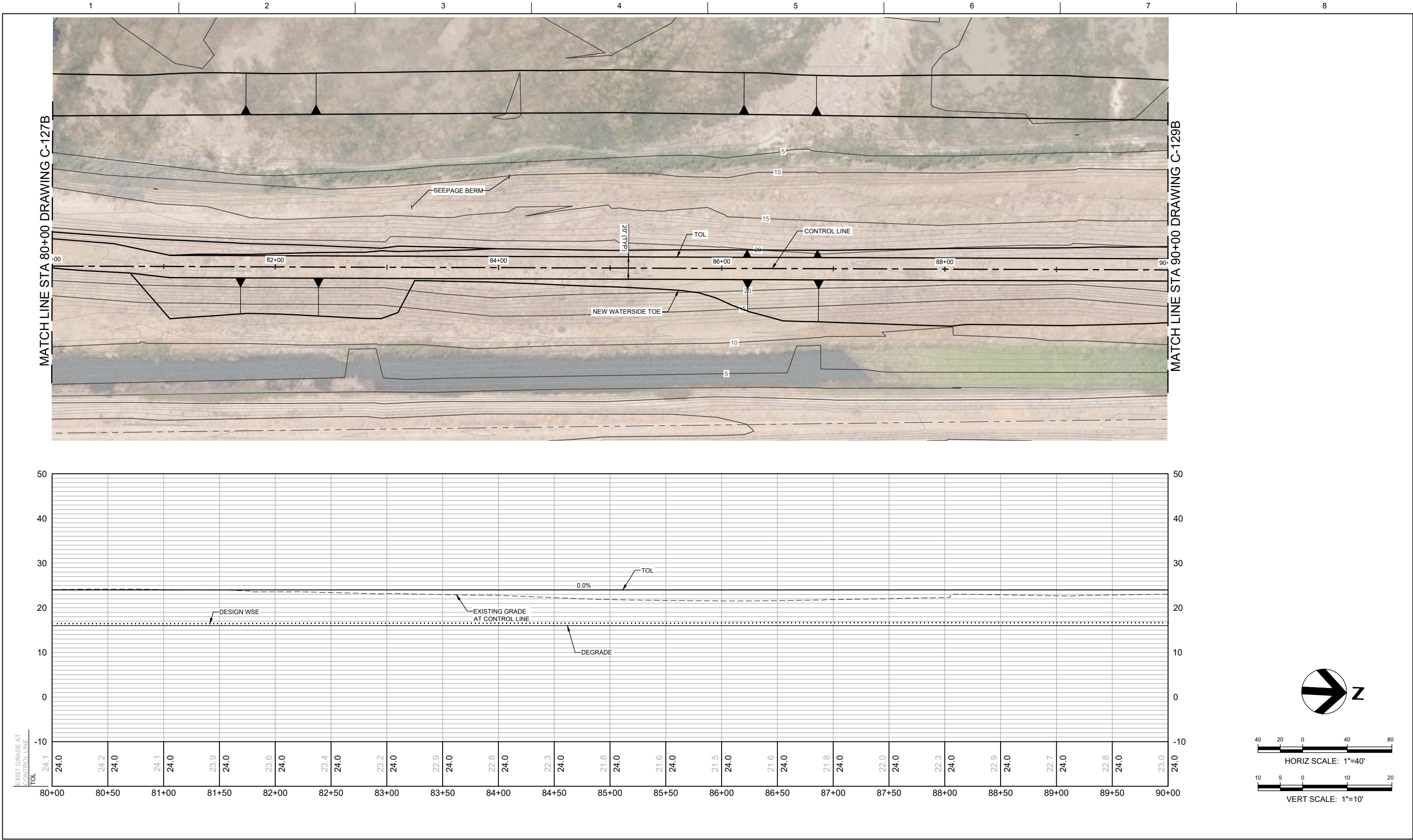
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

MELLIN LEVEE  
PLAN AND PROFILE  
STA 70+00 TO 80+00  
OPTION 2

FILENAME	10314280C-127B.dwg
SCALE	AS SHOWN

SHEET	C-127B
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ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

MELLIN LEVEE  
PLAN AND PROFILE  
STA 80+00 TO 90+00  
OPTION 2

FILENAME	10314280C-128B.dwg
SCALE	AS SHOWN

SHEET	C-128B
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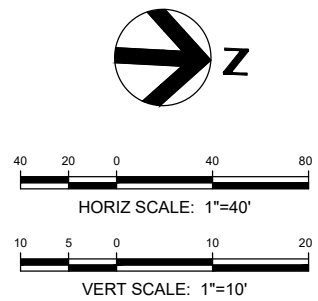
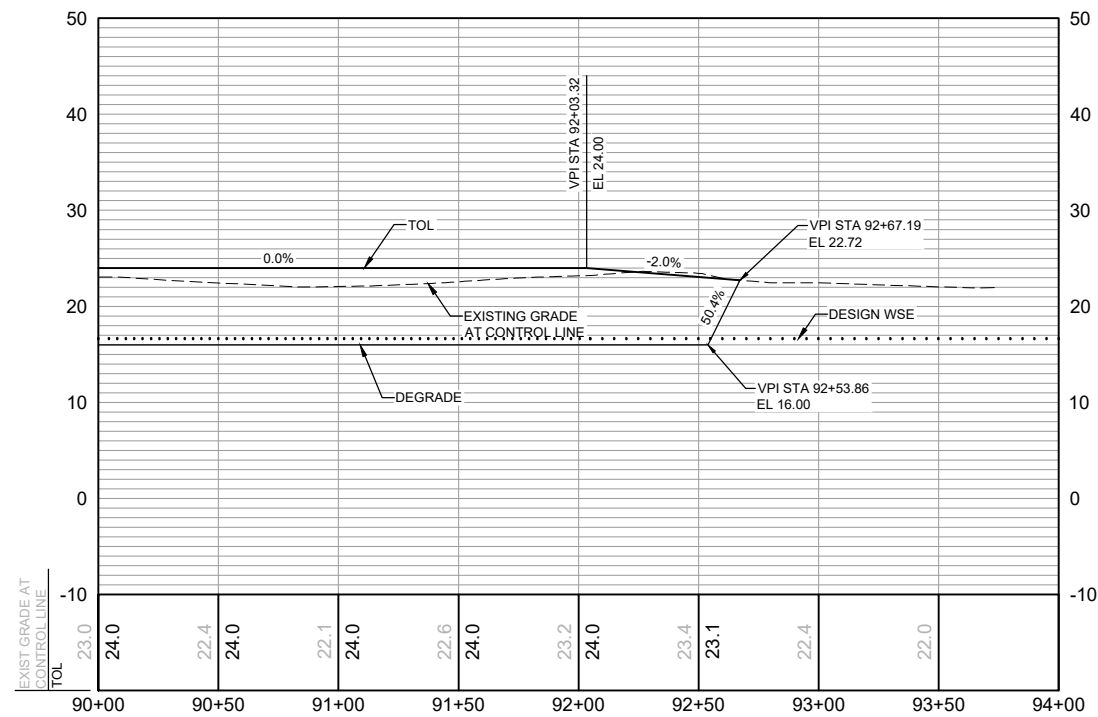
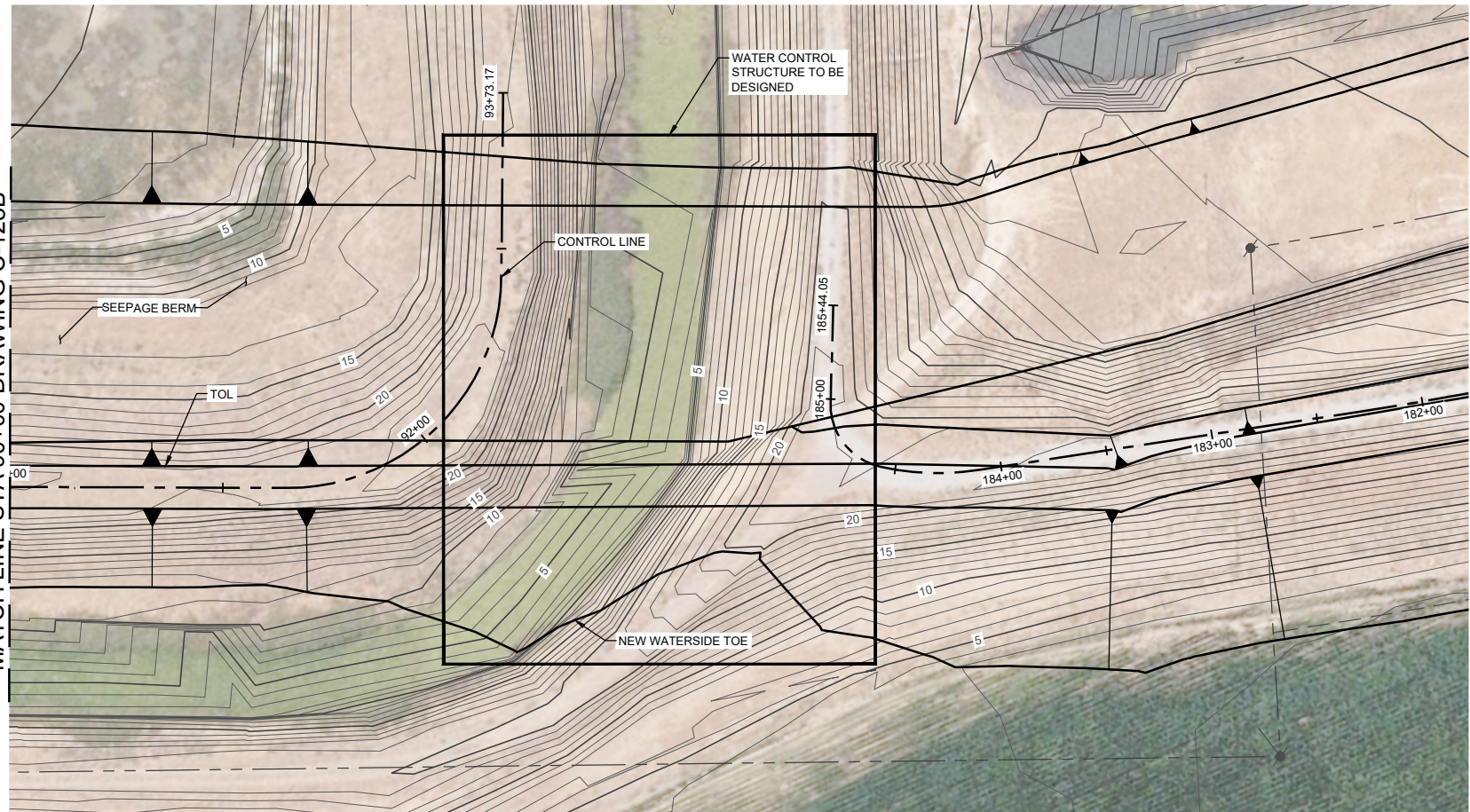
5

6

7

8

MATCH LINE STA 90+00 DRAWING C-128B



ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

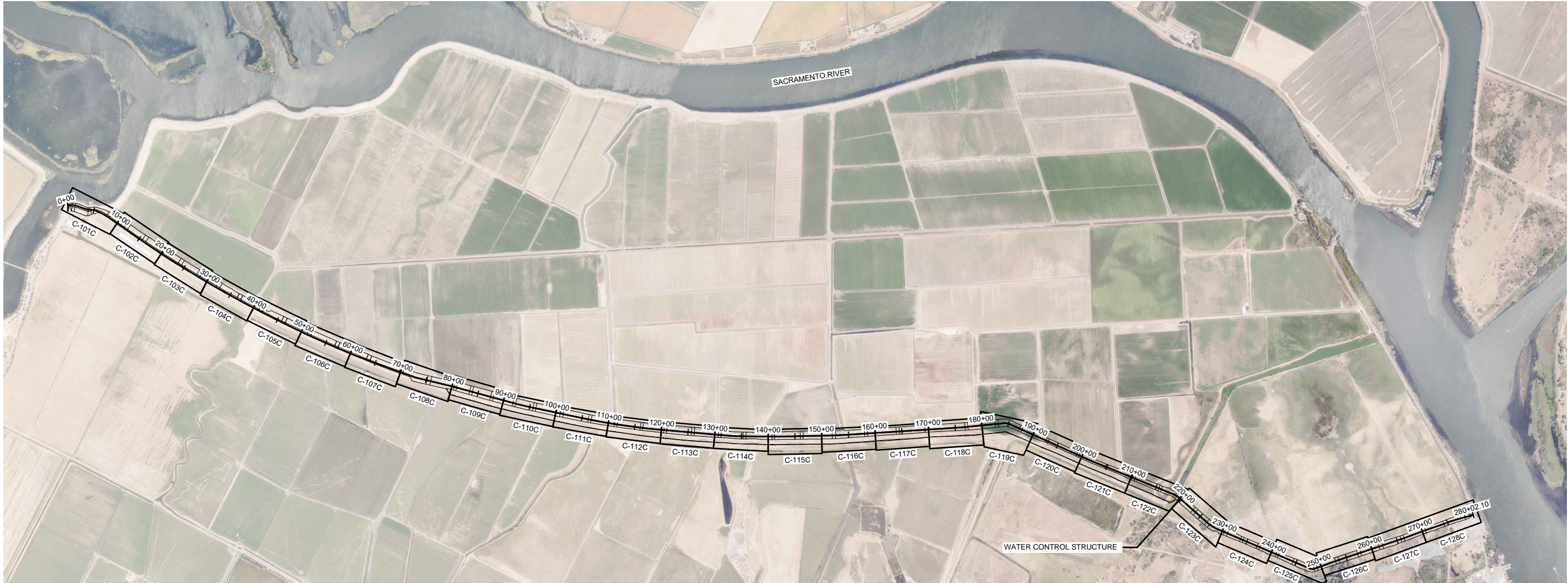
MELLIN LEVEE  
PLAN AND PROFILE  
STA 90+00 TO 92+67.19  
OPTION 2

FILENAME	10314280C-129B.dwg
SCALE	AS SHOWN

SHEET	C-129B
-------	--------

# Option 2B Plans





SCALE: 1"=1000'



ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

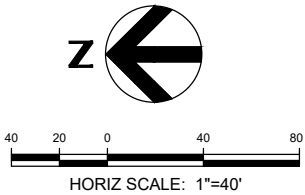
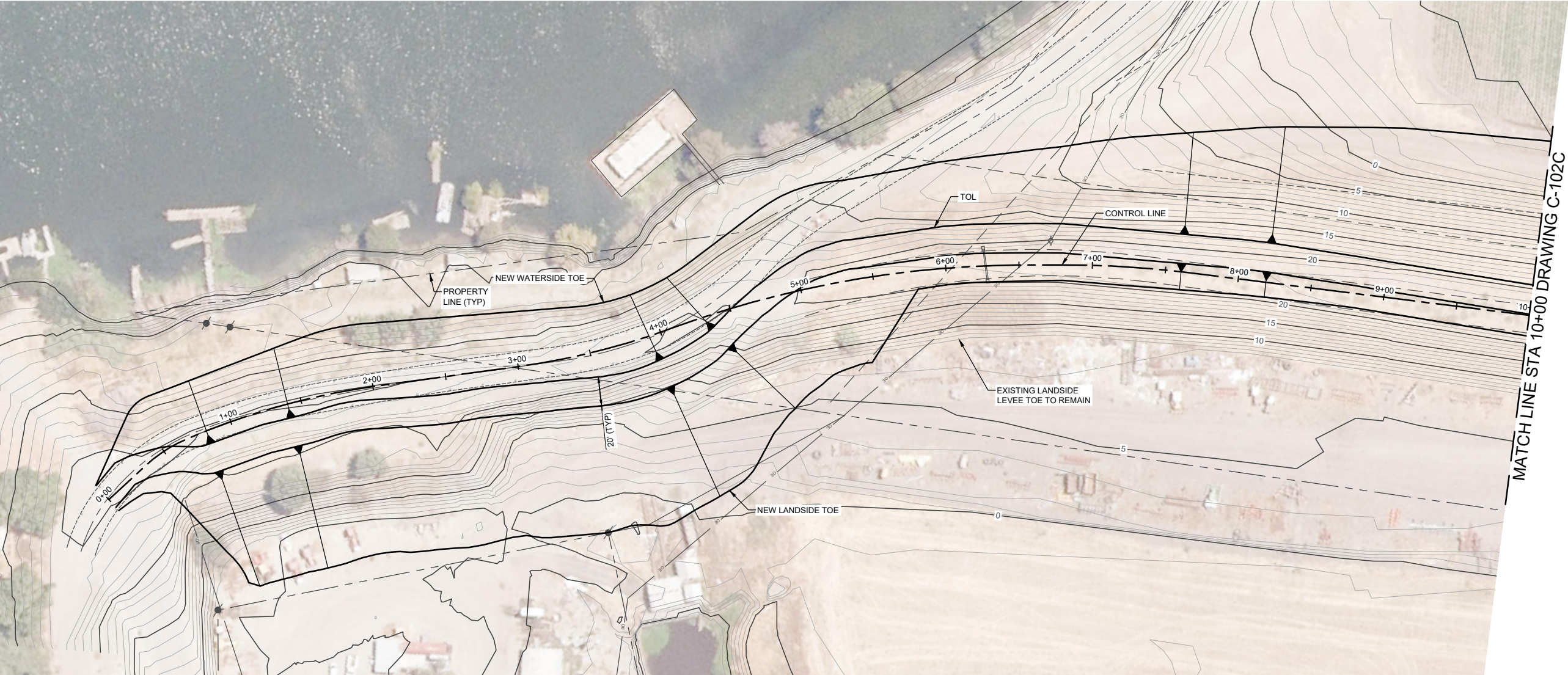
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 LEVEE  
OVERALL PLAN AND KEYMAP  
OPTION 2B

FILENAME	10314280C-100C.dwg
SCALE	AS SHOWN

SHEET
C-100C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

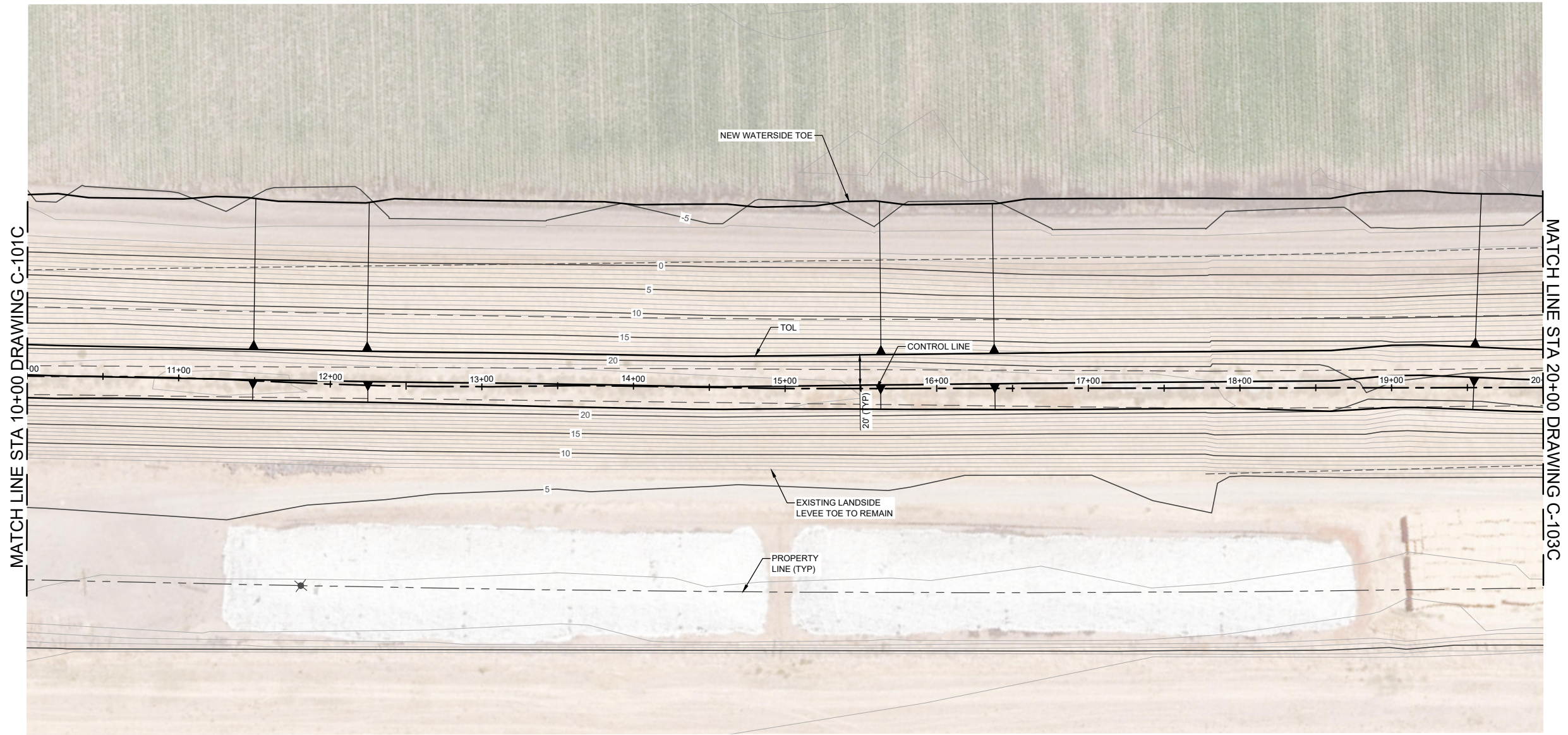
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FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLANS  
STA 0+00 TO 10+00  
OPTION 2B

FILENAME	10314280C-101C.dwg
SCALE	AS SHOWN

SHEET
C-101C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

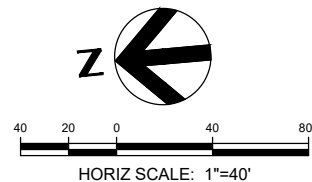
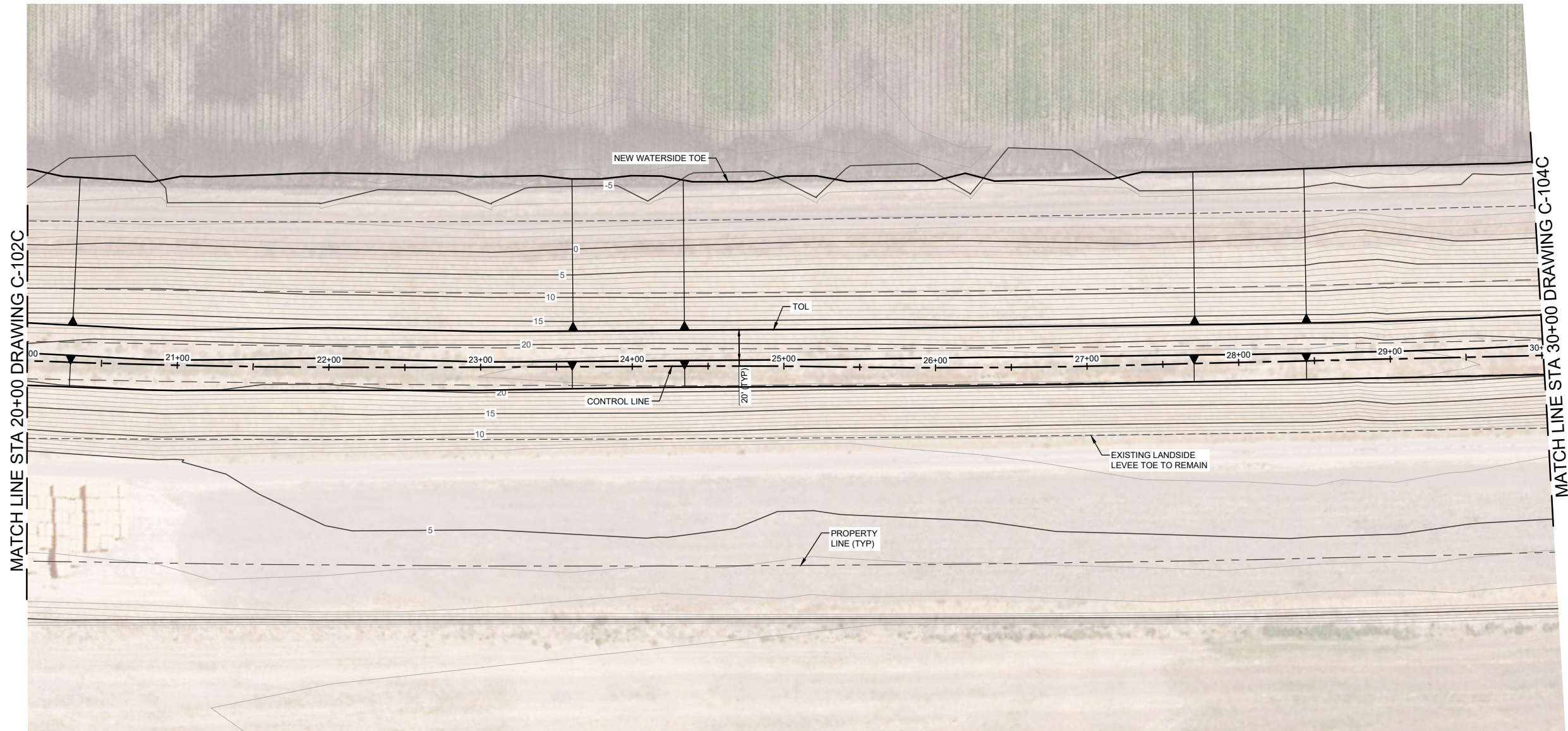
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 10+00 TO 20+00  
OPTION 2B

FILENAME	10314280C-102C.dwg
SCALE	AS SHOWN

SHEET
C-102C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBLTY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 20+00 TO 30+00  
OPTION 2B

FILENAME	10314280C-103C.dwg
SCALE	AS SHOWN

SHEET
C-103C



1

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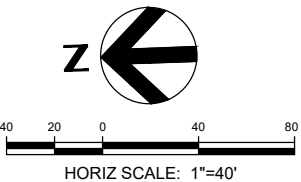
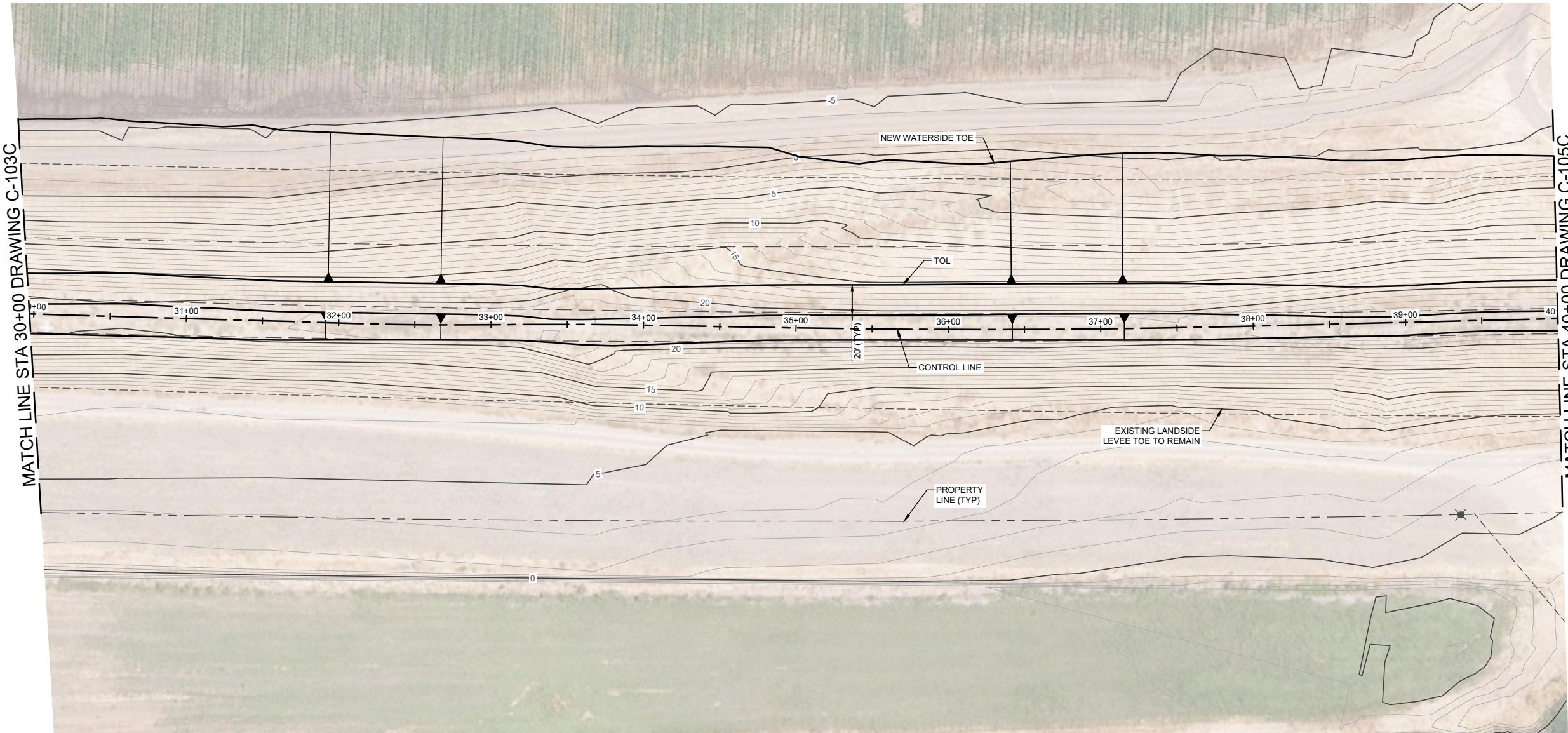
4

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6

7

8



ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

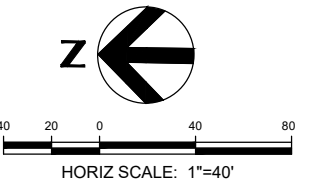
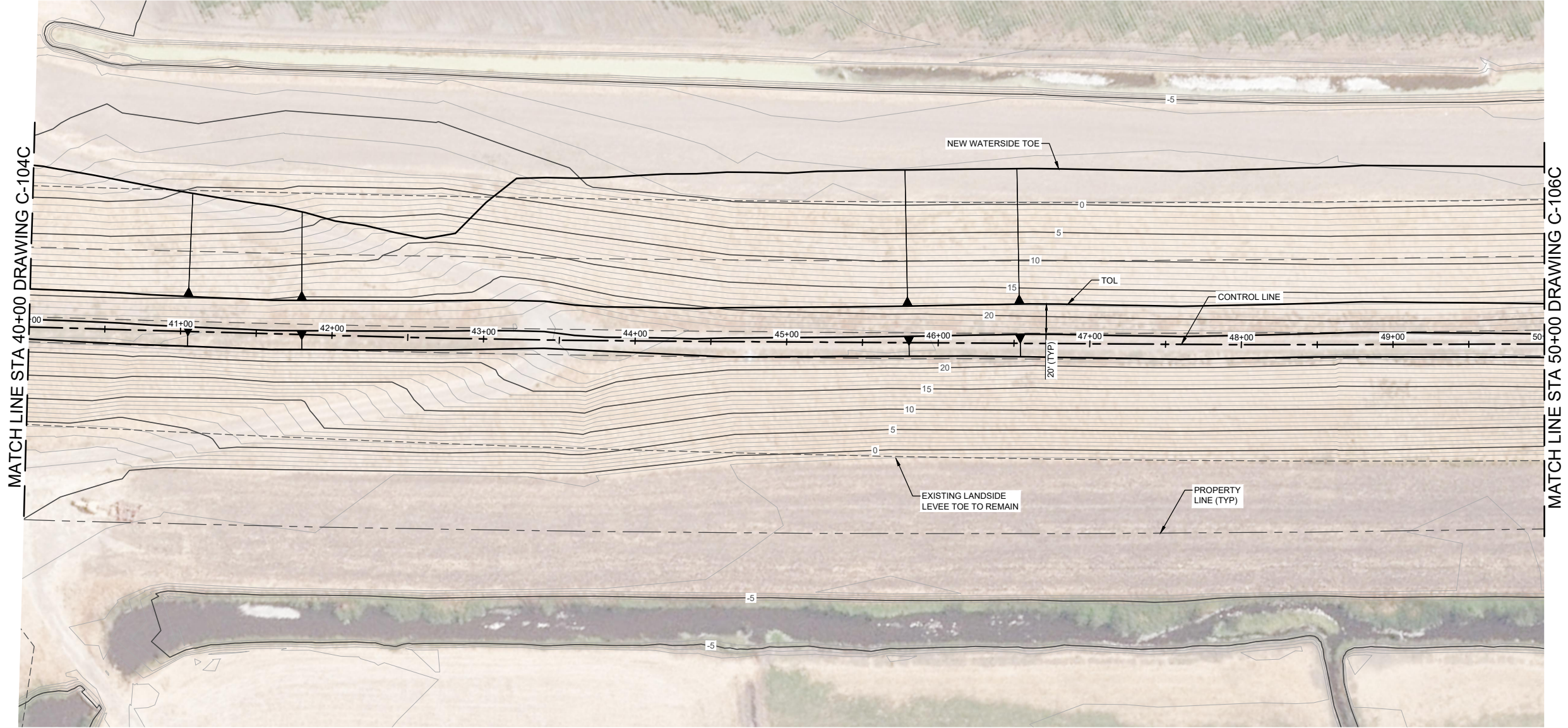
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 30+00 TO 40+00  
OPTION 2B

FILENAME	10314280C-104C.dwg
SCALE	AS SHOWN

SHEET
C-104C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

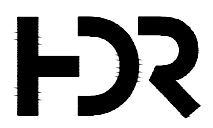
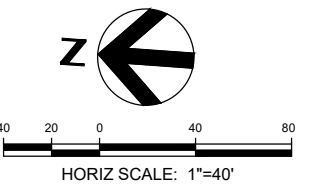
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 40+00 TO 50+00  
OPTION 2B

FILENAME	10314280C-105C.dwg
SCALE	AS SHOWN

SHEET  
C-105C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

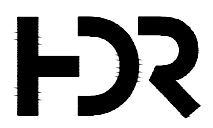
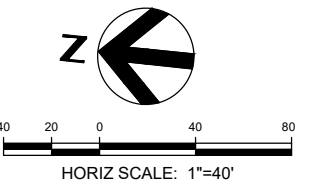
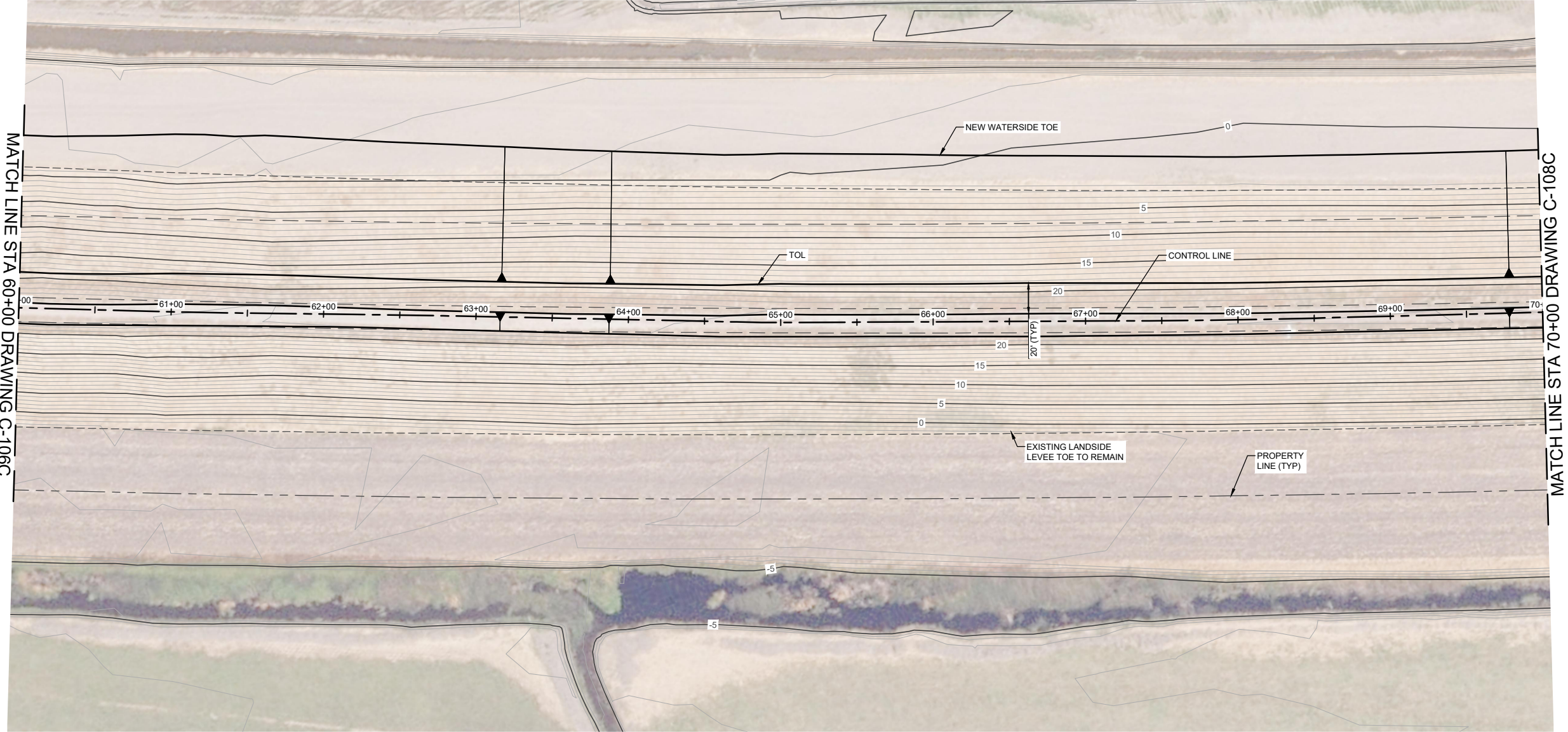
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 50+00 TO 60+00  
OPTION 2B

FILENAME	10314280C-106C.dwg
SCALE	AS SHOWN

SHEET
C-106C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

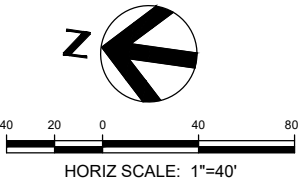
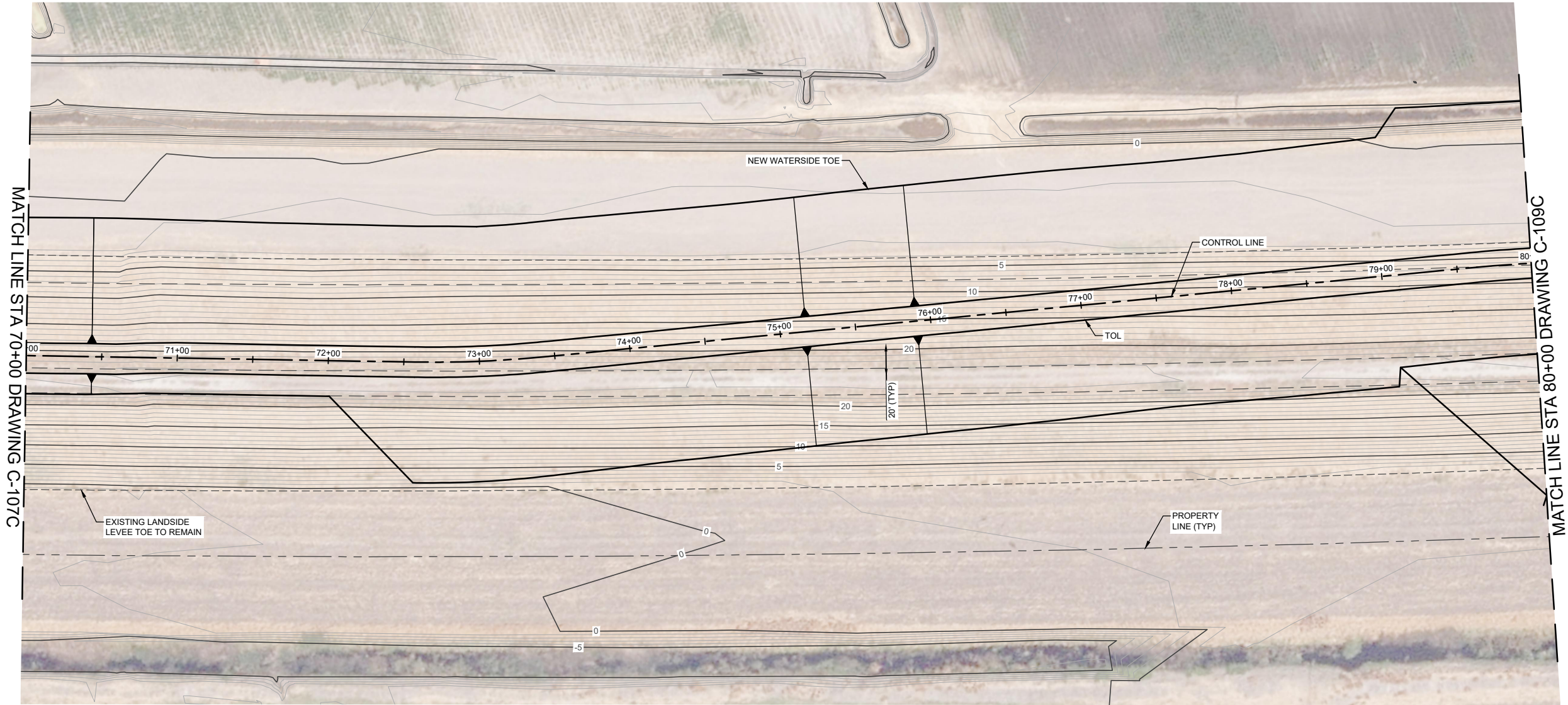
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 60+00 TO 70+00  
OPTION 2B

FILENAME	10314280C-107C.dwg
SCALE	AS SHOWN

SHEET  
C-107C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 70+00 TO 80+00  
OPTION 2B

FILENAME	10314280C-108C.dwg
SCALE	AS SHOWN

SHEET
C-108C



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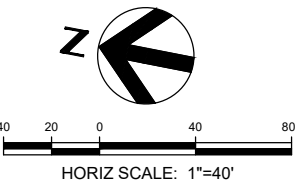
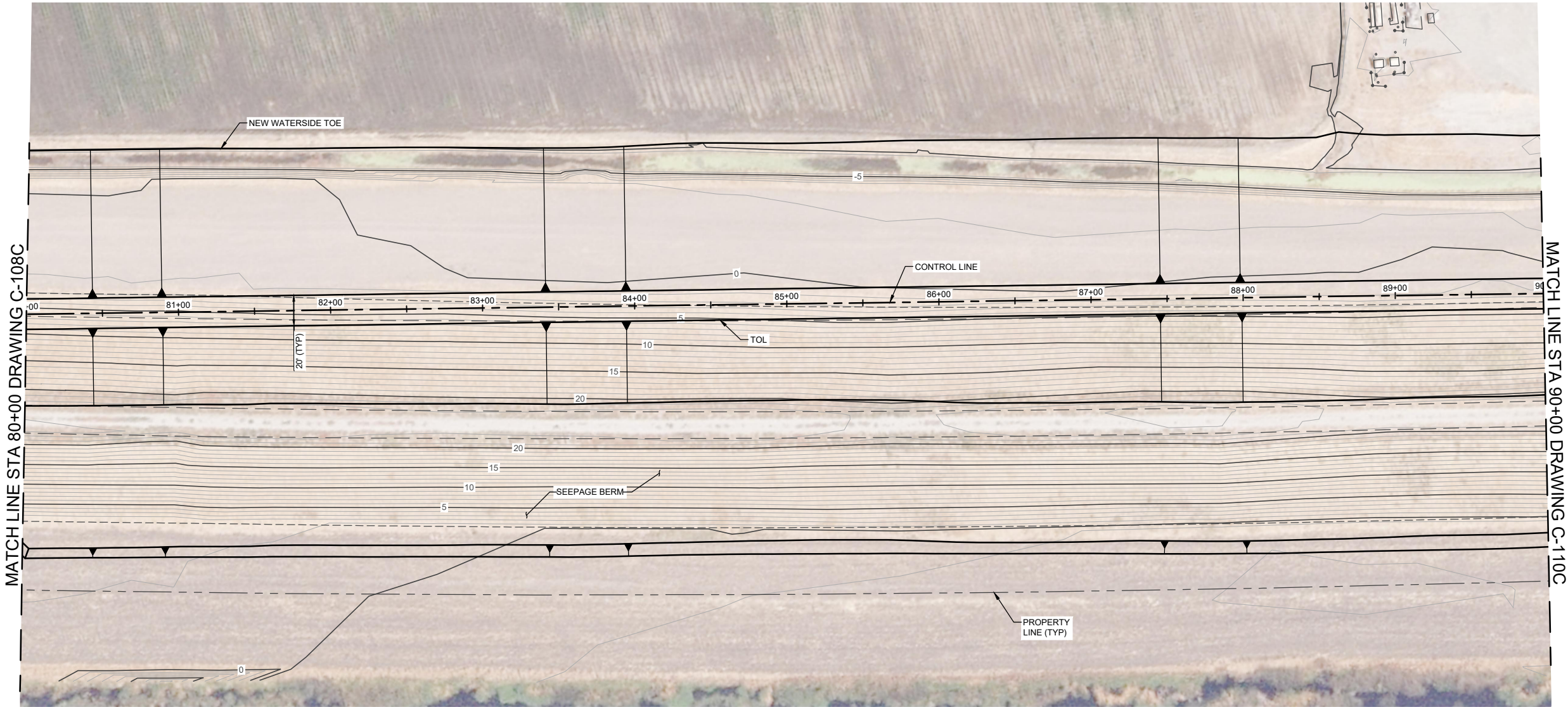
4

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ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

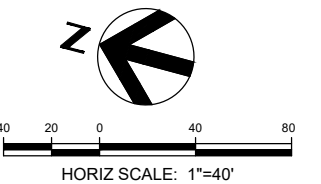
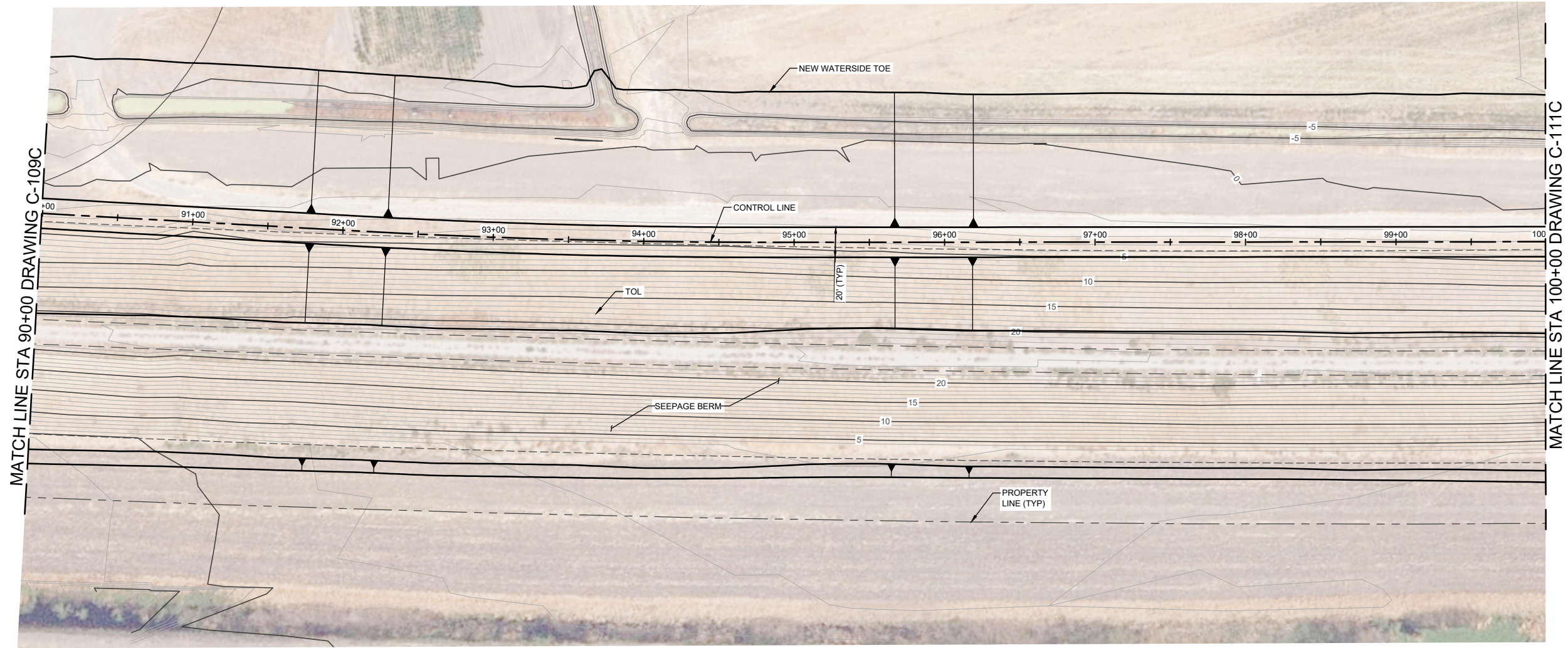
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 80+00 TO 90+00  
OPTION 2B

FILENAME	10314280C-109C.dwg
SCALE	AS SHOWN

SHEET  
C-109C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

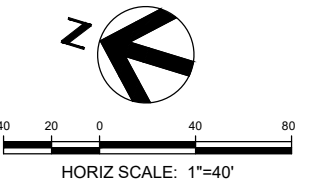
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FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 90+00 TO 100+00  
OPTION 2B

FILENAME	10314280C-110C.dwg
SCALE	AS SHOWN

SHEET
C-110C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

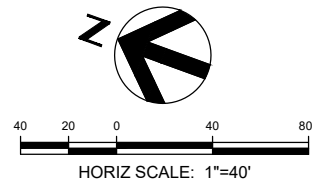
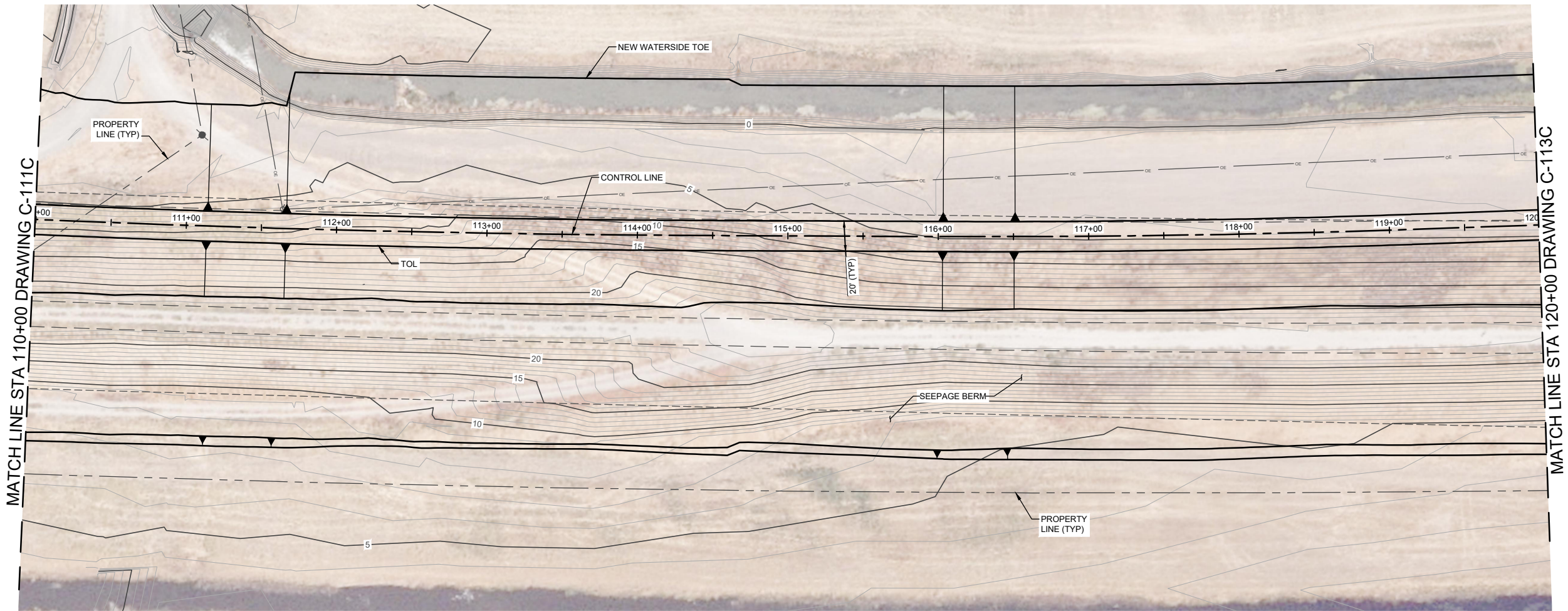
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 100+00 TO 110+00  
OPTION 2B

FILENAME	10314280C-111C.dwg
SCALE	AS SHOWN

SHEET  
C-111C





ISSUE	DATE	DESCRIPTION

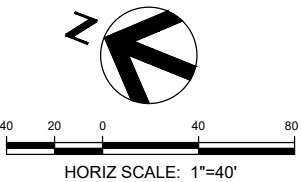
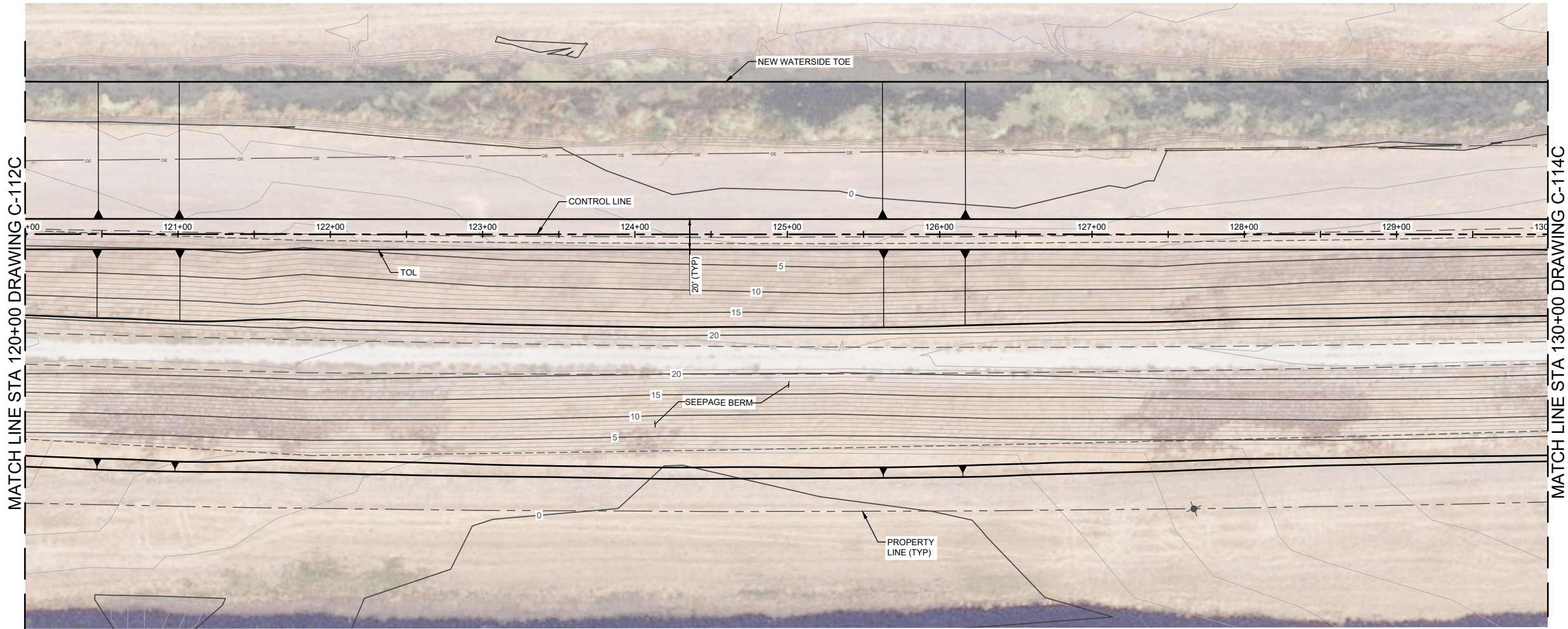
PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 110+00 TO 120+00  
OPTION 2B

FILENAME	10314280C-112C.dwg
SCALE	AS SHOWN





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

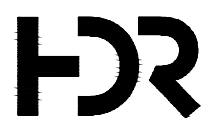
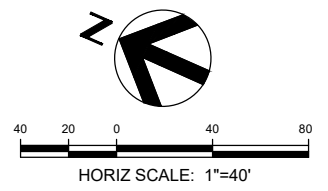
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 120+00 TO 130+00  
OPTION 2B

FILENAME	10314280C-113C.dwg
SCALE	AS SHOWN

SHEET  
C-113C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

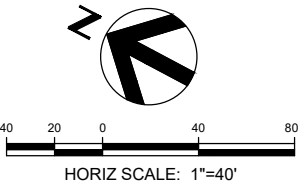
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 130+00 TO 140+00  
OPTION 2B

FILENAME	10314280C-114C.dwg
SCALE	AS SHOWN

SHEET
C-114C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

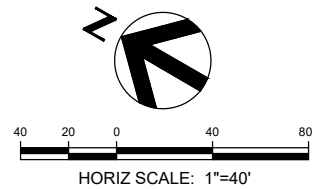
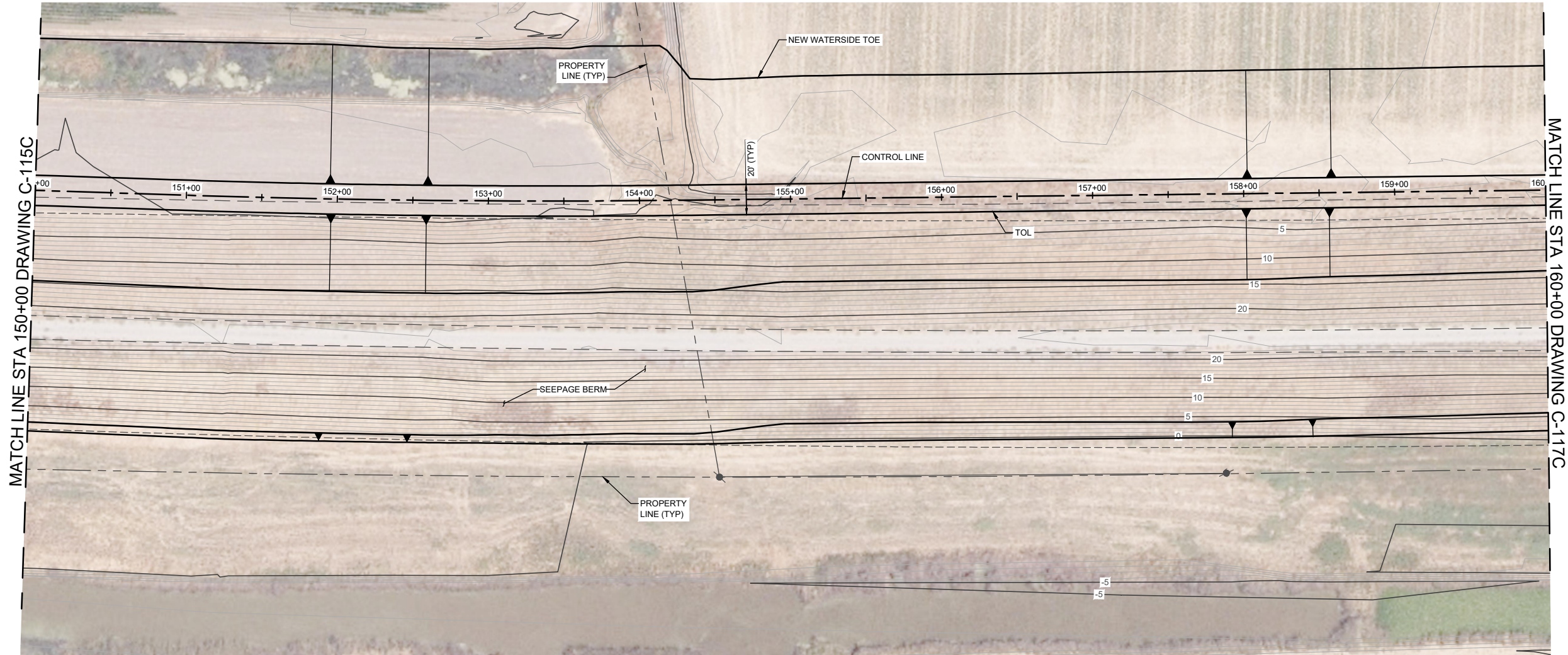
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 140+00 TO 150+00  
OPTION 2B

FILENAME	10314280C-115C.dwg
SCALE	AS SHOWN

SHEET  
C-115C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 150+00 TO 160+00  
OPTION 2B

FILENAME	10314280C-116C.dwg
SCALE	AS SHOWN

SHEET  
C-116C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

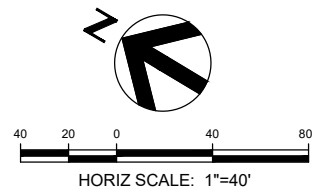
LITTLE EGBERT  
FEASIBLTY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 160+00 TO 170+00  
OPTION 2B

FILENAME	10314280C-117C.dwg
SCALE	AS SHOWN

SHEET  
C-117C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

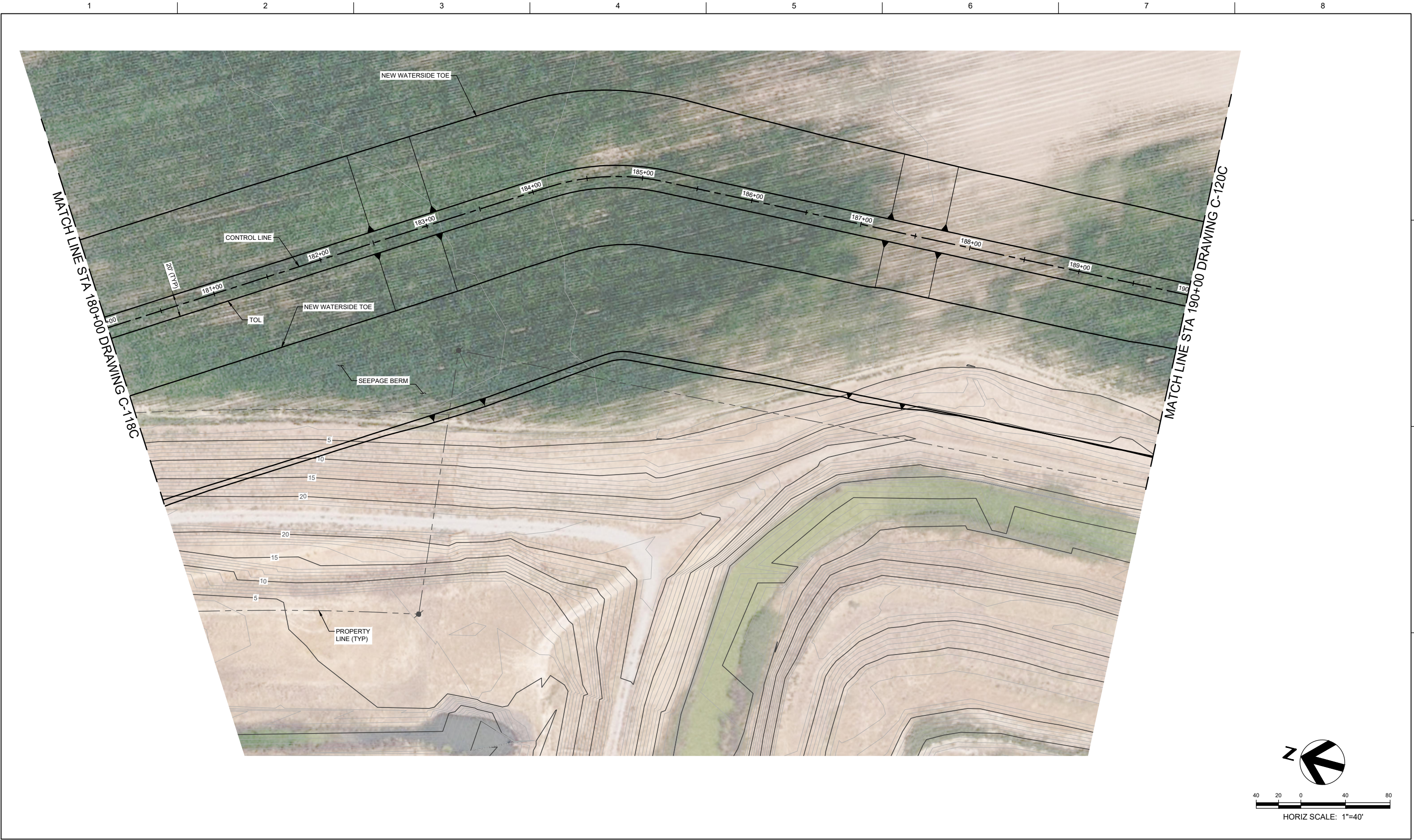
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CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 170+00 TO 180+00  
OPTION 2B

FILENAME	10314280C-118C.dwg
SCALE	AS SHOWN

SHEET  
C-118C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

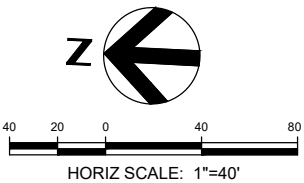
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OPTION 2B

FILENAME	10314280C-119C.dwg
SCALE	AS SHOWN

SHEET  
C-119C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

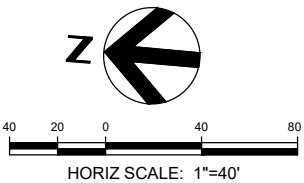
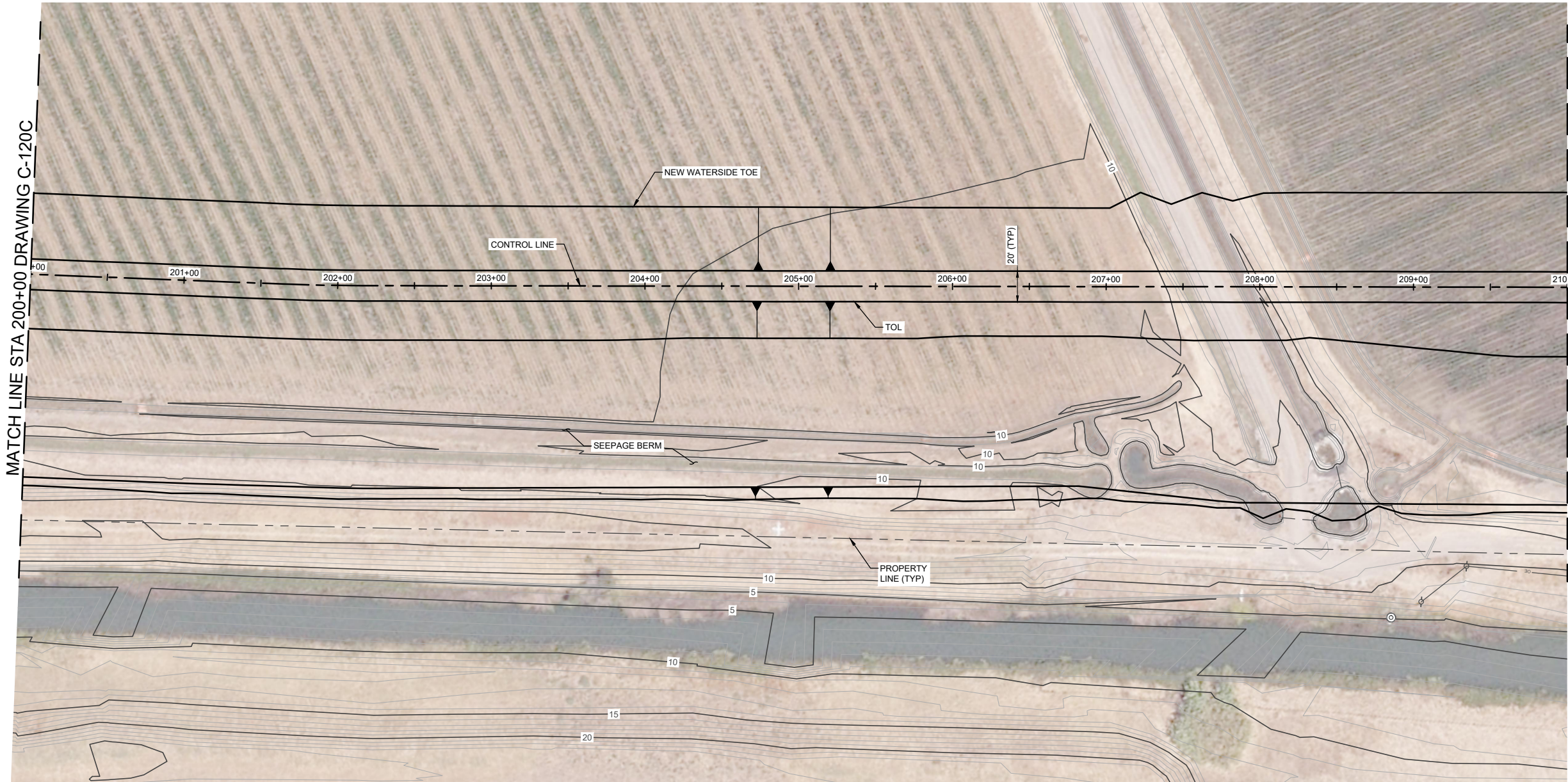
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PLAN  
STA 190+00 TO 200+00  
OPTION 2B

FILENAME	10314280C-120C.dwg
SCALE	AS SHOWN

SHEET  
C-120C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

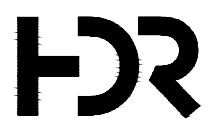
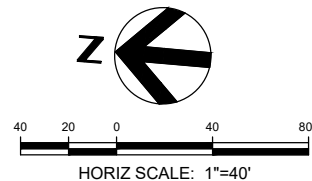
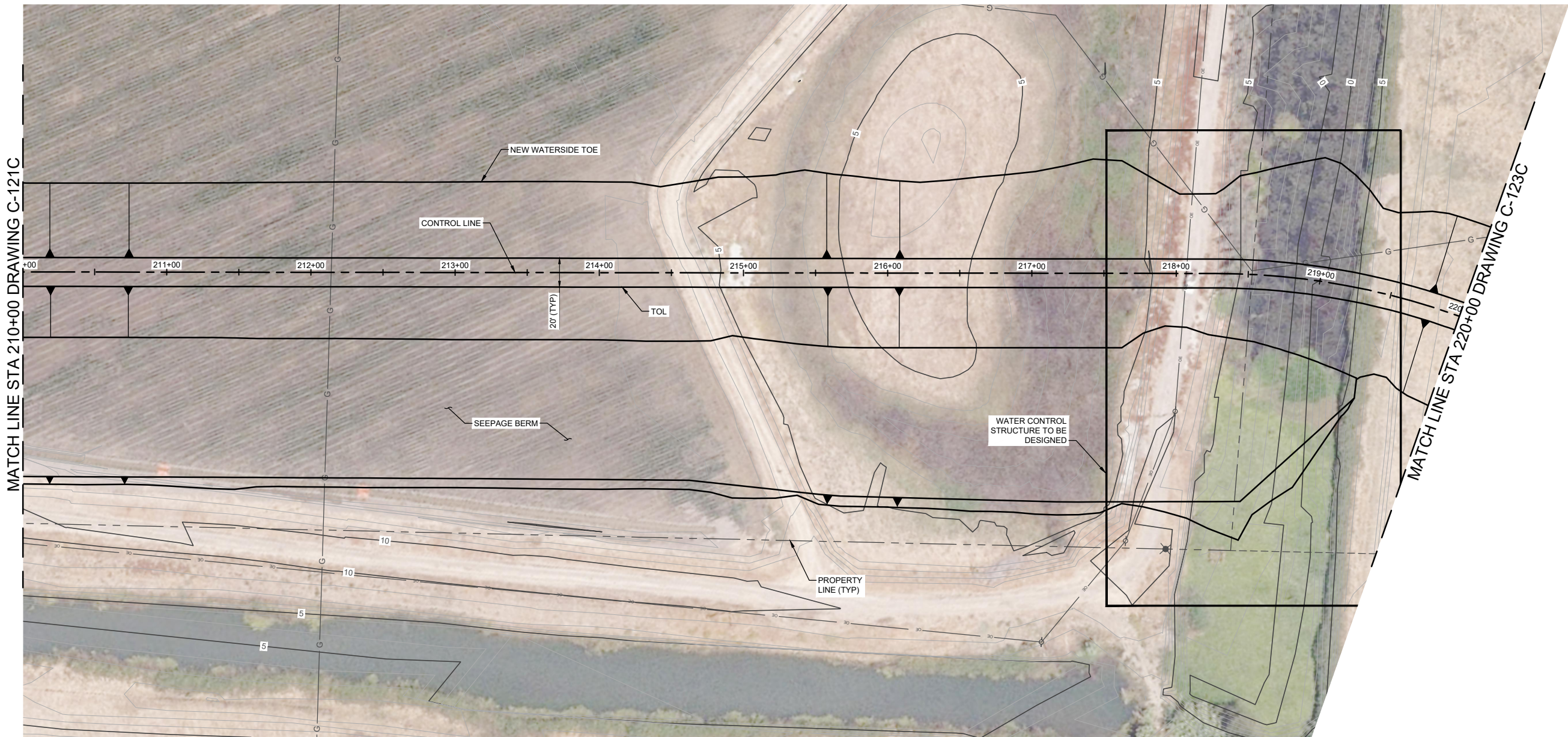
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FILENAME	10314280C-121C.dwg
SCALE	AS SHOWN

SHEET  
C-121C



1 2 3 4 5 6 7 8



ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

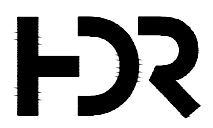
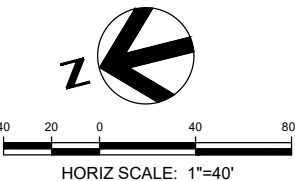
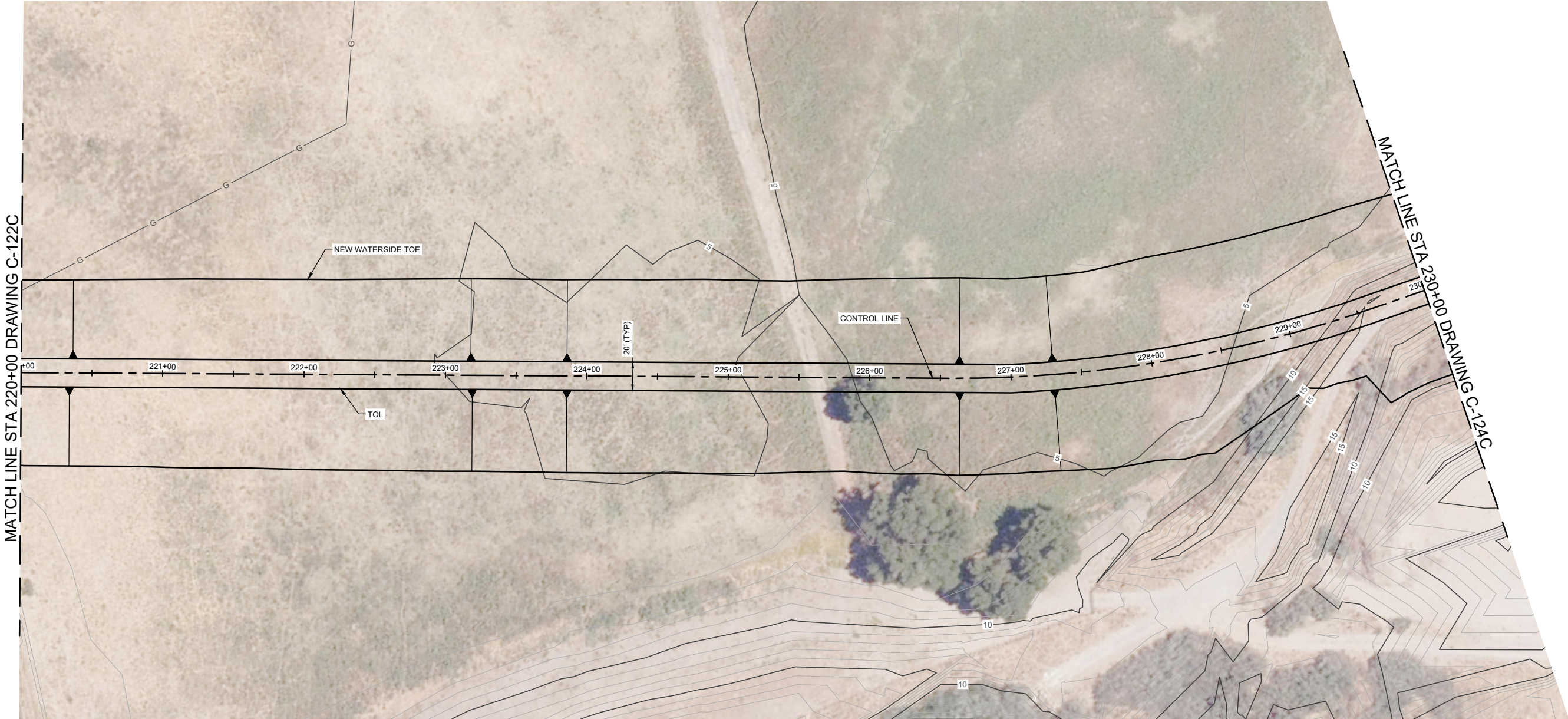
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FEASIBLTY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 210+00 TO 220+00  
OPTION 2B

FILENAME	10314280C-122C.dwg
SCALE	AS SHOWN

SHEET  
C-122C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

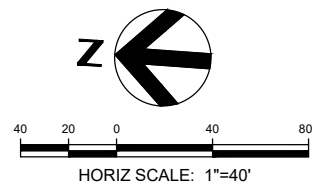
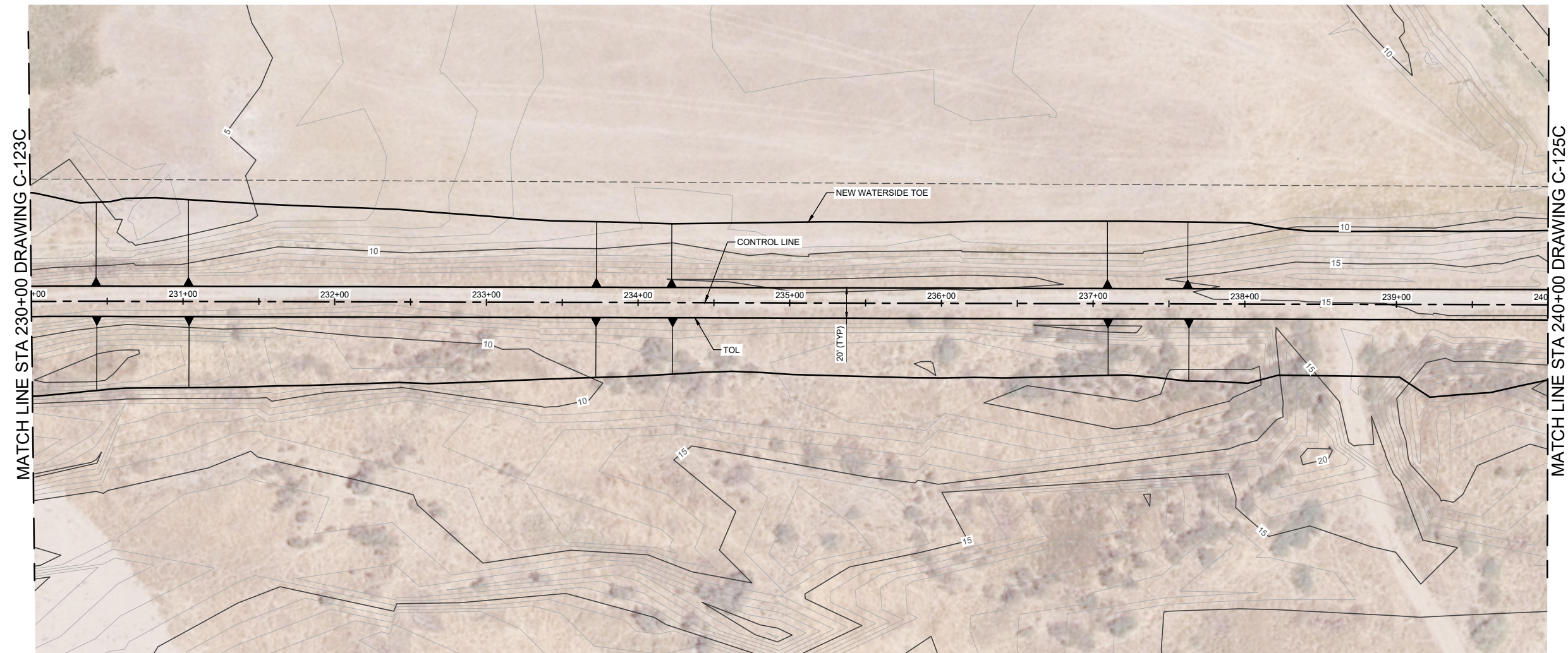
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FEASIBILITY STUDY  
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RD 536 / MELLIN LEVEES  
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STA 220+00 TO 230+00  
OPTION 2B

FILENAME	10314280C-123C.dwg
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SHEET  
C-123C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

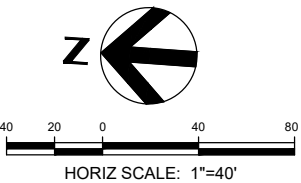
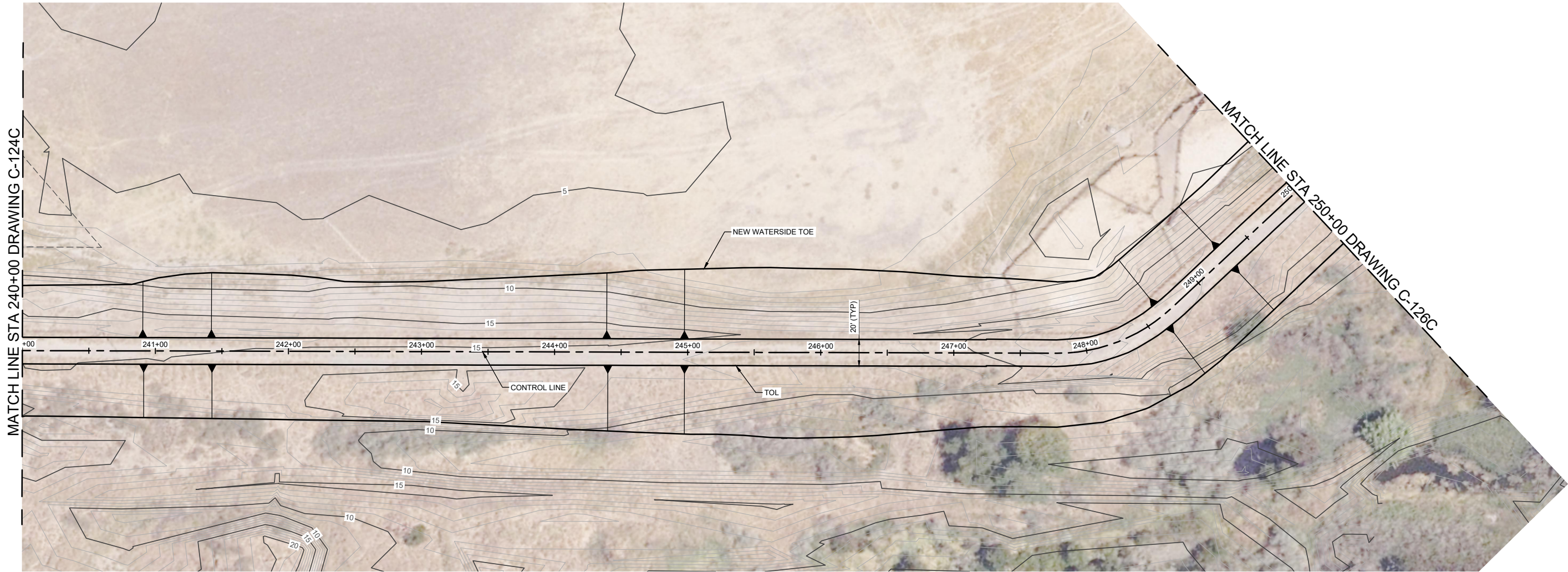
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 230+00 TO 240+00  
OPTION 2B

FILENAME	10314280C-124C.dwg
SCALE	AS SHOWN

SHEET  
C-124C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

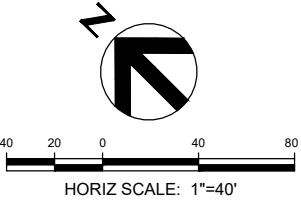
LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 240+00 TO 250+00  
OPTION 2B

FILENAME	10314280C-125C.dwg
SCALE	AS SHOWN

SHEET  
C-125C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

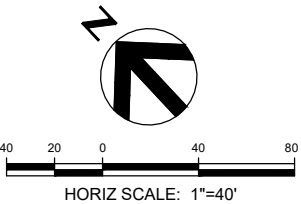
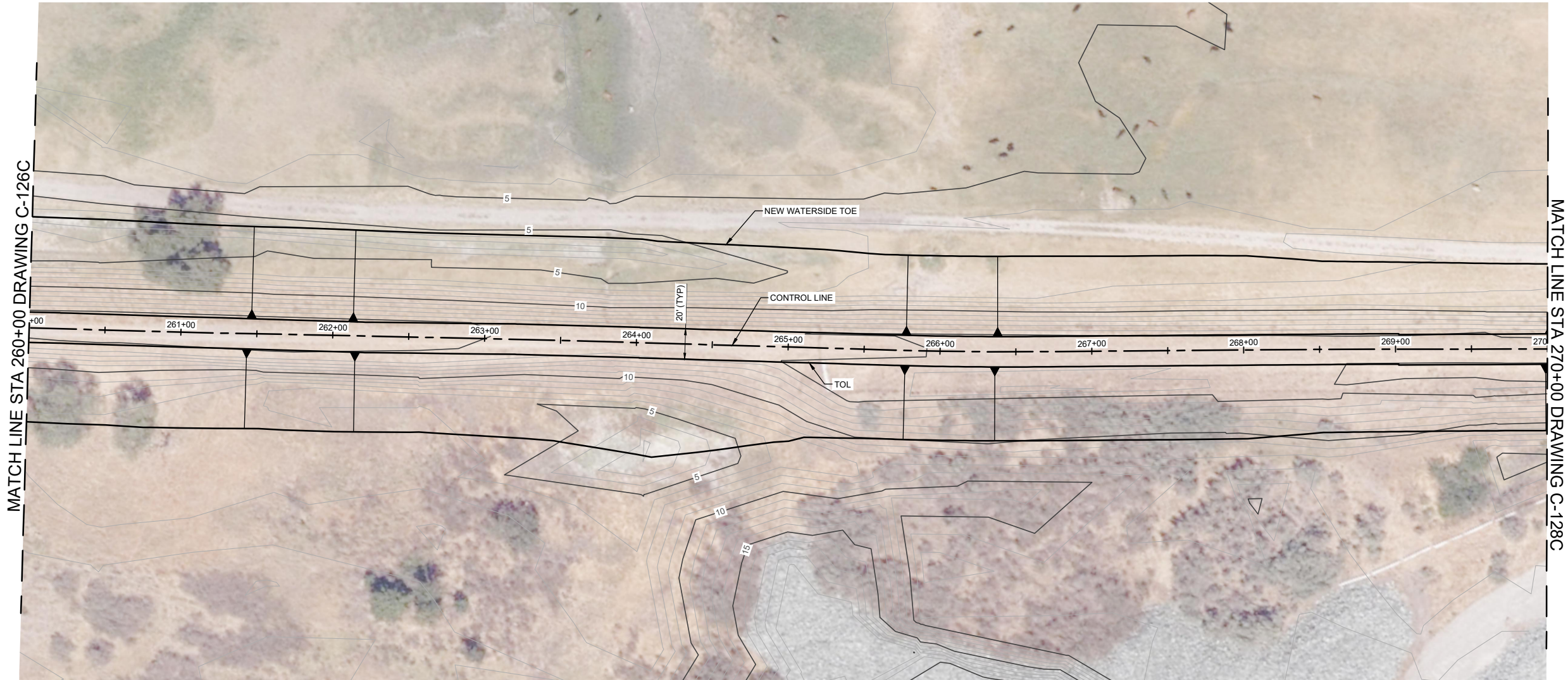
LITTLE EGBERT  
FEASIBLTY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 250+00 TO 260+00  
OPTION 2B

FILENAME	10314280C-126C.dwg
SCALE	AS SHOWN

SHEET
C-126C





ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBILITY STUDY  
CIVIL DESIGN APPENDIX

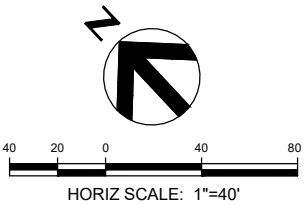
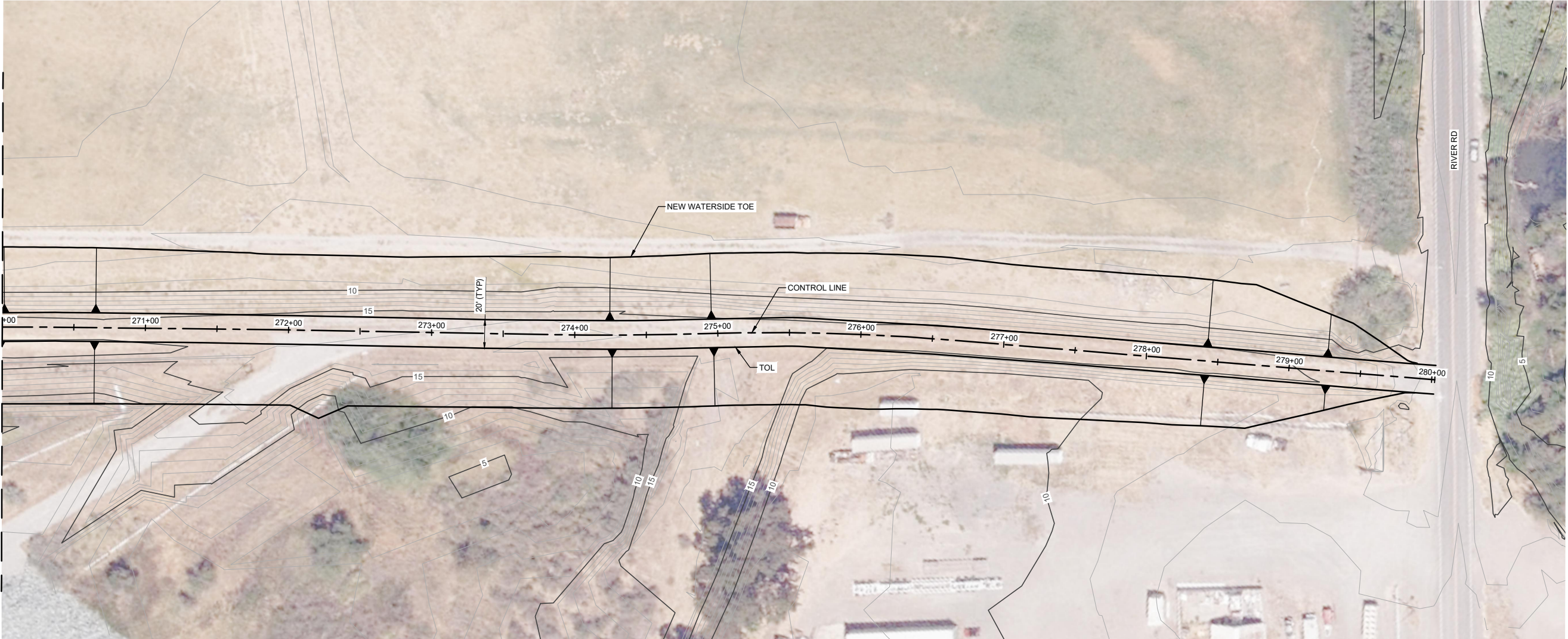
RD 536 / MELLIN LEVEES  
PLAN  
STA 260+00 TO 270+00  
OPTION 2B

FILENAME	10314280C-127C.dwg
SCALE	AS SHOWN

SHEET  
C-127C



MATCH LINE STA 270+00 DRAWING C-127C



ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	D. JABBOUR
DESIGNED BY	D. TEAK
DRAWN BY	A. JACKSON
CHECKED BY	M. SALMON
TECHNICAL LEAD	D. TEAK
DATE	JUN 2023
PROJECT NUMBER	10314280

LITTLE EGBERT  
FEASIBLTY STUDY  
CIVIL DESIGN APPENDIX

RD 536 / MELLIN LEVEES  
PLAN  
STA 270+00 TO 280+02  
OPTION 2B

FILENAME	10314280C-128C.dwg
SCALE	AS SHOWN

SHEET
C-128C

## Appendix D. ALTA Surveys



ALTA  
Egbert Tract

# ALTA/NSPS LAND TITLE SURVEY

EGBERT TRACT

4196 LIBERTY ISLAND ROAD & 3339 RIVER ROAD

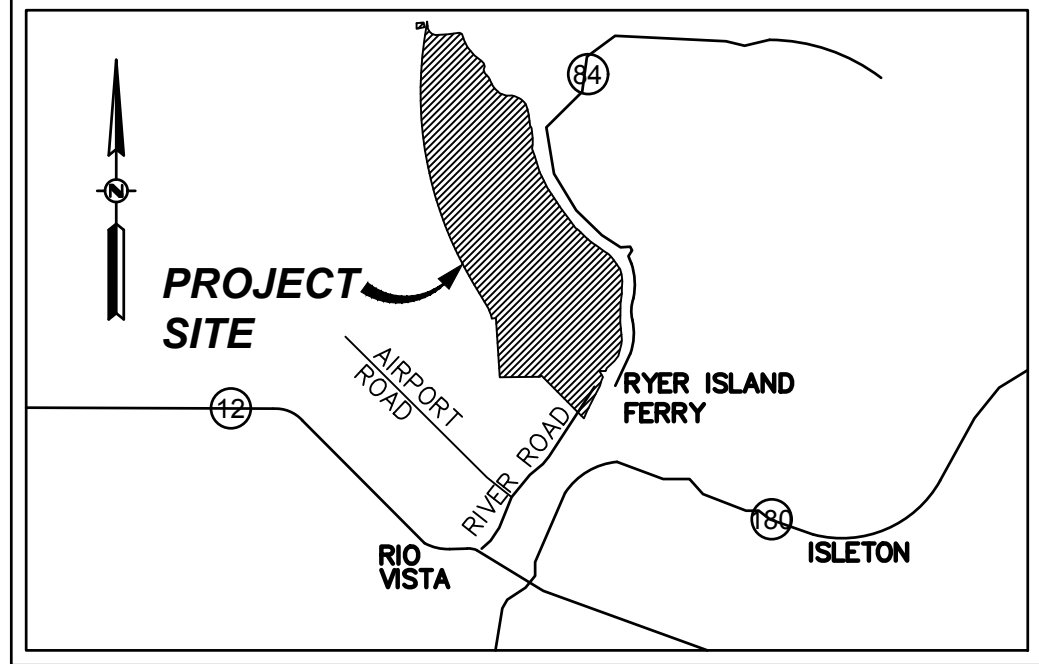
COUNTY OF SOLANO, STATE OF CALIFORNIA

JUNE, 2018

SCALE: N/A

RFE ENGINEERING, INC.

SHEET 1 OF 6



VICINITY MAP  
NO SCALE

## TITLE REPORT LEGAL DESCRIPTION:

THE LAND DESCRIBED HEREIN IS SITUATED IN THE STATE OF CALIFORNIA, COUNTY OF SOLANO, UNINCORPORATED AREA, DESCRIBED AS FOLLOWS:

### PARCEL ONE:

ALL THAT CERTAIN TRACT OF REAL PROPERTY SITUATE AND BEING IN TOWNSHIP 4 NORTH, RANGE 3 EAST, TOWNSHIP 4 NORTH, RANGE 2 EAST, TOWNSHIP 5 NORTH RANGE 3 EAST AND TOWNSHIP 5 NORTH, RANGE 2 EAST, M.D.B.M., SOLANO COUNTY, CALIFORNIA AND DESCRIBED AS FOLLOWS TO-WIT:

BEGINNING AT AN IRON PIPE MONUMENT SET IN CONCRETE WHICH BEARS NORTH 32°18'41" WEST, 2,846.38 FEET FROM AN IRON PIPE MONUMENT SET IN CONCRETE, BEING THE NORTHEASTERLY CORNER OF THAT CERTAIN 360.74 ACRE TRACT DESCRIBED IN DEED FROM PETER COOK, ET UX, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, RECORDED NOVEMBER 28, 1928 IN BOOK 23 AT PAGE 341 OF OFFICIAL RECORDS OF SOLANO COUNTY, CALIFORNIA AND FROM WHICH SAID LAST NAMED IRON PIPE A CONCRETE MONUMENT IN A FENCE LINE AT THE SOUTHERLY CORNER OF THAT CERTAIN PARCEL OF LAND CONVEYED TO G.H. VEHMEYER TO SACRAMENTO RIVER LAND CORPORATION BY DEED DATED FEBRUARY 14, 1911, AND RECORDED IN BOOK 186 OF DEEDS AT PAGE 401, SOLANO COUNTY RECORDS, BEARS SOUTH 58°29'23" EAST, 4,402.10 FEET, SAID LAST NAMED MONUMENT BEING ALSO REFERRED TO AS THE POINT OF BEGINNING OF THAT CERTAIN 527.3 ACRE TRACT DESCRIBED AS "PARCEL 2A" IN DEED FROM PETER COOK, JR., ET UX, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, DATED OCTOBER 20, 1943 AND RECORDED OCTOBER 25, 1943 IN BOOK 291 AT PAGE 389 OF SAID OFFICIAL RECORDS OF SOLANO COUNTY, THENCE NORTHWESTERLY ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 21,585.9 FEET FOR A DISTANCE OF 2,468.58 FEET, SAID ARC BEING SUBTENDED BY A CHORD BEARING NORTH 26°28'24" WEST, 2467.23 FEET TO AN IRON PIPE MONUMENT SET ON SAID ARC FROM WHICH THE CENTER OF SAID CURVE BEARS NORTH 66°48'18.2/3" EAST, SAID LAST NAMED POINT BEING THE NORTHWEST CORNER OF SAID 527.5 ACRE TRACT AND THE SOUTHERLY END OF THAT CERTAIN "BOUNDARY NO. 1", AS SAID BOUNDARY IS DESCRIBED IN THAT CERTAIN DEED TO THAT CERTAIN 1,445.4 ACRE TRACT CONVEYED BY CALIFORNIA PACKING CORPORATION TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, BY DEED DATED OCTOBER 18, 1943 AND RECORDED OCTOBER 25, 1943 IN BOOK 290 AT PAGE 379, OF OFFICIAL RECORDS OF SOLANO COUNTY, CALIFORNIA, THENCE LEAVING SAID 527.3 ACRE TRACT AND ALONG SAID "BOUNDARY NO. 1" AND THE WESTERLY BOUNDARY OF SAID 1,445.4 ACRE TRACT ON THE ARC OF SAID CURVE OF 21,585.9 FEET RADIUS NORTHWESTERLY CURVING TO THE RIGHT A DISTANCE OF 242.04 FEET TO A POINT ON SAID CURVE MARKED BY AN IRON PIPE MONUMENT AT THE NORTHERLY END OF SAID "BOUNDARY NO. 1" AND FROM WHICH LAST NAMED POINT THE CENTER OF SAID CURVE BEARS NORTH 67°26'51.5" EAST 21,585.9 FEET; SAID LAST NAMED POINT BEING NORTH 22°52'24.9" WEST, 242.03 FEET FROM THE SAID NORTHWEST CORNER OF SAID 527.3 ACRE TRACT; SAID NORTHERLY END OF SAID "BOUNDARY NO. 1" BEING THE SOUTHWEST CORNER OF THAT CERTAIN 131.24 ACRE TRACT DESCRIBED IN DEED FROM PETER COOK, JR., ET UX, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, DATED OCTOBER 20, 1943 AND RECORDED OCTOBER 25, 1943 IN BOOK 291 AT PAGE 389 OF OFFICIAL RECORDS OF SOLANO COUNTY, CALIFORNIA, SAID 131.24 ACRE TRACT BEING DESCRIBED AS "PARCEL 1-A" THEREIN; THENCE LEAVING SAID "BOUNDARY NO. 1" AND CONTINUING ALONG THE ARC OF SAID CURVE OF 21,585.9 FEET RADIUS, NORTHWESTERLY, CURVING TO THE RIGHT A DISTANCE OF 1,981.03 FEET TO A POINT ON SAID ARC MARKED BY AN IRON PIPE MONUMENT AT THE NORTHWEST CORNER OF SAID 131.24 ACRE TRACT, SAID POINT BEING ALSO LOCATED IN THE CENTERLINE OF A CERTAIN DIVERTING CANAL AND ON THE SOUTHWESTERLY BOUNDARY OF THAT CERTAIN 352.7 ACRE TRACT CONVEYED BY THE EXECUTORS OF THE ESTATE OF MARK I. CHURCH, ET AL, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, BY DEED DATED OCTOBER 21, 1943 AND RECORDED OCTOBER 25, 1943 IN BOOK 290 AT PAGE 387, OF OFFICIAL RECORDS OF SOLANO COUNTY, CALIFORNIA, SAID LAST NAMED POINT BEING ALSO LOCATED NORTH 19°55'30" WEST, 1,880.33 FEET FROM THE NORTHERLY END OF SAID "BOUNDARY NO. 1"; AND SAID LAST NAMED POINT BEING ALSO LOCATED FROM AN IRON PIPE MONUMENT AT THE WEST ONE-QUARTER CORNER OF SECTION 12, TOWNSHIP 4 NORTH, RANGE 2 EAST, M.D.B.M., THE FOLLOWING SIX COURSES AND DISTANCES FROM SAID ONE-QUARTER CORNER (1) NORTH 00°05' EAST, 1,300.2 FEET TO AN IRON PIPE MONUMENT ON THE SECTION LINE; THENCE (2) SOUTH 89°23' EAST, 336.7 FEET TO A FENCE CORNER; THENCE ALONG A FENCE LINE (3) NORTH 00°41' EAST, 634.0 FEET TO AN IRON PIPE MONUMENT; THENCE (4) NORTH 89°56'09" EAST, 1,891.0 FEET TO AN IRON PIPE MONUMENT; THENCE (5) NORTH 61°23'31" EAST, 3,973.7 FEET TO A POINT ON THE JUNCTION OF THE SAID DIVERTING CANAL WITH THE SO CALLED CONNECTING CANAL; AND THENCE (6) NORTH 54°00'48" WEST 385.5 FEET TO SAID IRON PIPE MONUMENT AT THE NORTHWEST CORNER OF SAID 131.24 ACRE TRACT; THENCE LEAVING SAID 131.24 ACRE TRACT AND ALONG THE WESTERLY BOUNDARY OF SAID 352.7 ACRE TRACT AND CONTINUING ALONG SAID ARC OF SAID CURVE OF 21,585.9 FEET RADIUS NORTHWESTERLY AND SOUTHEASTERLY CURVING TO THE RIGHT A DISTANCE OF 6,912.06 FEET TO A POINT ON SAID ARC MARKED BY AN IRON

PIPE MONUMENT AT THE NORTHWEST CORNER OF SAID 352.7 ACRE TRACT AND BEING LOCATED SOUTH 34°21'54.06" EAST, 4,575.32 FEET FROM A BRASS CAPPED IRON PIPE MONUMENT SET IN CONCRETE MARKED "U.S.E.D.B.M.," SET AT THE SOUTHEAST CORNER OF OLD OFFICE BUILDING AT "HEADQUARTERS CAMP" OF CALIFORNIA PACKING CORPORATION; SAID LAST NAMED ARC BEING SUBTENDED BY A CHORD BEARING NORTH 08°06'48" WEST, 6,882.58 FEET FROM SAID NORTHWEST CORNER OF SAID 151.24 ACRE TRACT; SAID NORTHWEST CORNER OF SAID 352.7 ACRE TRACT BEING ALSO THE SOUTHERN END OF THAT CERTAIN "BOUNDARY NO. 2" AS SAID BOUNDARY IS DESCRIBED IN SAID DEED OF SAID 1,445.4 ACRE TRACT AND AS SAID SOUTHERLY END IS FURTHER DESCRIBED IN SAID DEED AS BEING "SECTION H"; THENCE LEAVING SAID 352.7 ACRE TRACT AND ALONG THE WESTERLY BOUNDARY OF SAID 1,445.4 ACRE TRACT AND ALONG SAID "BOUNDARY NO. 2" AND CONTINUING ALONG THE ARC OF SAID CURVE, NORTHEASTERLY, CURVING TO THE RIGHT A DISTANCE OF 2,766.97 FEET AS MEASURED ALONG SAID ARC TO THE NORTH END OF SAID CURVE MARKED BY AN IRON PIPE MONUMENT THAT BEARS NORTH 04°43'30" EAST, 2,765.11 FEET FROM SAID "STATION H" AND FROM SAID NORTHERLY END OF SAID CURVE THE CENTER OF SAID CURVE BEARS SOUTH 81°38'10" EAST, 21,585.9 FEET; THENCE LEAVING SAID CURVE TANGENTIALLY NORTH 08°23'30" EAST, 1,125.0 FEET, MORE OR LESS, TO A POINT AT THE NORTHWEST CORNER OF SAID 1,445.4 ACRE TRACT AND FROM WHICH POINT SAID BRASS CAPPED IRON PIPE MONUMENT MARKED "U.S.E.D.B.M." BEARS SOUTH 88°40'50" WEST 2,976.08 FEET, MORE OR LESS, SAID NORTHWEST CO RNER BEING ALSO LOCATED ON THE RIGHT OR SOUTHERLY BANK OF LINDSEY (OR LINDA) SLOUGH AT THE NORTH END OF SAID "BOUNDARY NO. 2" THENCE LEAVING SAID "BOUNDARY NO. 2" AND ALONG THE NORTH BOUNDARY OF SAID 1,445.4 ACRE TRACT AND ALONG THE SAID SOUTH OR RIGHT BANK OF LINDSEY OR LINDA SLOUGH THE FOLLOWING SEVEN COURSES NUMBERED 1 TO 7, INCLUSIVE: (1) SOUTH 07°21'50" EAST, 417.26 FEET; (2) SOUTH 28°36'50" EAST, 210.28 FEET; (3) SOUTH 48°20'50" EAST, 194.77 FEET; (4) SOUTH 72°15'50" EAST, 194.48 FEET; (5) NORTH 87°17'10" EAST, 690.65 FEET; (6) NORTH 82°38'10" EAST, 725.62 FEET; (7) SOUTH 64°23'50" EAST, 172.19 FEET TO A POINT AT THE APPROXIMATE JUNCTION OF SAID BANK OF LINDSEY SLOUGH WITH THE RIGHT OR SOUTHWEST BANK OF CACHE SLOUGH; THENCE CONTINUING ALONG THE NORTHERLY, NORTHEASTERLY AND EASTERLY BOUNDARY OF SAID 145.4 ACRE TRACT THE FOLLOWING COURSES NUMBERED 8 TO 40, INCLUSIVE: (8) SOUTH 18°39'50" EAST, 426.95 FEET; (9) SOUTH 25°51'50" EAST, 415.94 FEET; (10) SOUTH 39°36'50" EAST, 614.55 FEET; (11) SOUTH 52°37'50" EAST, 549.05 FEET; (12) SOUTH 40°40'50" EAST, 177.40 FEET; (13) SOUTH 17°13'50" EAST, 189.22 FEET; (14) SOUTH 17°22'10" WEST, 215.07 FEET; (15) SOUTH 21°16'50" EAST, 208.94 FEET; (16) SOUTH 42°47'50" EAST, 332.66 FEET; (17) SOUTH 24°48'50" EAST, 516.85 FEET; (18) SOUTH 35°23'10" EAST, 203.17 FEET TO A POINT FROM WHICH AN IRON PIPE MONUMENT SET IN CONCRETE, CALLED "I.P.R.P." BEARS SOUTH 59°54' WEST, 54.9 FEET; THENCE (19) SOUTH 45°41'50" EAST, 437.59 FEET; (20) SOUTH 70°38'50" EAST, 406.51 FEET; (21) NORTH 88°05'10" EAST, 333.14 FEET; (22) SOUTH 73°25'50" EAST, 221.45 FEET; (23) SOUTH 63°20'50" EAST, 322.90 FEET; (24) SOUTH 47°23'22" EAST, 284.01 FEET TO A POINT FROM WHICH AN IRON PIPE MONUMENT SET IN CONCRETE, CALLED "I.P.R.P." BEARS SOUTH 59°54' WEST, 45.5 FEET; THENCE (25) SOUTH 36°20'10" EAST, 151.79 FEET; (26) SOUTH 19°38'50" EAST, 291.58 FEET; (27) SOUTH 11°59' 50" EAST, 328.91 FEET; (28) SOUTH 07°30'50" EAST, 671.26 FEET TO A POINT FROM WHICH AN IRON PIPE MONUMENT SET IN CONCRETE, CALLED "I.P.R.P." BEARS SOUTH 59°54' WEST, 36.0 FEET; THENCE (29) SOUTH 32°08'10" EAST, 153.27 FEET; (30) SOUTH 05°27'50" EAST, 624.60 FEET; (31) SOUTH 00°13'50" EAST, 285.00 FEET; (32) SOUTH 07°40'10" WEST, 312.97 FEET; (33) SOUTH 21°54'50" EAST, 346.52 FEET; (34) SOUTH 16°57'50" EAST, 340.19 FEET TO A POINT FROM WHICH AN IRON PIPE MONUMENT SET IN CONCRETE, CALLED "I.P.R.P." BEARS SOUTH 89°46' WEST, 90.0 FEET; THENCE, (35) SOUTH 18°32'50" EAST, 736.90 FEET; (36) SOUTH 26°03'50" EAST, 527.74 FEET; (37) SOUTH 25°28'15" EAST, 520.12 FEET TO A POINT FROM WHICH AN IRON PIPE MONUMENT CALLED "I.P.R.P." BEARS SOUTH 59°54' WEST, 27.73 FEET; THENCE (38) SOUTH 34°55'50" EAST, 484.03 FEET; (39) SOUTH 32°50' 50" EAST 955.72 FEET; (40) SOUTH 36°48'50" EAST 942.33 FEET TO A POINT FROM WHICH AN IRON PIPE MONUMENT CALLED "I.P.R.P." BEARS SOUTH 65°20'45" WEST, 62.15 FEET, THENCE LEAVING SAID SLOUGH AND ALONG THE NORTHERLY LINE OF THE LANDS DEEDED BY W.P. DARSIE AND L.J. GAMBLE TO PETER COOK, JR., SOUTH 65°20'45" WEST, 2,818.85 FEET TO AN IRON PIPE MONUMENT SET ON THE NORTHEASTERLY BANK OF THE MAIN DRAINAGE CANAL; THENCE SOUTH 63°16'35" WEST, 1,817.28 FEET TO AN IRON PIPE MONUMENT AND CONTINUING SOUTH 63°16'35" WEST A FURTHER DISTANCE OF 601.43 FEET TO AN IRON PIPE MONUMENT; THENCE ALONG THE CENTERLINE OF AN EXISTING DRAINAGE DITCH ON THE CENTERLINE PRODUCED SOUTH 50°07'52" WEST 1,494.70 FEET TO THE POINT OF BEGINNING, BEING THE NORTHERLY PORTION OF THAT CERTAIN 3,186.92 ACRE TRACT AS SHOWN ON THE "PLAT OF SURVEY OF 3186.92 ACRE TRACT," BEING SOLD BY SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT IN RANGE 40 LOS JULIPIS AND TOWNSHIP 4 AND 5 NORTH, RANGE 2 AND 3 EAST, M.D.B.M., FILED IN THE OFFICE OF THE RECORDER OF SOLANO COUNTY ON JUNE 4, 1945 IN BOOK 1 OF SURVEYS, PAGE 11.

EXCEPTING AND RESERVING FROM THAT PORTION THEREOF LYING WITHIN THE PARCEL OF LAND CONVEYED IN THE DEED FROM CALIFORNIA PACKING CORPORATION TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, DATED OCTOBER 18, 1943 RECORDED OCTOBER 25, 1943 IN BOOK 290 OF OFFICIAL RECORDS, PAGE 379, INSTRUMENT NO. 8812, ALL OIL, GAS, ASPHALTUM AND OTHER HYROCARBONS AND OTHER MINERALS, WHETHER SIMILAR TO THOSE HEREIN SPECIFIED OR NOT (TOGETHER WITH ALL RIGHTS

APPURTENANT THERETO) WITHIN OR UNDERLYING THE ABOVE DESCRIBED LANDS, AS EXCEPTED AND RESERVED IN SAID DEED TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT RECORDED IN BOOK 290 OF OFFICIAL RECORDS PAGE 379.

ALSO EXCEPTING AND RESERVING FROM THAT PORTION THEREOF LYING WITHIN THE PARCEL OF LAND CONVEYED IN THE DEED EXECUTED BY CARRIE CHURCH, AS EXECUTRIX OF THE ESTATE OF EMERY E. CHURCH, DECEASED, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT RECORDED OCTOBER 25, 1943 IN BOOK 290 OF OFFICIAL RECORDS, PAGE 387, INSTRUMENT NO. 8816 AND THE DEED EXECUTED BY HESTER CHURCH AND RAYMOND CHURCH AS EXECUTORS OF THE ESTATE OF MARK I. CHURCH, DECEASED, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, RECORDED OCTOBER 25, 1943 IN BOOK 290 OF OFFICIAL RECORDS, PAGE 390, INSTRUMENT NO. 8817, ALL OIL, GAS, ASPHALTUM AND OTHER HYDROCARBONS AND OTHER MINERALS, WHETHER SIMILAR TO THOSE HEREIN SPECIFIED OR NOT (TOGETHER WITH ALL RIGHTS APPURTENANT THERETO) WITHIN OR UNDERLYING THE ABOVE DESCRIBED LANDS, AS EXCEPTED AND RESERVED IN SAID DEEDS TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT RECORDED IN BOOK 290 OF OFFICIAL RECORDS PAGE 387 AND RECORDED IN BOOK 290 OF OFFICIAL RECORDS, PAGE 390.

ALSO EXCEPTING THEREFROM THE PARCEL OF LAND DESCRIBED AS PARCEL 1 IN THE DEED FROM RIVER INVESTMENT COMPANY TO PETER COOK, DATED JUNE 2, 1948 RECORDED JUNE 8, 1948 IN BOOK 451 OF OFFICIAL RECORDS, AT PAGE 425, INSTRUMENT NO. 6003.

ALSO EXCEPTING THEREFROM THE FOLLOWING: ALL THAT CERTAIN TRACT OF REAL PROPERTY SITUATE AND BEING IN SECTIONS 5, 6, 7 AND 8 OF TOWNSHIP 4 NORTH, RANGE 3 EAST, MOUNT DIABLO BASE AND MERIDIAN, SOLANO COUNTY, CALIFORNIA, AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT AN IRON PIPE MONUMENT LOCATED AT THE WEST ONE-QUARTER CORNER OF SECTION 12, TOWNSHIP 4 NORTH, RANGE 2 EAST, MOUNT DIABLO BASE AND MERIDIAN, AS SHOWN ON PLAT OF SURVEY RECORDED IN BOOK 1, PAGE 11, OFFICIAL RECORDS OF SOLANO COUNTY, THENCE NORTH 00°05' EAST, 1,300.2 FEET, TO AN IRON PIPE MONUMENT ON THE SECTION LINE; THENCE SOUTH 58°23' EAST, 336.7 FEET TO A FENCE CORNER; THENCE ALONG A FENCE LINE NORTH 00°41' EAST, 634.0 FEET TO AN IRON PIPE MONUMENT; THENCE NORTH 89°56' EAST, 1,891.0 FEET TO AN IRON PIPE MONUMENT; THENCE NORTH 61°23'31" EAST 3,973.7 FEET, TO THE SOUTHWEST CORNER OF A 352.7 ACRE TRACT CONVEYED FROM M.L. CHURCH, EST., IN DEED RECORDED OCTOBER 21, 1943 IN BOOK 290 OF OFFICIAL RECORDS, PAGE 390 OF THE SOLANO COUNTY RECORDS; THENCE ALONG THE SOUTH BOUNDARY OF THE 352.7 ACRE TRACT, NORTH 59°57' EAST, 3,173.1 FEET ALONG THE CENTERLINE OF THE CONNECTING CANAL TO ITS POINT OF INTERSECTION WITH THE CENTERLINE OF THE MAIN DRAINAGE CANAL OF THE EGBERT DISTRICT (RECLAMATION DISTRICT NO. 536), SAID POINT ALSO BEING THE MOST NORTHERLY CORNER OF THE 352.5 ACRE TRACT AS DESCRIBED IN GRANT DEED TO PETER COOK, RECORDED IN BOOK 451 OF DEEDS, AT PAGE 425, SOLANO COUNTY RECORDS, AND SAID POINT ALSO THE TRUE POINT OF BEGINNING OF THIS DESCRIPTION; THENCE FROM THE MOST NORTHERLY CORNER OF THE ABOVE MENTIONED 352.5 ACRE TRACT FOLLOWING THE RIGHT-OF-WAY OF A 40 FOOT WIDE IRRIGATION CANAL ALONG ITS CENTERLINE AS DESCRIBED IN DEED RECORDED IN BOOK 451 OF DEEDS, AT PAGE 426, SOLANO COUNTY RECORDS, THE FOLLOWING EIGHT (8) COURSES: (1) NORTH 3°30' EAST, 450.0 FEET; (2) NORTH 56°20' EAST, 460.0 FEET; (3) SOUTH 72°40' EAST, 654.7 FEET; (4) NORTH 74°37' EAST, 414.9 FEET; (5) NORTH 26° 28'30" EAST, 230.0 FEET; (6) SOUTH 79°51'30" EAST 1,035.8 FEET; (7) SOUTH 47°21' EAST, 258.3 FEET AND (8) SOUTH 81°23' EAST, 166.4 FEET, TO A HEADGATE IN THE WESTERLY BANK OF CACHE SLOUGH, THE PRESENT WEST BANK IS AT THE TERMINATION OF COURSE (8) IS IN A GENERAL WESTERLY DIRECTION FROM THE INTERSECTION OF COURSES (35) AND (36) OF THE CACHE SLOUGH TRAVERSE ON PLAT OF SURVEY FILED IN BOOK 1 OF SURVEYS, PAGE 11, SOLANO COUNTY RECORDS, CONTINUING ALONG THE WEST BANK OF CACHE SLOUGH IN A SOUTHEASTERLY DIRECTION AND GENERALLY WEST OF AND PARALLEL TO THE CACHE SLOUGH TRAVERSE PREVIOUSLY MENTIONED THE FOLLOWING FIVE COURSES: (1) SOUTH 26°03'50" EAST, 527.74 FEET; (2) SOUTH 25°28'15" EAST, 520.12 FEET; (3) SOUTH 34°35'50" EAST, 404.03 FEET; (4) SOUTH 32°50'50" EAST, 955.72 FEET; AND (5) SOUTH 36°48'50" EAST, 942.33 FEET TO AN INTERSECTION OF WEST BANK OF CACHE SLOUGH WITH THE NORTH LINE OF A 1,535.23 ACRE TRACT DEEDED BY W.P. DARSIE AND L.J. GAMBLE TO PETER COOK, JR., BY DEED RECORDED NOVEMBER 5, 1945 IN BOOK 335 OF OFFICIAL RECORDS OF SOLANO COUNTY, PAGE 266, SAID WEST BANK IS PRESENTLY WEST OF THE CACHE SLOUGH TRAVERSE LINE INTERSECTION OF COURSES (40) AND (41); THENCE ALONG THE NORTH LINE OF THE BEFORE MENTIONED 1,35.23 ACRE TRACT, SOUTH 65°20'40" WEST, 2,818.85 FEET TO THE SOUTHEAST CORNER OF THE 352.5 ACRE TRACT OF LAND DESCRIBED IN DEED TO PETER COOK RECORDED IN BOOK 451 OF DEEDS, PAGE 425; THENCE ALONG THE EAST BOUNDARY LINE OF THE BEFORE MENTIONED 352.5 ACRE TRACT OF LAND NORTH 30°03'30" WEST, 4,184.14 FEET TO THE POINT OF BEGINNING.

APN: 0042-240-070, 0042-240-080, 0177-030-010, 0177-030-020

### PARCEL TWO:

A PORTION OF THE CALIFORNIA PACKING CORPORATION PROPERTY IN PROJECTED SECTION 25, TOWNSHIP 5 NORTH, RANGE 2 EAST, M.D.B.&M., SOLANO COUNTY, CALIFORNIA AND DESIGNATED "PARCEL 1" ON RECORD OF SURVEYS MAP OF PORTIONS OF CALIFORNIA PACKING CORPORATION AND RIVER INVESTMENT COMPANY PROPERTIES; RECORDED AUGUST 11, 1954 IN VOLUME 4 OF SURVEYS, MAP NO. 21, SOLANO COUNTY RECORDS AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT AN IRON PIPE IN CONCRETE TAGGED "R.E. 8741" AT THE INTERSECTION OF THE NORTH BANK OF A DRAINAGE CANAL WITH THE SOUTH RIGHT OF WAY LINE OF THE LINDSEY SLOUGH LEVEE, AS SAID MONUMENT AND LINES ARE DESIGNATED ON SAID RECORD OF SURVEYS MAP, AND FROM WHICH AN IRON PIPE MONUMENT DESIGNATED "STATION H" ON MAP OF "3186.92 ACRE TRACT BEING SOLD BY SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT," RECORDED IN VOLUME 1 OF SURVEYS, MAP NO. 11, SOLANO COUNTY RECORDS, IS SOUTH 11°02'25" EAST, 28.25 FEET; SOUTH 28°51'10" EAST, 152.99 FEET; SOUTH 8°23'50" WEST, 635.42 FEET; AND SOUTH 4°43'30" WEST, 2,765.11 FEET; AND PROCEEDING THENCE FROM SAID POINT OF BEGINNING ALONG SAID LEVEE RIGHT OF WAY LINE, NORTH 11°02'25" WEST, 271.39 FEET TO AN IRON PIPE IN CONCRETE; THENCE CONTINUING ALONG SAID RIGHT OF WAY LINE SOUTH 89°56'20" WEST, 127.33 FEET TO AN IRON PIPE IN CONCRETE; THENCE LEAVING SAID RIGHT OF WAY LINE AND PROCEEDING ALONG THE SOUTH SHOULDER OF A DIRT ROAD SOUTH 84°48' WEST, 287.36 FEET TO AN IRON PIPE IN CONCRETE AT THE EXTENSION OF A DITCH CENTERLINE; THENCE ALONG SAID CENTERLINE SOUTH 0°07' EAST, 335.81 FEET TO A POINT FROM WHICH U.S.E.D. BENCHMARK NO. 54-43 IS SOUTH 78°22'30" EAST, 8.27 FEET; THENCE LEAVING SAID DITCH CENTERLINE AND PROCEEDING ALONG THE NORTH BANK OF SAID DRAINAGE CANAL NORTH 78°22'30" EAST 474.53 FEET TO THE POINT OF BEGINNING.

EXCEPTING AND RESERVING FROM PARCEL ONE AND PARCEL TWO ALL OIL, GAS, ASPHALTUM AND OTHER HYDROCARBONS AND ALL OTHER MINERALS WITHIN AND UNDERLYING THE ABOVE DESCRIBED LANDS, AS EXCEPTED AND RESERVED IN THE DEED FROM RIVER INVESTMENT COMPANY TO WILLIAM K. COBLENTZ, A MARRIED MAN AS HIS SEPARATE PROPERTY, DATED DECEMBER 21, 1983 AND RECORDED DECEMBER 30, 1983 OF OFFICIAL RECORDS, PAGE 110081, AS INSTRUMENT NO. 57645.

APN: 0042-180-080

## TITLE REPORT LEGAL DESCRIPTION CONTINUED ON SHEET 2

## SURVEYOR'S CERTIFICATE:

TO: WESTERVELT ECOLOGICAL AND PLACER TITLE COMPANY

THIS IS TO CERTIFY THAT THIS MAP OF PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 3, 4, 8, 11, AND 19 OF TABLE A THEREOF.

WILLIAM F. MCKINNEY, PLS 4715  
EXPIRES SEP 30, 2019

DATE





# ALTA/NSPS LAND TITLE SURVEY

EGBERT TRACT

4196 LIBERTY ISLAND ROAD & 3339 RIVER ROAD

COUNTY OF SOLANO, STATE OF CALIFORNIA

JUNE, 2018

SCALE: N/A

RFE ENGINEERING, INC.

SHEET 2 OF 6

## TITLE REPORT LEGAL DESCRIPTION CONTINUED FROM SHEET 1

### PARCEL THREE:

A PORTION OF THE RANCHO LOS ULPINOS, IN THE COUNTY OF SOLANO, STATE OF CALIFORNIA, AS SHOWN ON A MAP RECORDED NOVEMBER 23, 1868 IN BOOK 1 OF PATENTS BETWEEN PAGES 342 AND 343, DESCRIBED AS FOLLOWS: BEGINNING AT AN IRON PIPE MONUMENT SET IN CONCRETE, BEING THE NORTHEASTERLY CORNER OF THAT CERTAIN 360.74 ACRE TRACT DESCRIBED IN DEED FROM PETER COOK, ET UX TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, RECORDED NOVEMBER 28, 1928 IN BOOK 23 AT 341 OF OFFICIAL RECORDS OF SOLANO COUNTY, CALIFORNIA AND FROM WHICH POINT OF BEGINNING A CONCRETE MONUMENT IN A FENCE LINE AT THE SOUTHERLY CORNER OF THAT PARCEL OF LAND CONVEYED BY C.H. VEHMEYER TO SACRAMENTO RIVER LAND CORPORATION BY DEED DATED FEBRUARY 14, 1911, AND RECORDED IN BOOK 187 OF DEEDS AT PAGE 401, SOLANO COUNTY RECORDS, BEARS SOUTH 58°29'23" EAST 4,402.10 FEET, LAST NAMED MONUMENT BEING ALSO REFERRED TO AS THE POINT OF BEGINNING OF THAT CERTAIN 527.3 ACRE TRACT DESCRIBED AS "PARCEL 2A" IN DEED FROM PETER COOK, JR. ET UX, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, DATED OCTOBER 20, 1943, AND RECORDED OCTOBER 25, 1943 IN BOOK 291 AT PAGE 389 OF SAID OFFICIAL RECORDS OF SOLANO COUNTY; THENCE FROM SAID POINT OF BEGINNING AND ALONG THE NORTHERLY BOUNDARY OF SAID 360.74 ACRE TRACT, SOUTH 83°50'40" WEST 239.0 FEET TO AN IRON PIPE MONUMENT SET IN CONCRETE; THENCE LEAVING SAID NORTHERLY BOUNDARY AND ALONG THE WESTERLY BOUNDARY OF SAID 527.3 ACRE TRACT NORTHWESTERLY TO THE ARC OF A CURVE OF 2,444.53 FEET RADIUS, CURVING TO THE LEFT A DISTANCE OF 806.13 FEET, AS MEASURED ALONG SAID ARC, TO A POINT ON THE NORTH END OF SAID CURVE MARKED BY AN IRON PIPE MONUMENT, WHICH BEARS NORTH 21°11'20" WEST 802.5 FEET FROM SAID INITIAL POINT OF SAID ARC, THE CENTER OF SAID CURVE BEARS SOUTH 59°21'50" WEST 2,445.53 FEET FROM SAID NORTH END OF SAID CURVE; THENCE LEAVING SAID CURVE TANGENTIALY AND CONTINUING ALONG SAID WESTERLY BOUNDARY OF SAID 527.3 ACRE TRACT, NORTH 30°38'10" WEST 1,621.0 FEET TO AN IRON PIPE MONUMENT; THENCE NORTHWESTERLY, CURVING TO THE RIGHT OF THE ARC OF A CURVE OF RADIUS 21,585.9 FEET, THE CENTER OF WHICH CURVE BEARS NORTH 59°21'50" EAST 21,585.9 FEET A DISTANCE OF 334.88 FEET AS MEASURED ALONG SAID ARC TO A POINT ON SAID CURVE MARKED BY AN IRON PIPE MONUMENT WHICH BEARS NORTH 30°11'30" WEST 333.53 FEET FROM SAID INITIAL POINT OF SAID ARC, THE CENTER OF SAID CURVE BEARS NORTH 60°15'10" EAST 21,585.9 FEET FROM SAID LAST NAMED IRON PIPE MONUMENT; THENCE LEAVING SAID CURVE AND ALONG THE CENTERLINE OF AN EXISTING DRAINAGE DITCH ON THE CENTERLINE PRODUCED NORTH 50°07'52" EAST A DISTANCE OF 1,494.70 FEET, MORE OR LESS TO AN IRON PIPE MONUMENT; SAID LAST NAMED MONUMENT BEARS NORTH 63°16'35" 308.13 FEET FROM AN IRON PIPE MONUMENT SET IN CONCRETE; THENCE NORTH 63°16'35" EAST 601.43 FEET TO AN IRON PIPE MONUMENT; THENCE CONTINUING NORTH 63°16'35" EAST A DISTANCE OF 1,817.26 FEET TO A POINT ON THE NORTHWESTERLY BANK OF THE MAIN CANAL OF EGBERT DISTRICT, SO CALLED, SAID LAST NAMED POINT BEING MARKED BY AN IRON PIPE MONUMENT SET IN CONCRETE; THENCE NORTH 65°20'45" EAST 2,818.85 FEET TO AN IRON PIPE MONUMENT CALLED "1. P.R.P.," THENCE CONTINUING NORTH 65°20'45" EAST 62.15 FEET TO A POINT ON THE SOUTHWESTERLY OR RIGHT BANK OF CACHE SLOUGH; THENCE SOUTHEASTERLY, SOUTHERLY AND SOUTHWESTERLY ALONG THE RIGHT BANK OF CACHE SLOUGH THE FOLLOWING COURSES, NUMBER 1 TO 3A, INCLUSIVE (1) SOUTH 35°29'50" EAST 481.73 FEET, (2) SOUTH 54°06'50" EAST 229.11 FEET, (3A) SOUTH 44°51'50" EAST 47.63 FEET, MORE OR LESS TO THE NORTHEAST CORNER OF THAT CERTAIN AREA OF LAND REPUTED TO BE 182.6 ACRES, CONVEYED IN TWO PARCELS TOTALING 182.39 ACRES DESCRIBED IN DEED FROM MARY HAMILTON CHURCH, ET AL, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT DATED OCTOBER 21, 1943 AND RECORDED OCTOBER 25, 1943 IN BOOK 291 AT PAGE 386 OF OFFICIAL RECORDS OF SOLANO COUNTY; THENCE CONTINUING ALONG SAID BANK OF CACHE SLOUGH, (3B) SOUTH 44°51'50" EAST 507.39 FEET; (4) SOUTH 48°11'40" EAST 453.82 FEET TO A POINT FROM WHICH AN IRON PIPE MONUMENT CALLED "1. P.R.P." BEARS SOUTH 59°54' WEST 32.25 FEET; THENCE (5) SOUTH 55°23'50" EAST 448.31 FEET; (6) SOUTH 53°12'50" EAST 458.38 FEET; (7) SOUTH 57°14'50" EAST 356.46 FEET; (8A) SOUTH 42°23'50" EAST 3.62 FEET TO BOUNDARY COMMON TO SAID 182.6 ACRE TRACT AND THAT CERTAIN 207.0 ACRE TRACT CONVEYED BY PETER COOK, JR., ET UX, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, IN SAID DEED DATED OCTOBER 20, 1943 AND RECORDED IN BOOK 291, PAGE 389 OF OFFICIAL RECORDS OF SOLANO COUNTY, OCTOBER 25, 1943 AND DESCRIBED AS "PARCEL 3A" THEREIN; THENCE LEAVING SAID 182.6 ACRES TRACT BOUNDARY AND ALONG THE EASTERLY BOUNDARY OF SAID 207.0 ACRE TRACT AND CONTINUING ALONG SAID BANK OF CACHE SLOUGH, (8B) SOUTH 42°23'50" EAST 300.28 FEET, TO A POINT FROM WHICH AN IRON PIPE MONUMENT CALLED "1. P.R.P." BEARS SOUTH 59°54' WEST 40.00 FEET; THENCE (9) SOUTH 36°20'00" EAST 337.65 FEET; (10) SOUTH 33°48'50" EAST 464.54 FEET; (11) SOUTH 14°15'50" EAST 329.84 FEET; (12) SOUTH 05°17'50" EAST 396.55 FEET; (13) SOUTH 04°47'10" WEST 379.72 FEET TO A POINT FROM WHICH AN IRON PIPE MONUMENT CALLED "1. P.R.P." BEARS SOUTH 59°54' WEST 30.00 FEET; THENCE (14) SOUTH 00°03'50" WEST 346.74 FEET, (15A) SOUTH 07°40'40" WEST 545.18 FEET, (16) SOUTH 01°31'50" WEST 650.31 FEET, (17) SOUTH 00°23'30" WEST 460.03 FEET, TO THE SOUTHEAST CORNER OF SAID 207.0 ACRE TRACT AND THE NORTHEAST CORNER OF THE CERTAIN 305.4 ACRE TRACT CONVEYED BY MARY E. FERGUSON, ET AL, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT BY DEED DATED OCTOBER 20, 1943, AND RECORDED OCTOBER 25, 1943 IN BOOK 290 AT PAGE 383, OFFICIAL RECORDS OF SOLANO COUNTY; THENCE LEAVING SAID BOUNDARY OF SAID 207.0 ACRE TRACT AND ALONG THE SOUTHEAST BOUNDARY OF SAID 305.4 ACRE TRACT AND CONTINUING ALONG SAID BANK OF CACHE SLOUGH, (18) SOUTH 05°04'10" EAST 1,007.59 FEET, (19) SOUTH 05°33'20" WEST 297.52 FEET, (20) SOUTH 14°59'20" WEST 704.72 FEET (21) SOUTH 38°25'40" WEST 364.18 FEET, (22) SOUTH 46°47'30" WEST 601.42 FEET, (23) SOUTH 24°55'40" WEST 136.45 FEET TO A POINT FROM WHICH AN IRON PIPE MONUMENT CALLED "1. P.R.P.," BEARS SOUTH 89°45' WEST 235 FEET; THENCE CONTINUING (24) SOUTH 19°08'10" WEST 213.31 FEET (25) SOUTH 26°17'10" WEST 176.26 FEET (26) SOUTH 25°42'10" WEST 200.56 FEET (27) SOUTH 16°00'20" WEST 339.54 FEET (28) SOUTH 28°10'40" WEST 689.21 FEET (29) SOUTH 26°26'20" WEST 1,001.06 FEET (30) SOUTH 24°06'10" WEST 459.15 FEET MORE OR LESS, TO A POINT AT THE SOUTHERLY

CORNER OF SAID 305.4 ACRE TRACT FROM WHICH POINT A 6" X 6" FENCE POST AT THE EASTERLY MOST CORNER OF THAT CERTAIN TRACT OF LAND DESCRIBED IN DEED OF FLOWAGE EASEMENT OF LOIS HERINGER, ET AL, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, RECORDED FEBRUARY 5, 1940, IN BOOK 208 PAGE 396, OF OFFICIAL RECORDS OF SOLANO COUNTY, BEAR NORTH 44°32'54" WEST 96.40 FEET; THENCE LEAVING SAID SLOUGH BANK ALONG THE SOUTHWEST BOUNDARY OF SAID 305.4 ACRE TRACT, NORTH 44°32'54" WEST 96.40 FEET TO SAID 6" X 6" FENCE POST, THENCE ALONG SAID BOUNDARY COMMON TO SAID 305.4 ACRE TRACT AND LANDS NOW OR FORMERLY OWNED BY LOIS HERINGER, ET AL, NORTH 44°32'54" WEST, 3,439.78 FEET, MORE OR LESS, TO AN IRON PIPE MONUMENT AT THE MOST WESTERLY CORNER OF SAID 305.4 ACRE TRACT AND CORNER COMMON TO SAID LANDS OF LOIS HERINGER, ET AL, AND SOUTHERLY BOUNDARY AT THAT CERTAIN SAID 527.3 ACRE TRACT ABOVE REFERRED TO AND FROM WHICH POINT THE SAID CONCRETE MONUMENT SET IN A FENCE LINE AT THE SOUTHERLY CORNER OF THAT CERTAIN PARCEL OF LAND CONVEYED BY C.H. VEHMEYER TO SACRAMENTO RIVER LAND CORPORATION BY DEED DATED FEBRUARY 14, 1911, AND RECORDED IN BOOK 186 DEEDS, AT PAGE 401 OF SOLANO COUNTY RECORDS, AND BEING ALSO THE SOUTHEAST CORNER OF SAID 527.3 ACRE TRACT, BEARS NORTH 45°33'50" EAST 1,535.4 FEET FROM SAID LAST NAMED IRON PIPE MONUMENT AT SAID COMMON CORNER; THENCE LEAVING SAID 305.4 ACRE TRACT AND ALONG THE BOUNDARY COMMON TO SAID 527.3 ACRE TRACT AND SAID LANDS OF LOIS HERINGER, ET AL, SOUTH 45°35'27" WEST 3,234.86 FEET TO A 6" X 6" FENCE POST AT THE EASTERLY BOUNDARY OF 360.74 ACRE TRACT; THENCE LEAVING SAID BOUNDARY OF LANDS OF LOIS HERINGER, ET AL, AND ALONG THE BOUNDARY COMMON TO SAID 360.74 ACRE TRACT AND SAID 527.3 ACRE TRACT, NORTH 03°30'33" WEST 5,649.83 FEET TO THE POINT OF BEGINNING, CONTAINING A GROSS AREA OF 1,535.23 ACRES MORE OR LESS, AND BEING THE SOUTHEAST PORTION OF THAT CERTAIN 3,186.23 ACRES MORE OR LESS, AND BEING THE SOUTHEAST PORTION OF THAT CERTAIN 3,186.92 ACRE TRACT AS SHOWN ON THE "PLAT OF SURVEY OF 3,186.92 ACRE TRACT BEING SOLD BY SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT IN RANCHO LOS ULPINOS AND TOWNSHIP 4 AND 5 NORTH, RANGE 2 AND 3 EAST, MOUNT DIABLO BASE AND MERIDIAN" ON JUNE 4, 1945 IN BOOK 1 OF SURVEYS AT PAGE 11.

EXCEPTING THEREFROM THE PARCEL OF LAND DESCRIBED AS FOLLOWS:

BEGINNING AT AN IRON PIPE MONUMENT ON THE NORTHEAST BANK OF THE MAIN DRAIN OF EGBERT DISTRICT, SO-CALLED, WHICH POINT IS LOCATED SOUTH 71°11'45" EAST 2,562.59 FEET FROM A CONCRETE MONUMENT SET IN A FENCE LINE AT THE SOUTHERLY CORNER OF THAT CERTAIN SAID PARCEL OF LAND CONVEYED BY C.H. VEHMEYER TO SACRAMENTO RIVER LAND CORPORATION NORTH 89°46' EAST 235.0 FEET TO A POINT ON THE SOUTHEAST BOUNDARY OF SAID 1,535.23 ACRE TRACT AND THE WEST BANK OF CACHE SLOUGH; THENCE ALONG SAID SOUTHEAST BOUNDARY THE TWO FOLLOWING COURSES: (1) SOUTH 19°08'10" WEST 213.21 FEET, AND (2) SOUTH 26°17'10" WEST 176.26 FEET TO A POINT; THENCE LEAVING SAID BOUNDARY, NORTH 30°12' WEST 413.65 FEET TO A POINT; THENCE NORTH 89°46' EAST 120.0 FEET TO THE POINT OF BEGINNING.

ALSO EXCEPTING THEREFROM THE PARCEL OF LAND EXCEPTED IN THE DEED FROM MARY E. FERGUSON, ET AL, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, DATED OCTOBER 20, 1943 AND RECORDED OCTOBER 25, 1943 IN BOOK 290 OF OFFICIAL RECORDS PAGE 383, INSTRUMENT NO. 8813, AND DESCRIBED THEREIN AS FOLLOWS: "A SQUARE PARCEL OF LAND COMPRISING THREE ACRES, THE CENTER OF WHICH SHALL BE THAT CERTAIN GAS WELL NOW KNOWN AS PETER COOK NO. 4 IN THE RECORDS OF THE STATE DIVISION OF OIL AND GAS."

ALSO EXCEPTING THEREFROM ALL OIL, GAS, ASPHALTUM, HYDROCARBONS AND OTHER MINERALS, WHETHER SIMILAR TO THOSE HEREIN SPECIFIED OR NOT, WITHIN OR UNDERLYING PORTIONS OF SAID LANDS, OR THAT MAY BE PRODUCED FROM PORTIONS OF SAID LAND, TOGETHER WITH ANY AND ALL RIGHTS, EASEMENTS AND SERVITUDES APPURTENANT THERETO AND RESERVED IN THE FOLLOWING DEEDS TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, A PUBLIC AGENCY;

A) GRANT DEED EXECUTED BY CALIFORNIA PACKING CORPORATION, RECORDED OCTOBER 25, 1943, BOOK 290 OF OFFICIAL RECORDS, PAGE 379.

B) GRANT DEED EXECUTED BY MARY E. FERGUSON ET AL, RECORDED OCTOBER 24, 1943, BOOK 290 OF OFFICIAL RECORDS, PAGE 383.

C) GRANT DEED EXECUTED BY MARY HAMILTON CHURCH, ET AL, RECORDED OCTOBER 25, 1943, BOOK 291 OF OFFICIAL RECORDS, PAGE 386.

D) GRANT DEED EXECUTED BY PETER COOK, JR. AND MARY W. COOK, HIS WIFE, RECORDED OCTOBER 25, 1943, BOOK 291 OF OFFICIAL RECORDS, PAGE 389.

ALSO EXCEPTING ALL PETROLEUM, GAS, ASPHALTUM, AND OTHER HYDROCARBONS AND OTHER MINERAL, WHETHER SIMILAR TO THOSE HEREIN SPECIFIED OR NOT WITHIN AND UNDERLYING PORTIONS OF SAID LANDS, OR THAT MAY BE PRODUCED FROM PORTIONS OF SAID LAND, TOGETHER WITH ANY AND ALL RIGHTS, EASEMENTS AND SERVITUDES APPURTENANT THERETO AND RESERVED IN THE FOLLOWING DEEDS TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, A PUBLIC AGENCY;

ALSO EXCEPTING THEREFROM ALL PETROLEUM, OIL, GAS, ASPHALTUM AND OTHER HYDROCARBONS, AND OTHER MINERALS, WHETHER SIMILAR TO THOSE HEREIN SPECIFIED OR NOT (EXCEPTING ONLY WHAT HAS BEEN HERETOFORE TRANSFERRED OR CONVEYED), WITHIN GRANTED IN THE DEED FROM JOHN ELLIOTT COOK AS SURVIVING PARTNER OF PETER COOK - J.E. COOK, A CO-PARTNERSHIP, TO C & C MINERALS, A CALIFORNIA CORPORATION, DATED DECEMBER 14, 1973, RECORDED JANUARY 4, 1974 IN BOOK 1974 OF OFFICIAL RECORDS, PAGE 506, INSTRUMENT NO. 302.

ALSO EXCEPTING THEREFROM THOSE PARCELS OF LAND CONVEYED TO THE COUNTY OF SOLANO BY DEEDS RECORDED AS FOLLOWS: SEPTEMBER 19, 1895, BOOK 121 OF DEEDS, PAGE 334; AUGUST 6, 1923, BOOK 260 OF DEEDS, PAGE 12, SERIES NO. 2602; MAY 14, 1936, BOOK 160 OF OFFICIAL RECORDS, PAGE 66, SERIES NO. 2324.

EXCEPTING THEREFROM ALL THAT PORTION CONVEYED TO WALTER T. POWELL, AN UNMARRIED MAN, BY DEED RECORDED SEPTEMBER 26, 2007 AS INSTRUMENT NO. 2007-00102576, SOLANO COUNTY RECORDS, AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE MOST NORTHERLY CORNER OF THE LAND HERETOFORE CONVEYED BY T.L. GATES, ETAL, TO ELIZABETH CARPENTER BY DEED DATED FEBRUARY 21, 1934 IN BOOK 119, PAGE 208 OF OFFICIAL RECORDS OF SOLANO COUNTY; THENCE ALONG THE NORTHEASTERLY LINE OF SAID LAND SOUTH 45°45' WEST, 110.53 FEET TO THE TRUE POINT OF BEGINNING; THENCE SOUTH 89°40'48" WEST, 2,365.18 FEET TO A POINT ON THE BOUNDARY COMMON TO THAT CERTAIN 360.74 ACRE TRACT DESCRIBED IN DEED FROM PETER COOK, ET UX, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, RECORDED NOVEMBER 28, 1928 IN BOOK 23 AT PAGE 341 OF OFFICIAL RECORDS OF SOLANO COUNTY, CALIFORNIA AND THAT CERTAIN 527.3 ACRE TRACT DESCRIBED AS "PARCEL 2A" IN DEED FROM PETER COOK, JR., ET UX, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, DATED OCTOBER 20, 1943 AND RECORDED OCTOBER 25, 1943 IN BOOK 291 AT PAGE 389 OF SAID OFFICIAL RECORDS OF SOLANO COUNTY; THENCE SOUTH 3°30'33" EAST, 2,177.22 FEET TO THE MOST NORTHERLY CORNER OF A CERTAIN 2.2 ACRE TRACT OF LAND CONVEYED BY T.L. GATES, ET AL, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT BY DEED DATED JUNE 3, 1929 AND RECORDED JUNE 3, 1929 IN BOOK 34 OF OFFICIAL RECORDS, PAGE 252, SOLANO COUNTY RECORDS; THENCE NORTH 45°45' EAST, 3,124.33 FEET ALONG THE NORTH LINE OF SAID BOOK 119, OFFICIAL RECORDS, AT PAGE 208, TO THE POINT OF BEGINNING.

APN: 0177-090-070, 0177-110-150

### PARCEL FOUR:

BEGINNING AT AN IRON PIPE MONUMENT SET IN CONCRETE WHICH BEARS NORTH 32°18'41" WEST, 2,846.38 FEET FROM AN IRON PIPE MONUMENT SET IN CONCRETE BEING THE NORTHEASTERLY CORNER OF THAT CERTAIN 360.74 ACRE TRACT DESCRIBED IN THE DEED FROM PETER COOK, ET UX, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT RECORDED NOVEMBER 28, 1928 IN BOOK 23 AT PAGE 341 OF OFFICIAL RECORDS OF SOLANO COUNTY, AND FROM WHICH SAID LAST NAMES IRON PIPE A CONCRETE MONUMENT IN A FENCE LINE AT SOUTHERLY CORNER OF THAT CERTAIN PARCEL OF LAND CONVEYED BY C.H. VEHMEYER TO SACRAMENTO RIVER LAND CORPORATION BY DEED DATED FEBRUARY 14, 1911, AND RECORDED IN BOOK 286 OF DEEDS AT PAGE 401, SOLANO COUNTY RECORDS, BEARS SOUTH 58°29'23" EAST, 4,402.10 FEET; SAID LAST NAMED MONUMENT BEING ALSO THE POINT OF BEGINNING OF THAT CERTAIN 527.3 ACRE TRACT DESCRIBED AS "PARCEL 2A" IN DEED FROM PETER COOK, JR. ET UX TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, DATED OCTOBER 20, 1943 AND RECORDED OCTOBER 25, 1943 IN BOOK 291 AT PAGE 389 OF OFFICIAL RECORDS OF SOLANO COUNTY; THENCE FROM SAID POINT OF BEGINNING NORTHWESTERLY ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 21,585.9 FEET FOR A DISTANCE OF 2,468.58 FEET, SAID ARC BEING SUBTENDED BY A CHORD BEARING NORTH 26°28'24" WEST, 2,467.23 FEET TO AN IRON PIPE MONUMENT SET ON SAID ARC FROM WHICH THE CENTER OF SAID CURVE BEARS NORTH 66°48'18 23" EAST, SAID LAST NAMED IRON PIPE MONUMENT BEING THE NORTHWEST CORNER OF SAID 527.3 ACRE TRACT; THENCE CONTINUING NORTHWESTERLY ALONG SAID ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 21,585.9 FEET; A DISTANCE OF 242.04 FEET, SAID ARC BEING SUBTENDED BY A CHORD WHICH BEARS NORTH 23°52'24.91" WEST, 242.03 FEET TO AN IRON PIPE MONUMENT SET IN SAID ARC AT THE SOUTHWEST CORNER OF THAT CERTAIN 131.24 ACRE TRACT DESCRIBED AS "PARCEL 1A" IN DEED FROM PETER COOK, JR., ET UX TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, DATED OCTOBER 20, 1943 AND RECORDED OCTOBER 25, 1943 IN BOOK 291 AT PAGE 389 OF OFFICIAL RECORDS OF SOLANO COUNTY; THENCE CONTINUING NORTHWESTERLY ALONG THE ARC OF SAID CURVE OF 21,585.9 FEET RADIUS, A DISTANCE OF 1,981.03 FEET TO AN IRON PIPE MONUMENT SET AT THE NORTHWEST CORNER OF SAID 131.24 ACRE TRACT, SAID ARC BEING SUBTENDED BY A CHORD WHICH BEARS NORTH 19°55'30" WEST, 1,980.33 FEET AND SAID NORTHWEST CORNER OF SAID 131.24 ACRE TRACT BEING ALSO LOCATED FROM AN IRON PIPE MONUMENT AT THE WEST ONEQUARTER CORNER OF SECTION 12, TOWNSHIP 4 NORTH, RANGE 2 EAST, M.D.B.M., FOLLOWING SIX COURSES AND DISTANCES FROM ONE-QUARTER CORNER: (1) NORTH 00°05' EAST, 1,300.2 FEET TO AN IRON PIPE MONUMENT ON THE SECTION LINE; THENCE (2) SOUTH 89°23' EAST, 336.7 FEET TO A FENCE CORNER; THENCE ALONG A FENCE LINE (3) NORTH 00°41' EAST, 634.0 FEET TO AN IRON PIPE MONUMENT; THENCE (4) NORTH 89°56'09" EAST, 1,892.0 FEET TO AN IRON PIPE MONUMENT; THENCE (5) NORTH 61°23'31" EAST, 3,973.7 FEET TO A POINT WHICH WAS FORMERLY THE JUNCTION OF A DIVERTING CANAL WITH A CANAL CONNECTING THERETO AND RUNNING NORTHEASTERLY THEREFROM, AND THENCE (6) NORTH 54°00'48" WEST, 385.5 FEET TO SAID IRON PIPE MONUMENT AT THE NORTHWEST CORNER OF SAID 131.24 ACRE TRACT; THENCE ALONG THE NORTHERLY BOUNDARY OF SAID 131.24 ACRE TRACT SOUTH 54°07'40" EAST, 385.5 FEET TO SAID CONNECTING CANAL; THENCE ALONG SAID NORTHERLY BOUNDARY AND THE CENTERLINE OF SAID CONNECTING CANAL, NORTH 59°57' EAST, 3,173.1 FEET TO ITS INTERSECTION WITH THE CENTERLINE OF THE MAIN DRAINAGE CANAL OF RECLAMATION DISTRICT NO. 2084; THENCE ALONG THE CENTERLINE OF SAID MAIN DRAINAGE CANAL SOUTH 30°03'30" EAST 1,597.0 FEET TO THE SOUTHEAST CORNER OF SAID 131.24 ACRE TRACT; THENCE CONTINUING ALONG THE CENTERLINE OF SAID MAIN DRAINAGE CANAL, SOUTH 30°03'30" EAST 2,587.14 FEET TO THE NORTH LINE OF THAT 1,535.23 ACRE TRACT DEEDED BY W.P. DARSIE AND L.J. GAMBLE TO PETER COOK, JR., BY DEED RECORDED NOVEMBER 5, 1945, IN BOOK 336 OF OFFICIAL RECORDS OF SOLANO COUNTY AT PAGE 266; THENCE ALONG SAID NORTH LINE SOUTH 63°16'35" WEST, 1,793.07 FEET TO AN IRON PIPE MONUMENT AND CONTINUING SOUTH 63°16'35" WEST, 601.43 FEET TO AN IRON PIPE MONUMENT;

THENCE ALONG THE CENTERLINE OF A DRAINAGE DITCH AND THE CENTERLINE PRODUCED SOUTH 50°07'52" WEST, 1,494.70 FEET TO THE POINT OF BEGINNING, BEING A PORTION OF THAT CERTAIN 3,186.92 ACRE TRACT, BEING SOLD BY SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT IN RANCHO LOS ULPINOS AND TOWNSHIP 4 AND 5 NORTH, RANGE 2 AND 3 EAST, M.B.D.M." FILED IN THE OFFICE OF THE RECORDER OF SOLANO COUNTY, CALIFORNIA, ON JUNE 4, 1945 IN BOOK 1 OF SURVEYS AT PAGE 11.

EXCEPTING AND RESERVING FROM THAT PORTION THEREOF LYING WITHIN THE PARCEL OF LAND DESCRIBED IN THE DEED FROM CALIFORNIA PACKING CORPORATION TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, DATED OCTOBER 18, 1943 AND RECORDED OCTOBER 25, 1943 IN BOOK 290 OF OFFICIAL RECORDS AT PAGE 379, INSTRUMENT NO. 8812, ALL OIL, GAS, ASPHALTUM AND OTHER HYDROCARBONS AND OTHER MINERALS WHETHER SIMILAR TO THOSE HEREIN SPECIFIED OR NOT (TOGETHER WITH THE RIGHTS APPURTENANT THERETO) AS EXCEPTED AND RESERVED IN SAID DEED TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT RECORDED IN BOOK 290 OF OFFICIAL RECORDS, AT PAGE 379;

ALSO EXCEPTING THEREFROM ALL OIL, GAS, ASPHALTUM AND OTHER HYDROCARBONS AND OTHER MINERALS WHETHER SIMILAR TO THOSE HEREIN SPECIFIED OR NOT (EXCEPTING ONLY WHAT HAS BEEN HERETOFORE TRANSFERRED OR CONVEYED), WITHIN AND UNDERLYING OR THAT MAY BE PRODUCED FROM THE ABOVE DESCRIBED LAND, AS GRANTED IN THE DEED FROM JOHN ELLIOTT COOK AS SURVIVING PARTNER OF PETER COOK - J.E. COOK, A CO-PARTNERSHIP, TO C & C MINERALS, A CALIFORNIA CORPORATION DATED DECEMBER 14, 1973, RECORDED JANUARY 4, 1974 IN BOOK 1974 OF OFFICIAL RECORDS, PAGE 506, INSTRUMENT NO. 302.

ALSO EXCEPTING THEREFROM THOSE PARCELS OF LAND CONVEYED TO THE COUNTY OF SOLANO BY DEEDS RECORDED AS FOLLOWS: SEPTEMBER 19, 1895, BOOK 121 OF DEEDS, PAGE 334; AUGUST 6, 1923, BOOK 260 OF DEEDS, PAGE 12, SERIES NO. 2602; MAY 14, 1936, BOOK 160 OF OFFICIAL RECORDS, PAGE 66, SERIES NO. 2324.

APN: 0177-030-040

### PARCEL FIVE:

ALL THAT CERTAIN TRACT OF REAL PROPERTY SITUATE AND BEING IN SECTIONS 5, 6, 7 AND 8 OF TOWNSHIP 4 NORTH, RANGE 3 EAST, MOUNT DIABLO BASE AND MERIDIAN, SOLANO COUNTY, CALIFORNIA, AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE IRON PIPE MONUMENT LOCATED AT THE WEST ONE-QUARTER CORNER OF SECTION 12, TOWNSHIP 4 NORTH, RANGE 2 EAST, MOUNT DIABLO BASE AND MERIDIAN, AS SHOWN ON PLAT OF SURVEY RECORDED IN BOOK 1, PAGE 11, OFFICIAL RECORDS OF SOLANO COUNTY; THENCE NORTH 00°05' EAST, 1,300.2 FEET TO AN IRON PIPE MONUMENT ON THE SECTION LINE; THENCE SOUTH 89°23' EAST, 336.7 FEET TO A FENCE CORNER; THENCE ALONG A FENCE LINE NORTH 00°41' EAST, 634.0 FEET TO AN IRON PIPE MONUMENT; THENCE NORTH 89°56'09" EAST, 1,891.0 FEET TO AN IRON PIPE MONUMENT; THENCE NORTH 61°23'31" EAST, 3,973.7 FEET TO THE SOUTHWEST CORNER OF A 352.7 ACRE TRACT CONVEYED FROM M.E. CHURCH, EST., IN DEED RECORDED OCTOBER 21, 1943 IN BOOK 290 OF OFFICIAL RECORDS, PAGE 380, OF THE SOLANO COUNTY RECORDS; THENCE ALONG THE SOUTH BOUNDARY OF THE 352.7 ACRE TRACT, NORTH 59°57' EAST, 3,173.1 FEET ALONG THE CENTERLINE OF THE CONNECTING CANAL TO ITS POINT OF INTERSECTION WITH THE CENTERLINE OF THE MAIN DRAINAGE CANAL OF THE EGBERT DISTRICT (RECLAMATION DISTRICT NO. 536), SAID POINT ALSO BEING THE MOST NORTHERLY CORNER OF THE 352.5 ACRE TRACT AS DESCRIBED IN GRANT DEED TO PETER COOK, RECORDED IN BOOK 451 OF DEEDS, AT PAGE 425, SOLANO COUNTY RECORDS; AND SAID POINT ALSO BEING THE TRUE OF BEGINNING OF THIS DESCRIPTION; THENCE FROM THE MOST NORTHERLY CORNER OF THE ABOVE MENTIONED 352.5 ACRE TRACT FOLLOWING THE RIGHT OF WAY OF A 40 FOOT WIDE IRRIGATION CANAL, ALONG ITS CENTERLINE AS DESCRIBED IN DEED RECORDED IN BOOK 451 OF DEEDS, AT PAGE 426, SOLANO COUNTY RECORDS, THE FOLLOWING EIGHT (8) COURSES: (1) NORTH 3°30' EAST, 450.0 FEET, (2) NORTH 56°20' EAST, 460.0 FEET; (3) SOUTH 72°40' EAST, 654.7 FEET; (4) NORTH 74°37' EAST, 414.9 FEET; (5) NORTH 26°28'30" EAST, 230.0 FEET; (6) SOUTH 79°51'30" EAST, 1,035.8 FEET; (7) SOUTH 47°21' EAST, 258.3 FEET; AND (8) SOUTH 81°23' EAST, 166.4 FEET TO A HEADGATE IN THE WESTERLY BANK OF CACHE SLOUGH. THE PRESENT WEST BANK IS AT THE TERMINATION OF COURSE EIGHT IN A GENERAL WESTERLY DIRECTION FROM THE INTERSECTION OF COURSES 35 AND 36 OF THE CACHE SLOUGH TRAVERSE ON PLAT OF SURVEY FILED IN BOOK 1 OF SURVEYS, PAGE 11, SOLANO COUNTY RECORDS, CONTINUING ALONG THE WEST BANK OF CACHE SLOUGH IN A SOUTHEASTERLY DIRECTION AND GENERALLY WEST OF AND PARALLEL TO THE CACHE SLOUGH TRAVERSE PREVIOUSLY MENTIONED THE FOLLOWING FIVE (5) COURSES: (1) SOUTH 26°03'50" EAST, 527.74 FEET; (2) SOUTH 25°28'15" EAST, 520.12 FEET; (3) SOUTH 34°35'50" EAST, 404.03 FEET; (4) SOUTH 32°50' EAST, 935.72 FEET; AND (5) SOUTH 36°48'50" EAST, 942.33 FEET, TO AN INTERSECTION OF THE WEST BANK OF CACHE SLOUGH WITH THE NORTH LINE OF A 1,535.23 ACRE TRACT DEEDED BY W.P. DARSIE AND L.J. GAMBLE TO PETER COOK, JR., BY DEED RECORDED NOVEMBER 5, 1945 IN BOOK 335 OF OFFICIAL RECORDS OF SOLANO COUNTY, AT PAGE 266, SAID WEST BANK IS PRESENTLY WEST OF THE CACHE SLOUGH TRAVERSE LINE INTERSECTION OF COURSES 40 AND 41; THENCE ALONG THE NORTH LINE OF THE BEFORE MENTIONED 1,535.23 ACRE TRACT, SOUTH 65°20'40" WEST, 2,818.85 FEET TO THE SOUTHEAST CORNER OF THE 352.5 ACRE TRACT OF LAND DESCRIBED IN THE DEED TO PETER COOK RECORDED IN BOOK 451 OF DEEDS, PAGE 425; THENCE ALONG THE EAST BOUNDARY LINE OF THE BEFORE

MENTIONED 352.5 ACRE TRACT OF LAND NORTH 30°03'30" WEST 4,184.14 FEET, MORE OR LESS, TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION THEREOF DESCRIBED IN THE DEED FROM MARY HAMILTON CHURCH, ET AL, RECORDED OCTOBER 25, 1943 IN BOOK 291 OF OFFICIAL RECORDS, PAGE 386, THE FOLLOWING:

ALL OIL, GAS, ASPHALTUM AND OTHER HYDROCARBONS AND OTHER MINERALS, WHETHER SIMILAR TO THOSE HEREIN SPECIFIED OR NOT, WITHIN OR UNDERLYING THE ABOVE DESCRIBED LANDS, OR THAT MAY BE PRODUCED THEREFROM, TOGETHER WITH ANY AND ALL EASEMENTS, RIGHTS OF WAY AND SERVITUDES, IN, UNDER AND UPON SAID LANDS, NECESSARY OR CONVENIENT IN THE JUDGMENT OF GRANTORS, THEIR HEIRS OR ASSIGNS, TO EXPLORE, BY GEOPHYSICAL OR OTHER METHODS, FOR THE PURPOSE OF DETERMINING SUBSURFACE GEOLOGICAL CONDITIONS UNDERLYING SAID LANDS, AND TO DRILL FOR, MINE FOR, PRODUCE, EXTRACT AND TAKE ANY OF SAID MINERALS FROM SAID LANDS, AND TO TREAT AND TO STORE THE SAME THEREON, TO CONSTRUCT, RECONSTRUCT, USE, MAINTAIN, ERECT, REPAIR, REPLACE, RENEW, CHANGE THE SIZE AND LOCATION OF, INCREASE THE NUMBER OF, AND REMOVE IN, UNDER, ON AND FROM SAID LANDS, ALL PIPE LINES, POWER LINES, TELEPHONE AND TELEGRAPH LINES, AND OTHER STRUCTURES AND EQUIPMENT WHICH GRANTORS, THEIR HEIRS AND ASSIGNS, MAY REQUIRE IN CARRYING ON ANY OF SAID OPERATIONS, TOGETHER WITH THE RIGHT TO TAKE AND USE ON SAID LANDS WATER DEVELOPED THEREON BY GRANTORS, THEIR HEIRS AND ASSIGNS, NECESSARY FOR ANY OR ALL OF SUCH OPERATIONS AND TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS TO AND FROM SAID LANDS FOR ANY AND ALL OF SAID PURPOSES, AND ALSO ALL RIGHTS OF GRANTORS UNDER THE OIL AND GAS LEASE AGAINST SAID REAL PROPERTY, INCLUDING ANY AGREEMENT CONNECTED THEREWITH AND ANY EXTENSIONS OF SAID LEASE OR ANY SUCH AGREEMENT, PROVIDED THAT THE EXERCISE BY GRANTORS, THEIR HEIRS AND ASSIGNS, OR ANY RIGHT HEREBY EXCEPTED AND RESERVED SHALL BE SUBORDINATE TO THE RIGHT OF GRANTEE, ITS SUCCESSORS AND ASSIGNS, TO USE SAID LANDS FOR THE PASSAGE ALL FLOOD WATERS OF THE SACRAMENTO RIVER FLOOD CONTROL PROJECT, AND MUST BE EXERCISED AND USED SO AS NOT TO INTERFERE WITH OR DAMAGE ANY FLOOD CONTROL WORKS CONSTRUCTED ON SAID LANDS BY GRANTEE, ITS SUCCESSORS OR ASSIGNS; AND PROVIDED FURTHER THAT NO DRILLING SHALL BE DONE ON ANY OF SAID LANDS UPON WHICH IS LOCATED A LEVEE OR BERM OR OTHER FLOOD CONTROL WORKS, OR AT ANY OTHER PLACE WHERE DRILLING WOULD ENDANGER SUCH FLOOD CONTROL WORKS, THE OWNER OF SAID OIL, GAS OR MINERAL RIGHTS SHALL BE OBLIGATED TO COMPENSATE THE LANDOWNER FOR ANY AND ALL DAMAGE DONE OR PROPERTY TAKEN FOR THE ENJOYMENT OF SAID RIGHTS, OR ANY OF THEM.

EXCEPTING FROM THAT PORTION THEREOF DESCRIBED IN THE DEED FROM PETER COOK, RECORDED OCTOBER 25, 1943 IN BOOK 291, OFFICIAL RECORDS, PAGE 386, THE FOLLOWING:

ALL OIL, GAS, ASPHALTUM AND OTHER HYDROCARBONS AND OTHER MINERALS, WHETHER SIMILAR TO THOSE HEREIN SPECIFIED OR NOT, WITHIN OR UNDERLYING THE ABOVE DESCRIBED LANDS, OR THAT MAY BE PRODUCED THEREFROM, TOGETHER WITH ANY AND ALL EASEMENTS, RIGHTS OF WAY AND SERVITUDES, IN, UNDER AND UPON SAID LANDS, NECESSARY OR CONVENIENT IN THE JUDGMENT OF GRANTORS, THEIR HEIRS OR ASSIGNS, TO EXPLORE, BY GEOPHYSICAL OR OTHER METHODS, FOR THE PURPOSE OF DETERMINING SUBSURFACE GEOLOGICAL CONDITIONS UNDERLYING SAID LANDS, AND TO DRILL FOR, MINE FOR, PRODUCE, EXTRACT AND TAKE ANY OF SAID MINERALS FROM SAID LANDS, AND TO TREAT AND TO STORE THE SAME THEREON, TO CONSTRUCT, RECONSTRUCT, USE, MAINTAIN, ERECT, REPAIR, REPLACE, RENEW, CHANGE LANDS, ALL PIPE LINES, POWER LINES, TELEPHONE AND TELEGRAPH LINES, AND OTHER STRUCTURES AND EQUIPMENT WHICH GRANTORS, THEIR HEIRS AND ASSIGNS, MAY REQUIRE IN CARRYING ON ANY OF SAID OPERATIONS, TOGETHER WITH THE RIGHT TO TAKE AND USE ON SAID LANDS WATER DEVELOPED THEREON BY GRANTORS, THEIR HEIRS AND ASSIGNS, NECESSARY FOR ANY OR ALL OF SUCH OPERATIONS AND TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS TO AND FROM SAID LANDS FOR ANY AND ALL OF SAID PURPOSES, PROVIDED THAT THE EXERCISE BY GRANTORS, THEIR HEIRS AND ASSIGNS, OF ANY RIGHT HEREBY EXCEPTED AND RESERVED SHALL BE SUBORDINATE TO THE RIGHT OF GRANTEE, ITS SUCCESSORS AND ASSIGNS, TO USE SAID LANDS FOR THE PASSAGE OF ALL FLOOD WATERS OF THE SACRAMENTO RIVER FLOOD CONTROL PROJECT, AND MUST BE EXERCISED AND USED TO AS NOT TO INTERFERE WITH OR DAMAGE ANY FLOOD CONTROL WORKS CONSTRUCTED ON SAID LANDS BY GRANTEE, ITS SUCCESSORS OR ASSIGNS, AND PROVIDED FURTHER THAT NO DRILLING SHALL BE DONE ON ANY OF SAID LANDS UPON WHICH IS LOCATED A LEVEE OR BERM OR OTHER FLOOD CONTROL WORKS, AT ANY ANY OTHER PLACE WHERE DRILLING WOULD ENDANGER SUCH FLOOD CONTROL WORKS, THE OWNER OF SAID OIL, GAS OR MINERAL RIGHTS SHALL BE OBLIGATED TO COMPENSATE THE LANDOWNER FOR ANY AND ALL DAMAGE DONE OR PROPERTY TAKEN FOR THE ENJOYMENT OF SAID RIGHTS, OR ANY OF THEM.

APN: 0177-030-030



# ALTA/NSPS LAND TITLE SURVEY

## EGBERT TRACT

### 4196 LIBERTY ISLAND ROAD & 3339 RIVER ROAD

#### COUNTY OF SOLANO, STATE OF CALIFORNIA

JUNE, 2018                      SCALE: N/A

RFE ENGINEERING, INC.

### SHEET 3 OF 6

#### TITLE REPORT EXCEPTIONS:

1. TAXES, SPECIAL AND GENERAL, ASSESSMENT DISTRICTS AND SERVICE AREAS FOR THE FISCAL YEAR 2017-2018:

1ST INSTALLMENT: \$1,592.90 DUE  
2ND INSTALLMENT: \$1,592.90 DUE  
PARCEL NUMBER: 0042-180-060  
CODE AREA: 84005  
LAND VALUE: \$138,251.00  
IMP. VALUE: \$168,657.00  
TOTAL VALUE: \$306,908.00  
EXEMPTION AMOUNT: \$0.00

NOTE: FIRST INSTALLMENT IS DUE NOVEMBER 1 AND DELINQUENT DECEMBER 10. SECOND INSTALLMENT IS DUE FEBRUARY 1 AND DELINQUENT APRIL 10.

THE INSTALLMENTS SHOWN ABOVE REFLECT A CHARGE OF \$12.00, PER YEAR FOR PAYMENTS TO SF BAY REST AUTH-MEASURE AA, AND A CHARGE OF \$11.14, PER YEAR FOR PAYMENTS TO NORTH DELTA WATER. **NOT A SURVEY ITEM**

2. TAXES, SPECIAL AND GENERAL, ASSESSMENT DISTRICTS AND SERVICE AREAS FOR THE FISCAL YEAR 2017-2018:

1ST INSTALLMENT: \$5,297.17 DUE  
2ND INSTALLMENT: \$5,297.17 DUE  
PARCEL NUMBER: 0042-240-070  
CODE AREA: 84005  
LAND VALUE: \$847,073.00  
IMP. VALUE: \$0.00  
TOTAL VALUE: \$847,073.00  
EXEMPTION AMOUNT: \$0.00

NOTE: FIRST INSTALLMENT IS DUE NOVEMBER 1 AND DELINQUENT DECEMBER 10. SECOND INSTALLMENT IS DUE FEBRUARY 1 AND DELINQUENT APRIL 10.

THE INSTALLMENTS SHOWN ABOVE REFLECT A CHARGE OF \$12.00, PER YEAR FOR PAYMENTS TO SF BAY REST AUTH-MEASURE AA, AND A CHARGE OF \$1,853.30, PER YEAR FOR PAYMENTS TO NORTH DELTA WATER. **NOT A SURVEY ITEM**

3. TAXES, SPECIAL AND GENERAL, ASSESSMENT DISTRICTS AND SERVICE AREAS FOR THE FISCAL YEAR 2017-2018:

1ST INSTALLMENT: \$1,062.00 DUE  
2ND INSTALLMENT: \$1,062.00 DUE  
PARCEL NUMBER: 0042-240-080  
CODE AREA: 84005  
LAND VALUE: \$168,157.00  
IMP. VALUE: \$0.00  
TOTAL VALUE: \$168,157.00  
EXEMPTION AMOUNT: \$0.00

NOTE: FIRST INSTALLMENT IS DUE NOVEMBER 1 AND DELINQUENT DECEMBER 10. SECOND INSTALLMENT IS DUE FEBRUARY 1 AND DELINQUENT APRIL 10.

THE INSTALLMENTS SHOWN ABOVE REFLECT A CHARGE OF \$12.00, PER YEAR FOR PAYMENTS TO SF BAY REST AUTH-MEASURE AA, AND A CHARGE OF \$379.20, PER YEAR FOR PAYMENTS TO NORTH DELTA WATER. **NOT A SURVEY ITEM**

4. TAXES, SPECIAL AND GENERAL, ASSESSMENT DISTRICTS AND SERVICE AREAS FOR THE FISCAL YEAR 2018-2018:

1ST INSTALLMENT: \$2,623.29 DUE  
2ND INSTALLMENT: \$2,623.29 DUE  
PARCEL NUMBER: 0177-030-030  
CODE AREA: 84005  
LAND VALUE: \$420,944.00  
IMP. VALUE: \$0.00  
TOTAL VALUE: \$420,944.00  
EXEMPTION AMOUNT: \$0.00

NOTE: FIRST INSTALLMENT IS DUE NOVEMBER 1 AND DELINQUENT DECEMBER 10. SECOND INSTALLMENT IS DUE FEBRUARY 1 AND DELINQUENT APRIL 10.

THE INSTALLMENTS SHOWN ABOVE REFLECT A CHARGE OF \$12.00, PER YEAR FOR PAYMENTS TO SF BAY REST AUTH-MEASURE AA, AND A CHARGE OF \$896.80, PER YEAR FOR PAYMENTS TO NORTH DELTA WATER. **NOT A SURVEY ITEM**

5. TAXES, SPECIAL AND GENERAL, ASSESSMENT DISTRICTS AND SERVICE AREAS FOR THE FISCAL YEAR 2017-2018:

1ST INSTALLMENT: \$3,731.16 DUE  
2ND INSTALLMENT: \$3,731.16 DUE  
PARCEL NUMBER: 0177-030-040  
CODE AREA: 84005  
LAND VALUE: \$579,144.00  
IMP. VALUE: \$21,553.00  
TOTAL VALUE: \$600,697.00  
EXEMPTION AMOUNT: \$0.00

NOTE: FIRST INSTALLMENT IS DUE NOVEMBER 1 AND DELINQUENT DECEMBER 10. SECOND INSTALLMENT IS DUE FEBRUARY 1 AND DELINQUENT APRIL 10.

THE INSTALLMENTS SHOWN ABOVE REFLECT A CHARGE OF \$12.00, PER YEAR FOR PAYMENTS TO SF BAY REST AUTH-MEASURE AA, AND A CHARGE OF \$1,260.18, PER YEAR FOR PAYMENTS TO NORTH DELTA WATER. **NOT A SURVEY ITEM**

6. TAXES, SPECIAL AND GENERAL, ASSESSMENT DISTRICTS AND SERVICE AREAS FOR THE FISCAL YEAR 2017-2018:

1ST INSTALLMENT: \$1,828.14 DUE  
2ND INSTALLMENT: \$1,828.14 DUE  
PARCEL NUMBER: 0177-030-020  
CODE AREA: 84005  
LAND VALUE: \$300,492.00  
IMP. VALUE: \$0.00  
TOTAL VALUE: \$300,492.00  
EXEMPTION AMOUNT: \$0.00

NOTE: FIRST INSTALLMENT IS DUE NOVEMBER 1 AND DELINQUENT DECEMBER 10. SECOND INSTALLMENT IS DUE FEBRUARY 1 AND DELINQUENT APRIL 10.

THE INSTALLMENTS SHOWN ABOVE REFLECT A CHARGE OF \$12.00, PER YEAR FOR PAYMENTS TO SF BAY REST AUTH-MEASURE AA, AND A CHARGE OF \$547.74, PER YEAR FOR PAYMENTS TO NORTH DELTA WATER. **NOT A SURVEY ITEM**

7. TAXES, SPECIAL AND GENERAL, ASSESSMENT DISTRICTS AND SERVICE AREAS FOR THE FISCAL YEAR 2017-2018:

1ST INSTALLMENT: \$2,623.81 DUE  
2ND INSTALLMENT: \$2,623.81 DUE  
PARCEL NUMBER: 0177-030-010  
CODE AREA: 84005  
LAND VALUE: \$425,500.00  
IMP. VALUE: \$0.00  
TOTAL VALUE: \$425,500.00  
EXEMPTION AMOUNT: \$0.00

NOTE: FIRST INSTALLMENT IS DUE NOVEMBER 1 AND DELINQUENT DECEMBER 10. SECOND INSTALLMENT IS DUE FEBRUARY 1 AND DELINQUENT APRIL 10.

THE INSTALLMENTS SHOWN ABOVE REFLECT A CHARGE OF \$12.00, PER YEAR FOR PAYMENTS TO SF BAY REST AUTH-MEASURE AA, AND A CHARGE OF \$850.90, PER YEAR FOR PAYMENTS TO NORTH DELTA WATER. **NOT A SURVEY ITEM**

8. TAXES, SPECIAL AND GENERAL, ASSESSMENT DISTRICTS AND SERVICE AREAS FOR THE FISCAL YEAR 2017-2018:

1ST INSTALLMENT: \$14,242.14 DUE  
2ND INSTALLMENT: \$14,242.14 DUE  
PARCEL NUMBER: 0177-090-070  
CODE AREA: 84005  
LAND VALUE: \$2,290,004.00  
IMP. VALUE: \$53,660.00  
TOTAL VALUE: \$2,343,664.00  
EXEMPTION AMOUNT: \$0.00

NOTE: FIRST INSTALLMENT IS DUE NOVEMBER 1 AND DELINQUENT DECEMBER 10. SECOND INSTALLMENT IS DUE FEBRUARY 1 AND DELINQUENT APRIL 10.

THE INSTALLMENTS SHOWN ABOVE REFLECT A CHARGE OF \$12.00, PER YEAR FOR PAYMENTS TO SF BAY REST AUTH-MEASURE AA, AND A CHARGE OF \$4,320.86, PER YEAR FOR PAYMENTS TO NORTH DELTA WATER. **NOT A SURVEY ITEM**

9. TAXES, SPECIAL AND GENERAL, ASSESSMENT DISTRICTS AND SERVICE AREAS FOR THE FISCAL YEAR 2017-2018:

1ST INSTALLMENT: \$3,062.45 DUE  
2ND INSTALLMENT: \$3,062.45 DUE  
PARCEL NUMBER: 0177-110-150  
CODE AREA: 84005  
LAND VALUE: \$468,551.00  
IMP. VALUE: \$31,081.00  
TOTAL VALUE: \$499,632.00  
EXEMPTION AMOUNT: \$0.00

NOTE: FIRST INSTALLMENT IS DUE NOVEMBER 1 AND DELINQUENT DECEMBER 10. SECOND INSTALLMENT IS DUE FEBRUARY 1 AND DELINQUENT APRIL 10.

THE INSTALLMENTS SHOWN ABOVE REFLECT A CHARGE OF \$12.00, PER YEAR FOR PAYMENTS TO SF BAY REST AUTH-MEASURE AA, AND A CHARGE OF \$964.24, PER YEAR FOR PAYMENTS TO NORTH DELTA WATER. **NOT A SURVEY ITEM**

10. THE LIEN OF SUPPLEMENTAL TAXES, IF ANY, ASSESSED PURSUANT TO THE PROVISIONS OF CHAPTER 3.5, (COMMENCING WITH SECTION 75) OF THE REVENUE AND TAXATION CODE, OF THE STATE OF CALIFORNIA. **NOT A SURVEY ITEM**

11. THE HEREIN DESCRIBED PROPERTY LIES WITHIN THE BOUNDS OF THE NORTH DELTA WATER DISTRICT, AND IS THEREFORE SUBJECT TO ALL TAXES AND ASSESSMENTS THEREOF. SAID TAXES ARE PAYABLE AND COLLECTED WITH THE CITY AND COUNTY TAXES. **NOT A SURVEY ITEM**

12. RIGHTS OF THE PUBLIC AND/OR RECLAMATION DISTRICT NO. 2084, IN AND TO THE HIGHWAYS, ROADS, DITCHES, CANALS AND LEVEES EMBRACED WITHIN THE BOUNDARIES OF THE LAND DESCRIBED HEREIN. **NOT A SURVEY ITEM**

13. RIGHTS OF THE PUBLIC AND OF THE COUNTY OF SOLANO, AS TO THAT PORTION OF THE HEREIN DESCRIBED PROPERTY LYING WITHIN LIBERTY ISLAND ROAD AND RIVER ROAD, A PUBLIC ROAD. **NOT A SURVEY ITEM**

14. ANY ADVERSE CLAIM BASED UPON THE ASSERTION THAT SAID LAND OR ANY PART THEREOF IS NOW OR AT ANY TIME HAS BEEN INCLUDED WITHIN A NAVIGABLE RIVER, SLOUGH OR OTHER NAVIGABLE BODY OF WATER. **NOT A SURVEY ITEM**

15. RIGHTS AND EASEMENTS FOR COMMERCE, NAVIGATION AND FISHERY. **NOT A SURVEY ITEM**

16. ANY RIGHTS IN FAVOR OF THE PUBLIC WHICH MAY EXIST ON SAID LAND IF SAID LAND OR PORTIONS THEREOF ARE OR WERE AT ANY TIME USED BY THE PUBLIC. **NOT A SURVEY ITEM**

17. AN EASEMENT OVER SAID LAND FOR DISPOSAL OF EXCAVATED MATERIAL AND INCIDENTAL PURPOSES, GRANTED TO STATE OF CALIFORNIA, IN DEED RECORDED JULY 15, 1901, (BOOK) 144 (PAGE) 26, BOOK OF DEEDS.

AFFECTS: A PORTION OF PARCEL THREE

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **NOT A SURVEY ITEM**

18. AN EASEMENT OVER SAID LAND FOR ELECTRICAL FACILITIES AND INCIDENTAL PURPOSES, GRANTED TO GREAT WESTERN POWER COMPANY, IN DEED RECORDED DECEMBER 30, 1915, (BOOK) 223 (PAGE) 38, BOOK OF DEEDS.

AFFECTS: SEE MAP FOR PROBABLE LOCATION

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **PLOTTED AS SHOWN HEREON**

19. AN EASEMENT OVER SAID LAND FOR PUBLIC HIGHWAY AND INCIDENTAL PURPOSES, GRANTED TO COUNTY OF SOLANO, IN DEED RECORDED AUGUST 6, 1923, (BOOK) 260 (PAGE) 12, BOOK OF DEEDS.

AFFECTS: THE RIVER LEVEE ROAD FROM THE RYER ISLAND FERRY TO ABOUT 7,000 FT NORTH THEREOF.

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **NOT A SURVEY ITEM**

20. AN EASEMENT OVER SAID LAND FOR ELECTRICAL POLE LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED OCTOBER 28, 1927, (BOOK) 5 (PAGE) 72, OFFICIAL RECORDS.

AFFECTS: 20 FOOT STRIP RUNNING THROUGH PARCEL ONE

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT.

SAID EASEMENT MODIFIED BY INSTRUMENT RECORDED MARCH 2, 1928, (BOOK) 10 (PAGE) 490, OFFICIAL RECORDS AND INSTRUMENT RECORDED MARCH 13, 1943, (BOOK) 277 (PAGE) 183, OFFICIAL RECORDS. **LOCATION UNKNOWN**

21. AN EASEMENT OVER SAID LAND FOR ELECTRIC TRANSMISSION LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED MARCH 2, 1937, (BOOK) 169 (PAGE) 401, OFFICIAL RECORDS. **PLOTTED AS SHOWN HEREON**

22. AN EASEMENT OVER SAID LAND FOR ELECTRIC TRANSMISSION LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED APRIL 8, 1937, (BOOK) 173 (PAGE) 148, OFFICIAL RECORDS.

AFFECTS: A PORTION OF PARCEL ONE  
**PLOTTED AS SHOWN HEREON**

23. AN EASEMENT OVER SAID LAND FOR ELECTRIC TRANSMISSION LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED MAY 11, 1938, (BOOK) 185 (PAGE) 242, OFFICIAL RECORDS.

AFFECTS: A PORTION OF SAID PROPERTY  
**PLOTTED AS SHOWN HEREON**

24. AN EASEMENT OVER SAID LAND FOR ELECTRIC TRANSMISSION LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED MARCH 29, 1940, (BOOK) 212 (PAGE) 346, OFFICIAL RECORDS.

AFFECTS: A PORTION OF SAID PROPERTY

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **PLOTTED AS SHOWN HEREON**

25. AN EASEMENT OVER SAID LAND FOR ELECTRIC TRANSMISSION LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED FEBRUARY 10, 1943, (BOOK) 273 (PAGE) 154, OFFICIAL RECORDS.

AFFECTS: A PORTION OF SAID PROPERTY

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT.

26. AN EASEMENT OVER SAID LAND FOR GAS PIPE LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED JUNE 12, 1943, (BOOK) 280 (PAGE) 423, OFFICIAL RECORDS.

AFFECTS: A PORTION OF SAID PROPERTY

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **LOCATION UNKNOWN**

27. RIGHTS INCIDENTAL TO THE OWNERSHIP FOR THE USE AND DEVELOPMENT OF THE MINERAL INTERESTS RESERVED IN DEED EXECUTED BY CALIFORNIA PACKING CORPORATION, RECORDED OCTOBER 25, 1943, (BOOK) 290 (PAGE) 379, OFFICIAL RECORDS.

MINERAL RIGHTS NOT SHOWN FURTHER.  
**AREA OF DISPOSAL IS ALONG THE BANKS OF CACHE SLOUGH AND WITHIN THE AREA OF RANCHO DE LOS ULPINOS. EXACT LOCATION UNKNOWN. NOT A SURVEY ITEM**

28. RIGHTS INCIDENTAL TO THE OWNERSHIP FOR THE USE AND DEVELOPMENT OF THE MINERAL INTERESTS RESERVED IN DEED EXECUTED BY MARY E. FERGUSON ET AL, RECORDED OCTOBER 25, 1943, (BOOK) 290 (PAGE) 383, OFFICIAL RECORDS.

MINERAL RIGHTS NOT SHOWN FURTHER. **NOT A SURVEY ITEM**

29. RIGHTS INCIDENTAL TO THE OWNERSHIP FOR THE USE AND DEVELOPMENT OF THE MINERAL INTERESTS RESERVED IN DEED EXECUTED BY MARY HAMILTON CHURCH ET AL, RECORDED OCTOBER 25, 1943, (BOOK) 291 (PAGE) 386, OFFICIAL RECORDS.

MINERAL RIGHTS NOT SHOWN FURTHER. **NOT A SURVEY ITEM**

30. RIGHTS INCIDENTAL TO THE OWNERSHIP FOR THE USE AND DEVELOPMENT OF THE MINERAL INTERESTS RESERVED IN DEED EXECUTED BY PETER COOK, JR. AND MARY W. COOK, RECORDED OCTOBER 25, 1943, (BOOK) 281 (PAGE) 389, OFFICIAL RECORDS.

MINERAL RIGHTS NOT SHOWN FURTHER. **NOT A SURVEY ITEM**

31. AN EASEMENT OVER SAID LAND FOR PASSAGE OF FLOOD WATERS, LEVEES, PUBLIC HIGHWAY PURPOSES, FISHERIES, AND FLOWAGE RIGHTS AND INCIDENTAL PURPOSES, RESERVED BY SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, IN DEED RECORDED AUGUST 24, 1945, (BOOK) 283 (PAGE) 455, OFFICIAL RECORDS.

AFFECTS: PORTIONS OF SAID PROPERTY

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **NOT A SURVEY ITEM**

32. AN EASEMENT OVER SAID LAND FOR GAS PIPE LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED MAY 28, 1946, (BOOK) 341 (PAGE) 359, OFFICIAL RECORDS.

AFFECTS: A PORTION OF SAID PROPERTY

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **CANNOT BE PLOTTED - MAY BE WEST OF THE PARCELS SURVEYED.**

33. AN EASEMENT OVER SAID LAND FOR ELECTRICAL FACILITIES AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED JUNE 10, 1947, (BOOK) 392 (PAGE) 480, OFFICIAL RECORDS.

AFFECTS: A PORTION OF SAID PROPERTY

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **PLOTTED AS SHOWN HEREON**

34. AN EASEMENT OVER SAID LAND FOR ELECTRIC TRANSMISSION LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED JULY 2, 1947, (BOOK) 407 (PAGE) 4, OFFICIAL RECORDS.

AFFECTS: A PORTION OF PARCEL ONE

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **PLOTTED AS SHOWN HEREON**

35. AN EASEMENT OVER SAID LAND FOR RIGHT OF WAY FOR CONVEYANCE OF IRRIGATION WATER AND INCIDENTAL PURPOSES, GRANTED TO PETER COOK, IN DEED RECORDED JUNE 8, 1948, (BOOK) 451 (PAGE) 425, OFFICIAL RECORDS.

AFFECTS: A PORTION OF PARCEL ONE

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **PLOTTED AS SHOWN HEREON**

36. AN EASEMENT OVER SAID LAND FOR GAS PIPE LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED DECEMBER 30, 1949, (BOOK) 509 (PAGE) 194, OFFICIAL RECORDS.

AFFECTS: A PORTION OF PARCEL ONE

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **PLOTTED AS SHOWN HEREON**

37. AN EASEMENT OVER SAID LAND FOR DEEP WATER SHIP CHANNEL AND ELECTRICAL FACILITIES AND INCIDENTAL PURPOSES, GRANTED TO SACRAMENTO-YOLO PORT DISTRICT, IN DEED RECORDED JUNE 30, 1950, (BOOK) 540 (PAGE) 173, OFFICIAL RECORDS.

AFFECTS: EASTERLY PORTION OF PARCEL ONE

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT.

38. AN EASEMENT OVER SAID LAND FOR GAS PIPE LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED JULY 11, 1952, (BOOK) 628 (PAGE) 386, OFFICIAL RECORDS.

AFFECTS: A PORTION OF PARCEL ONE

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **PLOTTED AS SHOWN HEREON**

39. AN EASEMENT OVER SAID LAND FOR UTILITY FACILITIES AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED OCTOBER 23, 1952, (BOOK) 640 (PAGE) 313, OFFICIAL RECORDS.

AFFECTS: A PORTION OF SAID PROPERTY

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **LOCATION UNKNOWN**

40. AN EASEMENT OVER SAID LAND FOR UTILITY FACILITIES AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED DECEMBER 28, 1956, (BOOK) 862 (PAGE) 541, OFFICIAL RECORDS.

AFFECTS: A PORTION OF SAID PROPERTY

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **LOCATION UNKNOWN**

41. AN EASEMENT OVER SAID LAND FOR PUBLIC HIGHWAY AND INCIDENTAL PURPOSES, GRANTED TO SACRAMENTO-YOLO PORT DISTRICT, IN DEED RECORDED JUNE 7, 1957, (BOOK) 885 (PAGE) 191, OFFICIAL RECORDS.

AFFECTS: A PORTION OF PARCEL THREE

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **PLOTTED AS SHOWN HEREON.**

42. AN EASEMENT OVER SAID LAND FOR GAS PIPE LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED OCTOBER 18, 1960, (BOOK) 1048 (PAGE) 657, OFFICIAL RECORDS.

AFFECTS: A PORTION OF SAID PROPERTY

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **LOCATION UNKNOWN**

43. AN EASEMENT OVER SAID LAND FOR GAS PIPE LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED JANUARY 26, 1961, (BOOK) 1063 (PAGE) 161, OFFICIAL RECORDS.

AFFECTS: A PORTION OF SAID PROPERTY

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **PLOTTED AS SHOWN HEREON**

44. AN EASEMENT OVER SAID LAND FOR GAS PIPE LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED JULY 30, 1962, (BOOK) 1153 (PAGE) 791, OFFICIAL RECORDS.

AFFECTS: A PORTION OF SAID PROPERTY

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **LOCATION UNKNOWN**

45. AN EASEMENT OVER SAID LAND FOR GAS PIPE LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED NOVEMBER 23, 1962, (BOOK) 1172 (PAGE) 590, OFFICIAL RECORDS.

AFFECTS: A PORTION OF PARCEL ONE

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **PLOTTED AS SHOWN HEREON**

46. AN EASEMENT OVER SAID LAND FOR GAS PIPE LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED JUNE 14, 1963, (BOOK) 1205 (PAGE) 310, OFFICIAL RECORDS.

AFFECTS: A PORTION OF PARCEL ONE

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **PLOTTED AS SHOWN HEREON**

47. AN EASEMENT OVER SAID LAND FOR GAS PIPE LINE AND INCIDENTAL PURPOSES, GRANTED TO PACIFIC GAS AND ELECTRIC COMPANY, IN DEED RECORDED NOVEMBER 19, 1979, (INSTRUMENT) 59219 (BOOK) 1979 (PAGE) 99591, OFFICIAL RECORDS.

AFFECTS: A PORTION OF SAID PROPERTY

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **PLOTTED AS SHOWN HEREON**

48. AN AGREEMENT PURSUANT TO THE CALIFORNIA LAND CONSERVATION ACT OF 1965, PLACING THE HEREIN DESCRIBED PROPERTY WITHIN AGRICULTURAL PRESERVE NO. 1126, EXECUTED BY THE COUNTY OF SOLANO AND ROSEMEL PROPERTIES, N.V., RECORDED FEBRUARY 25, 1981, (INSTRUMENT) 7801 (BOOK) 1981 (PAGE) 13284, OFFICIAL RECORDS.

AFFECTS PARCELS THREE AND FOUR  
**NOT A SURVEY ITEM**

49. AN AGREEMENT PURSUANT TO THE CALIFORNIA LAND CONSERVATION ACT OF 1965, PLACING THE HEREIN DESCRIBED PROPERTY WITHIN AGRICULTURAL PRESERVE NO. 1146, EXECUTED BY THE COUNTY OF SOLANO AND WILLIAM K. COBLENZ, RECORDED NOVEMBER 16, 1984, (INSTRUMENT) 51619 (BOOK) 1984 (PAGE) 100636, OFFICIAL RECORDS.

AFFECTS PARCELS ONE, TWO AND FIVE  
**NOT A SURVEY ITEM**

50. AN EASEMENT OVER SAID LAND FOR PIPE LINES AND ACCESS THERETO AND INCIDENTAL PURPOSES, GRANTED TO PAUL GRAHAM DRILLING SERVICE COMPANY, A CALIFORNIA CORPORATION, IN DEED RECORDED APRIL 26, 2006, (INSTRUMENT) 200600052307, OFFICIAL RECORDS.

AFFECTS: A PORTION OF PARCELS THREE, FOUR AND FIVE

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT. **PLOTTED AS SHOWN HEREON**

51. THE TERMS, CONDITIONS AND PROVISIONS AS CONTAINED IN THE DOCUMENT ENTITLED "SURFACE USE EASEMENT AGREEMENT", BY AND BETWEEN FLOYD PEDERSEN AND JEAN PEDERSEN AS CO-TRUSTEES OF THE PEDERSEN FAMILY TRUST AND PAUL GRAHAM DRILLING AND SERVICE COMPANY, A CALIFORNIA CORPORATION, DATED APRIL 1, 2006, RECORDED APRIL 26, 2006, AS (INSTRUMENT) 200600052308, OFFICIAL RECORDS.

AFFECTS PARCELS THREE, FOUR AND FIVE  
**NOT A SURVEY ITEM**

52. DEED OF TRUST TO SECURE AN INDEBTEDNESS OF \$36,725,000.00, DATED JULY 8, 2009, RECORDED JULY 21, 2009, (INSTRUMENT) 200900061981, OFFICIAL RECORDS.

TRUSTOR: ROBERT J. HILARIDES AND SHARON J. HILARIDES, HUSBAND AND WIFE  
TRUSTEE: FEDERAL LAND BANK ASSOCIATION OF KINGSBURG, FLCA  
BENEFICIARY: FEDERAL LAND BANK ASSOCIATION OF KINGSBURG, FLCA  
LOAN NO.: 2595646, 3791068, 3790320, 3687570

SAID MATTER AFFECTS THE HEREIN DESCRIBED LAND AND OTHER LAND.

53. SAID DEED OF TRUST SECURES AN ADDITIONAL ADVANCE OF \$5,215,000.00, AS DISCLOSED BY INSTRUMENT DATED MARCH 15, 2013, EXECUTED BY ROBERT J. HILARIDES AND SHARON J. HILARIDES, RECORDED APRIL 3, 2013, AS (INSTRUMENT) 201300033004, OFFICIAL RECORDS. **NOT A SURVEY ITEM**

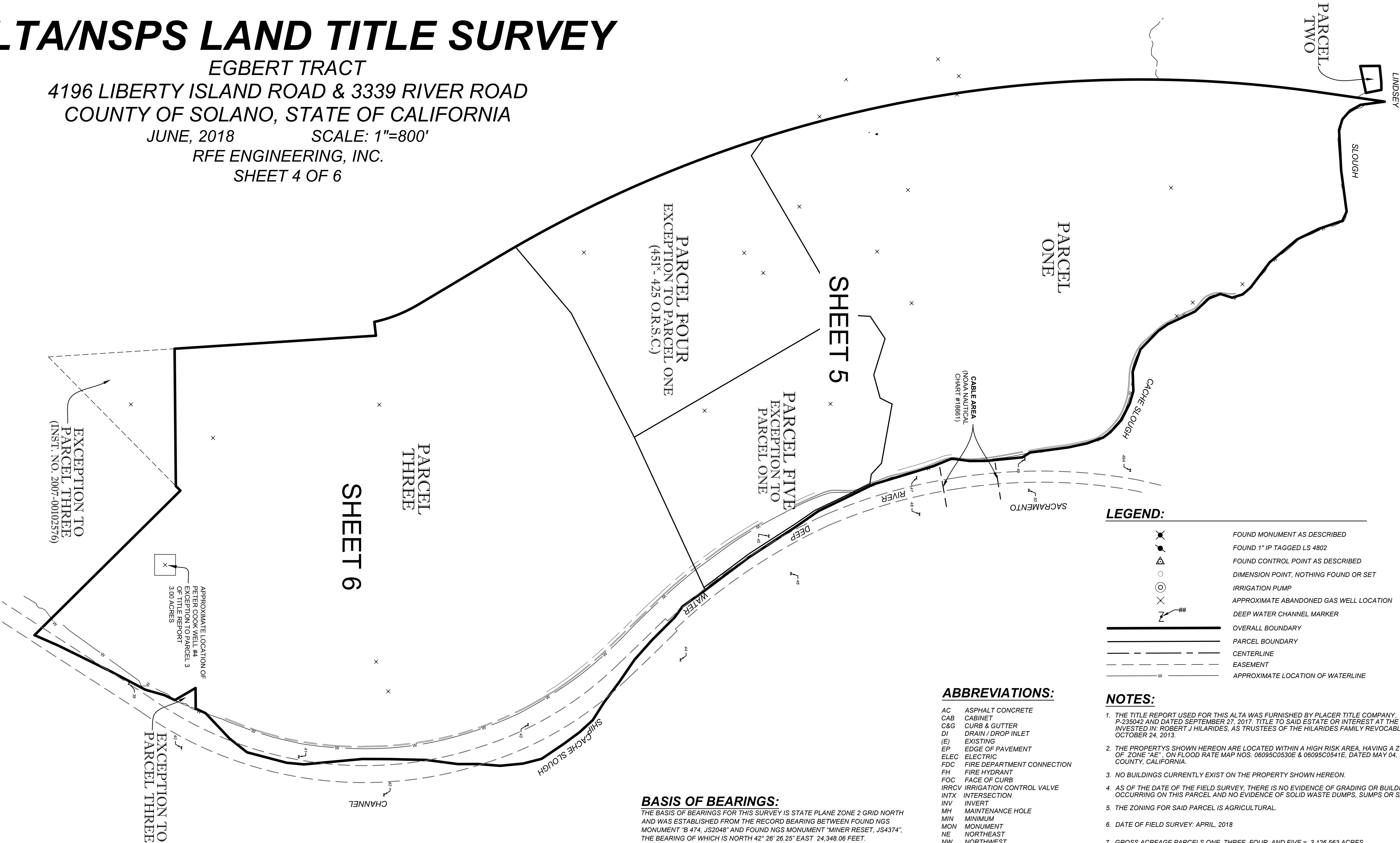
54. EASEMENTS FOR UTILITIES OR PIPELINES IN THAT PORTION OF THE LAND THAT IS AN ABANDONED OR VACATED ROAD OR RIGHT-OF-WAY AS RESERVED IN THAT CERTAIN RESOLUTION VACATING A PORTION OF LIBERTY ISLAND ROAD, RECORDED MAY 27, 2011, (INSTRUMENT) 201100047520, OFFICIAL RECORDS. **PLOTTED AS SHOWN HEREON**








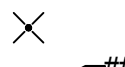






# ALTA/NSPS LAND TITLE SURVEY

EGBERT TRACT  
4196 LIBERTY ISLAND ROAD & 3339 RIVER ROAD  
COUNTY OF SOLANO, STATE OF CALIFORNIA

JUNE, 2018      SCALE: 1"=800'  
RFE ENGINEERING, INC.  
SHEET 4 OF 6



## LEGEND:

	FOUND MONUMENT AS DESCRIBED
	FOUND 1" IP TAGGED LS 4802
	FOUND CONTROL POINT AS DESCRIBED
	DIMENSION POINT, NOTHING FOUND OR SET
	IRRIGATION PUMP
	APPROXIMATE ABANDONED GAS WELL LOCATION
	DEEP WATER CHANNEL MARKER
	OVERALL BOUNDARY
	PARCEL BOUNDARY
	CENTERLINE
	EASEMENT
	APPROXIMATE LOCATION OF WATERLINE

## ABBREVIATIONS:

AC	ASPHALT CONCRETE
CAB	CABINET
C&G	CURB & GUTTER
DI	DRAIN / DROP INLET
(E)	EXISTING
EP	EDGE OF PAVEMENT
ELEC	ELECTRIC
FDC	FIRE DEPARTMENT CONNECTION
FH	FIRE HYDRANT
FOC	FACE OF CURB
IRRCV	IRRIGATION CONTROL VALVE
INTX	INTERSECTION
INV	INVERT
MH	MAINTENANCE HOLE
MIN	MINIMUM
MON	MONUMENT
NE	NORTHEAST
NW	NORTHWEST
PB	PULL BOX
PIV	POST INDICATOR VALVE
PUE	PUBLIC UTILITY EASEMENT
ROW	RIGHT-OF-WAY
SDMH	STORM DRAIN MANHOLE
SD	STORM DRAIN
SE	SOUTHEAST
SERV	SERVICE
SS	SANITARY SEWER
SSCO	SANITARY SEWER CLEAN OUT
SSMH	SANITARY SEWER MANHOLE
STLT	STREET LIGHT
SW	SIDEWALK OR SOUTHWEST
TRANS	TRANSFORMER
WV	WATER VALVE
WM	WATER METER

## NOTES:

- THE TITLE REPORT USED FOR THIS ALTA WAS FURNISHED BY PLACER TITLE COMPANY, AND IS NUMBERED P-235042 AND DATED SEPTEMBER 27, 2017. TITLE TO SAID ESTATE OR INTEREST AT THE DATE HEREOF IS INVESTED IN: ROBERT J HILARIDES, AS TRUSTEES OF THE HILARIDES FAMILY REVOCABLE TRUST OF OCTOBER 24, 2013.
- THE PROPERTYS SHOWN HEREON ARE LOCATED WITHIN A HIGH RISK AREA, HAVING A ZONE DESIGNATION OF "ZONE "AE", ON FLOOD RATE MAP NOS. 06095C0530E & 06095C0541E, DATED MAY 04, 2009 IN SOLANO COUNTY, CALIFORNIA.
- NO BUILDINGS CURRENTLY EXIST ON THE PROPERTY SHOWN HEREON.
- AS OF THE DATE OF THE FIELD SURVEY, THERE IS NO EVIDENCE OF GRADING OR BUILDING CONSTRUCTION OCCURRING ON THIS PARCEL AND NO EVIDENCE OF SOLID WASTE DUMPS, SUMPS OR SANITARY LANDFILLS.
- THE ZONING FOR SAID PARCEL IS AGRICULTURAL.
- DATE OF FIELD SURVEY: APRIL, 2018
- GROSS ACREAGE PARCELS ONE, THREE, FOUR, AND FIVE = 3,126.563 ACRES  
LESS PETER COOK WELL #5 = 3,123.563 ACRES
- GROSS ACREAGE PARCEL TWO = 3.101 ACRES
- STATE LANDS COMMISSION ACCEPTANCE OF RECLAMATION DISTRICT DATED NOVEMBER 15, 1945 COMPRISES OF THE ENTIRETY OF THIS ALTA SURVEY AND ITS EXCEPTIONS LESS THE WEST 100 OF THE LEVEE EASEMENT & LESS PARCEL TWO.
- THE GAS WELLS SHOWN HEREON WERE PLOTTED FROM INFORMATION PROVIDED BY OTHERS. THEIR LOCATION IS APPROXIMATE AS THERE IS NO FIELD EVIDENCE WITH WHICH TO LOCATE THEM.
- ACCESS BETWEEN PARCEL TWO AND THE OTHER PARCELS IS PERSCRIPTIVE ONLY OVER THE PAVED RIVER LEVEE ROAD AND THE DIRT ROAD ONTO THE WESTERLY LEVEE. THE PUBLIC ROAD ENDS AT THE NORTHWEST CORNER OF PARCEL TWO. THE PUBLIC ACCESS OVER THE PAVED RIVER LEVEE ROAD FROM THE NORTHWEST CORNER OF PARCEL TWO EASTERLY TO THE POINT SHOWN HEREON WAS VACATED BY COUNTY RESOLUTION NO. 2001-168, RECORDED AS DOCUMENT NO. 201100047520.

## BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS SURVEY IS STATE PLANE ZONE 2 GRID NORTH AND WAS ESTABLISHED FROM THE RECORD BEARING BETWEEN FOUND NGS MONUMENT "B 474, JS2048" AND FOUND NGS MONUMENT "MINER RESET, JS4374", THE BEARING OF WHICH IS NORTH 42° 26' 26.25" EAST 24,348.06 FEET.

## BENCHMARK:

THE BENCHMARK USED FOR THIS ALTA WAS NGS CONTROL POINT "B 474, JS2048", WHICH IS A BENCH MARK DISK SET IN THE TOP OF A CONCRETE MONUMENT AND STAMPED "B 474 1951" AND IS LOCATED 37 FEET NORTH OF THE CENTER LINE OF THE NORTH DRIVEWAY TO 3362 LIBERTY ISLAND ROAD AND ABOUT 120 FEET NORTH OF THE EXTENSION OF CLAYTON LANE CENTER LINE.  
ELEVATION = 25.1 FEET (NAVD 88 DATUM)

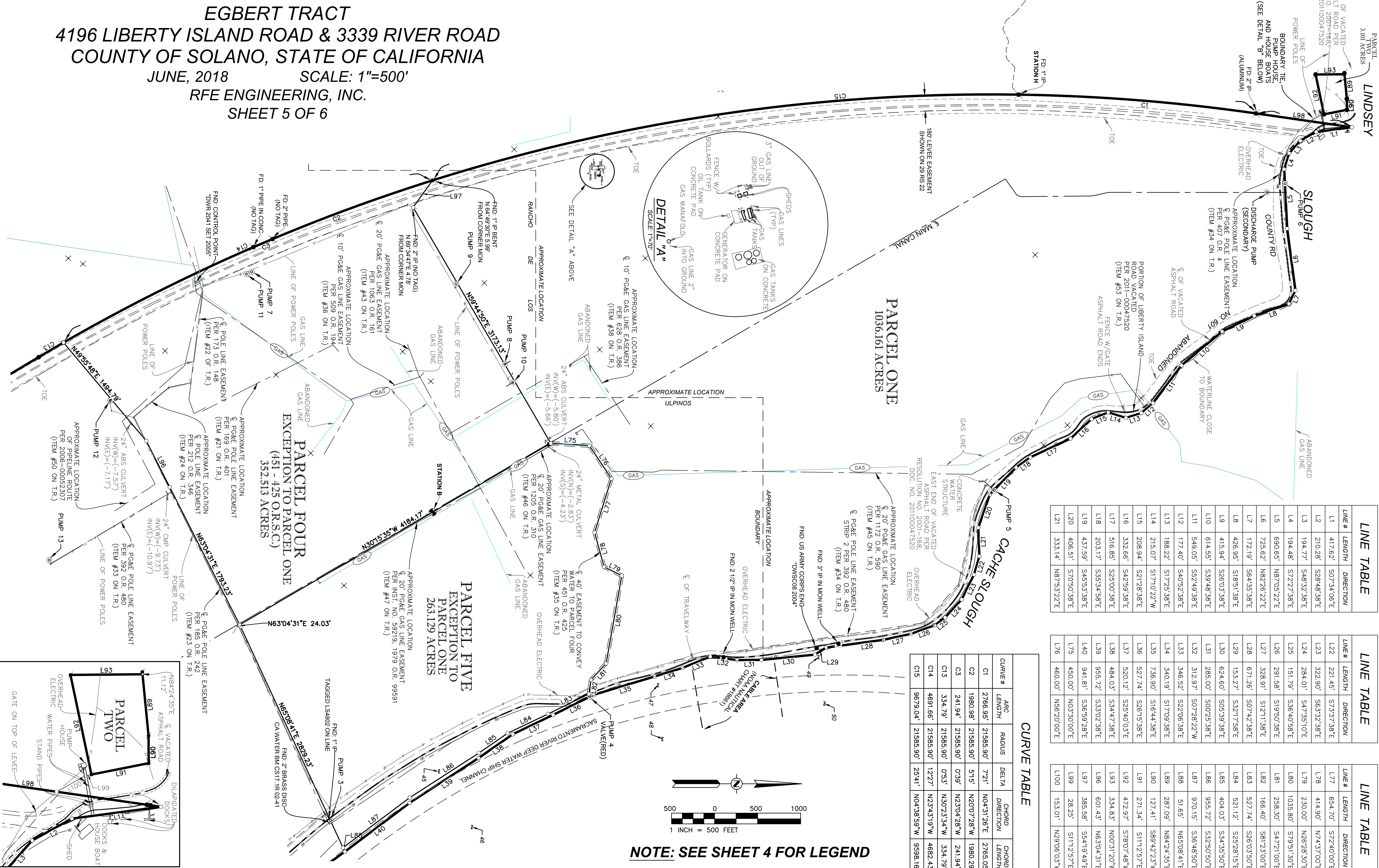
## UTILITY NOTES:

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.



# ALTA/NSPS LAND TITLE SURVEY

EGBERT TRACT  
4196 LIBERTY ISLAND ROAD & 3339 RIVER ROAD  
COUNTY OF SOLANO, STATE OF CALIFORNIA  
JUNE, 2018 SCALE: 1"=500'  
RFE ENGINEERING, INC.  
SHEET 5 OF 6



LINE TABLE		
LINE #	LENGTH	DIRECTION
L1	417.62'	S07°34.06'E
L2	210.28'	S28°48.38'E
L3	194.77'	S48°32.38'E
L4	194.48'	S72°27.38'E
L5	690.65'	N87°05.22'E
L6	725.62'	N82°26.22'E
L7	172.19'	S64°35.38'E
L8	426.95'	S18°51.38'E
L9	415.94'	S26°03.38'E
L10	614.55'	S39°48.38'E
L11	549.05'	S52°49.38'E
L12	177.40'	S40°52.38'E
L13	188.22'	S17°10.22'W
L14	215.07'	S17°10.22'W
L15	208.94'	S21°28.38'E
L16	332.66'	S42°59.38'E
L17	516.85'	S25°00.38'E
L18	203.17'	S35°34.38'E
L19	437.59'	S45°53.38'E
L20	406.51'	S70°50.38'E
L21	333.14'	N87°53.22'E

LINE TABLE		
LINE #	LENGTH	DIRECTION
L22	221.45'	S73°37.38'E
L23	322.90'	S63°32.38'E
L24	284.01'	S47°35.10'E
L25	151.79'	S36°40.58'E
L26	291.58'	S19°50.38'E
L27	328.91'	S12°11.38'E
L28	671.28'	S07°42.38'E
L29	153.27'	S32°17.58'E
L30	624.60'	S05°39.38'E
L31	285.00'	S00°25.38'E
L32	312.97'	S07°28.22'W
L33	346.52'	S22°06.38'E
L34	340.19'	S17°09.38'E
L35	736.90'	S16°44.38'E
L36	527.74'	S26°15.38'E
L37	520.12'	S25°40.03'E
L38	484.03'	S34°47.38'E
L39	955.72'	S33°02.38'E
L40	941.81'	S36°59.28'E
L75	450.00'	N03°30.00'E
L76	460.00'	N6°20.00'E

LINE TABLE		
LINE #	LENGTH	DIRECTION
L77	654.70'	S72°40.00'E
L78	414.90'	N7°37.00'E
L79	230.00'	N26°28.30'E
L80	1035.80'	S79°51.30'E
L81	258.30'	S47°21.00'E
L82	166.40'	S81°23.00'E
L83	527.74'	S26°03.50'E
L84	521.12'	S25°28.15'E
L85	404.03'	S34°35.50'E
L86	955.72'	S32°50.50'E
L87	970.15'	S36°48.50'E
L88	51.65'	N65°08.41'E
L89	287.09'	N84°24.35'E
L90	127.41'	S89°42.23'W
L91	271.34'	S11°12.57'E
L92	472.97'	S78°07.48'W
L93	334.83'	N00°31.20'W
L96	601.43'	N63°04.31'E
L97	355.58'	S54°19.49'E
L99	28.25'	S11°12.57'E
L100	153.01'	N29°06.03'W

CURVE TABLE				
CURVE #	ARC LENGTH	RADIUS	DELTA DIRECTION	CHORD LENGTH
C1	2768.95'	21585.90'	7°21' N04°31'28"E	2765.05'
C2	1980.98'	21585.90'	5°15' N20°07'28"W	1980.29'
C3	241.94'	21585.90'	0°39' N23°04'28"W	241.94'
C13	334.79'	21585.90'	0°53' N30°23'34"W	334.79'
C14	4691.66'	21585.90'	12°27' N23°43'19" W	4682.43'
C15	9679.04'	21585.90'	25°41' N04°38'58" W	9598.16'

NOTE: SEE SHEET 4 FOR LEGEND

DETAIL "B"  
SCALE 1"=200'



ALTA/NSPS LAND TITLE SURVEY

EGBERT TRACT

4196 LIBERTY ISLAND ROAD & 3339 RIVER ROAD

COUNTY OF SOLANO, STATE OF CALIFORNIA

JUNE, 2018

SCALE: 1"=500'

RFE ENGINEERING, INC.

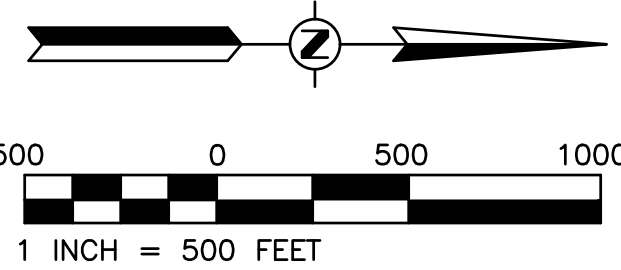
SHEET 6 OF 6

LINE TABLE		
LINE #	LENGTH	DIRECTION
L38	484.03'	S34°47'38"E
L39	955.72'	S33°02'38"E
L40	94.81'	S36°59'28"E
L41	481.66'	S35°41'57"E
L42	229.11'	S54°18'57"E
L43	47.63'	S45°03'57"E
L44	507.39'	S45°03'57"E
L45	453.82'	S48°23'47"E
L46	448.31'	S55°35'57"E
L47	458.38'	S53°24'57"E
L48	356.46'	S57°26'57"E
L49	3.62'	S42°35'57"E
L50	300.28'	S42°35'57"E
L51	337.65'	S36°32'07"E
L52	464.54'	S34°00'57"E

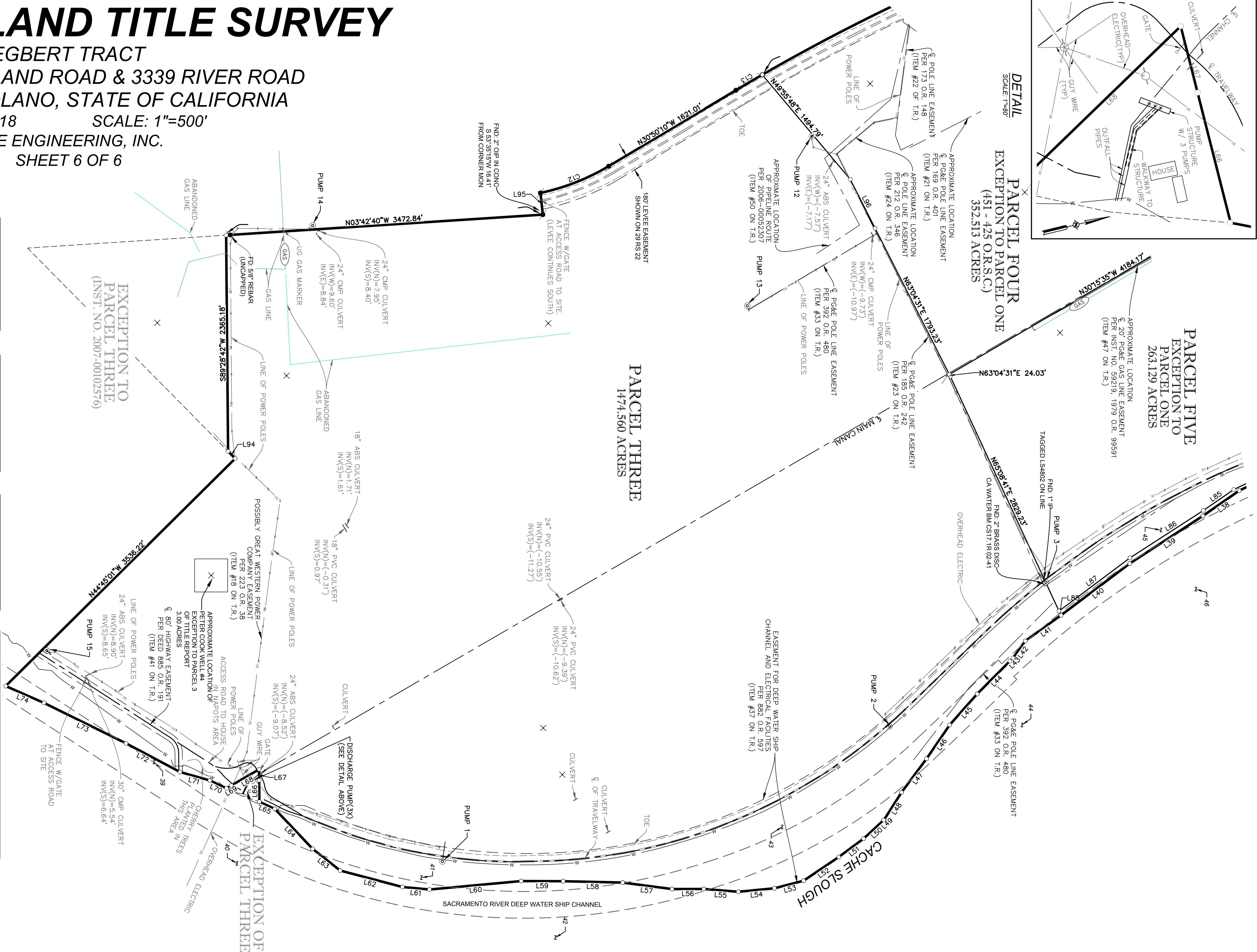
LINE TABLE		
LINE #	LENGTH	DIRECTION
L53	329.84'	S14°27'57"E
L54	396.55'	S05°29'57"E
L55	379.72'	S04°35'03"W
L56	346.74'	S00°08'17"E
L57	545.18'	S07°28'33"W
L58	650.31'	S01°19'43"W
L59	460.03'	S00°11'23"W
L60	1007.59'	S05°16'17"E
L61	297.52'	S05°21'13"W
L62	704.72'	S14°47'13"W
L63	384.18'	S38°13'33"W
L64	601.42'	S46°35'23"W
L65	186.45'	S24°43'33"W
L66	235.04'	S89°33'59"W
L67	119.98'	S89°33'42"W

LINE TABLE		
LINE #	LENGTH	DIRECTION
L68	351.77'	S30°14'07"E
L69	61.88'	S30°14'07"E
L70	200.56'	S25°30'03"W
L71	339.54'	S15°48'13"W
L72	669.21'	S27°58'33"W
L73	1001.06'	S26°14'13"W
L74	457.45'	S23°42'17"W
L85	404.03'	S34°35'50"E
L86	955.72'	S32°50'50"E
L87	970.15'	S36°48'50"E
L88	51.65'	N65°08'41"E
L94	110.53'	S45°23'20"W
L95	239.04'	S83°37'23"W
L96	601.43'	N63°04'31"E

CURVE TABLE					
CURVE #	ARC LENGTH	RADIUS	DELTA	CHORD DIRECTION	CHORD LENGTH
C12	806.20'	24444.53'	185°41'	N21°23'24"W	802.55'
C13	334.79'	21585.90'	0°53'	N30°23'34"W	334.79'



NOTE: SEE SHEET 4 FOR LEGEND



ALTA  
Powell Property



# ALTA/NSPS LAND TITLE SURVEY

## POWELL PROPERTY

APN(S): 0177-110-130, 0177-110-260 & 0177-150-010

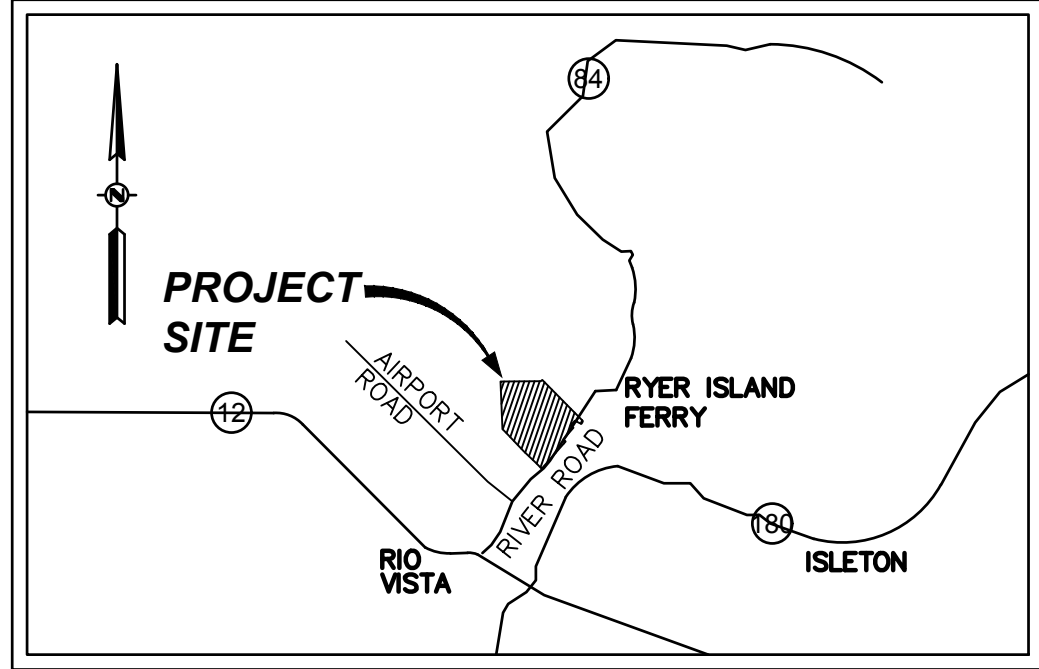
COUNTY OF SOLANO, STATE OF CALIFORNIA

FEBRUARY, 2019

SCALE: N/A

RFE ENGINEERING, INC.

SHEET 1 OF 2



VICINITY MAP  
NO SCALE

### TITLE REPORT LEGAL DESCRIPTION:

THE LAND DESCRIBED HEREIN IS SITUATED IN THE STATE OF CALIFORNIA, COUNTY OF SOLANO, UNINCORPORATED AREA, DESCRIBED AS FOLLOWS:

#### PARCEL ONE:

THE PROPERTY DESCRIBED IN THE DEED DATED SEPTEMBER 30, 1938, RECORDED OCTOBER 4, 1938 IN BOOK 190 OF OFFICIAL RECORDS, PAGE 5, INSTRUMENT NO. 5101, KNOWN AS THE CARPENTER RANCH, AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWEST CORNER OF THAT CERTAIN 0.39 ACRE TRACT OF LAND CONVEYED BY T. L. GATES, ET UX, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT BY DEED DATED NOVEMBER 8, 1929 AND RECORDED NOVEMBER 16, 1929 IN BOOK 46 OF OFFICIAL RECORDS, PAGE 174, SOLANO COUNTY RECORDS, WHICH SAID POINT BEARS SOUTH 53°48' EAST 43 FEET AND NORTH 56°15'-L/2' EAST 136.71 FEET FROM AN IRON PIPE MARKING THE CORNER COMMON TO THE LANDS FORMERLY OWNED BY JOSE C. NUÑES AND FRED J. KALBER AND THE LANDS OF THE COUNTY OF SOLANO, STATE OF CALIFORNIA, AND THE LAND OF COLOMBO GIOMETTI, WHICH IRON PIPE IS LOCATED NORTH 53°48' WEST 168.43 FEET FROM A POINT DESIGNATED AS POST "R" IN THAT CERTAIN DEED DATED AUGUST 22, 1895 FROM WILHELMINA PETER TO THE COUNTY OF SOLANO AND FILED FOR RECORD IN BOOK 121 OF DEEDS, PAGE 332, SOLANO COUNTY RECORDS; THENCE FROM SAID POINT OF BEGINNING AND ALONG THE NORTHWESTERLY LINE OF COUNTY ROAD NO. 474, NORTH 56°15'-1/2' EAST 201.16 FEET; THENCE ON CURVE TO THE LEFT WITH A RADIUS OF 472 FEET A DISTANCE OF 117.22 FEET; THENCE NORTH 42°01'37" EAST 2.625 FEET, MORE OR LESS, TO THE MOST SOUTHERLY CORNER OF LOT 10, AS SHOWN ON THAT CERTAIN MAP FILED FOR RECORD AT THE REQUEST OF J. T. MACHADO JUNE 4, 1937 IN BOOK 9 OF MAPS, PAGE 26; THENCE LEAVING THE NORTH BOUNDARY OF SAID COUNTY ROAD NO. 474, NORTH 47°59' WEST (NORTH 48°29'47" WEST)(M) 192.56 FEET TO THE MOST WESTERLY CORNER OF SAID LOT 10; THENCE NORTH 42°01' EAST (NORTH 41°30'31" EAST)(M) SOUTHERLY CORNER OF LOT 5, AS SHOWN ON SAID MAP; THENCE NORTH 47°59' WEST (NORTH 48°29'47" WEST)(M) 220.86 FEET TO THE MOST WESTERLY CORNER OF SAID LOT 5; THENCE ALONG THE NORTHWESTERLY LINE OF LOTS 5, 4 AND 2, AS SHOWN ON SAID MAP NORTH 42°01' WEST (NORTH 41°30'13" EAST)(M) 363.48 FEET TO THE MOST NORTHERLY CORNER OF LOT 2 AS SHOWN ON SAID MAP; THENCE NORTH 63°39' WEST (NORTH 64°09'47" WEST)(M) 12 FEET, MORE OR LESS TO THE MOST EASTERLY CORNER OF LOT 3 AS SHOWN ON SAID MAP; THENCE SOUTH 42°01' WEST (SOUTH 41°30'13" WEST)(M) 199.03 FEET TO THE MOST SOUTHERLY CORNER OF SAID LOT 3; THENCE NORTH 47°59' WEST (NORTH 48°29'47" WEST)(M) ALONG THE SOUTHWESTERLY LINE OF SAID LOT 3, 270.40 FEET TO THE MOST WESTERLY CORNER OF LOT 3; THENCE NORTH 42°01' EAST (NORTH 41°30'13" EAST)(M) 123.19 FEET TO THE MOST NORTHERLY CORNER OF SAID LOT 3; THENCE SOUTH 63°39' EAST (SOUTH 64°09'47" EAST)(M) 722.26 FEET, MORE OR LESS (722.72 FEET)(M), TO A POINT ON THE NORTHWESTERLY LINE OF SAID COUNTY ROAD NO. 474 AT THE MOST EASTERLY CORNER OF LOT 1, AS SHOWN ON MAP ABOVE REFERRED TO; THENCE NORTH 35°08'30" EAST (NORTH 34°37'43" EAST)(M) 94.0 FEET TO A FENCE CORNER; THENCE NORTH 25°34'30" EAST (NORTH 25°03'43" EAST)(M) 63.5 FEET (102.44 FEET)(M) ALONG THE NORTHWESTERLY LINE OF SAID COUNTY ROAD TO THE MOST EASTERLY CORNER OF THE PARCEL OF LAND HERETOFORE CONVEYED BY T. L. GATES, ET AL, TO ELIZABETH CARPENTER BY DEED DATED FEBRUARY 19, 1934 AND RECORDED FEBRUARY 21, 1934 IN BOOK 119, PAGE 208 OF OFFICIAL RECORDS, SOLANO COUNTY RECORDS; THENCE ALONG THE NORTHEASTERLY LINE OF SAID LAND NORTH 44°10' WEST (NORTH 44°45'01" WEST)(M) 3,448.0 FEET, MORE OR LESS (3393.22 FEET)(M), TO THE MOST NORTHERLY CORNER OF SAID TRACT; THENCE SOUTH 45°45' WEST (SOUTH 45°23'20" WEST)(M) ALONG THE NORTHWESTERLY LINE OF SAID TRACT 110.53 FEET; THENCE LEAVING SAID BOUNDARY OF LANDS OF LOIS HERINGER, ET AL, NORTH 89°40'48" WEST (SOUTH 89°28'42" WEST)(M) 2,365.18 FEET TO A POINT ON THE BOUNDARY COMMON TO SAID 360.74 ACRE TRACT AND SAID 527.3 ACRE TRACT, SAID POINT BEING 2,798.22 FEET NORTHWESTERLY ALONG SAID BOUNDARY FROM THE MOST SOUTHERLY CORNER OF A 2.2 ACRE TRACT OF LAND CONVEYED BY T. L. GATES, ET AL, TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT BY DEED DATED JUNE 3, 1929 AND RECORDED JUNE 3, 1929 IN BOOK 34 OF OFFICIAL RECORDS, PAGE 252, SOLANO COUNTY RECORDS; THENCE ALONG THE BOUNDARY OF SAID TRACT, SOUTH 3°30'33" EAST (SOUTH 03°42'40" EAST)(M) 2798.22 FEET (2861.71 FEET)(M) TO THE MOST SOUTHERLY CORNER OF SAID 2.2 ACRE TRACT; THENCE ALONG THE LINE OF LAND OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, SOUTH 43°23'37" EAST 1,800 FEET, MORE OR LESS, (SOUTH 43°44'59" EAST 366.98 FEET)(M), THENCE (SOUTH 43°44'59" EAST 1343.60 FEET)(M), TO THE MOST EASTERLY CORNER OF LOT 36, AS SHOWN ON MAP OF A PORTION OF THE RANCHO LOS ULPINOS OR BIDWELL GRANT BELONGING TO CHAPMAN AND TORODE, FILED FOR RECORD IN THE OFFICE OF THE COUNTY RECORDER OF COUNTY OF SOLANO, STATE OF CALIFORNIA IN MAY 1861; THENCE SOUTH 36°22'44" WEST 1,152.87 FEET ALONG THE SOUTHERLY LINE OF SAID LOT 36 TO THE EASTERLY LINE OF A CERTAIN 21.87 ACRE TRACT OF LAND OF SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT; THENCE ALONG THE BOUNDARY OF SAID LAND SOUTH 53°44'13" EAST 1,071 FEET, MORE OR LESS, TO THAT

CERTAIN LOT OF LAND CONVEYED BY T. L. GATES, ET AL, TO COLMO GIOMETTI AND ANITA GIOMETTI, HIS WIFE, BY DEED DATED MAY 28, 1928 AND RECORDED JUNE 6, 1928 IN BOOK 14 OF OFFICIAL RECORDS, PAGE 268, SOLANO COUNTY RECORDS; THENCE ALONG THE BOUNDARY OF SAID LAND NORTH 33°43' EAST 174.90 FEET; THENCE SOUTH 58°30' EAST 104.28 FEET AND SOUTH 31° WEST 135 FEET, MORE OR LESS TO THE PLACE OF COMMENCEMENT.

EXCEPTING THEREFROM THAT PORTION THEREOF LYING SOUTHWESTERLY OF THE NORTHEAST LINE OF THE PARCEL OF LAND DESCRIBED AS PARCEL NO. 2 IN THE DEED FROM BEULAH EMIGH, ET AL, TO SACRAMENTO YOLO PORT DISTRICT, DATED OCTOBER 2, 1970, RECORDED OCTOBER 9, 1970 IN BOOK 1647 OF OFFICIAL RECORDS AT PAGE 244, INSTRUMENT NO. 18271.

FURTHER EXCEPTING THEREFROM AN UNDIVIDED 3/60TH INTEREST IN ALL MINERAL DEPOSITS, OIL, GAS AND OTHER HYDROCARBON SUBSTANCES OF EVERY KIND AND CHARACTER, AND ALL GEOTHERMAL RESERVES AS RESERVED IN THE DEED FROM HAROLD A. EMIGH, ET UX, RECORDED SEPTEMBER 10, 1976, BOOK 1976, PAGE 51342, SERIES 31596, SOLANO COUNTY OFFICIAL RECORDS.

FURTHER EXCEPTING THEREFROM ALL REMAINING MINERAL INTEREST AND NOT AS A ROYALTY INTEREST, ALL MINERALS, OIL, GAS, HYDROCARBONS, AND ASSOCIATED SUBSTANCES IN, UNDER, OR PRODUCED AND SAVED FROM SAID REAL PROPERTY WITH THE RIGHT OF ENTRY TO THE SURFACE OF SAID REAL PROPERTY OR THE TOP 500 FEET OF THE SUBSURFACES OF SAID REAL PROPERTY FOR THE PURPOSE OF EXPLORING FOR, DEVELOPING, AND REMOVING SUCH MINERALS, OIL, GAS, HYDROCARBONS, AND ASSOCIATED SUBSTANCES, AS RESERVED IN THE DEED FROM HOWARD LAMOTHE, ET AL, RECORDED JULY 18, 2002, AS INSTRUMENT NO. 2002-00089454, SOLANO COUNTY RECORDS.

APN: 0177-110-130, 0177-110-260

#### PARCEL TWO:

ALL OF THAT CERTAIN PARCEL OF REAL PROPERTY BEING IN THE COUNTY OF SOLANO, STATE OF CALIFORNIA, AND BEING ALL OF THAT CERTAIN ONE-ACRE TRACT OF LAND DESCRIBED IN THAT CONVEYANCE FROM SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT TO THE WILDLIFE CONSERVATION BOARD, DATED NOVEMBER 16, 1976, AND RECORDED MARCH 7, 1977, IN BOOK 1977, PAGE 14751, SERIES NO. 8506 IN THE OFFICE OF THE COUNTY RECORDER OF SOLANO COUNTY, ALSO DESCRIBED AS THAT CERTAIN ONE-ACRE TRACT OF LAND DESCRIBED AS PARCEL TWO IN THAT DEED TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT RECORDED MAY 18, 1944, IN BOOK 317 OF OFFICIAL RECORDS AT PAGE 199, SOLANO COUNTY RECORDS; SAID PARCEL BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

PARCEL 71-965:

BEGINNING AT THE MOST EASTERLY CORNER OF THE HEREIN DESCRIBED PARCEL; AS SAID POINT BEARS NORTH 37°52'28" EAST 4,347.29 FEET FROM A FOUND 3/4-INCH IRON PIPE MARKING THE MOST EASTERLY CORNER OF THAT CERTAIN 21.87 ACRE TRACT OF LAND DESCRIBED BY DEED TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT RECORDED OCTOBER 6, 1927, IN BOOK 4 OF OFFICIAL RECORDS AT PAGE 84, SOLANO COUNTY RECORDS; THENCE FROM SAID POINT OF BEGINNING ALONG THE FOLLOWING FOUR (4) COURSES:

(1) NORTH 64°02'45" WEST 280.83 FEET; (2) SOUTH 41°37'15" WEST 123.19 FEET; (3) SOUTH 48°22'45" EAST 270.40 FEET AND (4) NORTH 41°37'15" EAST 199.03 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM: ALL MINERALS AS RESERVED IN THAT CERTAIN DEED FROM GUS WILLIAM MARTIN AND MURIEL MARTIN TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, RECORDED MAY 18, 1944, IN BOOK 317 OF OFFICIAL RECORDS AT PAGE 199, RECORDS OF SOLANO COUNTY, CALIFORNIA.

APN: 0177-150-010

#### END OF TITLE REPORT LEGAL DESCRIPTION

### TITLE REPORT EXCEPTIONS:

- TAXES, SPECIAL AND GENERAL, ASSESSMENT DISTRICTS AND SERVICE AREAS FOR THE FISCAL YEAR 2018-2019, A LIEN NOT YET DUE OR PAYABLE.  
**NOT A SURVEY ITEM**
- THE LIEN OF SUPPLEMENTAL TAXES, IF ANY, ASSESSED PURSUANT TO THE PROVISIONS OF CHAPTER 3.5, (COMMENCING WITH SECTION 75) OF THE REVENUE AND TAXATION CODE, OF THE STATE OF CALIFORNIA.

NOTE: (FOR PRORATION PURPOSES ONLY)

TAXES, SPECIAL AND GENERAL, ASSESSMENT DISTRICTS AND SERVICE AREAS FOR THE FISCAL YEAR 2017-2018:

1ST INSTALLMENT:	\$28.29 PAID
2ND INSTALLMENT:	\$28.29 PAID
PARCEL NUMBER:	0177-110-130
CODE AREA:	4023
LAND VALUE:	\$2,128.00
IMPROVEMENTS:	\$0.00
EXEMPTION:	\$0.00

NOTE: (FOR PRORATION PURPOSES ONLY)

TAXES, SPECIAL AND GENERAL, ASSESSMENT DISTRICTS AND SERVICE AREAS FOR THE FISCAL YEAR 2017-2018:

1ST INSTALLMENT:	\$1,247.57 PAID
2ND INSTALLMENT:	\$1,247.57 PAID
PARCEL NUMBER:	0177-110-260
CODE AREA:	84005
LAND VALUE:	\$116,564.00
IMPROVEMENTS:	\$0.00
EXEMPTION:	\$0.00

NOTE: (FOR PRORATION PURPOSES ONLY)

TAXES, SPECIAL AND GENERAL, ASSESSMENT DISTRICTS AND SERVICE AREAS FOR THE FISCAL YEAR 2017-2018:

1ST INSTALLMENT:	\$13.45 PAID
2ND INSTALLMENT:	\$13.45 PAID
PARCEL NUMBER:	0177-150-010
CODE AREA:	84005
LAND VALUE:	\$1,476.00
IMPROVEMENTS:	\$0.00
EXEMPTION:	\$0.00

**NOT A SURVEY ITEM**

- RIGHTS OF THE PUBLIC AND/OR THE SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, IN AND TO THE HIGHWAYS, ROADS, DITCHES, CANALS AND LEVEES EMBRACED WITHIN THE BOUNDARIES OF THE LAND DESCRIBED HEREIN.  
**NOT A SURVEY ITEM**
- AN EASEMENT OVER SAID LAND FOR PASSAGE OF FLOOD WATERS AND INCIDENTAL PURPOSES, GRANTED TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, IN DEED RECORDED FEBRUARY 5, 1940, (BOOK) 208 (PAGE) 396, OFFICIAL RECORDS.

AFFECTS: SAID PROPERTY

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT.  
**PLOTTED AND SHOWN HEREON**

- AN EASEMENT OVER SAID LAND FOR FLOOD CONTROL PURPOSES AND INCIDENTAL PURPOSES, GRANTED TO SACRAMENTO AND SAN JOAQUIN DRAINAGE DISTRICT, IN DEED RECORDED APRIL 15, 1944, (BOOK) 296 (PAGE) 473, OFFICIAL RECORDS.

AFFECTS: PORTION OF SAID PROPERTY

NO REPRESENTATION IS MADE AS TO THE CURRENT OWNERSHIP OF SAID EASEMENT.  
**PLOTTED AND SHOWN HEREON**

- AN AGREEMENT PURSUANT TO THE CALIFORNIA LAND CONSERVATION ACT OF 1965, PLACING THE HEREIN DESCRIBED PROPERTY WITHIN AN AGRICULTURAL PRESERVE, EXECUTED BY THE COUNTY OF SOLANO AND WALTER T. POWELL, RECORDED SEPTEMBER 27, 2007, (INSTRUMENT) 200700103008, OFFICIAL RECORDS.  
**NOT A SURVEY ITEM**

### SURVEYOR'S CERTIFICATE:

TO: WALTER T. POWELL AND PLACER TITLE COMPANY

THIS IS TO CERTIFY THAT THIS MAP OF PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 3, 4, 8, 11, AND 19 OF TABLE A THEREOF.

WILLIAM F. MCKINNEY, PLS 4715  
EXPIRES SEP 30, 2019

DATE

#### END OF EXCEPTIONS

# ALTA/NSPS LAND TITLE SURVEY

POWELL PROPERTY

APN(S): 0177-110-130, 0177-110-260 & 0177-150-010

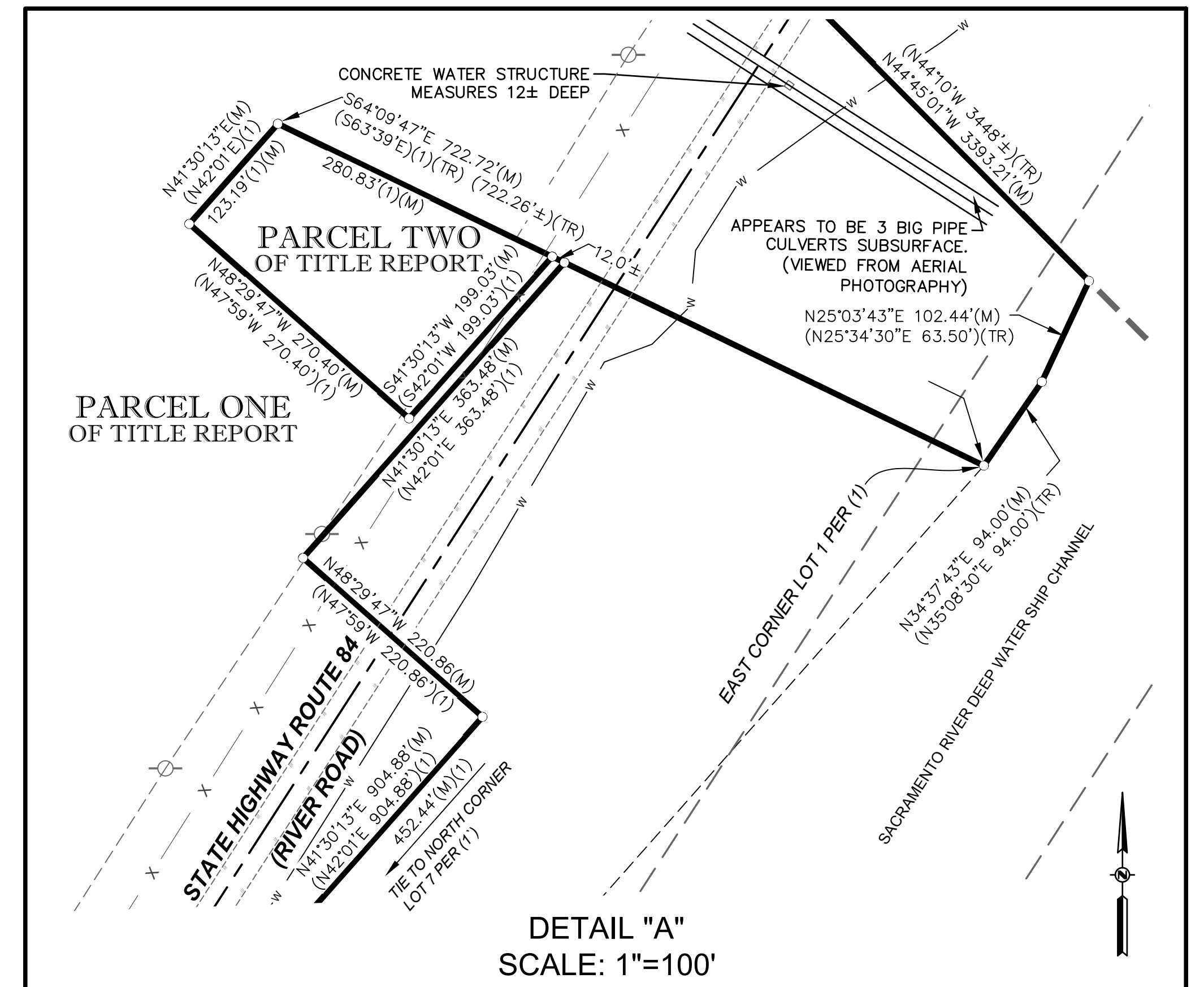
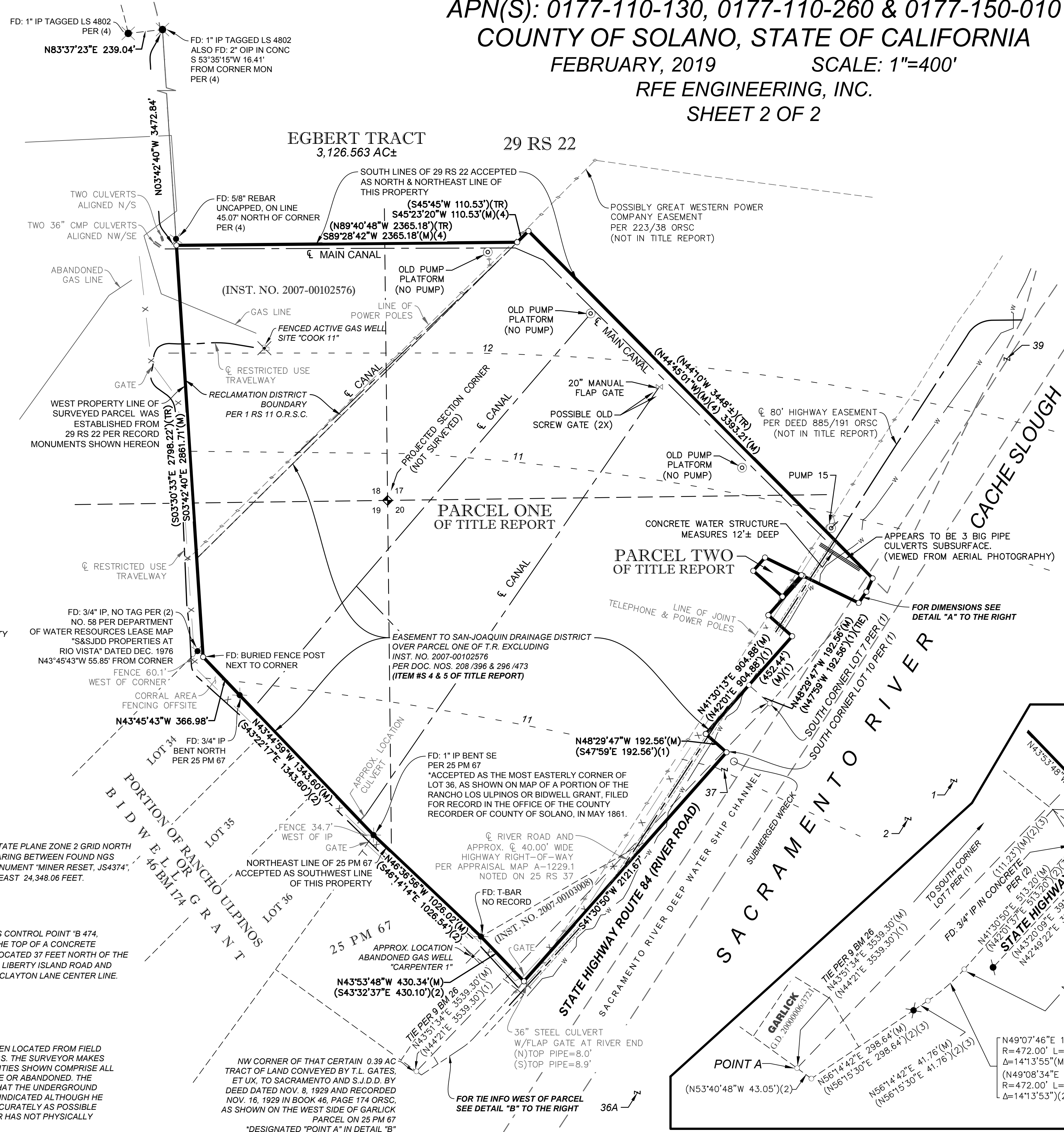
COUNTY OF SOLANO, STATE OF CALIFORNIA

FEBRUARY, 2019

SCALE: 1"=400'

RFE ENGINEERING, INC.

SHEET 2 OF 2



## ABBREVIATIONS:

BM	BOOK MAP
GD	GRANT DEED
ORSC	OFFICIAL RECORDS SOLANO COUNTY
PM	PARCEL MAP
RS	RECORD OF SURVEY
SJDD	SAN JOAQUIN DRAINAGE DISTRICT

## MAP LEGEND:

(M)	MEASURED BEARING AND DISTANCE
(TR)	TITLE REPORT BEARING AND DISTANCE
(1)	RECORD INFORMATION PER 9 BM 26
(2)	RECORD INFORMATION PER 25 PM 67
(3)	RECORD INFORMATION PER 25 RS 37
(4)	RECORD INFORMATION PER 29 RS 22

## BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS SURVEY IS STATE PLANE ZONE 2 GRID NORTH AND WAS ESTABLISHED FROM THE RECORD BEARING BETWEEN FOUND NGS MONUMENT "B 474, JS2048" AND FOUND NGS MONUMENT "MINER RESET, JS4374", THE BEARING OF WHICH IS NORTH 42° 26' 26.25" EAST 24,348.06 FEET.

## BENCHMARK:

THE BENCHMARK USED FOR THIS ALTA WAS NGS CONTROL POINT "B 474, JS2048", WHICH IS A BENCH MARK DISK SET IN THE TOP OF A CONCRETE MONUMENT AND STAMPED "B 474 1951" AND IS LOCATED 37 FEET NORTH OF THE CENTER LINE OF THE NORTH DRIVEWAY TO 3362 LIBERTY ISLAND ROAD AND ABOUT 120 FEET NORTH OF THE EXTENSION OF CLAYTON LANE CENTER LINE. ELEVATION = 25.1 FEET (NAVD 88 DATUM)

## UTILITY NOTES:

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

## LEGEND:

	FOUND MONUMENT AS DESCRIBED
	FOUND 5/8" REBAR W/ PLASTIC CAP LS 6925 PER (3)
	DIMENSION POINT, NOTHING FOUND OR SET
	IRRIGATION PUMP
	GAS WELL LOCATION
	DEEP WATER CHANNEL MARKER
	OVERALL BOUNDARY
	PARCEL BOUNDARY
	CENTERLINE
	FENCELINE
	APPROXIMATE LOCATION OF WATERLINE
	APPROXIMATE LOCATION OF BASE FLOOD ELEVATION LINE WITH ELEVATION

## NOTES:

- THE TITLE REPORT USED FOR THIS ALTA WAS FURNISHED BY PLACER TITLE COMPANY, AND IS NUMBERED P-290532 AND DATED SEPTEMBER 4, 2018. TITLE TO SAID ESTATE OR INTEREST AT THE DATE HEREOF IS INVESTED IN: WALTER T. POWELL.
- THE PROPERTIES SHOWN HEREON ARE LOCATED WITHIN A HIGH RISK AREA, HAVING A ZONE DESIGNATION OF "ZONE AE". ON FLOOD RATE MAP NOS. 06095C0535E & 06095C0541E, DATED MAY 04, 2009 IN SOLANO COUNTY, CALIFORNIA.
- NO BUILDINGS CURRENTLY EXIST ON THE PROPERTY SHOWN HEREON.
- AS OF THE DATE OF THE FIELD SURVEY, THERE IS NO EVIDENCE OF GRADING OR BUILDING CONSTRUCTION OCCURRING ON THIS PARCEL AND NO EVIDENCE OF SOLID WASTE DUMPS, SUMPS OR SANITARY LANDFILLS.
- THE ZONING FOR SAID PARCEL IS AGRICULTURAL.
- DATE OF FIELD SURVEY: JANUARY, 2019
- GROSS ACREAGE = 350.138 ACRES±
- STATE LANDS COMMISSION ACCEPTANCE OF RECLAMATION DISTRICT DATED NOVEMBER 15, 1945 COMPRISES OF A PORTION OF THIS ALTA SURVEY AND IS DELINEATED HEREON.
- DISTANCES SHOWN HEREON ARE GROUND DISTANCES.



## Appendix E. Cost Estimate

**LITTLE EGBERT JOINT POWERS AGENCY  
LITTLE EGBERT MULTI BENEFIT PROJECT  
FEASIBILITY STUDY ALTERNATIVE COSTS  
RD 536 LEVEE STA 0+00 TO 80+00  
LEVEE RAISE**

<b>Bid Schedule</b>					
<b>Line Item No.</b>	<b>Item Description</b>	<b>Estimated Quantity</b>	<b>Unit</b>	<b>Unit Price, \$</b>	<b>Extended Total, \$</b>
1	Mobilization and Demobilization	1	LS	\$277,000.00	\$277,000
2	Traffic Control	1	LS	\$80,000.00	\$80,000
3	Storm Water Pollution Control	1	LS	\$133,000.00	\$133,000
4	Project Fencing	17,600	LF	\$6.50	\$114,400
5	Clearing and Grubbing	41	AC	\$4,030.00	\$165,230
6	Remove Existing Aggregate Surfacing	8,000	LF	\$5.00	\$40,000
7	Topsoil Stripping	33,000	CY	\$12.04	\$397,436
8	Levee Excavation (Levee Degrade, Key Trench and Cutoff Trench)	14,300	CY	\$5.66	\$80,874
<del>9</del>	<del>Soil Bentonite Cutoff Wall</del>	<del>0</del>	<del>SF</del>	<del>\$0.00</del>	<del>\$0</del>
<del>10</del>	<del>Levee Embankment Fill (Soil Type 1)</del>	<del>0</del>	<del>CY</del>	<del>\$0.00</del>	<del>\$0</del>
11	Levee Embankment Fill (Soil Type 2)	276,000	CY	\$14.23	\$3,926,259
<del>12</del>	<del>Seepage Berm Fill</del>	<del>0</del>	<del>CY</del>	<del>\$0.00</del>	<del>\$0</del>
13	Class 2 Aggregate Surfacing	6,600	TN	\$52.26	\$344,916
14	Erosion Control Seeding	37	AC	\$5,070.00	\$187,590
15	Relocate Power Pole	10	EA	\$5,000.00	\$50,000
16	Relocate Gate	1	EA	\$2,000.00	\$2,000
<del>17</del>	<del>Relocate Pump 7</del>	<del>0</del>	<del>LS</del>	<del>\$10,000.00</del>	<del>\$0</del>
<del>18</del>	<del>Relocate Pump 11</del>	<del>0</del>	<del>LS</del>	<del>\$10,000.00</del>	<del>\$0</del>
<del>19</del>	<del>Relocate Culvert</del>	<del>0</del>	<del>EA</del>	<del>\$2,000.00</del>	<del>\$0</del>
20	Demolish Existing Pipe (1- to 2-inch Dia.)	4	EA	\$1,000.00	\$4,000
21	Rip Rap <sup>2</sup>	86,696	TN	\$82.00	\$7,109,072
Total Construction Contract Cost:					\$12,911,777
Escalation (Q1 2023 to Q3 2025, 6.92%):					\$893,495
Contingency (30%):					\$4,141,582
<b>TOTAL PROJECT COST:</b>					<b>\$17,946,854</b>

1 All quantities are in-place quantities.

2 Provided by WES



**LITTLE EGBERT JOINT POWERS AGENCY  
LITTLE EGBERT MULTI BENEFIT PROJECT  
FEASIBILITY STUDY ALTERNATIVE COSTS  
RD 536 LEVEE STA 80+00 TO 180+62  
OPTION 1: LEVEE RAISE AND CUTOFF WALL**

<b>Bid Schedule</b>					
<b>Line Item No.</b>	<b>Item Description</b>	<b>Estimated Quantity</b>	<b>Unit</b>	<b>Unit Price, \$</b>	<b>Extended Total, \$</b>
1	Mobilization and Demobilization	1	LS	\$1,009,000.00	\$1,009,000
2	Traffic Control	1	LS	\$291,000.00	\$291,000
3	Storm Water Pollution Control	1	LS	\$485,000.00	\$485,000
4	Project Fencing	22,200	LF	\$6.50	\$144,300
5	Clearing and Grubbing	49	AC	\$4,030.00	\$197,470
6	Remove Existing Aggregate Surfacing	10,100	LF	\$5.00	\$50,500
7	Topsoil Stripping	40,000	CY	\$12.04	\$481,740
8	Levee Excavation (Levee Degrade, Key Trench, and Cutoff Trench)	155,900	CY	\$5.27	\$822,224
9	Soil-Bentonite Cutoff Wall	795,000	SF	\$13.26	\$10,541,700
10	Levee Embankment Fill (Soil Type 1)	62,000	CY	\$14.81	\$918,106
11	Levee Embankment Fill (Soil Type 2)	437,000	CY	\$12.66	\$5,534,521
<del>12</del>	<del>Seepage Berm Fill</del>	<del>0</del>	<del>CY</del>	<del>\$0.00</del>	<del>\$0</del>
13	Class 2 Aggregate Surfacing	8,300	TN	\$52.26	\$433,758
14	Erosion Control Seeding (Site)	44	AC	\$5,070.00	\$223,080
15	Relocate Power Pole	3	EA	\$5,000.00	\$15,000
<del>16</del>	<del>Relocate Gate</del>	<del>0</del>	<del>EA</del>	<del>\$2,000.00</del>	<del>\$0</del>
17	Relocate Pump 7	1	LS	\$10,000.00	\$10,000
18	Relocate Pump 11	1	LS	\$10,000.00	\$10,000
<del>19</del>	<del>Relocate Culvert</del>	<del>0</del>	<del>EA</del>	<del>\$2,000.00</del>	<del>\$0</del>
20	Demolish Existing Pipe (1- to 2-inch Dia.)	10	EA	\$1,000.00	\$10,000
21	Rip Rap <sup>2</sup>	109,237	TN	\$82.00	\$8,957,434
Total Construction Contract Cost:					\$30,134,833
Escalation (Q1 2023 to Q3 2025, 6.92%):					\$2,085,331
Contingency (30%):					\$9,666,050
<b>TOTAL PROJECT COST:</b>					<b>\$41,886,214</b>

1 All quantities are in-place quantities.

2 Provided by WES

**LITTLE EGBERT JOINT POWERS AGENCY  
LITTLE EGBERT MULTI BENEFIT PROJECT  
FEASIBILITY STUDY ALTERNATIVE COSTS  
RD 536 LEVEE STA 80+00 TO 180+62  
OPTION 2: LEVEE RAISE AND SEEPAGE BERM**

<b>Bid Schedule</b>					
<b>Line Item No.</b>	<b>Item Description</b>	<b>Estimated Quantity</b>	<b>Unit</b>	<b>Unit Price, \$</b>	<b>Extended Total, \$</b>
1	Mobilization and Demobilization	1	LS	\$507,000.00	\$507,000
2	Traffic Control	1	LS	\$147,000.00	\$147,000
3	Storm Water Pollution Control	1	LS	\$244,000.00	\$244,000
4	Project Fencing	22,200	LF	\$6.50	\$144,300
5	Clearing and Grubbing	64	AC	\$4,030.00	\$257,920
6	Remove Existing Aggregate Surfacing	10,700	LF	\$5.00	\$53,500
7	Topsoil Stripping	52,000	CY	\$12.04	\$626,262
8	Levee Excavation (Levee Degrade and Key Trench)	17,900	CY	\$5.27	\$94,405
9	<del>Soil Bentonite Cutoff Wall</del>	0	SF	\$0.00	\$0
10	<del>Levee Embankment Fill (Soil Type 1)</del>	0	CY	\$0.00	\$0
11	Levee Embankment Fill (Soil Type 2)	338,000	CY	\$14.44	\$4,881,637
12	Seepage Berm Fill	197,000	CY	\$14.73	\$2,901,703
13	Class 2 Aggregate Surfacing	8,300	TN	\$52.26	\$433,758
14	Erosion Control Seeding (Site)	59	AC	\$5,070.00	\$299,130
15	Relocate Power Pole	3	EA	\$5,000.00	\$15,000
16	<del>Relocate Gate</del>	0	EA	\$2,000.00	\$0
17	Relocate Pump 7	1	LS	\$10,000.00	\$10,000
18	Relocate Pump 11	1	LS	\$10,000.00	\$10,000
19	<del>Relocate Culvert</del>	0	EA	\$2,000.00	\$0
20	Demolish Existing Pipe (1- to 2-inch Dia.)	10	EA	\$1,000.00	\$10,000
21	Rip Rap <sup>2</sup>	109,237	TN	\$82.00	\$8,957,434
Total Construction Contract Cost:					\$19,593,050
Escalation (Q1 2023 to Q3 2025, 6.92%):					\$1,355,840
Contingency (30%):					\$6,284,667
<b>TOTAL PROJECT COST:</b>					<b>\$27,233,557</b>

1 All quantities are in-place quantities.

2 Provided by WES



**LITTLE EGBERT JOINT POWERS AGENCY  
LITTLE EGBERT MULTI BENEFIT PROJECT  
FEASIBILITY STUDY ALTERNATIVE COSTS  
RD 536 LEVEE STA 80+00 TO 180+62  
OPTION 2B: LEVEE AND SEEPAGE BERM**

<b>Bid Schedule</b>					
<b>Line Item No.</b>	<b>Item Description</b>	<b>Estimated Quantity</b>	<b>Unit</b>	<b>Unit Price, \$</b>	<b>Extended Total, \$</b>
1	Mobilization and Demobilization	1	LS	\$961,000.00	\$961,000
2	Traffic Control	1	LS	\$278,000.00	\$278,000
3	Storm Water Pollution Control	1	LS	\$462,000.00	\$462,000
4	Project Fencing	23,600	LF	\$6.50	\$153,400
5	Clearing and Grubbing	25	AC	\$4,030.00	\$100,750
6	Remove Existing Aggregate Surfacing	10,100	LF	\$5.00	\$50,500
7	Topsoil Stripping	20,000	CY	\$12.04	\$240,870
8	Levee Excavation (Levee Degrade and Key Trench)	650,500	CY	\$5.27	\$3,430,768
9	<del>Soil Bentonite Cutoff Wall</del>	0	SF	<del>\$0.00</del>	<del>\$0</del>
10	<del>Levee Embankment Fill (Soil Type 1)</del>	0	<del>CY</del>	<del>\$0.00</del>	<del>\$0</del>
11	Levee Embankment Fill (Soil Type 2)	822,000	CY	\$14.44	\$11,871,910
12	Seepage Berm Fill	139,000	CY	\$14.73	\$2,047,395
13	Class 2 Aggregate Surfacing	8,300	TN	\$52.26	\$433,758
14	Erosion Control Seeding (Site)	20	AC	\$5,070.00	\$101,400
15	Relocate Power Pole	3	EA	\$5,000.00	\$15,000
16	<del>Relocate Gate</del>	0	<del>EA</del>	<del>\$2,000.00</del>	<del>\$0</del>
17	Relocate Pump 7	1	LS	\$10,000.00	\$10,000
18	Relocate Pump 11	1	LS	\$10,000.00	\$10,000
19	<del>Relocate Culvert</del>	0	<del>EA</del>	<del>\$2,000.00</del>	<del>\$0</del>
20	Demolish Existing Pipe (1- to 2-inch Dia.)	10	EA	\$1,000.00	\$10,000
21	Rip Rap <sup>2</sup>	116,823	TN	\$82.00	\$9,579,486
Total Construction Contract Cost:					\$29,756,237
Escalation (Q1 2023 to Q3 2025, 6.92%):					\$2,059,132
Contingency (30%):					\$9,544,611
<b>TOTAL PROJECT COST:</b>					<b>\$41,359,980</b>

1 All quantities are in-place quantities.

2 Provided by WES

**LITTLE EGBERT JOINT POWERS AGENCY  
LITTLE EGBERT MULTI BENEFIT PROJECT  
FEASIBILITY STUDY ALTERNATIVE COSTS  
MELLIN LEVEE STA 0+00 TO 62+00  
EMBANKMENT RECONSTRUCTION**

<b>Bid Schedule</b>					
<b>Line Item No.</b>	<b>Item Description</b>	<b>Estimated Quantity</b>	<b>Unit</b>	<b>Unit Price, \$</b>	<b>Extended Total, \$</b>
1	Mobilization and Demobilization	1	LS	\$266,000.00	\$266,000
2	Traffic Control	1	LS	\$77,000.00	\$77,000
3	Storm Water Pollution Control	1	LS	\$128,000.00	\$128,000
4	Project Fencing	13,700	LF	\$6.50	\$89,050
5	Clearing and Grubbing	22	AC	\$4,030.00	\$88,660
6	Remove Existing Aggregate Surfacing	6,200	LF	\$5.00	\$31,000
7	<del>Topsoil Stripping</del>	0	<del>CY</del>	<del>\$12.04</del>	<del>\$0</del>
8	Levee Excavation (Levee Degrade, Key Trench and Cutoff Trench)	153,100	CY	\$10.64	\$1,628,623
9	<del>Soil Bentonite Cutoff Wall</del>	0	<del>SF</del>	<del>\$0.00</del>	<del>\$0</del>
10	<del>Levee Embankment Fill (Soil Type 1)</del>	0	<del>CY</del>	<del>\$0.00</del>	<del>\$0</del>
11	Levee Embankment Fill (Soil Type 2)	210,000	CY	\$13.25	\$2,783,444
12	<del>Seepage Berm Fill</del>	0	<del>CY</del>	<del>\$0.00</del>	<del>\$0</del>
13	Class 2 Aggregate Surfacing	6,900	TN	\$52.26	\$360,594
14	Erosion Control Seeding (Site)	19	AC	\$5,070.00	\$96,330
15	Relocate Power Pole	2	EA	\$5,000.00	\$10,000
16	Relocate Gate	3	EA	\$2,000.00	\$6,000
17	<del>Relocate Pump 7</del>	0	<del>LS</del>	<del>\$10,000.00</del>	<del>\$0</del>
18	<del>Relocate Pump 11</del>	0	<del>LS</del>	<del>\$10,000.00</del>	<del>\$0</del>
19	Relocate Culvert	1	EA	\$2,000.00	\$2,000
20	Demolish Existing Pipe (1- to 2-inch Dia.)	1	EA	\$1,000.00	\$1,000
21	Rip Rap <sup>2</sup>	40,667	TN	\$82.00	\$3,334,694
Total Construction Contract Cost:					\$8,902,395
Escalation (Q1 2023 to Q3 2025, 6.92%):					\$616,046
Contingency (30%):					\$2,855,533
<b>TOTAL PROJECT COST:</b>					<b>\$12,373,974</b>

1 All quantities are in-place quantities.

2 Provided by WES



**LITTLE EGBERT JOINT POWERS AGENCY  
LITTLE EGBERT MULTI BENEFIT PROJECT  
FEASIBILITY STUDY ALTERNATIVE COSTS  
SOLANO COUNTY LEVEE 44 STA 62+00 TO 92+53  
OPTION 1: LEVEE RAISE AND CUTOFF WALL**

<b>Bid Schedule</b>					
<b>Line Item No.</b>	<b>Item Description</b>	<b>Estimated Quantity</b>	<b>Unit</b>	<b>Unit Price, \$</b>	<b>Extended Total, \$</b>
1	Mobilization and Demobilization	1	LS	\$323,000.00	\$323,000
2	Traffic Control	1	LS	\$93,000.00	\$93,000
3	Storm Water Pollution Control	1	LS	\$155,000.00	\$155,000
4	Project Fencing	6,800	LF	\$6.50	\$44,200
5	Clearing and Grubbing	16	AC	\$4,030.00	\$64,480
6	Remove Existing Aggregate Surfacing	3,100	LF	\$5.00	\$15,500
7	Topsoil Stripping	13,000	CY	\$12.04	\$156,566
8	Levee Excavation (Levee Degrade, Key Trench, and Cutoff Trench)	24,500	CY	\$10.62	\$260,234
9	Soil-Bentonite Cutoff Wall	260,000	SF	\$13.26	\$3,447,600
10	Levee Embankment Fill (Soil Type 1)	15,000	CY	\$13.83	\$207,439
11	Levee Embankment Fill (Soil Type 2)	130,000	CY	\$13.68	\$1,778,807
<del>12</del>	<del>Seepage Berm Fill</del>	<del>0</del>	<del>CY</del>	<del>\$0.00</del>	<del>\$0</del>
13	Class 2 Aggregate Surfacing	2,600	TN	\$52.26	\$135,876
14	Erosion Control Seeding (Site)	15	AC	\$5,070.00	\$76,050
15	Relocate Power Pole	2	EA	\$5,000.00	\$10,000
<del>16</del>	<del>Relocate Gate</del>	<del>0</del>	<del>EA</del>	<del>\$2,000.00</del>	<del>\$0</del>
<del>17</del>	<del>Relocate Pump 7</del>	<del>0</del>	<del>LS</del>	<del>\$10,000.00</del>	<del>\$0</del>
<del>18</del>	<del>Relocate Pump 11</del>	<del>0</del>	<del>LS</del>	<del>\$10,000.00</del>	<del>\$0</del>
<del>19</del>	<del>Relocate Culvert</del>	<del>0</del>	<del>EA</del>	<del>\$2,000.00</del>	<del>\$0</del>
<del>20</del>	<del>Demolish Existing Pipe (1- to 2- inch Dia.)</del>	<del>0</del>	<del>EA</del>	<del>\$1,000.00</del>	<del>\$0</del>
21	Rip Rap <sup>2</sup>	22,957	TN	\$82.00	\$1,882,474
Total Construction Contract Cost:					\$8,650,226
Escalation (Q1 2023 to Q3 2025, 6.92%):					\$598,596
Contingency (30%):					\$2,774,647
<b>TOTAL PROJECT COST:</b>					<b>\$12,023,469</b>

1 All quantities are in-place quantities.

2 Provided by WES

**LITTLE EGBERT JOINT POWERS AGENCY  
LITTLE EGBERT MULTI BENEFIT PROJECT  
FEASIBILITY STUDY ALTERNATIVE COSTS  
SOLANO COUNTY LEVEE 44 STA 62+00 TO 92+53  
OPTION 2: LEVEE RAISE AND SEEPAGE BERM**

<b>Bid Schedule</b>					
<b>Line Item No.</b>	<b>Item Description</b>	<b>Estimated Quantity</b>	<b>Unit</b>	<b>Unit Price, \$</b>	<b>Extended Total, \$</b>
1	Mobilization and Demobilization	1	LS	\$200,000.00	\$200,000
2	Traffic Control	1	LS	\$58,000.00	\$58,000
3	Storm Water Pollution Control	1	LS	\$97,000.00	\$97,000
4	Project Fencing	6,800	LF	\$6.50	\$44,200
5	Clearing and Grubbing	16	AC	\$4,030.00	\$64,480
6	Remove Existing Aggregate Surfacing	3,100	LF	\$5.00	\$15,500
7	Topsoil Stripping	16,000	CY	\$12.04	\$192,696
8	Levee Excavation (Levee Degrade and Key Trench)	5,500	CY	\$10.62	\$58,420
<del>9</del>	<del>Soil Bentonite Cutoff Wall</del>	<del>0</del>	<del>SF</del>	<del>\$0.00</del>	<del>\$0</del>
<del>10</del>	<del>Levee Embankment Fill (Soil Type 1)</del>	<del>0</del>	<del>CY</del>	<del>\$0.00</del>	<del>\$0</del>
11	Levee Embankment Fill (Soil Type 2)	109,000	CY	\$13.72	\$1,495,919
12	Seepage Berm Fill	128,000	CY	\$13.65	\$1,747,476
13	Class 2 Aggregate Surfacing	2,600	TN	\$52.26	\$135,876
14	Erosion Control Seeding (Site)	15	AC	\$5,070.00	\$76,050
15	Relocate Power Pole	2	EA	\$5,000.00	\$10,000
<del>16</del>	<del>Relocate Gate</del>	<del>0</del>	<del>EA</del>	<del>\$2,000.00</del>	<del>\$0</del>
<del>17</del>	<del>Relocate Pump 7</del>	<del>0</del>	<del>LS</del>	<del>\$10,000.00</del>	<del>\$0</del>
<del>18</del>	<del>Relocate Pump 11</del>	<del>0</del>	<del>LS</del>	<del>\$10,000.00</del>	<del>\$0</del>
<del>19</del>	<del>Relocate Culvert</del>	<del>0</del>	<del>EA</del>	<del>\$2,000.00</del>	<del>\$0</del>
<del>20</del>	<del>Demolish Existing Pipe (1- to 2- inch Dia.)</del>	<del>0</del>	<del>EA</del>	<del>\$1,000.00</del>	<del>\$0</del>
21	Rip Rap <sup>2</sup>	22,957	TN	\$82.00	\$1,882,474
Total Construction Contract Cost:					\$6,078,092
Escalation (Q1 2023 to Q3 2025, 6.92%):					\$420,604
Contingency (30%):					\$1,949,609
<b>TOTAL PROJECT COST:</b>					<b>\$8,448,305</b>

1 All quantities are in-place quantities.

2 Provided by WES



**LITTLE EGBERT JOINT POWERS AGENCY  
LITTLE EGBERT MULTI BENEFIT PROJECT  
FEASIBILITY STUDY ALTERNATIVE COSTS  
SOLANO COUNTY LEVEE 44 STA 62+00 TO 92+53  
OPTION 2B: LEVEE AND SEEPAGE BERM**

<b>Bid Schedule</b>					
<b>Line Item No.</b>	<b>Item Description</b>	<b>Estimated Quantity</b>	<b>Unit</b>	<b>Unit Price, \$</b>	<b>Extended Total, \$</b>
1	Mobilization and Demobilization	1	LS	\$290,000.00	\$290,000
2	Traffic Control	1	LS	\$84,000.00	\$84,000
3	Storm Water Pollution Control	1	LS	\$140,000.00	\$140,000
4	Project Fencing	6,800	LF	\$6.50	\$44,200
5	Clearing and Grubbing	8	AC	\$4,030.00	\$32,240
6	Remove Existing Aggregate Surfacing	3,100	LF	\$5.00	\$15,500
7	Topsoil Stripping	6,000	CY	\$12.04	\$72,261
8	Levee Excavation (Levee Degrade and Key Trench)	13,000	CY	\$10.62	\$138,084
<del>9</del>	<del>Soil Bentonite Cutoff Wall</del>	<del>0</del>	<del>SF</del>	<del>\$0.00</del>	<del>\$0</del>
<del>10</del>	<del>Levee Embankment Fill (Soil Type 1)</del>	<del>0</del>	<del>CY</del>	<del>\$0.00</del>	<del>\$0</del>
11	Levee Embankment Fill (Soil Type 2)	299,500	CY	\$13.72	\$4,110,345
12	Seepage Berm Fill	72,000	CY	\$13.65	\$982,955
13	Class 2 Aggregate Surfacing	2,600	TN	\$52.26	\$135,876
14	Erosion Control Seeding (Site)	6	AC	\$5,070.00	\$30,420
15	Relocate Power Pole	2	EA	\$5,000.00	\$10,000
<del>16</del>	<del>Relocate Gate</del>	<del>0</del>	<del>EA</del>	<del>\$2,000.00</del>	<del>\$0</del>
<del>17</del>	<del>Relocate Pump 7</del>	<del>0</del>	<del>LS</del>	<del>\$10,000.00</del>	<del>\$0</del>
<del>18</del>	<del>Relocate Pump 11</del>	<del>0</del>	<del>LS</del>	<del>\$10,000.00</del>	<del>\$0</del>
<del>19</del>	<del>Relocate Culvert</del>	<del>0</del>	<del>EA</del>	<del>\$2,000.00</del>	<del>\$0</del>
<del>20</del>	<del>Demolish Existing Pipe (1- to 2- inch Dia.)</del>	<del>0</del>	<del>EA</del>	<del>\$1,000.00</del>	<del>\$0</del>
21	Rip Rap <sup>2</sup>	22,957	TN	\$82.00	\$1,882,474
Total Construction Contract Cost:					\$7,968,356
Escalation (Q1 2023 to Q3 2025, 6.92%):					\$551,411
Contingency (30%):					\$2,555,931
<b>TOTAL PROJECT COST:</b>					<b>\$11,075,698</b>

1 All quantities are in-place quantities.

2 Provided by WES

**LITTLE EGBERT JOINT POWERS AGENCY  
LITTLE EGBERT MULTI BENEFIT PROJECT  
FEASIBILITY STUDY ALTERNATIVE COSTS  
RD 536 LEVEE**

**OPTION 1 WATER CONTROL STRUCTURE: 15-FT X 5-FT BOX CULVERT**

<b>Bid Schedule</b>					
<b>Line Item No.</b>	<b>Item Description</b>	<b>Estimated Quantity</b>	<b>Unit</b>	<b>Unit Price, \$</b>	<b>Extended Total, \$</b>
1	Excavation	7,967	CY	\$4.27	\$34,018
2	15-FT x 5-FT Box Culvert	282	LF	\$7,200.00	\$2,030,400
3	Backfill	12,573	CY	\$14.81	\$186,212
4	Install Cutoff Wall	21,353	SF	\$13.26	\$283,141
5	RipRap	17	TN	\$82.00	\$1,365
6	Flap Gate	2	EA	\$250,000.00	\$500,000
7	Irrigation Pipe	1	EA	\$164,191.16	\$164,191
Total Construction Contract Cost:					\$3,199,327
Escalation (Q1 2023 to Q3 2025, 6.92%):					\$221,394
Contingency (30%):					\$1,026,217
<b>TOTAL PROJECT COST:</b>					<b>\$4,446,938</b>

1 All quantities are in-place quantities.



**LITTLE EGBERT JOINT POWERS AGENCY  
LITTLE EGBERT MULTI BENEFIT PROJECT  
FEASIBILITY STUDY ALTERNATIVE COSTS  
RD 536 LEVEE  
OPTION 1 WATER CONTROL STRUCTURE: 8 X 48-IN RCP**

<b>Bid Schedule</b>					
<b>Line Item No.</b>	<b>Item Description</b>	<b>Estimated Quantity</b>	<b>Unit</b>	<b>Unit Price, \$</b>	<b>Extended Total, \$</b>
1	Excavation	7,967	CY	\$4.27	\$34,018
2	48-IN RCP	1,128	LF	\$550.00	\$620,400
3	Backfill	14,140	CY	\$14.81	\$209,414
4	Install Cutoff Wall	21,353	SF	\$13.26	\$283,141
5	RipRap	28	TN	\$82.00	\$2,287
6	Headwalls & Apron	30	CY	\$1,500.00	\$44,270
7	Flap Gate	8	EA	\$15,000.00	\$120,000
8	Irrigation Pipe	1	EA	\$164,191.16	\$164,191
Total Construction Contract Cost:					\$1,477,721
Escalation (Q1 2023 to Q3 2025, 6.92%):					\$102,259
Contingency (30%):					\$473,994
<b>TOTAL PROJECT COST:</b>					<b>\$2,053,974</b>

1 All quantities are in-place quantities.

**LITTLE EGBERT JOINT POWERS AGENCY  
LITTLE EGBERT MULTI BENEFIT PROJECT  
FEASIBILITY STUDY ALTERNATIVE COSTS  
RD 536 LEVEE**

**OPTION 2 & 2B WATER CONTROL STRUCTURE: 15-FT X 5-FT BOX CULVERT**

<b>Bid Schedule</b>					
<b>Line Item No.</b>	<b>Item Description</b>	<b>Estimated Quantity</b>	<b>Unit</b>	<b>Unit Price, \$</b>	<b>Extended Total, \$</b>
1	Excavation	8,190	CY	\$4.27	\$34,971
2	Box Culvert	484	LF	\$7,200.00	\$3,484,800
3	Backfill	11,451	CY	\$14.81	\$169,592
4	RipRap	17	TN	\$82.00	\$1,365
5	Flap Gate	2	EA	\$250,000.00	\$500,000
7	Irrigation Pipe	1	EA	\$173,811.40	\$173,811
Total Construction Contract Cost:					\$4,364,540
Escalation (Q1 2023 to Q3 2025, 6.92%):					\$302,027
Contingency (30%):					\$1,399,971
<b>TOTAL PROJECT COST:</b>					<b>\$6,066,538</b>

1 All quantities are in-place quantities.



**LITTLE EGBERT JOINT POWERS AGENCY  
LITTLE EGBERT MULTI BENEFIT PROJECT  
FEASIBILITY STUDY ALTERNATIVE COSTS  
RD 536 LEVEE  
OPTION 2 & 2B WATER CONTROL STRUCTURE: 8 X 48-IN RCP**

<b>Bid Schedule</b>					
<b>Line Item No.</b>	<b>Item Description</b>	<b>Estimated Quantity</b>	<b>Unit</b>	<b>Unit Price, \$</b>	<b>Extended Total, \$</b>
1	Excavation	8,190	CY	\$4.27	\$34,971
2	48-IN RCP	1,936	LF	\$550.00	\$1,064,800
3	Backfill	11,355	CY	\$14.81	\$168,164
4	RipRap	28	TN	\$82.00	\$2,287
5	Headwalls	30	CY	\$1,500.00	\$44,270
6	Flap Gate	8	EA	\$9,500.00	\$76,000
7	Irrigation Pipe	1	EA	\$173,811.40	\$173,811
Total Construction Contract Cost:					\$1,564,303
Escalation (Q1 2023 to Q3 2025, 6.92%):					\$108,250
Contingency (30%):					\$501,766
<b>TOTAL PROJECT COST:</b>					<b>\$2,174,319</b>

1 All quantities are in-place quantities.