

Elwood Outlet Feasibility Study Phase 1 – Outlet 30% Design

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Governance Committee Meeting

September 22, 2025

Elwood Outlet Feasibility Study

- Project follows from 2023-2024 Expanded Recapture Recon Study
 - Evaluated potential benefits
 - Additional recapture wells
 - Outlet from Elwood Reservoir to Plum Creek
 - Combinations of both
 - Sep 2024 – GC Directed to proceed with outlet feasibility
- Objective
 - Release excess flow water stored in Elwood Reservoir to Platte River (via Plum Creek) during periods of shortage to reduce deficits to USFWS target flows at Grand Island
- Currently Phase 1 – Outlet 30% Design
 - Open-channel options rejected by impacted landowners
 - Focus on 100 cfs buried pipeline
 - Limited incremental gain in score from 50 cfs to 100 cfs outlet
 - Greater operational flexibility

Elwood Outlet – Score Benefits

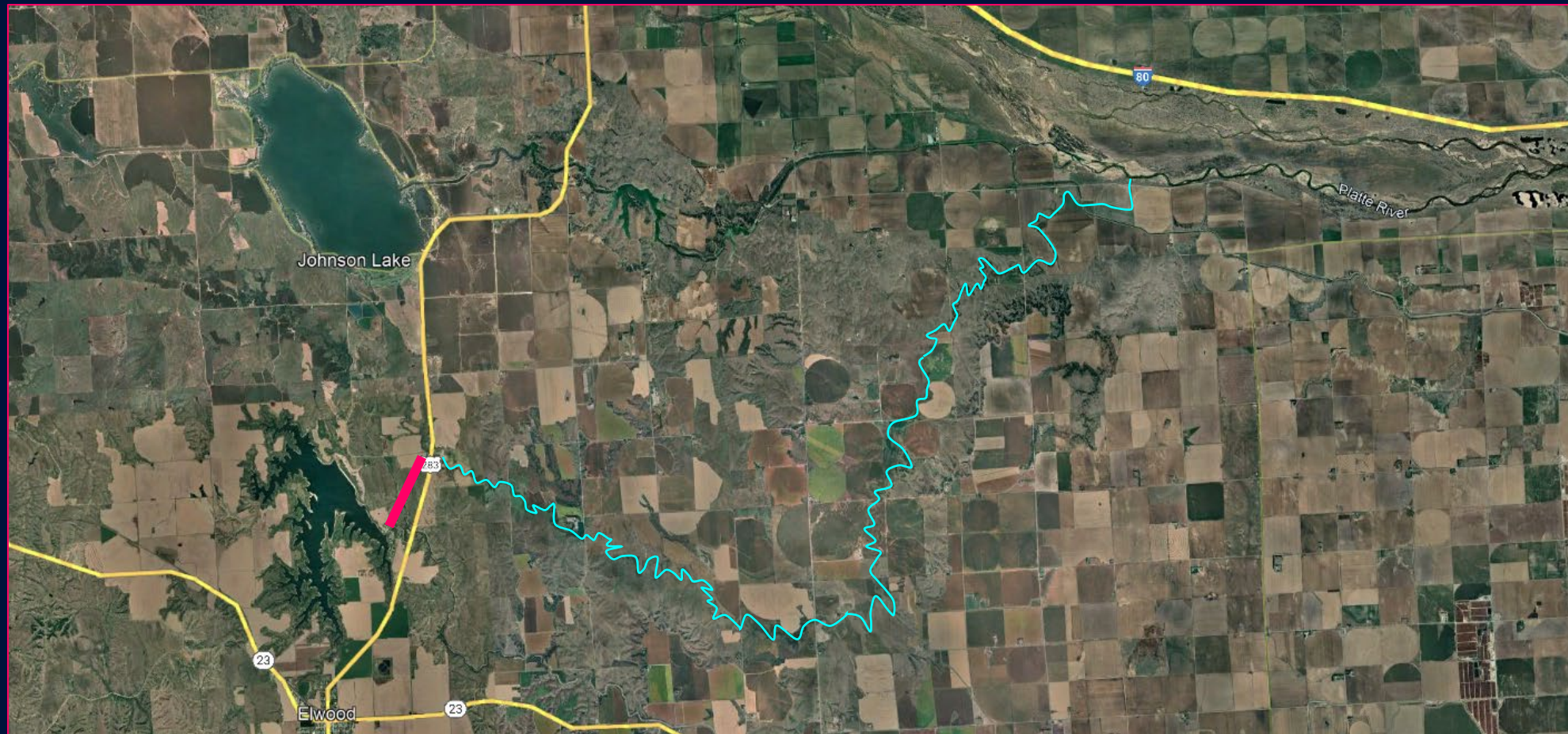
- Estimates developed during Expanded Recapture Recon Study
 - Results in Table 8 of October 7, 2024 final report
 - Used 1947-1994 OPSTUDY hydrology
- Incremental gain over existing Phelps/Elwood recharge and recapture scores:
 - **50 cfs outlet = 4,500 AF**
 - **100 cfs outlet = 5,000 AF**
 - Scores were ~230-430 AF LESS with recent (1995-2023) hydrology
- Estimated cost
 - \$40-\$60/AF of added score (average over 50 years)
 - ~125,000 AF remaining Elwood excess flow deliveries pre-paid at \$54.54/AF

Elwood Outlet - Uncertainties

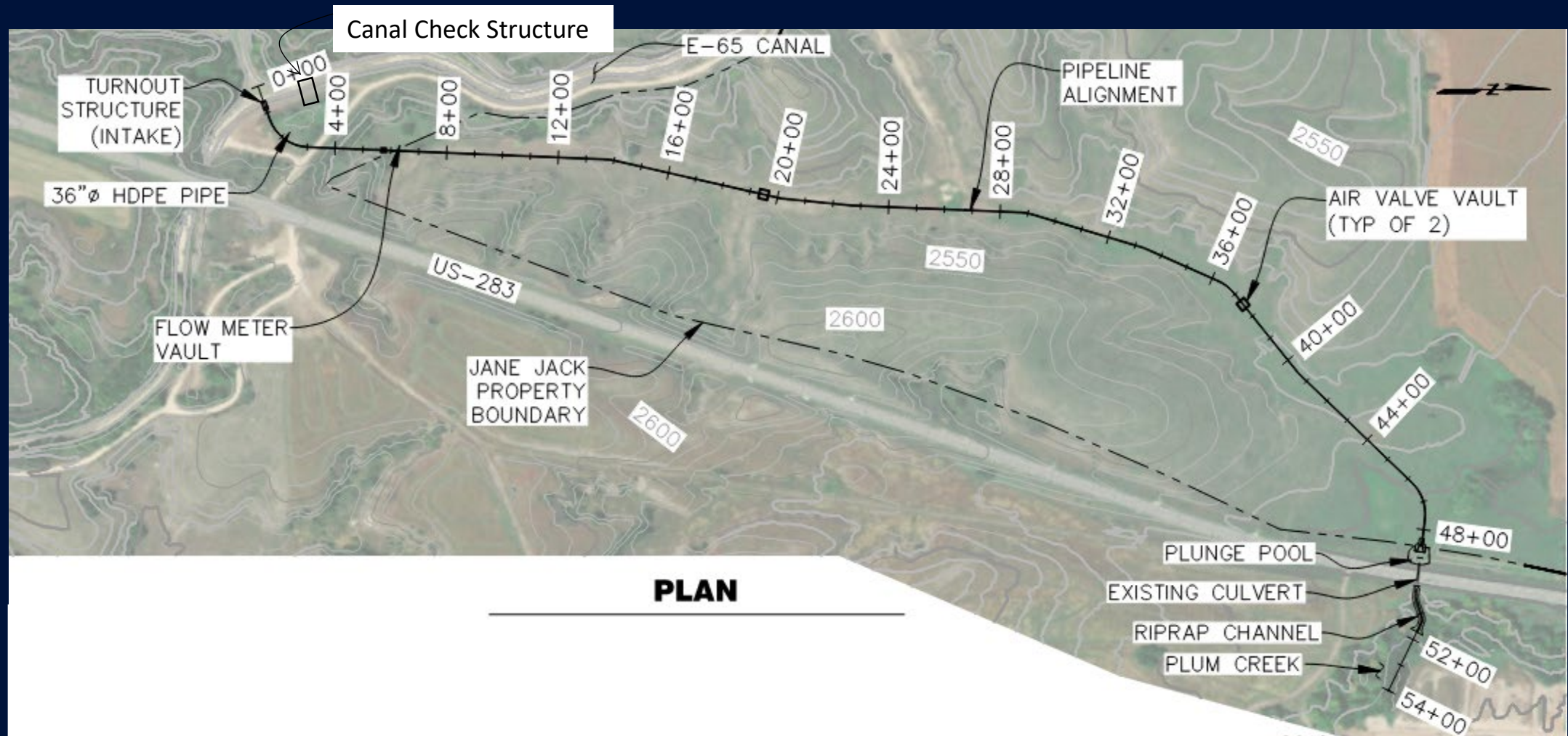
- Limitations of analysis
 - Based on modified version of original 2018 Elwood recharge score model
 - Assumes CNPPID operations regime similar to present (irrigation storage, pumping required)
- Expect future changes to CNPPID ops, but limited info
 - Planning new E65 canal and siphons, gravity inlet to Elwood
 - Eliminate need to pump all water into Elwood
 - Potentially additional storage capacity available for excess flows
 - Timeline to abandon existing siphons unknown, affects infrastructure needs (i.e., canal check structure) for outlet
- Water availability (excess flows)
- Participation by other entities
 - CNPPID – small irrigation deliveries
 - State of Nebraska?

Objective

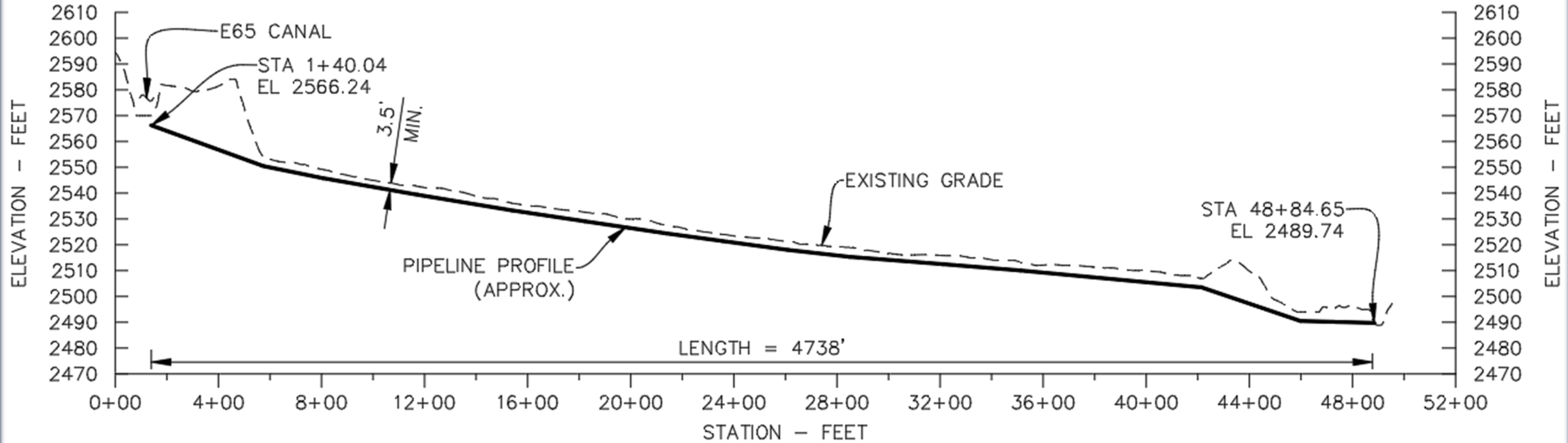
- **Project Objective:** Convey 100 cfs from Elwood Reservoir, through the E65 canal to Plum Creek, and through Plum Creek to the Platte River.



Preferred Alternative (Jack Property)



Profile



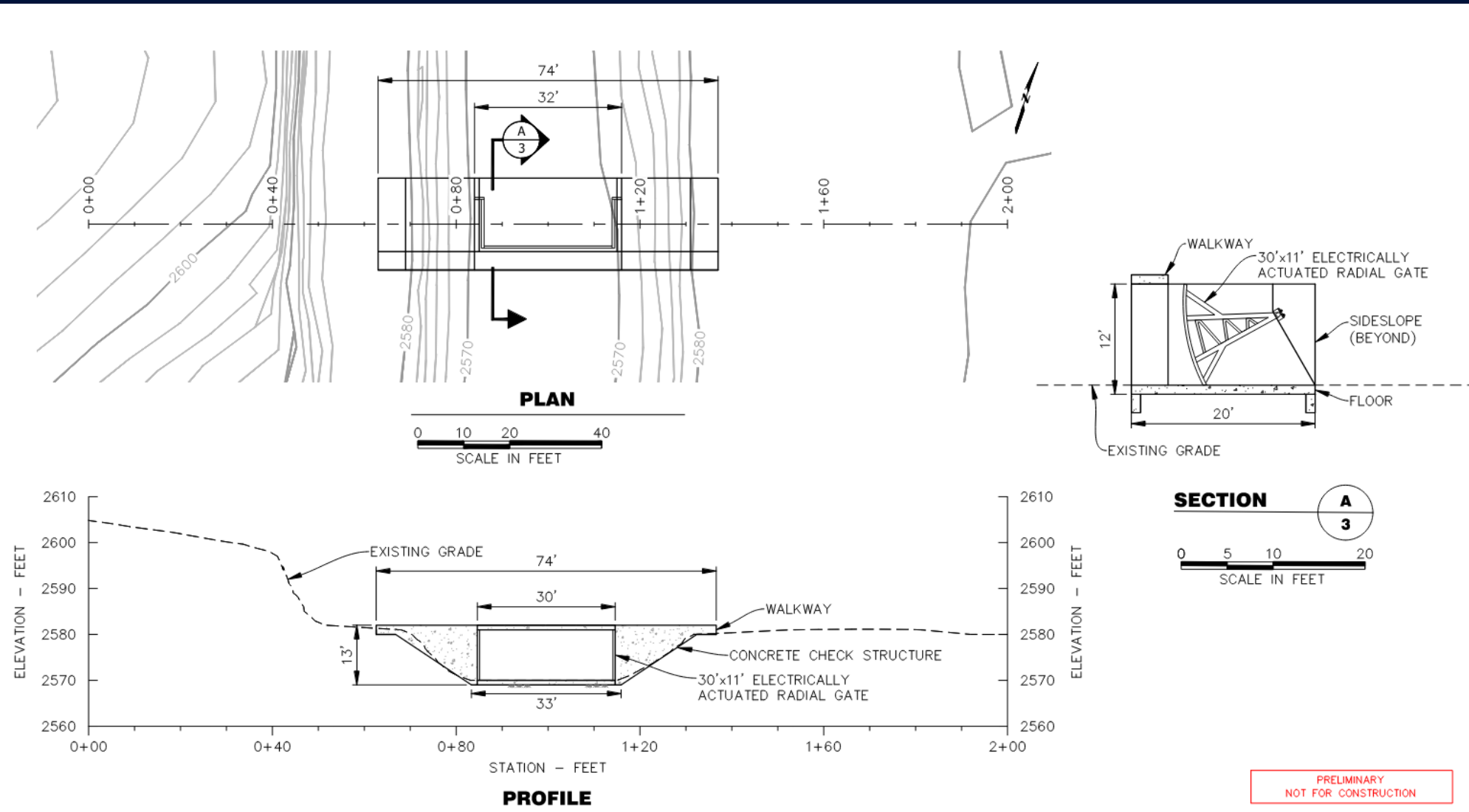
JANE JACK PROFILE

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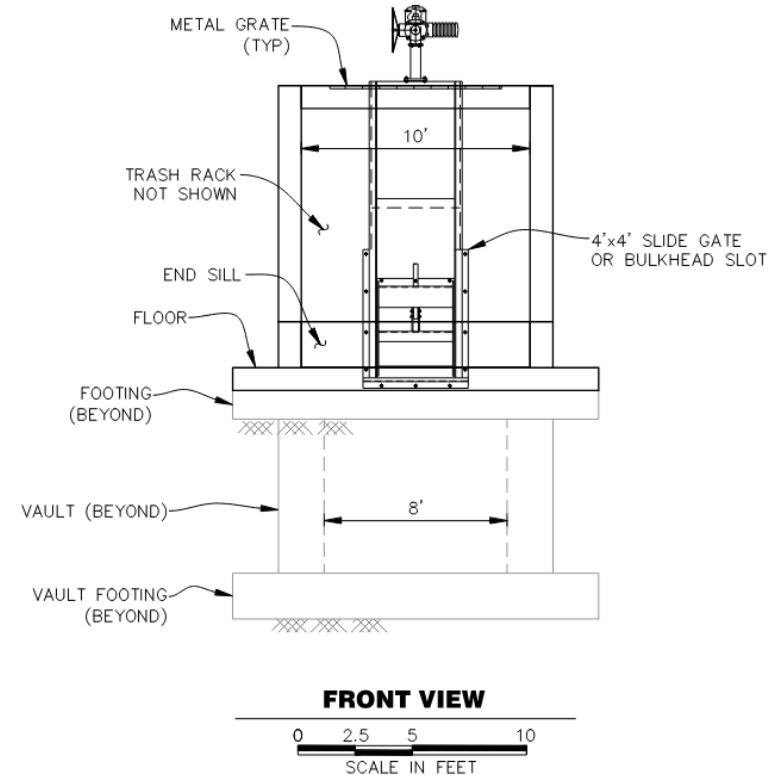
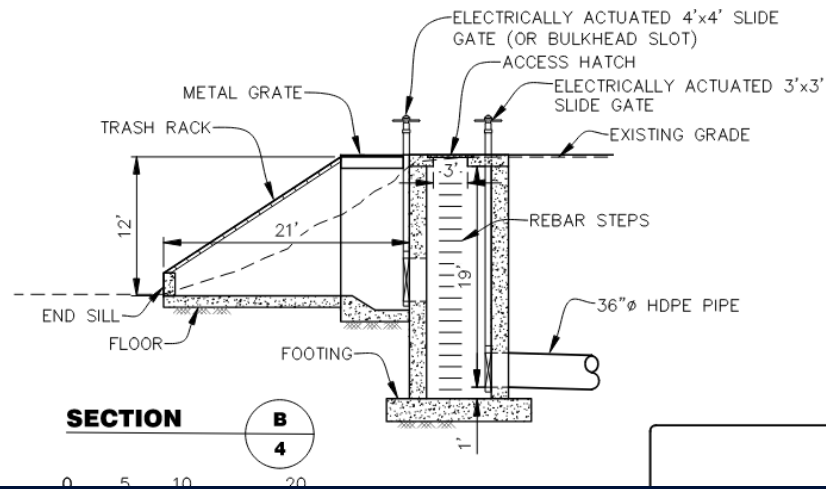
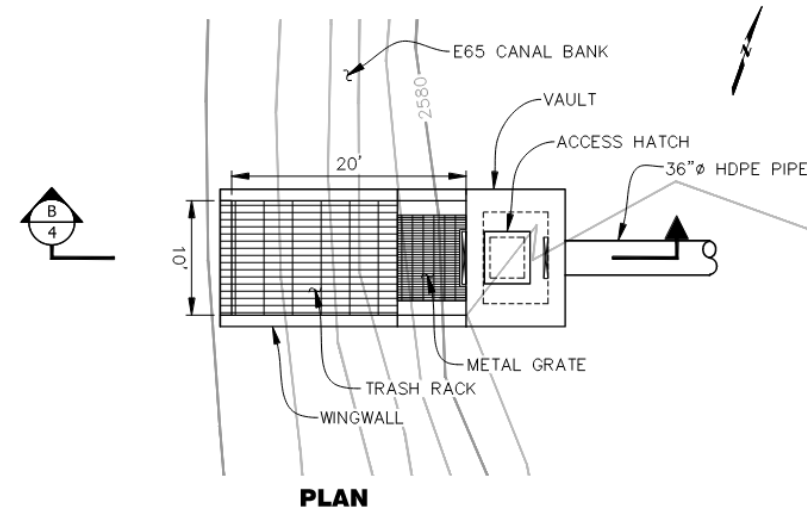
HORIZ. SCALE: 1" = 500'

VERT. SCALE: 1" = 50'

30% Design - Canal Check Structure



30% Design – Turnout Structure



PRELIMINARY
NOT FOR CONSTRUCTION



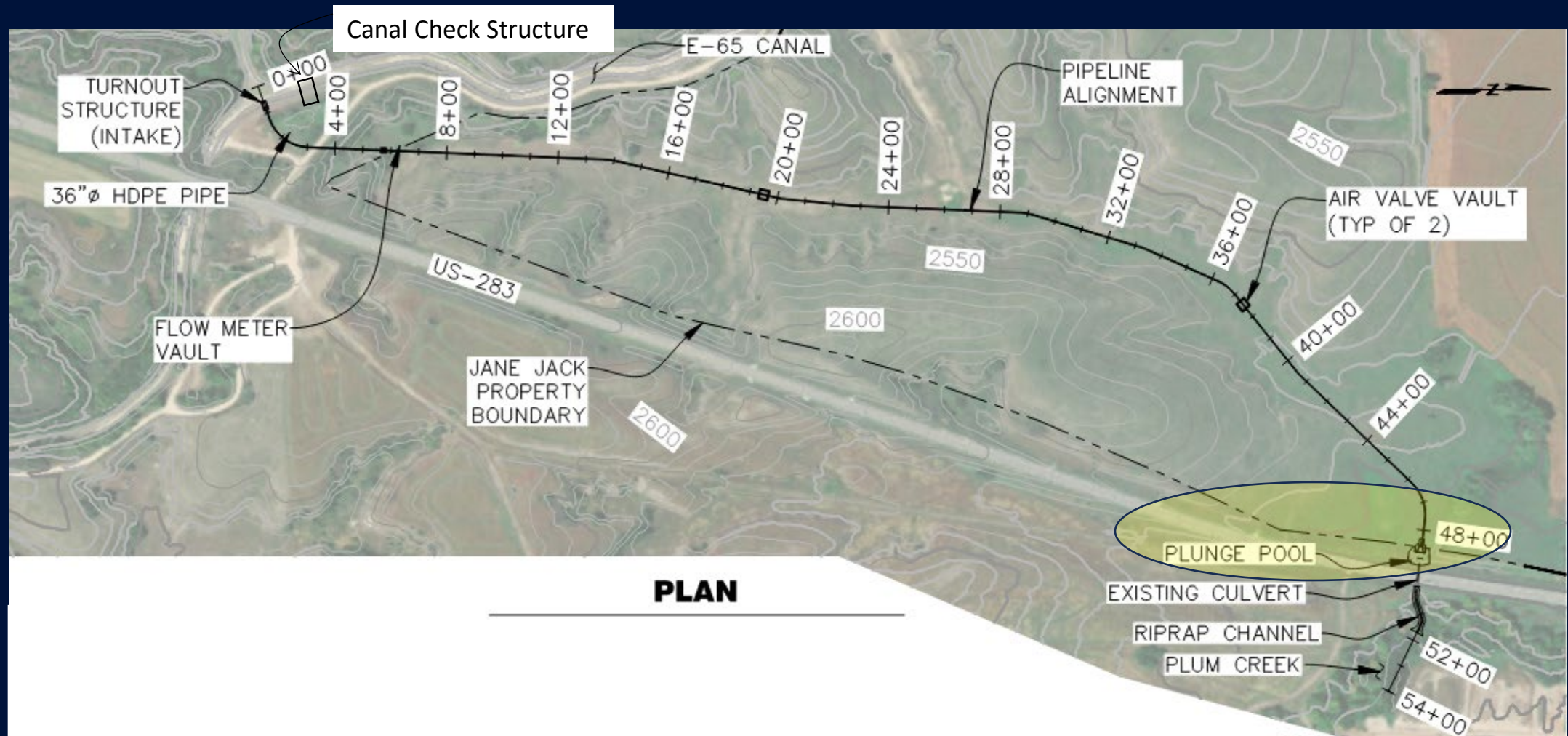
ELWOOD OUTLET
FEASIBILITY STUDY -
PHASE 1 OUTLET DESIGN

TURNOUT STRUCTURE
(INTAKE)

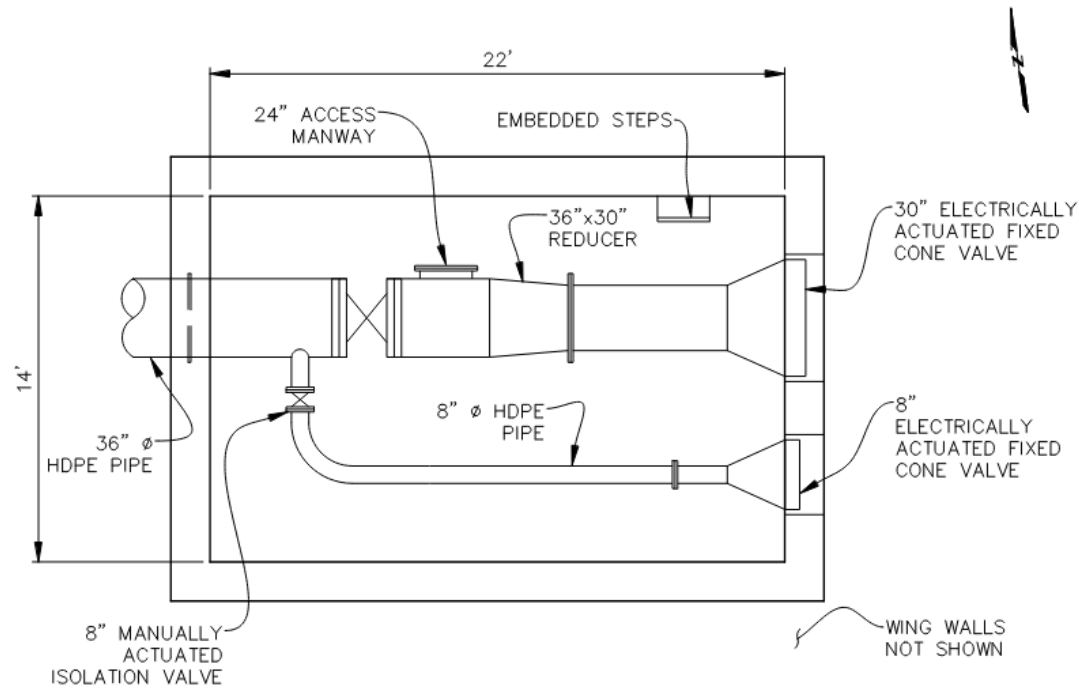
30% Design – Intake Facilities



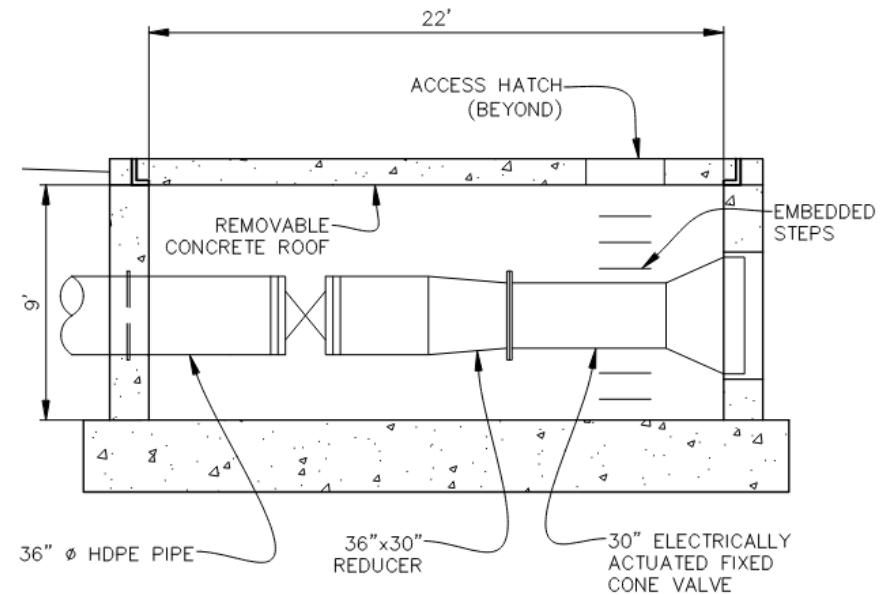
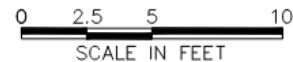
30% Design – Valve Vault



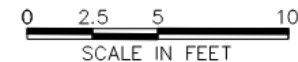
30% Design – Valve Vault (Discharge)



PLAN

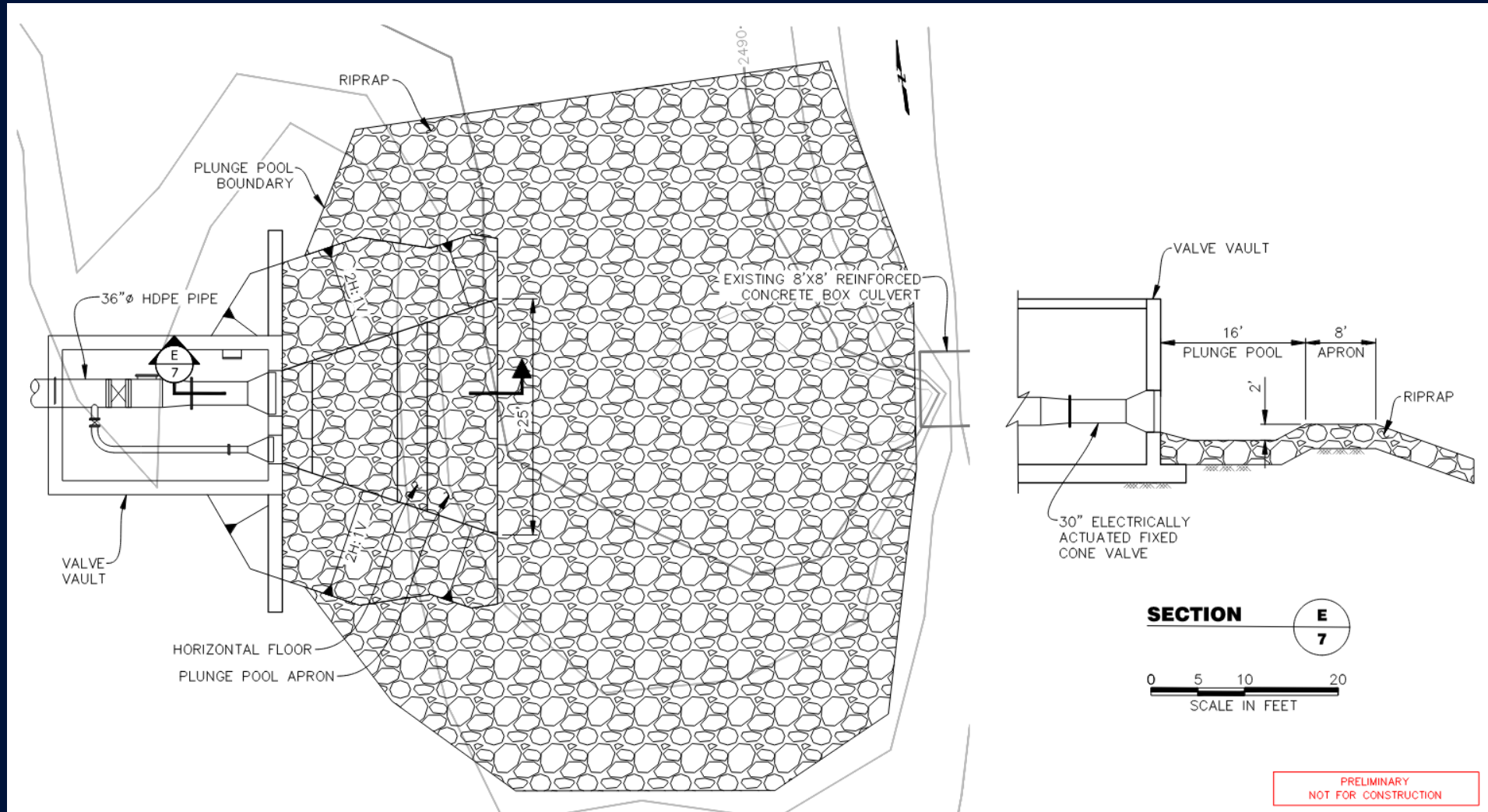


PROFILE



PRELIMINARY
NOT FOR CONSTRUCTION

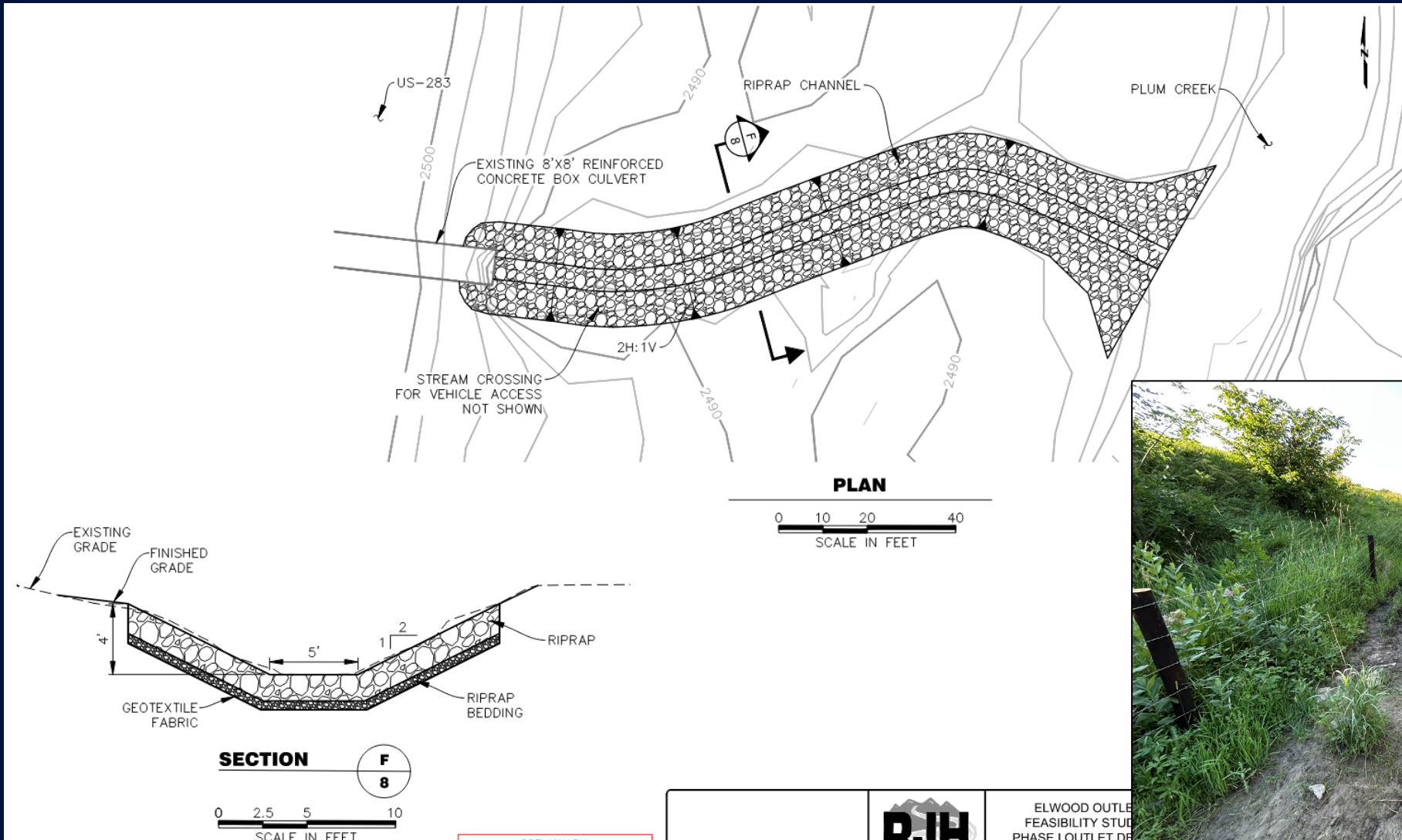
30% Design – Valve Vault (Discharge)



30% Design –Discharge to Culvert



30% Design –Culvert to Plum Creek





RJH Consultants, Inc.

Elwood Expanded Recapture Reconnaissance Study, Phase 1 – Outlet Design

Opinion of Probable Construction Cost (OPCC)

						Cost Share Summary	
						PRRIP	CNPPID
Item No.	Item	Unit	Estimated Quantity	Unit Price (\$)	Total Price (\$)	Total Price (\$)	Total Price (\$)
<i>General</i>							
1	Mobilization and Demobilization	LS	1	50,000	50,000	50,000	-
2	Clearing and Grubbing	LS	1	30,000	30,000	30,000	-
3	Dewatering	LS	1	250,000	250,000	250,000	-
4	SCADA and Instrumentation	LS	1	250,000	250,000	250,000	-
5	Access Roads	LS	1	30,000	30,000	30,000	-
<i>HDPE Pipeline</i>							
6	36" HDPE Pipe	LF	4,760	165	785,400	785,400	-
7	Excavation, Pipe Bedding, Backfill	LF	4,760	250	1,190,000	1,190,000	-
8	Trench Boxes	LS	1	100,000	100,000	100,000	-
9	Air Valve Vault	LS	2	70,000	140,000	140,000	-
10	Flow Meter Vault	LS	1	250,000	250,000	250,000	-
11	Turnout Structure and Vault, Slide Gates	LS	1	400,000	400,000	400,000	-
12	Fixed Cone Valve Vault w/ Bifurcation	LS	1	400,000	400,000	300,000	100,000
<i>Other Structures</i>							
13	Canal Check Structure w/ Radial Gate	LS	1	1,500,000	1,500,000	975,000	525,000
14	Riprap Plunge Pool	LS	1	50,000	50,000	50,000	-
15	Riprap Channel (d/s of US-283 Culvert)	LS	1	60,000	60,000	60,000	-
Base Construction Cost (BCC)					5,485,400	4,860,400	625,000
Unlisted Items (10% of BCC)					548,540	486,040	62,500
Design and Construction Contingency (30% of BCC)					1,645,620	1,458,120	187,500
Design Engineering (10% of BCC)					548,540	486,040	62,500
Construction Engineering and Management (15% of BCC)					822,810	729,060	93,750
Opinion of Probable Construction Cost (OPCC)					9,050,910	8,019,660	1,031,250

Cost

- **Total:**
 - **BCC = \$5.5 Million**
 - **OPCC = \$9.05 Million**
- **PRRIP's Share**
 - **BCC = \$4.86 Million**
 - **OPCC = \$8.0 Million**
- **CNPPID's Share**
 - **BCC = \$625,000**
 - **OPCC = \$1 Million**

Next Steps – For Conveyance Pipeline

1. Topographic and Boundary Survey.
2. Obtain NDOT Permission for use of Culvert – **In Progress**
3. Obtain Easements from Jane Jack, Knoerzer Farms – **In Progress**
4. Perform a Geotechnical Exploration
5. Obtain Environmental Permits (Simplified for Irrigation).
6. Perform Final Analyses and Design

Elwood Outlet – Next Steps

- About \$95k spent on Elwood Outlet Feasibility Study in 2024
- Phase 2 – Plum Creek Detailed Assessment and Concept Design
 - ~28 miles of meandering channel from Elwood outlet discharge to Platte River
 - Refined/enhanced evaluation of:
 - Channel capacity (2D hydraulic modeling)
 - Channel stability and geomorphic risk (BSTEM modeling)
 - Mitigation treatments for erosion
 - Conceptual designs for undersized or failing infrastructure (i.e., 13 ag/public road crossings)
 - Inter-fluve (subcontractor to LRE Water) proposed scope of work in Oct 2024
 - Would need to review and refine for new contract amendment
 - Proposed budget of ~\$255,000

Elwood Outlet – Next Steps

- Pipeline
 - RJH identified next steps, could continue some work with remaining budget (~\$40k)
 - CNPPID pursuing easement options with affected landowners
 - Need NDOT permission for conveyance through existing Hwy 283 culvert
- Score Analysis
 - LRE Water proposed additional refinements to GoldSim model (\$50-\$100k)
 - Would need to make assumptions about CNPPID future ops