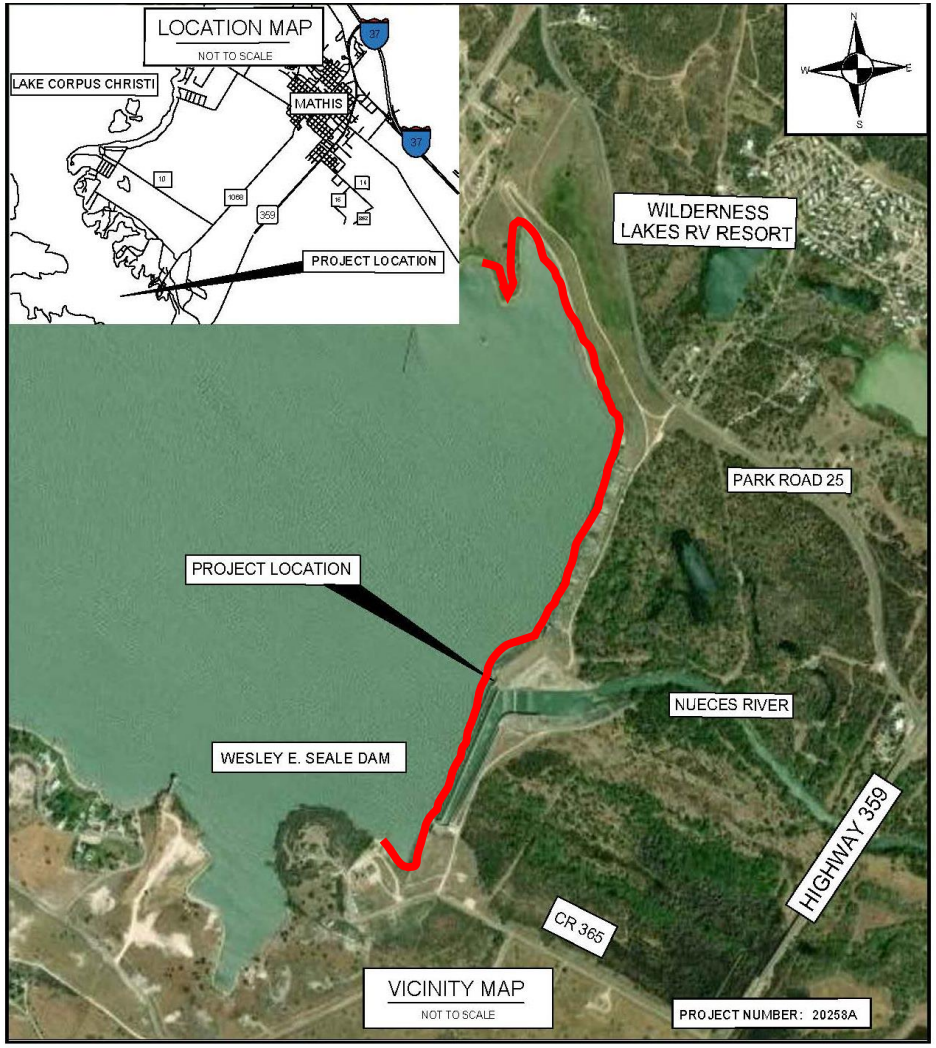
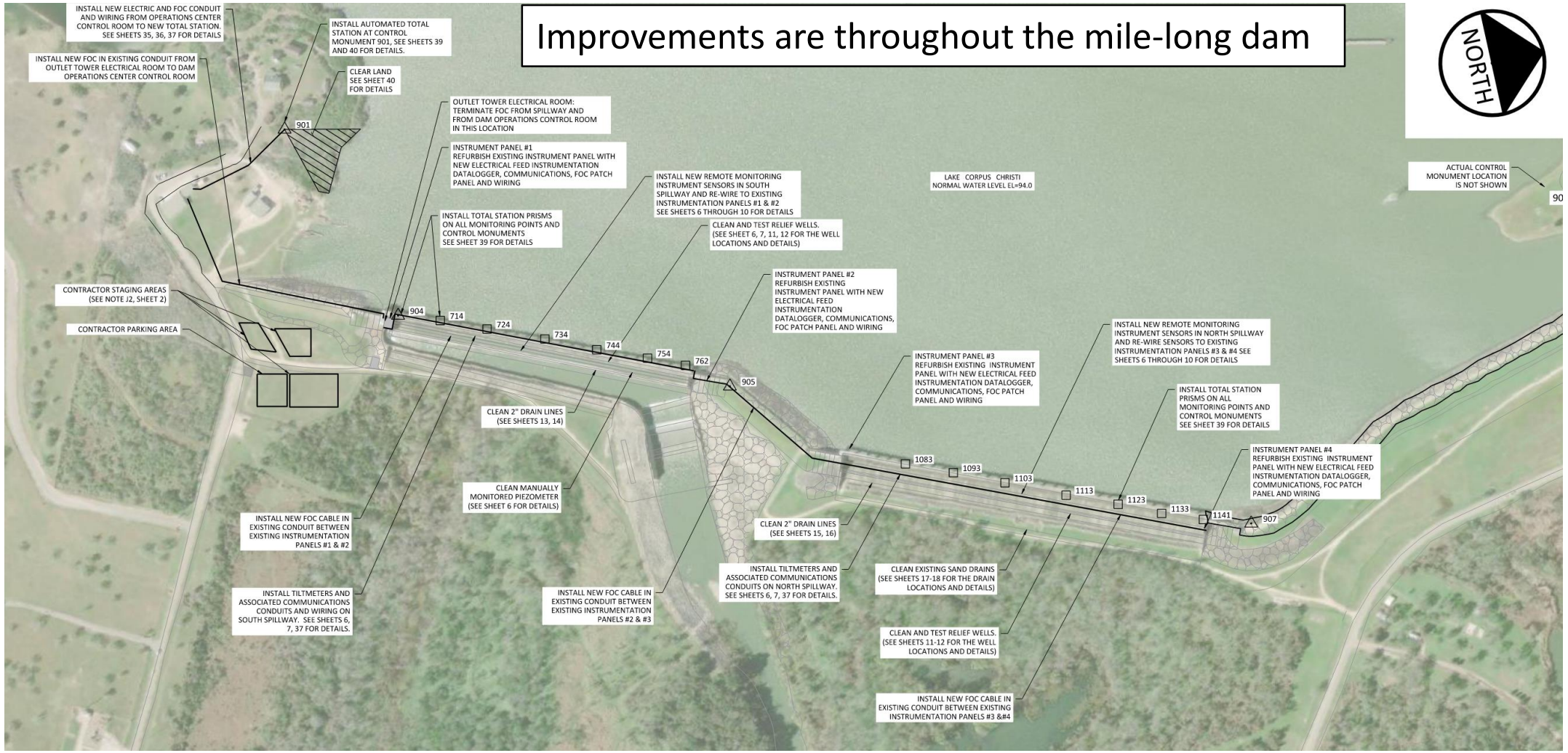
Wesley Seale Dam
Instrumentation Rehabilitation

Council Presentation
June 11, 2024

Project Location



Project Scope



Project Scope

This project consists of restoration of dam safety and monitoring instrumentation system to include the following:

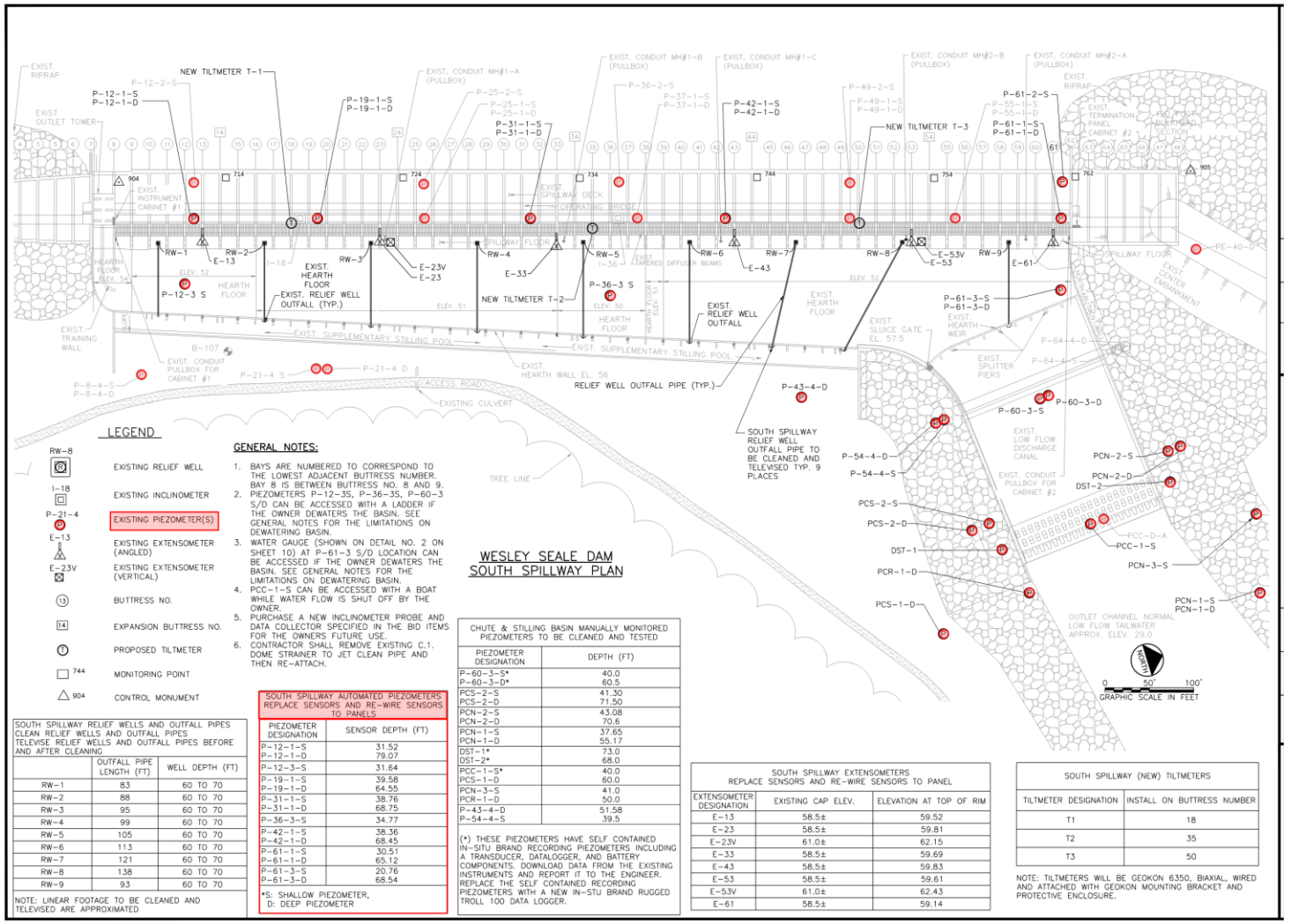
- Installation of instrument panel power supply for data collection, and communications equipment.
- Installation of new fiber optic cable (FOC) conduits and FOC communication cables and patch panels.
- Installation of new stationary total station survey system, related wiring and components, and protective enclosure structure
- Installation of new vibrating wire extensometers.
- Installation of new vibrating wire piezometers.
- Installation of new wire leads from the instrumentation to their panels.
- Integrate monitoring instrumentation data into the CCW SCADA system.
- Installation of new vibrating wire tiltmeters and related conduits and wiring.
- Cleaning and video surveying relief wells and discharge lines.
- Cleaning and treating specific identified piezometers.

Project Scope

- Cleaning and video surveying horizontal drains.
- Providing a new inclinometer probe.
- Install new FOC and cabinets to support upgraded Homeland Security video camera monitoring.
- Replace the twenty-two (22) year-old FOC the dam-wide Homeland Security Camera system.
- Installation of new monitoring instruments on each spillway called tilt-meters to monitor the downstream portion of the spillway.

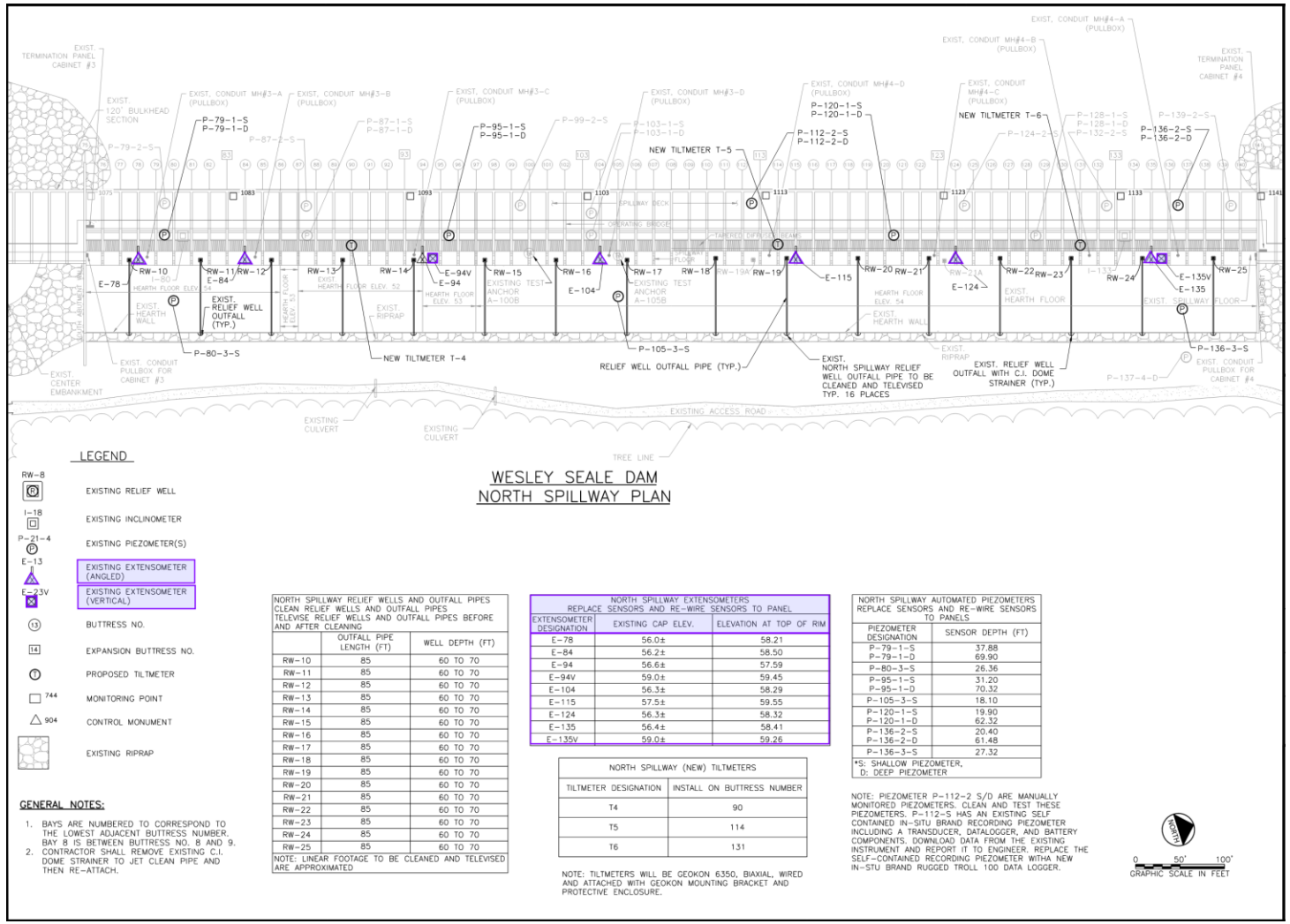
Piezometers

- Tool for measuring groundwater levels and pressures
- Piezometers isolate and measure the groundwater head in specific soil strata and specific sand layers
- Failure modes including sliding or overturning are evaluated by monitoring uplift pressures to understand the hydrostatic pressure in various underlying soil layers beneath the dam



Extensometers

- Tool for measuring movement of the dam at the buttresses
- The buttresses transfer the load from the lake to the ground
- Each monolith (independent structural unit) at each spillway is monitored for movement by either extensometers at the downstream base or tiltmeters at the downstream top



WESLEY SEALE DAM
NORTH SPILLWAY PLAN

LEGEND

- EXISTING RELIEF WELL
- EXISTING INCLINOMETER
- EXISTING PIEZOMETER(S)
- EXISTING EXTENSOMETER (ANGLED)
- EXISTING EXTENSOMETER (VERTICAL)
- BUTTRESS NO.
- EXPANSION BUTTRESS NO.
- PROPOSED TILTMETER
- MONITORING POINT
- CONTROL MONUMENT
- EXISTING RIPRAP

GENERAL NOTES:

1. BAYS ARE NUMBERED TO CORRESPOND TO THE LOWEST ADJACENT BUTTRESS NUMBER. BAY 8 IS BETWEEN BUTTRESS NO. 8 AND 9.
2. CONTRACTOR SHALL REMOVE EXISTING C.I. DOME STRAINER TO JET CLEAN PIPE AND THEN RE-ATTACH.

NORTH SPILLWAY RELIEF WELLS AND OUTFALL PIPES
CLEAN RELIEF WELLS AND OUTFALL PIPES
TELEVISE RELIEF WELLS AND OUTFALL PIPES BEFORE AND AFTER CLEANING

	OUTFALL PIPE LENGTH (FT)	WELL DEPTH (FT)
RW-10	85	60 TO 70
RW-11	85	60 TO 70
RW-12	85	60 TO 70
RW-13	85	60 TO 70
RW-14	85	60 TO 70
RW-15	85	60 TO 70
RW-16	85	60 TO 70
RW-17	85	60 TO 70
RW-18	85	60 TO 70
RW-19	85	60 TO 70
RW-20	85	60 TO 70
RW-21	85	60 TO 70
RW-22	85	60 TO 70
RW-23	85	60 TO 70
RW-24	85	60 TO 70
RW-25	85	60 TO 70

NOTE: LINEAR FOOTAGE TO BE CLEANED AND TELEVISED ARE APPROXIMATED

NORTH SPILLWAY EXTENSOMETERS
REPLACE SENSORS AND RE-WIRE SENSORS TO PANEL

EXTENSOMETER DESIGNATION	EXISTING CAP ELEV.	ELEVATION AT TOP OF RIM
E-78	56.0±	58.21
E-84	56.2±	58.50
E-94	56.6±	57.59
E-94V	59.0±	59.45
E-104	56.3±	58.29
E-115	57.5±	59.55
E-124	56.3±	58.32
E-135	56.4±	58.41
E-135V	59.0±	59.26

NORTH SPILLWAY (NEW) TILTMETERS

TILTMETER DESIGNATION	INSTALL ON BUTTRESS NUMBER
T4	90
T5	114
T6	131

NOTE: TILTMETERS WILL BE GEOKON 6350, BIAXIAL, WIRED AND ATTACHED WITH GEOKON MOUNTING BRACKET AND PROTECTIVE ENCLOSURE.

NORTH SPILLWAY AUTOMATED PIEZOMETERS
REPLACE SENSORS AND RE-WIRE SENSORS TO PANELS

PIEZOMETER DESIGNATION	SENSOR DEPTH (FT)
P-79-1-S	37.88
P-79-1-D	69.90
P-80-3-S	26.36
P-95-1-S	31.20
P-95-1-D	70.32
P-105-3-S	18.10
P-120-1-S	19.90
P-120-1-D	62.32
P-136-2-S	20.40
P-136-2-D	61.48
P-136-3-S	27.32

*S: SHALLOW PIEZOMETER,
D: DEEP PIEZOMETER

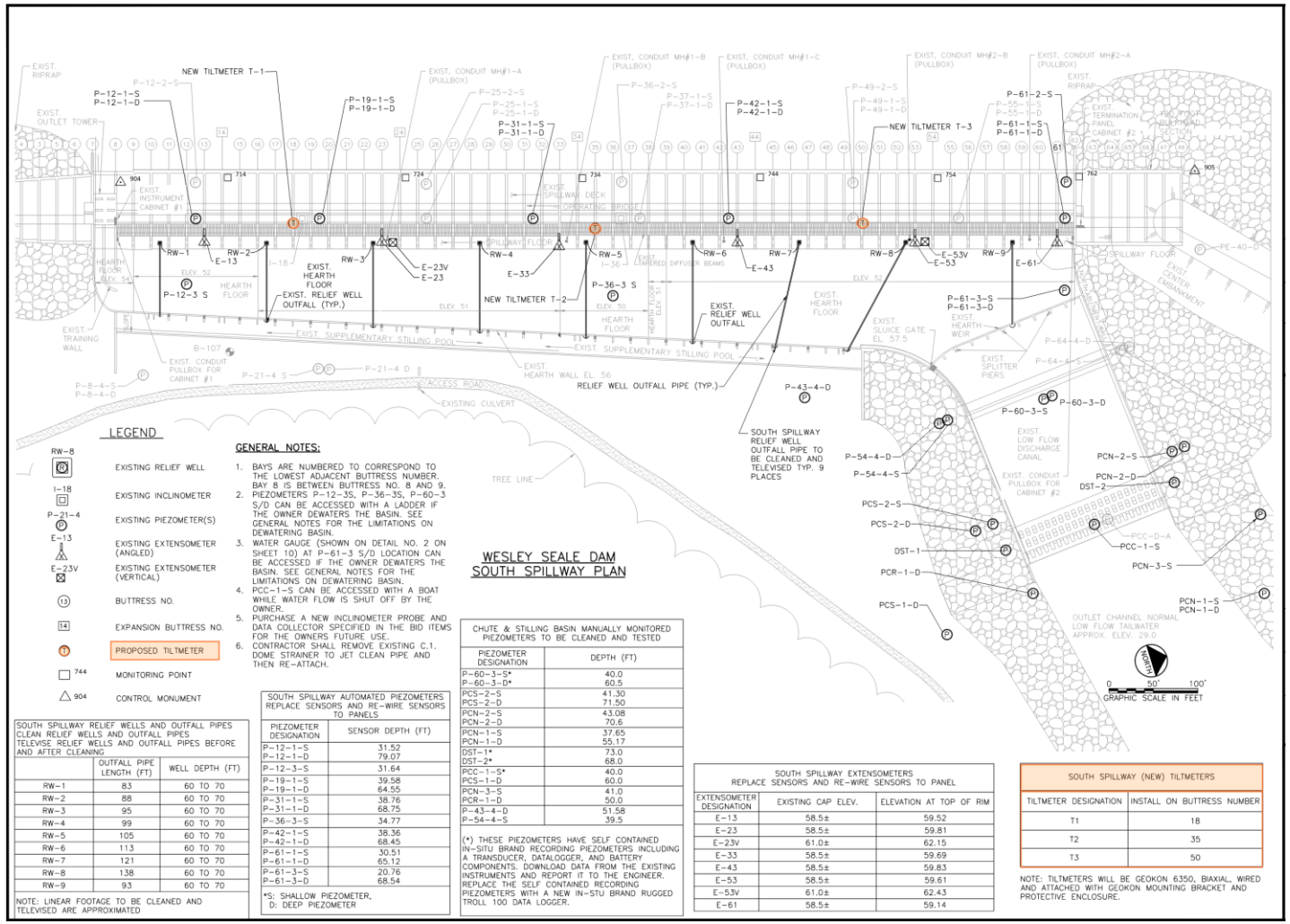
NOTE: PIEZOMETER P-112-2 S/D ARE MANUALLY MONITORED PIEZOMETERS. CLEAN AND TEST THESE PIEZOMETERS. P-112-S HAS AN EXISTING SELF CONTAINED IN-SITU BRAND RECORDING PIEZOMETER INCLUDING A TRANSDUCER, DATALOGGER, AND BATTERY COMPONENTS. DOWNLOAD DATA FROM THE EXISTING INSTRUMENT AND REPORT IT TO ENGINEER. REPLACE THE SELF-CONTAINED RECORDING PIEZOMETER WITHA NEW IN-STU BRAND RUGGED TROLL 100 DATA LOGGER.

NORTH

0 50' 100'
GRAPHIC SCALE IN FEET

Tiltmeters

- Tool for measuring movement of the dam at the buttresses
- Each spillway has several independent structural monoliths
- Each monolith at each spillway is monitored for movement by either extensometers at the downstream base or tiltmeters at the downstream top

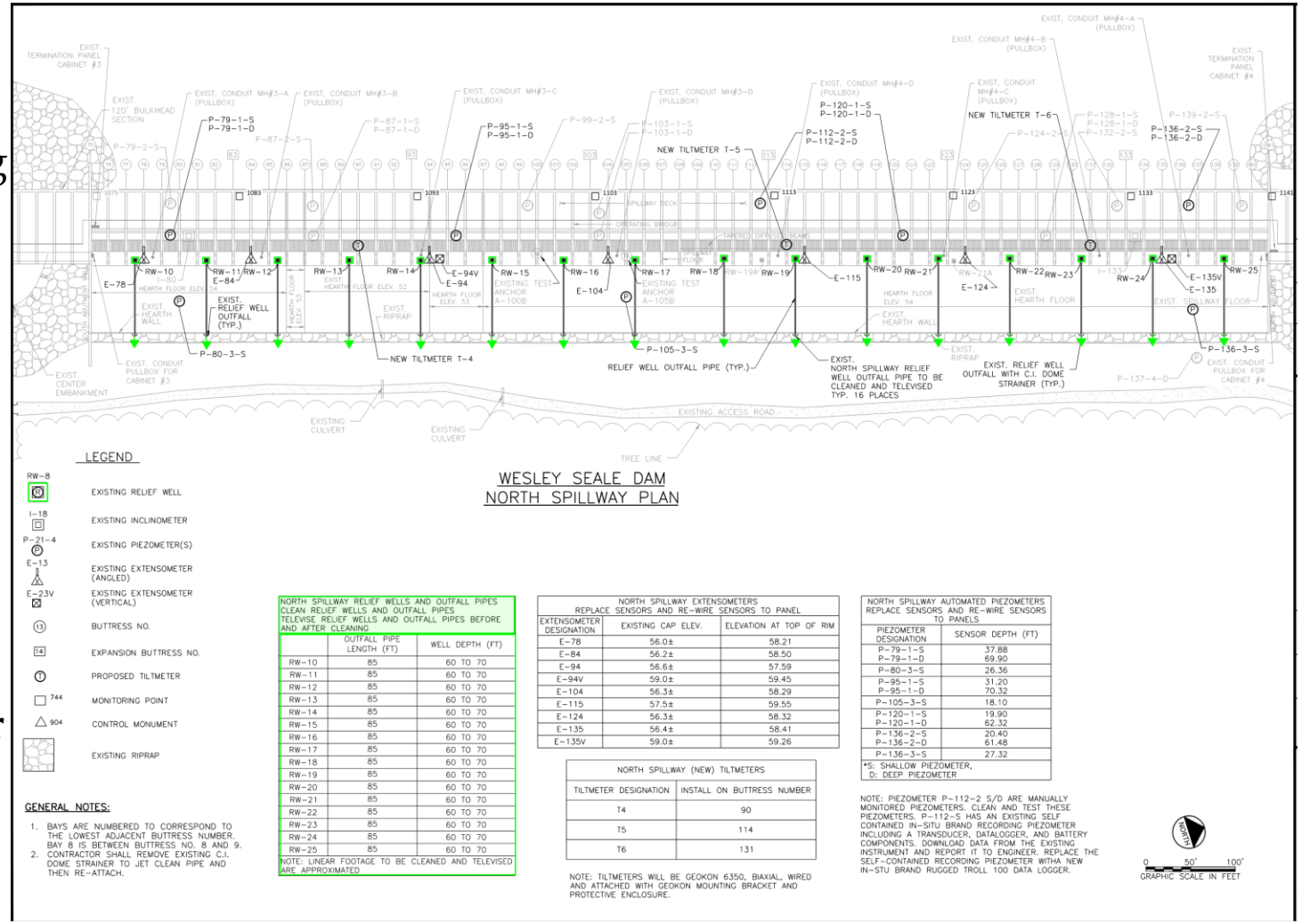


Total Station

- Previously CCW would measure movement of the dam with precision survey performed by a Survey Crew.
- The total station will continuously scan the dam for movement and provide an alert if any movement exceeds the threshold

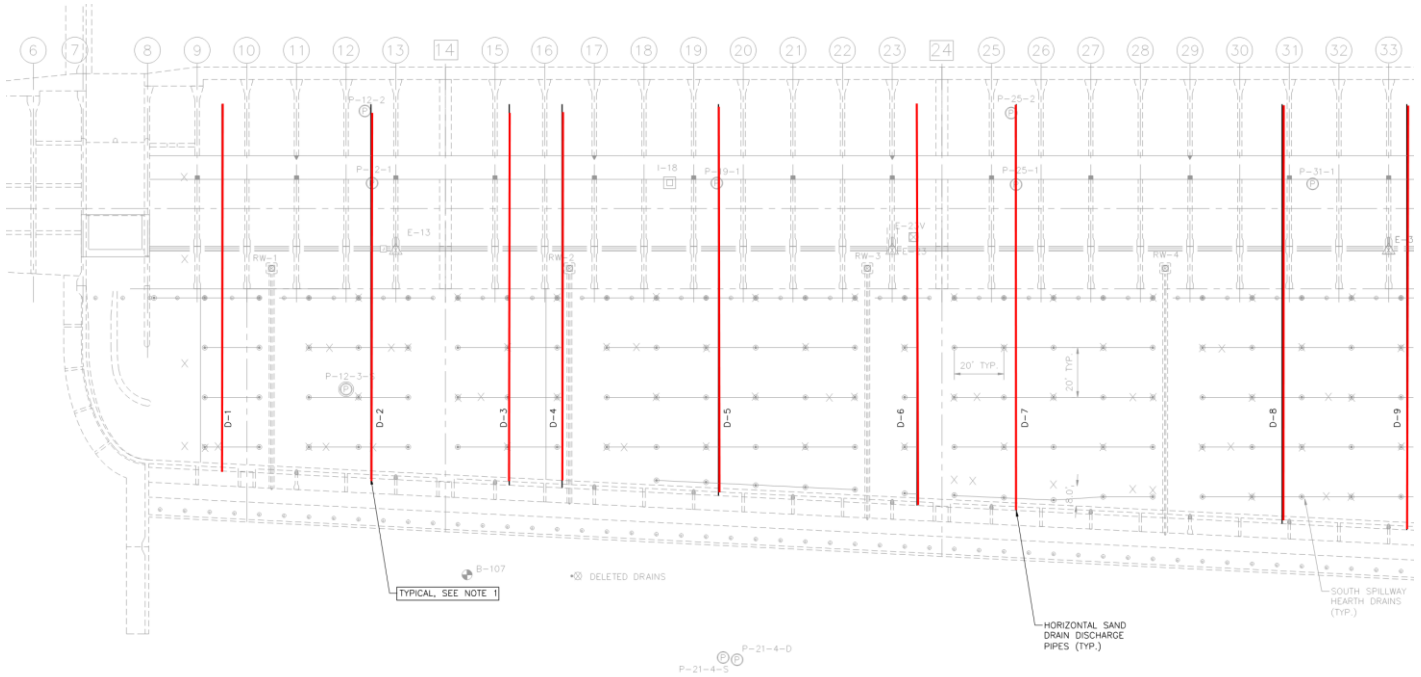
Relief Wells

- Relief Wells address the failure modes related to uplift pressures by relieving pressures in various soil layers below the dam and allowing them to drain off downstream in a controlled manner.
- Relief wells must be cleaned and maintained to flow properly and continue providing the protective function of relieving hydrostatic pressures under the dam



Sand Drains

- Sand drains address the failure modes related to uplift pressures by relieving those pressures in various soil layers below the dam and allowing them to drain off downstream in a controlled manner
- Sand drains must be cleaned and maintained to relieve hydrostatic pressures under the dam



Project Schedule

2020-2024	2024				2024-2025
October - January	M	A	M	J	July - July
Design	Bid/Award				Construction

Projected Schedule reflects City Council award in June 2024 with anticipated completion in July 2025.