

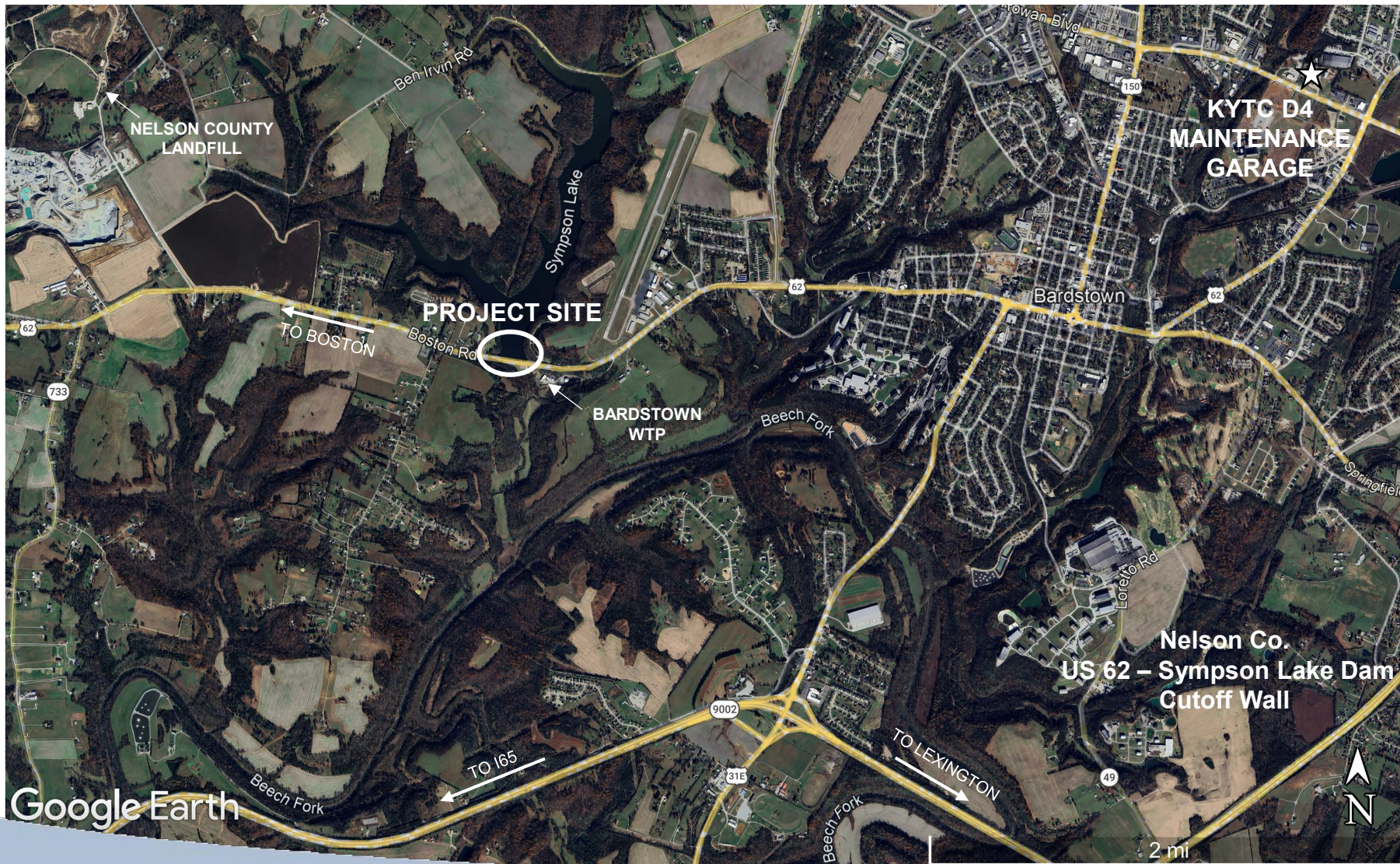
# Sympson Lake Dam Cutoff Wall US62 Westbound Lane Contract ID: 262198

## Pre-Bid Meeting

### Thursday, April 30<sup>th</sup>, 2026



# Site Map

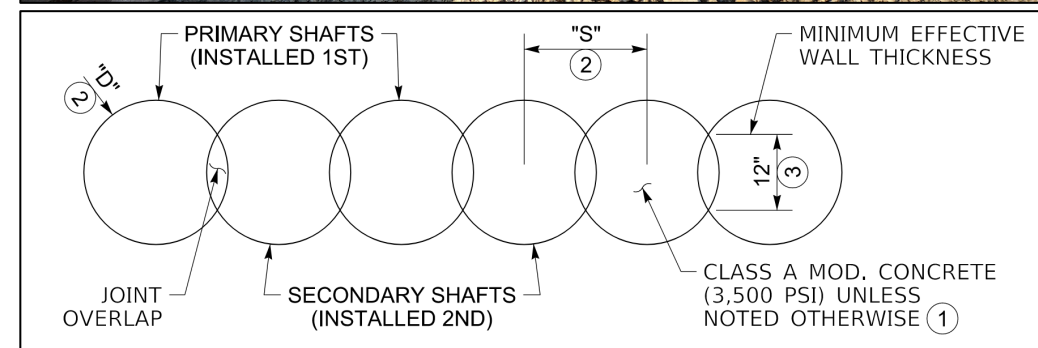


**\*\*A mandatory site visit will be conducted immediately following the conclusion of this meeting\*\***

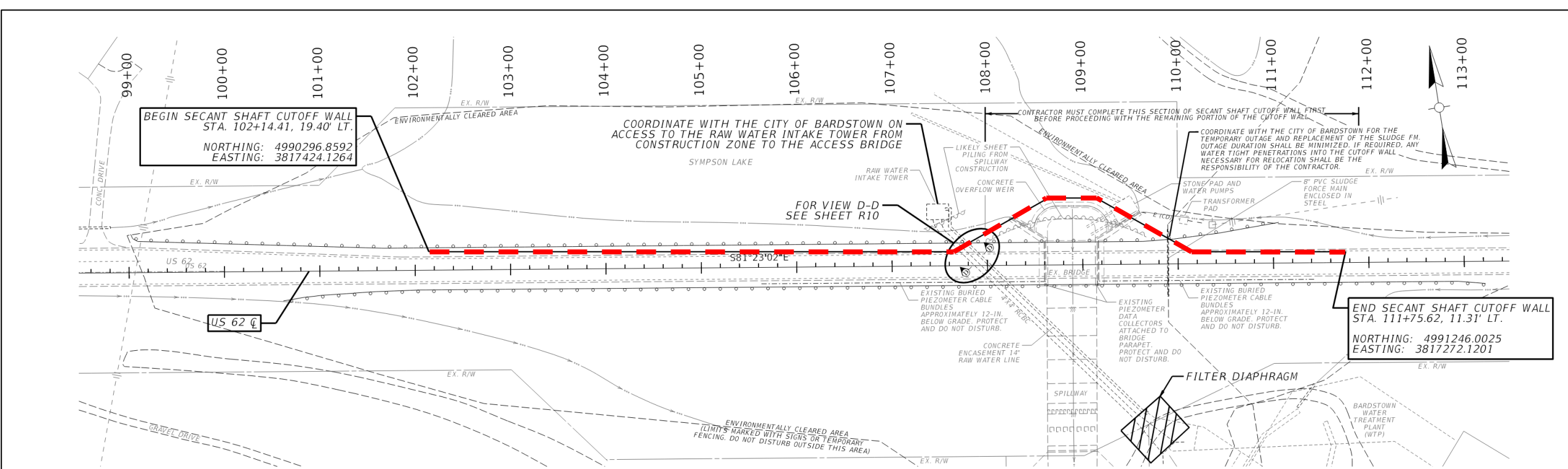
Traffic control will be provided in the westbound lane, limiting the duration of the visit.

# Cutoff Wall Alignment & Geometry

- Wall alignment is shown on the Plans to define the intended wall limits and project constraints.
  - Lateral limits (start/end) and depths are specified;
  - Wall must remain north of US62 centerline (in west bound lane or shoulder).
- May propose alternative alignments in west bound lane/shoulder, subject to Department review and approval.
- Responsible for selection of shaft diameter and center-to-center spacing.
  - Geometry shall produce a continuous wall with minimum effective thickness of 12 inches.



# Plan View Layout

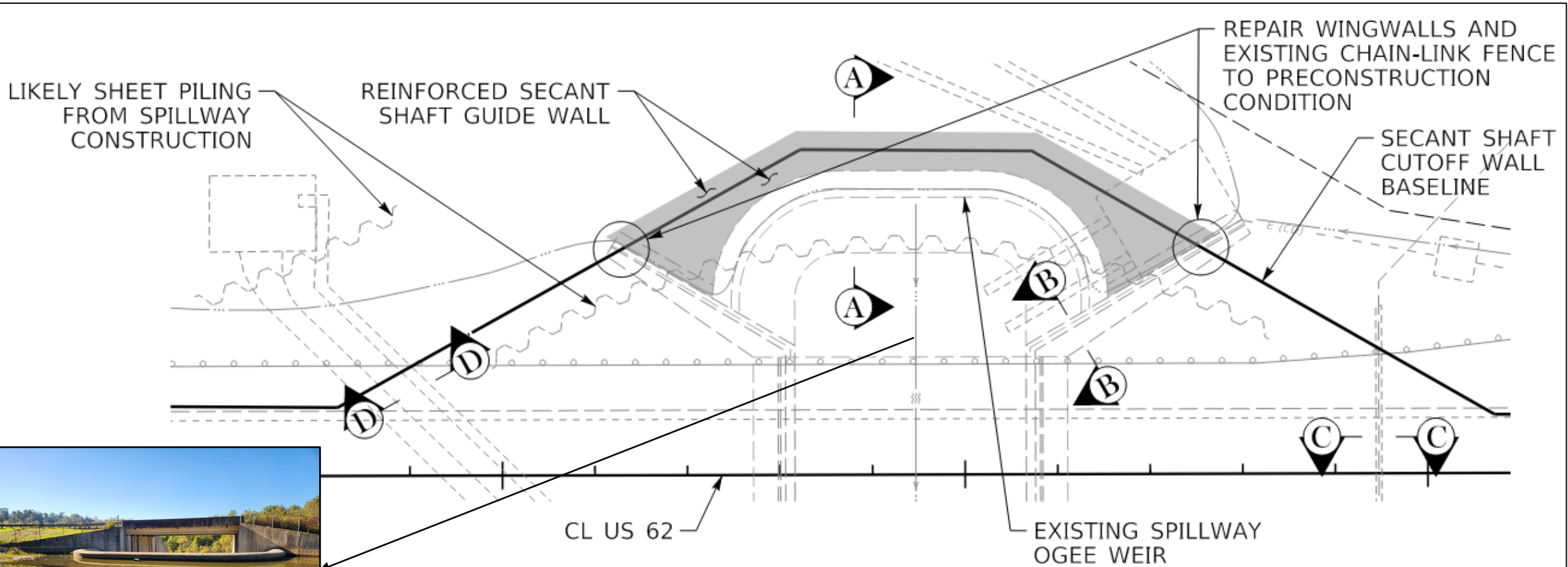


- Wall Length: ~ 990 feet
- Utility Crossings: 4'x4' RCBC, 14" Raw Water Line, 8" Sludge FM
- Alignment Constraints: Upstream of Spillway Ogee Weir

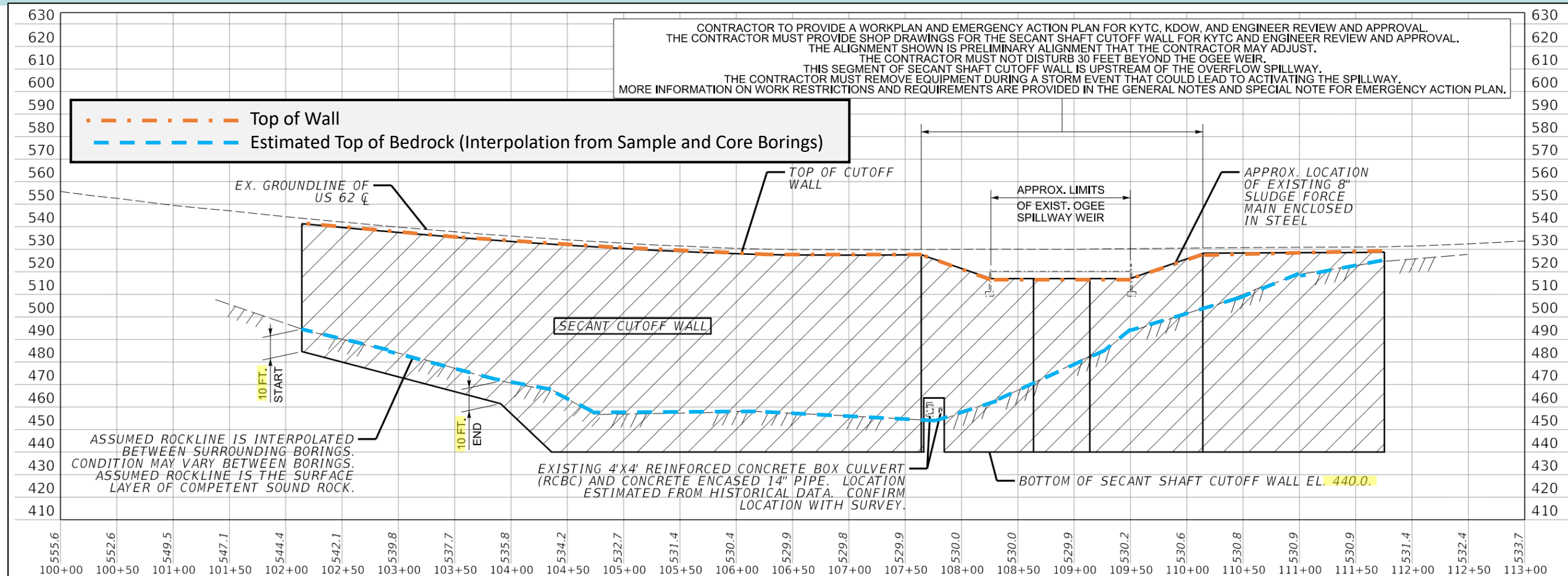
**\*\* Wall Construction Between STA 107+00 and End Station Must Be Completed First, Prior to Constructing Other Wall Segments.\*\***

**\*\* Alternative alignments may be proposed for review in areas adjacent to the spillway and bridge\*\***

# Plan View Layout (Cont'd)



# Wall Profile



- Wall Tip Elev/Depth:
  - Start to STA 103+97: 10 ft. Into Competent Bedrock
  - At 4'x4' RCBC / 14" Raw Water Line: w/ in 2 ft. Above RCBC Roof
  - Else: Elev. 440 ft.
- Wall Top:
  - Ogee Spillway Weir: El. 517'
  - Else, Existing Pavement Grade Minus Pavement/Roadway Stabilization Thickness

# Subsurface Investigations

## 2024 Investigation:

- Geotechnical Investigation:
  - 1001 to 1012
  - 12 Sample (Continuous) Borings w/ Coring (5' to ~30' Core Length)
  - 6 of 12 Borings Included VW Piezometers
  - 14 Unconfined Compression Tests on Bedrock (3,596 psi – 9,950 psi)
- Geophysical Investigation:
  - Seismic Refraction: 3 survey lines (crest, mid-slope, toe)
  - GPR: Spillway, 10' to 12' spacing, 120' length along chute

## 2026 Investigation:

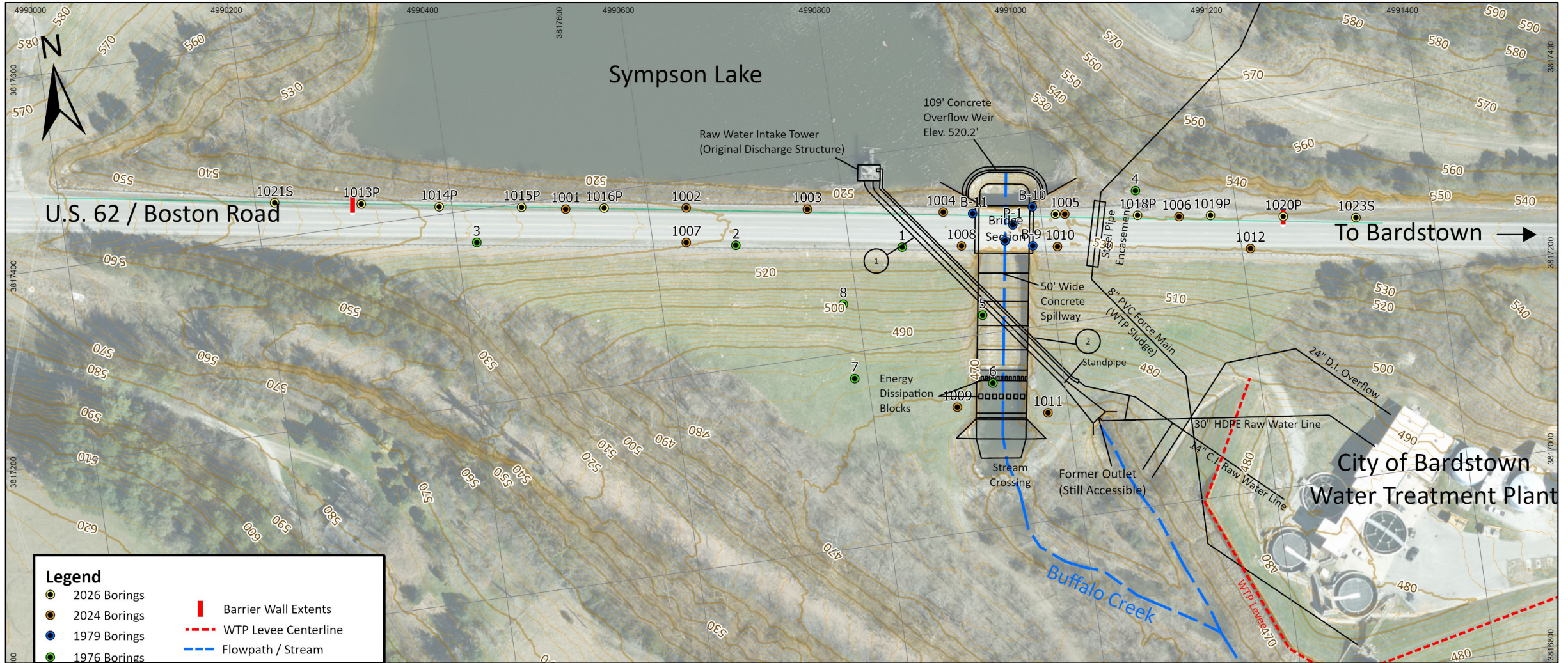
- 1013P to 1023S
- 9 Core Borings to El. 430'
- 1 Sample Boring w/ Coring to El. 430'
- 3 Unconfined Compression Tests on Bedrock (5,624 psi – 12,210 psi)
- 5 DCPT w/in Spillway Chute (Refusal ~ 15 ft. to 20 ft.)

## Historic Explorations:

- 1976: 8 Sample Borings w/ Coring (1 to 8)
- 1979: 5 Sample Borings (B-9 to B-12, P-1)
- 2021: 2 Sample Borings & GPR



# Subsurface Investigation Locations

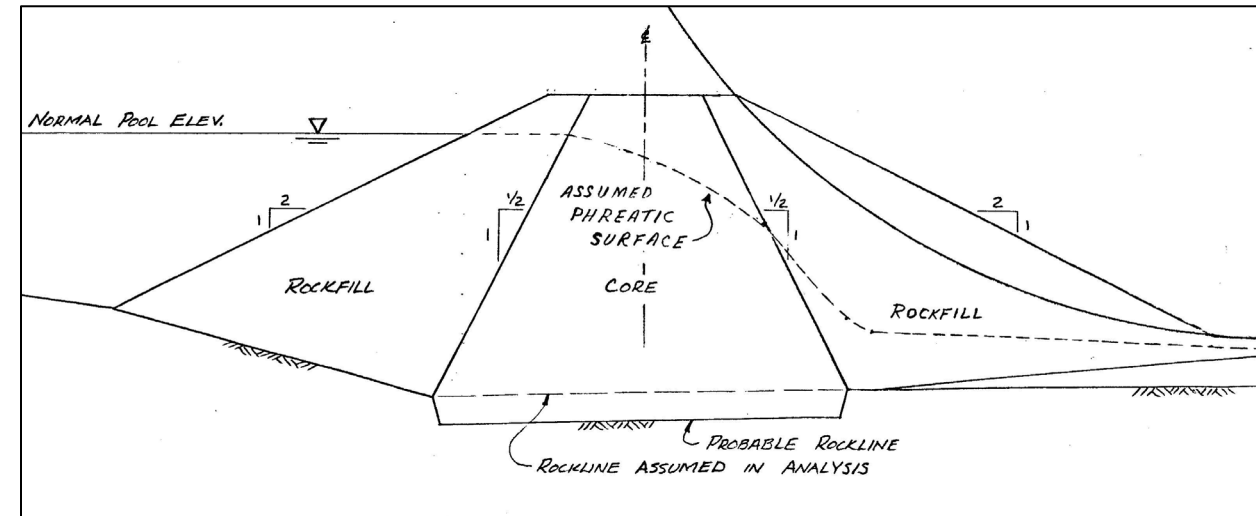


# *Project Related Information Available*

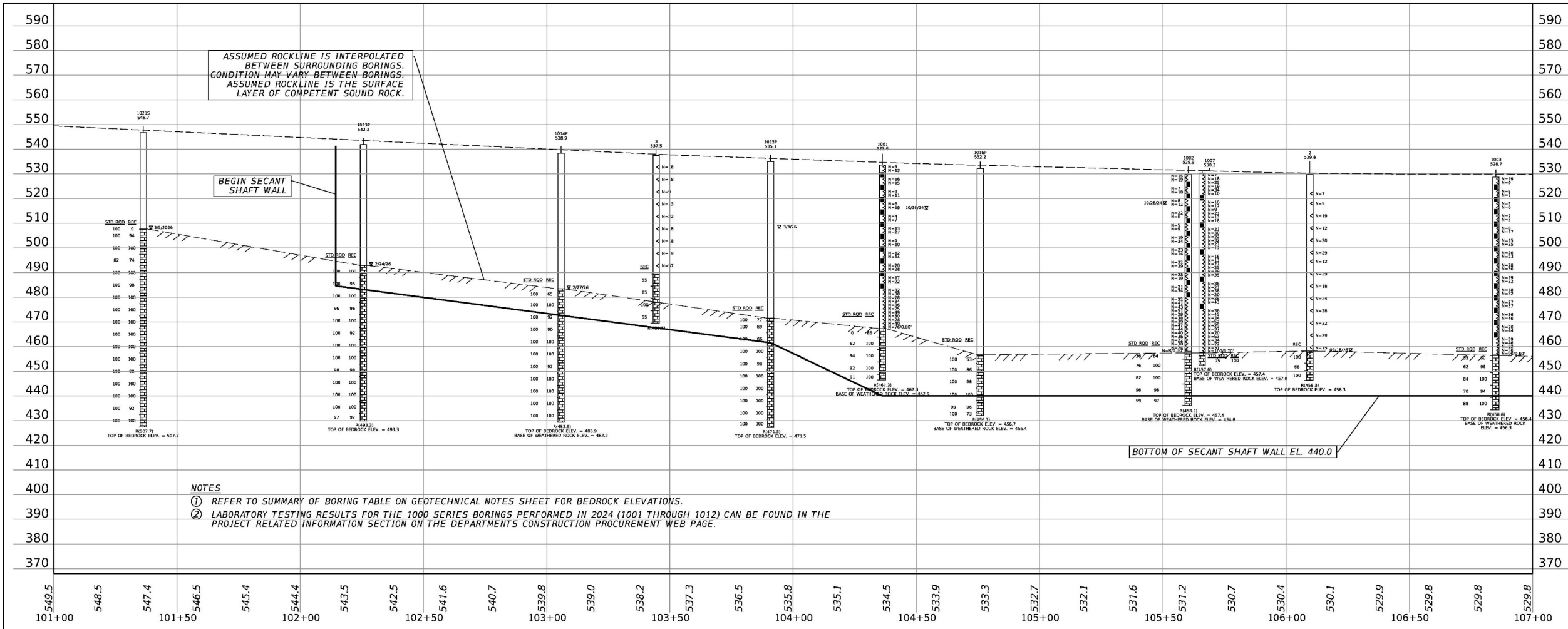
- Project-Related Information is available on KYTC's Division of Construction Procurement Website.
- The Information include:
  - Cutoff Wall Plan Set
  - Geotechnical Investigation Report
    - Past Evaluations and Inspections;
    - Site conditions including geologic setting and site hazards;
    - Results of the subsurface exploration and lab testing program, including backfill records;
    - Instrumentation Readings (Piezometers);
  - 2024 Geotechnical Investigation Lab Summary
  - Geophysical Survey Report dated June 2025 (Seismic Refraction/GPR)
  - 2026 Spillway DCP Investigation Results

# Subsurface Conditions

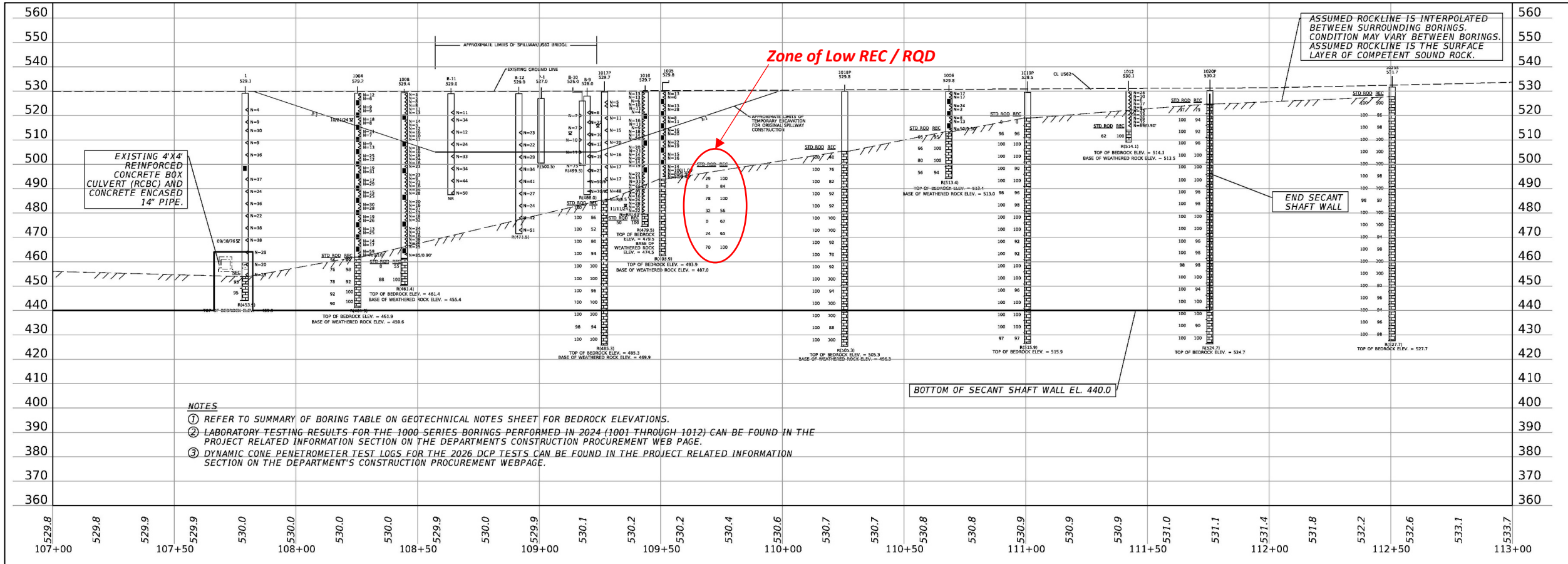
- Soil/rock types observed during the 2024 & 2026 subsurface investigations include -
  - Embankment Core (Lean Clay and Silt);
    - SPT “N” Value - 1 to Refusal (Avg = 23 - Very Stiff)
    - USCS Classification - CL, ML, lesser occurrences of GM, GC, SC, GP-GM
    - Compressive Strength - 460 to 5,900 psf (Avg = 2,350 psf)
  - Weathered Bedrock; &
  - Bedrock.
- Bedrock: Interbedded Dolostone and Limestone with minor Shale beds.
  - Saluda, Bardstown, Rowland, and Grant Lake Formations.
  - Unconfined Compressive Strength - 3,596 to 12,210 psi (avg = 7,465 psi)
  - STD RQD - 0 to 100 (Avg = 86)



# Subsurface Conditions (cont'd)



# Subsurface Conditions (cont'd)



# Additional Bedrock Core Testing

- Unconfined Compression (UC) Tests on rock core to-date:
  - 17 total tests, primarily within the upper 20 ft.;
  - Testing primarily in lateral extents of the 2024 exploration.
- Additional UC core breaks may be performed, subject to Department approval.
- All core samples from the 2024 and 2026 explorations are available for additional testing.
- The Department will consider other test types/methods beyond UC tests; however, approval is not guaranteed.
- All test requests and results will be posted to the project related information (construction procurement) and shared with all bidders.



# Earthen Embankment Construction

- Sympson Lake Dam - Significant Hazard (B) Structure per KAR 4:030 w/ an Unsatisfactory Condition Assessment.
- Failure may cause significant damage to property and project operation (***US62, Bardstown WTP***), but loss of human life is not expected but not completely ruled out.
- Wall construction requires directly disturbing the existing embankment dam. ***Special care and effort is required compared to general construction to prevent damage, slope instability, and the creation of seepage pathways within the embankment.***
- ***Under no circumstance shall construction be performed with the aid of water, air, or other downhole pressurized methods.***
- Satisfactory past experience with walls serving as a hydraulic barriers and earthen embankment dam construction are critical to successfully complete this work.

# Pre-Construction Submittals

- Personnel experience and submittal requirements, including deadlines, are provided in the Special Note for *Secant Shaft Cutoff Wall*.
- Personnel experience Submittals -
  - Submit no later than seven (7) calendar days after receiving Notice of Award.
  - Pre-qualified by the Department for "Grouting for Ground Improvements (I-39)" OR "Jet Grouting (J-20)".
- Construction and Material Submittals -
  - Submit no later than fourteen (14) calendar days after receiving Notice to Begin Work.
  - Required submittals include, but not limited to, Shop Drawings with proposed shaft diameter, estimated lengths, and details needed for wall construction around the spillway area, existing box culvert and 14-inch raw water line.

# Work Items

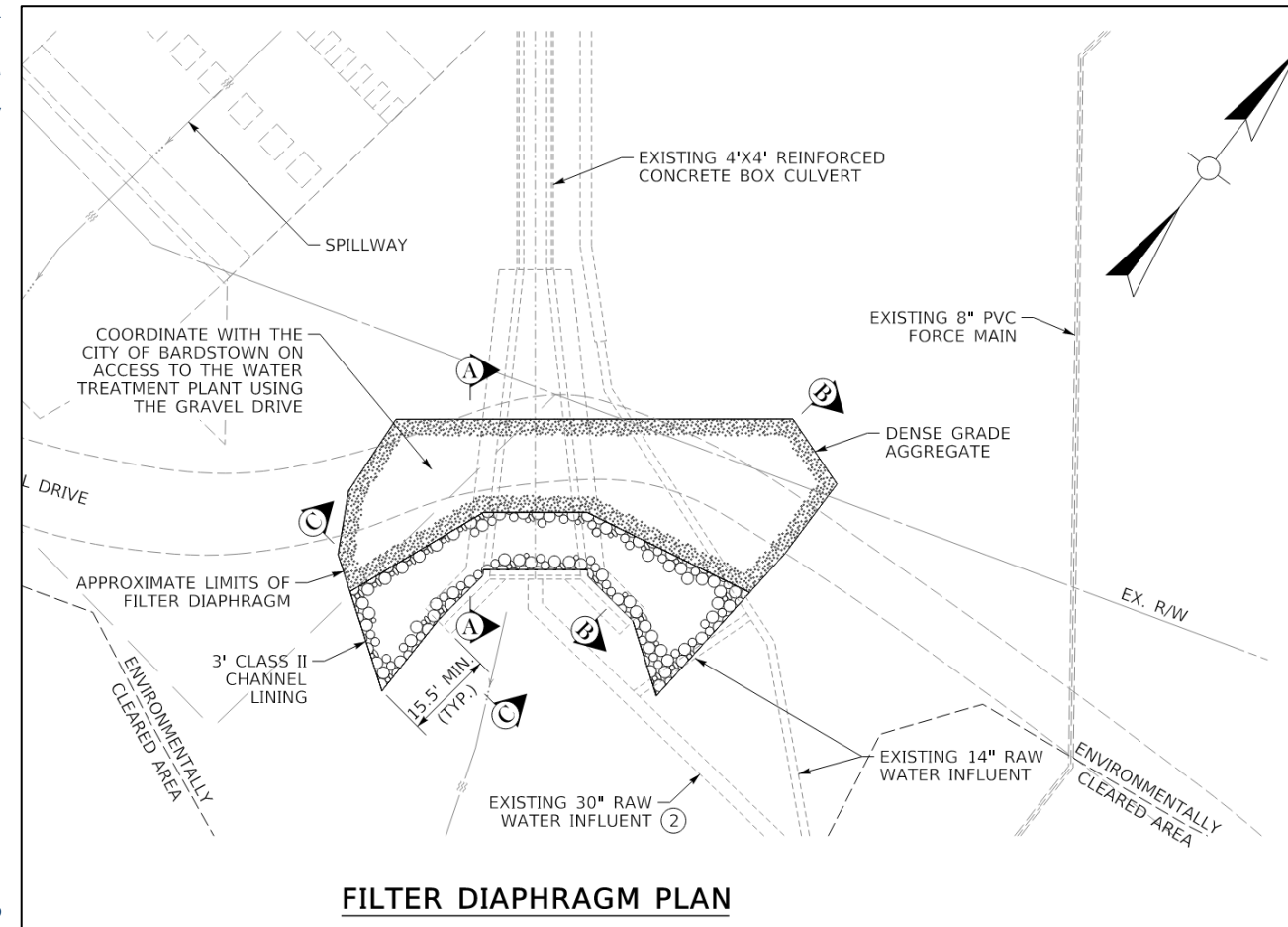
Work item requirements provided in the Special Notes & Contract Plans.

- Filter Diaphragm;
- Pre-Construction Condition Survey;
- Maintenance of Traffic;
- Secant Shaft Installation --
  - Vibration Control;
  - Guide Wall;
  - Shaft Drilling;
  - Placement of Concrete; &
  - Verification testing.

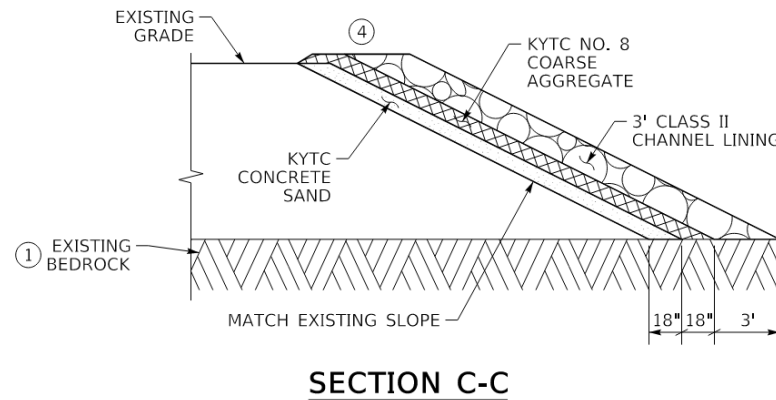
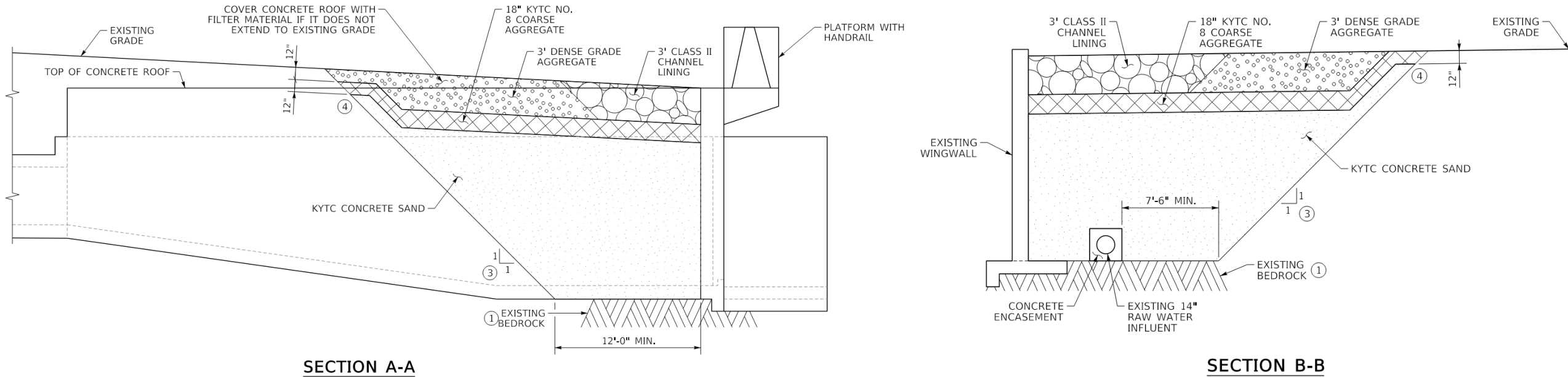


# Filter Diaphragm Installation

- Two stage filter diaphragm required to bedrock around the outlet of the existing 4-foot by 4-foot box culvert and 14-inch CIP raw water line near Buffalo Creek w/in environmentally cleared area.
  - KYTC Concrete Sand,
  - KYTC No. 8 Coarse Aggregate,
  - Dense Grade Aggregate, and
  - Class II Channel Lining.
- Existing box culvert, wingwalls and 14-inch CIP line must be protected from damage at all times.
- Coordinate w/ City to provide access along gravel road to WTP.
- Buffalo Creek is at risk for flooding when the Beech Fork River is elevated, weather forecasts should be monitored during diaphragm work.



# Filter Diaphragm Installation (Cont'd)



**\*\*Contractor is responsible for the design, construction, and maintenance of all temporary excavation slopes; slopes shown on the plans are for general guidance only and must remain safe and stable for the duration of the work\*\***

# Pre-Construction Condition Survey

- Pre-construction condition survey required for structures, embankment slopes, and utilities within 300 feet of the secant shaft drilling activity.
- Survey must include video and photographic documentation of the exterior and interior of above ground structures and of the interior of underground structures (if accessible).
- Submit the pre-construction Condition Survey Reports no later than 28 days before the commencement of drilling activity.



# Maintenance of Traffic (MOT)

- Overview
  - Work will be completed in three (3) phases
  - Temporary signals will be required at each abutment
  - Traffic will be maintained on US-62 throughout construction
- Phase 1
  - Implement temporary traffic signals at each end of project
  - Close eastbound lane of US-62
  - Maintain one-lane, two-way traffic in westbound lane (11' min. width)
  - Widen roadway pavement by ~8' along the existing eastbound shoulder from STA 98+20 to STA 115+70 (≈1,750')
- Existing utilities:
  - Buried piezometer cables located approximately 12 inches below grade along the eastbound shoulder
  - Contact KYTC Geotechnical Services Branch prior to excavation in this area



# Maintenance of Traffic (MOT) (Cont'd)

- Phase 2
  - Limits and layout generally similar to Phase 1
  - Shift traffic to widened eastbound direction
  - Maintain one-lane, two-way traffic in eastbound lane (11' min. width) using temporary traffic signals
  - Close westbound lane of US-62 to allow for cutoff wall construction
  - Construct new westbound pavement section, including guardrail, surface course and final pavement markings
- Phase 3
  - Shift traffic to westbound lane using one-lane, two-way traffic and temporary traffic signals.
  - 1.5" asphalt mill and overlay for the eastbound lane and shoulder
  - Install final pavement markings
  - Open both lanes to normal traffic operations



# Vibration Control

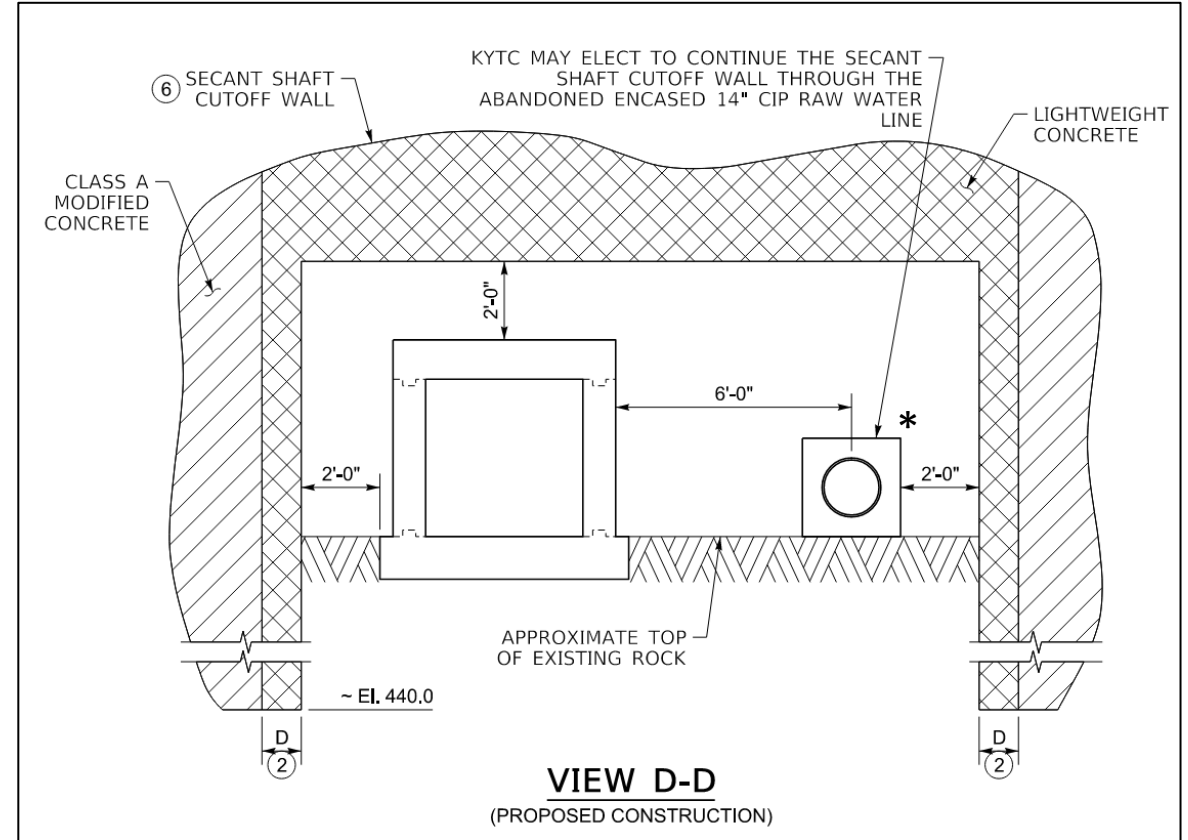
- Vibration monitoring shall be performed by a qualified, independent vibration consultant with a minimum of five (5) years of experience.
- Submit qualifications and experience/references prior to installation of monitors.
- Install instrumentation and monitor vibrations during all shaft installation activities within 300 ft of the construction at locations designated by the vibration consultant.
- Baseline (ambient) vibration readings shall be collected prior to initiating secant shaft installation.
- Maximum Allowable Vibration:
  - Peak Particle Velocity (PPV)  $\leq 2.0$  in/sec





# Placement of Concrete

- Conventional/Normal Weight Concrete:
  - KYTC Class A Mod
  - Slump: 7 to 9-inches.
- Lightweight Concrete:
  - Lightweight concrete is required in secant shafts constructed w/in a 2-foot window above and directly adjacent to:
    - Existing 4 ft × 4 ft box culvert
    - Concrete-encased 14-inch CIP raw water line
  - Material and testing requirements are defined in the Cutoff Wall Special Note, including:
    - Permeability  $\leq 1 \times 10^{-6}$  cm/s, confirmed per ASTM D5084
    - Unit weight  $\leq 115$  pcf
  - Trial batch approval required prior to production use
  - Alternate methods or materials may be submitted to the Department for review and approval



# Verification Testing

## 1. Concrete Core Holes:

- Ten (10) full depth holes through center of the shaft extending 5-feet into bedrock;
- Maximum of 10-foot sections, tremie backfilled upon completion.

## 2. Water Pressure Testing:

- Two (2) shafts (PQ-3) cored along the interface joint to perform single-packer water pressure testing.
- Maximum of 5-foot sections, inspected and logged. Perform testing at 10-foot intervals as hole is progressed.
- Maximum interface joint permeability of  $1 \times 10^{-6}$  cm/sec.

## 3. Falling Head Permeability Testing:

- Two (2) shafts cored along the interface joint to perform 24-hour falling head permeability testing.
- Test performed on entire shaft length, with maximum permeability of  $1 \times 10^{-6}$  cm/sec.

## 4. Cross-Hole Conic Logging (CSL):

- Ten (10) CSL tests (4-Tube) performed in accordance with Special Note for Non-Destructive Testing in Secant Shafts (Appendix C).

# Verification Testing (Cont'd)



# *Shaft Drilling - Demonstration Program*

- A demonstration program is required for the first 5 production shafts to verify that materials and installation procedures produce a continuous hydraulic barrier.
- Includes installation, verification testing, and acceptance of the first five shafts.
- Verification testing includes: center concrete core, CSL (Crosshole Sonic Logging), and interface joint concrete core with 24-hour falling-head permeability testing.
- Installation of subsequent shafts shall not proceed until verification test results are reviewed and approved.

# Critical Infrastructure & Operational Constraints

- Sole source of drinking water for the City

## Operational Constraints:

- Continuous access to the intake tower must be maintained for City staff throughout construction
- Existing RCBC and 30-inch raw water line within the RCBC must remain fully operational
- On-going work around and inside the intake tower may require coordination with a specialty engineering and construction contractor.

## Special Coordination:

- Lake drawdown for upstream work requires coordination with and approval from both KYTC and the City.
- Temporary outage and replacement of the 8-inch sludge force main shall be coordinated with the City. Outage must be less than **6 hours**.

## Penalties:

- **\$10,000/day** for any damage causing WTP operational shutdown, until fully restored



# Flood Risk & Lake Reservoir Pool Management

- Upstream cutoff wall construction is subject to elevated flood risk from rising lake levels
- Assume any rainfall event resulting in  **$\geq 2$  inches in 24 hours or cumulative  $\geq 2$  inches in a four-day period** will result in pool rise that places equipment/material staged within upstream area at risk.
- **Planning & Submittals:**
  - Emergency Action Plan (EAP) required in accordance with the EAP Special Note
  - Upstream construction protection and staging plan
- **Lake Level Management & Pumping:**
  - KYTC may lower the lake to **El. 515 ft**, when feasible, at a maximum rate of **0.5 ft/day**
  - Placement of material above **El. 517.0 ft** for flood protection or other reasons is not permitted in front of the ogee weir
  - Real time (every 10 mins.) lake level elevations are published and available on a Power BI Dashboard.



# Project Schedule Milestones & Completion Requirements

- Fixed Contract Completion Date: **August 1, 2027**
- Intermediate Completion Milestone:
  - Install cutoff wall from STA 107+00 to approximately STA 111+90 (end of wall)
  - Required intermediate completion date: **December 31, 2026**
- Liquidated Damages:
  - **\$2,500 per calendar day** for missing the intermediate completion date
  - Liquidated damages per KYTC Standard Specifications apply for failure to meet the fixed completion date
  - Damages will be assessed during December through March



*Sympson Lake Dam Cutoff Wall  
US62 Westbound Lane  
Contract ID: 262198*

