

Lower Olentangy Tunnel

Constructing a shaft in a Landfill,
adjacent to a medical center

2023



INDIANAPOLIS

FIVE CITIES PLUS

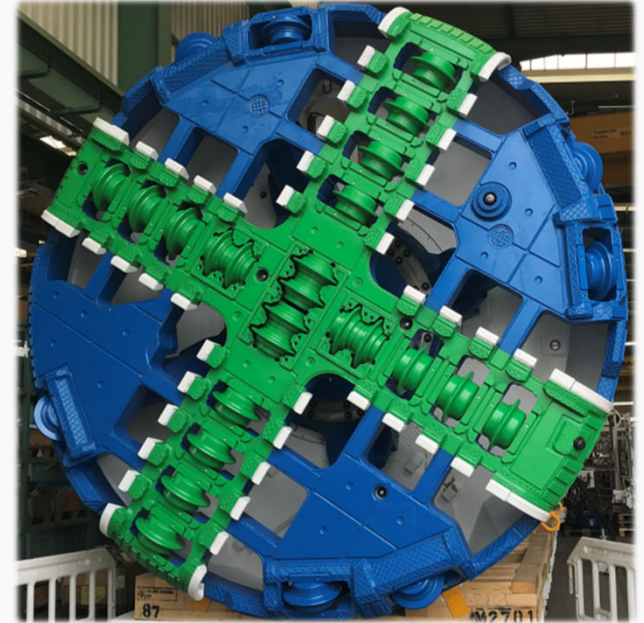
Agenda

- Introductions
- LOT Project Overview
- Gowdy Field Site Overview
- Environmental Requirements
- OSU SSCBC Overview
- Vibration Monitoring Requirements
- Current Project Status
- Questions



Introductions

- **City of Columbus**
 - Jeremy Cawley, P.E., Project Manager
- **DLZ**
 - Jeff Coffey, P.E., Design Project Manager
- **Black & Veatch**
 - Clint Wilson, P.E., Construction Manager

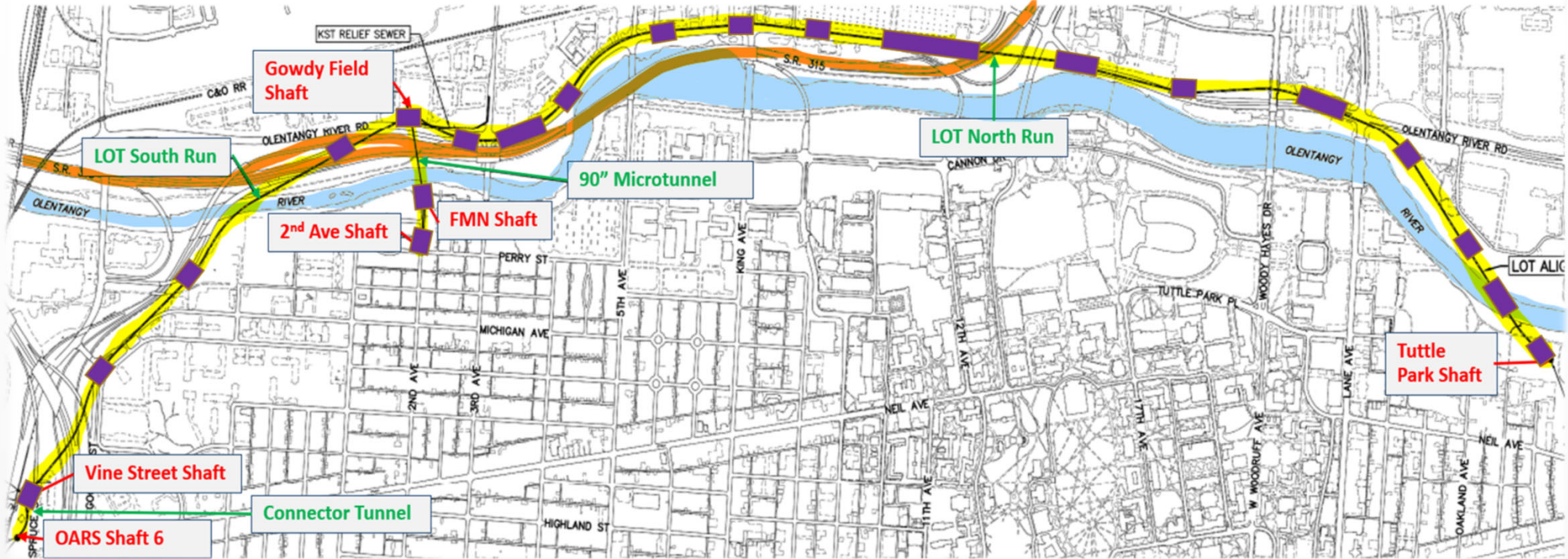


Lower Olentangy Tunnel Overview

- Key component of the revised, 2015 Wet Weather Management Plan
- 3 ½ Miles of soft ground, 12' diameter tunnel (~50' depth)
- 1,100 LF of curved, 90" micro-tunnel
- 950 LF of 36" Jack & Bore
- 320 LF of 30" Jack & Bore
- 5 Shafts

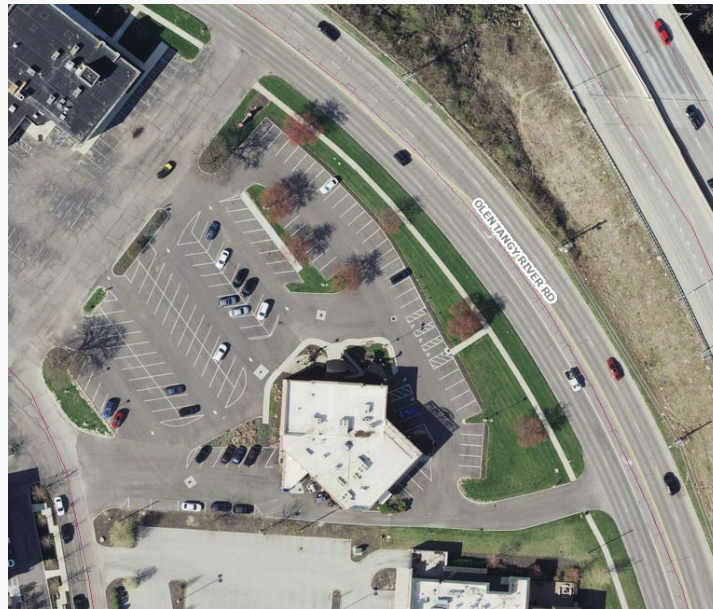


Lower Olentangy Tunnel Alignment



Gowdy Field Site Background

- Initial alignments looked at using different sites for the shaft
- This initial site would have created severe impacts to a local restaurant and was deemed too small.
- Created size and logistic issues at the launch site.



Gowdy Field Site Background

- Initial alignments looked at using different sites for the shaft

This site (3rd Ave) was deemed impracticable due to bridge foundation impacts within the Olentangy River.



Gowdy Field Site Background

- Final location was set for Gowdy Field
- Final location chosen due to size (2.5 acres) and proximity to diversion sewers.
- Constructed in an easement instead of purchasing due to other impacts.



Gowdy Field Site Background

- Originally constructed as a community garden to provide food through the Great Depression.
- Converted to baseball fields in the 1940's and renamed for the City's most famous baseball player, Hank Gowdy.
- 1964 the City of Columbus passed a resolution to use the fields as a landfill which operated until 1984.



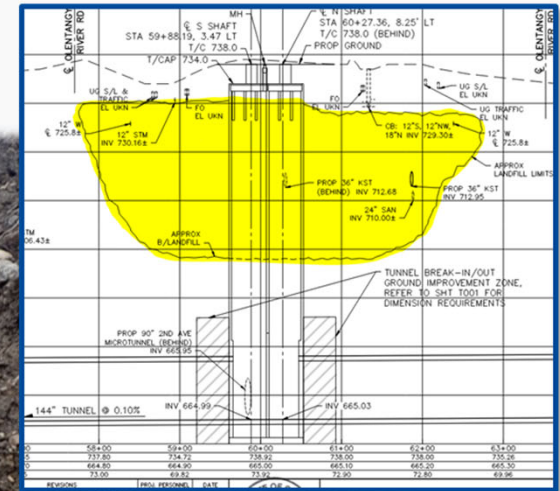
Gowdy Field Site Background

- Capped and used as a Police heliport until 2009.
- 2009-2013 the property sold and entered the Voluntary Action (VAP) program and the Covenant Not to Sue (CNS) was awarded
- 2021 the CNS was revised to include the LOT project.



Gowdy Field - Landfill

- Estimated 540,000 CY of solid waste, site wide.
- Maximum depth is 40 feet below ground surface but the top layer varied in depth from 12 feet to 25 feet.



Gowdy Field - Contract Requirements



- Considered a “historic” site due to it being an unpermitted solid waste facility.
- Required obtaining a Chapter 3745-513 (Chapter 513) authorization from the OEPA to begin work.
 - In order to obtain OEPA approval, it required approval from the land owner (OSU) due to CNS provisions.



Gowdy Field - Landfill Impacts

- Any work deeper than 2' required fulltime oversight from a Certified Professional Authorized Representative (CPAR)
- All workers had to be 40 hour HAZWOPER certified.
- Daily air sampling during excavation and then only periodic once the shaft was sealed.



Gowdy Field - Landfill Impacts

- Required the construction of a soils management area (SMA).
- All spoils required to be sampled and tested per VAP standards prior to removal from site.
 - Tests averaged 7 days for approval.



Gowdy Field - Site Layout



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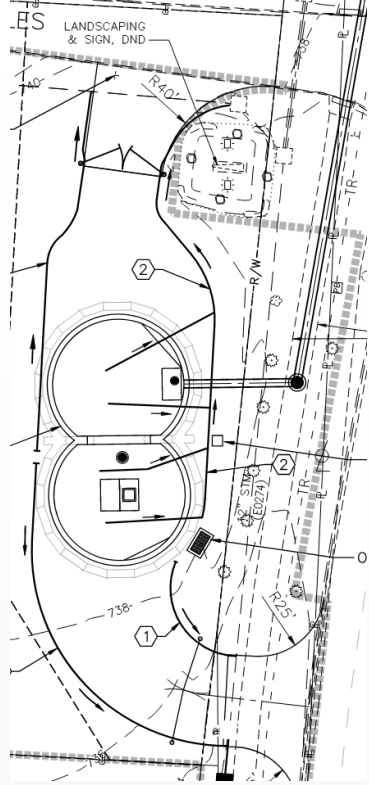
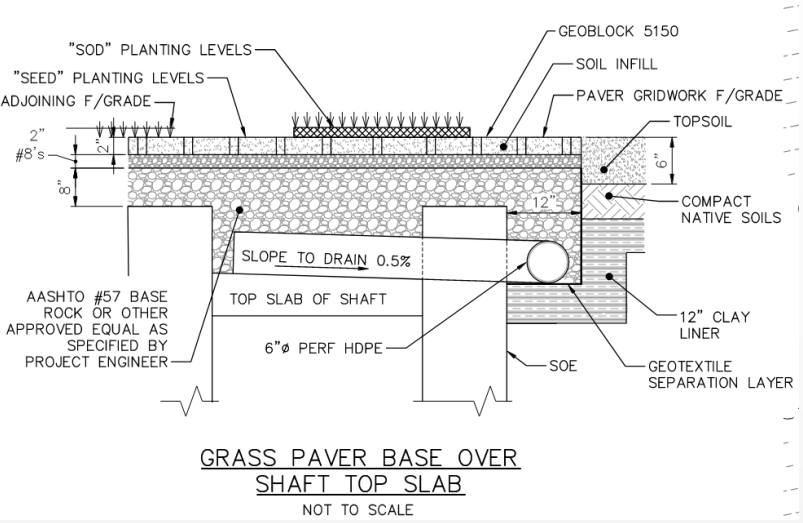
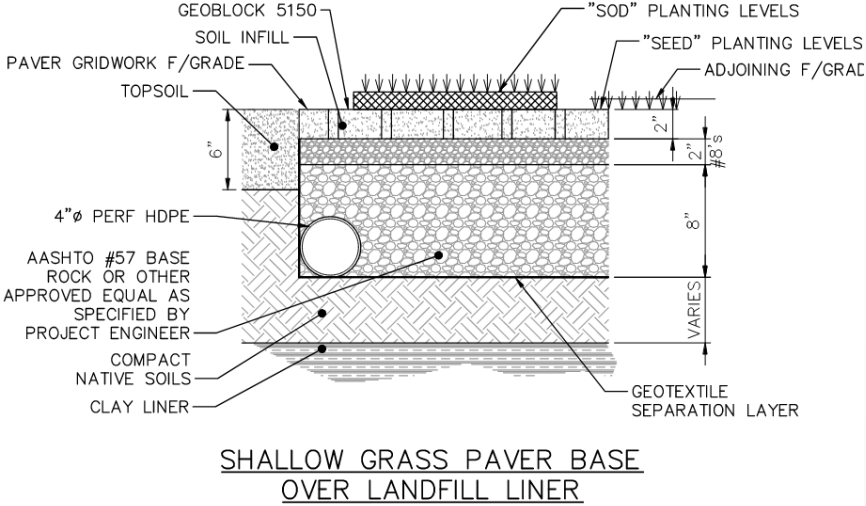
Gowdy Field - Post Construction



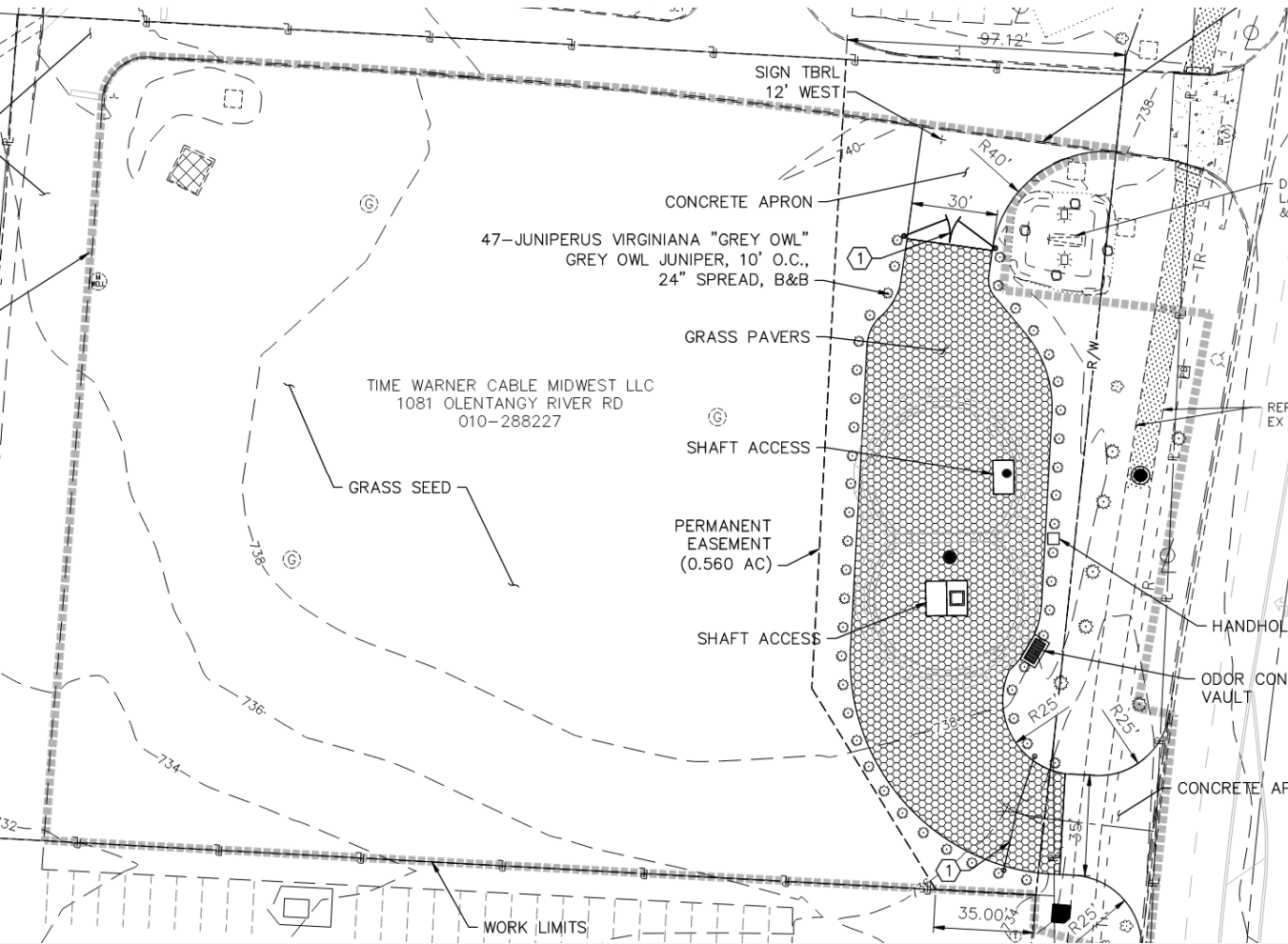
- All site restoration work will require fulltime oversight from a CPAR.
- All prior spoils sampling, storing and testing requirements will restart.
- Daily air sampling required until the site is sealed.
- Requires all workers to be 40 hour HAZWOPER certified.



Gowdy Field - Final SW BMP



Gowdy Field Final Layout



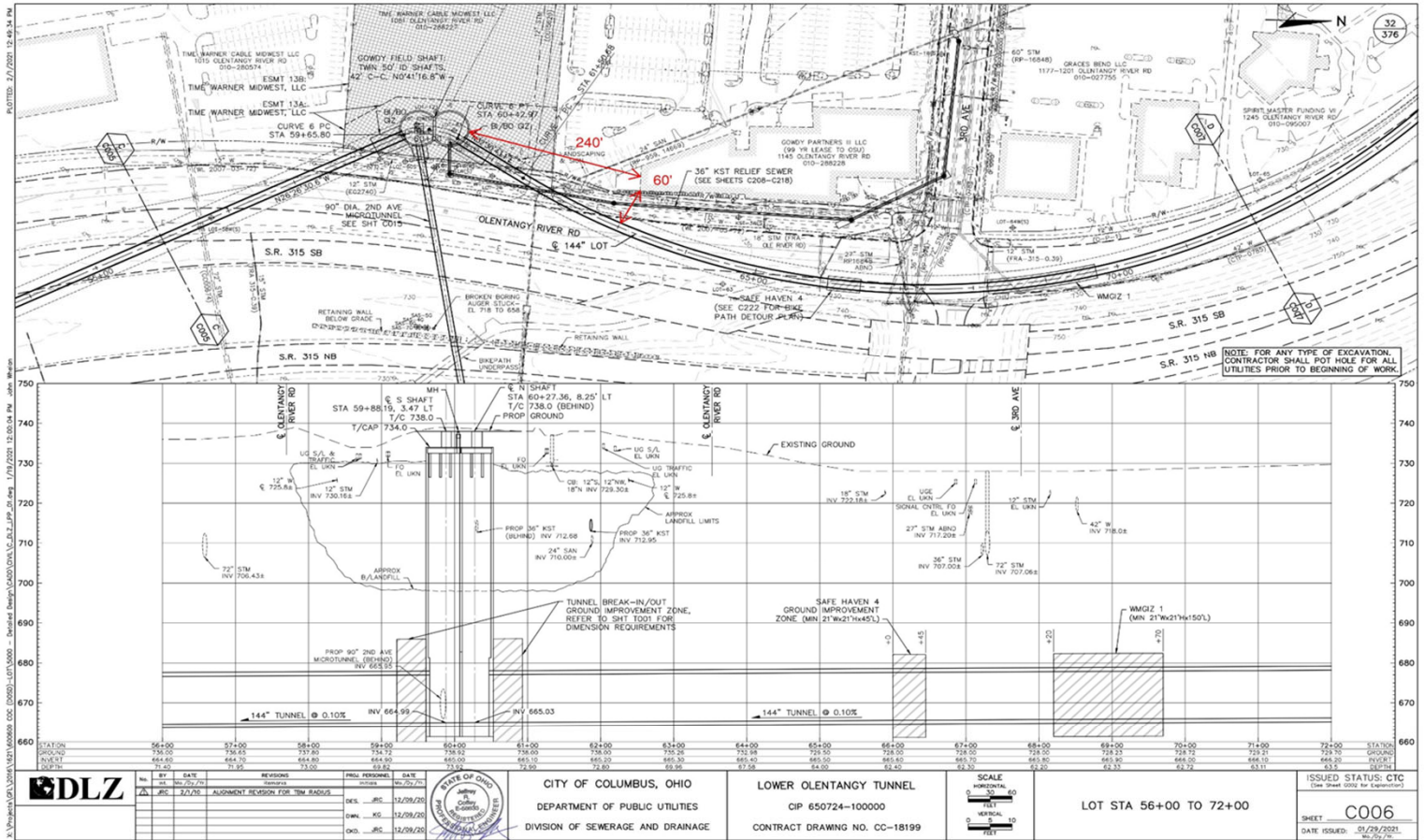
Stefanie Spielman Comprehensive Breast Center Background

- Cancer treatments weekdays: 7AM - 5PM (typically)
- Sensitive cancer treatment equipment requires vibration monitoring (Varian TrueBeam - LINAC)

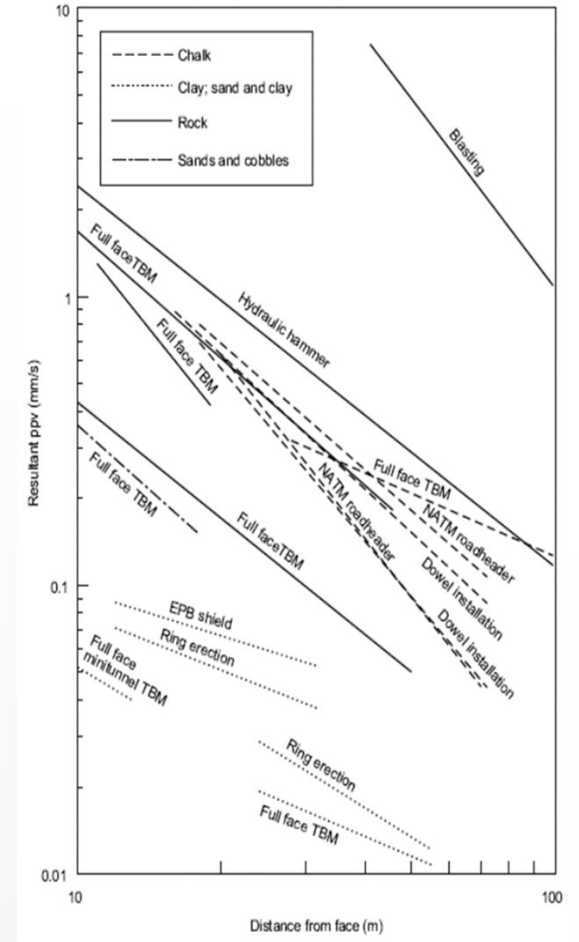
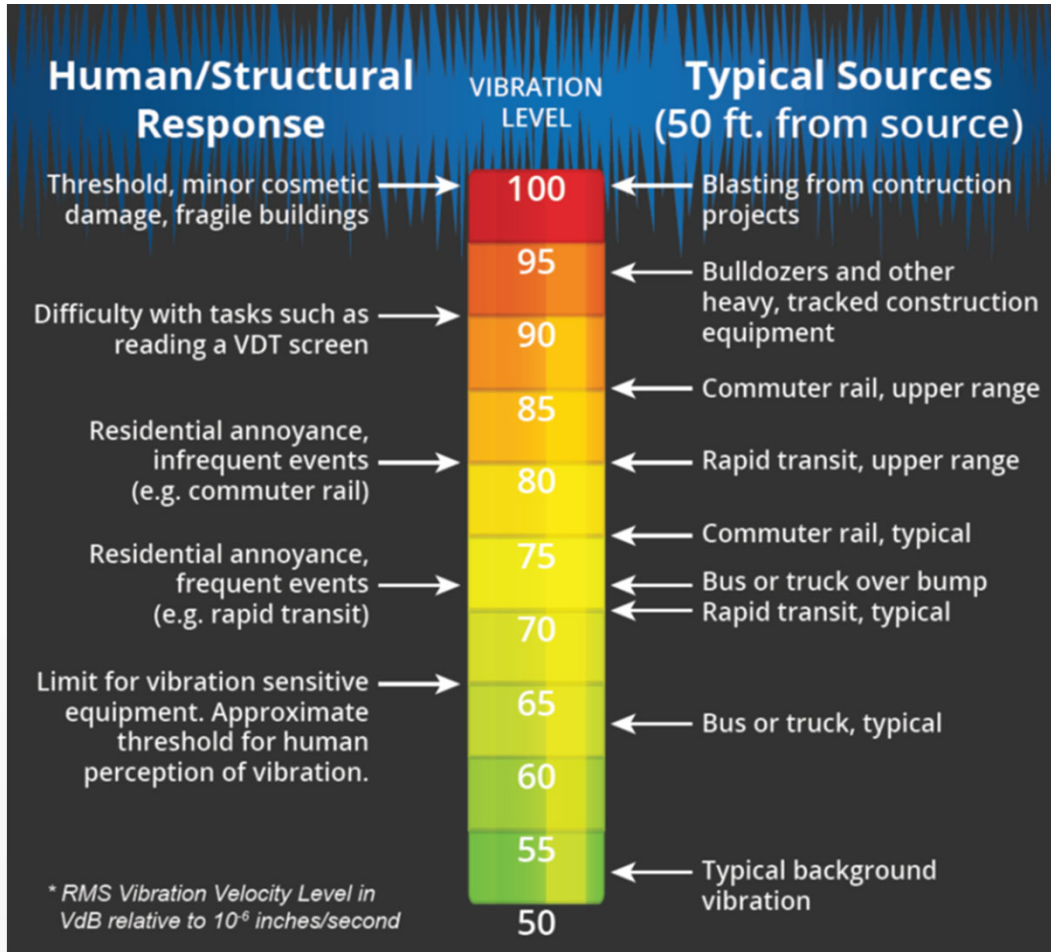


Gowdy Field Shaft Site

Primary tunneling work location



Expected Vibration Levels



SSCBC Vibration Monitoring Plan

Installed 3 Seismic Monitoring Stations around the perimeter of the building.



BASELINE MONITORING

February 17 - March 18, 2020

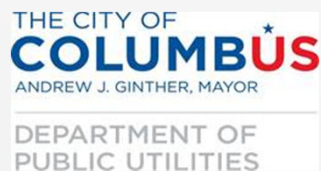
“Trigger Events” in Contract:

Review Level - 75 VdB (0.008 in/sec PPV)

Action Level - 80 VdB (0.0145 in/sec PPV)



Location	Peak Particle Velocity	Root Mean Square Amplitude	Peak Vibration Decibels	Root Mean Square Average	Average Vibration Decibels	Displacement
Linear Accelerator	0.0125 in/sec	0.008838 in/sec	78.93 VdB	0.002897 in/sec	69.24 VdB	0.0002 inch
CT Room	0.0125 in/sec	0.008838 in/sec	78.93 VdB	0.002889 in/sec	69.22 VdB	0.0004 inch
Generator	0.0150 in/sec	0.010606 in/sec	80.51 VdB	0.003705 in/sec	71.37 VdB	0.0005 inch



Gowdy Field Shaft Site

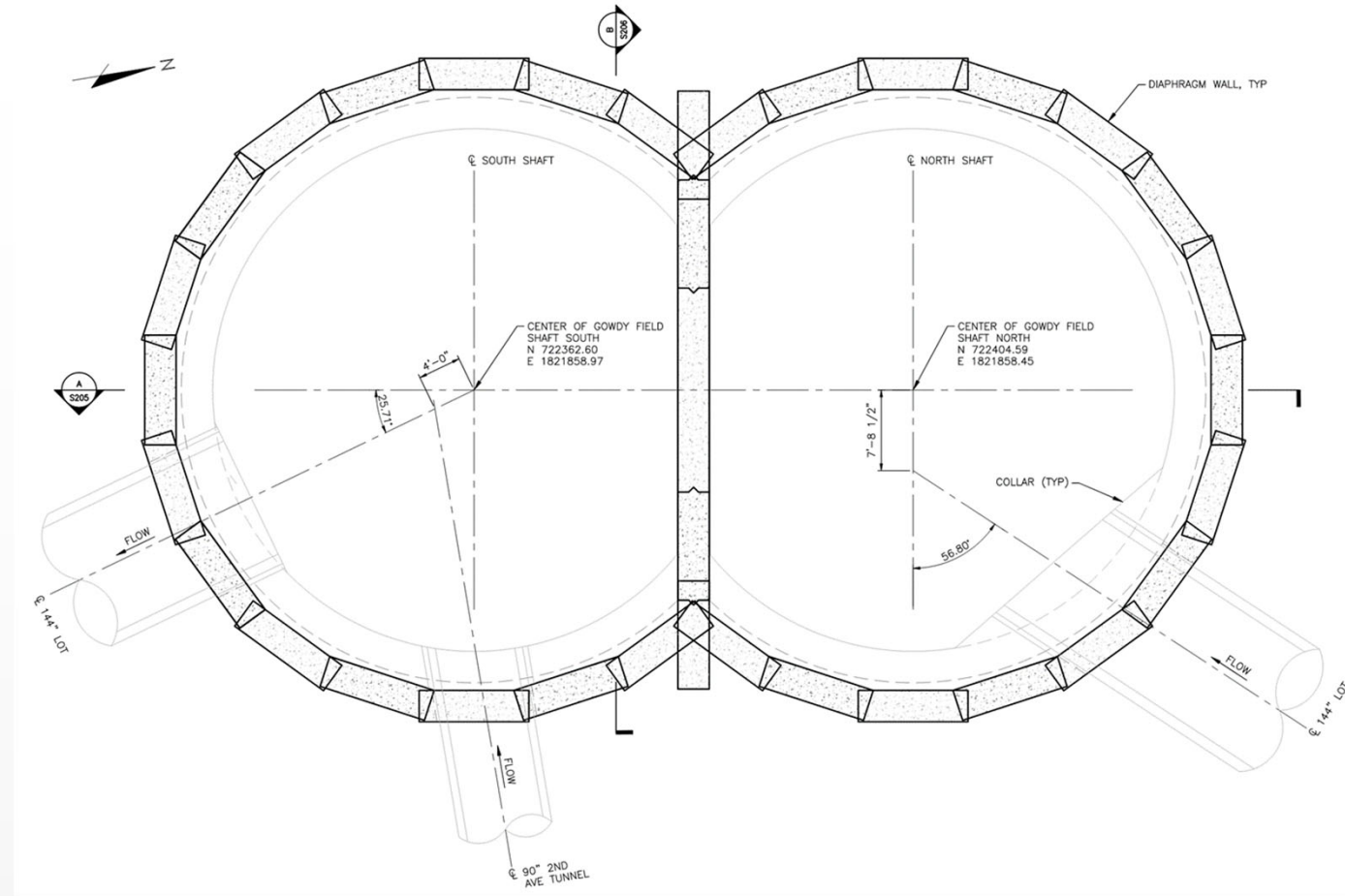


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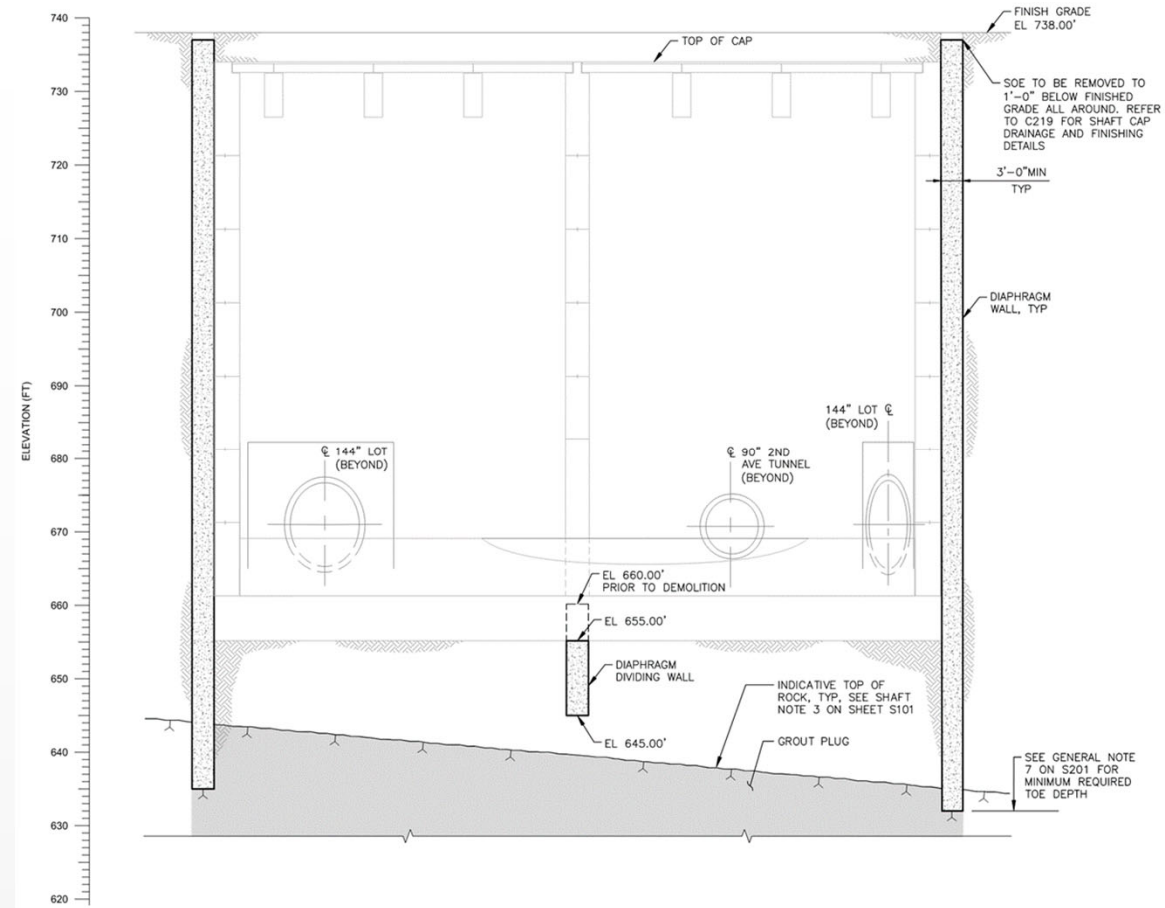
Gowdy Field Shaft Design

Watertight support of excavation utilizing slurry panels.



Gowdy Field Shaft Design

The slurry panels were socketed into bedrock.



Gowdy Field Shaft Design

Slurry panel installation required the use of a hydrophase drill rig.

No vibration problems noted with the SSCBC equipment!



KST Relief Sewer

36" Jack & Bore within a casing pipe.

Required night work.

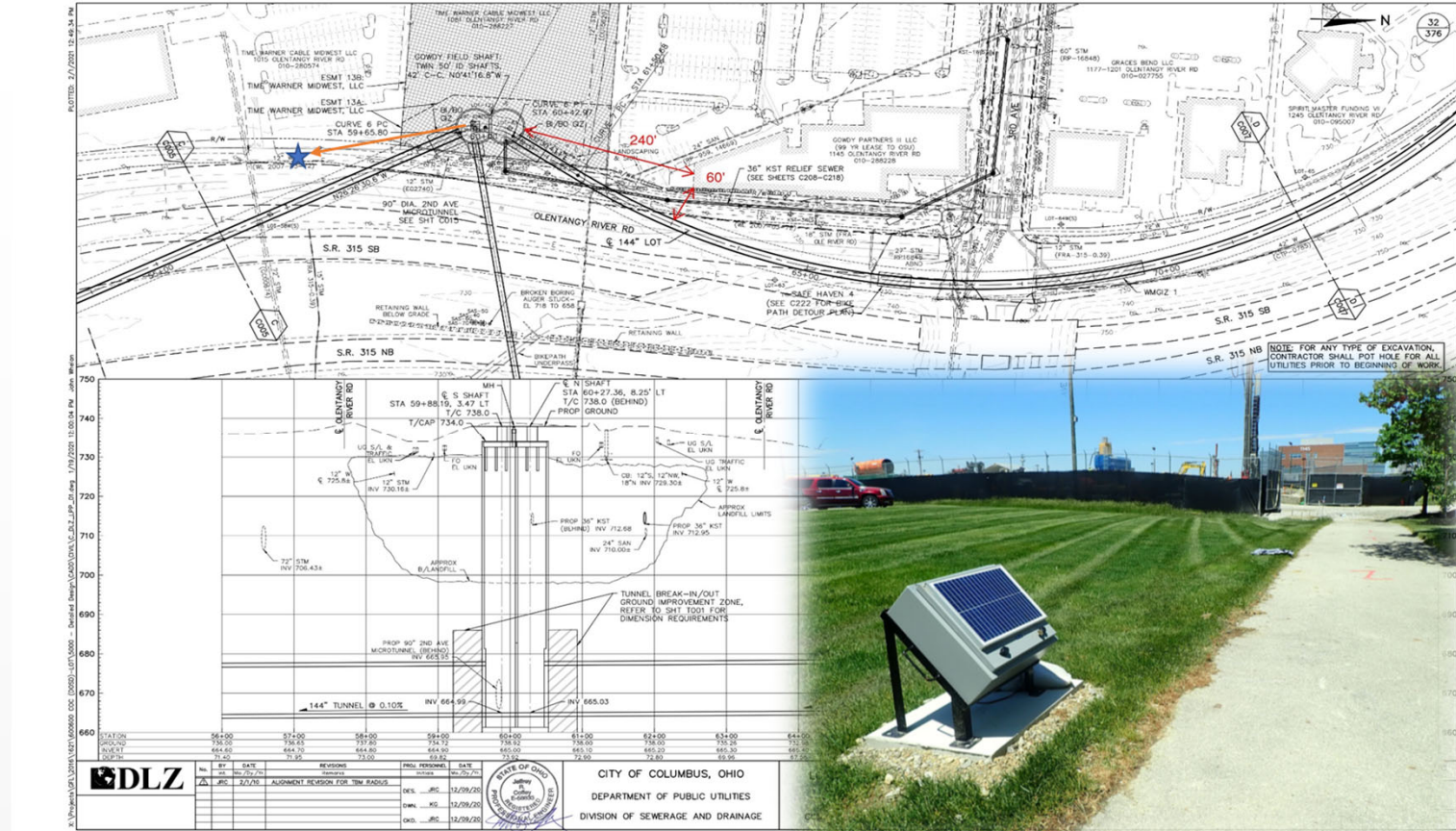
No vibration problems noted!



Tunneling Concerns

Added a monitor to the south of Gowdy Field to monitor TBM activity.

No vibration problems noted!



Lower Olentangy Tunnel

Lesson Learned

- Environmental
 - Engage with a VAP certified CPAR as early as possible in the design stages.
 - Ensure all aspects of the permitting process are included in the contract documents.
 - Ensure your site is large enough for all of the necessary equipment and storage.
- Vibration
 - Slurry panel installation did not cause excessive vibrations
 - The TBM mining within 60 horizontal feet of the monitor did NOT trigger any excessive vibrations.
 - Restricting open cut excavation to night prevented any excessive vibration impacts.

Lower Olentangy Tunnel

Current Project Status

- Tunneling
 - ~3,000 LF constructed to date.
- Gowdy Field
 - Main work site handling all tunnel support and spoils.
- Vine Street
 - Shaft excavation completed and main walls poured.
 - Drill and shoot tunnel to begin this fall/winter.
- 2nd Avenue
 - FMN and 2nd Ave Shafts excavation on going.
 - 90” micro-tunnel expected to begin in spring of 2024
- Tuttle Park
 - Support of excavation underway

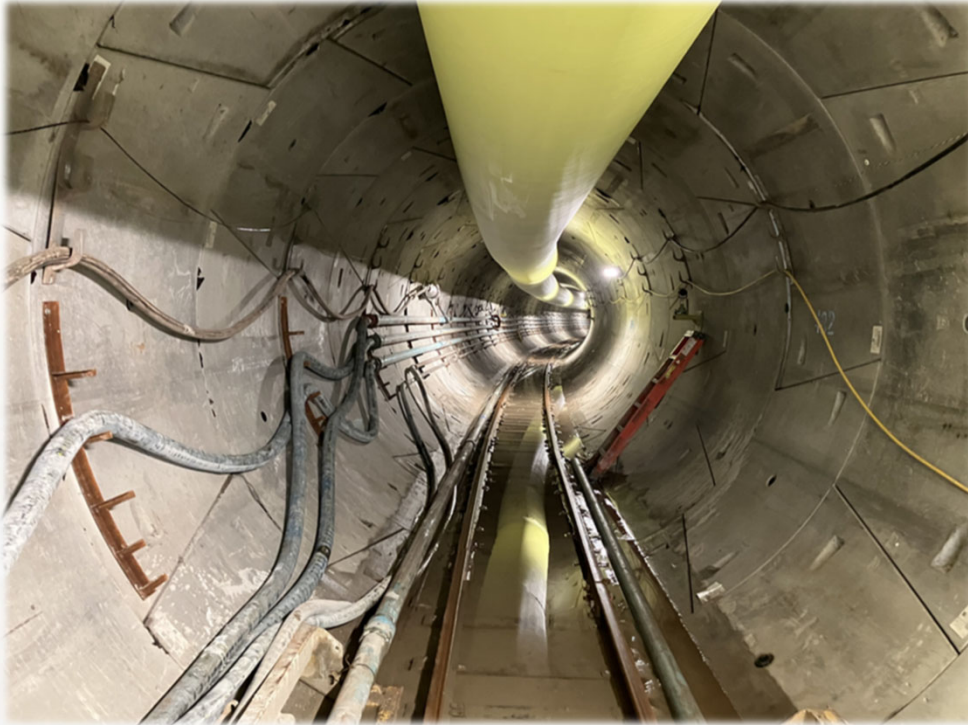
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Thank you to our project team

Design Team:

DLZ • Delve • EMH&T • CDM Smith • Harvey Sorenson • CCG • Eagon

Construction Management:

Black & Veatch • Anser Advisory • Marsh-Wagner • 7NT

Contractor:

Granite Construction

Questions?

