



Alto Tunnel Study

Weekly Progress Report Week Ending February 17, 2017



Report #2/Rev. No. 1
February 21, 2017

Table of Contents

| | | |
|------------|--|----------|
| 1.0 | Project Activities | 2 |
| 1.1 | Underhill Site Drilling Progress | 3 |
| 1.2 | Underhill Site Controls | 3 |
| 2.0 | Project Schedule | 4 |
| 2.1 | Project Drilling Progress | 4 |
| 2.2 | Updated Project Schedule | 4 |
| 2.3 | Project Delays and Comments | 4 |
| 3.0 | Project Items Summary | 6 |

List of Photos

| | | |
|----------|--|---|
| Photo 1. | Drill Tech installing additional drill rods to reach a total depth of 330 feet. | 8 |
| Photo 2. | Project information board displayed for public viewing on Underhill Road. | 8 |
| Photo 3. | Boot washing needed to prevent tracking offsite..... | 9 |

1.0 Project Activities

Project activities began at the Underhill Road project site on February 1, 2017; see Figure 1. Drilling commenced on February 6, 2017 at Borehole 2 and has progressed with drilling through the hard rock layers to a total depth of 330 feet at an angle of approximately 9.5 degrees; see Figure 2. Underhill site drilling progress. The drill casing has been advanced to a depth within close proximity to the tunnel crown, estimated at a depth of 360 feet in Borehole 2. Storm events the past week caused project delays and are outlined in Section 2.3 Project Delays. A project information board has been posted at the Underhill Site for public viewing; see Photo 2.

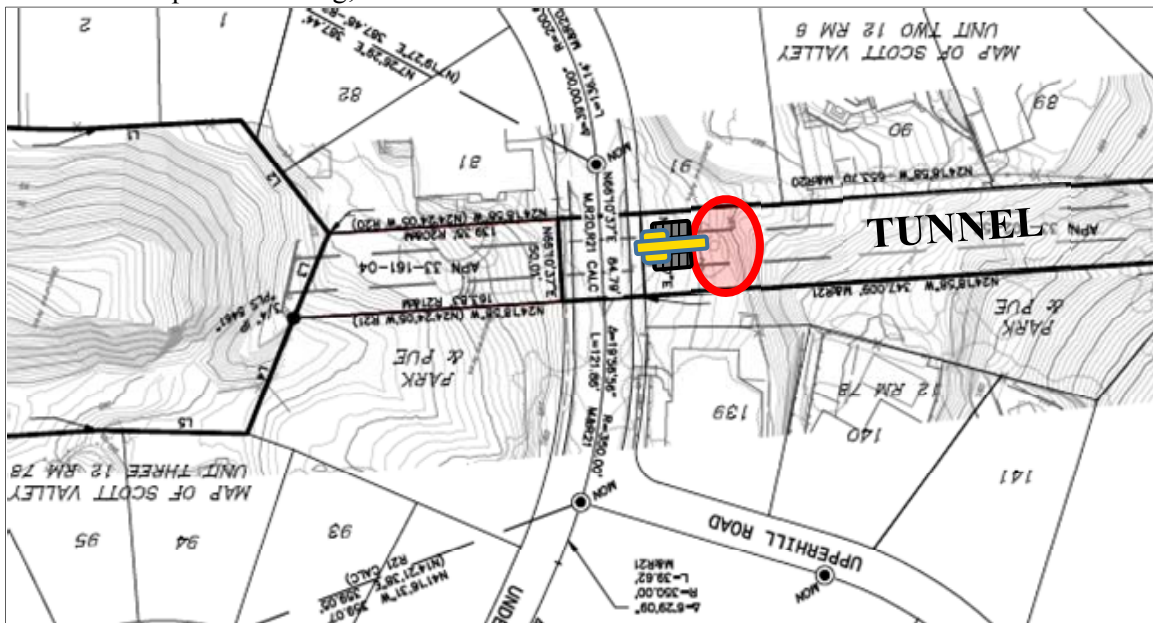


Figure 1. Drill rig and borehole locations above Alto Tunnel at the Underhill Road project site.

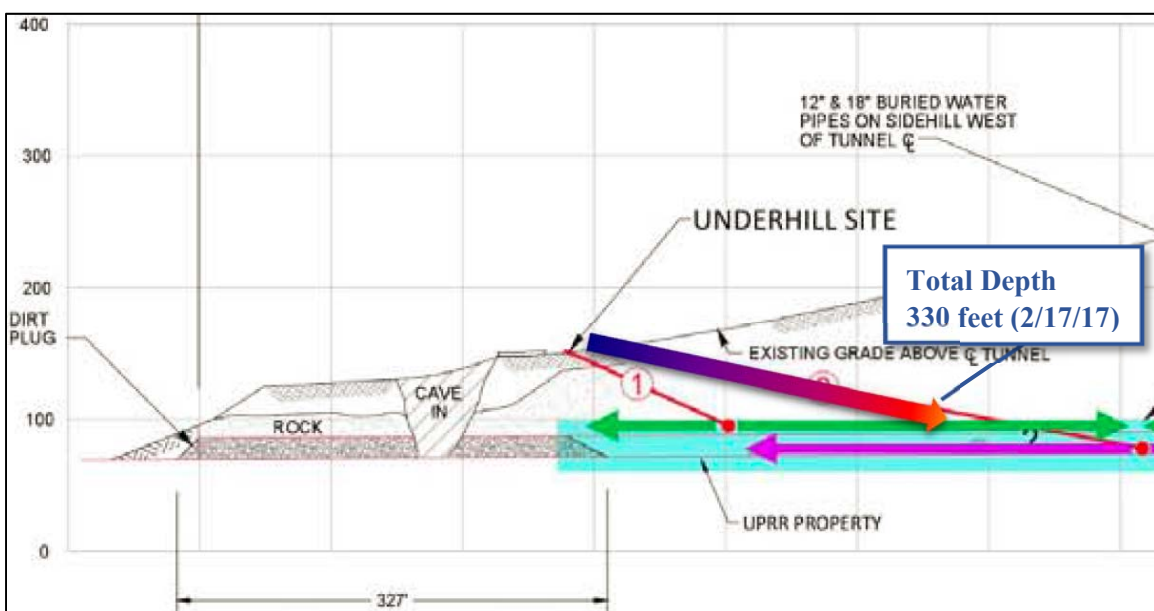


Figure 2. Underhill site drilling progress.

1.1 Underhill Site Drilling Progress

During drilling at Borehole 2, hard rock layers were encountered to a depth of 290 feet. At a depth of 290 feet, a void was encountered. The on-site air supply system produced 350 cfs and was not able to pressurize the void and return air through the system to remove cuttings from around the drill rods. There was concern of binding the drill rods within the casing and borehole without air return through the drilling system. The casing was pushed through the void where soft material was encountered at a depth of 295 feet. The casing was pushed through the soft material grading soft to dense to a depth of 320 feet. The material within the casing created a plug where the air system was able to return the cuttings down to a depth of 320 feet.

Air return was lost at a depth of 320 feet after drilling through the soil plug. Without air return, the drill casing was slowly advanced following the drill head to a final depth of 330 feet. Drilling was stopped at a depth of 330 feet due to the potential of binding the drill bit within collapsed material not supported by the casing. A down hole survey is planned to be conducted before proceeding with drilling to determine the drilled location relative to the tunnel.

1.2 Underhill Site Controls

Traffic control measures continued to be implemented along Underhill Road; these measures appeared to adequately manage the low traffic volume and provided a safe work zone. Site spoils were piled onsite and covered with plastic held with sandbags or stored within the container onsite. Secondary containment remained under the air compressor stored onsite. Plywood continued to protect the ground surface at the entrance of the site along Underhill Road.

Fugitive dust from drilling continued to be mitigated using water added to the air system. Site erosion controls were implemented in anticipation of the heavy rain forecast. Plastic sheeting was used to cover the site and silt fences, sand bags, and straw waddles implemented to control site runoff. A boot wash area will be constructed to prevent tracking mud offsite; see Photo 3. Noise monitoring will be conducted and recorded at the Underhill site at the locations shown in Figure 3.

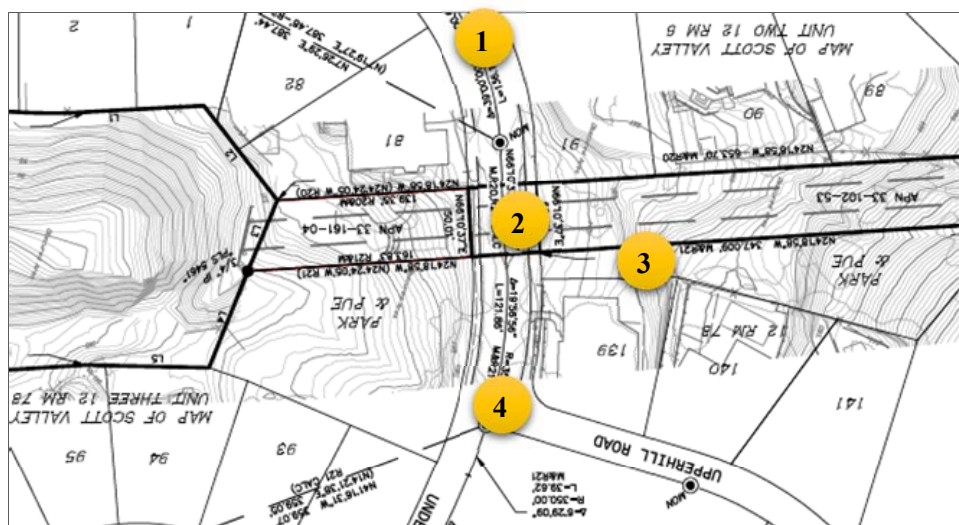


Figure 3. Underhill site noise monitoring locations.

2.0 Project Schedule

2.1 Project Drilling Progress

The planned drilling activity at the Underhill site location at Borehole 2 has progressed to a total drilled depth of 330 feet. No boreholes have been completed at the Chapman site. See Figure 4 for the project drilling progress.

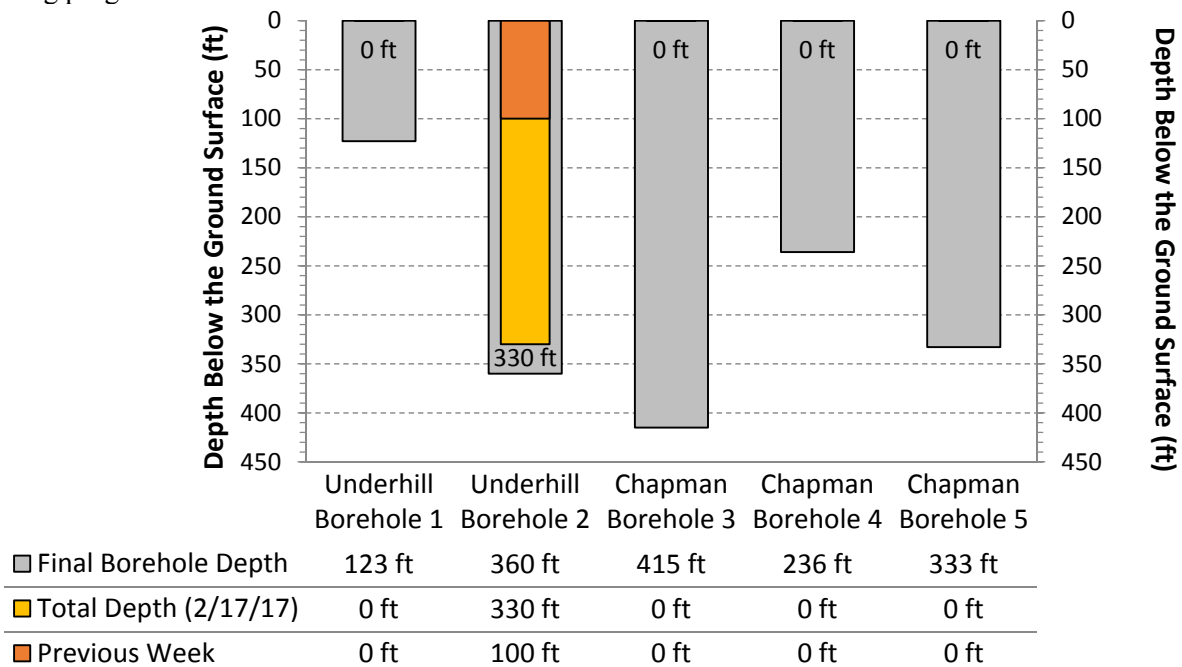


Figure 4. Project drilling progress.

2.2 Updated Project Schedule

Following the emailed project announcement on Thursday afternoon, the project schedule will be updated after the inclement weather forecasted this week. Demobilization of the Underhill site is anticipated for the beginning of next week.

2.3 Project Delays and Comments

Due to a storm event of heavy rains the past week site work was limited at Underhill due to concerns of site disturbance and stormwater runoff. There was no project activity on the following dates:

- Thursday, February 16, 2017
- Friday, February 17, 2017

Previous project delays are summarized in Table 1.

Table 1. Project delays summary.

| Date | Description |
|----------|-------------|
| 2/7/2017 | Weather |
| 2/8/2017 | Weather |
| 2/9/2017 | Weather |

The project delays related to the recent storm have impacted the project schedule. The delays have no impact on the current project budget scope items and have not incurred additional out of scope items. The project schedule has been adjusted by a week to account for the rain delays and down hole survey at the current drilled depth of 330 feet. Additional rain delays are not anticipated after Wednesday February 22nd, given the 14-day weather forecast provided in Figure 5.















| | | | | | | | |
|---------------|---|---------------|---------|---------------|--|--------------|---------|
| MON FEB 20 |  | Rain/Wind | 57°/51° | SAT FEB 25 |  | AM Showers | 52°/42° |
| TUE FEB 21 |  | AM Rain | 54°/44° | SUN FEB 26 |  | Mostly Sunny | 54°/43° |
| WED FEB 22 |  | Partly Cloudy | 53°/40° | MON FEB 27 |  | Mostly Sunny | 54°/41° |
| THU FEB 23 |  | Sunny | 53°/40° | TUE FEB 28 |  | Sunny | 55°/42° |
| FRI FEB 24 |  | Mostly Sunny | 52°/43° | WED MAR 1 |  | Sunny | 56°/42° |
| SAT FEB 25 |  | AM Showers | 52°/42° | THU MAR 2 |  | Mostly Sunny | 57°/42° |
| SUN FEB 26 |  | Mostly Sunny | 54°/43° | FRI MAR 3 |  | Mostly Sunny | 56°/42° |

Figure 5. 14-day weather forecast for the project area.

3.0 Project Items Summary

The items for this project include two boreholes at the Underhill site and three boreholes at the Chapman site. Individual hole depth estimates and percent completed are provided in Table 1. Task 3.2 included 1565 linear feet of drilling at five borehole locations. A modification to the drilling angles has reduced the total estimated linear feet of drilling to 1467 feet.

Table 2. Completed project items Task 3.2.

| Item No. | Description | Unit | Completed Quantity | Total Estimated | Completed |
|----------------|-------------|------|--------------------|-----------------|-----------|
| Underhill Site | | | | | |
| 1 | Borehole 1 | LF | 0 | 123 | 0% |
| 2 | Borehole 2 | LF | 330 | 360 | 92% |
| Chapman Site | | | | | |
| 3 | Borehole 3 | LF | 0 | 415 | 0% |
| 4 | Borehole 4 | LF | 0 | 236 | 0% |
| 5 | Borehole 5 | LF | 0 | 333 | 0% |
| Total | | LF | 330 | 1467 | 22% |

Photos



Photo 1. Drill Tech installing additional drill rods to reach a total depth of 330 feet.



Photo 2. Project information board displayed for public viewing on Underhill Road.



Photo 3. Boot washing needed to prevent tracking offsite.