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NEW HAMPSHIRE 200

June 16, 2025

Peter Britz
Director of Planning and Sustainability
Portsmouth Planning Department
1 Junkins Ave, 3rd Floor
Portsmouth, NH 03801

via email: plbritz@cityofportsmouth.com

RE: TAC Submission
35 Sherburne Road – PHA Housing Development LTD – Tax Map 259 Lot 10

Dear Peter:

On behalf of our client, PHA Housing Development LTD, TF Moran, Inc. (TFM) respectfully submits the following materials in electronic format, in support of this submission. We have also provided responses to the comments made by the City of Portsmouth Technical Advisory Committee on May 6, 2025.

- Drainage-Memo dated May 6, 2025, Last Revised June 13, 2025.
- Letter of Authorization, dated May 6, 2025
- Green-Statement, Memo dated May 6, 2025
- Traffic Impact and Access Study by TFMoran, Inc., dated May 5, 2025
- Noise Assessment Report by SRW Environmental Consulting, LLC, dated April 15, 2025
- Environmental Review Assessment Report by SRW Environmental Consulting, LLC, dated April 16, 2025
- Existing Sewer Flow Assessment Report by Flow Assessment Services, dated April 15, 2025
- Sewer Connection Permit.
- Geotechnical Report by Geotechnical Services, Inc. dated April 8, 2025
- NHB DataCheck Result Letter, New Hampshire Natural Heritage Bureau, Date January 31, 2025
- Preliminary Structural Review by TFMoran, Inc. date March 20, 2025
- Water Hydrant Flow Test, by Testing and Coring Company (Compiled by TFMoran), dated March 19, 2025
- Site Development Plans, Lot 10, Proposed Housing Development, 35 Sherburne Road, Portsmouth, New Hampshire, Owned by the City of Portsmouth, Prepared for PHA Housing Development LTD, dated January 29, 2025, last Revised June 16, 2025.

- Floor Plan and elevations for PHA Sherburne School, Existing, 35 Sherburne Road, Portsmouth, NH, dated May 6, 2025.
- Floor Plan for PHA Sherburne Small Building, 35 Sherburne Road, Portsmouth, NH, dated March 31, 2025
- Floor Plan for PHA Sherburne 90 Unit Building, 35 Sherburne Road, Portsmouth, NH, dated May 6, 2025
- Site Layout Plan Color-up, dated January 29, 2025
- Open Space Plan, dated January 29, 2025

To facilitate your review, we have provided TAC comments along with our responses, which are shown in ***bold blue italics***.

REVIEW COMMENTS:

Water Main

- One of the water mains on Sherburne Road to be abandoned.
    - ***Based on recommendations from DPW, we are connecting to the 10" water main in Sherburne Road. We understand the 6" main on the west side of Sherburne Road is to be abandoned.***
- State sizes of water main and services.
    - ***Proposed water mains and service sizes are shown on the Utility Plans, Phase 1 and Phase 2.***
- Water main goes through generator. Move one.
    - ***Water main moved.***
- Water main and gas are very close together.
    - ***Gas line has been moved 5 feet off of water main.***
- Hydrant should be a straight connection to the water main. Use an anchor tee.
    - ***Eastern most Hydrant is at end of line of the water main.***
    - ***Two new hydrants have straight connections off of water main.***
- May need to run water model.
    - ***If required, City to hire consultant to run water model.***
- Show existing water, sewer, gas, and electric connections to existing building.
    - ***Connections to existing building are shown on Sheet S-1, Existing Conditions Plan.***
- Show sewer, gas, electric connections to middle building.
    - ***These utility connections are now shown to the middle building.***

Sewer

- State proposed water and sewer needs.
    - ***The proposed water and sewer needs have been described in the Sewer Connection application.***
- SMH1 to close to transformer pad and sewer main runs under transformer pad. Move one.
    - ***Proposed sewer and transformer locations have been revised.***

- Sewer capacity analysis and condition of downstream sewer mains need to be reviewed.
    - ***We are working with the City on Proposed Offsite Sewer Improvements.***
- Where this sewer connects to City sewer, install new SMH.
    - ***Proposed sewer has been moved to connect down stream to a new proposed sewer manhole.***
- Sewer main from SMH1 to City sewer runs under transformer, dumpers pad, and community garden. SMH1 can move to run under foot path by community garden and connect into City sewer at a better angle with new structure.
    - ***Proposed Sewer location has been modified and no longer runs beneath these features.***

Fire

- Domestic and fire services must be separate **all the way to the water main**. Will the water main be at least 8”? Hydrants must be run of 8” main minimum.
    - ***Proposed Water Main is 8”***
    - ***Separate domestic and fire services run to each building.***
- Will additional fire hydrants be required on site?
    - ***Additional fire hydrants have been proposed, as shown on the utility plans.***

Layout

- 161 parking spaces shown, 7 handicapped spaces required, and one spot must be a van ADA space.
    - ***The proposed parking requirements are met.***
    - ***Full Buildout***

Required	***Provided***
169 spaces	***169 spaces***
6 Accessible	***6 Accessible***
1 Van	***3 Van***

Utility

- May want to reconfigure water service locations.
    - ***Water service locations have been updated.***
- State size of water main and services.
    - ***Water sizes listed on utility plans.***
- State size of sewer service.
    - ***Sewer service sizes are now shown on the utility plans.***
- Connect electric line to the transformer.
    - ***Electric line now connects to the transformer.***
- Sidewalk around building has multiple bump outs shown. Mayb not be ADA compliant.
    - ***Sidewalk has been graded to ADA standards.***

Miscellaneous

- Provide 2 separate connections to buildings for water – provide more separation.
    - ***Provided.***
- Provide hydrants on both sides of the building (90-unit building)
    - ***Provided.***
- Get a letter from Eversource on how they would power the site.
    - ***In Process.***
- Save as many trees as possible.
    - ***Any tree that does not interfere with proposed construction is to be saved.***
- Provide different colors on front, back and overhangs on turning paths.
    - ***Truck Overhang and Wheel Tracks differentiated by color.***
- Provide plan depicting profiles and sightlines.
    - ***Provided.***
- Provide a sight triangle at entrance if needed!
    - ***Landscaping removed from sight triangle to ensure adequate sight distance.***
- Provide bike rack details.
    - ***City standard bike rack, detail will be provided.***
- Add sidewalks on the southerly side of the crosswalk.
    - ***Provided.***
- Sign visitor spaces (22 in front plus others)
    - ***Added.***

We trust that the above responses satisfy the concerns expressed in the City of Portsmouth's comments. Should you wish to further discuss any of the above please contact us so that we may meet and resolve any outstanding concerns.

Respectfully,
TFMoran, Inc.

Jack McTigue, PC
Project Manager

JJM/arh

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NEW HAMPSHIRE 200

Letter of Authorization

I, Karen Conard, City Manager of the City of Portsmouth, 1 Junkins Avenue, Portsmouth, NH 03801, hereby authorize PHA Housing Development LTD, 245 Middle Street, Portsmouth, NH, and TFMoran, Inc., 170 Commerce Way, Suite 102, Portsmouth, NH, to develop plans and work on the property owned by The City of Portsmouth, at 35 Sherburne Road, Portsmouth, New Hampshire, known as Tax Map 259, Lot 10.

I hereby authorize PHA Housing Development LTD and TFMoran, Inc. to develop and submit plans for development of the above named property throughout the land use review and construction process.

Client Name 5/7/2025 Date

Witness 5/7/2025 Date

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NEW HAMPSHIRE 200

Letter of Authorization

I, Craig Welch of PHA Housing Development LTD hereby authorize TFMoran, Inc., 170 Commerce Way, Suite 102, Portsmouth, NH, to act on my behalf concerning property owned by the City of Portsmouth and being developed by PHA Housing Development LTD, 245 Middle Street, Portsmouth, NH, known as Tax Map 259, Lot 10.

I hereby appoint TFMoran, Inc. as my agent to act on my behalf in the review process, to include any required signatures.

Craig W. Welch
Client Name

5/6/2025
Date

Mary A. Bartlett
Witness

5/6/2025
Date

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Project #47528.00

DRAINAGE ANALYSIS

FOR

Sherburne Road Development

35 Sherburne Road
Portsmouth, New Hampshire
Somewhere County

Tax Map 259, Lot 10

Owned by City of Portsmouth
Prepared for PHA Housing Development LTD

May 6, 2025
Revised on June 16, 2025

Prepared By:

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

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1.0 - SUMMARY & PROJECT DESCRIPTION

The project includes the development of a 127-unit workforce housing project on 35 Sherburne Road, Portsmouth, NH. The existing Tax Map 259 Lot 10 is approximately 5.2 acres and currently contains an existing school building. The site is within the Municipal Zone and Highway Noise Overlay District and is adjacent to commercial and residential uses.

The proposed project is to construct the front portion of the existing school building, a 3-story building, and a 4-story building. Associated improvements include and are not limited to access, grading, utilities, stormwater management system, lighting, and landscaping. The project proposes a reduction of the school footprint from 17,650 SF to 7,280 SF building footprint, proposed 3-story building with a 9,424 SF footprint and a 4-story building with a 21,100 SF footprint. Including all the impervious on the site, there is a total of 114,840 SF of effective impervious area (49% EIC) within the property lines and approximately 108,000 SF of disturbance to facilitate the development.

This analysis verifies the project will not pose adverse stormwater effects on-site and off-site. Compared to the pre-development conditions, the post-development stormwater management system has been designed to reduce peak runoff rates, reduce the runoff volume, reduce the risk of erosion and sedimentation, and improve stormwater runoff quality. In addition, Best Management Practices are employed to formulate a plan that assures stormwater quality both during and after construction. The following summarizes the findings from the study.

2.0 - CALCULATION METHODS

The design storms analyzed in this study are the 2-year, 10-year, and 50-year 24-hour storm events. The software program, HydroCAD version 10.00[1] was utilized to calculate the peak runoff rates from these storm events. The program estimates the peak rates using the TR-20 method. A Type III storm pattern was used in the model. Rainfall frequencies for the analyzed region were also incorporated into the model. Rainfall frequencies from the higher of the Extreme Precipitation Rates from Cornell University's Northeast Regional Climate Center (see Appendix A) and City Site Plan Review Regulations were used to determine the storm-event intensities, see Table 1 - 24-Hour Rainfall Rates. Due to the project's location within the Coastal/Great Bay Region community, the design rainfall increases the Cornell rates by 15% to address projected storm surge, sea level rise, and precipitation events per Env-Wq 1503.08(I). Design standards were taken from the New Hampshire Stormwater Manual, December 2008[2].

Storm-Event (year)	Northeast Regional Climate Center Extreme Precipitation (in)	Design Rainfall (in)
2	3.22	3.70
10	4.88	5.61
50	7.41	8.52

Table 1 - 24-Hour Rainfall Rates

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[1] HydroCAD version 10.00, HydroCAD Software Solutions LLC, Chocorua, NH, 2013.

[2] New Hampshire Stormwater Manual: Volume One - Stormwater and Antidegradation, December 2008; Volume Two - Post-Construction Best Management Practices Selection and Design, December 2008; Volume Three - Erosion and Sediment Controls During Construction, December 2008.

Time of Concentration is the time it takes for water to flow from the hydraulically most remote point in the watershed (with the longest travel time) to the watershed outlet. This time is determined by calculating the time it takes runoff to travel this route under one of three hydrologic conditions: sheet flow, shallow concentrated flow, or channel flow. Because the Intensity-Duration-Frequency (IDF) curve is steep with short TC's, estimating the actual intensity is subject to error and overestimates actual runoff. Due to this, the TC's are adjusted to a minimum of 6 minutes.

3.0 – EXISTING SITE CONDITIONS

The soils within the proposed area of disturbance are identified in accordance with the Natural Recourses Conservation Service, NRCS (see Appendix B for detail and soil locations). The NRCS soil identifies the soils within the disturbed project somewhat excessively drained soils.

See Geotechnical Report for the associated Infiltration testing and boring data. 11 boring tests and 9 infiltration tests were conducted. In nearly all test pit locations, fine to medium sands were discovered.

4.0 - PRE-DEVELOPMENT CONDITIONS

The pre-development condition is characterized three watersheds, divided by five subcatchments composing four watersheds, which flow towards the rear of the property and easterly along a swale paralleling the I-95 Corridor. It ultimately discharges to North Mill Pond.

Stormwater runoff from the site primarily infiltrates into the somewhat excessively drained soils on-site. The remaining stormwater runoff discharges swale along the I-95 corridor.

In the pre-development conditions, the total impervious area, including offsite impervious, is 50,720 SF over a total drainage analysis area of 227,310 SF.

5.0 - POST-DEVELOPMENT CONDITIONS

The post-development condition is characterized by thre watersheds divided into many subcatchment areas.

In the post-development condition, the total impervious area is 22,780 SF over a total drainage analysis area of 227,310 SF. Five subsurface infiltration basins (Stormtech Systems) are proposed to treat and mitigate the stormwater runoff from the impact of the new impervious area from the proposed development.

See Geotechnical Report for the associated Infiltration testing and boring data. 11 boring tests and 9 infiltration tests were conducted. In nearly all test pit locations, fine to medium sands were discovered. Infiltration tests were determined per Ksat testing using bore hole permeability test per Env-Wq 1504.14(e)(4). The highest Estimated Seasonal High-Water Table (ESWT) observed were elevation 37.9 at Subsurface Infiltration Basin #1, elevation 37.9 at Subsurface Infiltration Basin #2, elevation 46.5 at Subsurface Infiltration Basin #3, elevation 46.5 at Subsurface Infiltration Basin #4, and elevation 41.2 at Subsurface Infiltration Basin #5.

Table 2 - Pre and Post- Development Peak Runoff Rate Compariso summarizes the pre- and post-development peak runoff rates for the 2-year, 10-year, and 50-year 24-hour Type III storm events for all discharge. Table 2 summarizes the pre- and post-development peak runoff volumes for the 2-year 24-hour Type III storm events for all discharge.

TABLE 2 – SURFACE WATER PEAK RUNOFF RATE COMPARISON (CF)				
POINT OF INTEREST		DESIGN STORM		
		2-year	10-year	50-year
POI-1	Pre	1.4	2.9	6.3
	Post	0.0	0.2	1.4
POI-2	Pre	0.0	0.0	0.4
	Post	0.0	0.0	0.1
POI-3	Pre	0.1	0.8	4.3
	Post	0.0	0.2	3.7

Table 2 - Pre and Post- Development Peak Runoff Rate Comparison

TABLE 3 – SURFACE WATER PEAK RUNOFF VOLUME COMPARISON (CF)		
POINT OF INTEREST		DESIGN STORM
		2-year
POI-1	Pre	6,594
	Post	290
POI-2	Pre	3
	Post	0
POI-3	Pre	1,045
	Post	204

Table 3 - Pre and Post- Development Peak Runoff Volume Comparison

The proposed project reduces peak rates of runoff compared to existing conditions for all storm events, in accordance with AoT regulations and City stormwater regulations. Additionally per NHDES, the 2-year 24-hour storm does not result in an increased peak flow rate and reduces or increases volume within the limits of Env-Wq 1507.05(b)(1) from the pre-development to post-development condition. There will be no adverse effects on the abutting properties from the proposed stormwater management system.

6.0 – REGULATORY COMPLIANCE

The project meets the stricter of the stormwater standards identified in the New Hampshire Department of Environmental Services (DES) Env-Wq 1500 Alteration of Terrain Regulations and City stormwater management regulations.

7.0 – BEST MANAGEMENT PRACTICES

Best Management Practices will be developed in accordance with the New Hampshire Stormwater Manual, Volumes Two and Three, December 2008[3] to formulate a plan that assures stormwater quality both during and after construction. The intent of the outlined measures is to minimize erosion and sedimentation during construction, stabilize and protect the site from erosion after construction is complete and mitigate any adverse impacts to stormwater quality resulting from development. Best Management Practices for this project include:

- Temporary practices to be implemented during construction.

- Permanent practices to be implemented after construction.

7.1 – TEMPORARY PRACTICES

1. Erosion, sediment, and stormwater detention measures must be installed as directed by the engineer.
2. All disturbed areas, as well as loam stockpiles, shall be seeded and contained by a silt barrier.
3. Silt barriers must be installed prior to any construction commencing. All erosion control devices including silt barriers and storm drain inlet filters shall be inspected at least once per week and following any rainfall. All necessary maintenance shall be completed within twenty-four (24) hours.
4. Any silt barriers found to be failing must be replaced immediately. Sediment is to be removed from behind the silt fence if found to be one-third the height of the silt barrier or greater.
5. Any area of the site, which has been disturbed and where construction activity will not occur for more than twenty-one (21) days, shall be temporarily stabilized by mulching and seeding.
6. No construction materials shall be buried on-site.
7. After all areas have been stabilized, temporary practices are to be removed, and the area they are removed from must be smoothed and revegetated.
8. Areas must be temporarily stabilized within 14 days of disturbance or seeded and mulched within 3 days of final stabilization.
9. After November 15th, incomplete driveways or parking areas must be protected with a minimum of 3” of crushed gravel, meeting the standards of NHDOT item 304.3.
10. An area shall be considered stable if one of the following has occurred:
    a) Base course gravels are installed in areas to be paved.
    b) A minimum of 85% vegetated growth has been established.
    c) A minimum of 3" of non-erosive material such as stone or rip rap has been installed.
    d) Erosion control blankets have been properly installed.

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[3] New Hampshire Stormwater Manual: Volume One - Stormwater and Antidegradation, December 2008; Volume Two - Post-Construction Best Management Practices Selection and Design, December 2008; Volume Three - Erosion and Sediment Controls During Construction, December 2008.

7.2 – PERMANENT PRACTICES

The objectives for developing permanent Best Management Practices for this site include the following:

1. Maintain existing runoff flow characteristics.
   a) Drainage is structured to minimize any offsite increase in runoff

2. Treatment BMP's are established to ensure the water quality.

3. Maintenance schedules are set to safeguard the long term working of the stormwater BMP's.

7.3 – BEST MANAGEMENT PRACTICE EFFICIENCIES

Appendix E of Volume 2 of the New Hampshire Stormwater [4] lists the pollutant removal efficiencies of various BMP's. All proposed BMP's meet all state and City requirements for total suspended solids (TSS) and pollutant removal, Total Nitrogen (TN), and Total Phosphorous (TP).

In-Ground and Subsurface Infiltration Basins (greater than 75 FT from surface water) have a 90% TSS removal efficiency, 60% TN removal efficiency, and 65% TP efficiency.

All the stormwater entering the Subsurface Infiltration Basins are pretreated with deep sump catch basins and StormTech Isolator rows prior to entering the primary stormwater treatment areas. The pretreatment areas help to settle sediment and prevent clogging of treatment areas.

8.0 – CONCLUSION

The proposed stormwater management system will treat, infiltrate, and mitigate the runoff generated from the proposed development and provide protection of groundwater and surface waters as required through the Alteration of Terrain Bureau and City stormwater management regulations. The project has been designed in accordance with NHDES and City regulations. There is little change in the flow characteristics of the site. The proposed project has been designed to pose no adverse effects on surrounding properties.

Respectfully,
TFMoran, Inc. Seacoast Division

Jack McTigue, PE, CPESC
Project Manager

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[4] New Hampshire Stormwater Manual: Volume One - Stormwater and Antidegradation, December 2008; Volume Two - Post-Construction Best Management Practices Selection and Design, December 2008; Volume Three - Erosion and Sediment Controls During Construction, December 2008.

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APPENDIX A – EXTREME PRECIPITATION RATES

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Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.800 degrees West
Latitude	43.060 degrees North
Elevation	0 feet
Date/Time	Mon, 23 Jan 2023 11:23:31 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.67	2.93	**1yr**	2.36	2.81	3.22	3.94	4.56	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.49	3.22	3.57	**2yr**	2.85	3.44	3.94	4.69	5.33	**2yr**
5yr	0.37	0.58	0.73	0.97	1.24	1.60	**5yr**	1.07	1.46	1.88	2.43	3.14	4.08	4.59	**5yr**	3.61	4.41	5.05	5.94	6.71	**5yr**
10yr	0.41	0.65	0.82	1.11	1.45	1.89	**10yr**	1.25	1.72	2.23	2.89	3.75	4.88	5.54	**10yr**	4.32	5.33	6.09	7.12	8.00	**10yr**
25yr	0.48	0.76	0.96	1.33	1.77	2.33	**25yr**	1.52	2.14	2.77	3.62	4.74	6.19	7.11	**25yr**	5.48	6.84	7.81	9.04	10.08	**25yr**
50yr	0.53	0.85	1.09	1.53	2.06	2.75	**50yr**	1.78	2.52	3.28	4.32	5.67	7.41	8.60	**50yr**	6.56	8.27	9.44	10.84	12.01	**50yr**
100yr	0.59	0.96	1.24	1.76	2.40	3.24	**100yr**	2.07	2.97	3.89	5.15	6.77	8.88	10.40	**100yr**	7.86	10.00	11.40	13.00	14.33	**100yr**
200yr	0.67	1.09	1.42	2.03	2.81	3.82	**200yr**	2.42	3.50	4.60	6.12	8.09	10.65	12.58	**200yr**	9.42	12.10	13.77	15.59	17.09	**200yr**
500yr	0.79	1.30	1.70	2.46	3.45	4.74	**500yr**	2.98	4.36	5.74	7.69	10.22	13.53	16.19	**500yr**	11.98	15.57	17.70	19.84	21.59	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.89	**1yr**	0.63	0.87	0.92	1.32	1.66	2.22	2.53	**1yr**	1.97	2.44	2.86	3.15	3.88	**1yr**
2yr	0.32	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.06	3.47	**2yr**	2.71	3.33	3.83	4.56	5.08	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.74	3.80	4.22	**5yr**	3.37	4.06	4.73	5.56	6.27	**5yr**
10yr	0.39	0.59	0.74	1.03	1.33	1.60	**10yr**	1.15	1.57	1.81	2.40	3.07	4.39	4.90	**10yr**	3.89	4.71	5.48	6.45	7.24	**10yr**
25yr	0.44	0.67	0.83	1.19	1.56	1.90	**25yr**	1.35	1.86	2.10	2.77	3.55	4.70	5.96	**25yr**	4.16	5.73	6.72	7.86	8.75	**25yr**
50yr	0.48	0.74	0.92	1.32	1.77	2.17	**50yr**	1.53	2.12	2.35	3.09	3.95	5.30	6.90	**50yr**	4.69	6.63	7.83	9.14	10.11	**50yr**
100yr	0.54	0.81	1.02	1.47	2.02	2.48	**100yr**	1.74	2.42	2.63	3.44	4.38	5.95	7.98	**100yr**	5.27	7.67	9.13	10.64	11.67	**100yr**
200yr	0.60	0.90	1.14	1.65	2.29	2.82	**200yr**	1.98	2.76	2.94	3.81	4.84	6.66	9.23	**200yr**	5.90	8.88	10.65	12.39	13.50	**200yr**
500yr	0.69	1.03	1.33	1.93	2.74	3.38	**500yr**	2.36	3.30	3.41	4.36	5.53	7.74	11.19	**500yr**	6.85	10.76	13.05	15.19	16.35	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.21	3.00	3.15	**1yr**	2.66	3.03	3.59	4.38	5.06	**1yr**
2yr	0.34	0.52	0.64	0.86	1.06	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.44	3.70	**2yr**	3.04	3.55	4.08	4.84	5.65	**2yr**
5yr	0.40	0.61	0.76	1.05	1.33	1.62	**5yr**	1.15	1.58	1.88	2.53	3.24	4.34	4.95	**5yr**	3.84	4.76	5.38	6.36	7.14	**5yr**
10yr	0.47	0.72	0.89	1.24	1.60	1.97	**10yr**	1.38	1.93	2.27	3.10	3.93	5.35	6.17	**10yr**	4.73	5.94	6.77	7.82	8.73	**10yr**
25yr	0.57	0.87	1.08	1.55	2.04	2.56	**25yr**	1.76	2.50	2.94	4.05	5.11	7.84	8.28	**25yr**	6.94	7.97	9.05	10.30	11.37	**25yr**
50yr	0.67	1.01	1.26	1.82	2.44	3.11	**50yr**	2.11	3.04	3.58	4.97	6.26	9.83	10.37	**50yr**	8.70	9.97	11.29	12.67	13.91	**50yr**
100yr	0.78	1.18	1.48	2.14	2.94	3.78	**100yr**	2.53	3.70	4.35	6.12	7.67	12.31	12.97	**100yr**	10.90	12.47	14.08	15.61	17.02	**100yr**
200yr	0.91	1.38	1.74	2.52	3.52	4.61	**200yr**	3.04	4.51	5.30	7.53	9.41	15.47	16.25	**200yr**	13.69	15.63	17.57	19.22	20.83	**200yr**
500yr	1.13	1.68	2.17	3.15	4.48	5.98	**500yr**	3.86	5.85	6.88	9.94	12.35	20.92	21.89	**500yr**	18.51	21.05	23.56	25.32	27.23	**500yr**

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APPENDIX B – PRE-DEVELOPMENT CALCULATIONS

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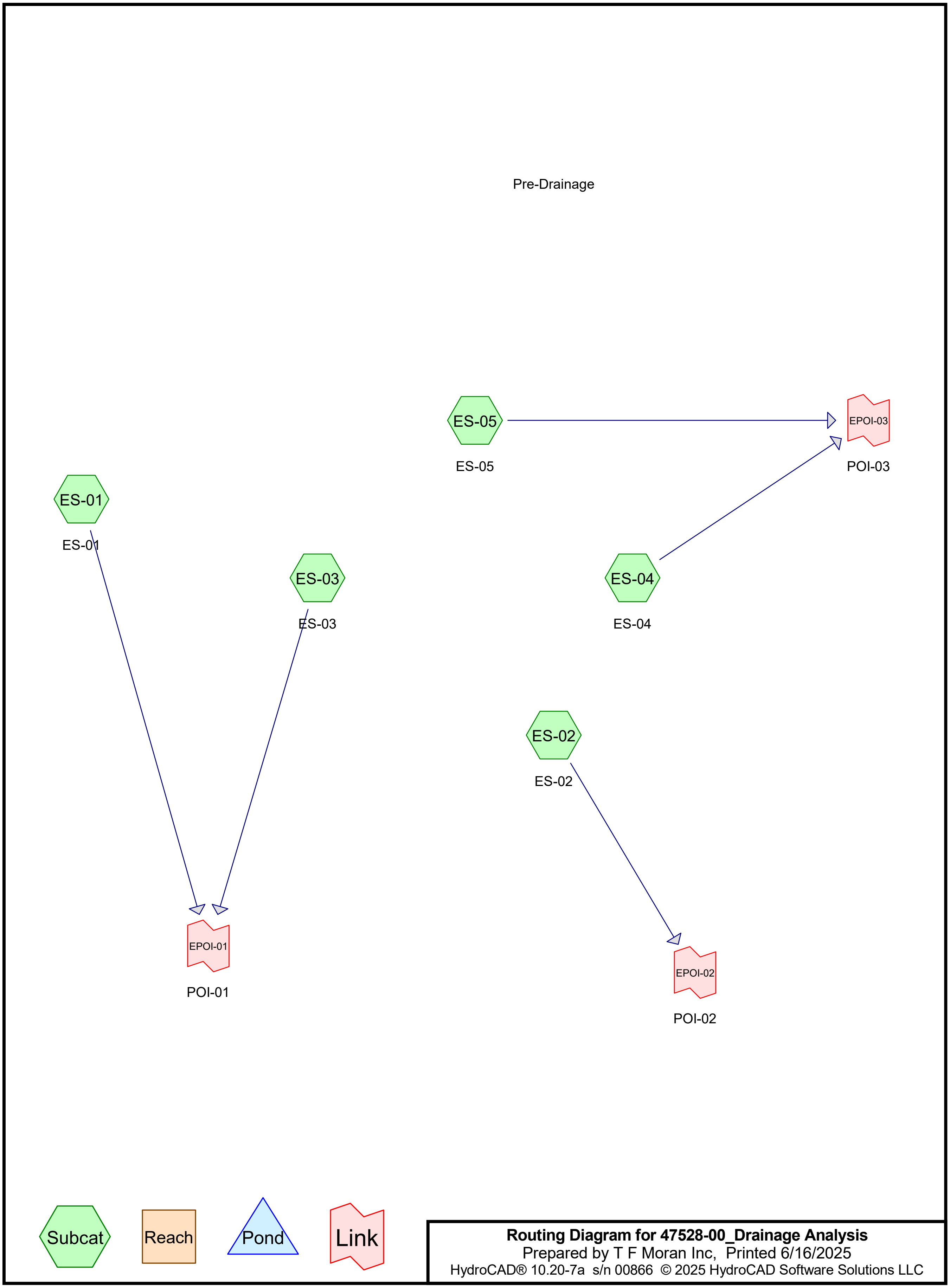

Routing Diagram for 47528-00_Drainage Analysis
Prepared by T F Moran Inc, Printed 6/16/2025
HydroCAD® 10.20-7a s/n 00866 © 2025 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
132,952	39	>75% Grass cover, Good, HSG A (ES-01, ES-02, ES-04, ES-05)
9,703	96	Gravel Surface, HSG A (ES-02, ES-04, ES-05)
11,102	98	Paved Parking, HSG A (ES-01)
17,992	98	Roofs, HSG A (ES-02, ES-03, ES-04)
11,925	98	Unconnected Pavement, HSG A (ES-01, ES-02, ES-04, ES-05)
43,643	30	Woods, Good, HSG A (ES-01, ES-02, ES-04, ES-05)
227,317	**50**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
227,317	HSG A	ES-01, ES-02, ES-03, ES-04, ES-05
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
227,317		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES-01: ES-01 Runoff Area=65,053 sf 22.08% Impervious Runoff Depth>0.28"
Flow Length=289' Tc=11.7 min UI Adjusted CN=51 Runoff=0.2 cfs 1,498 cf

Subcatchment ES-02: ES-02 Runoff Area=29,012 sf 2.88% Impervious Runoff Depth>0.00"
Flow Length=276' Tc=13.3 min CN=36 Runoff=0.0 cfs 3 cf

Subcatchment ES-03: ES-03 Runoff Area=17,655 sf 100.00% Impervious Runoff Depth>3.46"
Flow Length=96' Slope=0.0833 '/' Tc=6.0 min CN=98 Runoff=1.4 cfs 5,096 cf

Subcatchment ES-04: ES-04 Runoff Area=73,901 sf 3.98% Impervious Runoff Depth>0.03"
Flow Length=331' Tc=9.7 min UI Adjusted CN=40 Runoff=0.0 cfs 190 cf

Subcatchment ES-05: ES-05 Runoff Area=41,696 sf 12.54% Impervious Runoff Depth>0.25"
Flow Length=347' Tc=9.3 min UI Adjusted CN=50 Runoff=0.1 cfs 855 cf

Link EPOI-01: POI-01 Inflow=1.4 cfs 6,594 cf
Primary=1.4 cfs 6,594 cf

Link EPOI-02: POI-02 Inflow=0.0 cfs 3 cf
Primary=0.0 cfs 3 cf

Link EPOI-03: POI-03 Inflow=0.1 cfs 1,045 cf
Primary=0.1 cfs 1,045 cf

Total Runoff Area = 227,317 sf Runoff Volume = 7,642 cf Average Runoff Depth = 0.40"
81.96% Pervious = 186,298 sf 18.04% Impervious = 41,019 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES-01: ES-01 Runoff Area=65,053 sf 22.08% Impervious Runoff Depth>1.02"
Flow Length=289' Tc=11.7 min UI Adjusted CN=51 Runoff=1.1 cfs 5,527 cf

Subcatchment ES-02: ES-02 Runoff Area=29,012 sf 2.88% Impervious Runoff Depth>0.21"
Flow Length=276' Tc=13.3 min CN=36 Runoff=0.0 cfs 510 cf

Subcatchment ES-03: ES-03 Runoff Area=17,655 sf 100.00% Impervious Runoff Depth>5.37"
Flow Length=96' Slope=0.0833 '/' Tc=6.0 min CN=98 Runoff=2.2 cfs 7,899 cf

Subcatchment ES-04: ES-04 Runoff Area=73,901 sf 3.98% Impervious Runoff Depth>0.39"
Flow Length=331' Tc=9.7 min UI Adjusted CN=40 Runoff=0.2 cfs 2,372 cf

Subcatchment ES-05: ES-05 Runoff Area=41,696 sf 12.54% Impervious Runoff Depth>0.95"
Flow Length=347' Tc=9.3 min UI Adjusted CN=50 Runoff=0.7 cfs 3,318 cf

Link EPOI-01: POI-01 Inflow=2.9 cfs 13,427 cf
Primary=2.9 cfs 13,427 cf

Link EPOI-02: POI-02 Inflow=0.0 cfs 510 cf
Primary=0.0 cfs 510 cf

Link EPOI-03: POI-03 Inflow=0.8 cfs 5,690 cf
Primary=0.8 cfs 5,690 cf

Total Runoff Area = 227,317 sf Runoff Volume = 19,627 cf Average Runoff Depth = 1.04"
81.96% Pervious = 186,298 sf 18.04% Impervious = 41,019 sf

```
                    Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
                   Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
        Reach routing by Dyn-Stor-Ind method  -  Pond routing by Dyn-Stor-Ind method

Subcatchment ES-01: ES-01          Runoff Area=65,053 sf  22.08% Impervious  Runoff Depth>2.68"
                          Flow Length=289'  Tc=11.7 min  UI Adjusted CN=51  Runoff=3.6 cfs  14,524 cf

Subcatchment ES-02: ES-02            Runoff Area=29,012 sf  2.88% Impervious  Runoff Depth>1.08"
                                    Flow Length=276'  Tc=13.3 min  CN=36  Runoff=0.4 cfs  2,608 cf

Subcatchment ES-03: ES-03          Runoff Area=17,655 sf  100.00% Impervious  Runoff Depth>8.27"
                      Flow Length=96'  Slope=0.0833 '/'  Tc=6.0 min  CN=98  Runoff=3.3 cfs  12,175 cf

Subcatchment ES-04: ES-04            Runoff Area=73,901 sf  3.98% Impervious  Runoff Depth>1.48"
                            Flow Length=331'  Tc=9.7 min  UI Adjusted CN=40  Runoff=1.9 cfs  9,118 cf

Subcatchment ES-05: ES-05          Runoff Area=41,696 sf  12.54% Impervious  Runoff Depth>2.57"
                            Flow Length=347'  Tc=9.3 min  UI Adjusted CN=50  Runoff=2.4 cfs  8,922 cf

Link EPOI-01: POI-01                                                   Inflow=6.3 cfs  26,698 cf
                                                                      Primary=6.3 cfs  26,698 cf

Link EPOI-02: POI-02                                                    Inflow=0.4 cfs  2,608 cf
                                                                       Primary=0.4 cfs  2,608 cf

Link EPOI-03: POI-03                                                   Inflow=4.3 cfs  18,041 cf
                                                                      Primary=4.3 cfs  18,041 cf

         Total Runoff Area = 227,317 sf   Runoff Volume = 47,347 cf   Average Runoff Depth = 2.50"
                                     81.96% Pervious = 186,298 sf    18.04% Impervious = 41,019 sf
```

APPENDIX C – PRE-DEVELOPMENT CALCULATIONS (10 YR)

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Summary for Subcatchment ES-01: ES-01

Runoff = 1.1 cfs @ 12.21 hrs, Volume= 5,527 cf, Depth> 1.02"
Routed to Link EPOI-01 : POI-01

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Adj	Description
50,494	39		>75% Grass cover, Good, HSG A
11,102	98		Paved Parking, HSG A
3,261	98		Unconnected Pavement, HSG A
196	30		Woods, Good, HSG A
65,053	52	51	Weighted Average, UI Adjusted
50,690			77.92% Pervious Area
14,363			22.08% Impervious Area
3,261			22.70% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	6	0.0100	0.60		**Sheet Flow, sf1** Smooth surfaces n= 0.011 P2= 3.22"
8.6	94	0.0242	0.18		**Sheet Flow, sf2** Grass: Short n= 0.150 P2= 3.22"
2.9	189	0.0242	1.09		**Shallow Concentrated Flow, scf1** Short Grass Pasture Kv= 7.0 fps
11.7	289	Total			

Summary for Subcatchment ES-02: ES-02

Runoff = 0.0 cfs @ 12.94 hrs, Volume= 510 cf, Depth> 0.21"
Routed to Link EPOI-02 : POI-02

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
9,104	39	>75% Grass cover, Good, HSG A
601	98	Unconnected Pavement, HSG A
689	96	Gravel Surface, HSG A
234	98	Roofs, HSG A
18,384	30	Woods, Good, HSG A
29,012	36	Weighted Average
28,177		97.12% Pervious Area
835		2.88% Impervious Area
601		71.98% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	16	0.0100	0.72		**Sheet Flow, sf1** Smooth surfaces n= 0.011 P2= 3.22"
9.5	84	0.0150	0.15		**Sheet Flow, sf2** Grass: Short n= 0.150 P2= 3.22"
3.4	176	0.0150	0.86		**Shallow Concentrated Flow, scf1** Short Grass Pasture Kv= 7.0 fps
13.3	276	Total			

Summary for Subcatchment ES-03: ES-03

Runoff = 2.2 cfs @ 12.09 hrs, Volume= 7,899 cf, Depth> 5.37"
Routed to Link EPOI-01 : POI-01

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
17,655	98	Roofs, HSG A
17,655		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	96	0.0833	2.42		**Sheet Flow, sf1** Smooth surfaces n= 0.011 P2= 3.22"
5.3					**Direct Entry, de1**
6.0	96	Total			

Summary for Subcatchment ES-04: ES-04

Runoff = 0.2 cfs @ 12.42 hrs, Volume= 2,372 cf, Depth> 0.39"
Routed to Link EPOI-03 : POI-03

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Adj	Description
2,836	98		Unconnected Pavement, HSG A
103	98		Roofs, HSG A
3,244	96		Gravel Surface, HSG A
48,431	39		>75% Grass cover, Good, HSG A
19,287	30		Woods, Good, HSG A
73,901	41	40	Weighted Average, UI Adjusted
70,962			96.02% Pervious Area
2,939			3.98% Impervious Area
2,836			96.50% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	100	0.0740	0.29		**Sheet Flow, sf1** Grass: Short n= 0.150 P2= 3.22"
3.9	231	0.0200	0.99		**Shallow Concentrated Flow, scf1** Short Grass Pasture Kv= 7.0 fps
9.7	331	Total			

Summary for Subcatchment ES-05: ES-05

Runoff = 0.7 cfs @ 12.17 hrs, Volume= 3,318 cf, Depth> 0.95"
Routed to Link EPOI-03 : POI-03

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Adj	Description
24,923	39		>75% Grass cover, Good, HSG A
5,770	96		Gravel Surface, HSG A
5,227	98		Unconnected Pavement, HSG A
5,776	30		Woods, Good, HSG A
41,696	53	50	Weighted Average, UI Adjusted
36,469			87.46% Pervious Area
5,227			12.54% Impervious Area
5,227			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	100	0.1000	0.32		**Sheet Flow, sf1** Grass: Short n= 0.150 P2= 3.22"
4.2	247	0.0200	0.99		**Shallow Concentrated Flow, scf1** Short Grass Pasture Kv= 7.0 fps
9.3	347	Total			

Summary for Link EPOI-01: POI-01

Inflow Area = 82,708 sf, 38.71% Impervious, Inflow Depth > 1.95" for 10-Year event
Inflow = 2.9 cfs @ 12.11 hrs, Volume= 13,427 cf
Primary = 2.9 cfs @ 12.11 hrs, Volume= 13,427 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link EPOI-02: POI-02

Inflow Area = 29,012 sf, 2.88% Impervious, Inflow Depth > 0.21" for 10-Year event
Inflow = 0.0 cfs @ 12.94 hrs, Volume= 510 cf
Primary = 0.0 cfs @ 12.94 hrs, Volume= 510 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link EPOI-03: POI-03

```
Inflow Area =       115,597 sf,   7.06% Impervious,  Inflow Depth >   0.59"    for  10-Year event
Inflow       =        0.8 cfs @   12.21 hrs,  Volume=              5,690 cf
Primary      =        0.8 cfs @   12.21 hrs,  Volume=              5,690 cf,  Atten= 0%,  Lag= 0.0 min
```

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

APPENDIX D – POST DEVELOPMENT CALCULATIONS

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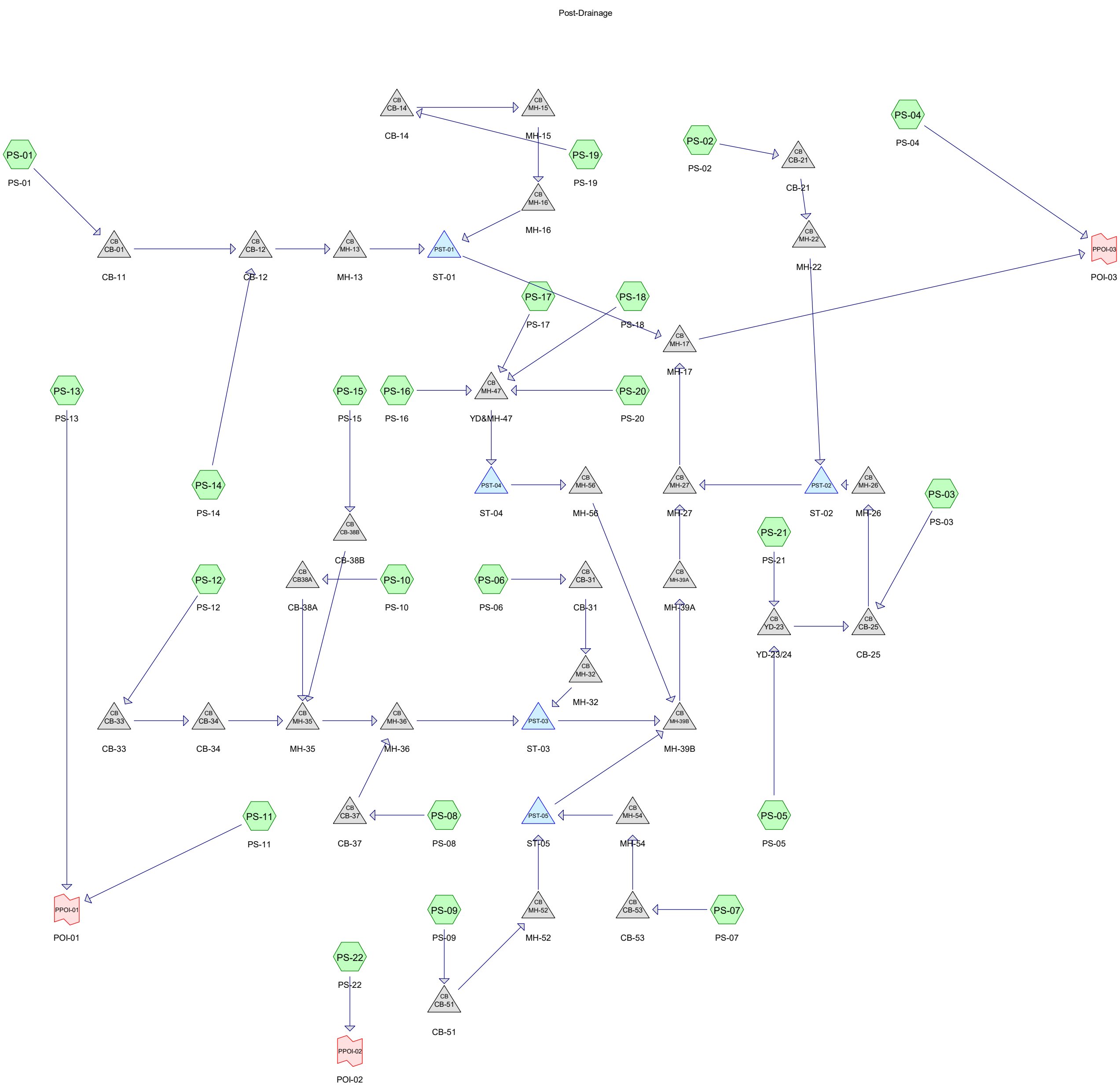

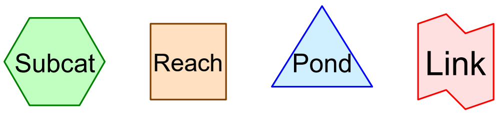

Routing Diagram for 47528-00_Drainage Analysis
Prepared by T F Moran Inc, Printed 6/16/2025
HydroCAD® 10.20-7a s/n 00866 © 2025 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
88,097	39	>75% Grass cover, Good, HSG A (PS-01, PS-02, PS-03, PS-04, PS-05, PS-06, PS-07, PS-08, PS-09, PS-10, PS-11, PS-12, PS-13, PS-15, PS-17, PS-22)
8,331	96	Gravel Surface, HSG A (PS-02, PS-03, PS-04, PS-11, PS-17)
71,125	98	Paved Parking, HSG A (PS-01, PS-02, PS-03, PS-05, PS-06, PS-07, PS-08, PS-09, PS-10, PS-12)
37,782	98	Roofs, HSG A (PS-14, PS-16, PS-18, PS-19, PS-20, PS-21)
15,665	98	Unconnected Pavement, HSG A (PS-01, PS-02, PS-03, PS-05, PS-06, PS-07, PS-08, PS-10, PS-12, PS-13, PS-15, PS-17)
6,317	30	Woods, Good, HSG A (PS-03, PS-04, PS-22)
227,317	**73**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
227,317	HSG A	PS-01, PS-02, PS-03, PS-04, PS-05, PS-06, PS-07, PS-08, PS-09, PS-10, PS-11, PS-12, PS-13, PS-14, PS-15, PS-16, PS-17, PS-18, PS-19, PS-20, PS-21, PS-22
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
227,317		**TOTAL AREA**

```
                 Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
                   Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
           Reach routing by Dyn-Stor-Ind method  -  Pond routing by Dyn-Stor-Ind method

Subcatchment PS-01: PS-01                 Runoff Area=33,190 sf   70.39% Impervious   Runoff Depth>1.87"
                         Flow Length=40'   Slope=0.0100 '/'   Tc=6.0 min   CN=81   Runoff=1.6 cfs  5,172 cf

Subcatchment PS-02: PS-02                  Runoff Area=5,079 sf   87.77% Impervious   Runoff Depth>2.73"
                                          Flow Length=322'   Tc=8.3 min   CN=91   Runoff=0.3 cfs  1,155 cf

Subcatchment PS-03: PS-03                 Runoff Area=15,538 sf   84.26% Impervious   Runoff Depth>2.63"
                        Flow Length=118'   Slope=0.0200 '/'   Tc=6.0 min   CN=90   Runoff=1.1 cfs  3,410 cf

Subcatchment PS-04: PS-04                  Runoff Area=14,953 sf   0.00% Impervious   Runoff Depth>0.16"
                                           Flow Length=118'   Tc=6.0 min   CN=47   Runoff=0.0 cfs  204 cf

Subcatchment PS-05: PS-05                  Runoff Area=5,670 sf   47.76% Impervious   Runoff Depth>0.96"
                                           Flow Length=152'   Tc=6.0 min   CN=67   Runoff=0.1 cfs  455 cf

Subcatchment PS-06: PS-06                  Runoff Area=7,954 sf   97.38% Impervious   Runoff Depth>3.24"
                                           Flow Length=89'   Tc=7.3 min   CN=96   Runoff=0.6 cfs  2,148 cf

Subcatchment PS-07: PS-07                 Runoff Area=11,437 sf   83.28% Impervious   Runoff Depth>2.45"
                                                           Tc=0.0 min   CN=88   Runoff=0.9 cfs  2,337 cf

Subcatchment PS-08: PS-08                  Runoff Area=3,317 sf   78.81% Impervious   Runoff Depth>2.19"
                                            Flow Length=38'   Tc=6.0 min   CN=85   Runoff=0.2 cfs  605 cf

Subcatchment PS-09: PS-09                  Runoff Area=4,571 sf   79.26% Impervious   Runoff Depth>2.27"
                           Flow Length=60'   Slope=0.0100 '/'   Tc=6.0 min   CN=86   Runoff=0.3 cfs  866 cf

Subcatchment PS-10: PS-10                  Runoff Area=1,851 sf   64.99% Impervious   Runoff Depth>1.58"
                                           Flow Length=187'   Tc=9.6 min   CN=77   Runoff=0.1 cfs  243 cf

Subcatchment PS-11: PS-11                  Runoff Area=25,202 sf   0.00% Impervious   Runoff Depth>0.10"
                                           Flow Length=186'   Tc=6.0 min   CN=44   Runoff=0.0 cfs  201 cf

Subcatchment PS-12: PS-12                 Runoff Area=20,169 sf   63.54% Impervious   Runoff Depth>1.51"
                                         Flow Length=242'   Tc=10.7 min   CN=76   Runoff=0.7 cfs  2,536 cf

Subcatchment PS-13: PS-13                 Runoff Area=11,168 sf   15.37% Impervious   Runoff Depth>0.10"
                            Flow Length=120'   Tc=11.1 min   UI Adjusted CN=44   Runoff=0.0 cfs  89 cf

Subcatchment PS-14: PS-14                 Runoff Area=7,282 sf   100.00% Impervious   Runoff Depth>3.47"
                                                           Tc=0.0 min   CN=98   Runoff=0.7 cfs  2,103 cf

Subcatchment PS-15: PS-15                  Runoff Area=3,070 sf   11.86% Impervious   Runoff Depth>0.06"
                                                     Tc=0.0 min   UI Adjusted CN=42   Runoff=0.0 cfs  15 cf

Subcatchment PS-16: PS-16                 Runoff Area=9,405 sf   100.00% Impervious   Runoff Depth>3.47"
                                                           Tc=0.0 min   CN=98   Runoff=0.9 cfs  2,716 cf
```

Subcatchment PS-17: PS-17 Runoff Area=22,422 sf 15.89% Impervious Runoff Depth>0.31"
Tc=0.0 min UI Adjusted CN=52 Runoff=0.1 cfs 579 cf

Subcatchment PS-18: PS-18 Runoff Area=5,173 sf 100.00% Impervious Runoff Depth>3.47"
Tc=0.0 min CN=98 Runoff=0.5 cfs 1,494 cf

Subcatchment PS-19: PS-19 Runoff Area=7,672 sf 100.00% Impervious Runoff Depth>3.46"
Flow Length=140' Slope=0.0200 '/' Tc=10.5 min CN=98 Runoff=0.5 cfs 2,213 cf

Subcatchment PS-20: PS-20 Runoff Area=3,251 sf 100.00% Impervious Runoff Depth>3.47"
Tc=0.0 min CN=98 Runoff=0.3 cfs 939 cf

Subcatchment PS-21: PS-21 Runoff Area=4,999 sf 100.00% Impervious Runoff Depth>3.47"
Tc=0.0 min CN=98 Runoff=0.5 cfs 1,444 cf

Subcatchment PS-22: PS-22 Runoff Area=3,944 sf 0.00% Impervious Runoff Depth>0.00"
Tc=0.0 min CN=36 Runoff=0.0 cfs 0 cf

Pond CB-01: CB-11 Peak Elev=61.44' Inflow=1.6 cfs 5,172 cf
12.0" Round Culvert n=0.013 L=140.0' S=0.0121 '/' Outflow=1.6 cfs 5,172 cf

Pond CB-12: CB-12 Peak Elev=58.54' Inflow=2.0 cfs 7,276 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0271 '/' Outflow=2.0 cfs 7,276 cf

Pond CB-14: CB-14 Peak Elev=52.77' Inflow=0.5 cfs 2,213 cf
12.0" Round Culvert n=0.013 L=45.0' S=0.0111 '/' Outflow=0.5 cfs 2,213 cf

Pond CB-21: CB-21 Peak Elev=53.29' Inflow=0.3 cfs 1,155 cf
12.0" Round Culvert n=0.013 L=69.0' S=0.0094 '/' Outflow=0.3 cfs 1,155 cf

Pond CB-25: CB-25 Peak Elev=53.54' Inflow=1.4 cfs 5,309 cf
12.0" Round Culvert n=0.013 L=29.0' S=0.0190 '/' Outflow=1.4 cfs 5,309 cf

Pond CB-31: CB-31 Peak Elev=55.86' Inflow=0.6 cfs 2,148 cf
12.0" Round Culvert n=0.013 L=14.0' S=0.0143 '/' Outflow=0.6 cfs 2,148 cf

Pond CB-33: CB-33 Peak Elev=55.47' Inflow=0.7 cfs 2,536 cf
12.0" Round Culvert n=0.013 L=96.0' S=0.0057 '/' Outflow=0.7 cfs 2,536 cf

Pond CB-34: CB-34 Peak Elev=54.83' Inflow=0.7 cfs 2,536 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0057 '/' Outflow=0.7 cfs 2,536 cf

Pond CB-37: CB-37 Peak Elev=58.86' Inflow=0.2 cfs 605 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0222 '/' Outflow=0.2 cfs 605 cf

Pond CB-38B: CB-38B Peak Elev=61.66' Inflow=0.0 cfs 15 cf
12.0" Round Culvert n=0.013 L=79.0' S=0.0310 '/' Outflow=0.0 cfs 15 cf

Pond CB-51: CB-51 Peak Elev=58.56' Inflow=0.3 cfs 866 cf
12.0" Round Culvert n=0.013 L=34.0' S=0.0118 '/' Outflow=0.3 cfs 866 cf

Pond CB-53: CB-53 Peak Elev=56.45' Inflow=0.9 cfs 2,337 cf
12.0" Round Culvert n=0.013 L=40.0' S=0.0055 '/' Outflow=0.9 cfs 2,337 cf

Pond CB38A: CB-38A Peak Elev=58.52' Inflow=0.1 cfs 243 cf
12.0" Round Culvert n=0.013 L=19.0' S=0.0211 '/' Outflow=0.1 cfs 243 cf

Pond MH-13: MH-13 Peak Elev=51.25' Inflow=2.0 cfs 7,276 cf
24.0" Round Culvert n=0.013 L=6.0' S=0.0000 '/' Outflow=2.0 cfs 7,268 cf

Pond MH-15: MH-15 Peak Elev=52.19' Inflow=0.5 cfs 2,213 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0167 '/' Outflow=0.5 cfs 2,213 cf

Pond MH-16: MH-16 Peak Elev=51.22' Inflow=0.5 cfs 2,213 cf
24.0" Round Culvert n=0.013 L=6.0' S=0.0000 '/' Outflow=0.5 cfs 2,212 cf

Pond MH-17: MH-17 Peak Elev=50.70' Inflow=0.0 cfs 0 cf
15.0" Round Culvert n=0.013 L=60.0' S=0.0117 '/' Outflow=0.0 cfs 0 cf

Pond MH-22: MH-22 Peak Elev=51.13' Inflow=0.3 cfs 1,155 cf
24.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=0.3 cfs 1,152 cf

Pond MH-26: MH-26 Peak Elev=51.15' Inflow=1.4 cfs 5,309 cf
24.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=1.4 cfs 5,308 cf

Pond MH-27: MH-27 Peak Elev=51.30' Inflow=0.0 cfs 0 cf
15.0" Round Culvert n=0.013 L=67.0' S=0.0104 '/' Outflow=0.0 cfs 0 cf

Pond MH-32: MH-32 Peak Elev=54.49' Inflow=0.6 cfs 2,148 cf
24.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=0.6 cfs 2,134 cf

Pond MH-35: MH-35 Peak Elev=54.50' Inflow=0.7 cfs 2,795 cf
12.0" Round Culvert n=0.013 L=96.0' S=0.0109 '/' Outflow=0.7 cfs 2,795 cf

Pond MH-36: MH-36 Peak Elev=54.50' Inflow=0.9 cfs 3,400 cf
12.0" Round Culvert n=0.013 L=8.5' S=0.0000 '/' Outflow=0.9 cfs 3,397 cf

Pond MH-39A: MH-39A Peak Elev=53.45' Inflow=0.0 cfs 0 cf
15.0" Round Culvert n=0.013 L=167.0' S=0.0123 '/' Outflow=0.0 cfs 0 cf

Pond MH-39B: MH-39B Peak Elev=54.40' Inflow=0.0 cfs 0 cf
12.0" Round Culvert n=0.013 L=90.0' S=0.0106 '/' Outflow=0.0 cfs 0 cf

Pond MH-47: YD&MH-47 Peak Elev=52.20' Inflow=1.7 cfs 5,729 cf
24.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=1.7 cfs 5,729 cf

Pond MH-52: MH-52 Peak Elev=54.60' Inflow=0.3 cfs 866 cf
24.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=0.3 cfs 866 cf

Pond MH-54: MH-54 Peak Elev=54.72' Inflow=0.9 cfs 2,337 cf
12.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=0.9 cfs 2,337 cf

Pond MH-56: MH-56
Peak Elev=54.50' Inflow=0.0 cfs 0 cf
15.0" Round Culvert n=0.013 L=36.0' S=-0.0722 '/' Outflow=0.0 cfs 0 cf

Pond PST-01: ST-01
Peak Elev=51.25' Storage=6,385 cf Inflow=2.5 cfs 9,480 cf
Discarded=0.1 cfs 3,345 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 3,345 cf

Pond PST-02: ST-02
Peak Elev=51.15' Storage=3,806 cf Inflow=1.8 cfs 6,460 cf
Discarded=0.1 cfs 3,326 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 3,326 cf

Pond PST-03: ST-03
Peak Elev=54.50' Storage=3,288 cf Inflow=1.5 cfs 5,531 cf
Discarded=0.1 cfs 2,740 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 2,740 cf

Pond PST-04: ST-04
Peak Elev=51.76' Storage=1,595 cf Inflow=1.7 cfs 5,729 cf
Discarded=0.2 cfs 5,740 cf Primary=0.0 cfs 0 cf Outflow=0.2 cfs 5,740 cf

Pond PST-05: ST-05
Peak Elev=54.60' Storage=1,485 cf Inflow=1.0 cfs 3,202 cf
Discarded=0.1 cfs 3,049 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 3,049 cf

Pond YD-23: YD-23/24
Peak Elev=55.12' Inflow=0.5 cfs 1,899 cf
12.0" Round Culvert n=0.013 L=151.0' S=0.0123 '/' Outflow=0.5 cfs 1,899 cf

Link PPOI-01: POI-01
Inflow=0.0 cfs 290 cf
Primary=0.0 cfs 290 cf

Link PPOI-02: POI-02
Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Link PPOI-03: POI-03
Inflow=0.0 cfs 204 cf
Primary=0.0 cfs 204 cf

Total Runoff Area = 227,317 sf Runoff Volume = 30,926 cf Average Runoff Depth = 1.63"
45.20% Pervious = 102,745 sf 54.80% Impervious = 124,572 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS-01: PS-01 Runoff Area=33,190 sf 70.39% Impervious Runoff Depth>3.53"
Flow Length=40' Slope=0.0100 '/' Tc=6.0 min CN=81 Runoff=3.1 cfs 9,756 cf

Subcatchment PS-02: PS-02 Runoff Area=5,079 sf 87.77% Impervious Runoff Depth>4.57"
Flow Length=322' Tc=8.3 min CN=91 Runoff=0.5 cfs 1,935 cf

Subcatchment PS-03: PS-03 Runoff Area=15,538 sf 84.26% Impervious Runoff Depth>4.46"
Flow Length=118' Slope=0.0200 '/' Tc=6.0 min CN=90 Runoff=1.7 cfs 5,779 cf

Subcatchment PS-04: PS-04 Runoff Area=14,953 sf 0.00% Impervious Runoff Depth>0.77"
Flow Length=118' Tc=6.0 min CN=47 Runoff=0.2 cfs 957 cf

Subcatchment PS-05: PS-05 Runoff Area=5,670 sf 47.76% Impervious Runoff Depth>2.24"
Flow Length=152' Tc=6.0 min CN=67 Runoff=0.3 cfs 1,057 cf

Subcatchment PS-06: PS-06 Runoff Area=7,954 sf 97.38% Impervious Runoff Depth>5.14"
Flow Length=89' Tc=7.3 min CN=96 Runoff=0.9 cfs 3,404 cf

Subcatchment PS-07: PS-07 Runoff Area=11,437 sf 83.28% Impervious Runoff Depth>4.25"
Tc=0.0 min CN=88 Runoff=1.5 cfs 4,052 cf

Subcatchment PS-08: PS-08 Runoff Area=3,317 sf 78.81% Impervious Runoff Depth>3.93"
Flow Length=38' Tc=6.0 min CN=85 Runoff=0.3 cfs 1,087 cf

Subcatchment PS-09: PS-09 Runoff Area=4,571 sf 79.26% Impervious Runoff Depth>4.04"
Flow Length=60' Slope=0.0100 '/' Tc=6.0 min CN=86 Runoff=0.5 cfs 1,538 cf

Subcatchment PS-10: PS-10 Runoff Area=1,851 sf 64.99% Impervious Runoff Depth>3.14"
Flow Length=187' Tc=9.6 min CN=77 Runoff=0.1 cfs 484 cf

Subcatchment PS-11: PS-11 Runoff Area=25,202 sf 0.00% Impervious Runoff Depth>0.59"
Flow Length=186' Tc=6.0 min CN=44 Runoff=0.2 cfs 1,247 cf

Subcatchment PS-12: PS-12 Runoff Area=20,169 sf 63.54% Impervious Runoff Depth>3.04"
Flow Length=242' Tc=10.7 min CN=76 Runoff=1.4 cfs 5,110 cf

Subcatchment PS-13: PS-13 Runoff Area=11,168 sf 15.37% Impervious Runoff Depth>0.59"
Flow Length=120' Tc=11.1 min UI Adjusted CN=44 Runoff=0.1 cfs 551 cf

Subcatchment PS-14: PS-14 Runoff Area=7,282 sf 100.00% Impervious Runoff Depth>5.37"
Tc=0.0 min CN=98 Runoff=1.1 cfs 3,260 cf

Subcatchment PS-15: PS-15 Runoff Area=3,070 sf 11.86% Impervious Runoff Depth>0.49"
Tc=0.0 min UI Adjusted CN=42 Runoff=0.0 cfs 125 cf

Subcatchment PS-16: PS-16 Runoff Area=9,405 sf 100.00% Impervious Runoff Depth>5.37"
Tc=0.0 min CN=98 Runoff=1.4 cfs 4,211 cf

```
Subcatchment PS-17: PS-17              Runoff Area=22,422 sf   15.89% Impervious   Runoff Depth>1.09"
                                              Tc=0.0 min   UI Adjusted CN=52   Runoff=0.6 cfs  2,037 cf

Subcatchment PS-18: PS-18              Runoff Area=5,173 sf   100.00% Impervious   Runoff Depth>5.37"
                                                              Tc=0.0 min   CN=98   Runoff=0.7 cfs  2,316 cf

Subcatchment PS-19: PS-19              Runoff Area=7,672 sf   100.00% Impervious   Runoff Depth>5.37"
                      Flow Length=140'   Slope=0.0200 '/'   Tc=10.5 min   CN=98   Runoff=0.8 cfs  3,430 cf

Subcatchment PS-20: PS-20              Runoff Area=3,251 sf   100.00% Impervious   Runoff Depth>5.37"
                                                              Tc=0.0 min   CN=98   Runoff=0.5 cfs  1,455 cf

Subcatchment PS-21: PS-21              Runoff Area=4,999 sf   100.00% Impervious   Runoff Depth>5.37"
                                                              Tc=0.0 min   CN=98   Runoff=0.7 cfs  2,238 cf

Subcatchment PS-22: PS-22                Runoff Area=3,944 sf   0.00% Impervious   Runoff Depth>0.21"
                                                                Tc=0.0 min   CN=36   Runoff=0.0 cfs  70 cf

Pond CB-01: CB-11                                          Peak Elev=61.91'   Inflow=3.1 cfs  9,756 cf
                    12.0"  Round Culvert  n=0.013  L=140.0'  S=0.0121 '/'   Outflow=3.1 cfs  9,756 cf

Pond CB-12: CB-12                                         Peak Elev=59.17'   Inflow=3.6 cfs  13,016 cf
                   12.0"  Round Culvert  n=0.013  L=170.0'  S=0.0271 '/'   Outflow=3.6 cfs  13,016 cf

Pond CB-14: CB-14                                          Peak Elev=53.73'   Inflow=0.8 cfs  3,430 cf
                     12.0"  Round Culvert  n=0.013  L=45.0'  S=0.0111 '/'   Outflow=0.8 cfs  3,430 cf

Pond CB-21: CB-21                                          Peak Elev=53.38'   Inflow=0.5 cfs  1,935 cf
                     12.0"  Round Culvert  n=0.013  L=69.0'  S=0.0094 '/'   Outflow=0.5 cfs  1,935 cf

Pond CB-25: CB-25                                          Peak Elev=53.82'   Inflow=2.5 cfs  9,075 cf
                     12.0"  Round Culvert  n=0.013  L=29.0'  S=0.0190 '/'   Outflow=2.5 cfs  9,075 cf

Pond CB-31: CB-31                                          Peak Elev=58.03'   Inflow=0.9 cfs  3,404 cf
                     12.0"  Round Culvert  n=0.013  L=14.0'  S=0.0143 '/'   Outflow=0.9 cfs  3,403 cf

Pond CB-33: CB-33                                          Peak Elev=58.03'   Inflow=1.4 cfs  5,110 cf
                     12.0"  Round Culvert  n=0.013  L=96.0'  S=0.0057 '/'   Outflow=1.4 cfs  5,110 cf

Pond CB-34: CB-34                                          Peak Elev=58.03'   Inflow=1.4 cfs  5,110 cf
                     12.0"  Round Culvert  n=0.013  L=70.0'  S=0.0057 '/'   Outflow=1.4 cfs  5,107 cf

Pond CB-37: CB-37                                          Peak Elev=58.94'   Inflow=0.3 cfs  1,087 cf
                      12.0"  Round Culvert  n=0.013  L=9.0'  S=0.0222 '/'   Outflow=0.3 cfs  1,087 cf

Pond CB-38B: CB-38B                                          Peak Elev=61.71'   Inflow=0.0 cfs  125 cf
                       12.0"  Round Culvert  n=0.013  L=79.0'  S=0.0310 '/'   Outflow=0.0 cfs  125 cf

Pond CB-51: CB-51                                          Peak Elev=58.65'   Inflow=0.5 cfs  1,538 cf
                     12.0"  Round Culvert  n=0.013  L=34.0'  S=0.0118 '/'   Outflow=0.5 cfs  1,538 cf
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Pond CB-53: CB-53
Peak Elev=56.66' Inflow=1.5 cfs 4,052 cf
12.0" Round Culvert n=0.013 L=40.0' S=0.0055 '/' Outflow=1.5 cfs 4,052 cf

Pond CB38A: CB-38A
Peak Elev=58.58' Inflow=0.1 cfs 484 cf
12.0" Round Culvert n=0.013 L=19.0' S=0.0211 '/' Outflow=0.1 cfs 484 cf

Pond MH-13: MH-13
Peak Elev=53.78' Inflow=3.6 cfs 13,016 cf
24.0" Round Culvert n=0.013 L=6.0' S=0.0000 '/' Outflow=3.6 cfs 12,996 cf

Pond MH-15: MH-15
Peak Elev=53.74' Inflow=0.8 cfs 3,430 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0167 '/' Outflow=0.8 cfs 3,431 cf

Pond MH-16: MH-16
Peak Elev=53.74' Inflow=0.8 cfs 3,431 cf
24.0" Round Culvert n=0.013 L=6.0' S=0.0000 '/' Outflow=0.8 cfs 3,418 cf

Pond MH-17: MH-17
Peak Elev=50.81' Inflow=0.1 cfs 386 cf
15.0" Round Culvert n=0.013 L=60.0' S=0.0117 '/' Outflow=0.1 cfs 386 cf

Pond MH-22: MH-22
Peak Elev=52.71' Inflow=0.5 cfs 1,935 cf
24.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=0.5 cfs 1,930 cf

Pond MH-26: MH-26
Peak Elev=52.75' Inflow=2.5 cfs 9,075 cf
24.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=2.5 cfs 9,065 cf

Pond MH-27: MH-27
Peak Elev=51.42' Inflow=0.1 cfs 386 cf
15.0" Round Culvert n=0.013 L=67.0' S=0.0104 '/' Outflow=0.1 cfs 386 cf

Pond MH-32: MH-32
Peak Elev=58.03' Inflow=0.9 cfs 3,403 cf
24.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=0.9 cfs 3,399 cf

Pond MH-35: MH-35
Peak Elev=58.03' Inflow=1.6 cfs 5,715 cf
12.0" Round Culvert n=0.013 L=96.0' S=0.0109 '/' Outflow=1.6 cfs 5,715 cf

Pond MH-36: MH-36
Peak Elev=58.03' Inflow=1.8 cfs 6,802 cf
12.0" Round Culvert n=0.013 L=8.5' S=0.0000 '/' Outflow=1.8 cfs 6,803 cf

Pond MH-39A: MH-39A
Peak Elev=53.56' Inflow=0.1 cfs 386 cf
15.0" Round Culvert n=0.013 L=167.0' S=0.0123 '/' Outflow=0.1 cfs 386 cf

Pond MH-39B: MH-39B
Peak Elev=54.52' Inflow=0.1 cfs 386 cf
12.0" Round Culvert n=0.013 L=90.0' S=0.0106 '/' Outflow=0.1 cfs 386 cf

Pond MH-47: YD&MH-47
Peak Elev=52.58' Inflow=3.2 cfs 10,019 cf
24.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=3.2 cfs 10,019 cf

Pond MH-52: MH-52
Peak Elev=55.77' Inflow=0.5 cfs 1,538 cf
24.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=0.5 cfs 1,526 cf

Pond MH-54: MH-54
Peak Elev=55.59' Inflow=1.5 cfs 4,052 cf
12.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=1.5 cfs 4,050 cf

Pond MH-56: MH-56 Peak Elev=54.50' Inflow=0.0 cfs 0 cf
15.0" Round Culvert n=0.013 L=36.0' S=-0.0722 '/' Outflow=0.0 cfs 0 cf

Pond PST-01: ST-01 Peak Elev=53.78' Storage=12,739 cf Inflow=4.4 cfs 16,414 cf
Discarded=0.1 cfs 3,682 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 3,682 cf

Pond PST-02: ST-02 Peak Elev=52.75' Storage=7,597 cf Inflow=3.0 cfs 10,995 cf
Discarded=0.1 cfs 3,662 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 3,662 cf

Pond PST-03: ST-03 Peak Elev=58.03' Storage=6,917 cf Inflow=2.7 cfs 10,202 cf
Discarded=0.1 cfs 3,025 cf Primary=0.1 cfs 386 cf Outflow=0.1 cfs 3,411 cf

Pond PST-04: ST-04 Peak Elev=52.57' Storage=3,692 cf Inflow=3.2 cfs 10,019 cf
Discarded=0.2 cfs 10,018 cf Primary=0.0 cfs 0 cf Outflow=0.2 cfs 10,018 cf

Pond PST-05: ST-05 Peak Elev=55.59' Storage=3,145 cf Inflow=1.8 cfs 5,576 cf
Discarded=0.1 cfs 3,365 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 3,365 cf

Pond YD-23: YD-23/24 Peak Elev=55.24' Inflow=0.9 cfs 3,295 cf
12.0" Round Culvert n=0.013 L=151.0' S=0.0123 '/' Outflow=0.9 cfs 3,295 cf

Link PPOI-01: POI-01 Inflow=0.2 cfs 1,798 cf
Primary=0.2 cfs 1,798 cf

Link PPOI-02: POI-02 Inflow=0.0 cfs 70 cf
Primary=0.0 cfs 70 cf

Link PPOI-03: POI-03 Inflow=0.2 cfs 1,342 cf
Primary=0.2 cfs 1,342 cf

Total Runoff Area = 227,317 sf Runoff Volume = 56,098 cf Average Runoff Depth = 2.96"
45.20% Pervious = 102,745 sf 54.80% Impervious = 124,572 sf

```
                 Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
                  Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
       Reach routing by Dyn-Stor-Ind method  -  Pond routing by Dyn-Stor-Ind method

Subcatchment PS-01: PS-01           Runoff Area=33,190 sf  70.39% Impervious  Runoff Depth>6.23"
                        Flow Length=40'  Slope=0.0100 '/'  Tc=6.0 min  CN=81  Runoff=5.3 cfs 17,230 cf

Subcatchment PS-02: PS-02            Runoff Area=5,079 sf  87.77% Impervious  Runoff Depth>7.43"
                                      Flow Length=322'  Tc=8.3 min  CN=91  Runoff=0.9 cfs  3,145 cf

Subcatchment PS-03: PS-03           Runoff Area=15,538 sf  84.26% Impervious  Runoff Depth>7.31"
                       Flow Length=118'  Slope=0.0200 '/'  Tc=6.0 min  CN=90  Runoff=2.8 cfs  9,469 cf

Subcatchment PS-04: PS-04            Runoff Area=14,953 sf   0.00% Impervious  Runoff Depth>2.23"
                                      Flow Length=118'  Tc=6.0 min  CN=47  Runoff=0.8 cfs  2,784 cf

Subcatchment PS-05: PS-05            Runoff Area=5,670 sf  47.76% Impervious  Runoff Depth>4.55"
                                      Flow Length=152'  Tc=6.0 min  CN=67  Runoff=0.7 cfs  2,151 cf

Subcatchment PS-06: PS-06            Runoff Area=7,954 sf  97.38% Impervious  Runoff Depth>8.03"
                                       Flow Length=89'  Tc=7.3 min  CN=96  Runoff=1.4 cfs  5,325 cf

Subcatchment PS-07: PS-07           Runoff Area=11,437 sf  83.28% Impervious  Runoff Depth>7.08"
                                                     Tc=0.0 min  CN=88  Runoff=2.4 cfs  6,745 cf

Subcatchment PS-08: PS-08            Runoff Area=3,317 sf  78.81% Impervious  Runoff Depth>6.71"
                                       Flow Length=38'  Tc=6.0 min  CN=85  Runoff=0.6 cfs  1,855 cf

Subcatchment PS-09: PS-09            Runoff Area=4,571 sf  79.26% Impervious  Runoff Depth>6.83"
                        Flow Length=60'  Slope=0.0100 '/'  Tc=6.0 min  CN=86  Runoff=0.8 cfs  2,602 cf

Subcatchment PS-10: PS-10            Runoff Area=1,851 sf  64.99% Impervious  Runoff Depth>5.75"
                                        Flow Length=187'  Tc=9.6 min  CN=77  Runoff=0.2 cfs  886 cf

Subcatchment PS-11: PS-11            Runoff Area=25,202 sf   0.00% Impervious  Runoff Depth>1.91"
                                      Flow Length=186'  Tc=6.0 min  CN=44  Runoff=1.1 cfs  4,003 cf

Subcatchment PS-12: PS-12           Runoff Area=20,169 sf  63.54% Impervious  Runoff Depth>5.62"
                                     Flow Length=242'  Tc=10.7 min  CN=76  Runoff=2.6 cfs  9,452 cf

Subcatchment PS-13: PS-13           Runoff Area=11,168 sf  15.37% Impervious  Runoff Depth>1.90"
                           Flow Length=120'  Tc=11.1 min  UI Adjusted CN=44  Runoff=0.4 cfs  1,771 cf

Subcatchment PS-14: PS-14           Runoff Area=7,282 sf  100.00% Impervious  Runoff Depth>8.28"
                                                     Tc=0.0 min  CN=98  Runoff=1.6 cfs  5,025 cf

Subcatchment PS-15: PS-15            Runoff Area=3,070 sf  11.86% Impervious  Runoff Depth>1.69"
                                             Tc=0.0 min  UI Adjusted CN=42  Runoff=0.1 cfs  433 cf

Subcatchment PS-16: PS-16           Runoff Area=9,405 sf  100.00% Impervious  Runoff Depth>8.28"
                                                     Tc=0.0 min  CN=98  Runoff=2.1 cfs  6,489 cf
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Subcatchment PS-17: PS-17 Runoff Area=22,422 sf 15.89% Impervious Runoff Depth>2.80"
Tc=0.0 min UI Adjusted CN=52 Runoff=1.8 cfs 5,233 cf

Subcatchment PS-18: PS-18 Runoff Area=5,173 sf 100.00% Impervious Runoff Depth>8.28"
Tc=0.0 min CN=98 Runoff=1.1 cfs 3,569 cf

Subcatchment PS-19: PS-19 Runoff Area=7,672 sf 100.00% Impervious Runoff Depth>8.27"
Flow Length=140' Slope=0.0200 '/' Tc=10.5 min CN=98 Runoff=1.3 cfs 5,287 cf

Subcatchment PS-20: PS-20 Runoff Area=3,251 sf 100.00% Impervious Runoff Depth>8.28"
Tc=0.0 min CN=98 Runoff=0.7 cfs 2,243 cf

Subcatchment PS-21: PS-21 Runoff Area=4,999 sf 100.00% Impervious Runoff Depth>8.28"
Tc=0.0 min CN=98 Runoff=1.1 cfs 3,449 cf

Subcatchment PS-22: PS-22 Runoff Area=3,944 sf 0.00% Impervious Runoff Depth>1.08"
Tc=0.0 min CN=36 Runoff=0.1 cfs 356 cf

Pond CB-01: CB-11 Peak Elev=64.98' Inflow=5.3 cfs 17,230 cf
12.0" Round Culvert n=0.013 L=140.0' S=0.0121 '/' Outflow=5.3 cfs 17,230 cf

Pond CB-12: CB-12 Peak Elev=60.92' Inflow=6.2 cfs 22,255 cf
12.0" Round Culvert n=0.013 L=170.0' S=0.0271 '/' Outflow=6.2 cfs 22,255 cf

Pond CB-14: CB-14 Peak Elev=55.32' Inflow=1.3 cfs 5,287 cf
12.0" Round Culvert n=0.013 L=45.0' S=0.0111 '/' Outflow=1.3 cfs 5,286 cf

Pond CB-21: CB-21 Peak Elev=55.63' Inflow=0.9 cfs 3,145 cf
12.0" Round Culvert n=0.013 L=69.0' S=0.0094 '/' Outflow=0.9 cfs 3,143 cf

Pond CB-25: CB-25 Peak Elev=55.65' Inflow=4.1 cfs 15,069 cf
12.0" Round Culvert n=0.013 L=29.0' S=0.0190 '/' Outflow=4.1 cfs 15,069 cf

Pond CB-31: CB-31 Peak Elev=58.51' Inflow=1.4 cfs 5,325 cf
12.0" Round Culvert n=0.013 L=14.0' S=0.0143 '/' Outflow=1.4 cfs 5,325 cf

Pond CB-33: CB-33 Peak Elev=59.23' Inflow=2.6 cfs 9,452 cf
12.0" Round Culvert n=0.013 L=96.0' S=0.0057 '/' Outflow=2.6 cfs 9,452 cf

Pond CB-34: CB-34 Peak Elev=59.11' Inflow=2.6 cfs 9,452 cf
12.0" Round Culvert n=0.013 L=70.0' S=0.0057 '/' Outflow=2.6 cfs 9,452 cf

Pond CB-37: CB-37 Peak Elev=59.03' Inflow=0.6 cfs 1,855 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0222 '/' Outflow=0.6 cfs 1,855 cf

Pond CB-38B: CB-38B Peak Elev=61.82' Inflow=0.1 cfs 433 cf
12.0" Round Culvert n=0.013 L=79.0' S=0.0310 '/' Outflow=0.1 cfs 433 cf

Pond CB-51: CB-51 Peak Elev=58.76' Inflow=0.8 cfs 2,602 cf
12.0" Round Culvert n=0.013 L=34.0' S=0.0118 '/' Outflow=0.8 cfs 2,602 cf

Pond CB-53: CB-53 Peak Elev=57.53' Inflow=2.4 cfs 6,745 cf
12.0" Round Culvert n=0.013 L=40.0' S=0.0055 '/' Outflow=2.4 cfs 6,745 cf

Pond CB38A: CB-38A Peak Elev=58.98' Inflow=0.2 cfs 886 cf
12.0" Round Culvert n=0.013 L=19.0' S=0.0211 '/' Outflow=0.2 cfs 886 cf

Pond MH-13: MH-13 Peak Elev=55.32' Inflow=6.2 cfs 22,255 cf
24.0" Round Culvert n=0.013 L=6.0' S=0.0000 '/' Outflow=6.2 cfs 22,244 cf

Pond MH-15: MH-15 Peak Elev=55.32' Inflow=1.3 cfs 5,286 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0167 '/' Outflow=1.3 cfs 5,285 cf

Pond MH-16: MH-16 Peak Elev=55.31' Inflow=1.3 cfs 5,285 cf
24.0" Round Culvert n=0.013 L=6.0' S=0.0000 '/' Outflow=1.3 cfs 5,285 cf

Pond MH-17: MH-17 Peak Elev=51.67' Inflow=3.4 cfs 18,446 cf
15.0" Round Culvert n=0.013 L=60.0' S=0.0117 '/' Outflow=3.4 cfs 18,446 cf

Pond MH-22: MH-22 Peak Elev=55.63' Inflow=0.9 cfs 3,143 cf
24.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=0.9 cfs 3,141 cf

Pond MH-26: MH-26 Peak Elev=55.65' Inflow=4.1 cfs 15,069 cf
24.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=4.1 cfs 15,067 cf

Pond MH-27: MH-27 Peak Elev=52.20' Inflow=2.7 cfs 9,597 cf
15.0" Round Culvert n=0.013 L=67.0' S=0.0104 '/' Outflow=2.7 cfs 9,597 cf

Pond MH-32: MH-32 Peak Elev=58.50' Inflow=1.4 cfs 5,325 cf
24.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=1.4 cfs 5,328 cf

Pond MH-35: MH-35 Peak Elev=58.99' Inflow=2.9 cfs 10,772 cf
12.0" Round Culvert n=0.013 L=96.0' S=0.0109 '/' Outflow=2.9 cfs 10,772 cf

Pond MH-36: MH-36 Peak Elev=58.71' Inflow=3.4 cfs 12,627 cf
12.0" Round Culvert n=0.013 L=8.5' S=0.0000 '/' Outflow=3.4 cfs 12,627 cf

Pond MH-39A: MH-39A Peak Elev=54.28' Inflow=2.7 cfs 7,717 cf
15.0" Round Culvert n=0.013 L=167.0' S=0.0123 '/' Outflow=2.7 cfs 7,717 cf

Pond MH-39B: MH-39B Peak Elev=55.39' Inflow=2.7 cfs 7,717 cf
12.0" Round Culvert n=0.013 L=90.0' S=0.0106 '/' Outflow=2.7 cfs 7,717 cf

Pond MH-47: YD&MH-47 Peak Elev=54.66' Inflow=5.8 cfs 17,535 cf
24.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=5.8 cfs 17,520 cf

Pond MH-52: MH-52 Peak Elev=57.96' Inflow=0.8 cfs 2,602 cf
24.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=0.8 cfs 2,596 cf

Pond MH-54: MH-54 Peak Elev=57.53' Inflow=2.4 cfs 6,745 cf
12.0" Round Culvert n=0.013 L=7.0' S=0.0000 '/' Outflow=2.4 cfs 6,745 cf

Pond MH-56: MH-56 Peak Elev=54.89' Inflow=0.0 cfs 0 cf
15.0" Round Culvert n=0.013 L=36.0' S=-0.0722 '/' Outflow=0.0 cfs 0 cf

Pond PST-01: ST-01 Peak Elev=55.31' Storage=15,063 cf Inflow=7.3 cfs 27,529 cf
Discarded=0.1 cfs 4,041 cf Primary=1.8 cfs 8,849 cf Outflow=1.8 cfs 12,890 cf

Pond PST-02: ST-02 Peak Elev=55.65' Storage=12,476 cf Inflow=4.9 cfs 18,208 cf
Discarded=0.1 cfs 4,032 cf Primary=0.2 cfs 1,880 cf Outflow=0.2 cfs 5,912 cf

Pond PST-03: ST-03 Peak Elev=58.49' Storage=7,231 cf Inflow=4.7 cfs 17,955 cf
Discarded=0.1 cfs 3,339 cf Primary=2.7 cfs 7,717 cf Outflow=2.7 cfs 11,056 cf

Pond PST-04: ST-04 Peak Elev=54.66' Storage=8,659 cf Inflow=5.8 cfs 17,520 cf
Discarded=0.2 cfs 11,990 cf Primary=0.0 cfs 0 cf Outflow=0.2 cfs 11,990 cf

Pond PST-05: ST-05 Peak Elev=57.53' Storage=6,141 cf Inflow=2.9 cfs 9,341 cf
Discarded=0.1 cfs 3,717 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 3,717 cf

Pond YD-23: YD-23/24 Peak Elev=55.65' Inflow=1.5 cfs 5,600 cf
12.0" Round Culvert n=0.013 L=151.0' S=0.0123 '/' Outflow=1.5 cfs 5,600 cf

Link PPOI-01: POI-01 Inflow=1.4 cfs 5,774 cf
Primary=1.4 cfs 5,774 cf

Link PPOI-02: POI-02 Inflow=0.1 cfs 356 cf
Primary=0.1 cfs 356 cf

Link PPOI-03: POI-03 Inflow=3.7 cfs 21,230 cf
Primary=3.7 cfs 21,230 cf

Total Runoff Area = 227,317 sf Runoff Volume = 99,504 cf Average Runoff Depth = 5.25"
45.20% Pervious = 102,745 sf 54.80% Impervious = 124,572 sf

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APPENDIX E – POST DEVELOPMENT CALCULATIONS (10YR)

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Summary for Subcatchment PS-01: PS-01

Runoff = 3.1 cfs @ 12.09 hrs, Volume= 9,756 cf, Depth> 3.53"
Routed to Pond CB-01 : CB-11

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
19,653	98	Paved Parking, HSG A
3,708	98	Unconnected Pavement, HSG A
9,829	39	>75% Grass cover, Good, HSG A
33,190	81	Weighted Average
9,829		29.61% Pervious Area
23,361		70.39% Impervious Area
3,708		15.87% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.87		**Sheet Flow, SF1** Smooth surfaces n= 0.011 P2= 3.22"
5.2					**Direct Entry, DE1**
6.0	40	Total			

Summary for Subcatchment PS-02: PS-02

Runoff = 0.5 cfs @ 12.11 hrs, Volume= 1,935 cf, Depth> 4.57"
Routed to Pond CB-21 : CB-21

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
4,195	98	Paved Parking, HSG A
263	98	Unconnected Pavement, HSG A
23	96	Gravel Surface, HSG A
598	39	>75% Grass cover, Good, HSG A
5,079	91	Weighted Average
621		12.23% Pervious Area
4,458		87.77% Impervious Area
263		5.90% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	100	0.0700	0.28		**Sheet Flow, SF1** Grass: Short n= 0.150 P2= 3.22"
1.2	70	0.0200	0.99		**Shallow Concentrated Flow, SCF1** Short Grass Pasture Kv= 7.0 fps
1.2	152	0.0100	2.03		**Shallow Concentrated Flow, SCF2** Paved Kv= 20.3 fps
8.3	322	Total			

Summary for Subcatchment PS-03: PS-03

Runoff = 1.7 cfs @ 12.09 hrs, Volume= 5,779 cf, Depth> 4.46"
Routed to Pond CB-25 : CB-25

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
11,896	98	Paved Parking, HSG A
1,196	98	Unconnected Pavement, HSG A
1,968	39	>75% Grass cover, Good, HSG A
81	30	Woods, Good, HSG A
397	96	Gravel Surface, HSG A
15,538	90	Weighted Average
2,446		15.74% Pervious Area
13,092		84.26% Impervious Area
1,196		9.14% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	4	0.0200	0.09		**Sheet Flow, SF1** Grass: Short n= 0.150 P2= 3.22"
1.2	96	0.0200	1.37		**Sheet Flow, SF2** Smooth surfaces n= 0.011 P2= 3.22"
0.1	18	0.0200	2.87		**Shallow Concentrated Flow, SCF1** Paved Kv= 20.3 fps
4.0					**Direct Entry, DE1**
6.0	118	Total			

Summary for Subcatchment PS-04: PS-04

Runoff = 0.2 cfs @ 12.13 hrs, Volume= 957 cf, Depth> 0.77"
Routed to Link PPOI-03 : POI-03

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
7,045	39	>75% Grass cover, Good, HSG A
5,028	30	Woods, Good, HSG A
2,880	96	Gravel Surface, HSG A
14,953	47	Weighted Average
14,953		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	100	0.0800	0.30		**Sheet Flow, SF1** Grass: Short n= 0.150 P2= 3.22"
0.2	18	0.0700	1.85		**Shallow Concentrated Flow, SCF1** Short Grass Pasture Kv= 7.0 fps
0.2					**Direct Entry, DE1**
6.0	118	Total			

Summary for Subcatchment PS-05: PS-05

Runoff = 0.3 cfs @ 12.10 hrs, Volume= 1,057 cf, Depth> 2.24"
Routed to Pond YD-23 : YD-23/24

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
1,448	98	Paved Parking, HSG A
2,962	39	>75% Grass cover, Good, HSG A
1,260	98	Unconnected Pavement, HSG A
5,670	67	Weighted Average
2,962		52.24% Pervious Area
2,708		47.76% Impervious Area
1,260		46.53% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	62	0.0700	0.26		**Sheet Flow, SF1** Grass: Short n= 0.150 P2= 3.22"
0.6	40	0.0200	1.15		**Sheet Flow, SF1** Smooth surfaces n= 0.011 P2= 3.22"
0.3	50	0.0200	2.87		**Shallow Concentrated Flow, SCF1** Paved Kv= 20.3 fps
1.1					**Direct Entry, DE1**
6.0	152	Total			

Summary for Subcatchment PS-06: PS-06

Runoff = 0.9 cfs @ 12.10 hrs, Volume= 3,404 cf, Depth> 5.14"
Routed to Pond CB-31 : CB-31

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
6,606	98	Paved Parking, HSG A
208	39	>75% Grass cover, Good, HSG A
1,140	98	Unconnected Pavement, HSG A
7,954	96	Weighted Average
208		2.62% Pervious Area
7,746		97.38% Impervious Area
1,140		14.72% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	17	0.0700	0.20		**Sheet Flow, SF1** Grass: Short n= 0.150 P2= 3.22"
0.5	24	0.0100	0.79		**Sheet Flow, SF2** Smooth surfaces n= 0.011 P2= 3.22"
5.4	48	0.0200	0.15		**Sheet Flow, SF3** Grass: Short n= 0.150 P2= 3.22"
7.3	89	Total			

Summary for Subcatchment PS-07: PS-07

Runoff = 1.5 cfs @ 12.00 hrs, Volume= 4,052 cf, Depth> 4.25"
Routed to Pond CB-53 : CB-53

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
9,073	98	Paved Parking, HSG A
1,912	39	>75% Grass cover, Good, HSG A
452	98	Unconnected Pavement, HSG A
11,437	88	Weighted Average
1,912		16.72% Pervious Area
9,525		83.28% Impervious Area
452		4.75% Unconnected

Summary for Subcatchment PS-08: PS-08

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 1,087 cf, Depth> 3.93"
Routed to Pond CB-37 : CB-37

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
2,469	98	Paved Parking, HSG A
703	39	>75% Grass cover, Good, HSG A
145	98	Unconnected Pavement, HSG A
3,317	85	Weighted Average
703		21.19% Pervious Area
2,614		78.81% Impervious Area
145		5.55% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	8	0.0100	0.08		**Sheet Flow, SF1** Grass: Short n= 0.150 P2= 3.22"
0.5	30	0.0150	0.97		**Sheet Flow, SF1** Smooth surfaces n= 0.011 P2= 3.22"
3.8					**Direct Entry, DE1**
6.0	38	Total			

Summary for Subcatchment PS-09: PS-09

Runoff = 0.5 cfs @ 12.09 hrs, Volume= 1,538 cf, Depth> 4.04"
Routed to Pond CB-51 : CB-51

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
3,623	98	Paved Parking, HSG A
948	39	>75% Grass cover, Good, HSG A
4,571	86	Weighted Average
948		20.74% Pervious Area
3,623		79.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	20	0.0100	0.09		**Sheet Flow, SF1** Grass: Short n= 0.150 P2= 3.22"
0.8	40	0.0100	0.87		**Sheet Flow, SF2** Smooth surfaces n= 0.011 P2= 3.22"
1.6					**Direct Entry, DE1**
6.0	60	Total			

Summary for Subcatchment PS-10: PS-10

Runoff = 0.1 cfs @ 12.14 hrs, Volume= 484 cf, Depth> 3.14"
Routed to Pond CB38A : CB-38A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
957	98	Paved Parking, HSG A
246	98	Unconnected Pavement, HSG A
648	39	>75% Grass cover, Good, HSG A
1,851	77	Weighted Average
648		35.01% Pervious Area
1,203		64.99% Impervious Area
246		20.45% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	40	0.0150	0.13		**Sheet Flow, SF1** Grass: Short n= 0.150 P2= 3.22"
0.2	6	0.0100	0.60		**Sheet Flow, SF2** Smooth surfaces n= 0.011 P2= 3.22"
3.0	23	0.0200	0.13		**Sheet Flow, SF3** Grass: Short n= 0.150 P2= 3.22"
0.6	32	0.0100	0.83		**Sheet Flow, SF4** Smooth surfaces n= 0.011 P2= 3.22"
0.5	86	0.0200	2.87		**Shallow Concentrated Flow, SCF1** Paved Kv= 20.3 fps
9.6	187	Total			

Summary for Subcatchment PS-11: PS-11

Runoff = 0.2 cfs @ 12.17 hrs, Volume= 1,247 cf, Depth> 0.59"
Routed to Link PPOI-01 : POI-01

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
23,084	39	>75% Grass cover, Good, HSG A
2,118	96	Gravel Surface, HSG A
25,202	44	Weighted Average
25,202		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	8	0.0100	0.08		**Sheet Flow, SF1** Grass: Short n= 0.150 P2= 3.22"
1.1	92	0.0200	1.36		**Sheet Flow, SF2** Smooth surfaces n= 0.011 P2= 3.22"
0.5	86	0.0200	2.87		**Shallow Concentrated Flow, SCF1** Paved Kv= 20.3 fps
3.3	186	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PS-12: PS-12

Runoff = 1.4 cfs @ 12.15 hrs, Volume= 5,110 cf, Depth> 3.04"
Routed to Pond CB-33 : CB-33

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
11,205	98	Paved Parking, HSG A
1,611	98	Unconnected Pavement, HSG A
7,353	39	>75% Grass cover, Good, HSG A
20,169	76	Weighted Average
7,353		36.46% Pervious Area
12,816		63.54% Impervious Area
1,611		12.57% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	100	0.0300	0.20		**Sheet Flow, SF1** Grass: Short n= 0.150 P2= 3.22"
2.4	142	0.0200	0.99		**Shallow Concentrated Flow, SCF1** Short Grass Pasture Kv= 7.0 fps
10.7	242	Total			

Summary for Subcatchment PS-13: PS-13

Runoff = 0.1 cfs @ 12.33 hrs, Volume= 551 cf, Depth> 0.59"
Routed to Link PPOI-01 : POI-01

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Adj	Description
1,717	98		Unconnected Pavement, HSG A
9,451	39		>75% Grass cover, Good, HSG A
11,168	48	44	Weighted Average, UI Adjusted
9,451			84.63% Pervious Area
1,717			15.37% Impervious Area
1,717			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	40	0.0200	0.14		**Sheet Flow, SF1** Grass: Short n= 0.150 P2= 3.22"
0.2	6	0.0100	0.60		**Sheet Flow, SF2** Smooth surfaces n= 0.011 P2= 3.22"
5.8	52	0.0200	0.15		**Sheet Flow, SF3** Grass: Short n= 0.150 P2= 3.22"
0.4	22	0.0200	0.99		**Shallow Concentrated Flow, SCF1** Short Grass Pasture Kv= 7.0 fps
11.1	120	Total			

Summary for Subcatchment PS-14: PS-14

Runoff = 1.1 cfs @ 12.00 hrs, Volume= 3,260 cf, Depth> 5.37"
Routed to Pond CB-12 : CB-12

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
7,282	98	Roofs, HSG A
7,282		100.00% Impervious Area

Summary for Subcatchment PS-15: PS-15

Runoff = 0.0 cfs @ 12.22 hrs, Volume= 125 cf, Depth> 0.49"
Routed to Pond CB-38B : CB-38B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Adj	Description
2,706	39		>75% Grass cover, Good, HSG A
364	98		Unconnected Pavement, HSG A
3,070	46	42	Weighted Average, UI Adjusted
2,706			88.14% Pervious Area
364			11.86% Impervious Area
364			100.00% Unconnected

Summary for Subcatchment PS-16: PS-16

Runoff = 1.4 cfs @ 12.00 hrs, Volume= 4,211 cf, Depth> 5.37"
Routed to Pond MH-47 : YD&MH-47

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
9,405	98	Roofs, HSG A
9,405		100.00% Impervious Area

Summary for Subcatchment PS-17: PS-17

Runoff = 0.6 cfs @ 12.02 hrs, Volume= 2,037 cf, Depth> 1.09"
Routed to Pond MH-47 : YD&MH-47

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Adj	Description
15,946	39		>75% Grass cover, Good, HSG A
3,563	98		Unconnected Pavement, HSG A
2,913	96		Gravel Surface, HSG A
22,422	56	52	Weighted Average, UI Adjusted
18,859			84.11% Pervious Area
3,563			15.89% Impervious Area
3,563			100.00% Unconnected

Summary for Subcatchment PS-18: PS-18

Runoff = 0.7 cfs @ 12.00 hrs, Volume= 2,316 cf, Depth> 5.37"
Routed to Pond MH-47 : YD&MH-47

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
5,173	98	Roofs, HSG A
5,173		100.00% Impervious Area

Summary for Subcatchment PS-19: PS-19

Runoff = 0.8 cfs @ 12.14 hrs, Volume= 3,430 cf, Depth> 5.37"
Routed to Pond CB-14 : CB-14

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
7,672	98	Roofs, HSG A
7,672		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	100	0.0200	0.17		**Sheet Flow, SF1** Grass: Short n= 0.150 P2= 3.22"
0.7	40	0.0200	0.99		**Shallow Concentrated Flow, SCF1** Short Grass Pasture Kv= 7.0 fps
10.5	140	Total			

Summary for Subcatchment PS-20: PS-20

Runoff = 0.5 cfs @ 12.00 hrs, Volume= 1,455 cf, Depth> 5.37"
Routed to Pond MH-47 : YD&MH-47

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
3,251	98	Roofs, HSG A
3,251		100.00% Impervious Area

Summary for Subcatchment PS-21: PS-21

Runoff = 0.7 cfs @ 12.00 hrs, Volume= 2,238 cf, Depth> 5.37"
Routed to Pond YD-23 : YD-23/24

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
4,999	98	Roofs, HSG A
4,999		100.00% Impervious Area

Summary for Subcatchment PS-22: PS-22

Runoff = 0.0 cfs @ 12.40 hrs, Volume= 70 cf, Depth> 0.21"
Routed to Link PPOI-02 : POI-02

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=5.61"

Area (sf)	CN	Description
2,736	39	>75% Grass cover, Good, HSG A
1,208	30	Woods, Good, HSG A
3,944	36	Weighted Average
3,944		100.00% Pervious Area

Summary for Pond CB-01: CB-11

Inflow Area = 33,190 sf, 70.39% Impervious, Inflow Depth > 3.53" for 10-Year event
Inflow = 3.1 cfs @ 12.09 hrs, Volume= 9,756 cf
Outflow = 3.1 cfs @ 12.09 hrs, Volume= 9,756 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.1 cfs @ 12.09 hrs, Volume= 9,756 cf
Routed to Pond CB-12 : CB-12

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 61.91' @ 12.09 hrs
Flood Elev= 65.15'

Device	Routing	Invert	Outlet Devices
#1	Primary	60.75'	**12.0" Round Culvert** L= 140.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 60.75' / 59.05' S= 0.0121 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.0 cfs @ 12.09 hrs HW=61.88' TW=59.13' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 3.0 cfs @ 3.84 fps)

Summary for Pond CB-12: CB-12

Inflow Area = 40,472 sf, 75.71% Impervious, Inflow Depth > 3.86" for 10-Year event
Inflow = 3.6 cfs @ 12.07 hrs, Volume= 13,016 cf
Outflow = 3.6 cfs @ 12.07 hrs, Volume= 13,016 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.6 cfs @ 12.07 hrs, Volume= 13,016 cf
Routed to Pond MH-13 : MH-13

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 59.17' @ 12.07 hrs
Flood Elev= 64.45'

Device	Routing	Invert	Outlet Devices
#1	Primary	57.75'	**12.0" Round Culvert** L= 170.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 57.75' / 53.15' S= 0.0271 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.6 cfs @ 12.07 hrs HW=59.14' TW=50.69' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 3.6 cfs @ 4.53 fps)

Summary for Pond CB-14: CB-14

Inflow Area = 7,672 sf,100.00% Impervious, Inflow Depth > 5.37" for 10-Year event
Inflow = 0.8 cfs @ 12.14 hrs, Volume= 3,430 cf
Outflow = 0.8 cfs @ 12.14 hrs, Volume= 3,430 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.8 cfs @ 12.14 hrs, Volume= 3,430 cf
Routed to Pond MH-15 : MH-15

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 53.73' @ 20.60 hrs
Flood Elev= 56.48'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.40'	**12.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.40' / 51.90' S= 0.0111 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.8 cfs @ 12.14 hrs HW=52.87' TW=52.30' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.8 cfs @ 3.26 fps)

Summary for Pond CB-21: CB-21

Inflow Area = 5,079 sf, 87.77% Impervious, Inflow Depth > 4.57" for 10-Year event
Inflow = 0.5 cfs @ 12.11 hrs, Volume= 1,935 cf
Outflow = 0.5 cfs @ 12.11 hrs, Volume= 1,935 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.5 cfs @ 12.11 hrs, Volume= 1,935 cf
Routed to Pond MH-22 : MH-22

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 53.38' @ 12.11 hrs
Flood Elev= 57.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	53.00'	**12.0" Round Culvert** L= 69.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.00' / 52.35' S= 0.0094 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.5 cfs @ 12.11 hrs HW=53.37' TW=50.87' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.5 cfs @ 2.97 fps)

Summary for Pond CB-25: CB-25

Inflow Area = 26,207 sf, 79.36% Impervious, Inflow Depth > 4.16" for 10-Year event
Inflow = 2.5 cfs @ 12.07 hrs, Volume= 9,075 cf
Outflow = 2.5 cfs @ 12.07 hrs, Volume= 9,075 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.5 cfs @ 12.07 hrs, Volume= 9,075 cf
Routed to Pond MH-26 : MH-26

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 53.82' @ 12.07 hrs
Flood Elev= 58.14'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.90'	**12.0" Round Culvert** L= 29.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.90' / 52.35' S= 0.0190 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.4 cfs @ 12.07 hrs HW=53.80' TW=50.96' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 2.4 cfs @ 3.24 fps)

Summary for Pond CB-31: CB-31

Inflow Area = 7,954 sf, 97.38% Impervious, Inflow Depth > 5.14" for 10-Year event
Inflow = 0.9 cfs @ 12.10 hrs, Volume= 3,404 cf
Outflow = 0.9 cfs @ 12.10 hrs, Volume= 3,403 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.9 cfs @ 12.10 hrs, Volume= 3,403 cf
Routed to Pond MH-32 : MH-32

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 58.03' @ 16.00 hrs
Flood Elev= 59.68'

Device	Routing	Invert	Outlet Devices
#1	Primary	55.45'	**12.0" Round Culvert** L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.45' / 55.25' S= 0.0143 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.9 cfs @ 12.10 hrs HW=55.98' TW=53.57' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.9 cfs @ 3.23 fps)

Summary for Pond CB-33: CB-33

Inflow Area = 20,169 sf, 63.54% Impervious, Inflow Depth > 3.04" for 10-Year event
Inflow = 1.4 cfs @ 12.15 hrs, Volume= 5,110 cf
Outflow = 1.4 cfs @ 12.15 hrs, Volume= 5,110 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.4 cfs @ 12.15 hrs, Volume= 5,110 cf
Routed to Pond CB-34 : CB-34

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 58.03' @ 16.12 hrs
Flood Elev= 59.11'

Device	Routing	Invert	Outlet Devices
#1	Primary	55.00'	**12.0" Round Culvert** L= 96.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.00' / 54.45' S= 0.0057 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.3 cfs @ 12.15 hrs HW=55.72' TW=55.07' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.3 cfs @ 3.11 fps)

Summary for Pond CB-34: CB-34

```
Inflow Area =        20,169 sf,  63.54% Impervious,  Inflow Depth >   3.04"    for  10-Year event
Inflow      =        1.4 cfs @   12.15 hrs,  Volume=          5,110 cf
Outflow     =        1.4 cfs @   12.15 hrs,  Volume=          5,107 cf,  Atten= 0%,  Lag= 0.0 min
Primary     =        1.4 cfs @   12.15 hrs,  Volume=          5,107 cf
    Routed to Pond MH-35 : MH-35
```

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 58.03' @ 16.07 hrs
Flood Elev= 61.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	54.35'	**12.0" Round Culvert** L= 70.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 54.35' / 53.95' S= 0.0057 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.3 cfs @ 12.15 hrs HW=55.07' TW=54.58' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.3 cfs @ 2.97 fps)

Summary for Pond CB-37: CB-37

```
Inflow Area =         3,317 sf,  78.81% Impervious,  Inflow Depth >   3.93"    for  10-Year event
Inflow      =        0.3 cfs @   12.09 hrs,  Volume=          1,087 cf
Outflow     =        0.3 cfs @   12.09 hrs,  Volume=          1,087 cf,  Atten= 0%,  Lag= 0.0 min
Primary     =        0.3 cfs @   12.09 hrs,  Volume=          1,087 cf
    Routed to Pond MH-36 : MH-36
```

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 58.94' @ 12.09 hrs
Flood Elev= 62.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	58.65'	**12.0" Round Culvert** L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 58.65' / 58.45' S= 0.0222 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.3 cfs @ 12.09 hrs HW=58.93' TW=53.69' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.3 cfs @ 1.81 fps)

Summary for Pond CB-38B: CB-38B

Inflow Area = 3,070 sf, 11.86% Impervious, Inflow Depth > 0.49" for 10-Year event
Inflow = 0.0 cfs @ 12.22 hrs, Volume= 125 cf
Outflow = 0.0 cfs @ 12.22 hrs, Volume= 125 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.0 cfs @ 12.22 hrs, Volume= 125 cf
Routed to Pond MH-35 : MH-35

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 61.71' @ 12.22 hrs
Flood Elev= 67.13'

Device	Routing	Invert	Outlet Devices
#1	Primary	61.65'	**12.0" Round Culvert** L= 79.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 61.65' / 59.20' S= 0.0310 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.0 cfs @ 12.22 hrs HW=61.71' TW=54.66' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.0 cfs @ 0.82 fps)

Summary for Pond CB-51: CB-51

Inflow Area = 4,571 sf, 79.26% Impervious, Inflow Depth > 4.04" for 10-Year event
Inflow = 0.5 cfs @ 12.09 hrs, Volume= 1,538 cf
Outflow = 0.5 cfs @ 12.09 hrs, Volume= 1,538 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.5 cfs @ 12.09 hrs, Volume= 1,538 cf
Routed to Pond MH-52 : MH-52

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 58.65' @ 12.09 hrs
Flood Elev= 62.47'

Device	Routing	Invert	Outlet Devices
#1	Primary	58.30'	**12.0" Round Culvert** L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 58.30' / 57.90' S= 0.0118 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.5 cfs @ 12.09 hrs HW=58.64' TW=54.63' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.5 cfs @ 2.94 fps)

Summary for Pond CB-53: CB-53

Inflow Area = 11,437 sf, 83.28% Impervious, Inflow Depth > 4.25" for 10-Year event
Inflow = 1.5 cfs @ 12.00 hrs, Volume= 4,052 cf
Outflow = 1.5 cfs @ 12.00 hrs, Volume= 4,052 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.5 cfs @ 12.00 hrs, Volume= 4,052 cf
Routed to Pond MH-54 : MH-54

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 56.66' @ 12.00 hrs
Flood Elev= 60.04'

Device	Routing	Invert	Outlet Devices
#1	Primary	55.90'	**12.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.90' / 55.68' S= 0.0055 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.4 cfs @ 12.00 hrs HW=56.65' TW=54.93' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 1.4 cfs @ 3.16 fps)

Summary for Pond CB38A: CB-38A

Inflow Area = 1,851 sf, 64.99% Impervious, Inflow Depth > 3.14" for 10-Year event
Inflow = 0.1 cfs @ 12.14 hrs, Volume= 484 cf
Outflow = 0.1 cfs @ 12.14 hrs, Volume= 484 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.1 cfs @ 12.14 hrs, Volume= 484 cf
Routed to Pond MH-35 : MH-35

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 58.58' @ 12.14 hrs
Flood Elev= 62.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	58.40'	**12.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 58.40' / 58.00' S= 0.0211 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.1 cfs @ 12.14 hrs HW=58.58' TW=54.56' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.1 cfs @ 1.43 fps)

Summary for Pond MH-13: MH-13

Inflow Area = 40,472 sf, 75.71% Impervious, Inflow Depth > 3.86" for 10-Year event
Inflow = 3.6 cfs @ 12.07 hrs, Volume= 13,016 cf
Outflow = 3.6 cfs @ 12.07 hrs, Volume= 12,996 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.6 cfs @ 12.07 hrs, Volume= 12,996 cf
Routed to Pond PST-01 : ST-01

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 53.78' @ 23.31 hrs
Flood Elev= 58.32'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.55'	**24.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 49.55' / 49.55' S= 0.0000 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.0 cfs @ 12.07 hrs HW=50.69' TW=50.74' (Dynamic Tailwater)
↰**1=Culvert** (Controls 0.0 cfs)

Summary for Pond MH-15: MH-15

Inflow Area = 7,672 sf,100.00% Impervious, Inflow Depth > 5.37" for 10-Year event
Inflow = 0.8 cfs @ 12.14 hrs, Volume= 3,430 cf
Outflow = 0.8 cfs @ 12.14 hrs, Volume= 3,431 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.8 cfs @ 12.14 hrs, Volume= 3,431 cf
Routed to Pond MH-16 : MH-16

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 53.74' @ 23.40 hrs
Flood Elev= 57.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.80'	**12.0" Round Culvert** L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.80' / 51.65' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.8 cfs @ 12.14 hrs HW=52.30' TW=50.85' (Dynamic Tailwater)
↰**1=Culvert** (Barrel Controls 0.8 cfs @ 3.07 fps)

Summary for Pond MH-16: MH-16

Inflow Area = 7,672 sf,100.00% Impervious, Inflow Depth > 5.37" for 10-Year event
Inflow = 0.8 cfs @ 12.14 hrs, Volume= 3,431 cf
Outflow = 0.8 cfs @ 12.14 hrs, Volume= 3,418 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.8 cfs @ 12.14 hrs, Volume= 3,418 cf
Routed to Pond PST-01 : ST-01

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 53.74' @ 22.40 hrs
Flood Elev= 57.29'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.55'	**24.0" Round Culvert** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 49.55' / 49.55' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.0 cfs @ 12.14 hrs HW=50.85' TW=51.09' (Dynamic Tailwater)
↰**1=Culvert** (Controls 0.0 cfs)

Summary for Pond MH-17: MH-17

Inflow Area = 172,050 sf, 71.41% Impervious, Inflow Depth = 0.03" for 10-Year event
Inflow = 0.1 cfs @ 15.92 hrs, Volume= 386 cf
Outflow = 0.1 cfs @ 15.92 hrs, Volume= 386 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.1 cfs @ 15.92 hrs, Volume= 386 cf
Routed to Link PPOI-03 : POI-03

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 50.81' @ 15.92 hrs
Flood Elev= 57.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.70'	**15.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 50.70' / 50.00' S= 0.0117 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.1 cfs @ 15.92 hrs HW=50.81' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.1 cfs @ 1.71 fps)

Summary for Pond MH-22: MH-22

Inflow Area = 5,079 sf, 87.77% Impervious, Inflow Depth > 4.57" for 10-Year event
Inflow = 0.5 cfs @ 12.11 hrs, Volume= 1,935 cf
Outflow = 0.5 cfs @ 12.11 hrs, Volume= 1,930 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.5 cfs @ 12.11 hrs, Volume= 1,930 cf
Routed to Pond PST-02 : ST-02

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 52.71' @ 17.75 hrs
Flood Elev= 57.73'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.10'	**24.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 50.10' / 50.10' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.0 cfs @ 12.11 hrs HW=50.87' TW=51.06' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.0 cfs)

Summary for Pond MH-26: MH-26

Inflow Area = 26,207 sf, 79.36% Impervious, Inflow Depth > 4.16" for 10-Year event
Inflow = 2.5 cfs @ 12.07 hrs, Volume= 9,075 cf
Outflow = 2.5 cfs @ 12.07 hrs, Volume= 9,065 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.5 cfs @ 12.07 hrs, Volume= 9,065 cf
Routed to Pond PST-02 : ST-02

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 52.75' @ 18.75 hrs
Flood Elev= 57.06'

Device	Routing	Invert	Outlet Devices
#1	Primary	50.10'	**24.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 50.10' / 50.10' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=1.5 cfs @ 12.07 hrs HW=50.96' TW=50.88' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.5 cfs @ 1.69 fps)

Summary for Pond MH-27: MH-27

Inflow Area = 123,906 sf, 68.23% Impervious, Inflow Depth = 0.04" for 10-Year event
Inflow = 0.1 cfs @ 15.92 hrs, Volume= 386 cf
Outflow = 0.1 cfs @ 15.92 hrs, Volume= 386 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.1 cfs @ 15.92 hrs, Volume= 386 cf
Routed to Pond MH-17 : MH-17

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 51.42' @ 15.92 hrs
Flood Elev= 58.94'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.30'	**15.0" Round Culvert** L= 67.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.30' / 50.60' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.1 cfs @ 15.92 hrs HW=51.42' TW=50.81' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.1 cfs @ 1.55 fps)

Summary for Pond MH-32: MH-32

Inflow Area = 7,954 sf, 97.38% Impervious, Inflow Depth > 5.13" for 10-Year event
Inflow = 0.9 cfs @ 12.10 hrs, Volume= 3,403 cf
Outflow = 0.9 cfs @ 12.10 hrs, Volume= 3,399 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.9 cfs @ 12.10 hrs, Volume= 3,399 cf
Routed to Pond PST-03 : ST-03

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 58.03' @ 15.95 hrs
Flood Elev= 60.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.50'	**24.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.50' / 52.50' S= 0.0000 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.0 cfs @ 12.10 hrs HW=53.57' TW=53.86' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.0 cfs)

Summary for Pond MH-35: MH-35

Inflow Area = 25,090 sf, 57.33% Impervious, Inflow Depth > 2.73" for 10-Year event
Inflow = 1.6 cfs @ 12.15 hrs, Volume= 5,715 cf
Outflow = 1.6 cfs @ 12.15 hrs, Volume= 5,715 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.6 cfs @ 12.15 hrs, Volume= 5,715 cf
Routed to Pond MH-36 : MH-36

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 58.03' @ 16.02 hrs
Flood Elev= 63.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	53.85'	**12.0" Round Culvert** L= 96.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.85' / 52.80' S= 0.0109 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.2 cfs @ 12.15 hrs HW=54.58' TW=54.09' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.2 cfs @ 2.72 fps)

Summary for Pond MH-36: MH-36

Inflow Area = 28,407 sf, 59.83% Impervious, Inflow Depth > 2.87" for 10-Year event
Inflow = 1.8 cfs @ 12.14 hrs, Volume= 6,802 cf
Outflow = 1.8 cfs @ 12.14 hrs, Volume= 6,803 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.8 cfs @ 12.14 hrs, Volume= 6,803 cf
Routed to Pond PST-03 : ST-03

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 58.03' @ 15.97 hrs
Flood Elev= 62.64'

Device	Routing	Invert	Outlet Devices
#1	Primary	52.50'	**12.0" Round Culvert** L= 8.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 52.50' / 52.50' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.0 cfs @ 12.14 hrs HW=54.01' TW=54.12' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.0 cfs)

Summary for Pond MH-39A: MH-39A

Inflow Area = 92,620 sf, 64.01% Impervious, Inflow Depth = 0.05" for 10-Year event
Inflow = 0.1 cfs @ 15.92 hrs, Volume= 386 cf
Outflow = 0.1 cfs @ 15.92 hrs, Volume= 386 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.1 cfs @ 15.92 hrs, Volume= 386 cf
Routed to Pond MH-27 : MH-27

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 53.56' @ 15.92 hrs
Flood Elev= 58.14'

Device	Routing	Invert	Outlet Devices
#1	Primary	53.45'	**15.0" Round Culvert** L= 167.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.45' / 51.40' S= 0.0123 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.1 cfs @ 15.92 hrs HW=53.56' TW=51.42' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.1 cfs @ 1.13 fps)

Summary for Pond MH-39B: MH-39B

Inflow Area = 92,620 sf, 64.01% Impervious, Inflow Depth = 0.05" for 10-Year event
Inflow = 0.1 cfs @ 15.92 hrs, Volume= 386 cf
Outflow = 0.1 cfs @ 15.92 hrs, Volume= 386 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.1 cfs @ 15.92 hrs, Volume= 386 cf
Routed to Pond MH-39A : MH-39A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 54.52' @ 15.92 hrs
Flood Elev= 58.14'

Device	Routing	Invert	Outlet Devices
#1	Primary	54.40'	**12.0" Round Culvert** L= 90.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 54.40' / 53.45' S= 0.0106 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.1 cfs @ 15.92 hrs HW=54.52' TW=53.56' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.1 cfs @ 1.70 fps)

Summary for Pond MH-47: YD&MH-47

Inflow Area = 40,251 sf, 53.15% Impervious, Inflow Depth > 2.99" for 10-Year event
Inflow = 3.2 cfs @ 12.00 hrs, Volume= 10,019 cf
Outflow = 3.2 cfs @ 12.00 hrs, Volume= 10,019 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.2 cfs @ 12.00 hrs, Volume= 10,019 cf
Routed to Pond PST-04 : ST-04

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 52.58' @ 13.71 hrs
Flood Elev= 58.65'

Device	Routing	Invert	Outlet Devices
#1	Primary	51.50'	**24.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.50' / 51.50' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=3.1 cfs @ 12.00 hrs HW=52.45' TW=51.75' (Dynamic Tailwater)
↑└─**1=Culvert** (Barrel Controls 3.1 cfs @ 3.08 fps)

Summary for Pond MH-52: MH-52

Inflow Area = 4,571 sf, 79.26% Impervious, Inflow Depth > 4.04" for 10-Year event
Inflow = 0.5 cfs @ 12.09 hrs, Volume= 1,538 cf
Outflow = 0.5 cfs @ 12.09 hrs, Volume= 1,526 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.5 cfs @ 12.09 hrs, Volume= 1,526 cf
Routed to Pond PST-05 : ST-05

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 55.77' @ 15.27 hrs
Flood Elev= 62.22'

Device	Routing	Invert	Outlet Devices
#1	Primary	54.10'	**24.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 54.10' / 54.10' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.0 cfs @ 12.09 hrs HW=54.63' TW=54.74' (Dynamic Tailwater)
↑└─**1=Culvert** (Controls 0.0 cfs)

Summary for Pond MH-54: MH-54

Inflow Area = 11,437 sf, 83.28% Impervious, Inflow Depth > 4.25" for 10-Year event
Inflow = 1.5 cfs @ 12.00 hrs, Volume= 4,052 cf
Outflow = 1.5 cfs @ 12.00 hrs, Volume= 4,050 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.5 cfs @ 12.00 hrs, Volume= 4,050 cf
Routed to Pond PST-05 : ST-05

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 55.59' @ 15.67 hrs
Flood Elev= 61.06'

Device	Routing	Invert	Outlet Devices
#1	Primary	54.10'	**12.0" Round Culvert** L= 7.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 54.10' / 54.10' S= 0.0000 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.4 cfs @ 12.00 hrs HW=54.93' TW=54.47' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 1.4 cfs @ 2.81 fps)

Summary for Pond MH-56: MH-56

Inflow Area = 40,251 sf, 53.15% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond MH-39B : MH-39B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 54.50' @ 0.00 hrs
Flood Elev= 59.33'

Device	Routing	Invert	Outlet Devices
#1	Primary	54.50'	**15.0" Round Culvert** L= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.90' / 54.50' S= -0.0722 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=54.50' TW=54.40' (Dynamic Tailwater)
↑**1=Culvert** (Controls 0.0 cfs)

Summary for Pond PST-01: ST-01

Inflow Area = 48,144 sf, 79.58% Impervious, Inflow Depth > 4.09" for 10-Year event
Inflow = 4.4 cfs @ 12.08 hrs, Volume= 16,414 cf
Outflow = 0.1 cfs @ 8.85 hrs, Volume= 3,682 cf, Atten= 99%, Lag= 0.0 min
Discarded = 0.1 cfs @ 8.85 hrs, Volume= 3,682 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond MH-17 : MH-17

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 53.78' @ 23.26 hrs Surf.Area= 3,539 sf Storage= 12,739 cf

Plug-Flow detention time= 278.7 min calculated for 3,674 cf (22% of inflow)
Center-of-Mass det. time= 88.8 min (874.2 - 785.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	48.70'	5,756 cf	**28.50'W x 124.19'L x 6.75'H Field A** 23,891 cf Overall - 9,502 cf Embedded = 14,390 cf x 40.0% Voids
#2A	49.45'	9,502 cf	**ADS_StormTech MC-4500 b +Cap** x 87 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 87 Chambers in 3 Rows Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf
#3	55.41'	1,062 cf	**28.50'W x 124.19'L x 1.50'H Prismatoid** -Impervious

			5,309 cf Overall x 20.0% Voids
		16,319 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	48.70'	**0.670 in/hr Exfiltration over Horizontal area** Phase-In= 0.04'
#2	Primary	53.60'	**12.0" Round Culvert** L= 45.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.60' / 53.15' S= 0.0099 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	55.00'	**12.0" Horiz. Orifice** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 8.85 hrs HW=48.79' (Free Discharge)
↑└**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=48.70' TW=50.70' (Dynamic Tailwater)
↑└**2=Culvert** (Controls 0.0 cfs)
  ↑└**3=Orifice** (Controls 0.0 cfs)

Summary for Pond PST-02: ST-02

Inflow Area =	31,286 sf, 80.73% Impervious,	Inflow Depth > 4.22" for 10-Year event		
Inflow =	3.0 cfs @	12.08 hrs, Volume=	10,995 cf	
Outflow =	0.1 cfs @	9.65 hrs, Volume=	3,662 cf,	Atten= 98%, Lag= 0.0 min
Discarded =	0.1 cfs @	9.65 hrs, Volume=	3,662 cf	
Primary =	0.0 cfs @	0.00 hrs, Volume=	0 cf	

Routed to Pond MH-27 : MH-27

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 52.75' @ 18.69 hrs Surf.Area= 3,004 sf Storage= 7,597 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 118.1 min (900.2 - 782.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	49.25'	4,916 cf	**37.58'W x 79.92'L x 6.75'H Field A** 20,274 cf Overall - 7,983 cf Embedded = 12,291 cf x 40.0% Voids
#2A	50.00'	7,983 cf	**ADS_StormTech MC-4500 b +Cap** x 72 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 72 Chambers in 4 Rows Cap Storage= 39.5 cf x 2 x 4 rows = 316.0 cf
#3	56.00'	901 cf	**37.58'W x 79.92'L x 1.50'H Prismatoid** -Impervious 4,505 cf Overall x 20.0% Voids
		13,801 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	49.25'	**0.820 in/hr Exfiltration over Horizontal area**
#2	Primary	54.25'	**12.0" Round Culvert** L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 54.25' / 53.95' S= 0.0107 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	55.50'	**12.0" W x 12.0" H Vert. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 9.65 hrs HW=49.34' (Free Discharge)
⮤**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=49.25' TW=51.30' (Dynamic Tailwater)
⮤**2=Culvert** (Controls 0.0 cfs)
  ⮤**3=Grate** (Controls 0.0 cfs)

Summary for Pond PST-03: ST-03

Inflow Area = 36,361 sf, 68.05% Impervious, Inflow Depth > 3.37" for 10-Year event
Inflow = 2.7 cfs @ 12.12 hrs, Volume= 10,202 cf
Outflow = 0.1 cfs @ 15.92 hrs, Volume= 3,411 cf, Atten= 96%, Lag= 228.0 min
Discarded = 0.1 cfs @ 10.10 hrs, Volume= 3,025 cf
Primary = 0.1 cfs @ 15.92 hrs, Volume= 386 cf
Routed to Pond MH-39B : MH-39B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 58.03' @ 15.92 hrs Surf.Area= 1,704 sf Storage= 6,917 cf

Plug-Flow detention time= 277.7 min calculated for 3,404 cf (33% of inflow)
Center-of-Mass det. time= 136.2 min (941.3 - 805.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	51.75'	2,845 cf	**28.50'W x 59.79'L x 6.75'H Field A** 11,502 cf Overall - 4,390 cf Embedded = 7,112 cf x 40.0% Voids
#2A	52.50'	4,390 cf	**ADS_StormTech MC-4500 b +Cap** x 39 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 39 Chambers in 3 Rows Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf
#3	58.50'	1,405 cf	**23.50'W x 59.79'L x 5.00'H Prismatoid** -Impervious 7,025 cf Overall x 20.0% Voids
		8,640 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	51.75'	**1.270 in/hr Exfiltration over Horizontal area** Phase-In= 0.03'
#2	Primary	55.80'	**12.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 55.80' / 55.50' S= 0.0150 '/' Cc= 0.900

```
                            n= 0.013  Corrugated PE, smooth interior,  Flow Area= 0.79 sf
  #3    Device 2       58.00'   12.0" Horiz. Orifice    C= 0.600   Limited to weir flow at low heads

Discarded OutFlow  Max=0.1 cfs @ 10.10 hrs  HW=51.87'   (Free Discharge)
└─1=Exfiltration  (Exfiltration Controls 0.1 cfs)

Primary OutFlow  Max=0.1 cfs @ 15.92 hrs  HW=58.03'  TW=54.52'   (Dynamic Tailwater)
└─2=Culvert  (Passes 0.1 cfs of 5.0 cfs potential flow)
   └─3=Orifice  (Weir Controls 0.1 cfs @ 0.59 fps)
```

Summary for Pond PST-04: ST-04

```
Inflow Area =         40,251 sf,  53.15% Impervious,  Inflow Depth >   2.99"    for  10-Year event
Inflow      =       3.2 cfs @   12.00 hrs,  Volume=          10,019 cf
Outflow     =       0.2 cfs @   11.75 hrs,  Volume=          10,018 cf,  Atten= 94%,  Lag= 0.0 min
Discarded  =        0.2 cfs @   11.75 hrs,  Volume=          10,018 cf
Primary     =       0.0 cfs @    0.00 hrs,  Volume=               0 cf
   Routed to Pond MH-56 : MH-56

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 52.57' @ 13.66 hrs   Surf.Area= 3,094 sf   Storage= 3,692 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 149.1 min ( 919.6 - 770.5 )

Volume      Invert    Avail.Storage   Storage Description
  #1A       50.75'         5,150 cf   64.83'W x 47.72'L x 6.75'H Field A
                                      20,882 cf Overall - 8,007 cf Embedded = 12,875 cf  x 40.0% Voids
  #2A       51.50'         8,007 cf   ADS_StormTech MC-4500 b +Cap  x 70  Inside #1
                                      Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
                                      Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
                                      70 Chambers in 7 Rows
                                      Cap Storage= 39.5 cf x 2 x 7 rows = 553.0 cf
  #3        56.75'        12,297 cf   64.83'W x 47.42'L x 20.00'H Prismatoid -Impervious
                                      61,485 cf Overall  x 20.0% Voids
                          25,454 cf   Total Available Storage

   Storage Group A created with Chamber Wizard

Device  Routing          Invert   Outlet Devices
  #1    Discarded        50.75'   2.750 in/hr Exfiltration over Horizontal area
  #2    Primary          55.75'   12.0"  Round Culvert
                                  L= 68.0'   CPP, square edge headwall,  Ke= 0.500
                                  Inlet / Outlet Invert= 55.75' / 55.00'   S= 0.0110 '/'   Cc= 0.900
                                  n= 0.013  Corrugated PE, smooth interior,  Flow Area= 0.79 sf
  #3    Device 2         57.00'   12.0" Horiz. Orifice/Grate    C= 0.600
                                  Limited to weir flow at low heads
```

Discarded OutFlow Max=0.2 cfs @ 11.75 hrs HW=51.03' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.2 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=50.75' TW=54.50' (Dynamic Tailwater)
└─**2=Culvert** (Controls 0.0 cfs)
  └─**3=Orifice/Grate** (Controls 0.0 cfs)

Summary for Pond PST-05: ST-05

Inflow Area = 16,008 sf, 82.13% Impervious, Inflow Depth > 4.18" for 10-Year event
Inflow = 1.8 cfs @ 12.01 hrs, Volume= 5,576 cf
Outflow = 0.1 cfs @ 11.20 hrs, Volume= 3,365 cf, Atten= 97%, Lag= 0.0 min
Discarded = 0.1 cfs @ 11.20 hrs, Volume= 3,365 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond MH-39B : MH-39B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 55.59' @ 15.62 hrs Surf.Area= 2,048 sf Storage= 3,145 cf

Plug-Flow detention time= 283.0 min calculated for 3,358 cf (60% of inflow)
Center-of-Mass det. time= 181.0 min (972.2 - 791.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	53.35'	3,391 cf	**28.50'W x 71.87'L x 6.75'H Field A** 13,825 cf Overall - 5,349 cf Embedded = 8,477 cf x 40.0% Voids
#2A	54.10'	5,349 cf	**ADS_StormTech MC-4500 b +Cap** x 48 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 48 Chambers in 3 Rows Cap Storage= 39.5 cf x 2 x 3 rows = 237.0 cf
#3	60.10'	4,097 cf	**71.87'W x 28.50'L x 10.00'H Prismatoid** -Impervious 20,483 cf Overall x 20.0% Voids
		12,836 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	53.35'	**1.270 in/hr Exfiltration over Horizontal area** Phase-In= 0.04'
#2	Primary	57.30'	**12.0" Round Culvert** L= 68.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 57.30' / 55.25' S= 0.0301 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	59.50'	**12.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.1 cfs @ 11.20 hrs HW=53.52' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=53.35' TW=54.40' (Dynamic Tailwater)
↑—**2=Culvert** (Controls 0.0 cfs)
  ↑—**3=Grate** (Controls 0.0 cfs)

Summary for Pond YD-23: YD-23/24

Inflow Area = 10,669 sf, 72.24% Impervious, Inflow Depth > 3.71" for 10-Year event
Inflow = 0.9 cfs @ 12.01 hrs, Volume= 3,295 cf
Outflow = 0.9 cfs @ 12.01 hrs, Volume= 3,295 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.9 cfs @ 12.01 hrs, Volume= 3,295 cf
  Routed to Pond CB-25 : CB-25

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 55.24' @ 12.01 hrs
Flood Elev= 58.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	54.75'	**12.0" Round Culvert** L= 151.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 54.75' / 52.90' S= 0.0123 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.9 cfs @ 12.01 hrs HW=55.23' TW=53.72' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.9 cfs @ 2.36 fps)

Summary for Link PPOI-01: POI-01

Inflow Area = 36,370 sf, 4.72% Impervious, Inflow Depth > 0.59" for 10-Year event
Inflow = 0.2 cfs @ 12.26 hrs, Volume= 1,798 cf
Primary = 0.2 cfs @ 12.26 hrs, Volume= 1,798 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PPOI-02: POI-02

Inflow Area = 3,944 sf, 0.00% Impervious, Inflow Depth > 0.21" for 10-Year event
Inflow = 0.0 cfs @ 12.40 hrs, Volume= 70 cf
Primary = 0.0 cfs @ 12.40 hrs, Volume= 70 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PPOI-03: POI-03

```
Inflow Area =      187,003 sf,  65.70% Impervious,  Inflow Depth >   0.09"    for  10-Year event
Inflow      =        0.2 cfs @   12.13 hrs,  Volume=            1,342 cf
Primary     =        0.2 cfs @   12.13 hrs,  Volume=            1,342 cf,  Atten= 0%,  Lag= 0.0 min
```

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

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APPENDIX F – NRCS WEB SOIL REPORT

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United States
Department of
Agriculture

Natural
Resources
Conservation
Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Rockingham County, New Hampshire

35 Sherburne Road

January 23, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:1,780 if printed on A portrait (8.5" x 11") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 25, Sep 12, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
599	Urban land-Hoosic complex, 3 to 15 percent slopes	7.8	100.0%
Totals for Area of Interest		**7.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rockingham County, New Hampshire

599—Urban land-Hoosic complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9cpg
Elevation: 90 to 1,100 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 120 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 55 percent
Hoosic and similar soils: 25 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting

Parent material: Outwash

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam
H2 - 8 to 15 inches: very gravelly fine sandy loam
H3 - 15 to 60 inches: very gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Udorthents

Percent of map unit: 4 percent
Hydric soil rating: No

Eldridge

Percent of map unit: 4 percent
Hydric soil rating: No

Scitico

Percent of map unit: 4 percent
Landform: Marine terraces
Hydric soil rating: Yes

Newfields

Percent of map unit: 4 percent
Hydric soil rating: No

Squamscott

Percent of map unit: 4 percent
Landform: Marine terraces
Hydric soil rating: Yes

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APPENDIX G – GEOTECHINICAL REPORT AND BORINGS

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GEOTECHNICAL REPORT

SHERBURNE ROAD HOUSING DEVELOPMENT
35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE

April 8, 2025

GSI Project No. 225144

Prepared for:

Jack McTigue, PE, CPESC
Project Manager
TF Moran, Inc.
170 Commerce Way, Ste 102
Portsmouth, NH 03801

Prepared by:

Geotechnical Services, Inc.
55 North Stark Highway
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Geotechnical Services Inc.
Geotechnical Engineering Environmental Studies Materials Testing Construction Monitoring

GEOTECHNICAL SERVICES INC.
Geotechnical Engineering · Environmental Studies · Materials Testing · Construction Monitoring

April 8, 2025

Jack McTigue, PE, CPESC
TF Moran, Inc.
170 Commerce Way, Ste 102
Portsmouth, NH 03801
Email: jmctigue@tfmoran.com

**RE: Geotechnical Report
Sherburne Rd Housing Development
35 Sherburne Road,
Portsmouth, NH 03801**

GSI Project No. 225144

Dear Mr. McTigue:

This report presents the results of a geotechnical investigation completed by Geotechnical Services, Inc. (GSI) for the construction of the proposed Housing Development in Portsmouth, New Hampshire. The objective of the geotechnical investigation was to explore subsurface conditions within the proposed development area and formulate geotechnical engineering recommendations for the design and construction of foundations, and floor slabs. Included are the findings of our subsurface exploration program and an engineering evaluation of the subsurface conditions encountered. The contents of this report are subject to the Limitations included in Appendix A.

PURPOSE AND SCOPE

The scope of services performed by GSI to meet the above-stated objectives for geotechnical engineering services included the following:

1. Coordination and observation of eleven (11) test borings at the locations illustrated on the attached Figure 2;

2. Performance of nine (9) borehole permeability tests at the locations illustrated on the attached Figure 2;

3. Evaluation of appropriate foundation systems based on subsurface conditions encountered. Formulation of design parameters for spread footing foundation and slab on-grade construction, including allowable bearing pressure and prediction of long-term settlement values;

4. Formulation of earthwork and foundation construction procedures to be followed during the construction phase of this project;

5. Establishment of seismic design parameters and liquefaction potential based on the subsurface profile and the proposed structure;

6. Preparation of this geotechnical engineering report which summarizes our findings and recommendations.

SITE AND PROJECT INFORMATION

The project involves the construction of a proposed housing development at 35 Sherburne Road in Portsmouth, New Hampshire. The development will consist of two separate apartment buildings and the surrounding parking areas. Currently, a single-story school occupies the site, which consists of the brick school building, parking areas and a ball field. The site is relatively level, with the existing building and parking areas at an approximate elevation of 66 feet. The site then slopes down approximately 10 feet to the ball field to an elevation of about 56 feet. The site is abutted by I-95 to the northwest, commercial properties to the northeast and east, Sherburne Road to the southwest, and Greenland Road to the south. Project information was provided on TF Moran’s test pit and boring layout plan, dated January 29, 2025, as well as draft site and grading plans, dated April 2, 2025.

SUBSURFACE INVESTIGATION

GSI observed a series of eleven (11) test borings located within the proposed building area designated GSI-1 through GSI-11. The borings were advanced to depths of 10 to 30 feet below ground surface. The subsurface explorations classified the on-site soils according to their color, grain size, and other material properties. The test boring program was conducted by Miller Engineering and Testing, Inc. of Manchester, New Hampshire.

Soil explorations were performed in accordance with methods prescribed by ASTM D1586. Soil samples were obtained at the surface and at five-foot intervals with a 1⅜ inch diameter split-spoon sampler. Standard Penetration Tests (SPTs) were performed at the sampling intervals in accordance with ASTM D1586. Field descriptions of the soils encountered, observed depth to groundwater while drilling when observed, and other pertinent observations are contained in the attached test boring logs. The test boring locations are illustrated on Figure 2 of this report. GSI test boring logs are presented in Appendix B.

SUBSURFACE CONDITIONS

Topsoil/ Subsoil

The majority of the test borings were advanced within grassy areas. At ground surface, approximately 4 to 12 inches of topsoil was observed, which was visually classified as dark brown, fine to medium Sand, little Silt, with various grass and plant roots. The topsoil and organic materials will be removed prior to development.

Bituminous Concrete

GSI-3 and GSI-8 were advanced within paved areas. At ground surface, approximately 4 inches of bituminous asphalt concrete was observed. This material will be removed prior to development.

Silty Sand

Test borings GSI-1, GSI-9, and GSI-10 encountered a Silty Sand, which was visually classified as Medium Dense to Very Dense, fine to medium Sand, little to some Silt. This material was observed at depths of 2 to 4 feet and extended to termination depths of 20 feet. N-Values within the silty sand ranged from 28 to over 50 blows per foot.

Sand and Gravel

The predominant soil encountered during the test borings was sand and gravel. The sand and gravel was present from depths of 2 to 4 feet and continued to test boring termination depth of approximately 31-feet. The soil was visually classified as medium dense to very dense, fine to coarse Sand, some Gravel, little Silt. SPT “N” values varied from 15 to over 50 blows per foot.

Groundwater

Groundwater was observed at GSI-4, GSI-5 and GSI-7 following the completion of the test borings at depths ranging from 17.5 to 23 feet below ground surface. Redox activity appears present at 5 feet in B-11, but it is believed to be “relic mottling” as groundwater was not encountered at 10 feet and other borings encountered groundwater at 17 to 23 feet. The ESHWT descends deeper than the infiltration test depths.

Groundwater observations should not be considered long-term, equilibrated groundwater levels, but rather an approximate indication of the likely groundwater elevation during construction. Groundwater levels should be anticipated to fluctuate from those measured during drilling operations in response to differences in equilibrated time, rainfall, snowmelt, and seasonal changes.

LABORATORY RESULTS

A total of five soil samples, one from GSI-2, GSI-3, GSI-4, GSI-5, and GSI-7, were submitted to GSI’s laboratory for sieve analysis testing (ASTM D422), to determine the particle size distribution. This test involves passing a sample through a series of standardized sieves with progressively smaller openings. The amount of material retained on each sieve is weighed, and the results are used to calculate the percentage of material in each size range, providing a detailed particle size distribution curve. The laboratory test results indicate that the soils are typically classified as SP (poorly graded sand) based on the Unified Soil Classification System (USCS). Detailed laboratory results are provided in Appendix D.

FOUNDATION DESIGN RECOMMENDATIONS

GSI recommends that building walls, columns and other structural elements be supported by reinforced concrete spread or strip footings bearing directly upon the native soils described above or structural fill. An allowable bearing pressure of 2 tons per square foot (4,000psf) may then be assumed for design. With regards to footing geometry, the minimum footing width of column and strip footings should be 4 feet and 2 feet, respectively. The spread footings should be founded at least 4 feet below exterior grade to obviate frost action in the bearing strata. If the construction occurs during the winter months, it will be necessary to provide temporary insulation and/or heat application to the foundations.

At the recommended bearing pressures, we anticipate that the total settlement of individual footings under static loading conditions and constructed as recommended herein, will not exceed 1 in., with differential settlements between adjacent footings not exceeding ¾ in. Most of the settlement will likely occur elastically during construction as structure dead loads are placed on the foundations. The live load contribution to foundation settlement is expected to be less than 50% of the dead load thus post construction settlements are not expected to be problematic

ENGINEERING PARAMETER OF ON-SITE SOILS

Based on results of our subsurface exploration program, the following engineering properties of soils that will be supporting foundation elements are estimated as follows:

On-Site Soil Engineering Design Parameters
(TABLE 1)

Soil Type	Friction Angle φ (Degrees)	Cohesion c (psf)	Unit Weight γ (pcf)	Coeff. Of Sliding Friction Soil to Concrete (tan δ)
Silty Sand	32	0	115	0.40
Sand and Gravel	34	0	125	0.45

SEISMIC DESIGN PARAMETERS

Seismic design parameters have been reviewed with respect to the 2021 Edition of the International Building Code. Upon review of the subsurface soils data, the site is to be associated with Site Class “D” and the design of structural elements should reflect this distinction. The subsurface conditions are also not deemed susceptible to earthquake induced “liquefaction.” A Summary of USGS Design Maps is included as Appendix E.

CONCRETE FLOOR SLAB

We recommend that ground floor slabs be designed as slabs-on-grade designed in accordance with ACI 360R-10. The slab should bear directly upon an 8-inch (minimum) layer of compacted Base Course Soil. The subgrade will consist of compacted structural fill or proof-compacted undisturbed soil. The floor slab may thus be designed following the ACI “elastic support” approach, using a modulus of subgrade reaction value, k = 250 pci.

Slabs should be designed to act independently of foundation walls and column footings with isolation joints. Shrinkage cracking may be controlled with welded wire fabric, reinforcing steel, or contraction joints. Contraction joints in plain concrete should not be spaced a distance greater than 30 times the slab thickness. Saw cuts should be made within 12 hours of slab finishing and penetrate at least ¼ the slab thickness or a minimum of 1 inch. Welded wire fabric or reinforcing steel may also be used to widen the control joint spacing.

For moisture sensitive environments, ACI indicates that a sub-slab vapor retarder may be used beneath the concrete slab. The vapor retarder should be at a minimum; 10-mil polyethylene with joints lapped at a minimum of 12 inches. It is emphasized that these are recommendations and that the final decision on the use and location of the sub-slab vapor retarder whether in direct contact with the slab or beneath the layer of compacted Structural Fill should be made considering specific conditions for the project. Factors which may affect this decision include moisture sensitivity of the planned floor finishes, anticipated moisture conditions, including precipitation and exposure before the slab is constructed, and the potential effects of slab curling and cracking. Design guidance is provided in ACI 360R-10, Design of Slabs on Grade, Figure 3-7.

FOUNDATION DRAINAGE, ROOF DRAINAGE, AND SLAB-ON-GRADE DAMP PROOFING RECOMMENDATIONS

Foundation drains are not required as below grade space is not expected to be incorporated into the existing structure. The ground surface immediately adjacent to the foundation should be sloped away from the building to allow for positive drainage. It is recommended that the surficial materials adjacent to the building be relatively impermeable to reduce the volume of precipitation infiltrating into the subsurface. Such impermeable materials may include Portland cement concrete, bituminous concrete, or vegetated silty topsoil. Roof drainage is recommended for the collection of run off because of stormwater. It is recommended that roof drainage and stormwater feature not discharge into foundation drains as applicable.

CONCRETE SIDEWALKS

Where concrete exterior sidewalks are provided, they shall be formed upon a minimum of 12 inches of slab base course or structural fill, which shall be increased to a minimum of 18 inches in the vicinity of exterior doorways, ramps, or other openings for frost protection at building entry points.

BOREHOLE PERMEABILITY TESTING

To evaluate the in-situ hydraulic conductivity of the existing soils in the area of the proposed stormwater systems, borehole permeability testing was performed in accordance with the NHDES Stormwater Manual, Volume Two. For each test, a 4-inch diameter solid pipe was installed to a depth of 6 feet below ground surface at nine locations. After installation, 24 inches of water was added to each pipe and allowed to pre-soak for 24 hours. The following day, each pipe was refilled with 24 inches of water and the drop in water level was measured after one hour (measured from the top of the casing). This process was repeated four times, and the results were averaged. The results of the borehole permeability tests are presented in the table below. Testing locations are outline in Figure 2.

Borehole Permeability Test Results (TABLE 2)

Location	K_{sf} (in/hr)
INF-1	1.3
INF-2	1.4
INF-3	0.8
INF-4	1.1
INF-5	3.0
INF-6	3.5
INF-7	1.6
INF-8	8.4
INF-9	2.6
AVERAGE	**2.6**

Borehole permeability tests were considered appropriate for this project as the area under investigation is an active softball field. Visual examination of the subsurface profile with excavated test pits was therefore precluded due to safety considerations. In the event that NHDES requires test pits be performed, this effort would require that the softball field be abandoned. Test pits result in destruction of the existing landscaping and GSI cannot be held responsible for complete repair.

EARTHWORK RECOMMENDATIONS

Foundation Subgrade Preparation

Prior to foundation construction, any topsoil, subsoil, or loose-fill soils encountered within the building footprint and foundation zone of influence should be removed. Foundation and floor slab subgrades should be proof compacted using a heavy vibratory plate or drum roller prior to foundation construction or placing additional fill in order to densify disturbed soils resulting from excavation and preload the subgrade.

Recommended proof compaction should include 4 passes with a minimum of a 10-ton vibratory roller. During the proof rolling process, the subgrade should be observed by a qualified Geotechnical Engineer to identify areas exhibiting weaving or excessive reaction. Any soils exhibiting excessive reaction should be locally excavated and replaced with free draining structural fill or crushed stone. The foundation subgrade should be observed by a qualified Geotechnical Engineer to verify competency.

Protection of Foundation Subgrades

The contractor must maintain stable, dewatered subgrades for foundations, pavement areas, and utility trenches. Subgrades may be disturbed by improper excavation methods, moisture, precipitation, groundwater control, and construction activities. The contractor should take precautions to protect the bearing subgrade against disturbance from construction traffic and weathering. If necessary, dewatering can be accomplished via open pumping utilizing submersible pumps and temporary stone lined sump pits.

A lift of compacted crushed stone is recommended to protect the subgrade surface from wear and disturbance should water be present within the excavation. The subgrade must still be verified for competency prior to the placement of concrete or backfill materials within the building footprint. If construction activities are to take place during winter months, the contractor should protect the work area from freezing, which may necessitate the use of soil blankets or tents and heaters to protect the subgrade surface.

Construction Dewatering

The site contractor should be prepared to remove any standing water from foundation excavations. If the sumps are unable to control the development of groundwater within the excavation, supplemental dewatering in the form of deep wells or wellpoints may be required. Stormwater runoff developed from storm events should be diverted away from excavation areas to minimize any impoundment in the excavation or disturbance to the foundation subgrades. It is anticipated that groundwater and stormwater may be controlled by localized dewatering efforts employing sumps and pumps.

The groundwater elevation should be maintained at least 12 inches below the foundation grade until backfilling is complete. A lift of crushed stone or free draining structural fill at foundation grade may be utilized if required to facilitate dewatering and provide a dry and stable subgrade during construction.

Backfilling

Backfill in the building area should be placed and compacted in lifts immediately after final excavation to limit disturbance to the subgrade surface. Except for zones requiring special backfill such as directly beneath pavements or exterior slabs, the exterior of foundation walls and other site areas may be backfilled with Common Fill. Placement of compacted fills should not be conducted when air temperatures are low enough (approximately 30°F, or below) to cause freezing of the moisture in the fill during or before placement. Fill materials should not be placed on snow, ice, or uncompacted frozen soil. Compacted fill should not be placed on frozen soil.

No fill should be allowed to freeze prior to compaction. At the end of each day's operations, the last lift of fill, after compaction, should be rolled by a smooth-wheeled roller to eliminate ridges of uncompacted soil.

Minimum compaction requirements for all fill materials are as follows:

Minimum Compaction Requirements
(TABLE 2)

Location or Area	Standard Proctor Density (ASTM D698)	Modified Proctor Density (ASTM D1557)	Testing Frequency One Test Per Lift Per
Building and Slab Subgrades	100%	95%	1,000 ft^2 or 100 lineal feet
Retaining Walls	95%	92%	1,000 ft^2
Pavements (up to 3-ft below finished grade)	95%	92%	2,000 ft^2 or 50 lineal feet
Pavements (in the upper 3-ft)	100%	95%	2,000 ft^2 or 50 lineal feet
Trenches	95%	92%	150 lineal feet
Structures and Walkways	95%	92%	2,000 ft^2
Lawns and Unimproved Areas	92%	90%	20,000 ft^2

Structural Fill

Structural Fill, if required, should consist of clean sand and gravel free of organic material, snow, ice, or other objectionable materials and should be well-graded within the following limits:

Sieve Size	Percent Finer by Weight
4 in.	100
No. 4	30-70
No. 40	10-50
No. 200	0-12.

Other materials could be acceptable for Structural Fill and should be evaluated by the Geotechnical Engineer on a case-by-case basis if proposed by the Contractor.

Structural Fill should be placed in lift thickness not exceeding 12 in. loose measure. Cobbles and boulders having a size exceeding 2/3 of the loose lift thickness should be removed prior to compaction. Compaction in open areas should consist of self-propelled vibratory rollers such as a BoMag BW-60S or equivalent.

In confined areas, hand guided equipment such as a large vibratory plate compactor, should be used and the loose lift thickness should not exceed 6 in. A minimum of four systematic passes of the compaction equipment should be used to compact each lift. Compaction effort should be verified by field density testing.

Common Fill

Common fill may be used to raise grades in paved and landscaped areas, subject to pavement design criteria and landscape planting or drainage requirements. Common fill should be granular mineral soil free from organic materials, loam, wood, trash, snow, ice, frozen soil, and other compressible materials. Common fill should not contain stones larger than 2/3 of the placement lift thickness, and have a maximum 80 percent passing the No. 40 sieve, and a maximum of 30 percent passing the No. 200 sieve. These soils typically would require moisture control during placement and compaction.

Slab Base Course

Slab Base Course beneath building slabs should consist of bank-run sand and gravel, free of organic material, snow, ice, or other unsuitable materials and should be well-graded within the following limits:

Sieve Size	Percent Finer by Weight
2 in.	100
No. 4	40-70
No. 40	25-45
No. 200	0-10

Other materials could be acceptable for compacted Slab Base Course and should be evaluated by the Geotechnical Engineer on a case-by-case basis if proposed by the Contractor.

Slab Base Course should be placed in lift thicknesses not exceeding 8-inches loose measure. In confined areas, hand-guided equipment such as a vibratory plate compactor should be used, and the loose lift thickness should not exceed 6 inches. A minimum of four systematic passes of the compaction equipment should be used to compact each lift.

CONSTRUCTION MONITORING

It is strongly recommended that GSI be retained to provide construction monitoring and testing services in conformance with the requirements of the International Building Code. GSI has the Geotechnical Engineers and Technicians trained and experienced in all facets of monitoring earthwork excavation and construction materials testing, as well as a full-service soils and materials laboratory. As a guide, we have enclosed a Recommended Program for Structural Tests and Inspections for Soils and Foundations, attached as Appendix F of this report.

These services may include:

- Construction Materials Testing of Soils, Aggregates, Concrete, Steel, and Asphalt.
- Design Phase engineering services including preparation of final earthwork specifications, review of contractor submittals, and plan review.
- Construction Phase engineering services on Geotechnical issues and/or differing conditions encountered during construction.

CLOSURE

We trust that you find this report consistent with your needs. Should you have any questions with regard to this report, please do not hesitate to contact our office.

Very truly yours,

GEOTECHNICAL SERVICES, INC.

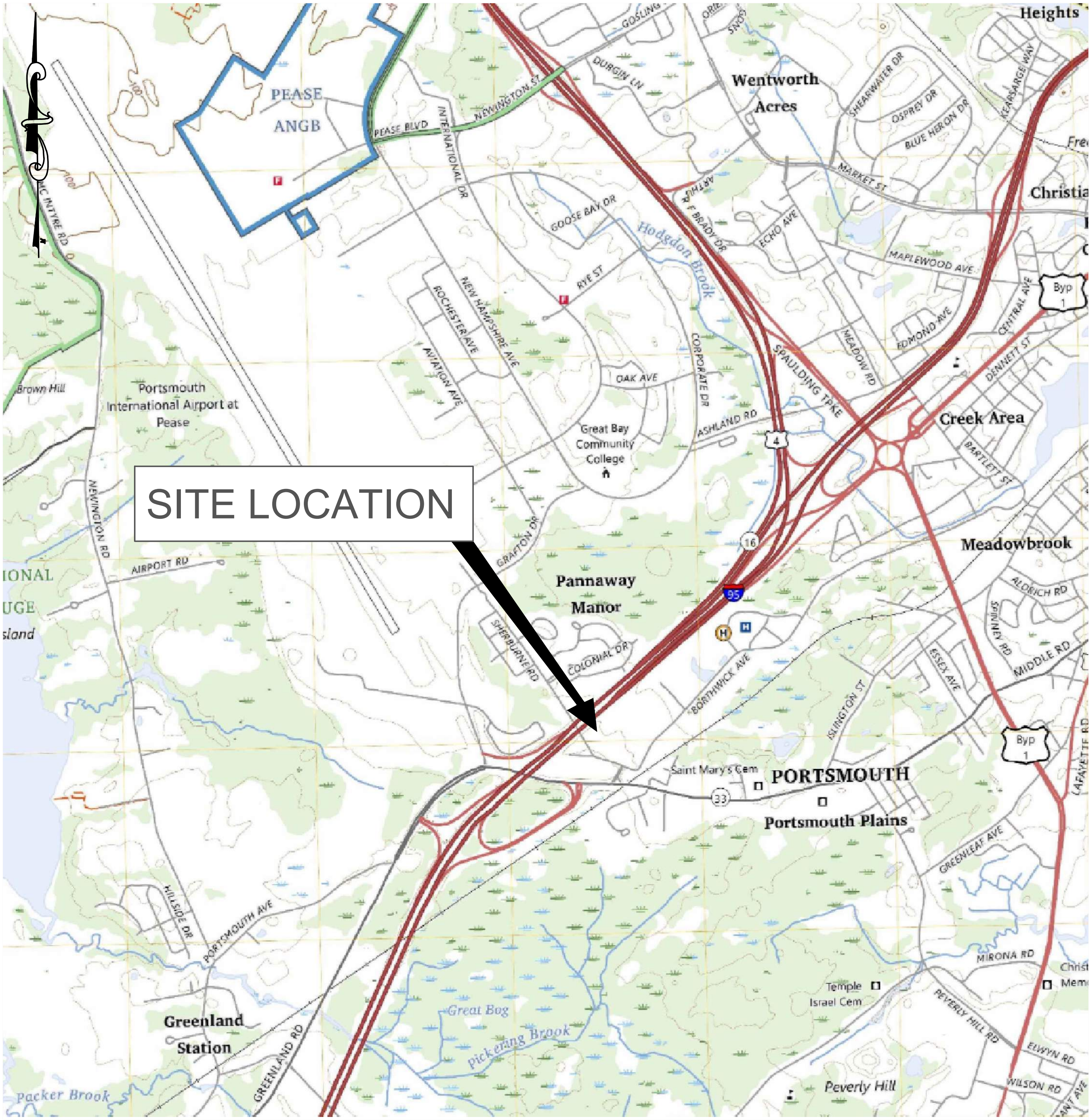
Charles A. Wetherbee, EIT
Staff Engineer

Harry K. Wetherbee, P.E.
Principal Engineer

Attachments:

Figure 1: Locus Map
Figure 2: Exploration Location Plan

Appendix A: Limitations
Appendix B: Exploration Logs
Appendix C: Subsurface Exploration Key
Appendix D: Laboratory Results
Appendix E: USGS Seismic Design Maps
Appendix F: Draft Earthwork Specifications



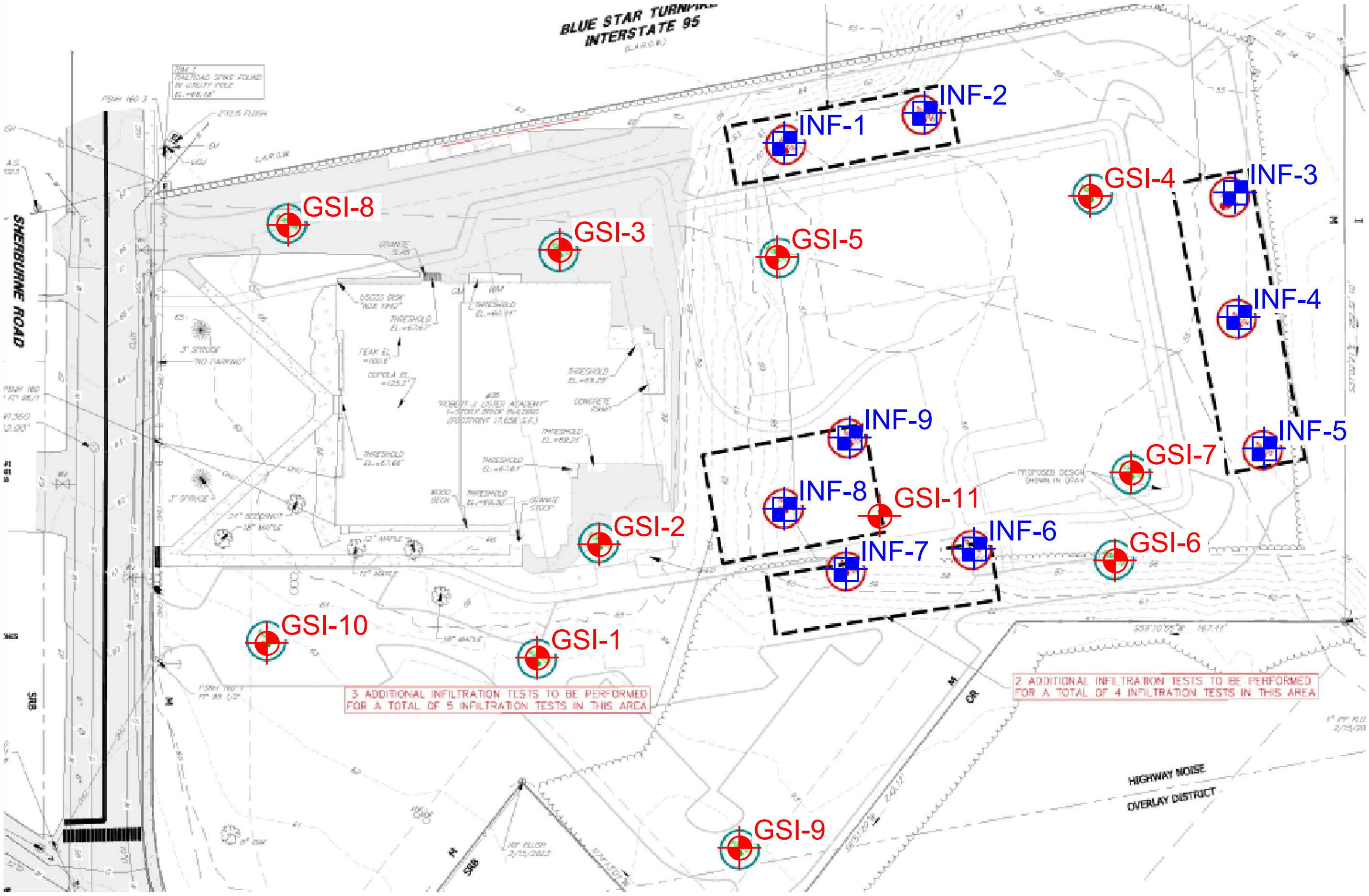
LOCUS MAP

GEOTECHNICAL SERVICES INC.
55 NORTH STARK HIGHWAY, WEARE, NH 03281
TEL. (603) 529-7766 FAX. (603) 529-7780

Sherburne Housing Development
Portsmouth, New Hampshire

DRAWN BY: CAW
CHECKED BY: HKW
FILE NAME: Sherburne Housing.dwg
DATE: April 2025
SCALE: NTS
PROJECT NO.: 225147

FIGURE NO. 1



3 ADDITIONAL INFILTRATION TESTS TO BE PERFORMED FOR A TOTAL OF 5 INFILTRATION TESTS IN THIS AREA

2 ADDITIONAL INFILTRATION TESTS TO BE PERFORMED FOR A TOTAL OF 4 INFILTRATION TESTS IN THIS AREA

● GSI-1 Test Boring Location (Approximate)

■ INF-1 Borehole Permeability Test Location (Approximate)

EXPLORATION LOCATION PLAN

GEOTECHNICAL SERVICES INC.
55 NORTH STARK HIGHWAY, WEARE, NH 03281
TEL. (603) 529-7766   FAX. (603) 529-7780

Sherburne Housing Development
Portsmouth, New Hampshire

DRAWN BY: CAW	DATE: April 2025	FIGURE NO. 2
CHECKED BY: HKW	SCALE: NTS	
FILE NAME: Sherburne Housing.dwg	PROJECT NO.: 225147	

APPENDIX A

LIMITATIONS

LIMITATIONS

Explorations

1. The analyses, recommendations, and designs submitted in this report are based in part upon the data obtained from preliminary subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretation of widely spaced explorations and samples; actual soil transitions are probably more gradual. For specific information, refer to the individual test pit and/or boring logs.

3. Water level readings have been made in the test pits and/or test borings under conditions stated on the logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other factors differing from the time the measurements were made.

Review

4. It is recommended that this firm be given the opportunity to review final design drawings and specifications to evaluate the appropriate implementation of the recommendations provided herein.

5. In the event that any changes in the nature, design, or location of the proposed areas are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of the report modified or verified in writing by Geotechnical Services, Inc.

Construction

6. It is recommended that this firm be retained to provide geotechnical engineering services during the earthwork phases of the work. This is to observe compliance with the design concepts, specifications, and recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

Use of Report

7. This report has been prepared for the exclusive use of the above and their assigns, in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

8. This report has been prepared for this project by Geotechnical Services, Inc. This report was completed for preliminary design purposes and may be limited in its scope to complete an accurate bid. Contractors wishing a copy of the report may secure it with the understanding that its scope is limited to evaluation considerations only.

APPENDIX B

EXPLORATION LOGS

Geotechnical Services, Inc. 55 North Stark Highway, Weare, NH 03281 Phone 603/529-7766 Fax 603/5297080 - 30 Newbury St. 3rd Floor, Boston, MA 02116 Phone 617/455-4248 Fax 617/745-4308

TEST BORING LOG

Boring No.
GSI-1

Page **1** **of** **1**

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/25/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data: No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	**Soil-Rock Visual Classification and Description** (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
0		S-1	0-2	20	4 5 7 7	12			Topsoil Tan, fine to medium Sand, some Gravel
5		S-2	4-6	22	9 23 30 30	53			Very Dense, Tan, fine to medium Sand, some Silt
10		S-3	9-11	22	22 24 34 29	58			Very Dense, Tan, fine to medium Sand, little Silt **Test Boring Terminated at 11 feet**
15									
20									

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/25	E.O.D.	11'	11'	N/E

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-1

TEST BORING LOG

Boring No. **GSI-2**

Page 1 of 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/25/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
0		S-1	0-2	16	4 8 11 9	19			4" Topsoil Brown, fine to coarse Sand, and Gravel
5		S-2	4-6	18	2 4 3 4	7			Loose, Tan/ Orange, fine to medium Sand, some to little Silt (Appear to be a Subsoil)
10		S-3	9-11	22	7 12 13 13	25			Medium Dense, light Tan, fine to medium Sand, trace Silt
15		S-4	14-16	24	8 12 17 17	29			Medium Dense, Tan, medium to fine Sand, little to trace Silt
20		S-5	19-21	16	2 28 21 23	49			Dense, Tan, fine to coarse Sand, little to trace Gravel, trace Silt

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/25	E.O.D.	31'	31'	N/E

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-2

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Geotechnical Services, Inc. 55 North Stark Highway, Weare, NH 03281 Phone 603/529-7766 Fax 603/5297080 - 30 Newbury St. 3rd Floor, Boston, MA 02116 Phone 617/455-4248 Fax 617/745-4308

TEST BORING LOG

Boring No.

GSI-2

Page 2 **of** 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/25/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
25		S-6	24-26	16	11 20 23 34	43			Dense, Tan, fine to coarse Sand, little Gravel, trace Silt
30		S-7	29-31	16	5 21 40 50	61			Dense, Tan, fine to coarse Sand, little Gravel, trace Silt Sampler Refusal at 31 feet **Test Boring Terminated at 31 feet**
35									
40									
45									

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/25	E.O.D.	31'	31'	N/E

Sample Identification	Cohesive Soils N-Value	Granular Soils N- Value
O = Open Ended Rod	0 to 2: Very Soft	0 to 4: Very Loose
U = Undisturbed	2 to 4: Soft	4 to 10: Loose
S = Split Spoon	4 to 8: Medium Stiff	11 to 30: Medium Dense
C = Rock Core	8 to 15: Stiff	31 to 50: Dense
G = Geoprobe	15 to 30 Very Stiff	Over 50: Very Dense
	Over 30: Hard	

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-2

TEST BORING LOG

Boring No.
GSI-3
Page 1 of 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/25/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck	☐ Skid	Hammer Type:
☐ Track	☐ ATV	☑ Safety Hammer
☐ Bomb.	☐ Geoprobe	☐ Doughnut
☐ Tripod	☐ Other	☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
0		S-1	0-2	12	- 14 14 13	28			4" Asphalt Black/ Brown, fine to coarse Sand, some Gravel, Brick
5		S-2	4-6	14	3 6 4 2	10			Loose, Brown/Black, Sand and Asphalt
10		S-3	9-11	12	2 2 1 1	3			Very Loose, Tan, fine to coarse Sand, and Gravel, little Silt
15		S-4	14-16	18	6 21 35 55	56			Very Dense, Tan, fine to coarse Sand, little Gravel, trace Silt
20		S-5	19-21	20	30 32 25 25	57			Very Dense, Tan, fine to coarse Sand, little to trace Gravel, trace Silt

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/25	E.O.D.	31'	31'	N/E

Sample Identification	Cohesive Soils N-Value	Granular Soils N- Value
O = Open Ended Rod	0 to 2: Very Soft	0 to 4: Very Loose
U = Undisturbed	2 to 4: Soft	4 to 10: Loose
S = Split Spoon	4 to 8: Medium Stiff	11 to 30: Medium Dense
C = Rock Core	8 to 15: Stiff	31 to 50: Dense
G = Geoprobe	15 to 30 Very Stiff	Over 50: Very Dense
	Over 30: Hard	

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-3

Geotechnical Services, Inc. 55 North Stark Highway, Weare, NH 03281 Phone 603/529-7766 Fax 603/5297080 - 30 Newbury St. 3rd Floor, Boston, MA 02116 Phone 617/455-4248 Fax 617/745-4308

TEST BORING LOG

Boring No.

GSI-3

Page 2 of 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/25/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
25		S-6	24-26	18	7 13 20 24	33			Medium Dense, Tan, fine to coarse d Sand, trace Gravel, trace Silt
30		S-7	29-31	18	5 22 23 25	45			Medium Dense, Tan, fine to coarse d Sand, trace Gravel, trace Silt **Test Boring Terminated at 31 feet**
35									
40									
45									

Water Level Data				
Date	Time	Depth (ft) to: Bott. of Casing	Depth (ft) to: Bott. of Hole	Water
3/25	E.O.D.	31'	31'	N/E

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value	Granular Soils N- Value
0 to 2: Very Soft	0 to 4: Very Loose
2 to 4: Soft	4 to 10: Loose
4 to 8: Medium Stiff	11 to 30: Medium Dense
8 to 15: Stiff	31 to 50: Dense
15 to 30 Very Stiff	Over 50: Very Dense
Over 30: Hard	

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-3

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TEST BORING LOG

Boring No. **GSI-4**

Page 1 **of** 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/25/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck	☐ Skid	Hammer Type:
☐ Track	☐ ATV	☑ Safety Hammer
☐ Bomb.	☐ Geoprobe	☐ Doughnut
☐ Tripod	☐ Other	☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
0		S-1	0-2	14	1 4 5 5	9			10" Topsoil 10" Tan, Sand and Gravel, little Silt
5		S-2	4-6	16	1 2 1 2	3			Very Loose, Dark Tan, fine to medium Sand, little to some Silt, little Gravel
10		S-3	9-11	12	3 3 7 6	10			Loose, Dark Tan, fine to medium Sand, little to some Silt, little Gravel
15		S-4	14-16	12	39 25 40 22	65			Very Dense, Tan, fine to coarse Sand, some Gravel, trace Silt
20		S-5	19-21	18	11 16 18 19	34			Dense, Tan, fine to coarse Sand, some Gravel, trace Silt

Water Level Data

Date	Time	Depth (ft) to: Bott. of Casing	Bott. of Hole	Water
3/25	E.O.D.	25.5'	25.5'	17.5'

Sample Identification	Cohesive Soils N-Value	Granular Soils N- Value
O = Open Ended Rod	0 to 2: Very Soft	0 to 4: Very Loose
U = Undisturbed	2 to 4: Soft	4 to 10: Loose
S = Split Spoon	4 to 8: Medium Stiff	11 to 30: Medium Dense
C = Rock Core	8 to 15: Stiff	31 to 50: Dense
G = Geoprobe	15 to 30 Very Stiff	Over 50: Very Dense
	Over 30: Hard	

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:

E.O.D. = End Of Drilling

N/E = None Encountered

GSI-4

TEST BORING LOG

Boring No.
GSI-4
Page 2 of 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/25/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

		Hammer Type:
☑ Truck	☐ Skid	☑ Safety Hammer
☐ Track	☐ ATV	☐ Doughnut
☐ Bomb.	☐ Geoprobe	☐ Automatic
☐ Tripod	☐ Other	

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
25		S-6	24-26	20	14 30 56 -	86			Very Dense, Brown/ Tan, fine to coarse d Sand, little Gravel, little to trace Silt, Rock, WET Sampler Refusal at 25.5 feet **Test Boring Refusal at 25.5 feet**
30									
35									
40									
45									

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/25	E.O.D.	25.5'	25.5'	17.5'

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value	Granular Soils N- Value
0 to 2: Very Soft	0 to 4: Very Loose
2 to 4: Soft	4 to 10: Loose
4 to 8: Medium Stiff	11 to 30: Medium Dense
8 to 15: Stiff	31 to 50: Dense
15 to 30 Very Stiff	Over 50: Very Dense
Over 30: Hard	

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-4

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TEST BORING LOG

Boring No.

GSI-5

Page 1 of 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
0		S-1	0-2	16	1 3 5 12	8			12" Topsoil 4" Tan, fine to coarse Sand, some Gravel, little Silt
5		S-2	4-6	18	4 7 8 9	15			Medium Dense, Tan, fine to coarse Sand, trace Gravel, trace Silt
10		S-3	9-11	1	20 22 25 25	47			Sand (Spoon Pushed Rock)
15		S-4	14-16	18	4 18 20 26	38			Dense, Tan, fine to coarse Sand, little Gravel, trace Silt
20		S-5	19-21	22	14 25 39 67	64			Very Dense, Tan, fine to coarse Sand, little Gravel, trace Silt

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	31'	31'	23.5'

Sample Identification	Cohesive Soils N-Value	Granular Soils N- Value
O = Open Ended Rod	0 to 2: Very Soft	0 to 4: Very Loose
U = Undisturbed	2 to 4: Soft	4 to 10: Loose
S = Split Spoon	4 to 8: Medium Stiff	11 to 30: Medium Dense
C = Rock Core	8 to 15: Stiff	31 to 50: Dense
G = Geoprobe	15 to 30 Very Stiff	Over 50: Very Dense
	Over 30: Hard	

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-5

TEST BORING LOG

Boring No.
GSI-5
Page 2 of 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	**Soil-Rock Visual Classification and Description** (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
25		S-6	24-26	14	8 29 41 64	70			Very Dense, Tan/Brown, fine to coarse Sand, little Gravel, little to trace Silt, WET
30		S-7	29-31	18	9 21 22 27	43			Dense, Brown, fine to coarse Sand, little Gravel, little to trace Silt, WET **Test Boring Terminated at 31 feet**
35									
40									
45									

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	31'	31'	23.5'

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-5

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TEST BORING LOG

Boring No.

GSI-6

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Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/26/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data						Stratum Change (ft)	Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)		
0		S-1	0-2	10	1 14 17 16	31			6" Topsoil Gravel
5		S-2	4-6	12	5 10 12 14	22			Medium Dense, Brown/ Tan, fine to coarse Sand, some Gravel, trace Silt
10		S-3	9-11	6	15 17 15 16	32			Medium Dense, Tan/Brown, fine to coarse Sand, little Gravel, little Silt
15		S-4	14-16	12	6 10 10 10	20			Tan, Gravel, some fine to coarse Sand, little to trace Silt
20		S-5	19-21	12	5 8 9 10	17			Tan, Gravel, some fine to coarse Sand, little to trace Silt

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	21'	21'	N/E

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-6

TEST BORING LOG

Boring No.
GSI-7

Page 1 **of** 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/26/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							**Soil-Rock Visual Classification and Description** (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
0		S-1	0-2	14	1 6 6 5	12			Topsoil Brown, Sand and Gravel
5		S-2	4-6	12	1 2 1 1	3			Very Loose, Brown, fine to coarse Sand, little Gravel, little Silt
10		S-3	9-11	12	3 9 17 17	26			Medium Dense, Brown, fine to coarse Sand, some Gravel, little Silt
15		S-4	14-16	16	4 6 79 -	85			Very Dense, Tan, fine to coarse Sand, little Gravel, little to trace Silt
20		S-5	19-21	12	5 9 15 14	24			Medium Dense, Brown/Gray, Gravel and Crushed Rock, little Sand, trace Silt

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	31'	31'	23'

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-7

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TEST BORING LOG

Boring No.
GSI-7
Page 2 of 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/26/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	**Soil-Rock Visual Classification and Description** (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
25		S-6	24-26	14	18 21 17 21	38			Very Dense, Brown, Gravel and Rock, little Sand, little Silt, WET
30		S-7	29-31	20	6 15 11 14	26			Very Dense, Brown, Gravel and Rock, little Sand, little Silt, WET **Test Boring Terminated at 31 feet**
35									
40									
45									

Water Level Data

Date	Time	Depth (ft) to: Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	31'	31'	23'

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value	Granular Soils N- Value
0 to 2: Very Soft	0 to 4: Very Loose
2 to 4: Soft	4 to 10: Loose
4 to 8: Medium Stiff	11 to 30: Medium Dense
8 to 15: Stiff	31 to 50: Dense
15 to 30 Very Stiff	Over 50: Very Dense
Over 30: Hard	

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-7

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TEST BORING LOG

Boring No. **GSI-8**

Page 1 of 1

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/26/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
0		S-1	0-2	18	- 10 8 17	18			Asphalt Black to Brown, fine to coarse Sand, little Gravel, little to trace Silt
5		S-2	4-6	18	2 3 3 10	6			Loose, Tan, fine to coarse Sand, trace Silt
10		S-3	9-11	18	10 17 20 24	37			Dense, Tan, fine to medium Sand, trace Silt
15		S-4	14-16	22	5 9 15 18	24			Medium Dense, Tan, fine to medium Sand, trace Silt
20		S-5	19-21	20	7 20 25 36	45			Dense, Tan, fine to medium Sand, trace Silt **Test Boring Terminated at 21 feet**

Water Level Data

Date	Time	Depth (ft) to:		
		Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	21'	21'	N/E

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value	Granular Soils N- Value
0 to 2: Very Soft	0 to 4: Very Loose
2 to 4: Soft	4 to 10: Loose
4 to 8: Medium Stiff	11 to 30: Medium Dense
8 to 15: Stiff	31 to 50: Dense
15 to 30 Very Stiff	Over 50: Very Dense
Over 30: Hard	

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-8

TEST BORING LOG

Boring No.

GSI-9

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Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/26/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	CME	Rig Model	45C

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	**Soil-Rock Visual Classification and Description** (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
0		S-1	0-2	6	2 2 3 3	5			6" Topsoil Gravel and Rock
5		S-2	4-6	18	4 13 15 17	28			Medium Dense, Tan, fine to medium Sand, little Silt
10		S-3	9-11	22	8 23 31 39	54			Very Dense, Tan, fine to medium Sand, little Silt
15		S-4	14-16	20	7 23 36 39	59			Very Dense, Tan, fine to medium Sand, little Silt
20		S-5	19-21	20	12 42 70 -	112			Very Dense, Tan, fine to medium Sand, little Silt Sampler Refusal at 20.5' **Test Boring Terminated at 20.5 feet**

Water Level Data

Date	Time	Depth (ft) to: Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	20.5'	20.5'	N/E

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-9

Geotechnical Services, Inc. 55 North Stark Highway, Weare, NH 03281 Phone 603/529-7766 Fax 603/5297080 - 30 Newbury St. 3rd Floor, Boston, MA 02116 Phone 617/455-4248 Fax 617/745-4308

TEST BORING LOG

Boring No.
GSI-10
Page 1 of 1

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/26/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	CME	Rig Model	45C

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	**Soil-Rock Visual Classification and Description** (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
0		S-1	0-2	16	2 3 4 6	7			Topsoil Tan, fine to medium Sand, little to trace Silt
5		S-2	4-6	16	7 23 28 19	51			Very Dense, Tan, fine to medium Sand, little to trace Silt
10		S-3	9-11	8	15 52 50/0" -	-			Very Dense, Tan, fine to coarse Sand, little to trace Silt
15		S-4	14-16	20	12 31 47 19	78			Very Dense, Tan, fine to medium Sand, little Silt
20		S-5	19-21	20	8 30 24 22	54			Very Dense, Tan, fine to medium Sand, little Silt **Test Boring Terminated at 21 feet**

Water Level Data

Date	Time	Depth (ft) to: Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	21'	21'	N/E

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-10

Geotechnical Services, Inc. 55 North Stark Highway, Weare, NH 03281 Phone 603/529-7766 Fax 603/5297080 - 30 Newbury St. 3rd Floor, Boston, MA 02116 Phone 617/455-4248 Fax 617/745-4308

TEST BORING LOG

Boring No. **GSI-11**
Page 1 of 1

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/26/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other
☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

Depth (ft)	Casing (Blows/ft)	Sample Data No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
0		S-1	0-2	20	1 4 4 6	8			
3		S-2	2-4	20	11 14 16 25	30			
5		S-3	4-6	18	4 13 17 10	-			
7		S-4	6-8	10	18 19 17 12	36			
9		S-5	8-10	22	15 14 16 17	30			

Water Level Data

Date	Time	Depth (ft) to: Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	10'	10'	N/E

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

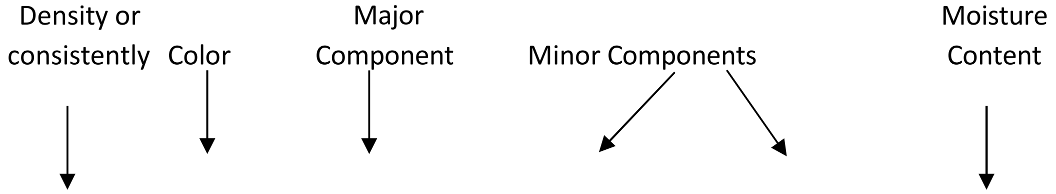
GSI-11

APPENDIX C

SUBSURFACE EXPLORATION KEY

FIELD DESCRIPTION AND CLASSIFICATION OF SOIL - Burmister System

Soil descriptions indicated on the test boring logs are based on Standard Penetration Test (SPT) results and observation of the soil samples obtained. Soil samples generally described and classified as illustrated in the following example:



Dense, brown, f-m SAND, some Gravel, trace Silt, moist.

1.0 DENSITY OR CONSISTENCY – The density or consistency is determined from the Standard Penetration Test (ASTM 1586), which corresponds to the number of blows required to drive a standard 2-inch outside diameter split-spoon sampler from the 6 to 18-inch depth of a 24-inch sample using a 140-pound weight falling freely for 30 inches.

Density of Granular Soil	Penetration Resistance (N-blows/ft)		Consistency of Composite Clay Soil
Very Loose	0 - 4	< 2	Very soft
Loose	4 - 10	2 - 4	Soft
Medium Dense	10 - 30	4 - 8	Medium soft
Dense	30 - 50	8 - 15	Stiff
Very Dense	> 50	15 - 30	Very stiff
		> 30	Hard

2.0 COLOR – Visual

3.0 SOIL COMPONENTS – The description and classification is based on the following criteria.

3.1 DESCRIPTION – The components of a soil sample are described by visually estimating the percentage of each component by weight of the total sample.

Major Component – The major component (>50%) is written with upper case letters for granular soil (SAND, GRAVEL), and a combination of upper and lower case letters for composite soil (Silty CLAY, Clayey SILT).

Minor Component – The minor soil components (≤50%) are written with the first letter of each material in upper case, and the remaining letters in lower case (Gravel, Silt). The minor components are identified and prefaced in the description based on the following percentages:

Description	Percentage
and	35 - 50%
some	20 - 35%
little	10 - 20%
trace	0 - 10%

Other Components – The other components within the soil which may be encountered include glass, bricks, trash, etc. The other components are identified and follow the major and minor soil components.

3.2 CLASSIFICATION

Granular Soil by Sieve Size – A granular soil sample is classified by visually estimating the particle size as referenced to a Standard Sieve.

Material*			Standard Sieve Limit	
			Upper	Lower
GRAVEL	-	coarse	3-inch	3/4-inch
	-	fine	3/4-inch	No. 4
SAND	-	coarse	No. 4	No. 10
	-	medium	No. 10	No. 40
	-	fine	No. 40	No. 200
SILT			No. 200	

Granular Soil by Visual Identification

Material	Visual ID
Silts and Clays	Too small to see.
Fine Sand	Finest visible grain.
Medium Sand	1/64” to 1/16”
Coarse Sand	1/16” to 1/4”
Fine Gravel	1/4" to 3/4"
Coarse Gravel	3/4" to 3”
Cobbles	3” to 6”
Boulders	Greater than 6”

*The Gravel/Sand portions of a granular soil are further divided based on the following proportions:

Gravel/Sand	Proportion
fine to coarse	> 10% all factions
coarse	< 10% fine and medium
medium to coarse	< 10% fine
medium	< 10% fine and coarse
fine to medium	< 10% coarse
fine	< 10% medium and coarse

Composite Clay Soil – A composite clay soil sample is classified by determining the smallest diameter thread that can be rolled manually.

Material	Smallest Thread Diameter	Degree of Plasticity
SILT	None	Nonplastic
Clayey SILT	1/4-inch	Slight
SILT & CLAY	1/8-inch	Low
CLAY & SILT	1/16-inch	Medium
Silty CLAY	1/32-inch	High
CLAY	1/64-inch	Very High

Organic Soil – An organic soil sample is classified by observation of the sample structure.

Material		
Topsoil	-	surficial soils that support plant life and which contain a high percentage of organic matter.
Fibrous Peat	-	deposits of plant remains in which the original plant fibers are still visible.
Amorphous Peat	-	deposits of plant remains in which the original plant fibers have been destroyed. Usually found underlying fibrous peat.
Organic Silt	-	fine grained marine soils which have been transported due to erosion and deposited in still water below the zone of wave action. May contain shell fragments, organic odor, high sand content, nonplastic.
Clayey Organic Silt	-	similar to Organic Silt, low sand content, plastic.

4.0 ADDITIONAL DETAILS AND DISCRIPTIVE TERMS

SOIL STRUCTURE – produced by deposition of sediments.

Stratified	-	random soil deposits of varying components or color.
Varved	-	alternating soil deposits of varying thickness (i.e. clays or silts).
Stratum	-	soil deposit greater than 12 inches thick.
Layer	-	soil deposit 3 inches to 12 inches thick.
Seam	-	soil deposit 1/8 inch to 3 inches thick.
Parting/lens	-	soil deposit less than 1/8 inch thick.

MOISTURE CONTENT

Dry	-	moisture not apparent, dusty, dry to the touch.
Moist	-	damp, but no visible water.
Wet	-	visible free water.

5.0 UNIFIED SOIL CLASSIFICATION SYMBOL AND DISCRIPTION

CL	Lean Clay	GW	Well Graded Gravel
ML	Silt	GP	Poorly Graded Gravel
OL	Organic Silt/ Clay Low Plasticity	GM	Silty Gravel
CH	Fat Clay	GC	Clayey Gravel
MH	Plastic Silt	SW	Well Graded Sand
OH	Organic Silt/Clay High Plasticity	SP	Poorly Graded Sand
PT	Peat	SM	Silty Sand
		SC	Clayey Sand

GUIDELINES TO CLASSIFICATION AND IDENTIFICATION OF ROCK

A. WEATHERING

Fresh	Fresh rock, crystals bright, few joints, may show slight staining. Rock rings under hammer if crystalline.
Slightly Weathered	Rock generally fresh, joints stained and discoloration extends into rock up to 1 inch. Joints may contain clay or gouge. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.
Moderately Weathered	Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some look clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.
Highly Weathered	All rock is discolored or stained. In granitoid rocks all feldspars are dull and discolored and majority shows kaolinization. Rock shows severe loss of strength and can be excavated with a geologists pick. A clunking sound when struck with a hammer.
Disintegrate Rock	Rock texture clear and evident, but reduced in strength to strong soil. Some fragments of strong rock usually left.

B. FRACTURING AND BEDDING

Spacing	Fracturing	Bedding and Foliation
More than 3 feet	Massive	Thick
1 foot – 3 feet	Slightly Fractured	Medium
2 inches – 1 foot	Moderately Fractured	Thin
Less than 2 inches	Highly fractured	Very Thin

C. GRAIN SIZE

Fine	Visible to naked eye to 1/16-inch diameter.
Medium	1/16-inch to 1/4-inch diameter.
Coarse	Greater than 1/4-inch diameter.

D. HARDNESS

Very Hard	Cannot be scratched with a knife or sharp pick. Breaking of hand specimens requires several hard blows with a geologists pick.
Hard	Can be scratched with a knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.
Moderately Hard	Can be scratched with a knife or pick. Gouges or grooves to ¼ inch deep can be excavated with hard blows of a geologists pick. Hand specimens can be detached by a moderate blow.
Medium	Can be grooved to a 1/16-inch deep by firm pressure on a knife or pick point. Can be excavated in small chips to pieces approximately 1-inch maximum size by hard blows of the point of a geologists pick.
Soft	Can be gouged or grooved easily with a knife or pick point. Can be excavated in chips to pieces several inches in size. Small thin pieces can be broken by finger pressure.
Very Soft	Can be carved with a knife. Can be excavated easily with the point of a pick. Pieces 1 inch or more in thickness can be broken with finger pressure.

E. ROCK QUALITY DESIGNATION (RQD)

RQD (Percent)	Diagnostic Description
Exceeding 90	Excellent
75 – 90	Good
50 – 75	Fair
25 – 50	Poor
0 – 25	Very Poor

Comments: RQD is applicable to NX core only. The diameter of an NX core is 2.16 inches. RQD is expressed as a percentage and is determined by dividing the length of the run by the total length of the recovered cores pieces measuring 4-inches or greater. Core recovery is reported as a percentage and is determined by dividing the length of the core recovered (all pieces) by the length of the run.

APPENDIX D

LABORATORY TEST RESULTS

Particle Size Distribution Report

ASTM D422

% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	1.3	2.4	3.6	13.4	71.9	7.4

Test Results (ASTM D422)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
6"	100.0			
4"	100.0			
3"	100.0			
2"	100.0			
1.5"	100.0			
1"	100.0			
0.75"	100.0			
0.5"	98.7			
0.375"	98.7			
#4	97.9			
#8	96.6			
#10	96.3			
#16	95.2			
#30	92.7			
#40	90.1			
#50	86.0			
#100	52.6			
#200	7.4			

* (no specification provided)

Material Description

med to fine SAND, trace Silt, trace med to fine Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.4222 D_{85}= 0.2906 D_{60}= 0.1710
D_{50}= 0.1434 D_{30}= 0.1049 D_{15}= 0.0841
D_{10}= 0.0781 C_u= 2.19 C_c= 0.83

Classification

USCS= AASHTO=

Test Remarks

Location: GSI-2; S-2
Sample Number: L-185-25 **Depth:** 4' to 6' **Sample Date:** 3/25/2025

GEOTECHNICAL SERVICES, INC.

Weare, New Hampshire

Client: TF Moran, Inc.
Project: Sherburn Road Housing Development
Portsmouth, New Hampshire
Project No: 225144 **Figure**

Tested By: S.Andrews

Particle Size Distribution Report

ASTM D422

% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	4.1	9.5	11.7	26.3	40.3	8.1

Test Results (ASTM D422)				
Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
6"	100.0			
4"	100.0			
3"	100.0			
2"	100.0			
1.5"	100.0			
1"	100.0			
0.75"	100.0			
0.5"	97.1			
0.375"	95.9			
#4	92.5			
#8	87.6			
#10	86.4			
#16	82.6			
#30	74.7			
#40	67.3			
#50	56.0			
#100	26.4			
#200	8.1			

* (no specification provided)

Material Description

coarse to fine SAND, little med to fine Gravel, trace Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 3.2976	D_{85}= 1.6155	D_{60}= 0.3354
D_{50}= 0.2592	D_{30}= 0.1653	D_{15}= 0.0995
D_{10}= 0.0807	C_u= 4.15	C_c= 1.01

Classification

USCS= AASHTO=

Test Remarks

Location: GSI-3; S-3
Sample Number: L-186-25 **Depth:** 9' to 11' **Sample Date:** 3/25/2025

GEOTECHNICAL SERVICES, INC.

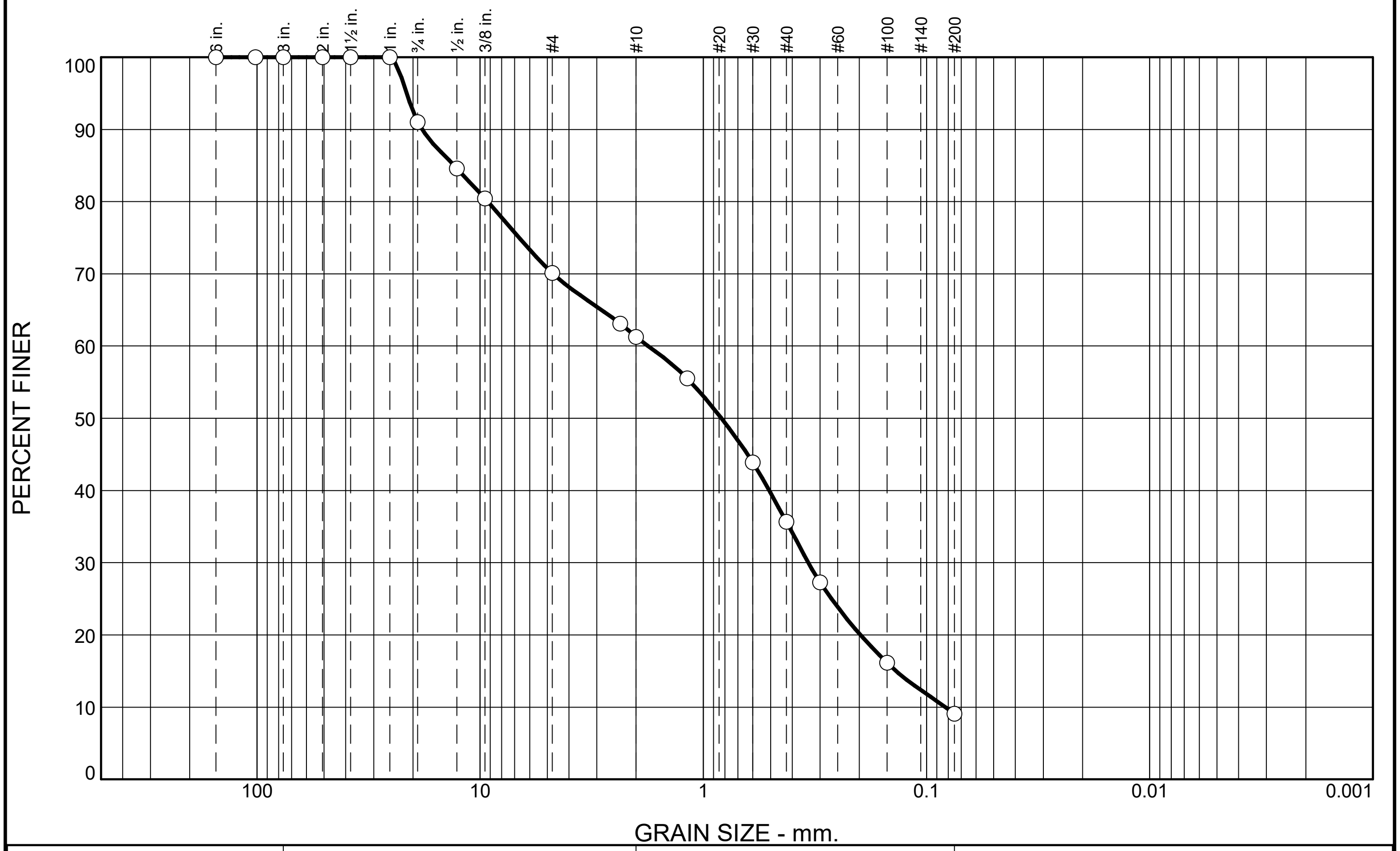
Weare, New Hampshire

Client: TF Moran, Inc.
Project: Sherburn Road Housing Development
Portsmouth, New Hampshire
Project No: 225144 **Figure**

Tested By: S.Andrews

Particle Size Distribution Report

ASTM D422



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	19.5	19.2	17.4	20.0	14.8	9.1

Test Results (ASTM D422)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
6"	100.0			
4"	100.0			
3"	100.0			
2"	100.0			
1.5"	100.0			
1"	100.0			
0.75"	91.0			
0.5"	84.6			
0.375"	80.5			
#4	70.1			
#8	63.1			
#10	61.3			
#16	55.5			
#30	43.9			
#40	35.7			
#50	27.3			
#100	16.1			
#200	9.1			

* (no specification provided)

Material Description

coarse to fine SAND, and med to fine Gravel, trace Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 18.1854	D_{85}= 13.0641	D_{60}= 1.7690
D_{50}= 0.8298	D_{30}= 0.3386	D_{15}= 0.1369
D_{10}= 0.0822	C_u= 21.52	C_c= 0.79

Classification

USCS= AASHTO=

Test Remarks

Location: GSI-4; S-2
Sample Number: L-187-25 **Depth:** 4' to 6' **Sample Date:** 3/25/2025

GEOTECHNICAL SERVICES, INC.

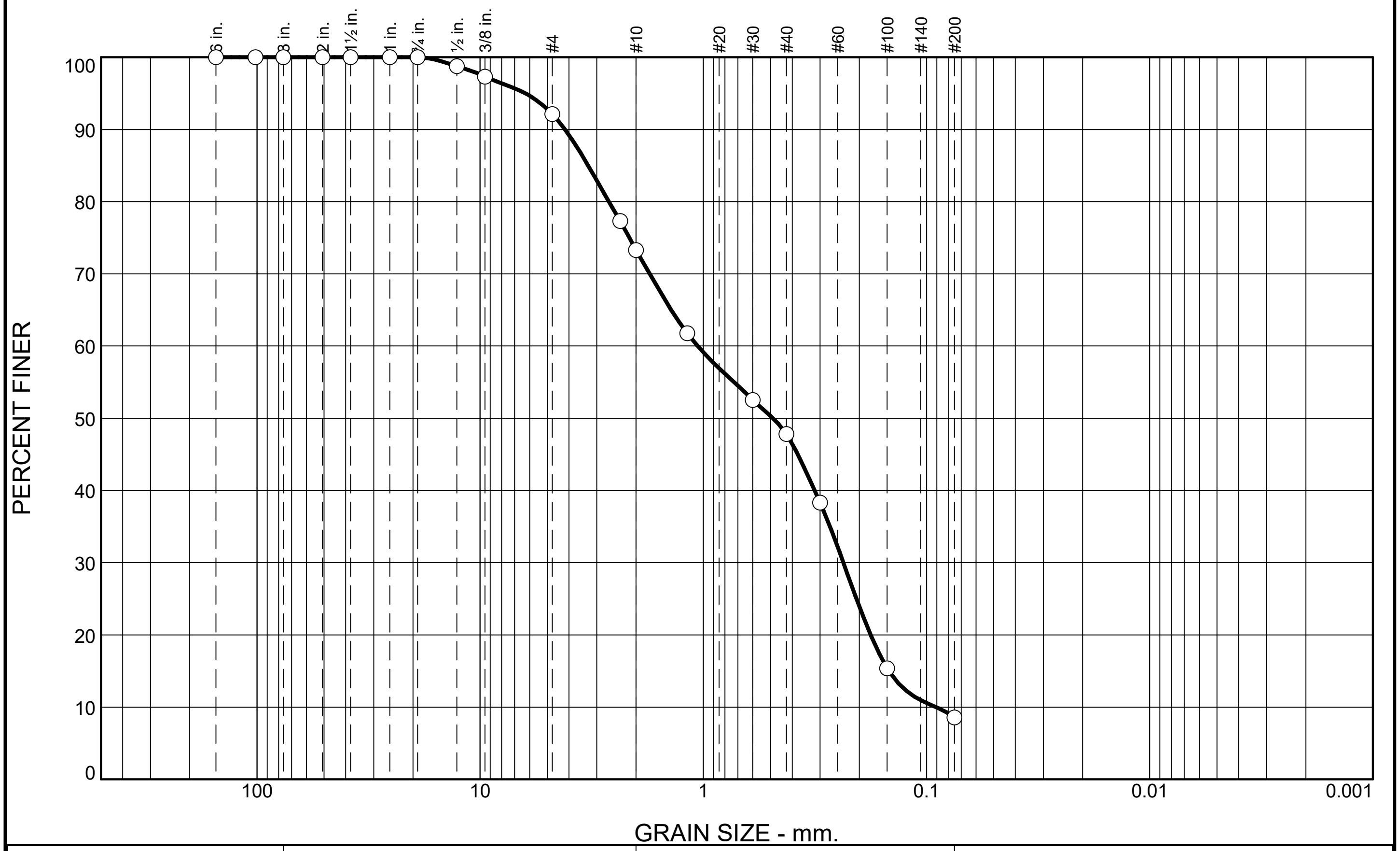
Weare, New Hampshire

Client: TF Moran, Inc.
Project: Sherburn Road Housing Development
Portsmouth, New Hampshire
Project No: 225144 **Figure**

Tested By: S.Andrews

Particle Size Distribution Report

ASTM D422



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	2.7	24.0	20.8	20.3	23.6	8.6

Test Results (ASTM D422)				
Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
6"	100.0			
4"	100.0			
3"	100.0			
2"	100.0			
1.5"	100.0			
1"	100.0			
0.75"	100.0			
0.5"	98.8			
0.375"	97.3			
#4	92.1			
#8	77.3			
#10	73.3			
#16	61.8			
#30	52.5			
#40	47.8			
#50	38.3			
#100	15.4			
#200	8.6			

* (no specification provided)

Material Description

coarse to fine SAND, some med to fine Gravel, trace Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 4.1690 D_{85}= 3.2812 D_{60}= 1.0607
D_{50}= 0.4868 D_{30}= 0.2357 D_{15}= 0.1473
D_{10}= 0.0906 C_u= 11.71 C_c= 0.58

Classification

USCS= AASHTO=

Test Remarks

Location: GSI-5; S-4
Sample Number: L-188-25 **Depth:** 14' to 16' **Sample Date:** 3/26/2025

GEOTECHNICAL SERVICES, INC.

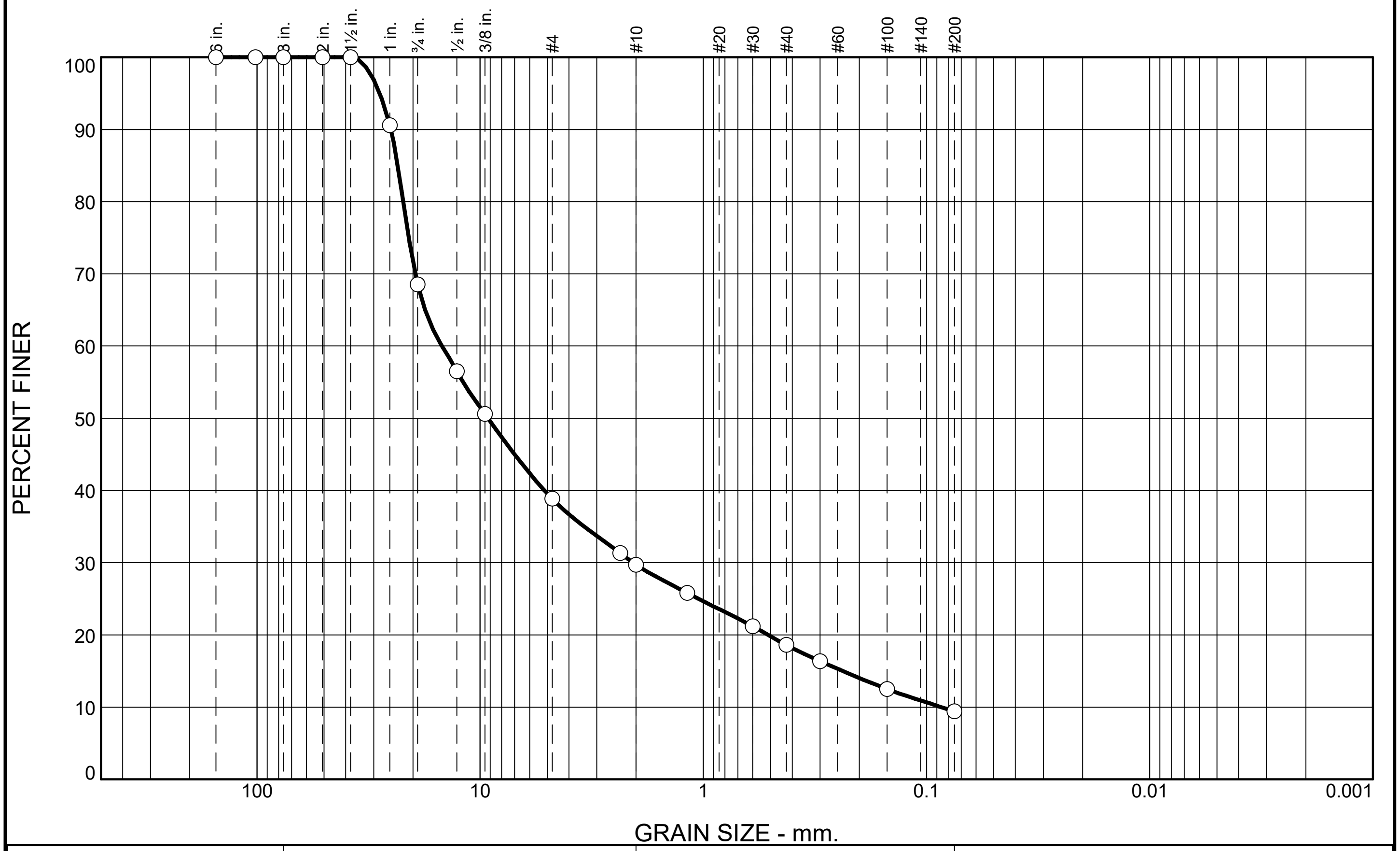
Weare, New Hampshire

Client: TF Moran, Inc.
Project: Sherburn Road Housing Development
Portsmouth, New Hampshire
Project No: 225144 **Figure**

Tested By: S.Andrews

Particle Size Distribution Report

ASTM D422



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	9.4	40.0	20.9	8.5	5.9	5.9	9.4

Test Results (ASTM D422)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
6"	100.0			
4"	100.0			
3"	100.0			
2"	100.0			
1.5"	100.0			
1"	90.6			
0.75"	68.5			
0.5"	56.5			
0.375"	50.6			
#4	38.9			
#8	31.3			
#10	29.7			
#16	25.8			
#30	21.2			
#40	18.6			
#50	16.4			
#100	12.5			
#200	9.4			

* (no specification provided)

Material Description

coarse to fine GRAVEL some, coarse to fine Sand, trace Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 25.1170	D_{85}= 23.3900	D_{60}= 14.8389
D_{50}= 9.2228	D_{30}= 2.0666	D_{15}= 0.2377
D_{10}= 0.0858	C_u= 173.03	C_c= 3.36

Classification

USCS= AASHTO=

Test Remarks

Location: GSI-7; S-3

Sample Number: L-189-25 **Depth:** 9' to 11' **Sample Date:** 3/26/2025

GEOTECHNICAL SERVICES, INC.

Weare, New Hampshire

Client: TF Moran, Inc.

Project: Sherburn Road Housing Development
Portsmouth, New Hampshire

Project No: 225144 **Figure**

Tested By: S.Andrews

APPENDIX E

USGS SEISMIC DESIGN MAPS

USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in *timeout* error.
USGS web services are now operational so this tool should work as expected.

Sherburne Housing Development

35 Sherburne Rd, Portsmouth, NH 03801, USA

Latitude, Longitude: 43.0597624, -70.799723

Date	4/1/2025, 1:42:48 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S_S	0.331	MCE_R ground motion. (for 0.2 second period)
S_1	0.075	MCE_R ground motion. (for 1.0s period)
S_{MS}	0.508	Site-modified spectral acceleration value
S_{M1}	0.18	Site-modified spectral acceleration value
S_{DS}	0.339	Numeric seismic design value at 0.2 second SA
S_{D1}	0.12	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	C	Seismic design category
F_a	1.535	Site amplification factor at 0.2 second
F_v	2.4	Site amplification factor at 1.0 second
PGA	0.205	MCE_G peak ground acceleration
F_{PGA}	1.395	Site amplification factor at PGA
PGA_M	0.286	Site modified peak ground acceleration
T_L	6	Long-period transition period in seconds
SsRT	0.331	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	0.357	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.075	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.081	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)

Type	Value	Description
PGAd	0.5	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.205	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.928	Mapped value of the risk coefficient at short periods
C_{R1}	0.932	Mapped value of the risk coefficient at a period of 1 s
C_V	0.921	Vertical coefficient

DISCLAIMER

APPENDIX F

DRAFT EARTHWORK SPECIFICATIONS

SECTION 02200
EARTHWORK

DRAFT

PART I- GENERAL

1.01 GENERAL REQUIREMENTS

1. Include GENERAL CONDITIONS and SUPPLEMENTARY CONDITIONS as part of this Section.

2. Examine all other Sections of the Specifications for requirements, which affect work of this Section whether or not such work is specifically mentioned in this Section.

3. Coordinate work with trades affecting, or affected by, work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 WORK INCLUDED

1. Perform all work required to complete the work of the Section, as indicated. Such work includes, but is not limited to, the following:

    1. Excavation, filling, grading and compaction
    2. Supplying of fill materials
    3. Construction Dewatering
    4. Sheeting, shoring and bracing
    5. Rock excavation/blasting

1.03 RELATED WORK UNDER OTHER SECTIONS

1. Erosion And Sediment Control
2. Site Preparation
3. Bituminous Concrete Paving
4. Site Water Lines
5. Storm Drainage System
6. Sanitary Sewer System
7. Site Furnishings
8. Site Irrigation
9. Lawns
10. Planting

1.04 SUBMITTALS

1. Issue submittals in accordance with Division 1. Submittals under this Section shall include manufacturer's specifications and installation instructions.

1.05 SAMPLES AND TESTING

1. A 50 lb. sample of each off-site material proposed for use, and of any on-site material when so requested by the Architect or Geotechnical Engineer, shall be submitted for

approval.

1. Samples shall be delivered to office of the Geotechnical Engineer, as directed.
2. Samples required in connection with compaction tests will be taken and transported by the Geotechnical Engineer.
3. Product Data: Submit location of pits for all borrow material.

1.06 COORDINATION

1. The work of this Section shall be coordinated with that of other trades affecting, or affected by, this work, as necessary to assure the steady progress of all work of the Contract.

2. Prior to the start of earthwork, the Contractor shall arrange an on-site meeting with the Architect and Geotechnical Engineer for the purpose of establishing Contractor's schedule of operations and scheduling inspection procedures and requirements.

3. As construction proceeds, the Contractor shall be responsible for notifying the Architect prior to start of earthwork operations requiring inspection and/or testing.

1.09 INFORMATION

1. It is hereby understood that the Contractor has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.

2. Plans, surveys, measurements and dimensions under which the work is to be performed are believed to be correct to the best of the Architect's knowledge, but the Contractor shall have examined them for himself during the bidding period, as no allowance will be made for any errors or inaccuracies that may be found herein.

3. Information on the Drawings, Reference Drawings, and in the Specifications relating to subsurface conditions, natural phenomena, and existing utilities and structures is from the best sources presently available. Such information is furnished only for the information and convenience of the Contractor, and the accuracy or completeness of this information is not guaranteed.

1.10 EXISTING CONDITIONS

1. The Contractor shall become thoroughly familiar with the site, consult records and drawings of adjacent structures and of existing utilities, and note all conditions, which may influence the work of this Section.

2. By submitting a bid, the Contractor affirms that he has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.

3. The Contractor may, at his own expense, conduct additional subsurface testing as required for his own information after approval by the Owner.

1.11 SUBSURFACE CONDITIONS AND SPECIAL SITE CONSIDERATIONS

1. Soil borings have been made by a qualified Contractor prior to this Contract. This information shall be made available to bidders as specified under other Sections. The final results of these subsurface explorations were prepared by Geotechnical Services, Inc., consulting geotechnical engineers, and are hereby attached to this specification for

information only. Procedures for dewatering, areas to receive special fill and other methods and procedures specified herein shall be supplemented by this information. For purposes of this specification, this information will be referred to as the report. Where procedures within the report vary from procedures as specified herein, this specification shall override. The results and recommendations are available in the geotechnical report prepared by Geotechnical Services. Copies of this report are available from the Architect. Soil samples may be examined at the office of the Geotechnical Engineer.

2. It is the responsibility of the Contractor under this Contract to do the excavation, filling, grading and rough grading to bring the existing grades to subgrade and parallel to finished grades as specified herein and as shown on the Drawings for this Work. The Contractor shall visit the site prior to submitting a bid to become familiar with the extent of the work to be done under this Contract. The Contractor shall be responsible for determining the quantities of earth materials necessary to complete the work under this Section. All earth materials shall be included in the Contractor's base bid.

3. Site Information - data on indicated subsurface conditions are not representations or warrants of continuity of such conditions between subsurface explorations. It is expressly understood that the Owner will not be responsible for interpretations or conclusions drawn there from by the Contractor. Data are made available for the convenience of the Contractor. Neither the Owner nor the Geotechnical Engineer assumes responsibility for accuracy of the data other than at the particular locations and at the time the explorations were made.

4. The subsurface data was gathered and report prepared by Geotechnical Services, Inc. The elevations indicated on the drill holes, borings and test pits refer to existing conditions. A copy of this report may be seen at the office of the Architect during normal working hours.

1.12 QUALITY ASSURANCE

1. The Owner will retain a Geotechnical Engineer to perform on-site observations and testing during the following phases of the construction operations. The services of the Geotechnical Engineer may include, but not be limited to the following:

    1. Observation during excavation and dewatering of building areas, parking areas and controlled fill areas.
    2. Observation and testing during placement and compaction of fills within the building area, parking area, and controlled fill areas.
    3. Laboratory testing and analysis of fill and bedding materials specified, as required.
    4. Observation, construction and performance of water content, gradation, and compaction tests at a frequency and at locations to assure conformance of this Specification. The results of these tests will be submitted to the Architect; copy to the Contractor, on a timely basis so that the Contractor can take such action as is required to remedy indicated deficiencies. During the course of construction, the Geotechnical Engineer will advise the Architect, in writing, with copy to Contractor if, at any time, in his opinion, the work is not in substantial conformity with the Contract Documents.

2. The Geotechnical Engineer's presence does not include supervision or direction of the actual work by the Contractor, his employees or agents. Neither the presence of the Geotechnical Engineer, nor any observations and testing performed by him, nor any notice or failure to give notice shall excuse the Contractor from defects discovered in his work.

3. The Owner reserves the right to modify or waive Geotechnical Engineer services.

1.13 PERMITS, CODES AND SAFETY REQUIREMENTS

1. All work shall conform to the Drawings and Specifications and shall comply with applicable codes and regulations.

2. Comply with the rules, regulations, laws and ordinances of town and state agencies and all other authorities having jurisdiction. Coordinate all work done within town and State rights of way with the appropriate agencies. Provide all required traffic control and safety measures, including uniformed police officers per town and State requirements. All labor, materials, equipment and services necessary to make the work comply with such requirements shall be provided without additional cost to the Owner.

3. Comply with the provisions of the Manual of Accident Prevention in Construction of the Associated General Contractors of America, Inc. and the requirements of the Occupational Safety and Health Administration (OSHA), United States Department of Labor.

4. The Contractor shall procure and pay for all permits and licenses required for the complete work specified herein and shown on the Drawings.

5. The Contractor shall not close or obstruct any street, sidewalk, or passageway unless authorized in writing by the Architect. The Contractor shall so conduct his operations as to interfere as little as possible with the use ordinarily made of roads, driveways, sidewalks or other facilities near enough to the work to be affected hereby. The Contractor shall comply with the time limits established by the terms for trucking onto and off of the site.

6. Any apparent conflict between the Drawings and Specifications and the applicable codes and regulations shall be referred to the Architect in writing, for resolution before the work is started.

1.14 LAYOUTS AND GRADES

1. All line and grade work not presently established at the site shall be laid out by a survey team under the supervision of a Registered Land Surveyor or Professional Engineer employed by the Contractor in accordance with Drawings and Specifications. The Contractor shall establish permanent benchmarks and replace as directed any which are destroyed or disturbed.

2. The words "finished grades" as used herein shall mean final grade elevations indicated on the Drawings. Spot elevations shall govern over proposed contours. Where not otherwise indicated, project site areas outside of the building shall be given uniform slopes between points for which finished grades are indicated or between such points and existing grades.

3. The word "subgrade" as used herein, means the required surface of excavated area, subsoil, borrow fill or compacted fill. This surface is immediately beneath the site improvements; fill materials as dimensioned on the Drawings, or other proposed surface material.

1.15 DISPOSITION OF EXISTING UTILITIES

1. Active utilities existing on the site and work areas shall be carefully protected from damage and relocated or removed as required by the work. When an active utility line is

exposed during construction, its location and elevation shall be plotted on the record drawings as described in this Section and both Architect and Utility Owner notified in writing.

2. Inactive or abandoned utilities encountered during construction shall be removed if within the building area or grouted, plugged or capped. The location of such utilities shall be noted on the record drawings and reported in writing to the Architect.

3. The Contractor shall notify "Dig Safe" and local utility companies prior to the start of construction. The "Dig Safe" number shall be submitted by the Contractor in writing to the Architect prior to construction.

1.16 SHORING, SHEETING, AND BRACING

1. Provide shoring, sheeting, and/or bracing at excavations, as required, to ensure complete safety against collapse of earth at sides of excavations.

2. If, at any place, sufficient or proper supports have not been provided, additional supports shall be placed at the expense of the Contractor. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and compacted.

3. All sheeting and bracing not ordered left in place shall be carefully removed in such a manner as not to endanger the construction of other structures, utilities or property whether public or private. All voids left after withdrawal of sheeting shall be immediately refilled with sand and rammed with tools adapted to that purpose or otherwise compacted as directed to achieve the required density.

4. Shoring or sheeting shall not constitute a condition for which an increase may be made in the contract price with the exception that if the Architect directs in writing that certain shoring or sheeting shall be left in place, the contract price will be adjusted in accordance with General Conditions.

5. Excavation support systems shall be designed to support the earth pressures, hydrostatic pressures, surcharge loads and other forces from existing site conditions, stored material and construction equipment.

6. Shoring and bracing of trenches and other excavations shall, at a minimum, be in accordance with the latest requirements of the Department of Labor and Industries Bulletin No. 12, Section 10, and all subsequent amendments.

7. Shoring and sheeting shall be designed by a Registered Professional Engineer and paid for by the Contractor. The contractor shall submit an earth shoring and bracing plan to the Architect for review by the Geotechnical Engineer at least 2 weeks prior to installation. The submittal shall include calculations and plans drawn to scale.

1.17 DRAINAGE

1. The Contractor shall control the grading in areas under construction on the site so that the surface of the ground will properly slope to prevent accumulation of water in excavated areas and adjacent properties.

2. The Contractor shall excavate interceptor swales and ditches where shown on the Drawings and as otherwise necessary prior to the start of major earthmoving operations to insure minimal erosion and to keep areas as free from surface water as possible.

3. Should surface, rain or ground water be encountered during the operations, the Contractor shall furnish and operate pumps or other equipment and provide all necessary piping to keep all excavations clear of water at all times and shall be responsible for any damage to work or adjacent properties for such water. All piping exposed above surface for this use, shall be properly covered to allow foot traffic and vehicles to pass without obstruction.

4. Presence of ground water in soil will not constitute a condition for which an increase in the contract price may be made. Under no circumstances place concrete fill, soil fill, lay piping or install appurtenances in excavation containing free water. Keep utility trenches free of water until pipe joint material has hardened and backfilled to prevent flotation.

1.18 FROST PROTECTION

1. Do not excavate to full-indicated depth when freezing temperatures may be expected, unless work can be completed to subgrade or piping can be installed and backfilled the same day. Protect the excavation from frost if placing of concrete or piping is delayed.

2. The Contractor shall keep the operations under this Contract clear and free of accumulation of snow within the limits of Contract Lines as required to carry out the work.

3. No work shall be installed on frozen ground.

4. Provide heat and/or insulation to slab, footings, foundation walls, and other elements during freezing conditions to prevent damage from frost heaving.

1.19 DISTURBANCE OF EXCAVATED AND FILLED AREAS DURING CONSTRUCTION

1. The Contractor shall take the necessary steps to avoid disturbance of subgrade and underlying natural soils/compacted fill during excavation and filling operations. Methods of excavation and filling operations shall be revised as necessary to avoid disturbance of the subgrade and underlying natural soils/compacted fill, including restricting the use of certain types of construction equipment and their movement over sensitive or unstable materials. The Contractor shall coordinate with the Architect or Geotechnical Engineer to modify his operations as necessary to minimize disturbance and protect bearing soils.

2. All excavated or filled areas disturbed during construction, all loose or saturated soil, and other areas that will not meet compaction requirements as specified herein shall be removed and replaced with compacted structural fill or crushed stone. Fill that cannot be compacted within 48 hours because of excess moisture shall be removed and replaced with compacted structural fill or crushed stone. Costs of removal of disturbed material and replacement with gravel fill or crushed stone shall be borne by the Contractor.

3. If requested by the Geotechnical Engineer, the Contractor shall place a six-inch layer of crushed stone or 4-inch concrete mud mat over natural underlying soil to stabilize the disturbed areas during construction. The placement of crushed stone layer or mud mat as well as material costs shall be borne by the Contractor.

1.20 PROTECTION OF BEARING SUBGRADES

1. The Contractor shall be required to maintain stable, dewatered, and frost fee subgrades for foundations, pavement areas, utility trenches, and other areas as directed by the Architect or Geotechnical Engineer.

2. The Contractor shall take precautions to reduce subgrade disturbance. Such precautions may include diverting storm water runoff away from construction areas, reducing traffic in

sensitive areas, thermal protection during cold weather periods, and maintaining an effective dewatering operation.

3. Soils exhibiting weaving/instability or which become frozen, as determined by the Geotechnical Engineer, shall be over-excavated (removed) to competent bearing material and replaced with compacted gravel fill or lean concrete at no additional cost to the Owner.

1.21 DEWATERING

1. Based on subsurface investigations conducted prior to this Contract, it is anticipated that excavation may be carried out below existing groundwater levels. The Contractor shall be required to implement ground water control measures to maintain the ground water level a minimum of one foot below all final excavation levels or to propose alternative methods for placement of fill over existing undisturbed material with ground water at or near the surface in such a manner that the existing materials will not be disturbed. The Contractor will be required to implement ground water control measures adequate to maintain the excavation sufficiently dry to allow efficient use of normal excavation equipment and to provide a borrow material suitable for placement and compaction as specified or as directed by the Geotechnical Engineer. The moisture content shall not exceed 3% above the optimum moisture content as determined by modified Proctor test (ASTM DI557). The Contractor shall furnish all labor, equipment and materials in connection with handling ground water and surface water encountered during construction and placement of compacted granular fill or other material as specified.

2. Not less than 14 days prior to the scheduled start of work, the Contractor shall submit his proposed method of dewatering and maintaining dry conditions to the Geotechnical Engineer for review. The submittal shall include calculations, plans, sketches, pump curves, method of sediment control, and disposal. The dewatering plan shall be prepared by a licensed Civil Engineer. Review by the Architect of the Contractor's proposed method of dewatering shall not relieve the Contractor of responsibility for the satisfactory performance of the dewatering system. The Contractor is responsible for correcting any disturbance of natural bearing soils or damage to structures caused by an inadequate dewatering system or by interruption of the continuous operation of the system as specified.

3. The Contractor shall make the entire excavation for this work in the dry. The water level is to be maintained continuously one foot below bottom of excavation for the length of time to complete the work. The Contractor shall place all fill materials and proposed improvements in the dry.

4. The Contractor shall, at all times during construction, provide and maintain proper equipment and facilities to remove promptly and dispose of properly, all water entering excavations and keep such excavations dry so as to obtain a satisfactory undisturbed bottom of excavation or subgrade condition. Dewatering shall be in operation until the fill, or the proposed surface condition has been completed to such extent that it will not be floated or otherwise damaged by allowing water levels to return to natural elevations.

5. In excavations below the ground water level, it is expected that dewatering trenches or deep sumps will be required for pre-drainage of the soils prior to final excavation, and for maintaining the lowered groundwater level until construction has been completed to such an extent that floating, slumping or damage to excavations or materials placed does not occur. Monitoring of adjacent ground water levels by observation wells or other satisfactory means may be required.

6. The Contractor shall discharge all pumped water away from the work area, and in

accordance with all applicable local codes and laws. Requirements specified herein for Erosion and Siltation Control shall be met during this process.

7. All fill material shall be placed and compacted in the dry. The Contractor shall dewater excavated areas as required to perform the work and in such a manner as to preserve the undisturbed Commonwealth of the natural inorganic or other subgrade soils.

8. The Contractor shall verify that the construction and/or operation of his dewatering system will not adversely affect any well, pond, stream structure, utility, etc., on or adjacent to the area being dewatered.

PART 2 - PRODUCTS

2.01 MATERIALS

1. Fill material shall be obtained from required on-site cut to the extent suitable material is available and off-site to the extent suitable material is not available from on-site cuts.

2. On-site material for use in compacted fill shall be natural inorganic granular soil taken from areas of cut after removal of pavement, topsoil, or other unsuitable materials.

3. Fill materials shall be well-graded within specified gradation limits. Gradation of backfill materials shall be determined in accordance with ASTM D-422.

4. Crushed Stone: Crushed stone processed from a stone quarry, washed, graded, free of organic materials. Gradation is as follows:

1. 1/2" Crushed Stone

U. S. SIEVE NO.	% PASSING BY WEIGHT
2"	100
1/2"	85-100
3/8"	15-45
#4	0-15
#8	0-5

2. 3/4" Crushed Stone

U.S. SIEVE NO.	% PASSING BY WEIGHT
1"	100
3/4"	90-100
1/2"	10-50
3/8"	0-20
# 4	0-5

3. 1-1/2" Crushed Stone

U.S. SIEVE NO.	% PASSING BY WEIGHT
2"	100
1-1/2"	95-100
1”	35-70
3/4"	0-25

4. Structural Fill: Well-graded, hard, durable, natural sand and gravel, free from ice and snow, roots, sod, rubbish, and other deleterious or organic matter. Material shall conform to the following gradation requirements:

U.S. SIEVE NO.	% PASSING BY WEIGHT
4"	100
#4	40-70
#40	25-45
#200	0-12

6. Ordinary/Common Fill: Well-graded, natural, inorganic soil approved by the Architect and meeting the following requirements:

    1. It shall have less than 3% organic matter, free from weak, compressible, or frozen materials, and of stones larger than eight inches in dimension. It shall not contain granite block, concrete, masonry rubble, roots, stumps or other similar materials.

    2. It shall be of such nature and character that it can be compacted to the specified densities.

    3. Topsoil and the zone directly below the topsoil indicated on the borings as "subsoil" shall not be considered Ordinary Fill nor shall topsoil, or subsoil stockpiled on the site. Where subsoil is encountered, it shall be stripped separately from the topsoil and the granular material directly beneath the subsoil. This excavated material shall only be utilized in lawn areas, playfield areas or other non-structural areas, and shall be placed in these areas at distances away from adjacent site improvements as specified herein or as directed by the Architect.

    4. Material from excavations on the site may be used as Ordinary Fill if it is deemed acceptable by the Geotechnical Engineer.

7. Unsuitable Material which is classified as "unsuitable" shall be material having at least one of the following properties:

    1. Material with a maximum unit dry weight per cubic foot less than 90 lbs., as determined by ASTM D1557.
    2. Material containing greater than 3% organic matter by weight, organic silt, peat, construction debris, roots and stumps.
    3. Material deemed unsuitable by the Geotechnical Engineer based on its inherent inability to perform satisfactorily as a bearing stratum.
    4. Soil, which is allowed to become frozen, saturated, or unstable because of the contractor's failure to employ appropriate dewatering, excavation methods, or weather protection is not deemed unsuitable soil but rather represents a condition in which the subgrade was not adequately prepared and/or protected.

8. Blast Rock Fill: Shall be broadly graded blasted rock with a maximum size of 12 inches, 25% smaller than six inches and 10% finer than 3/4 inch. Occasional boulders up to 18 inches will be permitted near the base of the fill.

    1. General site rock fill (outside the building area) may be placed up to within 42 inches of finish grade in pavement areas and to within 18 inches of inverts of utility lines. First lift over the top of rock fill shall be a choke stone layer 18 inches thick. Compaction shall be by minimum of four coverages of a self-propelled vibratory drum roller in each direction (i.e. north-south and east-west). The minimum weight of the drum shall be 10,000 lbs. Compaction may also be by four coverages of heavy track equipment such as a CAT D8 Bulldozer or other heavy track equipment approved by the Geotechnical Engineer.
    2. Rock shall not be placed within a five-foot horizontal distance on either side of

any proposed utility line. The intent is to leave a zone of granular fill that can later be excavated for installation of utilities. Also, large rock fragments shall be kept away from utility pipes.

9. Choke Stone: Shall have a maximum rock size of nine inches and shall have 50% finer than 1-1/2 inch and 25% finer than 3/4 inch.

10. Sand Fill: Shall consist of well-graded natural sand, free from organic, other weak or compressible materials, or frozen materials, Conforming to the following gradation:

U.S. SIEVE NO.	% PASSING BY WEIGHT
#4	100
#50	15-40
#100	2-10
#200	0-5

11. Slab Base Course : Shall be hard, durable, natural sand and gravel, free from ice and snow, roots, sod, rubbish, or organic matter. Material shall conform to the following gradation requirements:

U.S. SIEVE NO.	% PASSING BY WEIGHT
2"	100
#4	40-70
#40	25-45
#200	0-10

PART 3 - EXECUTION

3.01 GENERAL EXCAVATION

1. Excavate all materials encountered to allow construction of the proposed building and structures, utilities and site work as shown on the Drawings and as hereinafter specified.

2. Excavate to levels shown for footings and structures, as required to provide working clearance and to allow adequate inspection and to subgrades outside of buildings and structures as specified herein and as shown on Drawings.

3. In planted areas, remove ledge, boulders and other obstructions to a depth of at least two feet below finished grade.

4. Remove from the site and legally dispose of all debris and other excavated material not needed for, or suitable for, fill except as otherwise specified herein. Remove all materials subject to rot or attack by termites.

5. In general, the Contractor will be permitted to use machine excavation to the bottom of fill under concrete slabs on grade. The final three inches under footings and foundations shall be excavated using a straight blade bucket. If the final three inches cannot be satisfactorily excavated using a straight blade bucket without disturbing subgrades, the Contractor shall use alternative methods, including hand excavations. Alternative methods shall be subject to approval by the Architect or Geotechnical Engineer.

6. Unsuitable Soil Conditions:

    a. If unsuitable bearing materials are encountered at the specified subgrade depths, the Contractor shall notify the Architect. The Contractor shall carry excavation deeper and replace the excavated material with compacted fill or concrete as directed by the Architect or Geotechnical Engineer. Soil subgrades, which are unstable due to inadequate construction dewatering or excessive subgrade disturbance, are not deemed unsuitable soils.

  - b. Removal of such material and its replacement as directed will be paid for as extra compensation in quantity approved by the Architect. Only changes in the work authorized in advance by the Architect in writing shall constitute an adjustment in the Contract Price.
  - c. Material that is not within +\- 3% optimum moisture for compaction of the particular material in place as determined by the Architect or the Geotechnical Engineer and is disturbed by the Contractor during construction operations so that proper compaction cannot be reached shall not be construed as unsuitable bearing materials. This material shall be removed and replaced with lean concrete or structural fill as directed by the Architect or Geotechnical Engineer at no additional cost to the Owner.
  - d. The Contractor shall follow a construction procedure, which permits visual identification of firm natural ground.
  - e. The volume of unsuitable material shall be measured by profiling the in-place topography and calculation by the average-end-area method or other method deemed acceptable by the Geotechnical Engineer. The contractor’s Licensed Surveyor or Professional Engineer shall prepare the calculations. Payment limits shall be for rock excavation.

7. Excessive Excavation: If any part of the general or trench excavation is carried, through error, beyond the depth and the dimensions indicated on the Drawings or called for in the Specifications, the Contractor at his own expense, shall furnish and install compacted gravel fill, concrete, or take other remedial measures as directed by the Architect to bring fill material up to the required level.

3.02 TRENCH EXCAVATION

1. Excavate as necessary for all footings, structures, pipes, storm and sanitary drainage, electrical, gas, water, related structures and appurtenances, and for any other trenching necessary to complete the work. Unless otherwise indicated, provide separate trench for each utility.

2. Definitions:

    1. "Trench excavation" shall be defined as an excavation in which the bottom width does not exceed seven feet, and the top width does not exceed twice the depth or where footings are excavated by backhoe. Refer to Drawings for any special trenching conditions for utilities, structures, etc.

    2. The words "invert" or "invert elevation" as used herein mean the elevation at the inside bottom of pipe or channel.
    3. The words "bottom of the pipe" as used herein means the elevation at the base of the pipe at its outer surface.

3. In general, machine excavation of trenches will be permitted with the exception of preparation of pipe beds, which will be handwork. Excavate by hand or machine methods at least six inches below the bottom of all utilities.

4. Trench excavation shall include the removal of all materials encountered. During excavation, materials determined to be suitable for backfilling shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. All excavated materials not required or unsuitable for backfill

shall be removed and legally disposed of off the site. The banks of trenches shall be cut as near vertical as practicable to the extent allowed by OSHA.

5. The Contractor shall provide, at his own expense, suitable bridges over trenches where required for accommodation and safety of the traveling public and as necessary to satisfy the required permits and codes.

6. Trenches shall be excavated to the necessary width and depth for proper laying of pipe or other utility and shall have vertical sides or slopes as required by codes. Minimum width of trenches shall provide clearance between the sides of the trench and the outside face of the utility. Maximum trench sizes are as shown on the Drawings or as specified herein. The depth of the trench shall be six inches below the bottom of the pipe barrel or respective utility. If the existing soil is not suitable, the Architect or Geotechnical Engineer may approve removal and replacement of material. Costs for removal and replacement materials will be based on Unit Prices.

7. Coordinate all utility and trench backfilling with the trades involved.

3.03 ROCK EXCAVATION

1. Definitions and Classifications: The following classifications of excavation will be made only when rock excavation is required.

    1. "Earth Excavation" consists of removal and disposal of pavement and other obstructions visible on ground surface; underground structures and utilities indicated to be demolished and removed; material of any classification indicated in data on subsurface conditions; and other materials encountered that are not classified as rock excavation.
    2. "Rock Excavation" consists of removal and disposal of materials encountered that cannot be excavated without continuous and systematic drilling and blasting or continuous use of a ripper or other special equipment, except such materials that are classed as earth excavation. Typical of materials classified as rock excavation are as follows:

        1. Consolidated Bedrock.

        2. Boulders on site, outside trench limits, exceeding two cubic yards in volume.
        3. Boulders within trench limits, exceeding one cubic yard in volume.

    3. Should highly fractured or weathered bedrock be encountered during excavation, the following shall apply:

        1. When the material is encountered in trenching operations or under footings, it shall be excavated or ripped with a hydraulic backhoe equal to or larger than a Caterpillar 235 excavator and will be classified as Earth Excavation. When it is demonstrated to the satisfaction of the Architect and the Geotechnical Engineer that this material can no longer be removed with a hydraulic backhoe and requires drilling and blasting, this material shall be classified as Rock Excavation. - For excavation procedures when this material is encountered under footings, refer to paragraph below.

    4. Intermittent drilling and ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as Earth Excavation.

    5. Allowance for Rock Excavation: The Contractor shall carry in the Base Bid an allowance for xxx cubic yards of rock encountered in trench excavation removed from the site. The Contractor shall also carry in the Base Bid an allowance of xxx cubic yards of open rock excavation removed from the site. The Base Bid shall cover all costs relating to such rock excavation, including blasting, removal and placement of the excavated material, overhead and profit. The Owner for excavation herein defined will pay no amount other than that herein specified.

        1. If the total quantity of Rock Excavation, open and/or trench, exceeds the amount of Rock Excavation included in the Contract as listed above, the Owner shall pay the excess excavation at the unit prices as indicated in the contract.
        2. If the total quantity of Rock Excavation, open and/or trench, is less than the amount of Rock Excavation included in the Contract as listed above, the Contract sum will be decreased by the difference in Rock Excavation multiplied by the unit prices listed in the contract.

2. Measurements:

    1. When, during the process of excavation, rock is encountered, such material shall be uncovered and exposed in such a manner that the unbroken ledge surface is clearly visible, and the Contractor shall notify the Architect, before proceeding further. The areas in question shall then be cross sectioned as hereinafter specified.
    2. Failure on the part of the Contractor to uncover such material and to notify the Architect and proceeding by the Contractor with the rock excavation before cross-sections are taken, will forfeit the Contractor's right of claim towards the stated allowance or additional payment over and above the stated allowance at the quoted unit price.
    3. The Contractor shall employ and pay for a licensed Registered Civil Engineer or Land Surveyor to take cross-sections of rock before removal and to make computations of volume of rock encountered within the Payment Lines. Cross-sections shall be taken in the presence of the Geotechnical Engineer and the computations approved by the Architect. The volume calculations shall be by the average end area method. The Owner has the option to perform independent cross-sections and computations of rock quantities.
    4. Where removal of boulder or ledge is required outside the established payment lines, the Architect shall determine the extent of this removal and basis of payment.

3. Blasting: Obtain written permission and approval of method from local authorities before proceeding with rock excavation. Explosives shall be stored, handled, and employed in accordance with state and local regulations or, in the absence of such, in accordance with the provisions of the "Manual of Accident Prevention of Construction" of the Associated General Contractors of America, Inc.

    1. Notify the Architect at least 48 hours before any intended blasting and do no blasting without his specific approval of each blasting operation.
    2. Contractor shall present evidence that his insurance includes coverage for blasting operations before doing any blasting work. A pre-blast survey shall be performed for all buildings and utilities within a radius of 150 feet from the blasting zone or conforming to the ordinance governing blasting and the Fire Department regulations.
    3. All rock blasting shall be well covered with heavy mats or timbers chained together and the Contractor shall take great care to do no damage to existing structures, utility lines and trees to remain.

    4. Any damage caused by the work of this Contractor shall be repaired to the full satisfaction of the Architect at no additional cost to the Owner.
    5. Any rock fragments or loose material from blasting operations shall be removed. All voids shall be filled with a leveling mat of structural fill or lean concrete as directed by the Geotechnical Engineer.
    6. At least 2 weeks prior to blasting the contractor shall submit a blasting plan indicating blasting agents to be used, drill hole depths and spacing, powder factors, personnel, vibration limits and method of measurement, for review by the Geotechnical Engineer.

4. Complaints:

    1. Report all blasting complaints to the Architect within 24 hours of receipt thereof. Include the name, address, date, time received, date and time of blast complained about, and a brief description of the alleged damages or other circumstances upon which the complaint is predicated. Assign each complaint a number, and number all complaints consecutively in order of receipt.
    2. Submit a summary report to the Architect each month which indicates the date, time and name of person investigating the complaint, and the amount of settlement, if any.
    3. When settlement of a claim is made, furnish the Architect with a copy of the release of claim by the claimant.
    4. Immediately notify the Architect, throughout the statutory period of liability, of any formal claim or demands made by attorneys on behalf of claimants, or of serving of any notice, summons, subpoena, or other legal documents incidental to litigation, and of any out-of- court settlement or court verdict resulting from litigation.
    5. Immediately notify the Architect of any investigations, hearings, or orders received from any governmental agency, board or body claiming to have authority to regulate blasting operations.

5. If ledge is encountered within the limits of the Proposed Building Area, the Contractor shall excavate this material 18 inches below subgrade of footings and 12 inches below subgrade of slabs unless otherwise directed by the Architect or Geotechnical Engineer. All loose or shaken rock shall be removed and replaced with compacted gravel fill or lean concrete as specified herein.

6. Rock excavation for foundations outside of the Building Area: Remove rock to foundation or footing subgrade. All rock bottoms for foundations shall be carefully examined. Loose or shaken rock shall be removed to solid bearing, and the rock surface leveled, or shelved to a slope not exceeding one inch per two feet, or as directed.

7. Excavate rock encountered in grading under paved areas, lawns and plant beds to subgrade as specified herein and shown on the Drawings. All boulders or protruding rock outcrops shall remain undisturbed at lawns and plant beds when so directed by the Architect. Rock shall be fractured six inches below subgrade of paved areas, but this six-inch layer shall remain in place.

8. If any part of the rock excavation at footings be carried beyond the depth and the dimensions indicated on the Drawings or called for in the Specifications, the Contractor shall, at his own expense, furnish and install concrete of same strength as footings to the required subgrade level of the footings as shown on the Drawings. Doweling or other corrective structural measures as directed by the Architect may also be required to properly anchor or reinforce the concrete. If rock excavation is carried beyond the depth and dimensions to subgrade in other areas, the Contractor shall, at his own expense, furnish and install compacted gravel fill to subgrade as directed by the Architect.

9. Basis of Payment: The total amount of rock excavation will be based upon the volume of rock excavated within and/or above the lines referred to in the next paragraph as "Payment Lines". The payment lines are only to be used as a basis of payment and are not to be used as limits of excavation. Limits of excavation area as shown on the Drawings and as specified herein.

10. Payment Lines for Rock Excavation:

    1. Payment lines for columns and footings within the building shall be a vertical line one foot from the toe of the footings; the depth shall be measured at 24 inches below the bottom elevations shown on the Drawings. If rock is to remain directly below the bottom of the footings within the Building Area, payment lines shall be six inches below the bottom elevation of the footing as shown on the Drawings. Payment lines for walls to be damp- proofed shall be a vertical line two feet outside the walls. Payment lines for footings outside of the building shall be six inches below the bottom of footings. Vertical payment lines shall be as specified hereinafter.
    2. Payment lines for manholes and catch basins shall be one foot outside of the outer wall and six inches below subgrade beneath the structure.
    3. Payment lines for rock excavation under slabs on grade shall be six inches below the bottom elevation of the specified gravel base course outside of the building and 12 inches below subgrade for slabs within the building.
    4. Payment lines for rock excavation at paved areas and lawns shall be six inches below respective subgrades.
    5. Payment lines for rock excavation under pipes within the building and for utility trenches outside the building lines shall in no case be calculated as greater in width than the outside diameter of the pipe plus two feet for pipes up to 18 inches. For pipes 18 inches and larger payment lines shall in no case be calculated as greater in width than the outside diameter of the pipe plus three feet. Payment lines at bottom of all pipe and utility trenches shall be six inches below subgrade.

3.04 PROOF-ROLLING

1. Contractor shall be required to proof roll foundation and pavement subgrades prior to foundation construction or the placement and compaction of fill materials.

2. Proof rolling of foundation subgrades shall include at least ten passes of a small vibratory plate compactor for trench excavations or six passes of a heavy vibratory roller for open areas.

3. Proof rolling of pavement subgrades shall include four passes of a heavy vibratory roller.

4. If groundwater is located within two feet of foundation or pavement subgrade, proof rolling may be eliminated. However, the Contractor shall demonstrate care during excavation so as to minimize subgrade disturbance.

5. The Geotechnical Engineer shall visually observe Proof rolling. Foundation construction or replacement of fill materials shall not commence until the Geotechnical Engineer has witnessed subgrade conditions and proof rolling operations.

6. Soils which exhibit weaving or instability during the proof rolling operations as determined by the Geotechnical Engineer shall be removed and replaced with compacted Structural Fill or Crushed Stone at no additional cost to the Owner.

3.05 FILLING AND GRADING

1. Samples and Testing:

    1. All fill materials, and their placement shall be subject to quality control testing. The Owner shall pay for all testing except that the Contractor will bear cost of testing materials, which fail to conform to Specifications. Test results and laboratory recommendations will be available to Contractor. All sieve analyses for conformance of on-site and off-site fill materials to be used in the work shall be done by means of a mechanical wet sieve analysis and in accordance with ASTM D-422.
    2. The Owner will retain a Geotechnical Engineer to provide personnel, qualified by training and experience, to be at the site to observe preparation for the placement of compacted fills, to observe excavation and dewatering required for the work, and to observe earthwork operations and report on the conformity of operations with these Specifications. All service and approvals given by the Geotechnical Engineer shall not relieve the Contractor of his responsibility for performing the work in accordance with these Specifications. The Contractor agrees to accept as final the results of field and laboratory tests performed by the above representatives. As stated hereinbefore, the Owner reserves the right to modify or waive Geotechnical Engineer's services.
    3. Excavated material taken directly from on-site cuts that will meet these Specifications may be used as Ordinary Fill or Structural Fill provided the Contractor obtains written approval from the Architect. No such fill material shall be put in place until approved for use by the Architect in writing.
    4. Field density tests will be made by the Geotechnical Engineer in accordance with the Method of Test for ASTM Designation D1556 or D2944, to determine the adequacy of compaction; the location and frequency of such field tests shall be at the Geotechnical Engineer's discretion.
    5. The Contractor shall notify the Architect or the Geotechnical Engineer when an area is ready for compaction testing. This notification shall be 48 hours in advance of placing or final compaction so that the Geotechnical Engineer has adequate time to take compaction tests.
    6. The Architect or his designated representative shall have the right to observe the installation of all controlled compacted fills.
    7. Testing of materials as delivered may be made from time to time. Materials in question may not be used, pending test results. Tests of compacted materials will be made regularly. Remove rejected materials and replace them with new, whether in stockpiles or in place.
    8. Cooperate with the Geotechnical Engineer in obtaining field samples of in-place materials after compaction. Furnish incidental field labor in connection with these tests. The Contractor will be informed by the Geotechnical Engineer of areas of unsatisfactory density which may require improvement by removal and replacement, or by scarifying, aerating, sprinkling (as needed), and re-compaction prior to the placement of the new lift. No additional compensation shall be paid for work required to achieve proper compaction.
    9. The Geotechnical Engineer's presence does not include supervision or direction of the actual work by the Contractor, his employees, or agents. Neither the presence of the Geotechnical Engineer nor any observations and testing performed by him shall excuse the Contractor from defects discovered in his work.
    10. In no case will frozen material be allowed for use in fill, backfill, or rough grading material.
    11. Stones or rock fragments larger than four inches in their greatest dimension shall not be permitted within the top six inches of subgrade of any fills or embankments.

2. Placing, Spreading and Compacting Fill Material:

   1. Fill materials are to be placed as designated herein and as indicated on the Contract Drawings.

      1. Crushed Stone shall be placed as follows and compacted as specified herein:

         1.) Under and around utility structures and around foundation drains and underdrains.
         2.) Behind retaining walls, and under rip rap.
         3.) Where otherwise shown on Drawings or as directed by the Architect.

      2. Structural Fill shall be placed as follows and compacted in lifts to a minimum of 95% maximum dry density per the Modified Proctor Test (ASTM D 1557) as specified herein: (Refer to table specified herein for compaction methods and lift requirements.)

         1.) Within building pad areas.
         2.) As a subgrade fill for all material to be placed controlled compacted fills under exterior concrete slabs, foundations, on grade stairs, and other soil bearing situations.
         3.) Wherever a structural fill is called for or shown on the Drawings.

      3. Ordinary Fill shall be placed as follows and compacted as specified herein:
         1.) In general, areas such as lawn or parking islands except where Structural Fill is shown.
         2.) Wherever Ordinary Fill is called for and as specified hereinbefore.
         3.) Wherever Structural Fill, Crushed Stone, Sand Fill or Topsoil is not required herein or on the Drawings.

      4. Blast Rock Fill may be placed up to within three feet of finish grade in pavement areas and within two feet of finish grade in lawns, and to within 30 inches of inverts of utility lines and proposed utility routes. First lift over the top of rock fill shall be choked stone layer 18 inches thick which shall be a well-graded mixture of sand, gravel, and blasted rock with maximum stone size less than nine inches. Compaction shall be by minimum of six coverages of a self-propelled vibratory drum roller in each direction (i.e. north-south and east-west). The minimum weight of the drum shall be 1 0,000 lbs. Compaction may also be by four coverages of heavy track machinery such as a Caterpillar D8 or other track machinery approved by the Geotechnical Engineer.

         1.) Blast Rock Fill shall not be placed within 30 inches vertically of exterior concrete slabs (i.e. sidewalks, loading docks, etc.
         2.) Rock shall not be placed within a five-foot horizontal distance on either side of any proposed utility line. The intent is to leave a zone of granular fill that can later be excavated for installation of utilities. Also keep large rock fragments away from any utility lines.
         3.) Place woven filter fabric (Mirafi 500X or equivalent) over Blast Rock Fill.

        5. Sand Fill shall be placed as follows and compacted as specified for the particular item:

            1.) As a bedding material for PVC electrical conduit where concrete is not required, telephone-cable, primary electric service and gas pipe.
            2.) Where otherwise specified or shown on the Drawings.

        6. Slab Base Fill shall be placed in minimum 6-inch lift under concrete floor slabs.

        7. Subsoil shall be used only under lawn areas and athletic fields. This material shall not be placed closer to areas being otherwise prepared than a 1:1 angle of repose x depth of fill for the particular area. For instance, if a fill is four feet deep, subsoil may not be placed closer than four feet to the area being otherwise prepared.

            1.) Unsuitable Earth Materials shall be removed from the site.
            2.) The fill material shall be placed in uniform horizontal layers and compacted as specified herein.

        8. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to obtain uniformity of material in each layer. So far as practicable, each layer of material shall extend the entire length and width of the area being filled plus two additional feet horizontally along each side for every one foot of fill required.

    3. All fill material shall be placed and compacted in the dry. The Contractor shall dewater excavated areas as required to perform the work, and in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of a day's operation. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment.
    4. The Contractor shall not place a layer of compacted fill on soil that was permitted to freeze prior to compaction or on snow or ice. Removal of these unsatisfactory materials will be required as directed by the Owner.
    5. When the moisture content of the fill material is below optimal moisture necessary for compaction as specified herein, water shall be added until the moisture content is as specified.
    6. When the moisture content of the fill material is above the optimal moisture necessary for compaction as specified herein, the fill material shall be aerated by blending, mixing, or other satisfactory methods until the moisture content is as specified.
    7. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to the specified density. Compaction shall be continuous over the entire area and the equipment shall make sufficient passes to ensure that the desired density is obtained. A minimum of four coverages with acceptable compaction equipment described hereinafter is a requirement. These coverages are to be provided as systematic compactive effort; incidental coverages due to construction vehicle traffic through the area will not be included.

3. Structural Fill: All fills within the building area shall be made with Structural Fill as defined herein and shown on the Footing Zone of Influence detail included herein. No excavated

on-site material will be acceptable as Structural Fill unless specifically approved by testing as specified herein.

4. Allowance for Unsuitable Materials and replacement with Structural Fill: The Contractor shall include in his base bid xxx cubic yards for the removal of Unsuitable Materials and Structural Fill in place and graded as specified herein to be used as directed by the Architect or the Geotechnical Engineer. This quantity of Structural Fill is in addition to the requirements for Structural Fill in areas as specified herein and as shown on the Contract Documents and is to be used at the discretion of the Architect or the Geotechnical Engineer.

5. Backfilling of Trenches, Structures and Foundations:

    1. Areas to be backfilled shall be free of construction debris, refuse, compressible or decayable materials and standing water. Do not place fill when temperature is below 30 degrees F and when fill materials or layers below it are frozen unless specifically approved by the Geotechnical Engineer.
    2. Requirement of description, placement, compaction and spreading of fill materials as specified herein shall be applicable to backfilling operations.
    3. Structural Fill shall be used as Backfill around manholes and other structures. Excavated material may be used if approved by the Architect or Geotechnical Engineer.
    4. Backfilling of foundations, structures and retaining walls shall not commence until construction finish grade has been approved, forms removed, and the excavation cleaned of trash and debris. Backfill shall not be placed against walls until they are braced or cured sufficiently to develop the strength necessary to withstand, without damage, the pressure that will result from backfilling and compacting operations. If fill is required on both sides of a wall, it shall be brought up simultaneously and evenly on both sides. Avoid damage to the walls and to damp-proofing and waterproofing and other work in place. Allow seven days from the date of application of waterproofing before backfilling. Stones larger than four inches maximum dimension shall not be permitted in the upper six inches of fill or horizontally within 12 inches of walls.
    5. Do not commence backfilling operations of utility trenches until all piping, conduits, etc. have been installed, tested and approved and the locations of all pipe and appurtenances have been recorded. Backfill carefully by hand around pipe to depth of one foot above top of pipe using material specified herein and tamping firmly in layers not exceeding six-inch layers, compacting by hand rammers or mechanical tampers. When a manufacturer of utility line materials suggests backfill materials and methods other than those specified herein, such requirements shall govern providing the finished work equals or exceeds the result obtained by the materials and methods specified herein. Water mains shall be hand backfilled to a minimum cover of 18 inches before mechanical equipment can be used to backfill trench.
    6. Sand Bedding will be required below all pipe unless otherwise shown on the Drawings or specified herein. Crushed Stone is required under utility structures where shown on the Drawings. Gravel Bedding, Sand Bedding or Crushed Stone shall be placed to the full width of the trench and under utility structure foundations as indicated on the Drawings. After a pipe is bedded, the trench shall be filled to the centerline of the pipe with Gravel Fill or Sand Bedding except at the joint. After the joint is inspected, that portion shall be filled in with Sand Bedding. Material under and around the pipe shall be carefully and thoroughly tamped.
    7. From the centerline of the pipe to a point 12 inches above the top of the pipe the backfill shall be Structural Fill or Sand Fill placed by hand and hand tamped. Above this point, backfill shall be placed in layers six inches deep and each layer

shall be compacted with mechanical tampers to not less than 95% of maximum density at optimum moisture of the material. This backfill shall be carried up to the bottom of materials specified to be placed for surfacing requirements.

8. Utilities shall not be laid directly on ledge, boulders or other hard material. This material shall be removed as specified herein within trench limits, and within vertical planes one foot outside of structure walls. Backfill will be placed in eight-inch lifts and thoroughly compacted. If hand guided compaction equipment is used, fill shall be placed in six-inch lifts. All rock excavation shall be considered unsuitable for backfill around utilities. Ordinary fill may be used as backfill in areas specified herein.
9. Coordinate all utility and trench backfilling with the trades involved.

6. Compaction Equipment:

    1. Compaction shall be accomplished by vibratory rollers, multiple wheel pneumatic tired rollers or other types of approved compacting equipment. Loaded trucks, low beds, water wagons and the like shall not be considered as acceptable compaction equipment unless specifically approved by the Architect or Geotechnical Engineer for a particular location. Equipment shall be of any such design that it will be able to compact the fill to the specified density in a reasonable length of time. All compaction equipment shall be subject to the approval of the Geotechnical Engineer.

7. Compaction Requirements:

    1. The following table lists minimum compactive efforts and lift weights which are required for all fill materials. Compaction of each lift shall be completed before compaction of the next lift is started. The compaction equipment shall make an equal number of transverse and longitudinal coverages of each lift. Allow the Geotechnical Engineer sufficient time to make necessary observations and tests. The degree of compaction for fill placed in various areas shall be as follows:

    <u>Relative Compaction</u>

    1. Within buildings and structures:

-Under footings	95%
-under slab	95%

    2. Outside building areas:

-within paved areas	95%
-within lawn areas and playing fields	85%

- Percent of maximum dry density of the material at optimum moisture content as determined by methods or tests for ASTM designation D 1557.

8. Methods: The compaction alternatives given below are stated to provide minimum compaction standards only and in no way relieves the Contractor of his obligation to achieve the specified degree of compaction by whatever additional effort is necessary.

    1. All fill to be placed "in-the-dry" with the exception specified hereinafter. If, in the opinion of the Architect or the Geotechnical Engineer, the Contractor has followed a logical sequence of construction procedures, has employed the proper and necessary equipment, and has otherwise conducted himself in a workmanlike manner, but still cannot effectively dewater the excavation, the Architect or the Geotechnical Engineer may permit the Contractor to place a first

lift of Gravel or Crushed Stone fill "in-the-wet". Fill placed in-the-wet must meet the gradation and placement requirements specified herein. The quantity of fill placed in-the-wet must be no greater than deemed necessary by the Architect and must be limited to the lowermost lift.

9. Moisture Control:

    1. Variation of moisture content in fill and backfill materials shall be limited to Optimum Moisture (-l% to +2%). Moisture content shall be as uniformly distributed as practicable within each lift and shall be adjusted as necessary to obtain the specified compaction.
    2. Material which does not contain sufficient moisture to be compacted to the specified densities shall be moisture conditioned by sprinkling, discing, windrowing, or other method approved by the Geotechnical Engineer.

    1. Material conditioned by sprinkling shall have water added before compaction. Uniformly apply water to surface of subgrade or layer of soil material to obtain sufficient moisture content. The Contractor shall maintain sufficient hoses and/or water distributing equipment at the site for this purpose.

    3. Material containing excess moisture shall be dried to required Optimum Moisture before it is placed and compacted. Excessively moist soils shall be removed and replaced and shall be scarified by use of plows, discs, or other approved methods, and air-dried to meet the above requirements.
    4. Materials, which are within the moisture requirements specified above, but which display pronounced elasticity or deformation under the action of earthmoving and compaction equipment, shall be reduced to Optimum Moisture Content, or below, to secure stability.
    5. In the event of sudden downpours or other inclement weather, exposed subgrades and fills which, in the opinion of the Geotechnical Engineer, become inundated or excessively moistened shall have excess water removed and soil dried as specified above.

3.06 ROUGH GRADING

1. Rough grading shall include the shaping, trimming, rolling and finishing the surface of the sub- base, shoulders, and earth slopes, and the preparation of the sub-base for loam, seeding and paved surfaces. The grading of shoulders and sloped areas may be done by machine methods. Up to two inches in 100" tolerance will be permitted on slopes and one inch in 100" on lawn areas provided the slopes are uniform in appearance and without abrupt changes. All ruts shall be eliminated. Grading of subgrades for paved areas shall be finished at the required depth below and parallel to the proposed surface within 3/8 inch in 100" tolerance.

2. If, during the progress of rough grading work, water pipe, sewer conduit, drain, or other construction is damaged due to operations under this Contract, the Contractor shall repair all such damage at no additional cost to the Owner and restore damaged areas to their original condition.

3. Do all other cutting, filling and rough grading to the lines and grades indicated on the Drawings. Grade evenly to within the dimensions required for finished grades shown on the Drawings. No stone larger than three inches in largest dimension shall be placed in upper 12 inches of fill.

4. Grades shall be brought below finished grades in accordance with the various depths specified below:

    1. Under slabs-on-grade, as specified herein and as shown on the Drawings.
    2. Under paved areas, bottom of base course as shown on Drawings.
    3. Under seeded areas, six inches.
    4. Under cattail marsh area and pond bottom, 12 inches.

5. No rubbish of any description shall be allowed to enter fill material. Such material shall be removed from the site.

6. Complete the grading operations after the building has been finished, the utilities installed, site improvements constructed, and all materials, rubbish and debris removed from the site. Leave subgrade for lawns clean at required grades. There must be sufficient grade staking to provide correct lines and grades.

3.07 DEFICIENCY OF FILL MATERIAL

1. Provide required additional fill material from offsite sources to complete the work if a sufficient quantity of suitable material is not available from the required excavation on the project site.

3.08 SURPLUS OF FILL MATERIAL

1. Surplus fill which is not required to fulfill the requirements of the Contract shall be removed from the site and legally disposed of.

3.09 DUST AND EROSION CONTROL

1. The Contractor shall take all necessary measures and provide equipment and/or materials to minimize dust from rising and blowing across the site and also to control surface water throughout the operation so that it does not run onto paved ways without being filtered. In addition, the Contractor shall control all dust created by construction operations and movement of construction vehicles, both on the site and on paved ways. Provide additional crushed stone where necessary to provide traps or pads for construction vehicles carrying sediment. Provide temporary swales and interceptor ditches to control surface runoff water where necessary.

2. If dust control is required off-site due to work under this Contract, in addition to watering, sweeping and other methods, the Contractor shall apply calcium chloride in the required amounts to properly control dust. These amounts shall be approved by the City Engineer prior to application.

3.10 RESTORATION OF SITE ITEMS

1. Wherever streets, lawns or other items within the Contract Limit Lines have been excavated in fulfilling the work required under the Contract, the Contractor shall furnish and install all material at no cost to the Owner to bring finish surface level with the existing adjacent conditions. All work shall be installed to match the existing conditions.

END OF SECTION 02200

APPENDIX H – PRE AND POST DEVELOPMENT PLANS

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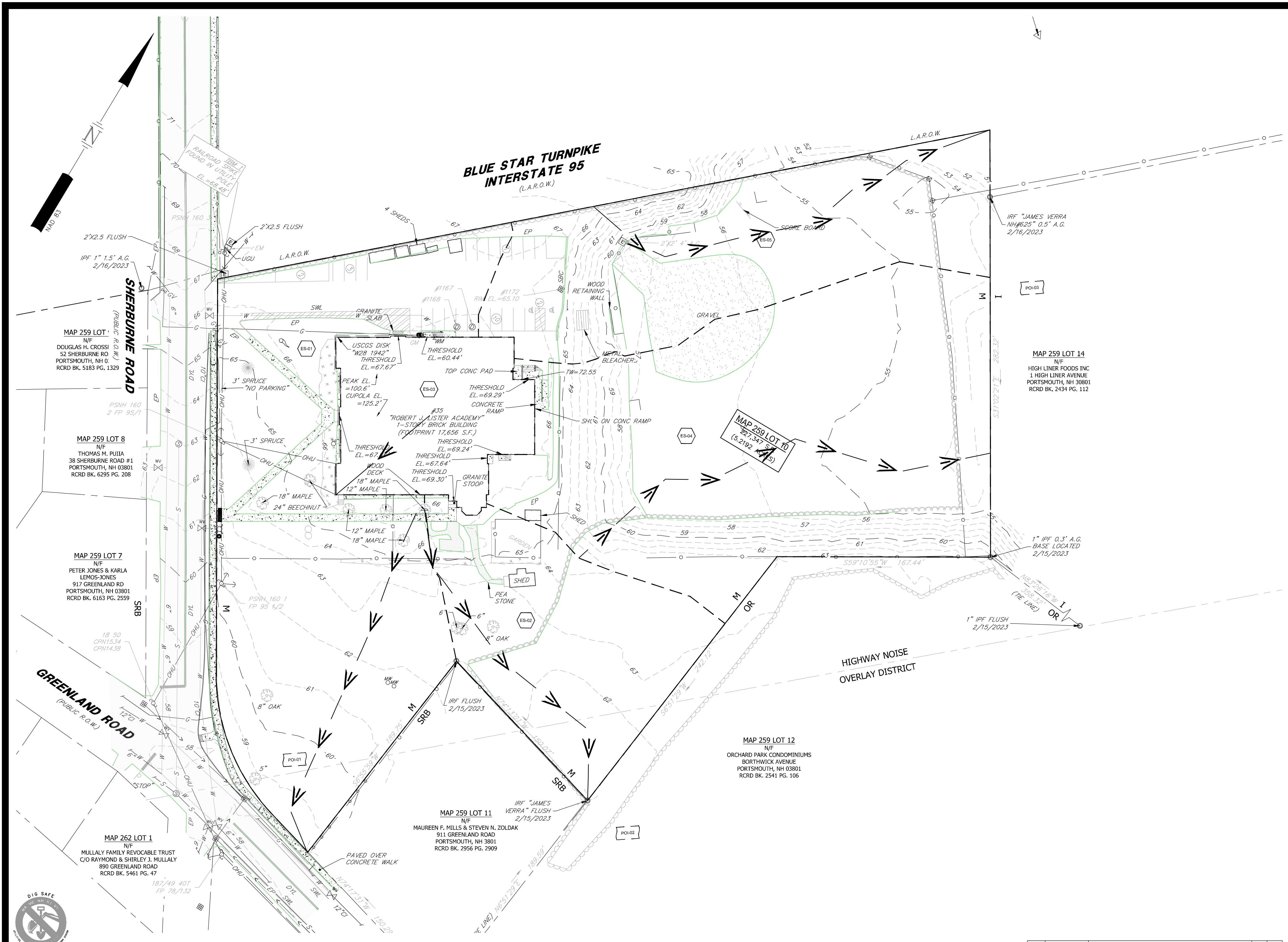


HORIZONTAL SCALE 1"=20'

20 10 0 20

LEGEND

	PROPERTY LINE
	LIMITS OF DRAINAGE SUBCATCHMENT
XXX	SOIL GROUP BREAKLINE
	FLOW PATH (Tc LINE)
	REACH
POI-1	POINT OF INTEREST
ES-1	SUBCATCHMENT AREA
EP-1	POND, CULVERT, OR CATCH BASIN
ER-1	REACH

SOIL PHASE LEGEND
(PERCENT)

A	B	C	D	E	F
0–3	3–8	8–15	15–25	25–50	50+

SOIL LEGEND
(PER USDA NRCS WEB SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP	DRAINAGE CLASS
599	URBAN LAND HOOSIC COMPLEX, 3% –15% PERCENT SLOPES	C/D	WELL TO EXCESSIVELY

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

PRE-DEVELOPMENT DRAINAGE MAP

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH
PREPARED FOR
PHA HOUSING DEVELOPMENT LTD.

1"=60' (11"X17")
SCALE: 1"=30' (22"X34")
JANUARY 29, 2025

REV	DATE	DESCRIPTION	DR	CK
1	6/16/2025	REVISED PER TAC WORKSHOP	DKS	JJM

TFM

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

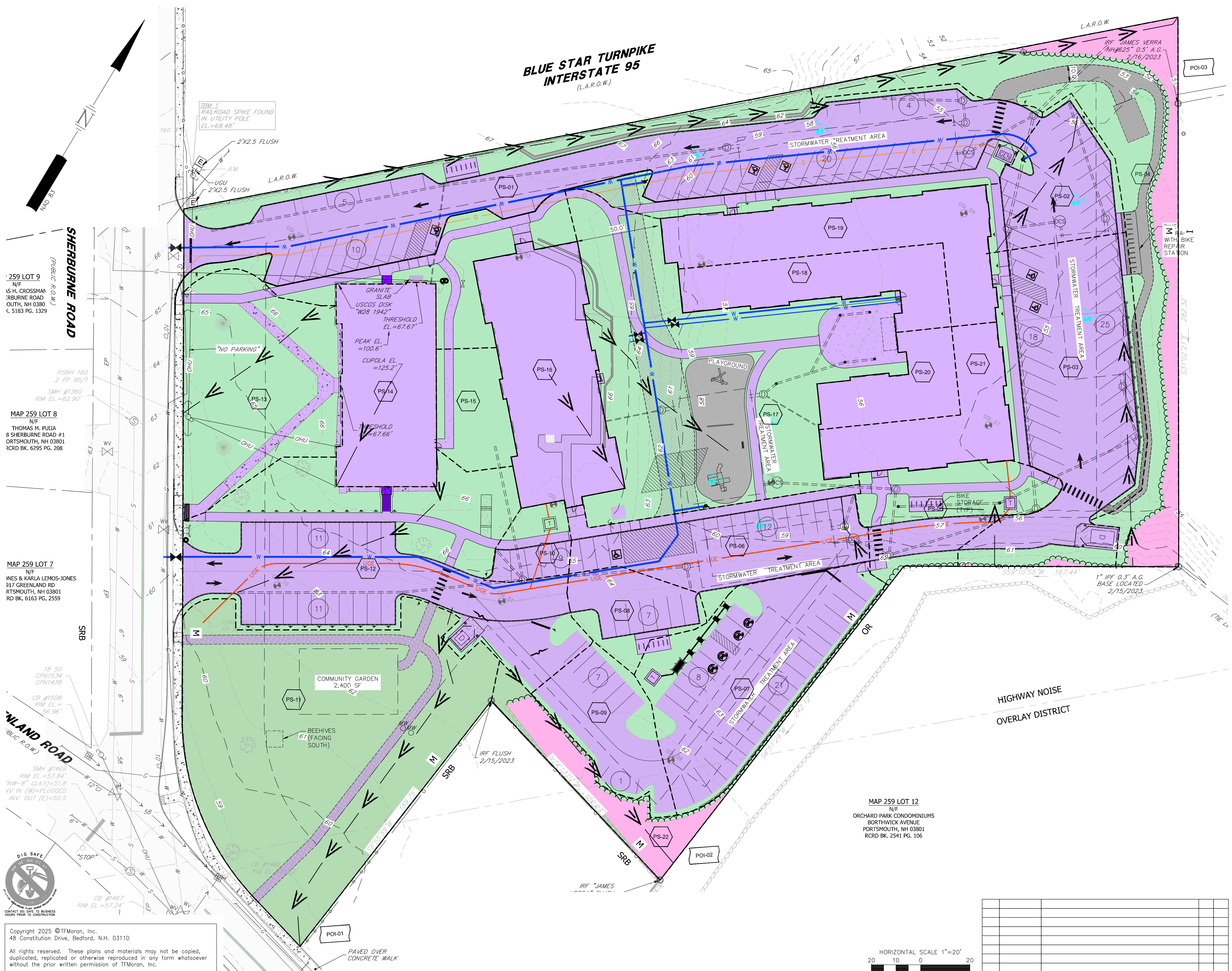
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	DR	XXX	FB	–	
47528.00	CK	XXX	CADFILE	PRE-DRAINAGE MAP	D-01

CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

This plan is not effective unless signed by a duly authorized officer of TFMoran, Inc.

Jun 16, 2025 - 3:55pm
F:\MSC Projects\47528 Sherburne Road, Portsmouth, NH\47528-00 Sherburne Road, Portsmouth, NH\Design\Exhibits\PRE-DRAINAGE MAP.dwg



LEGEND

— — — —	PROPERTY LINE
▬ ▬ ▬ ▬	LIMITS OF DRAINAGE SUBCATCHMENT
······ XXX ······	SOIL GROUP BREAKLINE
- > — > — > —	FLOW PATH (Tc LINE)
- ➤ — ➤ —	REACH
POI-1	POINT OF INTEREST
ES-1	SUBCATCHMENT AREA
EP-1	POND, CULVERT, OR CATCH BASIN
ER-1	REACH

SOIL PHASE LEGEND
(PERCENT)

A	B	C	D	E	F
0–3	3–8	8–15	15–25	25–50	50+

SOIL LEGEND
(PER USDA NRCS WEB SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP	DRAINAGE CLASS
599	URBAN LAND HOOSIC COMPLEX, 3% –15% PERCENT SLOPES	C/D	WELL TO EXCESSIVELY

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

PRE-DEVELOPMENT DRAINAGE MAP

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH
PREPARED FOR
PHA HOUSING DEVELOPMENT LTD.
1"=60' (11"X17")
SCALE: 1"=30' (22"X34") **JANUARY 29, 2025**

REV	DATE	DESCRIPTION	DR	CK
1	6/16/2025	REVISED PER TAC WORKSHOP	DKS	JJM

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	47528.00	DR	XXX	FB	–
		CK	XXX	CADFILE	POST-DRAINAGE MAP

D-02

TFM
Since 1968
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

NEW HAMPSHIRE 200

May 6, 2025

Peter Britz
Director of Planning
Portsmouth Planning Department
1 Junkins Ave, 3rd Floor
Portsmouth, NH 03801

Re: Statement of Green Building Components, Sherburne Workforce Housing Development,
35 Sherburne Road – Portsmouth, NH
TFMoran Project: 47528.00

Dear Peter:

The architectural strategy of this development will be to maximize efficiency and scale, reduce overall utility burden and create safe and comfortable living spaces for both tenants and the neighborhood beyond. Emphasis will be placed on tightness of building envelope, efficiency of selected mechanical and electrical systems, designing a solar-ready building and systems, using low flow fixtures as well as installing EV charging stations and low maintenance plantings.

Sincerely,
TFMoran, Inc.

Jack McTigue, PE, CPESC
Project Manager

cc: Craig Welch, Mark Lentz, Robert Harbeson

TFMoran, Inc.
48 Constitution Drive, Bedford, NH 03110
T(603) 472-4488 www.tfmoran.com

TFMoran, Inc. Seacoast Division
170 Commerce Way–Suite 102, Portsmouth, NH 03801
T(603) 431-2222

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Traffic Report

STATE OF NEW HAMPSHIRE – PROFESSIONAL ENGINEER
ROBERT E. DUVAL
No. 7105
LICENSED
06 May 2025

Traffic Impact and Access Study

Proposed Affordable Housing
35 Sherburne Road
Portsmouth, New Hampshire

TFM Project #47528.00

May 5, 2025

Prepared for:
Portsmouth Housing Authority

Submitted to:
City of Portsmouth

Prepared by:
TFM®
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive, Bedford, NH 03110
(603) 472-4488 www.tfmoran.com

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APPENDICES

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Traffic Impact and Access Study

Proposed Affordable Housing
35 Sherburne Road
Portsmouth, New Hampshire
May 5, 2025

1. Introduction

TFMoran Inc. has completed this traffic impact and access study on behalf Portsmouth Housing Authority to determine traffic impacts associated with a 128 unit affordable housing development. The objectives of the study are:

- To estimate trip generation and distribution for the proposed use to perform capacity analysis for the project study area
- To determine potential traffic impacts of the proposed development use
- To provide recommendations for operational improvements within the study area to mitigate the proposed development's traffic impacts

Portsmouth Housing Authority is proposing an affordable housing development at 35 Sherburne Road in Portsmouth. The project includes a 30-unit 3-story apartment building, a 90-unit 4-story apartment building and converting the existing school building on site into 8 apartment units. The site will have a playground, community garden, picnic area and dog walk for residents.

The site will have two driveways, the new driveway to the south will be full access to allow vehicles to use the first 22 space parking lot to enter and exit. Beyond that front lot will be one way counterclockwise around the site and the existing driveway will be converted to exit only. This will allow one-way circulation around the site. There are 173 total parking spaces proposed.

The existing site is currently an "alternative high school" for approximately 30 students which will be moving to a new location on the nearby community college campus at Pease.

Scope of Study

At the traffic scoping meeting held via Zoom on February 17th, 2023 with City Engineering, TFMoran, and the PHA. It was agreed that this study would consider the following conditions. The same criteria was followed for the 2025 update.

Analysis Periods:

- Weekday AM and PM roadway peak hours
- No Saturday

Covid/Stay-at-Home Volume Adjustments:

- Volumes will be adjusted by a Covid/Stay-at-Home factor.
  - review data from City and NHDOT MS2

Background growth:

- 1% seems to high for this area, review data from City and check MS2 data

Seasonal Adjustment:

- NHDOT Group 4 data for seasonal adjustment

Opening Year/Future Year:

- 2026/2036 – **Updated to 2027/2037**

Other Developments:

- Two other projects in area – Liberty Mutual Building (consolidating office into the Greenland Road location), and Hospital expansion project.

Site Trip Generation/Composition:

- Trip Generation and Composition is based on the current ITE Trip Generation 11th Edition
  - LUC 223 Affordable Housing
  - Al trips Primary

Site Trip Distribution

- Distribution prorata based on the counts

Study Area Intersections:

1) Site Driveway
2) Greenland Road at Borthwick Ave [stop controlled]
3) Greenland Road at NH Route 33 [signal]

2. Existing Conditions

Description of Roadways and Intersections:

<u>Roadways</u>

NH Route 33 (Greenland Road)

- Classification. NH33 is a State-maintained highway in the Seacoast Region that provides east-west travel connecting Stratham with Portsmouth. The following descriptions apply within the study area.
- Lane widths and usage. In the project vicinity, the roadway generally provides two 12’ travel lanes in each direction, with left turn lanes at major intersections, and 5-6’ wide paved shoulders.
- Pedestrian facilities. Pedestrians are not permitted.
- Signage. The speed limit is posted at 35 mph. There are lane use signs, roadway directional signs, overhead lane designations signs and blue hospital & interstate signs. Pavement markings consist of double-yellow centerline, dashed white lines dividing lanes and white shoulder markings, in generally good condition.
- Lighting. Cobra-head roadway lighting is provided in the study area intersections.
- Road conditions. The roadway is fairly level, open drainage with guardrails and normal crown along straights. The pavement is in fair to good condition.

Greenland Road (City portion)

- Classification. Greenland Road is a short local roadway that connects to NH33 and is dead-ended.
- Lane widths and usage. The roadway generally provides two way travel with 12’ lanes in each direction and varying widths of paved shoulder.
- Pedestrian facilities. There are sidewalks along the residential portion of the roadway.
- Signage. The speed limit is 30 mph. There are roadway signs, a stop sign, a “Dead End” sign. There is no striping along the roadway.
- Lighting. A cobra-head roadway light is provided at the intersection of Sherburne Road.
- Road conditions. The roadway is generally flat and straight, open drainage, and normal crown throughout. The pavement is in fair condition with cracking, rutting and pavement patches.
- Adjacent uses and driveways. Other than Orchard Park business park near the intersection of Greenland Road and Borthwick Avenue, the remaining area is residential homes.

Borthwick Avenue

- Classification. Borthwick Avenue is a local roadway that connects NH33 with Bypass US1.
- Lane widths and usage. The roadway generally provides two way travel with 12’ lanes in each direction and 2-6’ wide paved shoulders.
- Pedestrian facilities. There are sidewalks along the east side of the roadway.
- Signage. The speed limit is 25 mph in the study area. There are crosswalk signs, a warning chevron arrow at the corner approaching Greenland Road, “No Parking This Side of Street” signs on the east side of the roadway and a stop sign. Pavement markings consist of double-yellow centerline and white shoulder markings.

- Lighting. Cobra-head roadway lighting is generally provided throughout.
- Road conditions. The roadway is generally flat with curves, open drainage and normal crown throughout. The pavement is in fair to good condition. .
- Adjacent uses and driveways. The Borthwick Park is located along the roadway including Portsmouth Hospital, Liberty Mutual, High Liner Foods, Fairfield Inn and other Office/industrial/Service companies.

Sherburne Road

- Classification. Sherburne Road is a local roadway that is primarily a residential area. The far end of the roadway is gated and does not allow access onto Grafton Road.
- Lane widths and usage. The roadway generally provides two way travel with 12' lanes in each direction, no painted shoulder.
- Pedestrian facilities. Sidewalks are provided on the east side of the roadway.
- Signage. Posted speed limit is 20 mph. There is a “No Parking” sign in front of the school, but no other signs in the area. Pavement markings consist of double yellow centerline in fair condition.
- Sight Distance. Sight distance along the roadway is adequate for the posted speed.
- Lighting. Cobra-head roadway lighting is provided at the southern end of the I95 overpass.
- Road conditions. The roadway is curbed where there is sidewalk and open drainage on the opposite side. The pavement is in fair condition. There is minor crack-sealing, and cracking at the edges of the non-curbed roadway.
- Adjacent uses and driveways: school, and residential.

Intersections

NH Route 33 at Greenland Road

- Traffic Control. This is an existing 3-way signalized intersection. NH Route 33 forms the eastbound and westbound approaches and Greenland Road forms the southbound approach.
- Pedestrian facilities. No sidewalks at intersection.
- Approaches. The EB and WB approaches consist of two 12' lanes. The EB approach has an exclusive left turn lane, and the WB approach has a right turn slip lane onto Greenland Road. The SB approach consists of two lanes, a right-turn lane and a left-turn lane.
- Signage. “Keep Right”, “No Turns on Right Arrow” and NH33 signs are present at the intersection.
- Sight Distance. Intersection sight distance appears adequate in all directions for the posted speed.
- Lighting. Cobra-head style lighting is provided at the SB approach and the center of the intersection on the south side of NH33.
- Roadway condition. Existing roadway is in good condition through the intersection.
- Signal Timing. Existing data provided by NHDOT, Coordinated system with ramps, but likely running free..

Greenland Road at Borthwick Avenue

- Traffic Control. This is an existing 3-way stop controlled unsignalized intersection. Greenland Road forms the EB and NB approaches. Borthwick Ave forms the WB approach.
- Pedestrian facilities. There is an existing sidewalk along the north end of the intersection along Borthwick and Greenland Road. A City Neighborhood Sidewalk Improvement project installed an extension of the sidewalk along the south side of Borthwick Avenue and a new pedestrian crossing at the 3-way intersection and reroute the sidewalk along Greenland Road west.
- Approaches. Each approach accommodates two way traffic. The EB and WB approaches consist of one lane each for through movements and turns. The NB approach provides a left only lane and a right slip lane for turns heading onto Borthwick Ave. The NB approach is divided by concrete median at the center line and grass island between the NB lanes.
- Signage. The 2023 Sidewalk project will propose a stop sign at all three legs of the intersection. A yield sign will remain at the northbound left turn lane onto Borthwick Ave. There are also road identification signs, “stay right” signs at medians, blue informational signs (parking bans and hospital), a Borthwick Park directional sign and a “No Outlet” sign on Greenland Road heading west.
- Sight Distance. Intersection sight distance appears adequate in all directions for the posted speed.
- Lighting. Cobra head lighting is provided in the grass island between the NBL and NBR lanes.
- Roadway condition. Existing roadways in good condition.

Sherburne Road at Site Driveway (Existing)

- Traffic Control. This is an existing driveway. Sherburne Road forms the NB and SB approaches. The driveway forms the WB approach.
- Pedestrian facilities. A sidewalk is located on the east side of Sherburne Road.
- Approaches. All approaches each consist of a single lane for both through movements and turns.
- Signage. There is a “No Parking” sign in front of the school, but no other signs in the area.
- Sight Distance. Intersection sight distance appears adequate in all directions for the posted speed.
- Lighting. Cobra-head style lighting is provided at the bridge just north of the driveway.
- Roadway condition. Existing roadways in fair condition.

3. Background Volumes:

To quantify existing peak hour traffic volumes within the study area, turning movement counts were taken at the study intersections. These counts are tabulated in Appendix I.

Counts were taken at all study intersections on Thursday March 9, 2023 – 7AM to 9AM and 2PM to 6PM.

Seasonal Adjustment.

To account for seasonal variations, the data was seasonally adjusted upward by a factor of 15% to reflect the estimated peak month traffic volume. See Appendix C.

COVID/Stay-at Home Adjustment.

Data was provided by the City at a local signalized intersection where data is collected daily. At the intersection of Lafayette Road and South Street, the City has been collecting data since before the pandemic.

Comparing the data for mid-week (Tuesday – Thursday) for the months of January and February of 2019 vs 2023, shows that the daily volumes are still down by about 13%. The March 2023 counts were adjusted up by 13% to account for traffic that has not returned to pre-pandemic volumes. See calculations in Appendix C.

Volumes adjusted as necessary are shown in the following Base condition figures.

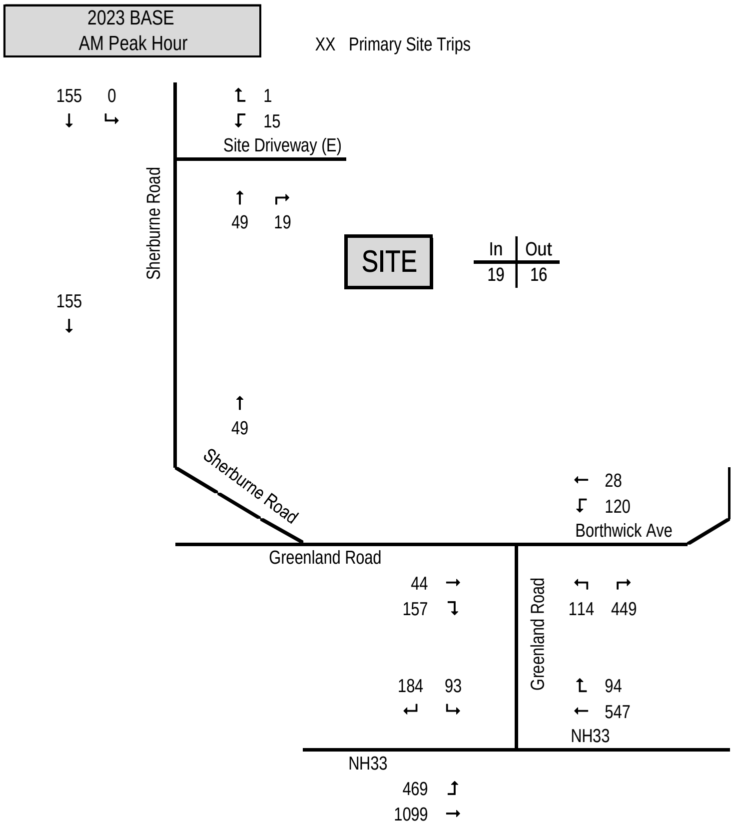
Signal Timings

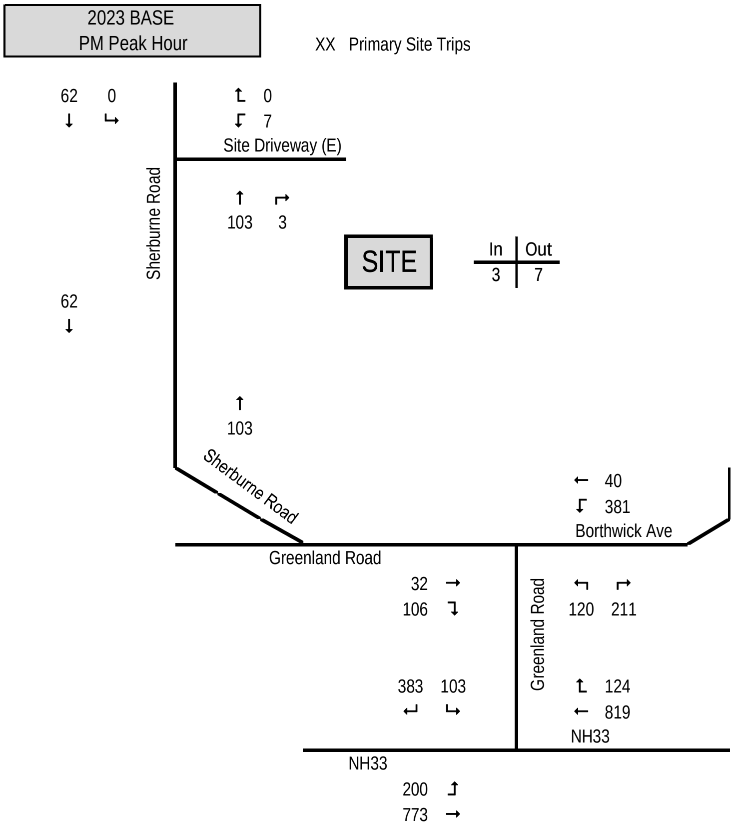
Existing signal timing at the NH33 and Greenland Road intersection is based on current NHDOT timings received by TFM on April 16, 2025. NHDOT noted that it is likely the signal is running Free. The timings are attached in Appendix J.

Balance

Volumes were balanced between the Greenland/Borthwick intersection and the signal at NH33.

The existing volumes are shown in the following figures:


2023 BASE
AM Peak Hour
XX Primary Site Trips
155
0
1
15
Site Driveway (E)
Sherburne Road
49
19
SITE
In
Out
19
16
155
49
Sherburne Road
28
120
Borthwick Ave
Greenland Road
44
157
Greenland Road
114
449
184
93
94
547
NH33
NH33
469
1099


2023 BASE
PM Peak Hour
XX Primary Site Trips
62
0
0
7
Site Driveway (E)
Sherburne Road
103
3
SITE
In
Out
3
7
62
103
Sherburne Road
40
381
Borthwick Ave
Greenland Road
32
106
Greenland Road
120
211
383
103
124
819
NH33
NH33
200
773

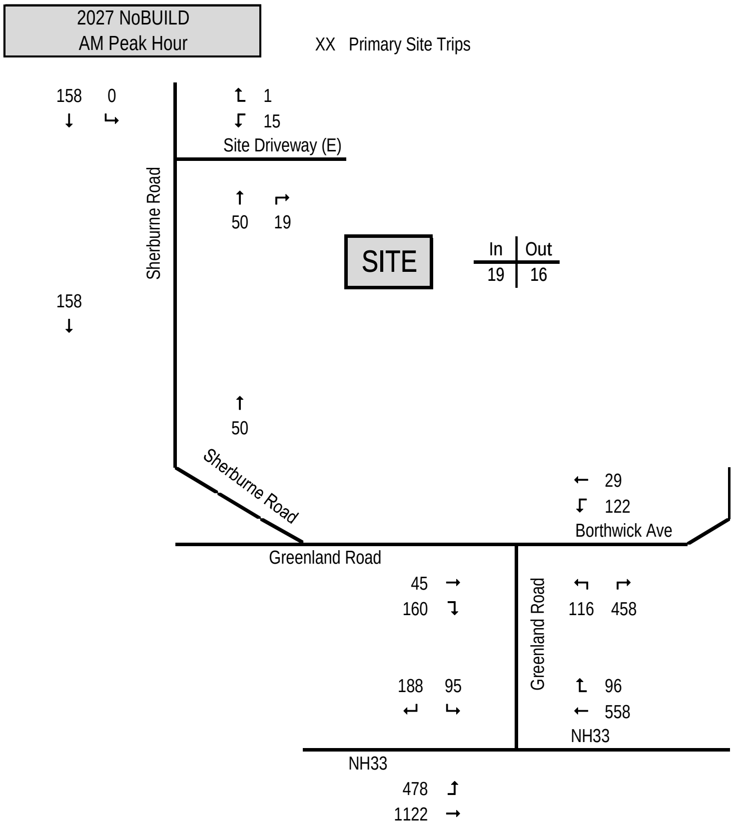
4. No-Build Volumes:

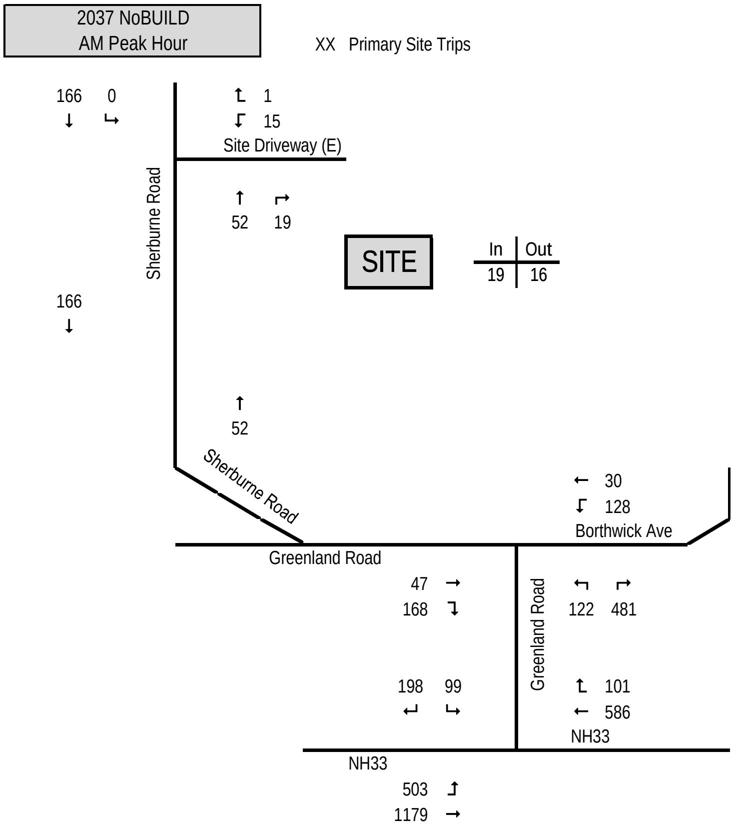
To establish No-Build traffic volumes for this study, the following adjustments were made to the Covid- and seasonally adjusted 2023 Base volumes:

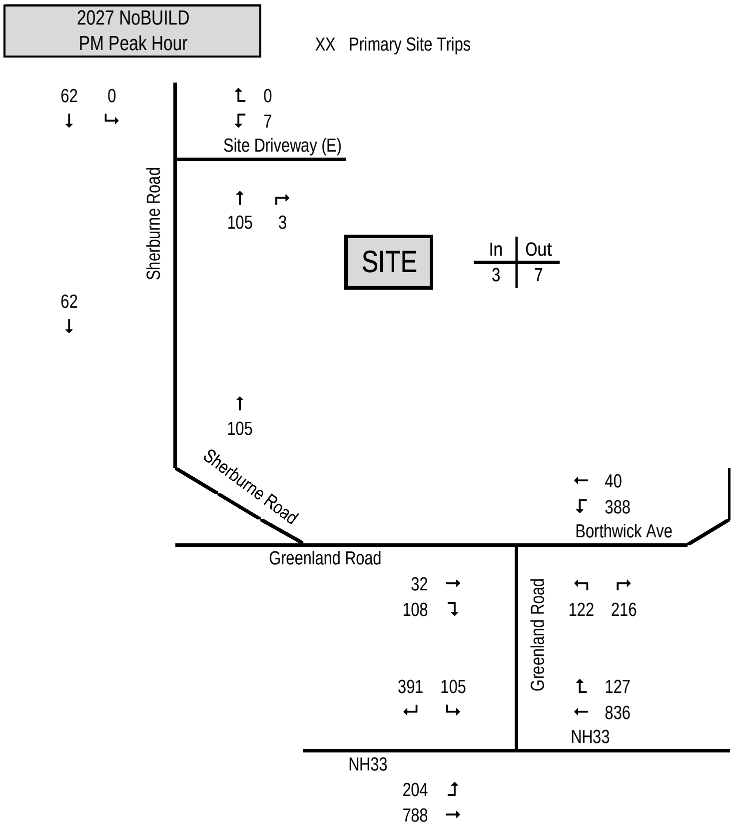
Growth Factor.
NHDOT Historical Annual Growth Data from 2006 to 2019 was reviewed at two stations in Portsmouth: NH33 west of Griffin Road and Borthwick Avenue east of Highliner Avenue. Calculations show that NH33 calculated a plus 0.31% growth rate and Borthwick Ave a minus 0.62% growth rate. The average of the two results in a nearly zero rate of growth for the area, minus 0.16%. See the data and calculations in Appendix C. For the volume calculations, a plus 0.50% growth rate was used as a conservative assumption to account for small local development and in keeping with other studies done in the area.

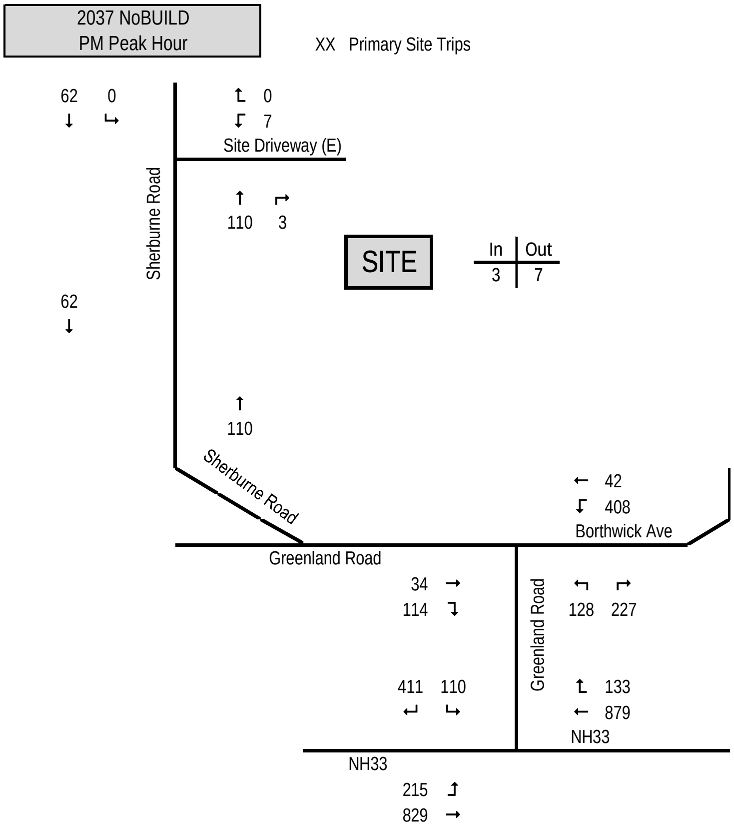
Other Developments.
Per the scoping meeting, two nearby projects were mentioned that would not be included in the count data: a Hospital Expansion and Liberty Mutual reoccupying their existing building. Correspondence with the City (Appendix D) noted that the hospital project only provided a trip memo as it was generating less than a dozen trips during peak hours. Liberty Mutual is just reoccupying their existing building which had been partially vacant during the pandemic and no traffic study was required. Both occurrences can be accounted for within the background growth rate or daily fluctuations of traffic and no additional trips were added to the No-Build volumes.

The total no-build volumes for the opening (2027) and future (2037) years are presented in the figures below.


2027 NoBUILD
AM Peak Hour
XX Primary Site Trips
158
0
1
15
Site Driveway (E)
Sherburne Road
50
19
SITE
In
Out
19
16
158
50
Sherburne Road
29
122
Borthwick Ave
Greenland Road
45
160
116
458
Greenland Road
188
95
96
558
NH33
NH33
478
1122


2037 NoBUILD
AM Peak Hour
XX Primary Site Trips
166
0
1
15
Site Driveway (E)
Sherburne Road
52
19
SITE
In
Out
19
16
166
52
Sherburne Road
30
128
Borthwick Ave
Greenland Road
47
168
122
481
Greenland Road
198
99
101
586
NH33
NH33
503
1179


2027 NoBUILD
PM Peak Hour
XX Primary Site Trips
62
0
0
7
Site Driveway (E)
Sherburne Road
105
3
SITE
In
Out
3
7
62
105
Sherburne Road
40
388
Borthwick Ave
Greenland Road
32
108
122
216
Greenland Road
391
105
127
836
NH33
NH33
204
788


2037 NoBUILD
PM Peak Hour
XX Primary Site Trips
62
0
0
7
Site Driveway (E)
Sherburne Road
110
3
SITE
In
Out
3
7
62
110
Sherburne Road
42
408
Borthwick Ave
Greenland Road
34
114
128
227
Greenland Road
411
110
133
879
NH33
NH33
215
829

5. Trip Generation:

Proposed Trips

Standard trip generation rates published by the ITE[1] (11th Edition), were used to calculate the vehicle trips for the proposed development. LUC 223, Affordable Housing was used to calculate the trips for the apartment buildings and converted school apartments. Existing school trips were counted at the site driveway. See the table below.

Table 1a – Proposed Trip Generation

Land Use	In	Out	Total
Affordable Housing (LUC 223): 111 Units			
Weekday AM Peak Hour Adjacent Street	13	33	46
Weekday PM Peak Hour Adjacent Street	35	24	59

Table 1b – Existing Trip Generation

Land Use School (based on counts)	In	Out	Total
Existing School			
Weekday AM Peak Hour Adjacent Street	17	14	31
Weekday PM Peak Hour Adjacent Street	3	6	9

Table 1c – New Trips

	In	Out	Total
Weekday AM Peak Hour Adjacent Street	(4)	19	15
Weekday PM Peak Hour Adjacent Street	32	18	50

6. Trip Composition, Distribution and Assignment:

Composition

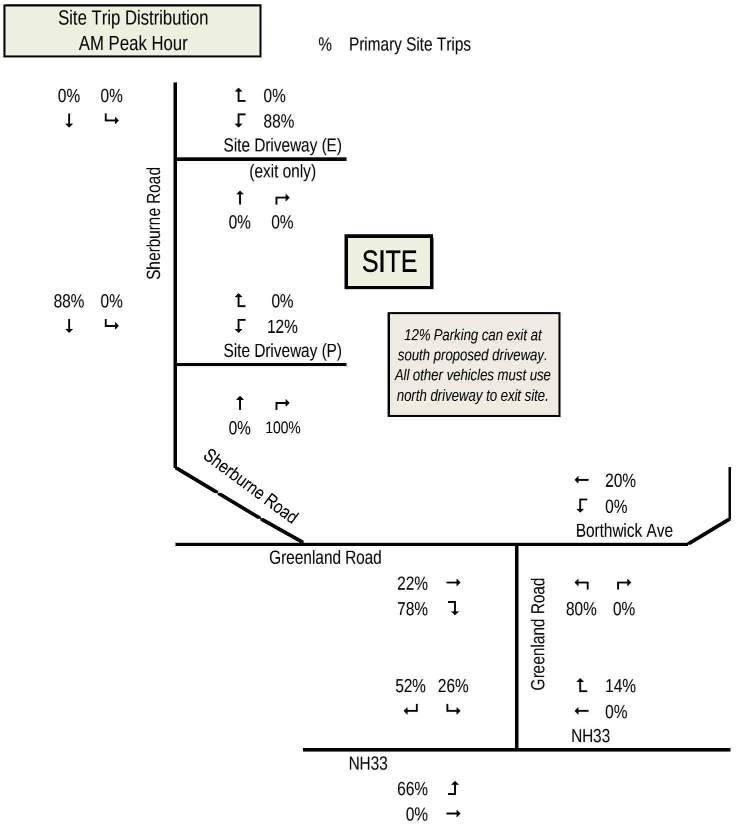
For this project, all trips are considered primary trips. Primary trips go directly from origin to generator and return to origin.

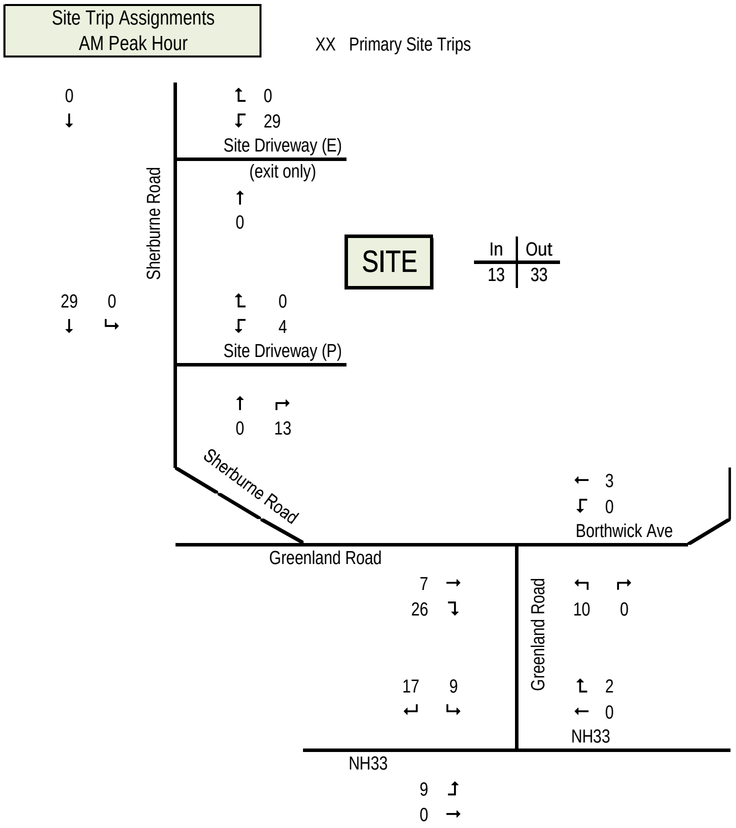
Distribution

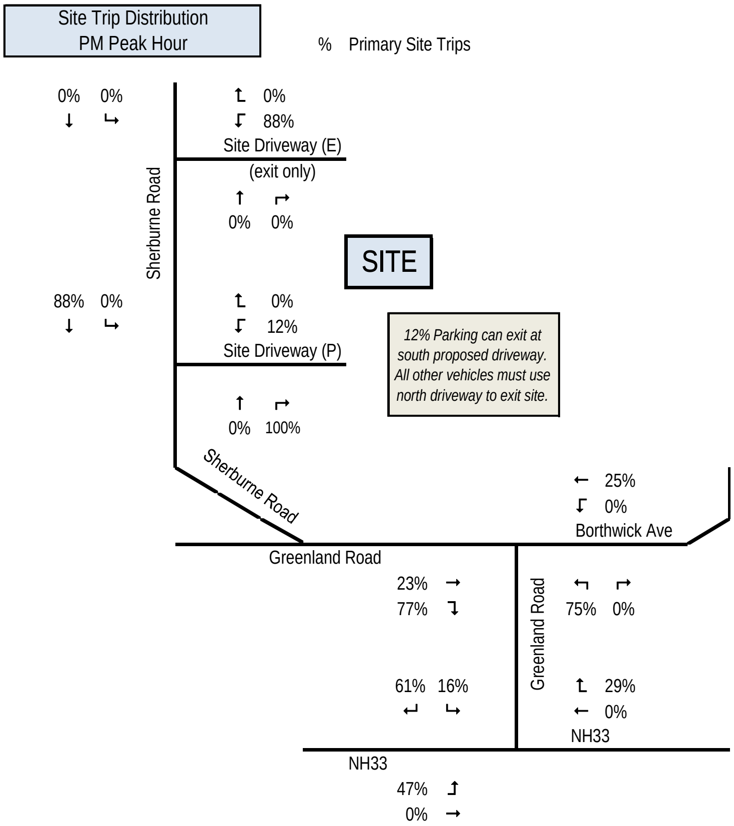
We used prorata distribution based on the new counts in the study area. Sherburne Road is a dead-end roadway, so the existing intersection distributions would represent where residential trips are going to and arriving from. The site trip distributions are shown in the diagrams below.

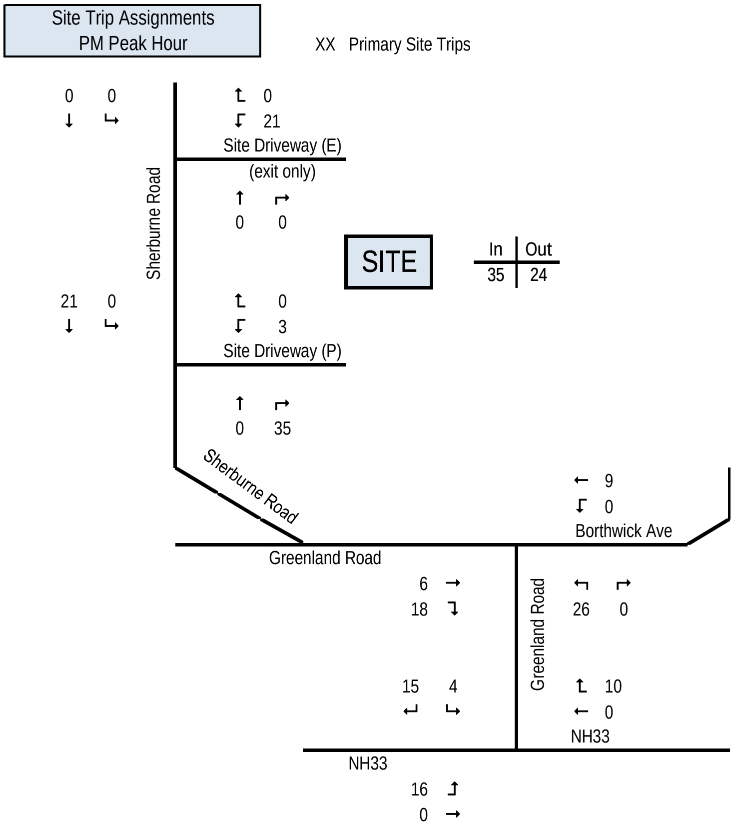
---

[1] *Trip Generation Manual*, Institute of Transportation Engineers (ITE), 11th Edition.


Site Trip Distribution
AM Peak Hour
% Primary Site Trips
0% 0%
0%
88%
Site Driveway (E)
(exit only)
0% 0%
Sherburne Road
SITE
88% 0%
0%
12%
Site Driveway (P)
12% Parking can exit at south proposed driveway. All other vehicles must use north driveway to exit site.
0% 100%
Sherburne Road
20%
0%
Borthwick Ave
Greenland Road
22%
78%
Greenland Road
80% 0%
52% 26%
14%
0%
NH33
NH33
66%
0%


Site Trip Assignments
AM Peak Hour
XX Primary Site Trips
0
0
29
Site Driveway (E)
(exit only)
0
Sherburne Road
SITE
In Out
13 33
29 0
0
4
Site Driveway (P)
0 13
Sherburne Road
3
0
Borthwick Ave
Greenland Road
7
26
Greenland Road
10 0
17 9
2
0
NH33
NH33
9
0

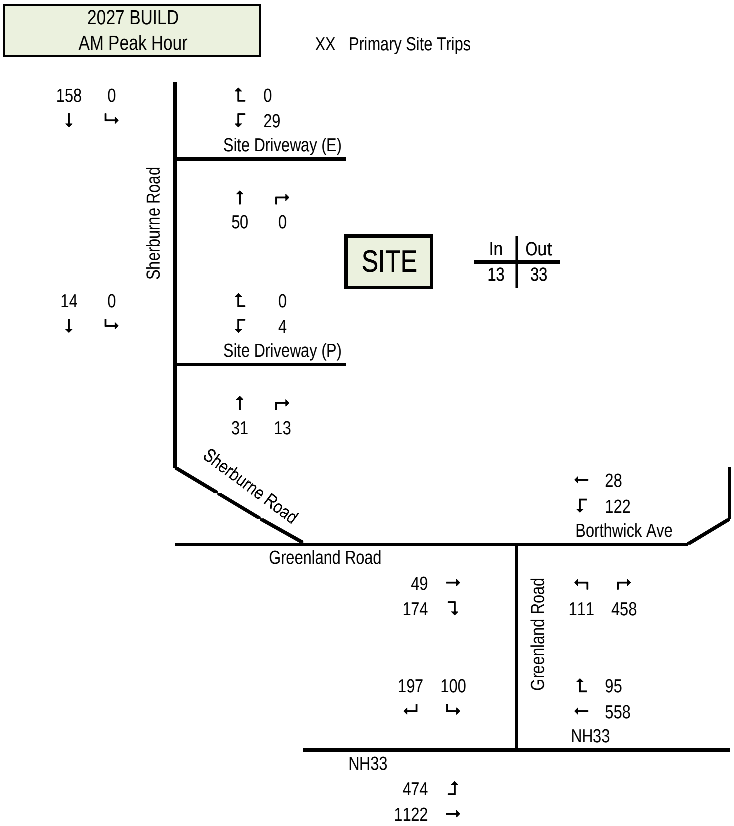

Site Trip Distribution
PM Peak Hour
% Primary Site Trips
0% 0%
0%
88%
Site Driveway (E)
(exit only)
0% 0%
Sherburne Road
SITE
88% 0%
0%
12%
Site Driveway (P)
12% Parking can exit at south proposed driveway. All other vehicles must use north driveway to exit site.
0% 100%
Sherburne Road
25%
0%
Borthwick Ave
Greenland Road
23%
77%
75% 0%
Greenland Road
61% 16%
29%
0%
NH33
NH33
47%
0%

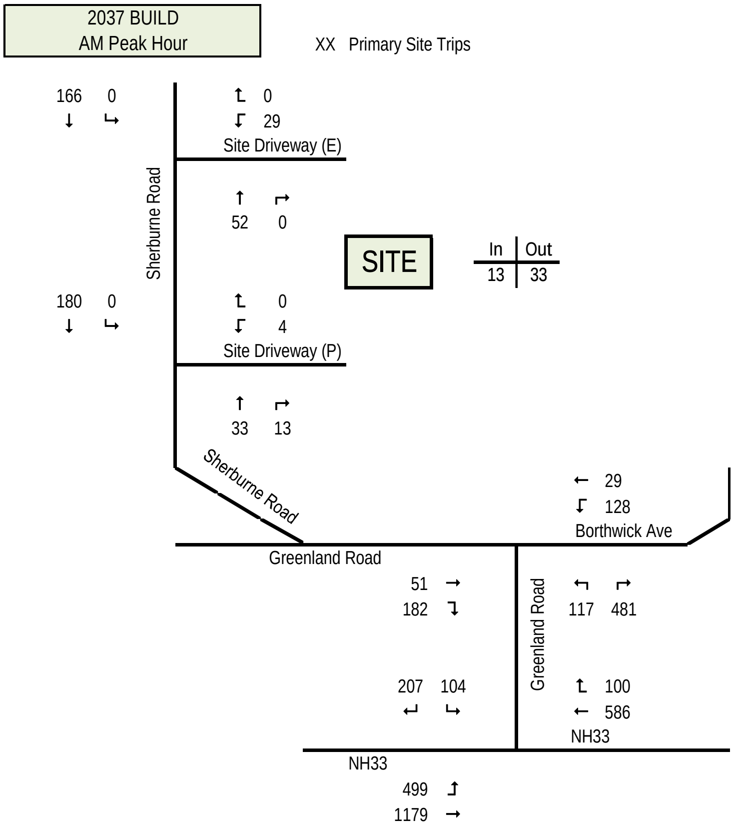

Site Trip Assignments
PM Peak Hour
XX Primary Site Trips
0 0
0
21
Site Driveway (E)
(exit only)
0 0
Sherburne Road
SITE
In Out
35 24
21 0
0
3
Site Driveway (P)
0 35
Sherburne Road
9
0
Borthwick Ave
Greenland Road
6
18
26 0
Greenland Road
15 4
10
0
NH33
NH33
16
0

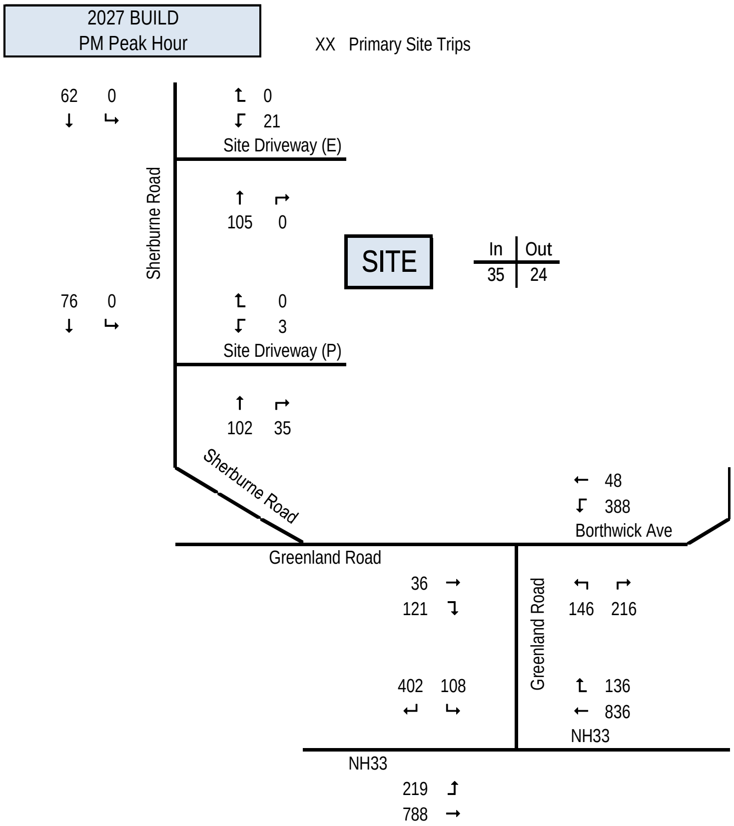
7. Build Volumes:

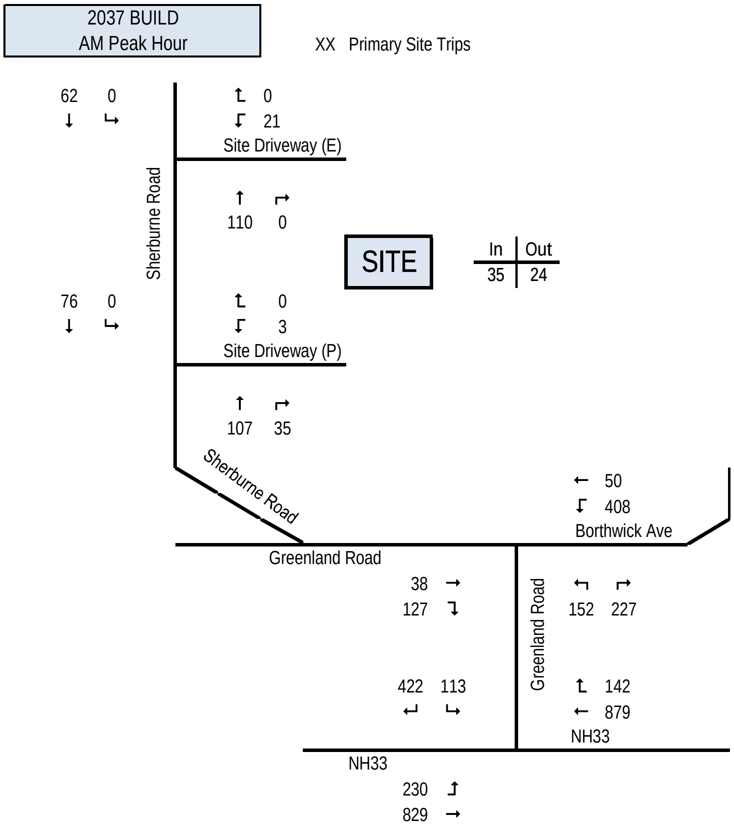
The existing school volumes are deducted from the NoBuild Volumes, and then the site trips generated by the development were added to No-Build traffic volumes throughout the study area to produce Build diagrams for the project.

2027 and 2037 diagrams are shown on the following pages for each peak hour:


2027 BUILD
AM Peak Hour
XX Primary Site Trips
158
0
0
29
Site Driveway (E)
Sherburne Road
50
0
SITE
In
Out
13
33
14
0
0
4
Site Driveway (P)
31
13
Sherburne Road
28
122
Borthwick Ave
Greenland Road
49
174
Greenland Road
111
458
197
100
95
558
NH33
NH33
474
1122


2037 BUILD
AM Peak Hour
XX Primary Site Trips
166
0
0
29
Site Driveway (E)
Sherburne Road
52
0
SITE
In
Out
13
33
180
0
0
4
Site Driveway (P)
33
13
Sherburne Road
29
128
Borthwick Ave
Greenland Road
51
182
Greenland Road
117
481
207
104
100
586
NH33
NH33
499
1179


2027 BUILD
PM Peak Hour
XX Primary Site Trips
62
0
0
21
Site Driveway (E)
Sherburne Road
105
0
SITE
In
Out
35
24
76
0
0
3
Site Driveway (P)
102
35
Sherburne Road
48
388
Borthwick Ave
Greenland Road
36
121
146
216
Greenland Road
402
108
136
836
NH33
NH33
219
788


2037 BUILD
AM Peak Hour
XX Primary Site Trips
62
0
0
21
Site Driveway (E)
Sherburne Road
110
0
SITE
In
Out
35
24
76
0
0
3
Site Driveway (P)
107
35
Sherburne Road
50
408
Borthwick Ave
Greenland Road
38
127
152
227
Greenland Road
422
113
142
879
NH33
NH33
230
829

8. Level of Service Analysis:

Level of Service Analysis:
Level of service (LOS) is a qualitative description of operational conditions within a traffic stream measured in terms of control delay, a function of capacity, degree of saturation, and delay associated with traffic signals and "STOP" signs. Control delay includes initial deceleration, delay approaching a control device, stopped delay, queue move-up time, and acceleration delay from a stopped condition. The relationship between control delay and LOS is shown in the following table.

Level of Service (LOS)	Signalized Control Delay (sec)	Unsignalized Control Delay (sec)
A	≤10.0	≤10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	Over 80.0	Over 50.0

Study Area.
Analyses were performed for the study area intersections previously described, that is:

1. Sherburne Road at Site Driveway (exit only)
2. Sherburne Road at Site Driveway (full access)
3. Greenland Road at Borthwick Avenue
4. NH33 at Greenland Road

Queue Analysis.
Vehicle queue lengths are determined by the capacity of the movement under study and the volume of traffic processed by the intersection during the analysis period. It is standard practice to report the 95th percentile queue, that is, the queue that will be exceeded no more than 5% of the time during the peak periods.

Methodology.
Trafficware "Synchro" v11 software was used to analyze signalized and unsignalized intersections (based on HCM 2000 for the signal and HCM 6th for stop controlled) within the study area intersections during the weekday PM and Saturday peak hours.

Signal Timing.
Signal timing for the NH33 signal is modeled based on data provided by the NHDOT in the Appendix.

Volume to capacity (v/c) ratios, Level of Service (LOS), delays and queue results are summarized in the following tables:

Table 2 Level of Service Analysis Summary (2023/2027)

Location/ *Peak Hour*	2023 BASE				2027 NoBuild				2027 Build			
Movement	v/c[a]	Del.[b]	LOS[c]	Q[d]	v/c[a]	Del.[b]	LOS[c]	Q[d]	v/c[a]	Del.[b]	LOS[c]	Q[d]
1: Sherburne Road at Site Driveway (Existing) - [exit only Build Case]												
AM Peak OVERALL	---	1.3	A	---	---	1.3	A	---	---	1.1	A	---
WB L/R	0.06	10.5	B	5	0.06	10.5	B	5	0.05	10.2	B	3
SB L/T [T]	-	0.0	A	0	-	0.0	A	0	-	-	-	-
PM Peak OVERALL	---	0.7	A	---	---	0.7	A	---	---	0.9	A	---
WB L/R	0.02	9.8	A	3	0.02	9.8	A	3	0.03	9.9	A	3
SB L/T [T]	-	0.0	A	0	-	0.0	A	0	-	-	-	-
2: Sherburne Road at Site Driveway (Proposed) - [full access]												
AM Peak OVERALL	---	---	---	---	---	---	---	---	---	0.2	A	---
WB L/R	-	-	-	--	-	-	-	-	0.01	9.8	A	0
SB L/T [T]	-	-	-	-	-	-	-	-	-	-	-	-
PM Peak OVERALL	---	---	---	---	---	---	---	---	---	0.1	A	---
WB L/R	-	-	-	-	-	-	-	-	0.00	9.7	A	0
SB L/T [T]	-	-	-	-	-	-	-	-	-	-	-	-
4: Greenland Road at Borthwick Avenue												
AM Peak OVERALL	---	20.1	C	---	---	21.4	C	---	---	22.2	C	---
EB All	0.37	11.7	B	43	0.38	11.9	B	43	0.41	12.4	B	50
WB All	0.30	12.0	B	33	0.31	12.2	B	33	0.31	12.3	B	33
NB L	0.27	11.3	B	28	0.27	11.4	B	28	0.26	11.4	B	25
NB R	0.83	28.0	D	233	0.86	30.5	D	253	0.86	31.9	D	260
PM Peak OVERALL	---	15.0	B	---	---	15.4	C	---	---	16.4	C	---
EB All	0.23	9.8	A	23	0.24	9.9	A	23	0.27	10.4	B	28
WB All	0.69	19.5	C	138	0.70	20.3	C	145	0.73	22.2	C	160
NB L	0.25	11.8	B	25	0.26	11.9	B	25	0.32	12.7	B	33
NB R	0.37	11.5	B	43	0.38	11.7	B	45	0.39	11.9	B	45
5: NH33 at Greenland Road (signalized)												
AM Peak OVERALL	0.74	22.2	C	---	0.76	22.7	C	---	0.76	22.8	C	---
EB L	0.88	40.3	D	442	0.88	40.0	D	465	0.89	40.7	D	459
EB T	0.52	5.9	A	192	0.53	6.2	A	205	0.54	6.3	A	205
WB TT/R	0.69	31.7	C	253	0.73	33.6	C	259	0.72	3312	C	258
SB L	0.48	38.3	D	97	0.49	38.0	D	97	0.50	38.0	D	102
SB R	0.15	34.9	C	44	0.15	34.7	C	43	0.16	34.6	C	44
PM Peak OVERALL	0.63	19.4	B	---	0.64	19.8	B	---	0.66	20.4	C	---
EB L	0.62	33.2	C	154	0.63	33.4	C	158	0.65	34.1	C	170
EB T	0.33	5.3	A	133	0.34	5.3	A	137	0.34	5.4	A	138
WB TT/R	0.72	22.1	C	433	0.74	22.8	C	447	0.76	23.8	C	453
SB L	0.42	31.9	C	88	0.42	31.9	C	89	0.43	31.8	C	91
SB R	0.26	30.4	C	68	0.26	30.4	C	68	0.27	30.3	C	69

[a] Volume-to-capacity ratio - [b] Average control delay (sec/veh) - [c] Level of service - [d] 95th percentile queue in feet

Table 3 Level of Service Analysis Summary (2037)

Location/ *Peak Hour*	2037 NoBuild				2037 Build			
Movement	v/c[a]	Del.[b]	LOS[c]	Q[d]	v/c[a]	Del.[b]	LOS[c]	Q[d]
1: Sherburne Road at Site Driveway (Existing) - [exit only Build Case]								
AM Peak OVERALL	---	0.6	A	---	---	1.2	A	---
WB L/R	0.03	10.1	B	3	0.04	10.0	B	3
SB L/T [T]	-	0.0	A	0	-	-	-	-
PM Peak OVERALL	---	0.4	A	---	---	1.0	A	---
WB L/R	0.01	9.5	A	0	0.03	9.6	A	3
SB L/T [T]	-	0.0	A	0	-	-	-	-
2: Sherburne Road at Site Driveway (Proposed) - [full access]								
AM Peak OVERALL	---	---	---	---	---	0.2	A	---
WB L/R	-	-	-	--	0.01	9.8	A	0
SB L/T [T]	-	-	-	-	-	-	-	-
PM Peak OVERALL	---	---	---	---	---	0.1	A	---
WB L/R	-	-	-	--	0.00	9.7	A	0
SB L/T [T]	-	-	-	-	-	-	-	-
4: Greenland Road at Borthwick Avenue								
AM Peak OVERALL	---	16.1	C	---	---	16.4	C	---
EB All	0.36	11.3	B	40	0.39	11.7	B	45
WB All	0.30	11.8	B	30	0.30	11.8	B	33
NB L	0.24	11.0	B	23	0.23	11.0	B	28
NB R	0.74	20.9	C	168	0.75	21.5	C	173
PM Peak OVERALL	---	16.8	C	---	---	17.9	C	---
EB All	0.24	10.1	B	25	0.28	10.6	B	28
WB All	0.74	22.8	C	168	0.77	25.1	D	185
NB L	0.27	12.1	B	28	0.33	13.0	B	35
NB R	0.40	12.0	B	48	0.40	12.3	B	48
5: NH33 at Greenland Road								
AM Peak OVERALL	0.75	22.4	C	---	0.80	24.2	C	---
EB L	0.88	40.3	D	502	0.90	41.0	D	496
EB T	0.51	5.8	A	215	0.57	6.7	A	221
WB TT/R	0.72	31.9	C	275	0.81	37.8	D	274
SB L	0.48	38.3	D	105	0.51	38.2	D	105
SB R	0.14	35.0	C	60	0.16	34.5	C	44
PM Peak OVERALL	0.67	20.6	C	---	0.69	21.3	C	---
EB L	0.65	33.9	C	167	0.67	34.5	C	179
EB T	0.36	5.6	A	149	0.36	5.7	A	149
WB TT/R	0.78	24.7	C	481	0.80	26.0	C	486
SB L	0.43	31.6	C	92	0.44	31.6	C	95
SB R	0.28	30.2	C	70	0.28	30.2	C	71

[a] Volume-to-capacity ratio - [b] Average control delay (sec/veh) - [c] Level of service - [d] 95th percentile queue in feet

9. Sight Distance:

The proposed driveways have adequate sight distance based on grade and distance to adjacent intersections. The existing site driveway on Sherburne Road has a clear sight distance of 350' looking left and 380' looking right. The proposed driveway has 280' looking left over the lawn area and 380' looking right. At 20 mph, the required AASHTO intersection sight distance for a left turn is 225'. The required sight distance for 32 mph (85th percentile per Section 10) is 353'.

10. Speed Study

A speed study was measured along Sherburne Road adjacent to the existing school driveway. The travel times were recorded using ATRs over a 24-hour period which recorded travel speeds. The results of the speed measurements are summarized in the table below.

Table 4 – Observed Travel Speeds

Sherburne Road at existing school driveway	Posted Speed Limit	Average Speed	85th Percentile Speed
Northbound	20	28.2	32.0
Southbound	20	24.6	28.0

As shown in Table 3, the observed speeds along Sherburne Road were found to exceed the posted school zone speed limit of 20 mph. The school zone designation will need to be removed as part of this project; however, the adjacent neighborhood on the north side of the I95 overpass is also posted at 20 mph.

11. Accident Evaluation:

Crash data requested for the study intersections was received from the Portsmouth Police Department for the years 2019-2022 and from NHDOT for years 2021-2023. Three is provided in Appendix H. A summary of the crash data in provided in Table 4.

Table 5 – Crash Data Summary

	Greenland Rd at Borthwick Ave **(Unsignalized)**	NH33 at Greenland Rd **(Signal)**
CRASH FREQUENCY		
Total Crashes	7	6
Crashes per Year (Ave)	1.4	1.2
CRASH SEVERITY		
Property Damage Only	6	5
Injury	1	1
Fatalities	0	0
CRASH TYPE		
Angle/Cross Movement	3	0
Rear End	3	1
Side-Swipe	0	1
ADVERSE CONDITIONS		
Sun Glare	1	0
Snow	1	0
WEEKDAY COMMUTER PEAK		
Weekday AM (7-9am)	2	1
Weekday PM (3-6pm)	0	3
Non-Commuter Peak	5	2

Greenland Road at Borthwick Avenue (3-leg unsignalized intersection)
Seven crashes occurred in the vicinity of the Greenland Road/Borthwick Ave intersection and with only one resulting in injury. All crashes involved two vehicles, three of which were rear end occurrences and three from crossing the intersection, one unknown. Two were the result of adverse conditions (sun glare or snow) with only one accident occurring during the weekday peak hours of the roadway. Based on this data, there does not appear to be any safety concerns at this intersection, however, the City has updated this intersection, by making all three legs stop controlled.

NH33 at Greenland Road (3-leg signalized intersection)
Two crashes occurred in the vicinity of the NH33/Greenland Road intersection, with only one incident resulting in injury. All crashes involved two vehicles, one was a side-swipe from changing lanes and one rear end collision, the others are unknown. Both accidents occurred during the weekday peak PM hours of the roadway. Based on this data, there does not appear to be any elevated safety concerns at this intersection.

12. Conclusions:

This study shows that traffic from this redevelopment housing proposal is all primary trips and adds 15 new trips in the AM Peak Hour and 50 new trips during the PM Peak Hour. That is less than one new trip per minute during peak hours. Therefore, only minor changes occur at the study area intersections.

- Queues and delays at the study intersections are essentially unchanged (overall LOS C or better) in all scenarios.
- At the site driveways, traffic operates favorably (B or better) in all scenarios, with 95th pctl queues of less than one car length for entering and exiting traffic.
- School zone signs should be removed upon closure of the school.

We therefore conclude that this new proposal will have no significant negative impact on the adjacent roadway network. The existing intersections will operate acceptably in opening and future years.

Respectfully Submitted,
TFMORAN, INC.

Robert Duval, PE
Chief Engineer

APPENDIX A

Proposed Trip Generation

Based on ITE Trip Generation 11th Edition

ITE LUC 223 - Affordable Housing - Income Limits

Use Includes: 128 Dwelling Units (30 apartment units, 90 apartment units, 8 units in existing building)

Time Period	Rate/Equn		Rate/ Eq	Trip Ends	Directional Split		Directional Distribution	
	X	Rate	Used		In	Out	In	Out
Weekday AM Peak Hour Adjacent Street	128	0.36	Rate	46	29%	71%	13	33
Weekday PM Peak Hour Adjacent Street	128	0.46	Rate	59	59%	41%	35	24
Weekday Daily	128	4.81	Rate	616	50%	50%	308	308

Description of LUC 223:
Affordable housing includes all multifamily housing that is rented at below market rate to households that include at least one employed member. Eligibility to live in affordable housing can be a function of limited household income and resident age.

Site Trip Distribution

Primary

	In	Out
AM Totals	13	33

Sherburne Road at Site Driveway (Existing)

	PERCENTAGES		TRIPS	
Movement	In	Out	In	Out
WBL		88%	0	29
WLR			0	0
NBT			0	0
NBR			0	0
SBL			0	0
SBT			0	0

Sherburne Road at Site Driveway (Proposed)

	PERCENTAGES		TRIPS	
Movement	In	Out	In	Out
WBL		12%	0	4
WLR			0	0
NBT			0	0
NBR	100%		13	0
SBL			0	0
SBT		88%	0	29

Greenland at Borthwick

	PERCENTAGES		TRIPS	
Movement	In	Out	In	Out
EBT		22%	0	7
EBR		78%	0	26
WBL			0	0
WBT	20%		3	0
NBL	80%		10	0
NBR			0	0

NH33 at Greenland

	PERCENTAGES		TRIPS	
Movement	In	Out	In	Out
EBL	66%		9	0
EBT			0	0
WBT			0	0
WBR	14%		2	0
SBL		26%	0	9
SBR		52%	0	17

TOTAL: Site Trip Assignment

TOTAL

	AM TOTAL
	46

Sherburne Road at Site Driveway (Existing)

Movement	
WBL	29
WLR	0
NBT	0
NBR	0
SBL	0
SBT	0

Sherburne Road at Site Driveway (Proposed)

Movement	
WBL	4
WLR	0
NBT	0
NBR	13
SBL	0
SBT	29

Greenland at Borthwick

Movement	
EBT	7
EBR	26
WBL	0
WBT	3
NBL	10
NBR	0

NH33 at Greenland

Movement	
EBL	9
EBT	0
WBT	0
WBR	2
SBL	9
SBR	17

Site Trip Distribution

Primary

	In	Out
PM Totals	35	24

Sherburne Road at Site Driveway (Existing)

	PERCENTAGES		TRIPS	
Movement	In	Out	In	Out
WBL		88%	0	21
WLR			0	0
NBT			0	0
NBR			0	0
SBL			0	0
SBT			0	0

Sherburne Road at Site Driveway (Proposed)

	PERCENTAGES		TRIPS	
Movement	In	Out	In	Out
WBL		12%	0	3
WLR			0	0
NBT			0	0
NBR	100%		35	0
SBL			0	0
SBT		88%	0	21

Greenland at Borthwick

	PERCENTAGES		TRIPS	
Movement	In	Out	In	Out
EBT		23%	0	6
EBR		77%	0	18
WBL			0	0
WBT	25%		9	0
NBL	75%		26	0
NBR			0	0

NH33 at Greenland

	PERCENTAGES		TRIPS	
Movement	In	Out	In	Out
EBL	47%		16	0
EBT			0	0
WBT			0	0
WBR	29%		10	0
SBL		16%	0	4
SBR		61%	0	15

TOTAL:
Site Trip Assignment

TOTAL

	PM TOTAL
	59

Sherburne Road at Site Driveway (Existing)

Movement	
WBL	21
WLR	0
NBT	0
NBR	0
SBL	0
SBT	0

Sherburne Road at Site Driveway (Proposed)

Movement	
WBL	3
WLR	0
NBT	0
NBR	35
SBL	0
SBT	21

Greenland at Borthwick

Movement	
EBT	6
EBR	18
WBL	0
WBT	9
NBL	26
NBR	0

NH33 at Greenland

Movement	
EBL	16
EBT	0
WBT	0
WBR	10
SBL	4
SBR	15

APPENDIX B

Site Trip Distribution

Primary

	In	Out
AM Totals	19	16

TOTAL: Site Trip Assignment

TOTAL

	AM TOTAL
	35

Sherburne Road at Site Driveway (Existing)

	PERCENTAGES		TRIPS	
Movement	In	Out	In	Out
WBL		**95%**	0	15
WBR		**5%**	0	1
NBT			0	0
NBR	**100%**		19	0
SBL			0	0
SBT			0	0

Sherburne Road at Site Driveway (Existing)

Movement	
WBL	-15
WBR	-1
NBT	0
NBR	-19
SBL	0
SBT	0

Sherburne Road at Site Driveway (Proposed)

	PERCENTAGES		TRIPS	
Movement	In	Out	In	Out
WBL			0	0
WLR			0	0
NBT	100%		19	0
NBR			0	0
SBL			0	0
SBT		95%	0	15

Sherburne Road at Site Driveway (Proposed)

Movement	
WBL	0
WLR	0
NBT	-19
NBR	0
SBL	0
SBT	-15

Greenland at Borthwick

	PERCENTAGES		TRIPS	
Movement	In	Out	In	Out
EBT		21%	0	3
EBR		74%	0	12
WBL			0	0
WBT	20%		4	0
NBL	80%		15	0
NBR			0	0

Greenland at Borthwick

Movement	
EBT	-3
EBR	-12
WBL	0
WBT	-4
NBL	-15
NBR	0

NH33 at Greenland

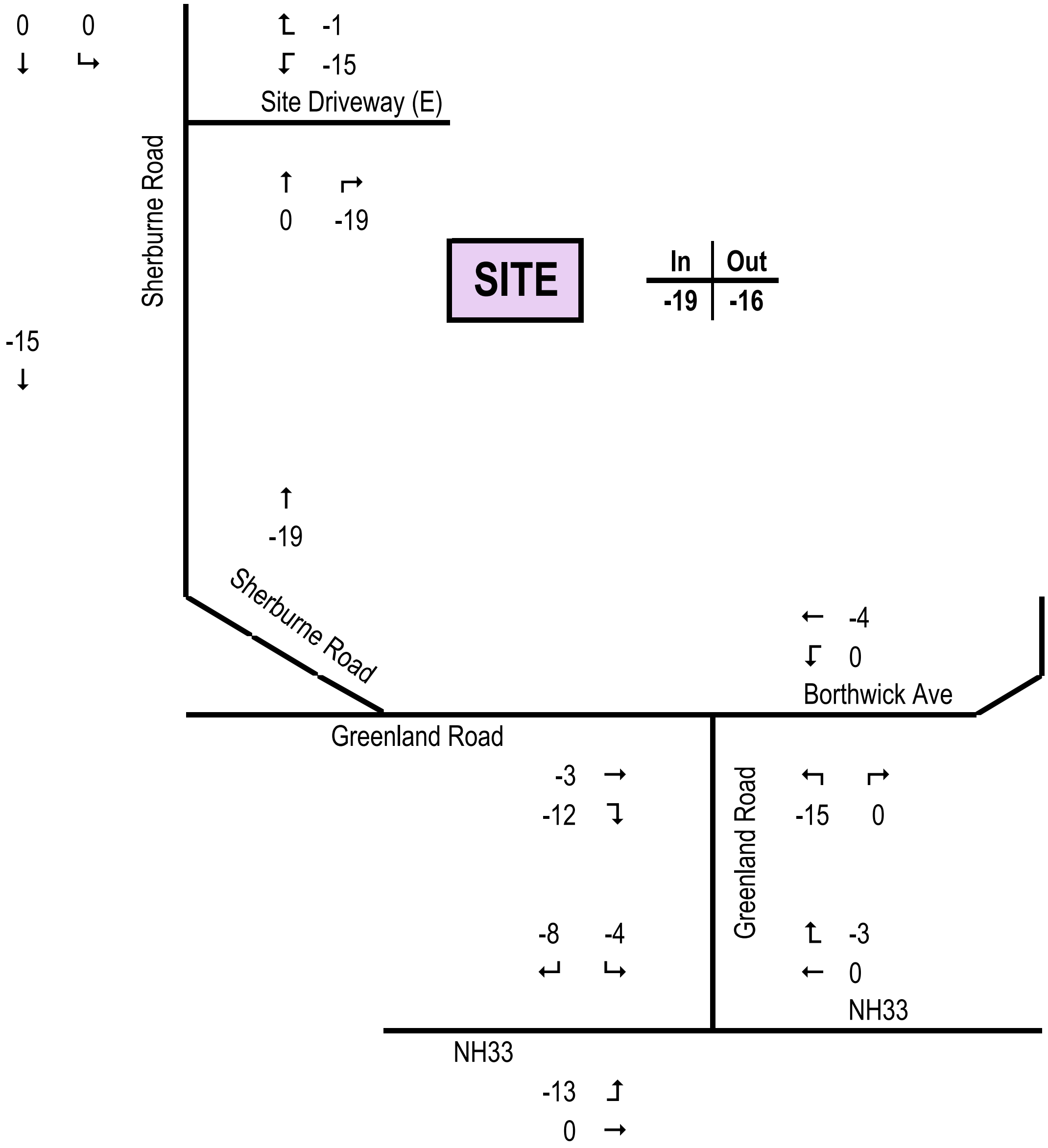
	PERCENTAGES		TRIPS	
Movement	In	Out	In	Out
EBL	66%		13	0
EBT			0	0
WBT			0	0
WBR	14%		3	0
SBL		24%	0	4
SBR		50%	0	8

NH33 at Greenland

Movement	
EBL	-13
EBT	0
WBT	0
WBR	-3
SBL	-4
SBR	-8

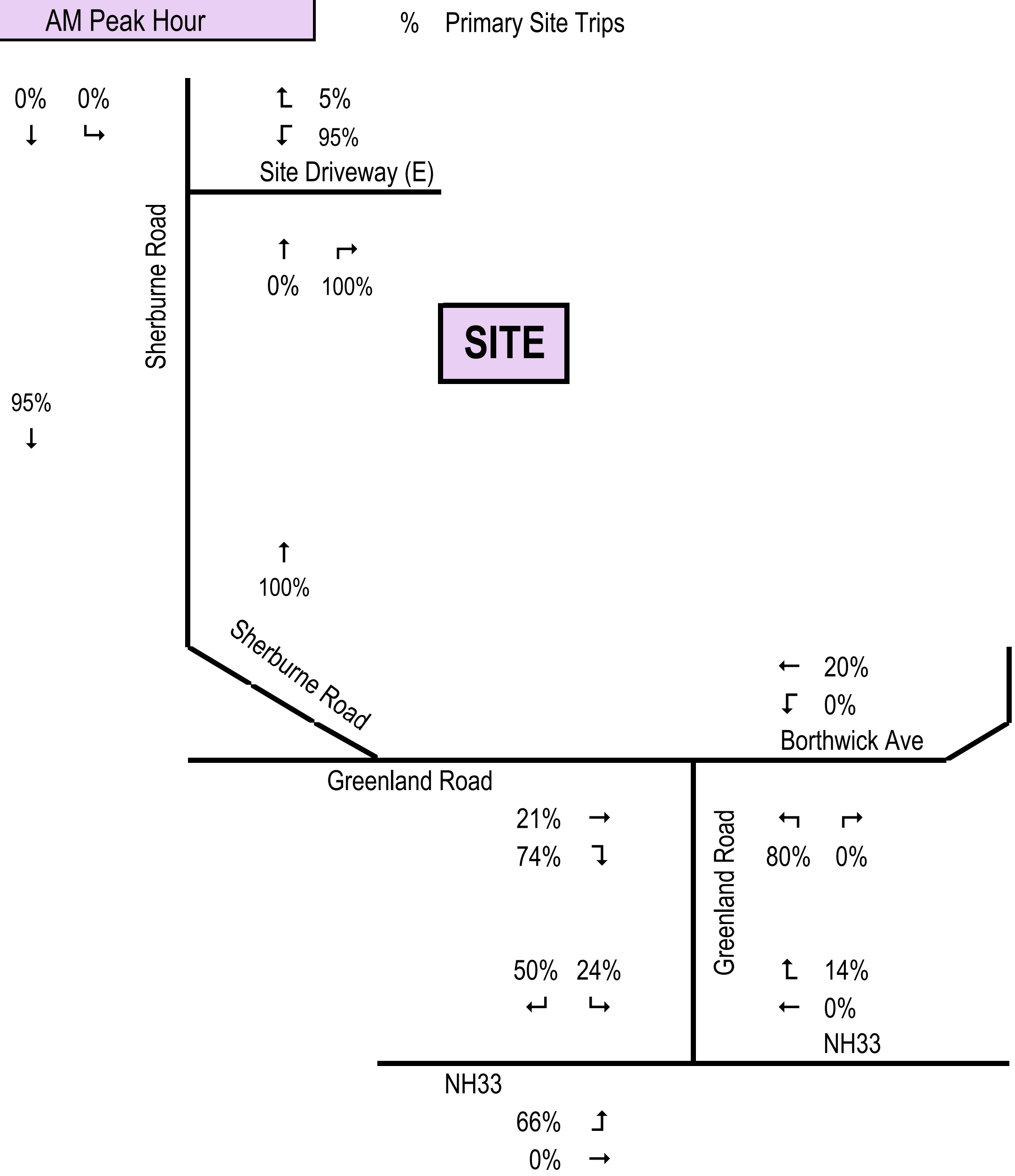
Existing Site Trip Deductions
2023 BASE
AM Peak Hour

XX Primary Site Trips



Existing Site Trip Deduction %

AM Peak Hour



Site Trip Distribution

Primary

	In	Out
PM Totals	3	7

Sherburne Road at Site Driveway (Existing)

Movement	PERCENTAGES In	PERCENTAGES Out	TRIPS In	TRIPS Out
WBL		**100%**	0	7
WBR			0	0
NBT			0	0
NBR	**100%**		3	0
SBL			0	0
SBT			0	0

Sherburne Road at Site Driveway (Proposed)

Movement	PERCENTAGES In	PERCENTAGES Out	TRIPS In	TRIPS Out
WBL			0	0
WLR			0	0
NBT	100%		3	0
NBR			0	0
SBL			0	0
SBT		100%	0	7

Greenland at Borthwick

Movement	PERCENTAGES In	PERCENTAGES Out	TRIPS In	TRIPS Out
EBT		23%	0	2
EBR		77%	0	5
WBL			0	0
WBT	25%		1	0
NBL	75%		2	0
NBR			0	0

NH33 at Greenland

Movement	PERCENTAGES In	PERCENTAGES Out	TRIPS In	TRIPS Out
EBL	47%		1	0
EBT			0	0
WBT			0	0
WBR	*28%*		1	0
SBL		16%	0	1
SBR		61%	0	4

TOTAL:
Site Trip Assignment

TOTAL

	PM TOTAL
	10

Sherburne Road at Site Driveway (Existing)

Movement	
WBL	-7
WBR	0
NBT	0
NBR	-3
SBL	0
SBT	0

Sherburne Road at Site Driveway (Proposed)

Movement	
WBL	0
WLR	0
NBT	-3
NBR	0
SBL	0
SBT	-7

Greenland at Borthwick

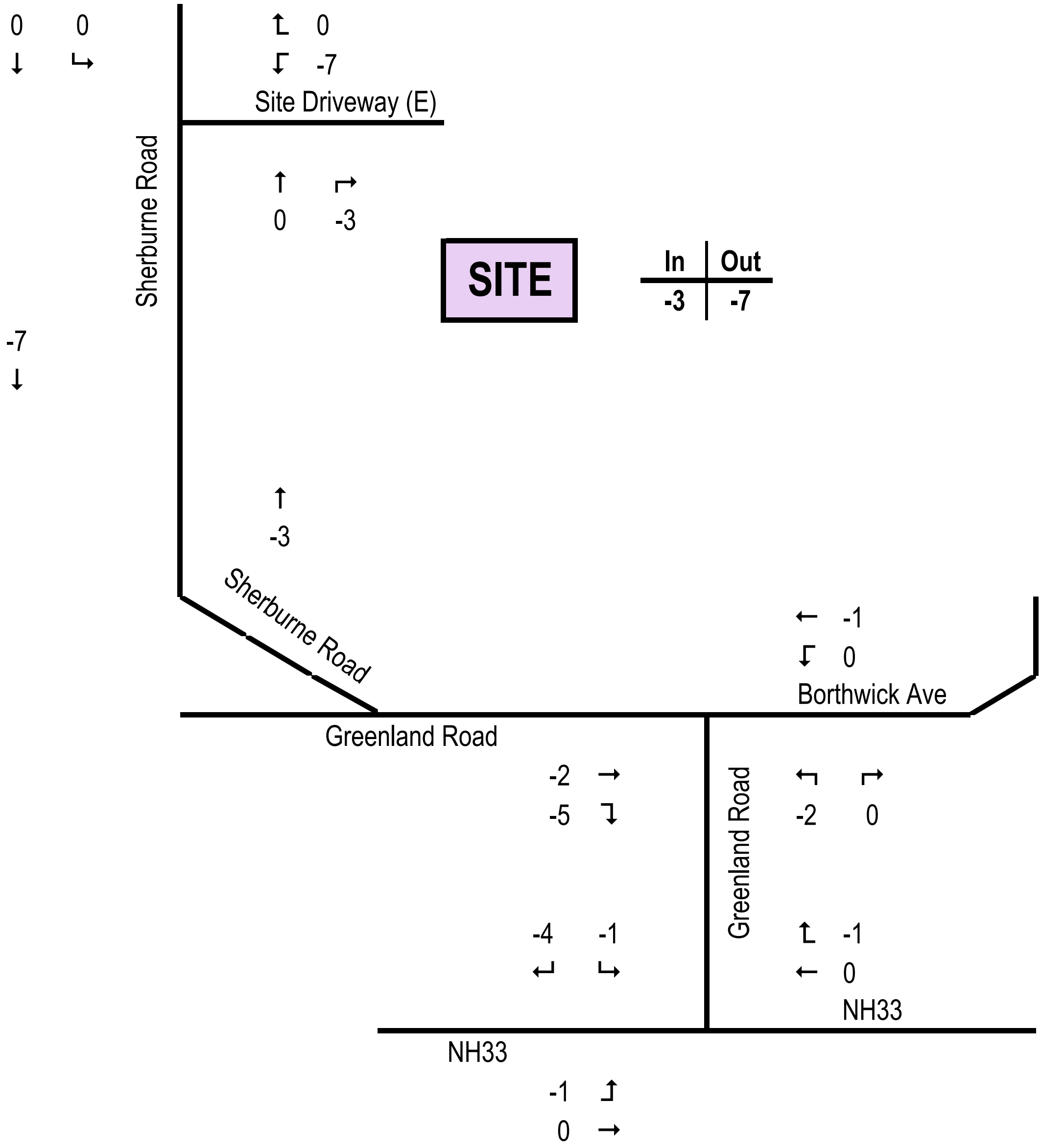
Movement	
EBT	-2
EBR	-5
WBL	0
WBT	-1
NBL	-2
NBR	0

NH33 at Greenland

Movement	
EBL	-1
EBT	0
WBT	0
WBR	-1
SBL	-1
SBR	-4

Existing Site Trip Deductions
2023 BASE
PM Peak Hour

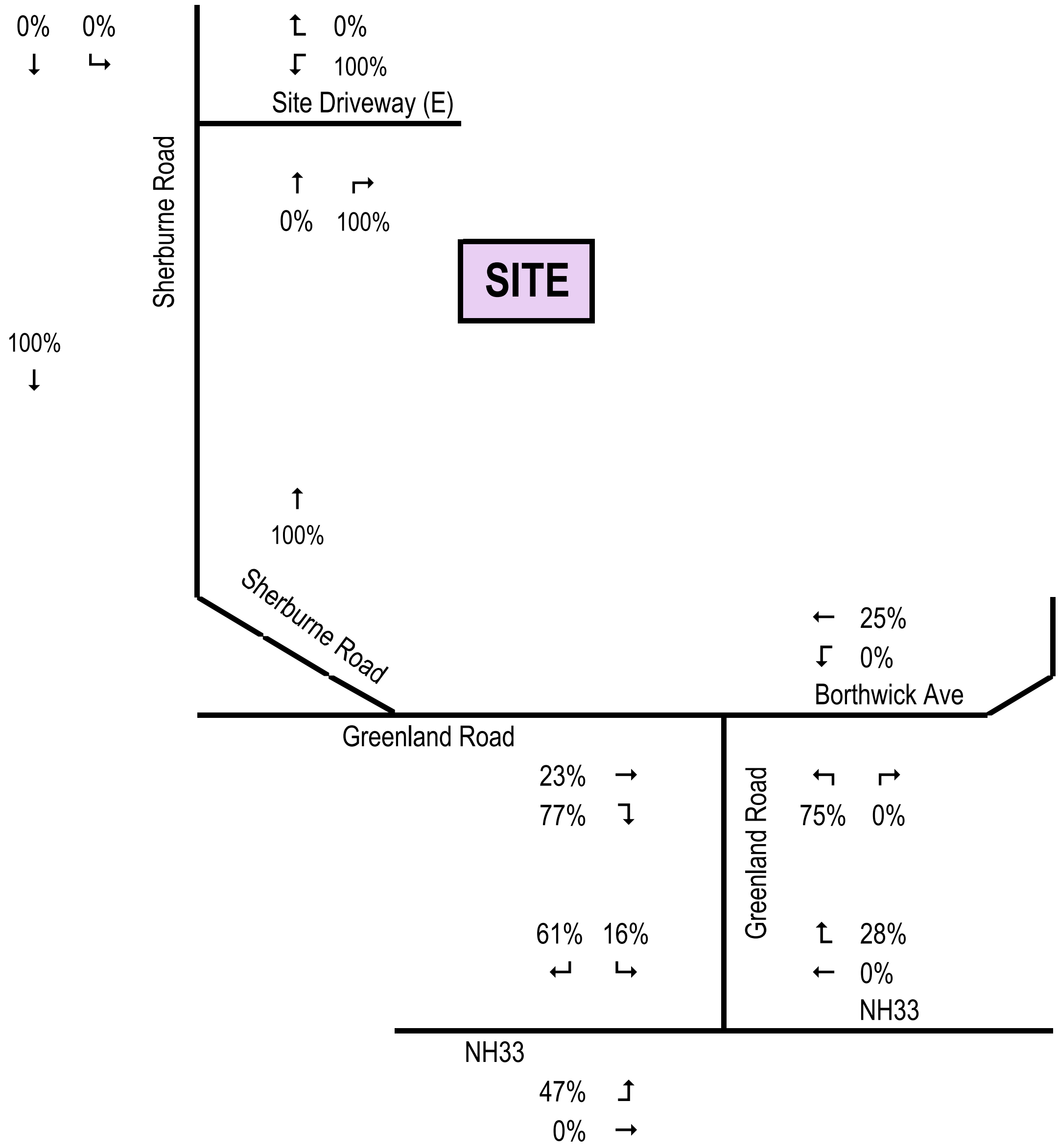
XX Primary Site Trips



Existing Site Trip Deduction %

PM Peak Hour

% Primary Site Trips



APPENDIX C

Year 2019 Monthly Data

Group 4 Averages: Urban Highways

Month	ADT	For WARRANTS Adjustment to Average	For Traffic Adjustment to Peak
January	11,431	1.12	1.23
February	11,848	1.08	1.18
March	12,141	1.06	1.15
April	12,860	1.00	1.09
May	13,551	0.95	1.03
June	13,785	0.93	1.02
July	13,942	0.92	1.01
August	14,016	0.92	1.00
September	13,379	0.96	1.05
October	13,339	0.96	1.05
November	12,265	1.05	1.14
December	11,496	1.12	1.22

Average ADT:	12,838
Peak ADT:	14,016

PM Peak Hour at South and Lafayette (Data from City)

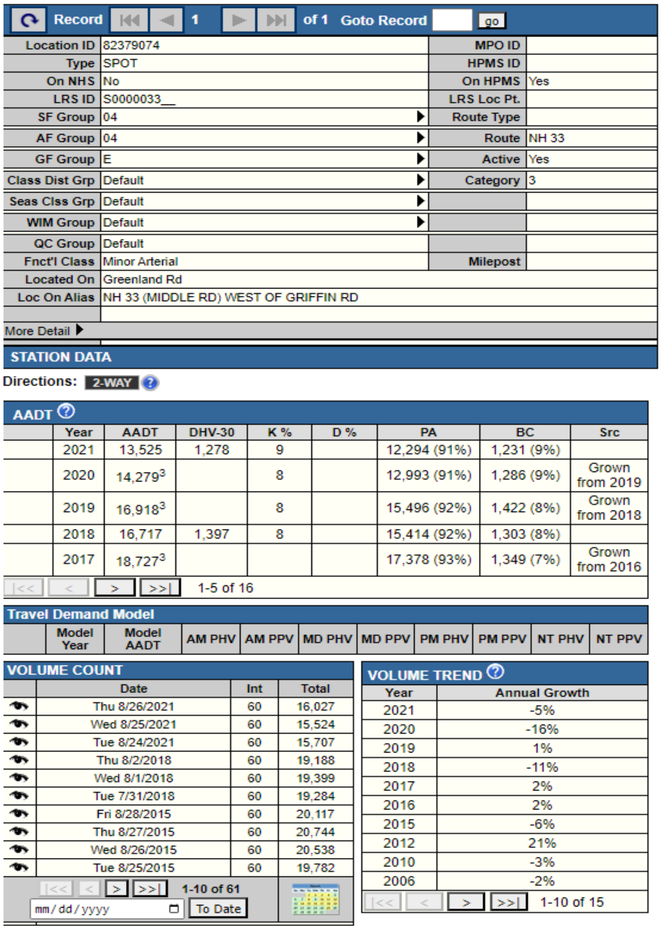
	2019 PM Peak Hr			2023 PM Peak Hr		% Change	
DATE	**WEEKDAY**	**VOLUME**	**DATE**	**WEEKDAY**	**VOLUME**		
	2019 PM Peak Hr						
1/1/2019	Tuesday	1016	~~1/3/2023~~	~~Tuesday~~	~~1214~~	~~19%~~	Remove Highest
1/2/2019	Wednesday	1550	1/4/2023	Wednesday	1286	-17%	
1/3/2019	Thursday	1532	1/5/2023	Thursday	1357	-11%	
1/8/2019	Tuesday	1411	1/10/2023	Tuesday	1327	-6%	
1/9/2019	Wednesday	1457	1/11/2023	Wednesday	1378	-5%	
1/10/2019	Thursday	1571	~~1/12/2023~~	~~Thursday~~	~~1158~~	~~-26%~~	Remove Lowest
1/15/2019	Tuesday	1498	1/17/2023	Tuesday	1330	-11%	
1/16/2019	Wednesday	1480	1/18/2023	Wednesday	1274	-14%	
1/17/2019	Thursday	1529	1/19/2023	Thursday	1402	-8%	
1/22/2019	Tuesday	1316	1/24/2023	Tuesday	1185	-10%	
1/23/2019	Wednesday	1295	1/25/2023	Wednesday	1033	-20%	
1/24/2019	Thursday	1440	1/26/2023	Thursday	1279	-11%	
1/29/2019	Tuesday	1388	1/31/2023	Tuesday	1257	-9%	
1/30/2019	Wednesday	1454	2/1/2023	Wednesday	1309	-10%	
1/31/2019	Thursday	1525	2/2/2023	Thursday	1274	-16%	
2/5/2019	Tuesday	1473	2/7/2023	Tuesday	1262	-14%	
2/6/2019	Wednesday	1415	2/8/2023	Wednesday	1137	-20%	
2/7/2019	Thursday	1407	2/9/2023	Thursday	1304	-7%	
2/12/2019	Tuesday	1468	2/14/2023	Tuesday	1244	-15%	
2/13/2019	Wednesday	1237	2/15/2023	Wednesday	1281	4%	
2/14/2019	Thursday	1480	2/16/2023	Thursday	1310	-11%	
2/19/2019	Tuesday	1538	2/21/2023	Tuesday	1267	-18%	
2/20/2019	Wednesday	1473	2/22/2023	Wednesday	1384	-6%	
2/21/2019	Thursday	1474	2/23/2023	Thursday	786	-47%	
2/26/2019	Tuesday	1132	~~2/28/2023~~	~~Tuesday~~	~~686~~	~~-39%~~	2023
2/27/2019	Wednesday	1123	~~3/1/2023~~	~~Wednesday~~	~~1030~~	~~-8%~~	School
2/28/2019	Thursday	1074	~~3/2/2023~~	~~Thursday~~	~~979~~	~~-9%~~	Vacation
				Average Weekday Change		**-13%**	

NHDOT Historical Traffic Growth Rate
MS2 Data

		Year											Average
Station	**Location**	**2006**	**2009**	**2010**	**2012**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020***	**2021***	**Annual Rate**
82379074	NH33 (Middle Road) West of Griffin Rd	-2%		-3%	21%	-6%	2%	2%	-11%	1%	-16%	-5%	0.31%
82379094	Borthwick Ave East of Highliner Ave	-4%	4%	0%	-1%	-1%	2%	2%	-5%	1%	-16%	-1%	-0.62%

* Years not included in calculcation due to ongoing covid recovery

Average Annula Growth Rate = -0.16%



Location ID	82379074	MPO ID	
Type	SPOT	HPMS ID	
On NHS	No	On HPMS	Yes
LRS ID	S0000033__	LRS Loc Pt.	
SF Group	04	Route Type	
AF Group	04	Route	NH 33
GF Group	E	Active	Yes
Class Dist Grp	Default	Category	3
Seas Clss Grp	Default		
WIM Group	Default		
QC Group	Default		
Fnct'l Class	Minor Arterial	Milepost	
Located On	Greenland Rd		
Loc On Alias	NH 33 (MIDDLE RD) WEST OF GRIFFIN RD		

More Detail

STATION DATA

Directions: 2-WAY

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2021	13,525	1,278	9		12,294 (91%)	1,231 (9%)	
2020	14,279^3		8		12,993 (91%)	1,286 (9%)	Grown from 2019
2019	16,918^3		8		15,496 (92%)	1,422 (8%)	Grown from 2018
2018	16,717	1,397	8		15,414 (92%)	1,303 (8%)	
2017	18,727^3				17,378 (93%)	1,349 (7%)	Grown from 2016

1-5 of 16

Travel Demand Model

Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

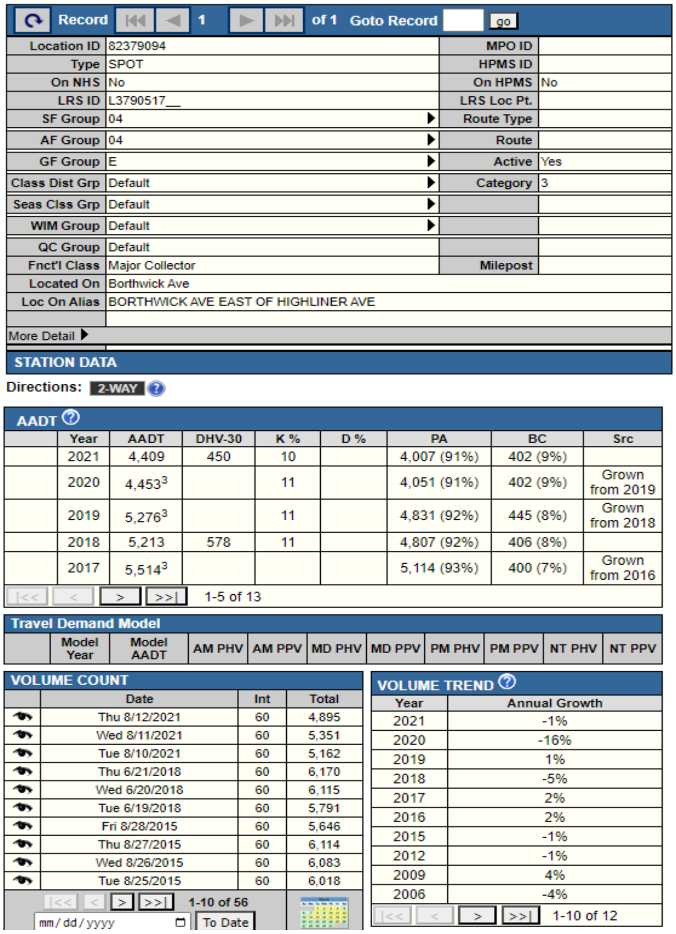
Date	Int	Total
Thu 8/26/2021	60	16,027
Wed 8/25/2021	60	15,524
Tue 8/24/2021	60	15,707
Thu 8/2/2018	60	19,188
Wed 8/1/2018	60	19,399
Tue 7/31/2018	60	19,284
Fri 8/28/2015	60	20,117
Thu 8/27/2015	60	20,744
Wed 8/26/2015	60	20,538
Tue 8/25/2015	60	19,782

1-10 of 61

VOLUME TREND

Year	Annual Growth
2021	-5%
2020	-16%
2019	1%
2018	-11%
2017	2%
2016	2%
2015	-6%
2012	21%
2010	-3%
2006	-2%

1-10 of 15



Location ID	82379094	MPO ID	
Type	SPOT	HPMS ID	
On NHS	No	On HPMS	No
LRS ID	L3790517__	LRS Loc Pt.	
SF Group	04	Route Type	
AF Group	04	Route	
GF Group	E	Active	Yes
Class Dist Grp	Default	Category	3
Seas Clss Grp	Default		
WIM Group	Default		
QC Group	Default		
Fnct'l Class	Major Collector	Milepost	
Located On	Borthwick Ave		
Loc On Alias	BORTHWICK AVE EAST OF HIGHLINER AVE		

More Detail

STATION DATA

Directions: 2-WAY

AADT

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2021	4,409	450	10		4,007 (91%)	402 (9%)	
2020	4,453^3		11		4,051 (91%)	402 (9%)	Grown from 2019
2019	5,276^3		11		4,831 (92%)	445 (8%)	Grown from 2018
2018	5,213	578	11		4,807 (92%)	406 (8%)	
2017	5,514^3				5,114 (93%)	400 (7%)	Grown from 2016

1-5 of 13

Travel Demand Model

Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

Date	Int	Total
Thu 8/12/2021	60	4,895
Wed 8/11/2021	60	5,351
Tue 8/10/2021	60	5,162
Thu 6/21/2018	60	6,170
Wed 6/20/2018	60	6,115
Tue 6/19/2018	60	5,791
Fri 8/28/2015	60	5,646
Thu 8/27/2015	60	6,114
Wed 8/26/2015	60	6,083
Tue 8/25/2015	60	6,018

1-10 of 56

VOLUME TREND

Year	Annual Growth
2021	-1%
2020	-16%
2019	1%
2018	-5%
2017	2%
2016	2%
2015	-1%
2012	-1%
2009	4%
2006	-4%

1-10 of 12

APPENDIX D

From: Eric B. Eby <ebeby@cityofportsmouth.com>
Sent: Thursday, March 30, 2023 5:19 PM
To: Jack McTigue <jmctigue@tfmoran.com>
Subject: RE: Sherburne Traffic Study

Jack
The hospital expansion only provided a brief trip generation memo, as it was generating less than a dozen trips during the peak hours. That amount of traffic can be accounted for in any background growth rate or daily fluctuations of traffic.
Liberty Mutual is not expanding, just reoccupying their existing building which had been mostly vacant since the pandemic. So no traffic study was required.
Eric

Eric B. Eby, P.E.
City Engineer – Parking, Transportation, and Planning
Department of Public Works
City of Portsmouth
680 Peverly Hill Road
Portsmouth, NH 03801
(603) 766-1415
Cell (603)-815-1761

From: Jack McTigue <jmctigue@tfmoran.com>
Sent: Thursday, March 30, 2023 4:47 PM
To: Eric B. Eby <ebeby@cityofportsmouth.com>
Subject: Sherburne Traffic Study

Eric,

Do you have the traffic studies for the hospital expansion or Liberty Mutual? Do you know if they were done yet?

Our traffic engineer would like to include them in our report.

Sincerely,

Jack McTigue, PE, CPESC
Project Manager

TFMoran Seacoast Division
170 Commerce Way - Suite 102, Portsmouth, NH 03801
E-Mail: jmctigue@tfmoran.com
Tel: (603) 431-2222 Fax: (603) 431-0910
Cell: (603) 315-3078

APPENDIX E

Background Traffic Volumes
AM Peak data

Assumed growth rate	0.005	
MARCH 2019 Seasonal	1.15	NHDOT Group 4 Averages
Covid/Stay-home factor	1.130	NHDOT Methodology

Site Trips are not Seasonally Adjusted or Grown.

ALL TRIPS ARE COVID ADJUSTED

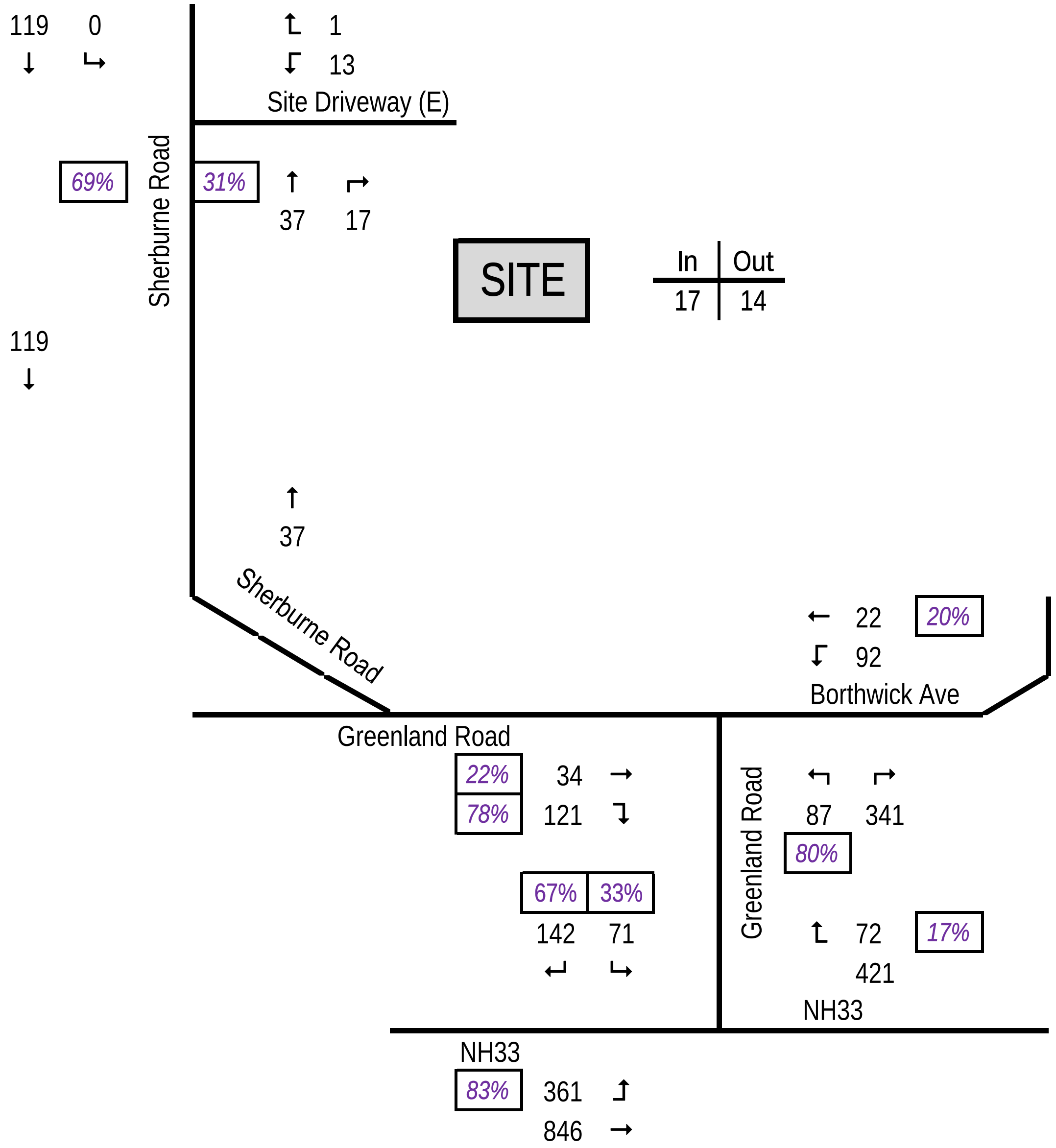
AM Peak Hour	Existing 2023 (Raw data) [03/09/2023]	Existing 2023 w/ Seasonal Adjustment	Covid/Stay Home Adjustment	2023 ADJUSTED	Balance	2023 BASE	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
1: Sherburne Road	7:30 AM																			
at Site Driveway (E)	per video obs																			
Movement	[A]																			
WBL	13	*13*	1.130	*14.69*		14.69	*14.69*	*14.69*	*14.69*	*14.69*	*14.69*	*14.69*	*14.69*	*14.69*	*14.69*	*14.69*	*14.69*	*14.69*	*14.69*	*14.69*
WBR	1	*1*	1.130	*1.13*		1.13	*1.13*	*1.13*	*1.13*	*1.13*	*1.13*	*1.13*	*1.13*	*1.13*	*1.13*	*1.13*	*1.13*	*1.13*	*1.13*	*1.13*
NBT	37	43	1.130	48.59		48.59	48.83	49.07	49.32	49.57	49.82	50.07	50.32	50.57	50.82	51.07	51.33	51.59	51.85	52.11
NBR	17	*17*	1.130	*19.21*		19.21	*19.21*	*19.21*	*19.21*	*19.21*	*19.21*	*19.21*	*19.21*	*19.21*	*19.21*	*19.21*	*19.21*	*19.21*	*19.21*	*19.21*
SBL	0	*0*	1.130	*0.00*		0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
SBT	119	137	1.130	154.81		154.81	155.58	156.36	157.14	157.93	158.72	159.51	160.31	161.11	161.92	162.73	163.54	164.36	165.18	166.01
2: Sherburne Road	calculated from																			
at Site Driveway (P)	above																			
Movement																				
WBL		*0*	1.130	*0.00*		0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
WBR		*0*	1.130	0.00		0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
NBT	37	43	1.130	48.59		48.59	48.83	49.07	49.32	49.57	49.82	50.07	50.32	50.57	50.82	51.07	51.33	51.59	51.85	52.11
NBR		*0*	1.130	*0.00*		0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
SBL		*0*	1.130	*0.00*		0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
SBT	119	137	1.130	*154.81*		154.81	155.58	156.36	157.14	157.93	158.72	159.51	160.31	161.11	161.92	162.73	163.54	164.36	165.18	166.01
4: Greenland Road																				
at Borthwick Ave	7:30 AM																			
Movement	(B)																			
EBT	34	39	1.130	44.07		44.07	44.29	44.51	44.73	44.95	45.17	45.40	45.63	45.86	46.09	46.32	46.55	46.78	47.01	47.25
EBR	121	139	1.130	157.07		157.07	157.86	158.65	159.44	160.24	161.04	161.85	162.66	163.47	164.29	165.11	165.94	166.77	167.60	168.44
WBL	92	106	1.130	119.78		119.78	120.38	120.98	121.58	122.19	122.80	123.41	124.03	124.65	125.27	125.90	126.53	127.16	127.80	128.44
WBT	22	25	1.130	28.25		28.25	28.39	28.53	28.67	28.81	28.95	29.09	29.24	29.39	29.54	29.69	29.84	29.99	30.14	30.29
NBL	87	100	1.130	113.00	+1	114.00	114.57	115.14	115.72	116.30	116.88	117.46	118.05	118.64	119.23	119.83	120.43	121.03	121.64	122.25
NBR	341	392	1.130	442.96	+6	448.96	451.20	453.46	455.73	458.01	460.30	462.60	464.91	467.23	469.57	471.92	474.28	476.65	479.03	481.43
5: NH33																				
at Greenland Road	7:30 AM																			
Movement	(A)																			
EBL	361	415	1.130	468.95		468.95	471.29	473.65	476.02	478.40	480.79	483.19	485.61	488.04	490.48	492.93	495.39	497.87	500.36	502.86
EBT	846	973	1.130	1099.49		1099.49	1104.99	1110.51	1116.06	1121.64	1127.25	1132.89	1138.55	1144.24	1149.96	1155.71	1161.49	1167.30	1173.14	1179.01
WBT	421	484	1.130	546.92		546.92	549.65	552.40	555.16	557.94	560.73	563.53	566.35	569.18	572.03	574.89	577.76	580.65	583.55	586.47
WBR	72	83	1.130	93.79		93.79	94.26	94.73	95.20	95.68	96.16	96.64	97.12	97.61	98.10	98.59	99.08	99.58	100.08	100.58
SBL	71	82	1.130	92.66		92.66	93.12	93.59	94.06	94.53	95.00	95.48	95.96	96.44	96.92	97.40	97.89	98.38	98.87	99.36
SBR	142	163	1.130	184.19		184.19	185.11	186.04	186.97	187.90	188.84	189.78	190.73	191.68	192.64	193.60	194.57	195.54	196.52	197.50

AM PHF	% Heavy	Counted Heavy	AM Peak Hour	2023 BASE	2027 No-Build	EXISTING TRIP DEDUCTION	Site Trip Distribution	2027 Build	Build PHF	Build HV	Build HV
			1: Sherburne Road at Site Driveway								
			Movement								
0.39	14%	2	WBL	15	15	-15	29	29	0.90	0%	0
	0%	0	WBR	1	1	-1	0	0		0%	0
0.79	6%	3	NBT	49	50	0	0	50	0.79	6%	3
	10%	2	NBR	19	19	-19	0	0		0%	0
0.76	0%	0	SBL	0	0	0	0	0	0.76	0%	0
	2%	3	SBT	155	158	0	0	158		2%	3
			2: Sherburne Road at Site Driveway								
			Movement								
0.90	0%		WBL	0	0	0	4	4	0.90	0%	
	0%		WBR	0	0	0	0	0		0%	
0.90	10%	5	NBT	49	50	-19	0	31	0.90	6%	3
	0%		NBR	0	0	0	13	13		0%	
0.90	0%		SBL	0	0	0	0	0	0.90	0%	
	3%	5	SBT	155	158	-15	29	172		2%	3
			4: Greenland Road at Borthwick Ave								
			Movement								
0.84	2%	1	EBT	44	45	-3	7	49	0.84	2%	
	3%	4	EBR	157	160	-12	26	174		3%	
0.86	6%	7	WBL	120	122	0	0	122	0.86	6%	
	0%	0	WBT	28	29	-4	3	28		0%	
0.75	6%	7	NBL	114	116	-15	10	111	0.75	6%	
	2%	11	NBR	449	458	0	0	458		2%	
			5: NH33 at Greenland Road								
			Movement								
0.82	2%	11	EBL	469	478	-13	9	474	0.82	2%	
	3%	33	EBT	1099	1122	0	0	1122		3%	
0.89	4%	22	WBT	547	558	0	0	558	0.89	4%	
	4%	4	WBR	94	96	-3	2	95		4%	
0.82	3%	3	SBL	93	95	-4	9	100	0.82	3%	
	5%	9	SBR	184	188	-8	17	197		5%	

AM Peak Hour	2037 No-Build	EXISTING TRIP DEDUCTION	Site Trip Distribution	2037 Build	Future PHF
1: Sherburne Road at Site Driveway					
Movement					
WBL	15	-15	29	29	0.90
WBR	1	-1	0	0	
NBT	52	0	0	52	0.90
NBR	19	-19	0	0	
SBL	0	0	0	0	0.90
SBT	166	0	0	166	
2: Sherburne Road at Site Driveway					
Movement					
WBL	0	0	4	4	0.90
WBR	0	0	0	0	
NBT	52	-19	0	33	0.90
NBR	0	0	13	13	
SBL	0	0	0	0	0.90
SBT	166	-15	29	180	
4: Greenland Road at Borthwick Ave					
Movement					
EBT	47	-3	7	51	0.90
EBR	168	-12	26	182	
WBL	128	0	0	128	0.90
WBT	30	-4	3	29	
NBL	122	-15	10	117	0.90
NBR	481	0	0	481	
5: NH33 at Greenland Road					
Movement					
EBL	503	-13	9	499	0.90
EBT	1179	0	0	1179	
WBT	586	0	0	586	0.90
WBR	101	-3	2	100	
SBL	99	-4	9	104	0.90
SBR	198	-8	17	207	

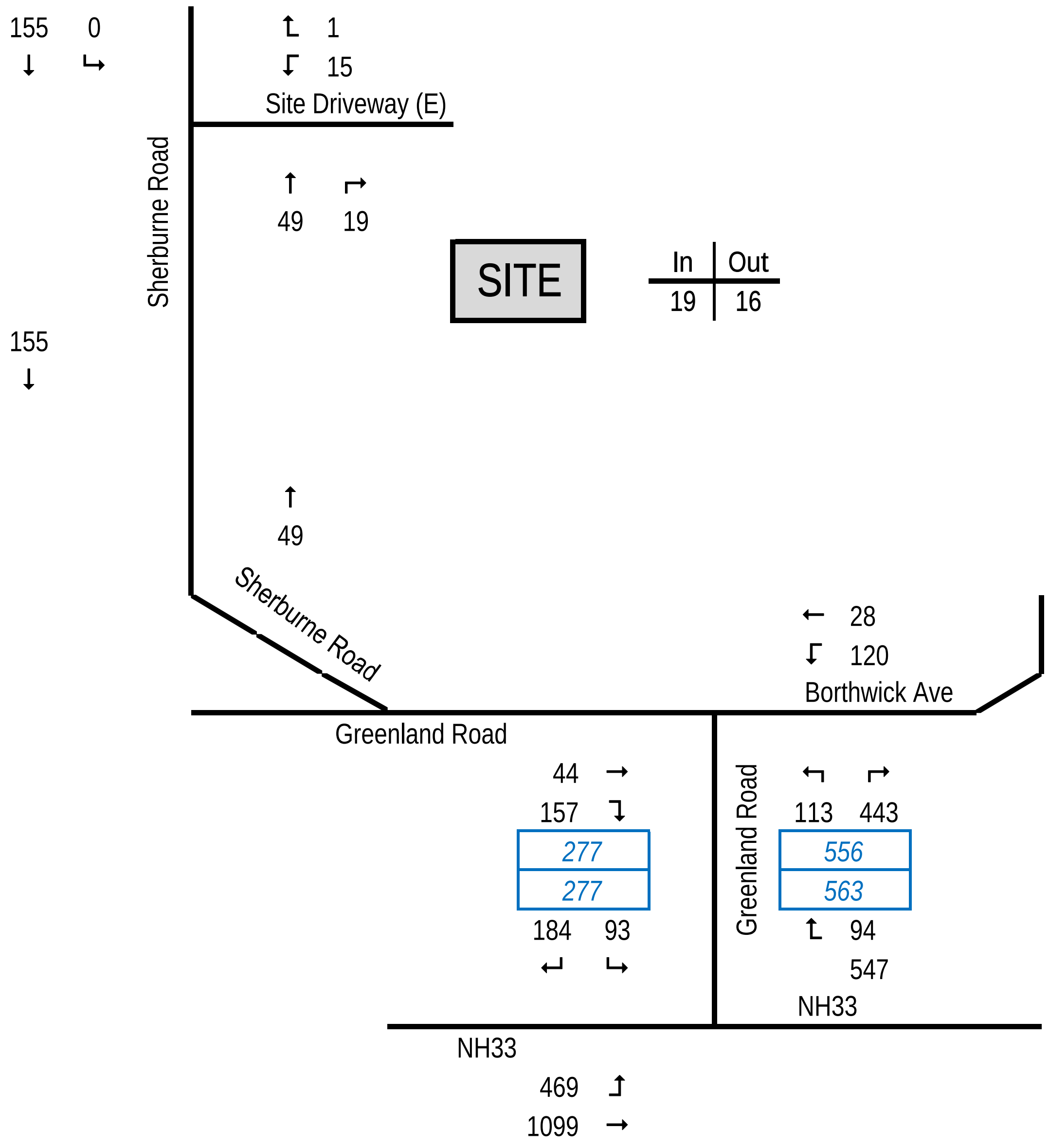
2023 RAW DATA
PRORATA
AM Peak Hour

XX Primary Site Trips



2023 ADJUSTED
BALANCE
AM Peak Hour

XX Primary Site Trips



Background Traffic Volumes
PM Peak data

Assumed growth rate	0.005	
MARCH 2019 Seasonal	1.15	NHDOT Group 4 Averages
Covid/Stay-home factor	1.130	NHDOT Methodology

Site Trips are not Seasonally Adjusted or Grown.

ALL TRIPS ARE COVID ADJUSTED

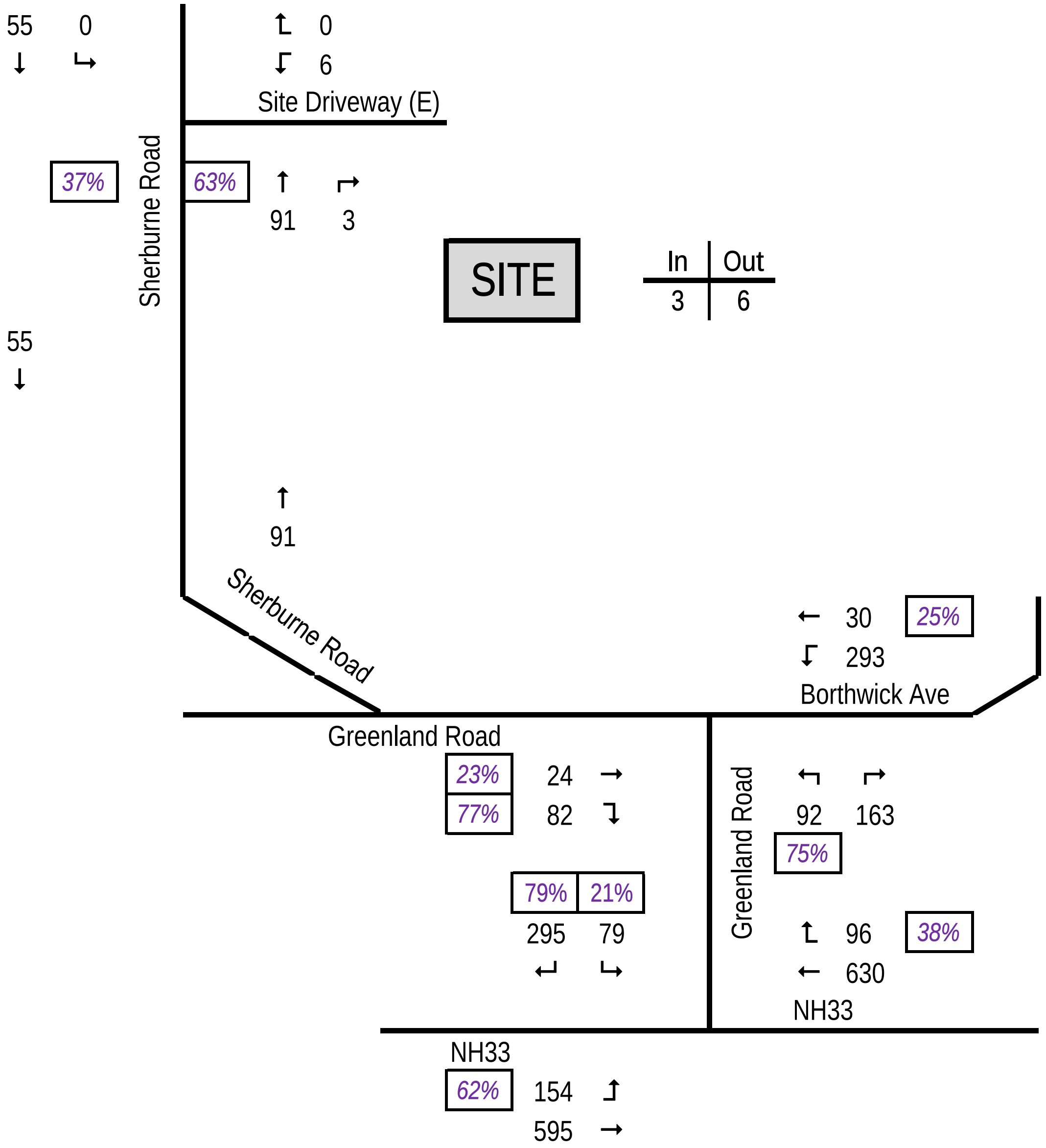
PM Peak Hour	Existing 2023 (Raw data) [03/09/2023]	Existing 2023 w/ Seasonal Adjustment	Covid/Stay Home Adjustment	2023 ADJUSTED	BALANCE	2023 BASE	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
1: Sherburne Road	3:30 PM																			
at Site Driveway (E)	per video obs																			
Movement	[A]																			
WBL	6	6	1.130	6.78		6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78
WBR	0	0	1.130	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NBT	91	91	1.130	102.83		102.83	103.34	103.86	104.38	104.90	105.42	105.95	106.48	107.01	107.55	108.09	108.63	109.17	109.72	110.27
NBR	3	3	1.130	3.39		3.39	3.39	3.39	3.39	3.39	3.39	3.39	3.39	3.39	3.39	3.39	3.39	3.39	3.39	3.39
SBL	0	0	1.130	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SBT	55	55	1.130	62.15		62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15
2: Sherburne Road	calculated from																			
at Site Driveway (P)	above																			
Movement																				
WBL		0	1.130	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WBR		0	1.130	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NBT	91	91	1.130	102.83		102.83	103.34	103.86	104.38	104.90	105.42	105.95	106.48	107.01	107.55	108.09	108.63	109.17	109.72	110.27
NBR		0	1.130	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SBL		0	1.130	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SBT	55	55	1.130	62.15		62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15	62.15
4: Greenland Road																				
at Borthwick Ave	3:00 PM																			
Movement	(B)																			
EBT	24	28	1.130	31.64		31.64	31.80	31.96	32.12	32.28	32.44	32.60	32.76	32.92	33.08	33.25	33.42	33.59	33.76	33.93
EBR	82	94	1.130	106.22		106.22	106.75	107.28	107.82	108.36	108.90	109.44	109.99	110.54	111.09	111.65	112.21	112.77	113.33	113.90
WBL	293	337	1.130	380.81		380.81	382.71	384.62	386.54	388.47	390.41	392.36	394.32	396.29	398.27	400.26	402.26	404.27	406.29	408.32
WBT	30	35	1.130	39.55		39.55	39.75	39.95	40.15	40.35	40.55	40.75	40.95	41.15	41.36	41.57	41.78	41.99	42.20	42.41
NBL	92	106	1.130	119.78		119.78	120.38	120.98	121.58	122.19	122.80	123.41	124.03	124.65	125.27	125.90	126.53	127.16	127.80	128.44
NBR	163	187	1.130	211.31		211.31	212.37	213.43	214.50	215.57	216.65	217.73	218.82	219.91	221.01	222.12	223.23	224.35	225.47	226.60
5: NH33																				
at Greenland Road	3:15 PM																			
Movement	(A)																			
EBL	154	177	1.130	200.01		200.01	201.01	202.02	203.03	204.05	205.07	206.10	207.13	208.17	209.21	210.26	211.31	212.37	213.43	214.50
EBT	595	684	1.130	772.92		772.92	776.78	780.66	784.56	788.48	792.42	796.38	800.36	804.36	808.38	812.42	816.48	820.56	824.66	828.78
WBT	630	725	1.130	819.25		819.25	823.35	827.47	831.61	835.77	839.95	844.15	848.37	852.61	856.87	861.15	865.46	869.79	874.14	878.51
WBR	96	110	1.130	124.30		124.30	124.92	125.54	126.17	126.80	127.43	128.07	128.71	129.35	130.00	130.65	131.30	131.96	132.62	133.28
SBL	79	91	1.130	102.83		102.83	103.34	103.86	104.38	104.90	105.42	105.95	106.48	107.01	107.55	108.09	108.63	109.17	109.72	110.27
SBR	295	339	1.130	383.07		383.07	384.99	386.91	388.84	390.78	392.73	394.69	396.66	398.64	400.63	402.63	404.64	406.66	408.69	410.73

PM PHF	% Heavy	Counted Heavy	PM Peak Hour	2023 BASE	2027 No-Build	EXISTING TRIP DEDUCTION	Site Trip Distribution	2027 Build	Build PHF	Build HV	Build HV
			1: Sherburne Road at Site Driveway								
			Movement								
0.38	0%	0	WBL	7	7	-7	21	21	0.90	0%	0
	0%	0	WBR	0	0	0	0	0		0%	0
0.69	1%	1	NBT	103	105	0	0	105	0.69	1%	1
	0%	0	NBR	3	3	-3	0	0		0%	0
0.81	0%	0	SBL	0	0	0	0	0	0.81	0%	0
	2%	1	SBT	62	62	0	0	62		2%	1
			2: Sherburne Road at Site Driveway								
			Movement								
0.90	0%		WBL	0	0	0	3	3	0.90	0%	
	0%		WBR	0	0	0	0	0		0%	
0.90	1%	1	NBT	103	105	-3	0	102	0.90	1%	1
	0%		NBR	0	0	0	35	35		0%	
0.90	0%		SBL	0	0	0	0	0	0.90	0%	
	2%	1	SBT	62	62	-7	21	76		2%	1
			4: Greenland Road at Borthwick Ave								
			Movement								
0.86	3%	1	EBT	32	32	-2	6	36	0.86	3%	
	3%	3	EBR	106	108	-5	18	121		3%	
0.91	2%	8	WBL	381	388	0	0	388	0.91	2%	
	3%	1	WBT	40	40	-1	9	48		3%	
0.88	3%	3	NBL	120	122	-2	26	146	0.88	3%	
	4%	9	NBR	211	216	0	0	216		4%	
			5: NH33 at Greenland Road								
			Movement								
0.94	2%	5	EBL	200	204	-1	16	219	0.94	2%	
	2%	15	EBT	773	788	0	0	788		2%	
0.89	2%	14	WBT	819	836	0	0	836	0.89	2%	
	6%	7	WBR	124	127	-1	10	136		6%	
0.93	6%	6	SBL	103	105	-1	4	108	0.93	6%	
	1%	5	SBR	383	391	-4	15	402		1%	

PM Peak Hour	2037 No-Build	EXISTING TRIP DEDUCTION	Site Trip Distribution	2037 Build	Future PHF
1: Sherburne Road at Site Driveway					
Movement					
WBL	7	-7	21	21	0.90
WBR	0	0	0	0	
NBT	110	0	0	110	0.90
NBR	3	-3	0	0	
SBL	0	0	0	0	0.90
SBT	62	0	0	62	
2: Sherburne Road at Site Driveway					
Movement					
WBL	0	0	3	3	0.90
WBR	0	0	0	0	
NBT	110	-3	0	107	0.90
NBR	0	0	35	35	
SBL	0	0	0	0	0.90
SBT	62	-7	21	76	
4: Greenland Road at Borthwick Ave					
Movement					
EBT	34	-2	6	38	0.90
EBR	114	-5	18	127	
WBL	408	0	0	408	0.91
WBT	42	-1	9	50	
NBL	128	-2	26	152	0.90
NBR	227	0	0	227	
5: NH33 at Greenland Road					
Movement					
EBL	215	-1	16	230	0.94
EBT	829	0	0	829	
WBT	879	0	0	879	0.90
WBR	133	-1	10	142	
SBL	110	-1	4	113	0.93
SBR	411	-4	15	422	

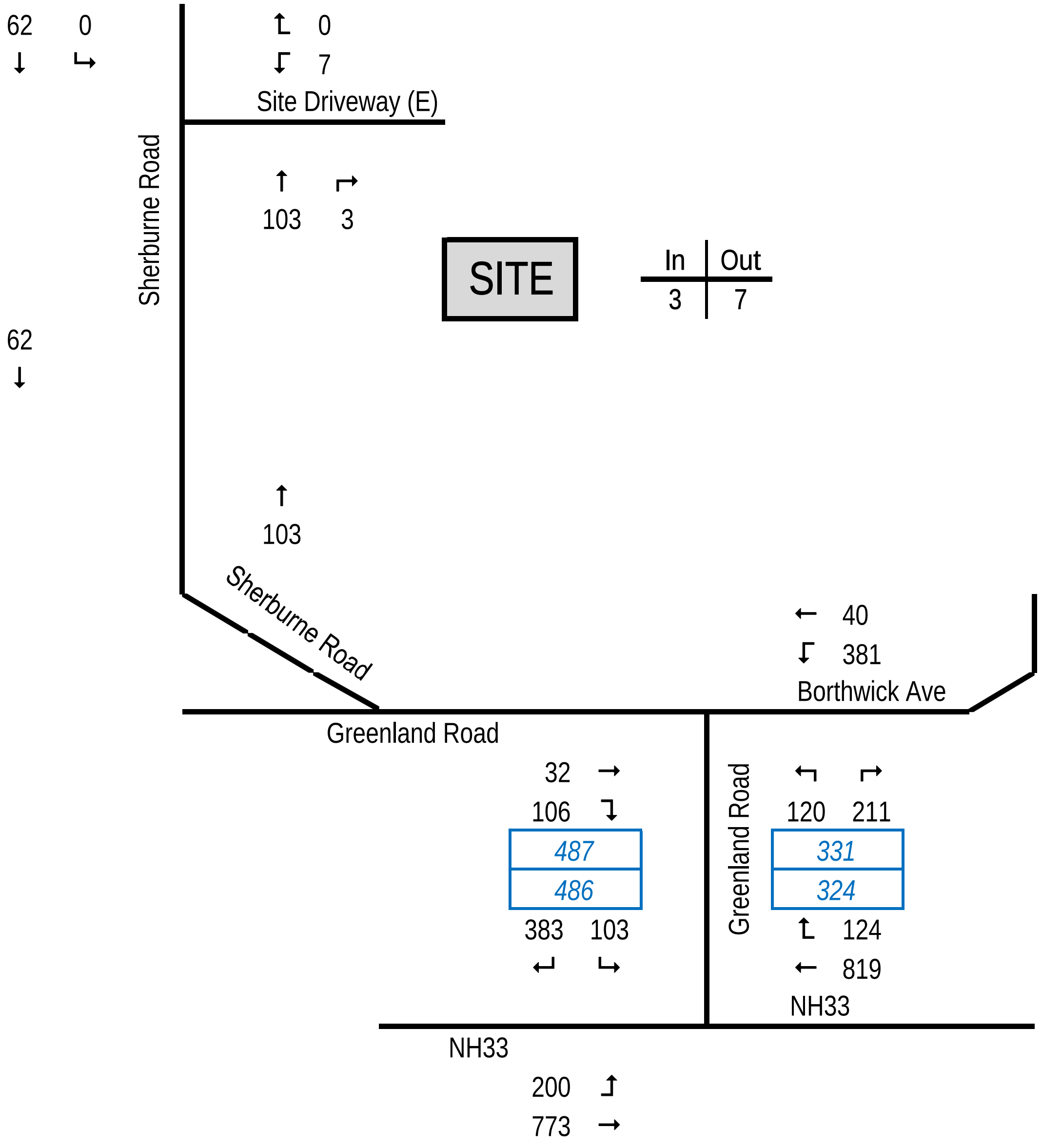
2023 RAW DATA
PRORATA
PM Peak Hour

XX Primary Site Trips



2023 ADJUSTED
BALANCE
PM Peak Hour

XX Primary Site Trips



APPENDIX F

1: Sherburne Rd & Site Driveway (Existing)

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰↱		↱			↰
Traffic Vol, veh/h	15	1	49	19	0	155
Future Vol, veh/h	15	1	49	19	0	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	39	39	79	79	76	76
Heavy Vehicles, %	14	0	6	10	0	2
Mvmt Flow	38	3	62	24	0	204

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	278	74	0	0	86	0
Stage 1	74	-	-	-	-	-
Stage 2	204	-	-	-	-	-
Critical Hdwy	6.54	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.54	-	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-	-
Follow-up Hdwy	3.626	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	687	993	-	-	1523	-
Stage 1	919	-	-	-	-	-
Stage 2	802	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	687	993	-	-	1523	-
Mov Cap-2 Maneuver	687	-	-	-	-	-
Stage 1	919	-	-	-	-	-
Stage 2	802	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	700	1523	-
HCM Lane V/C Ratio	-	-	0.059	-	-
HCM Control Delay (s)	-	-	10.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Intersection Delay, s/veh	20.1
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰	↱
Traffic Vol, veh/h	44	157	120	28	114	449
Future Vol, veh/h	44	157	120	28	114	449
Peak Hour Factor	0.84	0.84	0.86	0.86	0.75	0.75
Heavy Vehicles, %	2	3	6	0	6	2
Mvmt Flow	52	187	140	33	152	599
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	11.7	12	24.6
HCM LOS	B	B	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	81%
Vol Thru, %	0%	0%	22%	19%
Vol Right, %	0%	100%	78%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	114	449	201	148
LT Vol	114	0	0	120
Through Vol	0	0	44	28
RT Vol	0	449	157	0
Lane Flow Rate	152	599	239	172
Geometry Grp	7	7	2	2
Degree of Util (X)	0.266	0.836	0.366	0.301
Departure Headway (Hd)	6.31	5.03	5.502	6.291
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	570	718	653	571
Service Time	4.042	2.761	3.541	4.333
HCM Lane V/C Ratio	0.267	0.834	0.366	0.301
HCM Control Delay	11.3	28	11.7	12
HCM Lane LOS	B	D	B	B
HCM 95th-tile Q	1.1	9.3	1.7	1.3

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↰	↑↑	↑↱	↰	↱
Traffic Volume (vph)	469	1099	547	93	184
Future Volume (vph)	469	1099	547	93	184
Turn Type	Prot	NA	NA	Perm	Perm
Protected Phases	1	6	2		
Permitted Phases				3	3
Detector Phase	1	6	2	3	3
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	14.0	24.0	24.0	23.0	23.0
Total Split (s)	36.0	67.0	31.0	23.0	23.0
Total Split (%)	40.0%	74.4%	34.4%	25.6%	25.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	Min	Min
Act Effct Green (s)	33.0	66.0	26.9	12.0	12.0
Actuated g/C Ratio	0.37	0.73	0.30	0.13	0.13
v/c Ratio	0.88	0.52	0.70	0.48	0.56
Control Delay	44.1	6.5	32.0	42.4	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	6.5	32.0	42.4	10.7
LOS	D	A	C	D	B
Approach Delay		17.7	32.0	21.3	
Approach LOS		B	C	C	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 51 (57%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

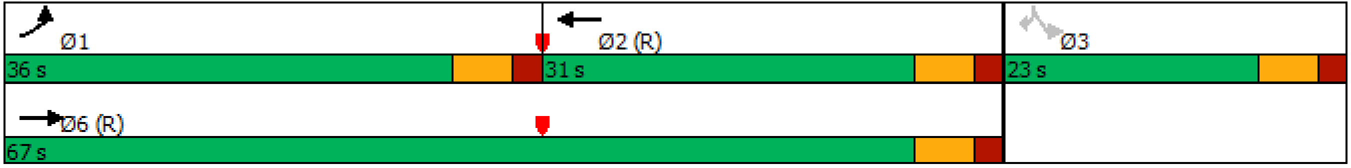
Maximum v/c Ratio: 0.88

Intersection Signal Delay: 21.6 Intersection LOS: C

Intersection Capacity Utilization 65.8% ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 5: RT33 & Greenland Rd



5: RT33 & Greenland Rd

	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	572	1340	721	113	224
v/c Ratio	0.88	0.52	0.70	0.48	0.56
Control Delay	44.1	6.5	32.0	42.4	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	6.5	32.0	42.4	10.7
Queue Length 50th (ft)	288	143	190	60	0
Queue Length 95th (ft)	#442	192	253	97	44
Internal Link Dist (ft)		520	520	270	
Turn Bay Length (ft)	200			100	
Base Capacity (vph)	649	2568	1030	330	472
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.88	0.52	0.70	0.34	0.47

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰	↱
Traffic Volume (vph)	469	1099	547	94	93	184
Future Volume (vph)	469	1099	547	94	93	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3505	3395		1752	1538
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3505	3395		1752	1538
Peak-hour factor, PHF	0.82	0.82	0.89	0.89	0.82	0.82
Adj. Flow (vph)	572	1340	615	106	113	224
RTOR Reduction (vph)	0	0	15	0	0	194
Lane Group Flow (vph)	572	1340	706	0	113	30
Heavy Vehicles (%)	2%	3%	4%	4%	3%	5%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	1	6	2			
Permitted Phases					3	3
Actuated Green, G (s)	33.0	66.0	27.0		12.0	12.0
Effective Green, g (s)	33.0	66.0	27.0		12.0	12.0
Actuated g/C Ratio	0.37	0.73	0.30		0.13	0.13
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	649	2570	1018		233	205
v/s Ratio Prot	c0.32	0.38	c0.21			
v/s Ratio Perm					c0.06	0.02
v/c Ratio	0.88	0.52	0.69		0.48	0.15
Uniform Delay, d1	26.7	5.2	27.8		36.1	34.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	13.7	0.8	3.9		2.2	0.4
Delay (s)	40.3	5.9	31.7		38.3	34.9
Level of Service	D	A	C		D	C
Approach Delay (s)		16.2	31.7		36.1	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰↱		↑↱			↰↑
Traffic Vol, veh/h	15	1	50	19	0	158
Future Vol, veh/h	15	1	50	19	0	158
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	39	39	79	79	76	76
Heavy Vehicles, %	14	0	6	10	0	2
Mvmt Flow	38	3	63	24	0	208

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	283	75	0	0	87	0
Stage 1	75	-	-	-	-	-
Stage 2	208	-	-	-	-	-
Critical Hdwy	6.54	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.54	-	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-	-
Follow-up Hdwy	3.626	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	682	992	-	-	1522	-
Stage 1	918	-	-	-	-	-
Stage 2	799	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	682	992	-	-	1522	-
Mov Cap-2 Maneuver	682	-	-	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	799	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	696	1522	-
HCM Lane V/C Ratio	-	-	0.059	-	-
HCM Control Delay (s)	-	-	10.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Intersection Delay, s/veh	21.4
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰	↱
Traffic Vol, veh/h	45	160	122	29	116	458
Future Vol, veh/h	45	160	122	29	116	458
Peak Hour Factor	0.84	0.84	0.86	0.86	0.75	0.75
Heavy Vehicles, %	2	3	6	0	6	2
Mvmt Flow	54	190	142	34	155	611
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	11.9	12.2	26.6
HCM LOS	B	B	D

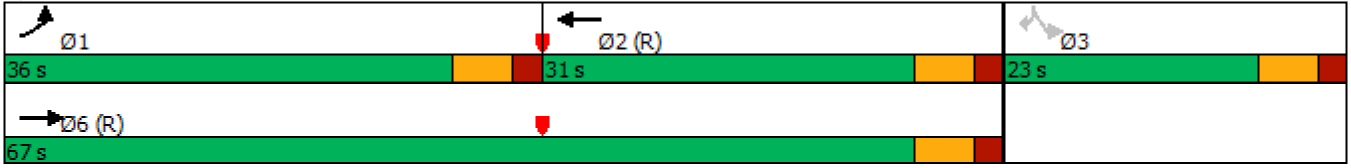
Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	81%
Vol Thru, %	0%	0%	22%	19%
Vol Right, %	0%	100%	78%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	116	458	205	151
LT Vol	116	0	0	122
Through Vol	0	0	45	29
RT Vol	0	458	160	0
Lane Flow Rate	155	611	244	176
Geometry Grp	7	7	2	2
Degree of Util (X)	0.272	0.858	0.376	0.309
Departure Headway (Hd)	6.342	5.061	5.545	6.336
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	568	714	649	567
Service Time	4.073	2.792	3.587	4.381
HCM Lane V/C Ratio	0.273	0.856	0.376	0.31
HCM Control Delay	11.4	30.5	11.9	12.2
HCM Lane LOS	B	D	B	B
HCM 95th-tile Q	1.1	10.1	1.7	1.3

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↰	↑↑	↑↱	↰	↱
Traffic Volume (vph)	478	1122	558	95	188
Future Volume (vph)	478	1122	558	95	188
Turn Type	Prot	NA	NA	Perm	Perm
Protected Phases	1	6	2		
Permitted Phases				3	3
Detector Phase	1	6	2	3	3
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	14.0	24.0	24.0	23.0	23.0
Total Split (s)	36.0	67.0	31.0	23.0	23.0
Total Split (%)	40.0%	74.4%	34.4%	25.6%	25.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	Min	Min
Act Effct Green (s)	33.6	65.7	26.1	12.3	12.3
Actuated g/C Ratio	0.37	0.73	0.29	0.14	0.14
v/c Ratio	0.88	0.53	0.74	0.49	0.56
Control Delay	44.1	6.7	33.6	42.0	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	6.7	33.6	42.0	10.5
LOS	D	A	C	D	B
Approach Delay		17.9	33.6	21.1	
Approach LOS		B	C	C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 51 (57%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 22.1 Intersection LOS: C
Intersection Capacity Utilization 66.6% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: RT33 & Greenland Rd



	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	583	1368	735	116	229
v/c Ratio	0.88	0.53	0.74	0.49	0.56
Control Delay	44.1	6.7	33.6	42.0	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	6.7	33.6	42.0	10.5
Queue Length 50th (ft)	297	149	196	62	0
Queue Length 95th (ft)	#465	205	259	97	43
Internal Link Dist (ft)		520	520	270	
Turn Bay Length (ft)	200			100	
Base Capacity (vph)	661	2558	999	330	476
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.88	0.53	0.74	0.35	0.48

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	478	1122	558	96	95	188
Future Volume (vph)	478	1122	558	96	95	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3505	3395		1752	1538
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3505	3395		1752	1538
Peak-hour factor, PHF	0.82	0.82	0.89	0.89	0.82	0.82
Adj. Flow (vph)	583	1368	627	108	116	229
RTOR Reduction (vph)	0	0	15	0	0	198
Lane Group Flow (vph)	583	1368	720	0	116	31
Heavy Vehicles (%)	2%	3%	4%	4%	3%	5%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	1	6	2			
Permitted Phases					3	3
Actuated Green, G (s)	33.6	65.7	26.1		12.3	12.3
Effective Green, g (s)	33.6	65.7	26.1		12.3	12.3
Actuated g/C Ratio	0.37	0.73	0.29		0.14	0.14
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	660	2558	984		239	210
v/s Ratio Prot	c0.33	0.39	c0.21			
v/s Ratio Perm					c0.07	0.02
v/c Ratio	0.88	0.53	0.73		0.49	0.15
Uniform Delay, d1	26.4	5.4	28.8		35.9	34.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	13.6	0.8	4.8		2.1	0.4
Delay (s)	40.0	6.2	33.6		38.0	34.7
Level of Service	D	A	C		D	C
Approach Delay (s)		16.3	33.6		35.8	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

1: Sherburne Rd & Site Driveway (Existing)

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
Traffic Vol, veh/h	15	1	52	19	0	166
Future Vol, veh/h	15	1	52	19	0	166
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	14	0	6	10	0	2
Mvmt Flow	17	1	58	21	0	184

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	253	69	0	0	79	0
Stage 1	69	-	-	-	-	-
Stage 2	184	-	-	-	-	-
Critical Hdwy	6.54	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.54	-	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-	-
Follow-up Hdwy	3.626	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	710	1000	-	-	1532	-
Stage 1	924	-	-	-	-	-
Stage 2	819	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	710	1000	-	-	1532	-
Mov Cap-2 Maneuver	710	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	819	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	723	1532	-
HCM Lane V/C Ratio	-	-	0.025	-	-
HCM Control Delay (s)	-	-	10.1	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Intersection Delay, s/veh	16.1
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰	↱
Traffic Vol, veh/h	47	168	128	30	122	481
Future Vol, veh/h	47	168	128	30	122	481
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	3	6	0	6	2
Mvmt Flow	52	187	142	33	136	534
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	11.3	11.8	18.9
HCM LOS	B	B	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	81%
Vol Thru, %	0%	0%	22%	19%
Vol Right, %	0%	100%	78%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	122	481	215	158
LT Vol	122	0	0	128
Through Vol	0	0	47	30
RT Vol	0	481	168	0
Lane Flow Rate	136	534	239	176
Geometry Grp	7	7	2	2
Degree of Util (X)	0.237	0.744	0.355	0.298
Departure Headway (Hd)	6.291	5.01	5.346	6.121
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	572	721	674	586
Service Time	4.017	2.736	3.382	4.161
HCM Lane V/C Ratio	0.238	0.741	0.355	0.3
HCM Control Delay	11	20.9	11.3	11.8
HCM Lane LOS	B	C	B	B
HCM 95th-tile Q	0.9	6.7	1.6	1.2

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↰	↑↑	↑↱	↰	↱
Traffic Volume (vph)	503	1179	586	99	198
Future Volume (vph)	503	1179	586	99	198
Turn Type	Prot	NA	NA	Perm	Perm
Protected Phases	1	6	2		
Permitted Phases				3	3
Detector Phase	1	6	2	3	3
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	14.0	24.0	24.0	23.0	23.0
Total Split (s)	36.0	67.0	31.0	23.0	23.0
Total Split (%)	40.0%	74.4%	34.4%	25.6%	25.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	Min	Min
Act Effct Green (s)	32.4	66.1	27.7	11.9	11.9
Actuated g/C Ratio	0.36	0.73	0.31	0.13	0.13
v/c Ratio	0.88	0.51	0.72	0.48	0.56
Control Delay	44.0	6.3	32.5	42.3	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	6.3	32.5	42.3	10.8
LOS	D	A	C	D	B
Approach Delay		17.6	32.5	21.3	
Approach LOS		B	C	C	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 51 (57%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 80

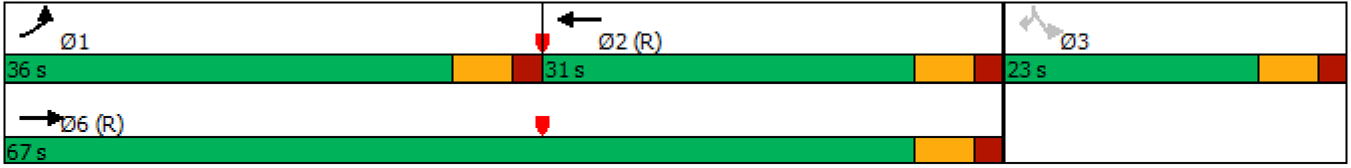
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 21.8	Intersection LOS: C
Intersection Capacity Utilization 69.0%	ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 5: RT33 & Greenland Rd



Queues

AM 2037 NoBuild

5: RT33 & Greenland Rd

	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	559	1310	763	110	220
v/c Ratio	0.88	0.51	0.72	0.48	0.56
Control Delay	44.0	6.3	32.5	42.3	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	6.3	32.5	42.3	10.8
Queue Length 50th (ft)	278	137	205	59	0
Queue Length 95th (ft)	#502	215	275	105	60
Internal Link Dist (ft)		520	520	270	
Turn Bay Length (ft)	200			100	
Base Capacity (vph)	641	2573	1058	330	468
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.87	0.51	0.72	0.33	0.47

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: RT33 & Greenland Rd

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰	↱
Traffic Volume (vph)	503	1179	586	101	99	198
Future Volume (vph)	503	1179	586	101	99	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3505	3395		1752	1538
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3505	3395		1752	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	559	1310	651	112	110	220
RTOR Reduction (vph)	0	0	15	0	0	191
Lane Group Flow (vph)	559	1310	748	0	110	29
Heavy Vehicles (%)	2%	3%	4%	4%	3%	5%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	1	6	2			
Permitted Phases					3	3
Actuated Green, G (s)	32.4	66.1	27.7		11.9	11.9
Effective Green, g (s)	32.4	66.1	27.7		11.9	11.9
Actuated g/C Ratio	0.36	0.73	0.31		0.13	0.13
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	637	2574	1044		231	203
v/s Ratio Prot	c0.32	0.37	c0.22			
v/s Ratio Perm					c0.06	0.02
v/c Ratio	0.88	0.51	0.72		0.48	0.14
Uniform Delay, d1	26.9	5.1	27.7		36.2	34.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	13.3	0.7	4.2		2.1	0.4
Delay (s)	40.3	5.8	31.9		38.3	35.0
Level of Service	D	A	C		D	C
Approach Delay (s)		16.1	31.9		36.1	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰↱		↑			↑
Traffic Vol, veh/h	29	0	50	0	0	158
Future Vol, veh/h	29	0	50	0	0	158
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	79	79	76	76
Heavy Vehicles, %	0	0	6	0	0	2
Mvmt Flow	32	0	63	0	0	208

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	271	63	0	-	-	-
Stage 1	63	-	-	-	-	-
Stage 2	208	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	723	1007	-	0	0	-
Stage 1	965	-	-	0	0	-
Stage 2	832	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	723	1007	-	-	-	-
Mov Cap-2 Maneuver	723	-	-	-	-	-
Stage 1	965	-	-	-	-	-
Stage 2	832	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	10.2		0		0	
HCM LOS	B					

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	723	-
HCM Lane V/C Ratio	-	0.045	-
HCM Control Delay (s)	-	10.2	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰↱		↱			↰
Traffic Vol, veh/h	4	0	31	13	0	172
Future Vol, veh/h	4	0	31	13	0	172
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	6	0	0	2
Mvmt Flow	4	0	34	14	0	191

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	232	41	0	0	48	0
Stage 1	41	-	-	-	-	-
Stage 2	191	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	761	1036	-	-	1572	-
Stage 1	987	-	-	-	-	-
Stage 2	846	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	761	1036	-	-	1572	-
Mov Cap-2 Maneuver	761	-	-	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	846	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	9.8		0		0	
HCM LOS	A					

Minor Lane/Major Mvmt		NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)		-	-	761	1572	-
HCM Lane V/C Ratio		-	-	0.006	-	-
HCM Control Delay (s)		-	-	9.8	0	-
HCM Lane LOS		-	-	A	A	-
HCM 95th %tile Q(veh)		-	-	0	0	-

Intersection	
Intersection Delay, s/veh	22.2
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰	↱
Traffic Vol, veh/h	49	174	122	28	111	458
Future Vol, veh/h	49	174	122	28	111	458
Peak Hour Factor	0.84	0.84	0.86	0.86	0.75	0.75
Heavy Vehicles, %	2	3	6	0	6	2
Mvmt Flow	58	207	142	33	148	611
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	12.4	12.3	27.9
HCM LOS	B	B	D

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	81%
Vol Thru, %	0%	0%	22%	19%
Vol Right, %	0%	100%	78%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	111	458	223	150
LT Vol	111	0	0	122
Through Vol	0	0	49	28
RT Vol	0	458	174	0
Lane Flow Rate	148	611	265	174
Geometry Grp	7	7	2	2
Degree of Util (X)	0.263	0.868	0.41	0.309
Departure Headway (Hd)	6.398	5.117	5.554	6.386
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	562	708	648	562
Service Time	4.133	2.851	3.6	4.438
HCM Lane V/C Ratio	0.263	0.863	0.409	0.31
HCM Control Delay	11.4	31.9	12.4	12.3
HCM Lane LOS	B	D	B	B
HCM 95th-tile Q	1	10.4	2	1.3

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↰	↑↑	↑↱	↰	↱
Traffic Volume (vph)	474	1122	558	100	197
Future Volume (vph)	474	1122	558	100	197
Turn Type	Prot	NA	NA	Perm	Perm
Protected Phases	1	6	2		
Permitted Phases				3	3
Detector Phase	1	6	2	3	3
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	14.0	24.0	24.0	23.0	23.0
Total Split (s)	36.0	67.0	31.0	23.0	23.0
Total Split (%)	40.0%	74.4%	34.4%	25.6%	25.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	Min	Min
Act Effct Green (s)	33.2	65.5	26.3	12.5	12.5
Actuated g/C Ratio	0.37	0.73	0.29	0.14	0.14
v/c Ratio	0.89	0.54	0.73	0.50	0.57
Control Delay	44.7	6.8	33.3	42.4	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.7	6.8	33.3	42.4	10.4
LOS	D	A	C	D	B
Approach Delay		18.1	33.3	21.2	
Approach LOS		B	C	C	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 51 (57%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

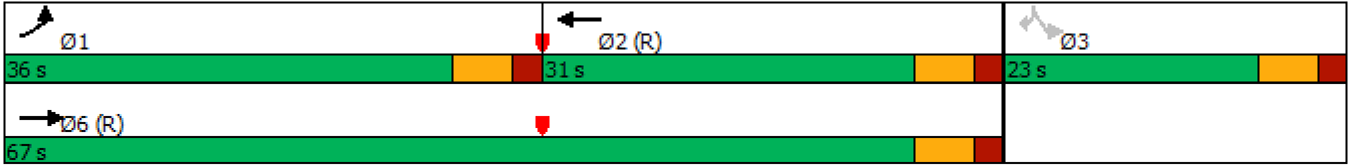
Maximum v/c Ratio: 0.89

Intersection Signal Delay: 22.1 Intersection LOS: C

Intersection Capacity Utilization 66.4% ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 5: RT33 & Greenland Rd



	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	578	1368	734	122	240
v/c Ratio	0.89	0.54	0.73	0.50	0.57
Control Delay	44.7	6.8	33.3	42.4	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.7	6.8	33.3	42.4	10.4
Queue Length 50th (ft)	295	151	195	65	0
Queue Length 95th (ft)	#459	205	258	102	44
Internal Link Dist (ft)		520	520	270	
Turn Bay Length (ft)	200			100	
Base Capacity (vph)	653	2551	1007	330	485
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.89	0.54	0.73	0.37	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰	↱
Traffic Volume (vph)	474	1122	558	95	100	197
Future Volume (vph)	474	1122	558	95	100	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3505	3395		1752	1538
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3505	3395		1752	1538
Peak-hour factor, PHF	0.82	0.82	0.89	0.89	0.82	0.82
Adj. Flow (vph)	578	1368	627	107	122	240
RTOR Reduction (vph)	0	0	15	0	0	207
Lane Group Flow (vph)	578	1368	719	0	122	33
Heavy Vehicles (%)	2%	3%	4%	4%	3%	5%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	1	6	2			
Permitted Phases					3	3
Actuated Green, G (s)	33.2	65.5	26.3		12.5	12.5
Effective Green, g (s)	33.2	65.5	26.3		12.5	12.5
Actuated g/C Ratio	0.37	0.73	0.29		0.14	0.14
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	652	2550	992		243	213
v/s Ratio Prot	c0.33	0.39	c0.21			
v/s Ratio Perm					c0.07	0.02
v/c Ratio	0.89	0.54	0.72		0.50	0.16
Uniform Delay, d1	26.6	5.5	28.6		35.9	34.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	14.1	0.8	4.6		2.2	0.5
Delay (s)	40.7	6.3	33.2		38.1	34.6
Level of Service	D	A	C		D	C
Approach Delay (s)		16.5	33.2		35.8	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑			↑
Traffic Vol, veh/h	29	0	52	0	0	166
Future Vol, veh/h	29	0	52	0	0	166
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	6	0	0	2
Mvmt Flow	32	0	58	0	0	184

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	242	58	0	-	-	-
Stage 1	58	-	-	-	-	-
Stage 2	184	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	751	1014	-	0	0	-
Stage 1	970	-	-	0	0	-
Stage 2	852	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	751	1014	-	-	-	-
Mov Cap-2 Maneuver	751	-	-	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	852	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	10		0		0	
HCM LOS	B					

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	751	-
HCM Lane V/C Ratio	-	0.043	-
HCM Control Delay (s)	-	10	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0.1	-

2: Sherburne Rd & Site Driveway (Proposed)

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
Traffic Vol, veh/h	4	0	33	13	0	180
Future Vol, veh/h	4	0	33	13	0	180
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	6	0	0	2
Mvmt Flow	4	0	37	14	0	200

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	244	44	0	0	51	0
Stage 1	44	-	-	-	-	-
Stage 2	200	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	749	1032	-	-	1568	-
Stage 1	984	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	749	1032	-	-	1568	-
Mov Cap-2 Maneuver	749	-	-	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	838	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	9.8		0		0	
HCM LOS	A					

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	749	1568	-
HCM Lane V/C Ratio	-	-	0.006	-	-
HCM Control Delay (s)	-	-	9.8	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Intersection Delay, s/veh	16.4
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰	↱
Traffic Vol, veh/h	51	182	128	29	117	481
Future Vol, veh/h	51	182	128	29	117	481
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	3	6	0	6	2
Mvmt Flow	57	202	142	32	130	534
Number of Lanes	1	0	0	1	1	1

Approach	EB		WB		NB	
Opposing Approach	WB		EB			
Opposing Lanes	1		1		0	
Conflicting Approach Left			NB		EB	
Conflicting Lanes Left	0		2		1	
Conflicting Approach Right	NB				WB	
Conflicting Lanes Right	2		0		1	
HCM Control Delay	11.7		11.8		19.4	
HCM LOS	B		B		C	

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	82%
Vol Thru, %	0%	0%	22%	18%
Vol Right, %	0%	100%	78%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	117	481	233	157
LT Vol	117	0	0	128
Through Vol	0	0	51	29
RT Vol	0	481	182	0
Lane Flow Rate	130	534	259	174
Geometry Grp	7	7	2	2
Degree of Util (X)	0.229	0.751	0.385	0.299
Departure Headway (Hd)	6.341	5.059	5.351	6.163
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	567	716	671	583
Service Time	4.072	2.791	3.39	4.205
HCM Lane V/C Ratio	0.229	0.746	0.386	0.298
HCM Control Delay	11	21.5	11.7	11.8
HCM Lane LOS	B	C	B	B
HCM 95th-tile Q	0.9	6.9	1.8	1.2

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↰	↑↑	↑↱	↰	↱
Traffic Volume (vph)	499	1179	586	104	207
Future Volume (vph)	499	1179	586	104	207
Turn Type	Prot	NA	NA	Perm	Perm
Protected Phases	1	6	2		
Permitted Phases				3	3
Detector Phase	1	6	2	3	3
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	14.0	24.0	24.0	23.0	23.0
Total Split (s)	36.0	67.0	31.0	23.0	23.0
Total Split (%)	40.0%	74.4%	34.4%	25.6%	25.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	Min	Min
Act Effct Green (s)	34.5	65.3	24.8	12.7	12.7
Actuated g/C Ratio	0.38	0.73	0.28	0.14	0.14
v/c Ratio	0.90	0.57	0.81	0.52	0.58
Control Delay	45.9	7.2	37.4	42.7	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	7.2	37.4	42.7	10.4
LOS	D	A	D	D	B
Approach Delay		18.7	37.4	21.2	
Approach LOS		B	D	C	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 51 (57%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 90

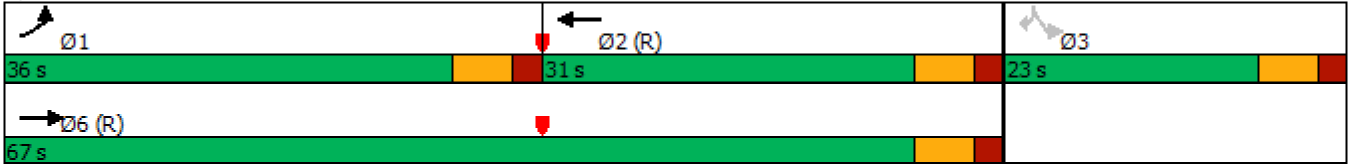
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 23.5	Intersection LOS: C
Intersection Capacity Utilization 68.7%	ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 5: RT33 & Greenland Rd



5: RT33 & Greenland Rd

	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	609	1438	770	127	252
v/c Ratio	0.90	0.57	0.81	0.52	0.58
Control Delay	45.9	7.2	37.4	42.7	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	7.2	37.4	42.7	10.4
Queue Length 50th (ft)	321	166	208	68	0
Queue Length 95th (ft)	#496	221	274	105	44
Internal Link Dist (ft)		520	520	270	
Turn Bay Length (ft)	200			100	
Base Capacity (vph)	678	2544	958	330	494
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.90	0.57	0.80	0.38	0.51

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰	↱
Traffic Volume (vph)	499	1179	586	100	104	207
Future Volume (vph)	499	1179	586	100	104	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3505	3395		1752	1538
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3505	3395		1752	1538
Peak-hour factor, PHF	0.82	0.82	0.89	0.89	0.82	0.82
Adj. Flow (vph)	609	1438	658	112	127	252
RTOR Reduction (vph)	0	0	15	0	0	216
Lane Group Flow (vph)	609	1438	755	0	127	36
Heavy Vehicles (%)	2%	3%	4%	4%	3%	5%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	1	6	2			
Permitted Phases					3	3
Actuated Green, G (s)	34.5	65.3	24.8		12.7	12.7
Effective Green, g (s)	34.5	65.3	24.8		12.7	12.7
Actuated g/C Ratio	0.38	0.73	0.28		0.14	0.14
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	678	2543	935		247	217
v/s Ratio Prot	c0.34	0.41	c0.22			
v/s Ratio Perm					c0.07	0.02
v/c Ratio	0.90	0.57	0.81		0.51	0.16
Uniform Delay, d1	26.1	5.7	30.4		35.8	34.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	14.9	0.9	7.4		2.4	0.5
Delay (s)	41.0	6.7	37.8		38.2	34.5
Level of Service	D	A	D		D	C
Approach Delay (s)		16.9	37.8		35.7	
Approach LOS		B	D		D	

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX G

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
Traffic Vol, veh/h	7	0	103	3	0	62
Future Vol, veh/h	7	0	103	3	0	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	38	38	69	69	81	81
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	18	0	149	4	0	77

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	228	151	0	0	153	0
Stage 1	151	-	-	-	-	-
Stage 2	77	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	765	901	-	-	1440	-
Stage 1	882	-	-	-	-	-
Stage 2	951	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	765	901	-	-	1440	-
Mov Cap-2 Maneuver	765	-	-	-	-	-
Stage 1	882	-	-	-	-	-
Stage 2	951	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	9.8		0		0	
HCM LOS	A					

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	765	1440	-
HCM Lane V/C Ratio	-	-	0.024	-	-
HCM Control Delay (s)	-	-	9.8	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Intersection Delay, s/veh	15
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰	↱
Traffic Vol, veh/h	32	106	381	40	120	211
Future Vol, veh/h	32	106	381	40	120	211
Peak Hour Factor	0.86	0.86	0.91	0.91	0.88	0.88
Heavy Vehicles, %	3	3	2	3	3	4
Mvmt Flow	37	123	419	44	136	240
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	9.8	19.5	11.6
HCM LOS	A	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	90%
Vol Thru, %	0%	0%	23%	10%
Vol Right, %	0%	100%	77%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	120	211	138	421
LT Vol	120	0	0	381
Through Vol	0	0	32	40
RT Vol	0	211	106	0
Lane Flow Rate	136	240	160	463
Geometry Grp	7	7	2	2
Degree of Util (X)	0.255	0.368	0.233	0.69
Departure Headway (Hd)	6.726	5.527	5.218	5.37
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	535	652	688	675
Service Time	4.46	3.26	3.254	3.398
HCM Lane V/C Ratio	0.254	0.368	0.233	0.686
HCM Control Delay	11.8	11.5	9.8	19.5
HCM Lane LOS	B	B	A	C
HCM 95th-tile Q	1	1.7	0.9	5.5

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↰	↑↑	↑↱	↰	↱
Traffic Volume (vph)	200	773	819	103	383
Future Volume (vph)	200	773	819	103	383
Turn Type	Prot	NA	NA	Perm	Perm
Protected Phases	1	6	2		
Permitted Phases				3	3
Detector Phase	1	6	2	3	3
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	14.0	24.0	24.0	23.0	23.0
Total Split (s)	26.0	54.0	28.0	26.0	26.0
Total Split (%)	32.5%	67.5%	35.0%	32.5%	32.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	Min	Min
Act Effct Green (s)	15.6	55.5	33.9	12.5	12.5
Actuated g/C Ratio	0.20	0.69	0.42	0.16	0.16
v/c Ratio	0.62	0.33	0.72	0.42	0.69
Control Delay	36.9	5.9	25.2	33.9	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	5.9	25.2	33.9	9.7
LOS	D	A	C	C	A
Approach Delay		12.3	25.2	14.8	
Approach LOS		B	C	B	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 75 (94%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 18.0	Intersection LOS: B
Intersection Capacity Utilization 60.3%	ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 5: RT33 & Greenland Rd

5: RT33 & Greenland Rd

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	213	822	1059	111	412
v/c Ratio	0.62	0.33	0.72	0.42	0.69
Control Delay	36.9	5.9	25.2	33.9	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	5.9	25.2	33.9	9.7
Queue Length 50th (ft)	98	67	213	52	0
Queue Length 95th (ft)	154	133	#433	88	68
Internal Link Dist (ft)		520	520	270	
Turn Bay Length (ft)	200			100	
Base Capacity (vph)	445	2454	1474	425	708
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.33	0.72	0.26	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰	↱
Traffic Volume (vph)	200	773	819	124	103	383
Future Volume (vph)	200	773	819	124	103	383
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3452		1703	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3452		1703	1599
Peak-hour factor, PHF	0.94	0.94	0.89	0.89	0.93	0.93
Adj. Flow (vph)	213	822	920	139	111	412
RTOR Reduction (vph)	0	0	12	0	0	348
Lane Group Flow (vph)	213	822	1047	0	111	64
Heavy Vehicles (%)	2%	2%	2%	6%	6%	1%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	1	6	2			
Permitted Phases					3	3
Actuated Green, G (s)	15.6	55.5	33.9		12.5	12.5
Effective Green, g (s)	15.6	55.5	33.9		12.5	12.5
Actuated g/C Ratio	0.19	0.69	0.42		0.16	0.16
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	345	2455	1462		266	249
v/s Ratio Prot	c0.12	0.23	c0.30			
v/s Ratio Perm					c0.07	0.04
v/c Ratio	0.62	0.33	0.72		0.42	0.26
Uniform Delay, d1	29.5	4.9	19.1		30.5	29.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.7	0.4	3.0		1.4	0.8
Delay (s)	33.2	5.3	22.1		31.9	30.4
Level of Service	C	A	C		C	C
Approach Delay (s)		11.0	22.1		30.7	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
Traffic Vol, veh/h	7	0	105	3	0	62
Future Vol, veh/h	7	0	105	3	0	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	38	38	69	69	81	81
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	18	0	152	4	0	77

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	231	154	0	0	156	0
Stage 1	154	-	-	-	-	-
Stage 2	77	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	762	897	-	-	1436	-
Stage 1	879	-	-	-	-	-
Stage 2	951	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	762	897	-	-	1436	-
Mov Cap-2 Maneuver	762	-	-	-	-	-
Stage 1	879	-	-	-	-	-
Stage 2	951	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	762	1436	-
HCM Lane V/C Ratio	-	-	0.024	-	-
HCM Control Delay (s)	-	-	9.8	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰	↱
Traffic Vol, veh/h	32	108	388	40	122	216
Future Vol, veh/h	32	108	388	40	122	216
Peak Hour Factor	0.86	0.86	0.91	0.91	0.88	0.88
Heavy Vehicles, %	3	3	2	3	3	4
Mvmt Flow	37	126	426	44	139	245
Number of Lanes	1	0	0	1	1	1

Approach	EB		WB		NB	
Opposing Approach	WB		EB			
Opposing Lanes	1		1		0	
Conflicting Approach Left			NB		EB	
Conflicting Lanes Left	0		2		1	
Conflicting Approach Right	NB				WB	
Conflicting Lanes Right	2		0		1	
HCM Control Delay	9.9		20.3		11.8	
HCM LOS	A		C		B	

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	91%
Vol Thru, %	0%	0%	23%	9%
Vol Right, %	0%	100%	77%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	122	216	140	428
LT Vol	122	0	0	388
Through Vol	0	0	32	40
RT Vol	0	216	108	0
Lane Flow Rate	139	245	163	470
Geometry Grp	7	7	2	2
Degree of Util (X)	0.26	0.379	0.238	0.705
Departure Headway (Hd)	6.759	5.559	5.254	5.398
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	532	648	682	673
Service Time	4.495	3.295	3.293	3.427
HCM Lane V/C Ratio	0.261	0.378	0.239	0.698
HCM Control Delay	11.9	11.7	9.9	20.3
HCM Lane LOS	B	B	A	C
HCM 95th-tile Q	1	1.8	0.9	5.8

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↰	↑↑	↑↱	↰	↱
Traffic Volume (vph)	204	788	836	105	391
Future Volume (vph)	204	788	836	105	391
Turn Type	Prot	NA	NA	Perm	Perm
Protected Phases	1	6	2		
Permitted Phases				3	3
Detector Phase	1	6	2	3	3
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	14.0	24.0	24.0	23.0	23.0
Total Split (s)	26.0	54.0	28.0	26.0	26.0
Total Split (%)	32.5%	67.5%	35.0%	32.5%	32.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	Min	Min
Act Effct Green (s)	15.7	55.4	33.7	12.6	12.6
Actuated g/C Ratio	0.20	0.69	0.42	0.16	0.16
v/c Ratio	0.63	0.34	0.74	0.42	0.69
Control Delay	37.1	6.0	25.9	34.0	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.1	6.0	25.9	34.0	9.7
LOS	D	A	C	C	A
Approach Delay		12.4	25.9	14.8	
Approach LOS		B	C	B	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 75 (94%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 18.3 Intersection LOS: B

Intersection Capacity Utilization 61.4% ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 5: RT33 & Greenland Rd

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	217	838	1082	113	420
v/c Ratio	0.63	0.34	0.74	0.42	0.69
Control Delay	37.1	6.0	25.9	34.0	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.1	6.0	25.9	34.0	9.7
Queue Length 50th (ft)	100	70	222	53	0
Queue Length 95th (ft)	158	137	#447	89	68
Internal Link Dist (ft)		520	520	270	
Turn Bay Length (ft)	200			100	
Base Capacity (vph)	444	2450	1466	425	714
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.49	0.34	0.74	0.27	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: RT33 & Greenland Rd

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰	↱
Traffic Volume (vph)	204	788	836	127	105	391
Future Volume (vph)	204	788	836	127	105	391
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3451		1703	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3451		1703	1599
Peak-hour factor, PHF	0.94	0.94	0.89	0.89	0.93	0.93
Adj. Flow (vph)	217	838	939	143	113	420
RTOR Reduction (vph)	0	0	12	0	0	354
Lane Group Flow (vph)	217	838	1070	0	113	66
Heavy Vehicles (%)	2%	2%	2%	6%	6%	1%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	1	6	2			
Permitted Phases					3	3
Actuated Green, G (s)	15.7	55.4	33.7		12.6	12.6
Effective Green, g (s)	15.7	55.4	33.7		12.6	12.6
Actuated g/C Ratio	0.20	0.69	0.42		0.16	0.16
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	347	2450	1453		268	251
v/s Ratio Prot	c0.12	0.24	c0.31			
v/s Ratio Perm					c0.07	0.04
v/c Ratio	0.63	0.34	0.74		0.42	0.26
Uniform Delay, d1	29.5	5.0	19.4		30.4	29.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.0	0.4	3.4		1.5	0.8
Delay (s)	33.4	5.3	22.8		31.9	30.4
Level of Service	C	A	C		C	C
Approach Delay (s)		11.1	22.8		30.7	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

1: Sherburne Rd & Site Driveway (Existing)

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰↱		↑↱			↰↑
Traffic Vol, veh/h	7	0	110	3	0	62
Future Vol, veh/h	7	0	110	3	0	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	8	0	122	3	0	69

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	193	124	0	0	125	0
Stage 1	124	-	-	-	-	-
Stage 2	69	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	800	932	-	-	1474	-
Stage 1	907	-	-	-	-	-
Stage 2	959	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	800	932	-	-	1474	-
Mov Cap-2 Maneuver	800	-	-	-	-	-
Stage 1	907	-	-	-	-	-
Stage 2	959	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	800	1474	-
HCM Lane V/C Ratio	-	-	0.01	-	-
HCM Control Delay (s)	-	-	9.5	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Intersection Delay, s/veh	16.8
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰	↱
Traffic Vol, veh/h	34	114	408	42	128	227
Future Vol, veh/h	34	114	408	42	128	227
Peak Hour Factor	0.90	0.90	0.91	0.91	0.90	0.90
Heavy Vehicles, %	3	3	2	3	3	4
Mvmt Flow	38	127	448	46	142	252
Number of Lanes	1	0	0	1	1	1

Approach	EB		WB		NB
Opposing Approach	WB		EB		
Opposing Lanes	1		1		0
Conflicting Approach Left			NB		EB
Conflicting Lanes Left	0		2		1
Conflicting Approach Right	NB				WB
Conflicting Lanes Right	2		0		1
HCM Control Delay	10.1		22.8		12
HCM LOS	B		C		B

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	91%
Vol Thru, %	0%	0%	23%	9%
Vol Right, %	0%	100%	77%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	128	227	148	450
LT Vol	128	0	0	408
Through Vol	0	0	34	42
RT Vol	0	227	114	0
Lane Flow Rate	142	252	164	495
Geometry Grp	7	7	2	2
Degree of Util (X)	0.27	0.395	0.244	0.747
Departure Headway (Hd)	6.841	5.64	5.336	5.438
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	525	638	671	668
Service Time	4.58	3.378	3.38	3.47
HCM Lane V/C Ratio	0.27	0.395	0.244	0.741
HCM Control Delay	12.1	12	10.1	22.8
HCM Lane LOS	B	B	B	C
HCM 95th-tile Q	1.1	1.9	1	6.7

5: RT33 & Greenland Rd

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↰	↑↑	↑↱	↰	↱
Traffic Volume (vph)	215	829	879	110	411
Future Volume (vph)	215	829	879	110	411
Turn Type	Prot	NA	NA	Perm	Perm
Protected Phases	1	6	2		
Permitted Phases				3	3
Detector Phase	1	6	2	3	3
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	14.0	24.0	24.0	23.0	23.0
Total Split (s)	26.0	54.0	28.0	26.0	26.0
Total Split (%)	32.5%	67.5%	35.0%	32.5%	32.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	Min	Min
Act Effct Green (s)	16.0	55.0	33.0	13.0	13.0
Actuated g/C Ratio	0.20	0.69	0.41	0.16	0.16
v/c Ratio	0.65	0.36	0.78	0.43	0.70
Control Delay	37.9	6.3	27.8	33.6	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.9	6.3	27.8	33.6	9.6
LOS	D	A	C	C	A
Approach Delay		12.8	27.8	14.6	
Approach LOS		B	C	B	

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 75 (94%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 19.2 Intersection LOS: B

Intersection Capacity Utilization 64.0% ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 5: RT33 & Greenland Rd

5: RT33 & Greenland Rd

	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	229	882	1125	118	442
v/c Ratio	0.65	0.36	0.78	0.43	0.70
Control Delay	37.9	6.3	27.8	33.6	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.9	6.3	27.8	33.6	9.6
Queue Length 50th (ft)	105	80	245	54	0
Queue Length 95th (ft)	167	149	#481	92	70
Internal Link Dist (ft)		520	520	270	
Turn Bay Length (ft)	200			100	
Base Capacity (vph)	442	2432	1436	425	731
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.52	0.36	0.78	0.28	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

5: RT33 & Greenland Rd

PM 2037 NoBuild

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰	↱
Traffic Volume (vph)	215	829	879	133	110	411
Future Volume (vph)	215	829	879	133	110	411
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3452		1703	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3452		1703	1599
Peak-hour factor, PHF	0.94	0.94	0.90	0.90	0.93	0.93
Adj. Flow (vph)	229	882	977	148	118	442
RTOR Reduction (vph)	0	0	12	0	0	370
Lane Group Flow (vph)	229	882	1113	0	118	72
Heavy Vehicles (%)	2%	2%	2%	6%	6%	1%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	1	6	2			
Permitted Phases					3	3
Actuated Green, G (s)	16.0	55.0	33.0		13.0	13.0
Effective Green, g (s)	16.0	55.0	33.0		13.0	13.0
Actuated g/C Ratio	0.20	0.69	0.41		0.16	0.16
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	354	2433	1423		276	259
v/s Ratio Prot	c0.13	0.25	c0.32			
v/s Ratio Perm					c0.07	0.04
v/c Ratio	0.65	0.36	0.78		0.43	0.28
Uniform Delay, d1	29.4	5.2	20.4		30.2	29.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.5	0.4	4.3		1.5	0.8
Delay (s)	33.9	5.6	24.7		31.6	30.2
Level of Service	C	A	C		C	C
Approach Delay (s)		11.5	24.7		30.5	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

1: Sherburne Rd & Site Driveway (Existing)

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑			↑
Traffic Vol, veh/h	21	0	105	0	0	62
Future Vol, veh/h	21	0	105	0	0	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	69	69	81	81
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	23	0	152	0	0	77

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	229	152	0	-	-	-
Stage 1	152	-	-	-	-	-
Stage 2	77	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	764	900	-	0	0	-
Stage 1	881	-	-	0	0	-
Stage 2	951	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	764	900	-	-	-	-
Mov Cap-2 Maneuver	764	-	-	-	-	-
Stage 1	881	-	-	-	-	-
Stage 2	951	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	764	-
HCM Lane V/C Ratio	-	0.031	-
HCM Control Delay (s)	-	9.9	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↱			↰
Traffic Vol, veh/h	3	0	102	35	0	76
Future Vol, veh/h	3	0	102	35	0	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	3	0	113	39	0	84

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	217	133	0	0	152	0
Stage 1	133	-	-	-	-	-
Stage 2	84	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	776	922	-	-	1441	-
Stage 1	898	-	-	-	-	-
Stage 2	944	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	776	922	-	-	1441	-
Mov Cap-2 Maneuver	776	-	-	-	-	-
Stage 1	898	-	-	-	-	-
Stage 2	944	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	776	1441	-
HCM Lane V/C Ratio	-	-	0.004	-	-
HCM Control Delay (s)	-	-	9.7	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Intersection Delay, s/veh	16.4
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰	↱
Traffic Vol, veh/h	36	121	388	48	146	216
Future Vol, veh/h	36	121	388	48	146	216
Peak Hour Factor	0.86	0.86	0.91	0.91	0.88	0.88
Heavy Vehicles, %	3	3	2	3	3	4
Mvmt Flow	42	141	426	53	166	245
Number of Lanes	1	0	0	1	1	1

Approach	EB		WB		NB
Opposing Approach	WB		EB		
Opposing Lanes	1		1		0
Conflicting Approach Left			NB		EB
Conflicting Lanes Left	0		2		1
Conflicting Approach Right	NB				WB
Conflicting Lanes Right	2		0		1
HCM Control Delay	10.4		22.2		12.2
HCM LOS	B		C		B

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	89%
Vol Thru, %	0%	0%	23%	11%
Vol Right, %	0%	100%	77%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	216	157	436
LT Vol	146	0	0	388
Through Vol	0	0	36	48
RT Vol	0	216	121	0
Lane Flow Rate	166	245	183	479
Geometry Grp	7	7	2	2
Degree of Util (X)	0.316	0.386	0.272	0.733
Departure Headway (Hd)	6.855	5.654	5.368	5.508
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	524	636	668	656
Service Time	4.596	3.394	3.414	3.542
HCM Lane V/C Ratio	0.317	0.385	0.274	0.73
HCM Control Delay	12.7	11.9	10.4	22.2
HCM Lane LOS	B	B	B	C
HCM 95th-tile Q	1.3	1.8	1.1	6.4

5: RT33 & Greenland Rd

	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↰	↑↑	↑↱	↰	↱
Traffic Volume (vph)	219	788	836	108	402
Future Volume (vph)	219	788	836	108	402
Turn Type	Prot	NA	NA	Perm	Perm
Protected Phases	1	6	2		
Permitted Phases				3	3
Detector Phase	1	6	2	3	3
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	14.0	24.0	24.0	23.0	23.0
Total Split (s)	26.0	54.0	28.0	26.0	26.0
Total Split (%)	32.5%	67.5%	35.0%	32.5%	32.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	Min	Min
Act Effct Green (s)	16.1	55.2	33.1	12.8	12.8
Actuated g/C Ratio	0.20	0.69	0.41	0.16	0.16
v/c Ratio	0.65	0.34	0.76	0.43	0.70
Control Delay	37.9	6.1	26.8	33.9	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.9	6.1	26.8	33.9	9.7
LOS	D	A	C	C	A
Approach Delay		13.0	26.8	14.8	
Approach LOS		B	C	B	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 75 (94%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 62.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: RT33 & Greenland Rd

5: RT33 & Greenland Rd

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	233	838	1092	116	432
v/c Ratio	0.65	0.34	0.76	0.43	0.70
Control Delay	37.9	6.1	26.8	33.9	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.9	6.1	26.8	33.9	9.7
Queue Length 50th (ft)	107	71	229	54	0
Queue Length 95th (ft)	170	138	#453	91	69
Internal Link Dist (ft)		520	520	270	
Turn Bay Length (ft)	200			100	
Base Capacity (vph)	443	2443	1440	425	723
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.53	0.34	0.76	0.27	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰	↱
Traffic Volume (vph)	219	788	836	136	108	402
Future Volume (vph)	219	788	836	136	108	402
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3446		1703	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3446		1703	1599
Peak-hour factor, PHF	0.94	0.94	0.89	0.89	0.93	0.93
Adj. Flow (vph)	233	838	939	153	116	432
RTOR Reduction (vph)	0	0	13	0	0	363
Lane Group Flow (vph)	233	838	1079	0	116	69
Heavy Vehicles (%)	2%	2%	2%	6%	6%	1%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	1	6	2			
Permitted Phases					3	3
Actuated Green, G (s)	16.1	55.2	33.1		12.8	12.8
Effective Green, g (s)	16.1	55.2	33.1		12.8	12.8
Actuated g/C Ratio	0.20	0.69	0.41		0.16	0.16
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	356	2441	1425		272	255
v/s Ratio Prot	c0.13	0.24	c0.31			
v/s Ratio Perm					c0.07	0.04
v/c Ratio	0.65	0.34	0.76		0.43	0.27
Uniform Delay, d1	29.4	5.0	20.0		30.3	29.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.7	0.4	3.8		1.5	0.8
Delay (s)	34.1	5.4	23.8		31.8	30.3
Level of Service	C	A	C		C	C
Approach Delay (s)		11.7	23.8		30.6	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

1: Sherburne Rd & Site Driveway (Existing)

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑			↑
Traffic Vol, veh/h	21	0	110	0	0	62
Future Vol, veh/h	21	0	110	0	0	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	23	0	122	0	0	69

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	191	122	0	-	-	-
Stage 1	122	-	-	-	-	-
Stage 2	69	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	803	935	-	0	0	-
Stage 1	908	-	-	0	0	-
Stage 2	959	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	803	935	-	-	-	-
Mov Cap-2 Maneuver	803	-	-	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	959	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	803	-
HCM Lane V/C Ratio	-	0.029	-
HCM Control Delay (s)	-	9.6	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰↱		↑↱			↰↑
Traffic Vol, veh/h	3	0	107	35	0	76
Future Vol, veh/h	3	0	107	35	0	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	0	0	2
Mvmt Flow	3	0	119	39	0	84

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	223	139	0	0	158	0
Stage 1	139	-	-	-	-	-
Stage 2	84	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	770	915	-	-	1434	-
Stage 1	893	-	-	-	-	-
Stage 2	944	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	770	915	-	-	1434	-
Mov Cap-2 Maneuver	770	-	-	-	-	-
Stage 1	893	-	-	-	-	-
Stage 2	944	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	770	1434	-
HCM Lane V/C Ratio	-	-	0.004	-	-
HCM Control Delay (s)	-	-	9.7	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

4: Greenland Rd & Borthwick Ave

Intersection	
Intersection Delay, s/veh	17.9
Intersection LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰	↱
Traffic Vol, veh/h	38	127	408	50	152	227
Future Vol, veh/h	38	127	408	50	152	227
Peak Hour Factor	0.90	0.90	0.91	0.91	0.90	0.90
Heavy Vehicles, %	3	3	2	3	3	4
Mvmt Flow	42	141	448	55	169	252
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	10.6	25.1	12.6
HCM LOS	B	D	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	89%
Vol Thru, %	0%	0%	23%	11%
Vol Right, %	0%	100%	77%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	152	227	165	458
LT Vol	152	0	0	408
Through Vol	0	0	38	50
RT Vol	0	227	127	0
Lane Flow Rate	169	252	183	503
Geometry Grp	7	7	2	2
Degree of Util (X)	0.325	0.402	0.277	0.775
Departure Headway (Hd)	6.934	5.732	5.448	5.546
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	518	628	658	654
Service Time	4.678	3.475	3.497	3.582
HCM Lane V/C Ratio	0.326	0.401	0.278	0.769
HCM Control Delay	13	12.3	10.6	25.1
HCM Lane LOS	B	B	B	D
HCM 95th-tile Q	1.4	1.9	1.1	7.4

5: RT33 & Greenland Rd

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↰	↑↑	↑↱	↰	↱
Traffic Volume (vph)	230	829	879	113	422
Future Volume (vph)	230	829	879	113	422
Turn Type	Prot	NA	NA	Perm	Perm
Protected Phases	1	6	2		
Permitted Phases				3	3
Detector Phase	1	6	2	3	3
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	14.0	24.0	24.0	23.0	23.0
Total Split (s)	26.0	54.0	28.0	26.0	26.0
Total Split (%)	32.5%	67.5%	35.0%	32.5%	32.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	Min	Min
Act Effct Green (s)	16.5	54.9	32.4	13.1	13.1
Actuated g/C Ratio	0.21	0.69	0.40	0.16	0.16
v/c Ratio	0.67	0.36	0.81	0.44	0.71
Control Delay	38.4	6.4	29.2	33.7	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	6.4	29.2	33.7	9.6
LOS	D	A	C	C	A
Approach Delay		13.3	29.2	14.7	
Approach LOS		B	C	B	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 75 (94%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 20.0 Intersection LOS: B
Intersection Capacity Utilization 65.0% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: RT33 & Greenland Rd

	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	245	882	1135	122	454
v/c Ratio	0.67	0.36	0.81	0.44	0.71
Control Delay	38.4	6.4	29.2	33.7	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	6.4	29.2	33.7	9.6
Queue Length 50th (ft)	112	81	254	56	0
Queue Length 95th (ft)	179	149	#486	95	71
Internal Link Dist (ft)		520	520	270	
Turn Bay Length (ft)	200			100	
Base Capacity (vph)	442	2426	1407	425	740
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.55	0.36	0.81	0.29	0.61

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱		↰	↱
Traffic Volume (vph)	230	829	879	142	113	422
Future Volume (vph)	230	829	879	142	113	422
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3446		1703	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3446		1703	1599
Peak-hour factor, PHF	0.94	0.94	0.90	0.90	0.93	0.93
Adj. Flow (vph)	245	882	977	158	122	454
RTOR Reduction (vph)	0	0	13	0	0	380
Lane Group Flow (vph)	245	882	1122	0	122	74
Heavy Vehicles (%)	2%	2%	2%	6%	6%	1%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	1	6	2			
Permitted Phases					3	3
Actuated Green, G (s)	16.5	54.9	32.4		13.1	13.1
Effective Green, g (s)	16.5	54.9	32.4		13.1	13.1
Actuated g/C Ratio	0.21	0.69	0.40		0.16	0.16
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	365	2428	1395		278	261
v/s Ratio Prot	c0.14	0.25	c0.33			
v/s Ratio Perm					c0.07	0.05
v/c Ratio	0.67	0.36	0.80		0.44	0.28
Uniform Delay, d1	29.3	5.2	21.0		30.1	29.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	5.2	0.4	5.0		1.5	0.8
Delay (s)	34.5	5.7	26.0		31.6	30.2
Level of Service	C	A	C		C	C
Approach Delay (s)		11.9	26.0		30.5	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX H

J.PORTER Ƶ JJM

#47528.00

Please Print or Type (Single Space) **TO BE COMPLETED AND FILED WITHIN 15 DAYS** Sheet 1 of 1 Sheets(s) 1 [12]

LOCAL USE
19-6887-AC

Amended Report ☐ Hit and Run ☐ School Bus ☐ Driver Ed. ☐

STATE OF NEW HAMPSHIRE
UNIFORM POLICE
TRAFFIC ACCIDENT REPORT
DSMV159 (Rev.04/00)

M.V. USE ONLY
No.
Date Rec'd
NR ☐ Supplemental Report ☐ Motor Carrier Report ☐

1 [13]
1 [14]
1 [15]

[1] 1 DATE OF ACCIDENT 02/19/2019 | DAY OF WEEK Tuesday | TIME (Military) OF ACCIDENT 1415 | CITY/TOWN PORTSMOUTH

TOTAL KILLED 0 | TOTAL INJURED 0 | TOTAL VEHICLES 2 | POLICE NOTIFIED 1415 | POLICE ARRIVED 1431 | AMBULANCE ARRIVED | DEPARTMENT Portsmouth | 13 [16]

[2] ACCIDENT OCCURRED ON: 875 GREENLAND RD
ROUTE NO. AND/OR STREET NAME
☐ MILES ☐ N ☐ E
☐ FEET ☐ S ☐ W
☒ AT INTERSECTION WITH
OF
INTERSECTING ROAD, BRIDGE, TOWN LINE (not telephone pole, house): BORTHWICK AVE
ROUTE NO. AND/OR STREET NAME
POSTED SPEED 30 | 8 [17]

[3] 1 Complete first node for accidents at node, complete both for accidents between nodes.
FIRST NODE: ___ MAP 10___ ZONE ___/___ NODE SUF
DISTANCE FROM FIRST NODE TOWARD SECOND: ___ FEET
SECOND NODE: ___ MAP 10___ ZONE ___/___ NODE SUF
MILE-MARKER ON INTERSTATE ONLY ___ FEET ☐ N ☐ E ☐ S ☐ W
MILE ___
20 [18]

UNIT NO.: 1 INFORMATION

[4] 4 BICYCLE ☐ PEDESTRIAN ☐ SUMMONED ☐ ARRESTED ☐ CHARGE: M.V.R. YES RECOM ☐

DRIVER LICENSE NO. [redacted] STATE [redacted] CLASSIFICATION [redacted]

[5] 5 DRIVER'S NAME LAST, FIRST, MIDDLE [redacted]

[6] 4 D.O.B. [redacted] SEX [redacted] RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐

[7] 4 CURRENT ADDRESS, NUMBER, AND STREET [redacted] PHONE NO. [redacted]

CITY / TOWN [redacted] STATE [redacted] ZIP CODE [redacted]

[8] 1 PLATE NUMBER [redacted] PLATE TYPE [redacted] STATE [redacted] TRAILER PLATE STATE

[9] 1 MAKE YEAR [redacted] COMMERCIAL VEHICLE ACCIDENT ☐ HAZARDOUS MATERIALS ☐

[10] 1 V.I.N. [redacted]

SAME AS DRIVER ☒ OWNER NAME LAST, FIRST MIDDLE

[11] 1 CURRENT ADDRESS, NUMBER AND STREET PHONE NO.

CITY / TOWN STATE ZIP CODE

INSURANCE CO. & POLICY # [redacted] OR DSMV 385 ISSUED ☐

VEHICLE TOWED ☐ BY: TO:

UNIT NO.: 2 INFORMATION

BICYCLE ☐ PEDESTRIAN ☐ SUMMONED ☐ ARRESTED ☐ CHARGE: M.V.R. YES RECOM ☐ | 18 [19]

DRIVER LICENSE NO. [redacted] STATE [redacted] CLASSIFICATION | 9 [20]

DRIVER'S NAME LAST, FIRST, MIDDLE [redacted] | 9 [21]

D.O.B. [redacted] SEX [redacted] RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐ | 14 [22]

CURRENT ADDRESS, NUMBER, AND STREET [redacted] PHONE NO. [redacted] | 10 [23]

CITY / TOWN [redacted] STATE [redacted] ZIP CODE [redacted]

PLATE NUMBER [redacted] PLATE TYPE [redacted] STATE [redacted] TRAILER PLATE STATE | 10 [24]

MAKE [redacted] YEAR [redacted] COMMERCIAL VEHICLE ACCIDENT ☐ HAZARDOUS MATERIALS ☐ | 10 [25]

V.I.N. [redacted]

SAME AS DRIVER ☐ OWNER NAME LAST, FIRST MIDDLE [redacted]

CURRENT ADDRESS, NUMBER AND STREET [redacted] PHONE NO.

CITY / TOWN [redacted] STATE [redacted] ZIP CODE [redacted]

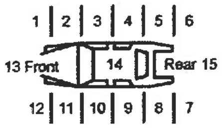
INSURANCE CO. & POLICY # [redacted] OR DSMV 385 ISSUED ☐

VEHICLE TOWED ☐ BY: TO:

REF.	26	27	28	29	NAME(S) OF OCCUPANTS OR WITNESSES	ADDRESS / PHONE	30	31	32	33
1	1	N	4	[redacted]	[redacted]	[redacted]	1	1	8	F
2	2	N	4	[redacted]	[redacted]	[redacted]	1	1	8	M
3	1	N	1	[redacted]	[redacted]	[redacted]	17	1	8	M
4										
5										
6										

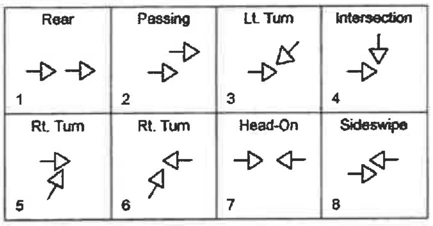
UNIT NO: 1

INDICATE PROBABLE POINT OF IMPACT 7



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

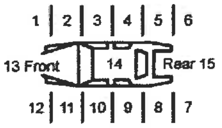
Circle numbers indicating areas damaged.



Indicate Vehicle Numbers on Arrows Above

UNIT NO: 2

INDICATE PROBABLE POINT OF IMPACT 12



18. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

Circle numbers indicating areas damaged.

ACCIDENT SKETCH

Indicate North

By Arrow

Moved prior to my arrival.

N

GIST OF ACCIDENT

Vehicle #1 was stopped (N/B) at the yield sign, yielding for traffic, on Borthwick Ave at Greenland Road. While waiting to enter traffic Vehicle #1 was struck by Vehicle #2. Vehicle #1 sustained damage to the left rear corner. The driver of Vehicle #1 did not complain of injury.

Vehicle #2 was traveling on Borthwick Ave (N/B). The driver of Vehicle # 2 stated that as he approached the intersection he did not see Vehicle #1 due to the glare of the sun obstructing his view. Vehicle #2 struck the rear of Vehicle #1. Vehicle #2 sustained damage to the right front corner. The driver of Vehicle #2 admitted fault for the collision. The Driver of Vehicle #2 did not complain of injury.

There were no witnesses on scene. Officer did not observe collision. Both vehicles were removed from the scene by their original drivers without further issue.

End report.

Officer Seth Chavez
Portsmouth Police Department.

SIGNATURE OF INVESTIGATING OFFICER

DATE OF REPORT 02/20/2019

REVIEWED BY

DEPARTMENT / DIVISION / TROOP
Portsmouth Police Department

PHOTOS TAKEN
YES ☒ NO ☐ BY:

___ Please Print or Type (Single Space) **TO BE COMPLETED AND FILED WITHIN 15 DAYS** Sheet 1 of 1 Sheets(s) | 1 [12]

LOCAL USE
19-11167-AC

STATE OF NEW HAMPSHIRE
UNIFORM POLICE
TRAFFIC ACCIDENT REPORT
DSMV159 (Rev.04/00)

M.V. USE ONLY
No.
Date Rec'd

1 [13]

Amended Report ☐ | Hit and Run ☐ | School Bus ☐ | Driver Ed. ☐

NR ☐ | Supplemental Report ☐ | Motor Carrier Report ☐ | 99 [14]

99 [15]

[1] 1 | DATE OF ACCIDENT 03/20/2019 | DAY OF WEEK Wednesday | TIME (Military) } OF ACCIDENT 0837 | CITY/TOWN PORTSMOUTH

TOTAL KILLED 0 | TOTAL INJURED 1 | TOTAL VEHICLES 2 | POLICE NOTIFIED 0837 | POLICE ARRIVED 0902 | AMBULANCE ARRIVED | DEPARTMENT Portsmouth | 16 [16]

ACCIDENT OCCURRED ON:
[2] 875 GREENLAND RD
ROUTE NO. AND/OR STREET NAME

_____ ☐ MILES N ☐ E ☐
☐ FEET S ☐ W ☐ OF
☐ AT INTERSECTION WITH

INTERSECTING ROAD, BRIDGE, TOWN LINE (not telephone pole, house)
ROUTE NO. AND/OR STREET NAME

POSTED SPEED

1 [17]

Complete first node for accidents at node, complete both for accidents between nodes.

FIRST NODE | DISTANCE FROM FIRST NODE TOWARD SECOND | **SECOND NODE**

[3] 10 | ___ 10___ MAP ZONE | ___/___ NODE SUF | FEET | ___ 10___ MAP ZONE | ___/___ NODE SUF

MILE-MARKER ON INTERSTATE ONLY
FEET
N ☐ E ☐ S ☐ W ☐

MILE

1 [18]

UNIT NO.: 1 INFORMATION

[4] 1 | BICYCLE ☐ | PEDESTRIAN ☐ | SUMMONED ☐ | ARRESTED ☐ | CHARGE: | M.V.R. YES RECOM ☐

[5] 98 | DRIVER LICENSE NO. [redacted] | STATE [redacted] | CLASSIFICATION [redacted]

DRIVER'S NAME LAST, FIRST, MIDDLE [redacted]

[6] 4 | D.O.B. [redacted] | SEX [redacted] | RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐

[7] 98 | CURRENT ADDRESS, NUMBER, AND STREET [redacted] | PHONE NO. [redacted]

CITY / TOWN [redacted] | STATE [redacted] | ZIP CODE [redacted]

[8] 1 | PLATE NUMBER [redacted] | PLATE TYPE [redacted] | STATE [redacted] | TRAILER PLATE | STATE

[9] 1 | MAKE | YEAR [redacted] | COMMERCIAL VEHICLE ACCIDENT ☐ | HAZARDOUS MATERIALS ☐

[10] 1 | V.I.N. [redacted]

SAME AS DRIVER ☒ | OWNER NAME LAST, FIRST MIDDLE

[11] 1 | CURRENT ADDRESS, NUMBER AND STREET | PHONE NO.

CITY / TOWN | STATE | ZIP CODE

INSURANCE CO. & POLICY # [redacted] | OR | DSMV 385 ISSUED ☐

VEHICLE TOWED ☐ | BY: | TO:

UNIT NO.: 2 INFORMATION

BICYCLE ☐ | PEDESTRIAN ☐ | SUMMONED ☐ | ARRESTED ☐ | CHARGE: | M.V.R. YES RECOM ☐ | 99 [19]

DRIVER LICENSE NO. [redacted] | STATE [redacted] | CLASSIFICATION [redacted] | 9 [20]

DRIVER'S NAME LAST, FIRST, MIDDLE [redacted] | 9 [21]

D.O.B. [redacted] | SEX [redacted] | RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐ | 3 [22]

CURRENT ADDRESS, NUMBER, AND STREET [redacted] | PHONE NO. | 14 [23]

CITY / TOWN [redacted] | STATE [redacted] | ZIP CODE [redacted]

PLATE NUMBER [redacted] | PLATE TYPE [redacted] | STATE [redacted] | TRAILER PLATE | STATE | 10 [24]

MAKE [redacted] | YEAR [redacted] | COMMERCIAL VEHICLE ACCIDENT ☐ | HAZARDOUS MATERIALS ☐ | 10 [25]

V.I.N. [redacted]

SAME AS DRIVER ☒ | OWNER NAME LAST, FIRST MIDDLE

CURRENT ADDRESS, NUMBER AND STREET | PHONE NO.

CITY / TOWN | STATE | ZIP CODE

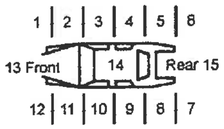
INSURANCE CO. & POLICY # [redacted] | OR | DSMV 385 ISSUED ☐

VEHICLE TOWED ☐ | BY: | TO:

REF.	26	27	28	29	NAME(S) OF OCCUPANTS OR WITNESSES	ADDRESS / PHONE	30	31	32	33
1	1	U	4	[redacted]	[redacted]	[redacted]	1	1	2	F
2	2	N	4	[redacted]	[redacted]	[redacted]	1	1	8	M
3										
4										
5										
6										

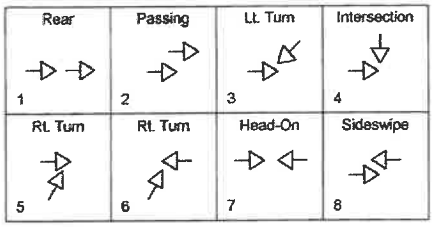
UNIT NO: 1

6 INDICATE PROBABLE POINT OF IMPACT



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

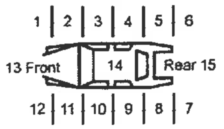
Circle numbers indicating areas damaged.



Indicate Vehicle Numbers on Arrows Above

UNIT NO: 2

INDICATE PROBABLE POINT OF IMPACT 1



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

Circle numbers indicating areas damaged.

ACCIDENT SKETCH

Indicate North

By Arrow

NO DIAGRAM

GIST OF ACCIDENT

On Wednesday March 20, 2019 at approximately 8:37 AM I was dispatched to a two (2) car accident in the private parking lot of Orchard Park, 875 Greenland Road. The Emergency Communication Center (ECC) advised of no known personal injuries.

[redacted] was operating a 2013 GMC Terrain, bearing New [redacted]. [redacted] was backing out of a parking spot when she collided with another vehicle traveling through said private lot on the main access/thru. There was damage to the rear passenger corner of [redacted] SUV. Photographs were taken of said damage. I asked [redacted] if she required any medical attention, she claimed her neck was sore. I asked her if she required any medical attention from the City of Portsmouth FD, she declined.

[redacted] was operating said grey Toyota Tacoma, bearing [redacted], that [redacted] collided with. There was damage to the front passenger corner of said truck. Photographs were taken of said damage. I asked [redacted] if he required any medical attention, he stated no. [redacted] commented to me that [redacted] [redacted] appeared to back out of said parking space rather quickly.

[redacted] was advised that he could not drive his truck from said private lot due to the damage and was advised he would need to have the vehicle removed from the parking lot.

SIGNATURE OF INVESTIGATING OFFICER	DATE OF REPORT 03/20/2019	REVIEWED BY
DEPARTMENT / DIVISION / TROOP Portsmouth Police Department	PHOTOS TAKEN YES ☐ NO ☒ BY:	

____Please Print or Type (Single Space) **TO BE COMPLETED AND FILED WITHIN 15 DAYS** Sheet 1 of 1 Sheets(s) | 1 [12]

LOCAL USE
19-20502-AC

Amended Report ☐ | Hit and Run ☐ | School Bus ☐ | Driver Ed. ☐

STATE OF NEW HAMPSHIRE UNIFORM POLICE TRAFFIC ACCIDENT REPORT

DSMV159 (Rev.04/00)

M.V. USE ONLY
No. | 1 [13]
Date Rec'd

NR ☐ | Supplemental Report ☐ | Motor Carrier Report ☐ | [14]

[15]

[1] 1	DATE OF ACCIDENT 05/21/2019	DAY OF WEEK Tuesday	TIME (Military) } OF ACCIDENT 1208	CITY/TOWN PORTSMOUTH	
	TOTAL KILLED 0	TOTAL INJURED 0	TOTAL VEHICLES 2	POLICE NOTIFIED 1208	POLICE ARRIVED 1227

AMBULANCE ARRIVED

DEPARTMENT Portsmouth | 7 [16]

[2] ACCIDENT OCCURRED ON: 2 BORTHWICK AVE
ROUTE NO. AND/OR STREET NAME

______ ☐ MILES ☐ FEET ☒ AT INTERSECTION WITH | N ☐ S ☐ | E ☐ W ☐ | OF

INTERSECTING ROAD, BRIDGE, TOWN LINE (not telephone pole, house): 719 GREENLAND RD
ROUTE NO. AND/OR STREET NAME

POSTED SPEED 30 | 7 [17]

Complete first node for accidents at node, complete both for accidents between nodes.

[3] 1

FIRST NODE: ____ MAP 10____ ZONE ____/____ NODE SUF

DISTANCE FROM FIRST NODE TOWARD SECOND: ________ FEET

SECOND NODE: ____ MAP 10____ ZONE ____/____ NODE SUF

MILE-MARKER ON INTERSTATE ONLY ________ FEET
N ☐ E ☐ S ☐ W ☐

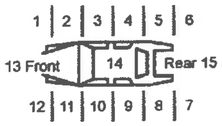
MILE ________ | 20 [18]

	UNIT NO.: 1 INFORMATION	**UNIT NO.: 2 INFORMATION**	
[4] 3	BICYCLE ☐ PEDESTRIAN ☐ SUMMONED ☐ ARRESTED ☐ CHARGE: M.V.R. YES RECOM ☐	BICYCLE ☐ PEDESTRIAN ☐ SUMMONED ☐ ARRESTED ☐ CHARGE: M.V.R. YES RECOM ☐	14 [19]
	DRIVER LICENSE NO. [redacted] STATE [redacted] CLASSIFICATION [redacted]	DRIVER LICENSE NO. [redacted] STATE [redacted] CLASSIFICATION [redacted]	9 [20]
[5]	DRIVER'S NAME LAST, FIRST, MIDDLE [redacted]	DRIVER'S NAME LAST, FIRST, MIDDLE [redacted]	9 [21]
[6]	D.O.B. [redacted] SEX [redacted] RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐	D.O.B. [redacted] SEX [redacted] RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐	14 [22]
[7]	CURRENT ADDRESS, NUMBER, AND STREET [redacted] PHONE NO. [redacted]	CURRENT ADDRESS, NUMBER, AND STREET [redacted] PHONE NO. [redacted]	14 [23]
	CITY / TOWN [redacted] STATE ZIP CODE	CITY / TOWN [redacted] STATE [redacted] ZIP CODE [redacted]	
[8] 1	PLATE NUMBER [redacted] PLATE TYPE [redacted] STATE [redacted] TRAILER PLATE STATE	PLATE NUMBER [redacted] PLATE TYPE [redacted] STATE [redacted] TRAILER PLATE STATE	10 [24]
[9] 1	MAKE [redacted] YEAR [redacted] COMMERCIAL VEHICLE ACCIDENT ☐ HAZARDOUS MATERIALS ☐	MAKE [redacted] YEAR [redacted] COMMERCIAL VEHICLE ACCIDENT ☐ HAZARDOUS MATERIALS ☐	10 [25]
[10] 1	V.I.N. [redacted]	V.I.N. [redacted]	
	SAME AS DRIVER ☒ OWNER NAME LAST, FIRST MIDDLE	SAME AS DRIVER ☒ OWNER NAME LAST, FIRST MIDDLE	
[11] 1	CURRENT ADDRESS, NUMBER AND STREET PHONE NO.	CURRENT ADDRESS, NUMBER AND STREET PHONE NO.	
	CITY / TOWN STATE ZIP CODE	CITY / TOWN STATE ZIP CODE	
	INSURANCE CO. & POLICY # [redacted] OR DSMV 385 ISSUED ☐	INSURANCE CO. & POLICY # [redacted] OR DSMV 385 ISSUED ☐	
	VEHICLE TOWED ☐ BY: TO:	VEHICLE TOWED ☐ BY: TO:	

REF.	26	27	28	29	NAME(S) OF OCCUPANTS OR WITNESSES	ADDRESS / PHONE	30	31	32	33
1	1	N	4	[redacted]	[redacted]	[redacted]		1	8	F
2	2	N	4	[redacted]	[redacted]	[redacted]		1	8	M
3	1	N	4	[redacted]	[redacted]	[redacted]		1	8	M
4	1	N	1	[redacted]	[redacted]	[redacted]		1	8	M
5										
6										

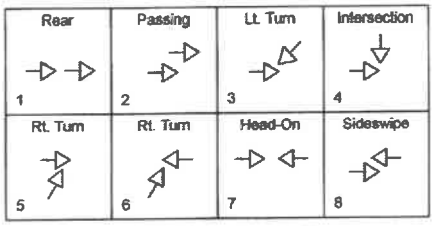
UNIT NO: 1

6 INDICATE PROBABLE POINT OF IMPACT



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

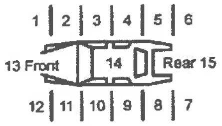
Circle numbers indicating areas damaged.



Indicate Vehicle Numbers on Arrows Above

UNIT NO: 2

INDICATE PROBABLE POINT OF IMPACT 12



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

Circle numbers indicating areas damaged.

ACCIDENT SKETCH

Indicate North

By Arrow

GIST OF ACCIDENT

Gist: Vehicle 1 was starting from stopped at the yield sign from Greenland Road onto Borthwick Avenue but then stopped again for oncoming traffic. Vehicle 2 was stopped directly behind Vehicle 1 and started to proceed after seeing Vehicle 1 start to do the same but looked toward oncoming traffic for a second and did not see Vehicle 1 stop again, crashing into the rear of Vehicle 1. Damages were documented with photographs. Vehicles were moved prior to police arrival so there is no diagram. No injuries were reported on scene.

Master Patrol Officer Christina J. Meyer
Uniformed Patrol Division
Portsmouth Police Department

SIGNATURE OF INVESTIGATING OFFICER

DATE OF REPORT 05/30/2019

REVIEWED BY

DEPARTMENT / DIVISION / TROOP
Portsmouth Police Department

PHOTOS TAKEN
YES ☐ NO ☒ BY:

Please Print or Type (Single Space) **TO BE COMPLETED AND FILED WITHIN 15 DAYS** Sheet 1 of 1 Sheets(s) 12 [12]

LOCAL USE
19-28481-AC

Amended Report ☐ Hit and Run ☐ School Bus ☐ Driver Ed. ☐

STATE OF NEW HAMPSHIRE UNIFORM POLICE TRAFFIC ACCIDENT REPORT

DSMV159 (Rev.04/00)

1776

M.V. USE ONLY
No.
Date Rec'd
1 [13]

NR ☐ Supplemental Report ☐ Motor Carrier Report ☐ [14]

[15]

[1] 1 DATE OF ACCIDENT 07/11/2019 | DAY OF WEEK Thursday | TIME (Military) OF ACCIDENT 1412 | CITY/TOWN PORTSMOUTH

TOTAL KILLED 0 | TOTAL INJURED 0 | TOTAL VEHICLES 2 | POLICE NOTIFIED 1412 | POLICE ARRIVED 1428 | AMBULANCE ARRIVED | DEPARTMENT Portsmouth | 3 [16]

[2] ACCIDENT OCCURRED ON: 2 BORTHWICK AVE
ROUTE NO. AND/OR STREET NAME
☐ MILES N ☐ E ☐
☐ FEET S ☐ W ☐ OF
☒ AT INTERSECTION WITH
INTERSECTING ROAD, BRIDGE, TOWN LINE (not telephone pole, house): 719 GREENLAND RD
ROUTE NO. AND/OR STREET NAME
POSTED SPEED 30 | 4 [17]

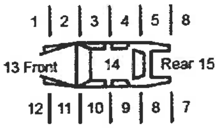
[3] 1 Complete first node for accidents at node, complete both for accidents between nodes.
FIRST NODE: MAP ___ ZONE 10___ NODE ___ / SUF ___
DISTANCE FROM FIRST NODE TOWARD SECOND: ___ FEET
SECOND NODE: MAP ___ ZONE 10___ NODE ___ / SUF ___
MILE-MARKER ON INTERSTATE ONLY ___ FEET N ☐ E ☐ S ☐ W ☐
MILE ___
20 [18]

	UNIT NO.: 1 INFORMATION	UNIT NO.: 2 INFORMATION	
[4] 3	BICYCLE ☐ PEDESTRIAN ☐ SUMMONED ☐ ARRESTED ☐ CHARGE: M.V.R. YES RECOM ☐	BICYCLE ☐ PEDESTRIAN ☐ SUMMONED ☐ ARRESTED ☐ CHARGE: M.V.R. YES RECOM ☐	1 [19]
	DRIVER LICENSE NO. [redacted] STATE [redacted] CLASSIFICATION [redacted]	DRIVER LICENSE NO. [redacted] STATE [redacted] CLASSIFICATION [redacted]	9 [20]
[5] 3	DRIVER'S NAME LAST, FIRST, MIDDLE [redacted]	DRIVER'S NAME LAST, FIRST, MIDDLE [redacted]	9 [21]
[6]	D.O.B. [redacted] SEX [redacted] RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐	D.O.B. [redacted] SEX [redacted] RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐	14 [22]
[7] 1	CURRENT ADDRESS, NUMBER, AND STREET [redacted] PHONE NO. [redacted]	CURRENT ADDRESS, NUMBER, AND STREET [redacted] PHONE NO. [redacted]	14 [23]
	CITY / TOWN [redacted] STATE [redacted] ZIP CODE [redacted]	CITY / TOWN [redacted] STATE [redacted] ZIP CODE [redacted]	
[8] 1	PLATE NUMBER [redacted] PLATE TYPE [redacted] STATE [redacted] TRAILER PLATE STATE	PLATE NUMBER [redacted] PLATE TYPE [redacted] STATE [redacted] TRAILER PLATE STATE	10 [24]
[9] 1	MAKE [redacted] YEAR [redacted] COMMERCIAL VEHICLE ACCIDENT ☐ HAZARDOUS MATERIALS ☐	MAKE [redacted] YEAR [redacted] COMMERCIAL VEHICLE ACCIDENT ☐ HAZARDOUS MATERIALS ☐	10 [25]
[10] 1	V.I.N. [redacted]	V.I.N. [redacted]	
	SAME AS DRIVER ☒ OWNER NAME LAST, FIRST MIDDLE	SAME AS DRIVER ☐ OWNER NAME LAST, FIRST MIDDLE [redacted]	
[11] 2	CURRENT ADDRESS, NUMBER AND STREET PHONE NO.	CURRENT ADDRESS, NUMBER AND STREET [redacted] PHONE NO. 603-834-6451	
	CITY / TOWN STATE ZIP CODE	CITY / TOWN [redacted] STATE [redacted] ZIP CODE [redacted]	
	INSURANCE CO. & POLICY # OR DSMV 385 ISSUED ☒	INSURANCE CO. & POLICY # [redacted] OR DSMV 385 ISSUED ☐	
	VEHICLE TOWED ☐ BY: TO:	VEHICLE TOWED ☐ BY: TO:	

REF.	26	27	28	29	NAME(S) OF OCCUPANTS OR WITNESSES	ADDRESS / PHONE	30	31	32	33
1	1	N	4	[redacted]	[redacted]	[redacted]	1	1	8	M
2	2	N	4	[redacted]	[redacted]	[redacted]	1	1	8	M
3	1	N	4	[redacted]	[redacted]	[redacted]	12	1	8	F
4										
5										
6										

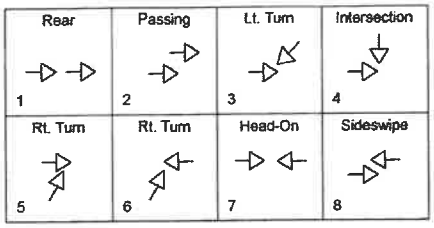
UNIT NO: 1

12 INDICATE PROBABLE POINT OF IMPACT



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

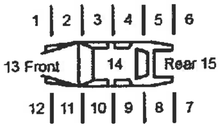
Circle numbers indicating areas damaged.



Indicate Vehicle Numbers on Arrows Above

UNIT NO: 2

INDICATE PROBABLE POINT OF IMPACT 21



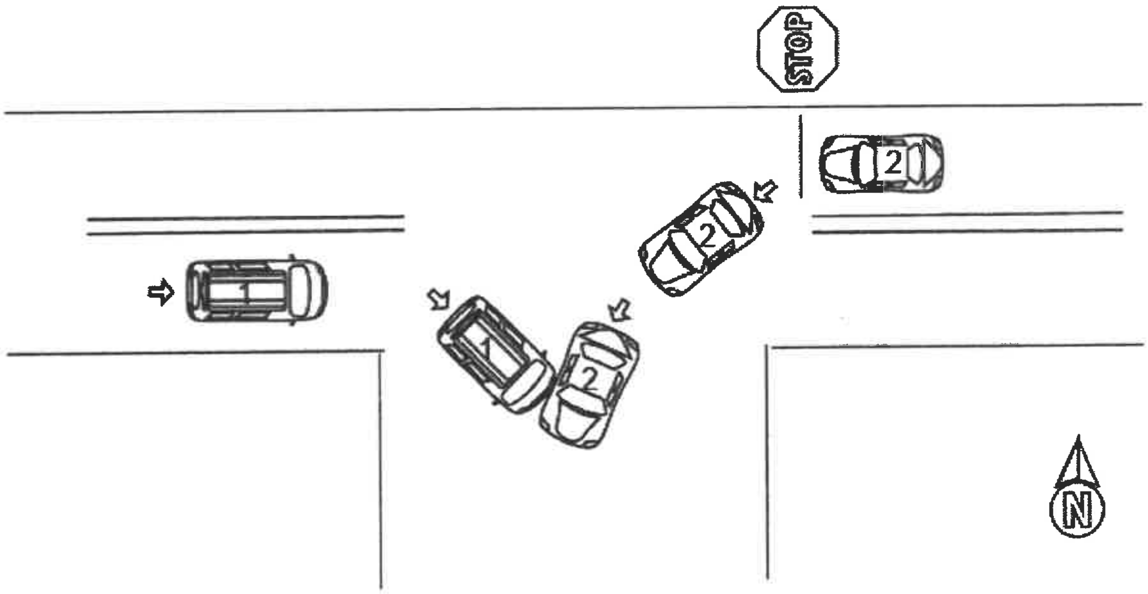
16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

Circle numbers indicating areas damaged.

ACCIDENT SKETCH

Indicate North

By Arrow



GIST OF ACCIDENT

07/12/2019

VEH 1 WAS MAKING RIGHT TURN WHILE TRAVELING ON GREENLAND RD. VEH 2 WAS MAKING LEFT TURN FROM BORTHWICK AVE ONTO GREENLAND RD. OPERATOR OF VEH 2 ADVISED HE BELIEVED HE HAD TIME TO MAKE TURN IN FRONT OF VEH 1. VEH 1 AND VEH 2 COLLIDED AS BOTH VEHICLES ENTERED INTERSECTION AT SAME TIME.

END REPORT.

PATROL OFFICER CHARLES A RAIZES
PORTSMOUTH POLICE DEPARTMENT

SIGNATURE OF INVESTIGATING OFFICER

DATE OF REPORT
07/16/2019

REVIEWED BY

DEPARTMENT / DIVISION / TROOP
Portsmouth Police Department

PHOTOS TAKEN
YES ☒ NO ☐ BY:

Please Print or Type (Single Space) **TO BE COMPLETED AND FILED WITHIN 15 DAYS** Sheet 1 of 1 Sheets(s) 1 [12]

LOCAL USE

21-7344-AC

Amended Report ☐ Hit and Run ☐ School Bus ☐ Driver Ed. ☐

STATE OF NEW HAMPSHIRE UNIFORM POLICE TRAFFIC ACCIDENT REPORT

1776

DSMV159 (Rev.04/00)

M.V. USE ONLY 1 [13]

No.

Date Rec'd

NR ☐ Supplemental Report ☐ Motor Carrier Report ☐ 2 [14]

3 [15]

[1] 1 DATE OF ACCIDENT: 03/06/2021 | DAY OF WEEK: Saturday | TIME (Military) OF ACCIDENT: 1038 | CITY/TOWN: PORTSMOUTH

TOTAL KILLED: 0 | TOTAL INJURED: 0 | TOTAL VEHICLES: 2 | POLICE NOTIFIED: 1038 | POLICE ARRIVED: 1038 | AMBULANCE ARRIVED: | DEPARTMENT: Portsmouth 4 [16]

ACCIDENT OCCURRED ON: ☐ MILES ☐ FEET ☒ AT INTERSECTION WITH N ☐ S ☐ E ☐ W ☐ OF

INTERSECTING ROAD, BRIDGE, TOWN LINE (not telephone pole, house)

[2] 2 719 GREENLAND RD — ROUTE NO. AND/OR STREET NAME

2 BORTHWICK AVE — ROUTE NO. AND/OR STREET NAME

POSTED SPEED: 30 1 [17]

Complete first node for accidents at node, complete both for accidents between nodes.

FIRST NODE | DISTANCE FROM FIRST NODE TOWARD SECOND | SECOND NODE

[3] 1 MAP ___ ZONE 10___ NODE ___/ SUF | FEET | MAP ___ ZONE 10___ NODE ___/ SUF

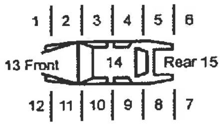
MILE-MARKER ON INTERSTATE ONLY: FEET N ☐ E ☐ S ☐ W ☐ | MILE 14 [18]

	UNIT NO.: 1 INFORMATION	UNIT NO.: 2 INFORMATION	
	BICYCLE ☐ SUMMONED ☐ ARRESTED ☐ M.V.R. YES	BICYCLE ☐ SUMMONED ☐ ARRESTED ☐ M.V.R. YES	20 [19]
[4] 3	PEDESTRIAN ☐ CHARGE: RECOM ☐	PEDESTRIAN ☐ CHARGE: RECOM ☐	
	DRIVER LICENSE NO.: [redacted] STATE: [redacted] CLASSIFICATION: [redacted]	DRIVER LICENSE NO.: [redacted] STATE: CLASSIFICATION: [redacted]	9 [20]
[5] 3	DRIVER'S NAME LAST, FIRST, MIDDLE: [redacted]	DRIVER'S NAME LAST, FIRST, MIDDLE: [redacted]	9 [21]
[6] 4	D.O.B.: [redacted] SEX: [redacted] RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐	D.O.B.: [redacted] SEX: [redacted] RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐	14 [22]
[7] 1	CURRENT ADDRESS, NUMBER, AND STREET: [redacted] PHONE NO.: [redacted]	CURRENT ADDRESS, NUMBER, AND STREET: [redacted] PHONE NO.: [redacted]	14 [23]
	CITY / TOWN: [redacted] STATE: [redacted] ZIP CODE:	CITY / TOWN: [redacted] STATE: [redacted] ZIP CODE: [redacted]	
[8] 1	PLATE NUMBER: [redacted] PLATE TYPE: [redacted] STATE: [redacted] TRAILER PLATE: STATE:	PLATE NUMBER: [redacted] PLATE TYPE: [redacted] STATE: [redacted] TRAILER PLATE: STATE:	10 [24]
[9] 9	MAKE: [redacted] YEAR: [redacted] COMMERCIAL VEHICLE ACCIDENT ☐ HAZARDOUS MATERIALS ☐	MAKE: [redacted] YEAR: [redacted] COMMERCIAL VEHICLE ACCIDENT ☐ HAZARDOUS MATERIALS ☐	10 [25]
[10] 1	V.I.N.: [redacted]	V.I.N.: [redacted]	
	SAME AS DRIVER ☒ OWNER NAME LAST, FIRST MIDDLE:	SAME AS DRIVER ☒ OWNER NAME LAST, FIRST MIDDLE:	
[11] 1	CURRENT ADDRESS, NUMBER AND STREET: PHONE NO.:	CURRENT ADDRESS, NUMBER AND STREET: PHONE NO.:	
	CITY / TOWN: STATE: ZIP CODE:	CITY / TOWN: STATE: ZIP CODE:	
	INSURANCE CO. & POLICY #: [redacted] OR DSMV 385 ISSUED ☐	INSURANCE CO. & POLICY #: [redacted] OR DSMV 385 ISSUED ☐	
	VEHICLE TOWED ☐ BY: TO:	VEHICLE TOWED ☐ BY: TO:	

REF.	26	27	28	29	NAME(S) OF OCCUPANTS OR WITNESSES	ADDRESS / PHONE	30	31	32	33
1	1	N	4	[redacted]	[redacted]	[redacted]	1	1	8	F
2	2	N	4	[redacted]	[redacted]	[redacted]	1	1	8	M
3										
4										
5										
6										

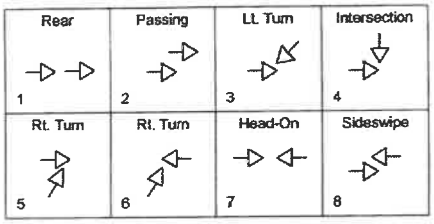
UNIT NO: 1

13 INDICATE PROBABLE POINT OF IMPACT



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

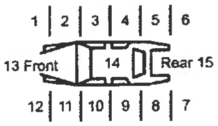
Circle numbers indicating areas damaged.



Indicate Vehicle Numbers on Arrows Above

UNIT NO: 2

INDICATE PROBABLE POINT OF IMPACT 4



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

Circle numbers indicating areas damaged.

ACCIDENT SKETCH

Indicate North

By Arrow

Vehicles moved prior to arrival.

GIST OF ACCIDENT

Around 1038 hours on 03/03/2021 I came across a two car motor vehicle accident at the intersection of Greenland Road at Borthwick Avenue. The operator and sole occupant of unit one identified herself with a [redacted] driver's license as [redacted] The operator and sole occupant of unit two identified himself with a [redacted] driver's license as [redacted] Both operators described the following.

Unit one came to a complete stop at the stop sign of Greenland Road and Borthwick Avenue. Unit one went to execute a left turn to remain on Greenland Road. Unit one did not see unit two who was driving south on Greenland Road heading straight onto Borthwick Avenue. Unit two did not have a stop sign and had the right of way. Unit one subsequently struck the right side of unit two cause a moderate dent and scratch to the rear right door. Unit one sustained moderate dents and scratches to the front center of the bumper.

Both drivers were not injured and there were no air bags deployed.

End of report.

Officer Denman
Patrolman
Portsmouth, NH Police Department

SIGNATURE OF INVESTIGATING OFFICER	DATE OF REPORT 03/09/2021	REVIEWED BY
DEPARTMENT / DIVISION / TROOP Portsmouth Police Department	PHOTOS TAKEN YES ☒ NO ☐ BY:	

Please Print or Type (Single Space) **TO BE COMPLETED AND FILED WITHIN 15 DAYS** Sheet 1 of 1 Sheets(s) 1 ¹²

LOCAL USE

22-800-AC

Amended Report ☐ Hit and Run ☐ School Bus ☐ Driver Ed. ☐

STATE OF NEW HAMPSHIRE UNIFORM POLICE TRAFFIC ACCIDENT REPORT

DSMV159 (Rev.04/00)

M.V. USE ONLY

No. 2 ¹³

Date Rec'd

NR ☐ Supplemental Report ☐ Motor Carrier Report ☐ 2 ¹⁴

2 ¹⁵

¹ 1	DATE OF ACCIDENT 01/07/2022	DAY OF WEEK Friday	TIME (Military) } OF ACCIDENT 0830	CITY/TOWN PORTSMOUTH

TOTAL KILLED 0	TOTAL INJURED 0	TOTAL VEHICLES 2	POLICE NOTIFIED 0830	POLICE ARRIVED 0854	AMBULANCE ARRIVED	DEPARTMENT Portsmouth	9 ¹⁶

ACCIDENT OCCURRED ON:

² 719 GREENLAND RD

ROUTE NO. AND/OR STREET NAME

☐ MILES N ☐ E ☐
☐ FEET S ☐ W ☐ OF
☒ AT INTERSECTION WITH

INTERSECTING ROAD, BRIDGE, TOWN LINE (not telephone pole, house)

2 BORTHWICK AVE

ROUTE NO. AND/OR STREET NAME

POSTED SPEED 35

8 ¹⁷

Complete first node for accidents at node, complete both for accidents between nodes.

³ 3

FIRST NODE: MAP ____ 10 ZONE ____ NODE ____ / SUF ____

DISTANCE FROM FIRST NODE TOWARD SECOND: ____ FEET

SECOND NODE: MAP ____ 10 ZONE ____ NODE ____ / SUF ____

MILE-MARKER ON INTERSTATE ONLY ____ FEET N ☐ E ☐ S ☐ W ☐

MILE ____

20 ¹⁸

UNIT NO.: 1 INFORMATION	UNIT NO.: 2 INFORMATION
BICYCLE ☐ PEDESTRIAN ☐ SUMMONED ☐ ARRESTED ☐ CHARGE: M.V.R. YES RECOM ☐	BICYCLE ☐ PEDESTRIAN ☐ SUMMONED ☐ ARRESTED ☐ CHARGE: M.V.R. YES RECOM ☐
DRIVER LICENSE NO. [redacted] STATE [redacted] CLASSIFICATION [redacted]	DRIVER LICENSE NO. [redacted] STATE [redacted] CLASSIFICATION [redacted]
DRIVER'S NAME LAST, FIRST, MIDDLE [redacted]	DRIVER'S NAME LAST, FIRST, MIDDLE [redacted]
D.O.B. [redacted] SEX [redacted] RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐	D.O.B. [redacted] SEX [redacted] RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐
CURRENT ADDRESS, NUMBER, AND STREET [redacted] PHONE NO. [redacted]	CURRENT ADDRESS, NUMBER, AND STREET [redacted] PHONE NO. [redacted]
CITY / TOWN [redacted] STATE [redacted] ZIP CODE [redacted]	CITY / TOWN [redacted] STATE [redacted] ZIP CODE [redacted]
PLATE NUMBER [redacted] PLATE TYPE [redacted] STATE [redacted] TRAILER PLATE STATE	PLATE NUMBER [redacted] PLATE TYPE [redacted] STATE [redacted] TRAILER PLATE STATE
MAKE YEAR [redacted] COMMERCIAL VEHICLE ACCIDENT ☐ HAZARDOUS MATERIALS ☐	MAKE [redacted] YEAR [redacted] COMMERCIAL VEHICLE ACCIDENT ☐ HAZARDOUS MATERIALS ☐
V.I.N. [redacted]	V.I.N. [redacted]
SAME AS DRIVER ☐ OWNER NAME LAST, FIRST MIDDLE [redacted]	SAME AS DRIVER ☒ OWNER NAME LAST, FIRST MIDDLE
CURRENT ADDRESS, NUMBER AND STREET [redacted] PHONE NO. 603-661-9034	CURRENT ADDRESS, NUMBER AND STREET PHONE NO.
CITY / TOWN [redacted] STATE [redacted] ZIP CODE [redacted]	CITY / TOWN STATE ZIP CODE
INSURANCE CO. & POLICY # [redacted] OR DSMV 385 ISSUED ☐	INSURANCE CO. & POLICY # [redacted] OR DSMV 385 ISSUED ☐
VEHICLE TOWED ☐ BY: TO:	VEHICLE TOWED ☐ BY: TO:

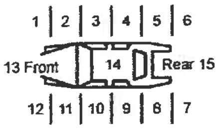
Left margin: ⁴ 2, ⁵ 2, ⁶ 4, ⁷ 1, ⁸ 1, ⁹ 3, ¹⁰ 1, ¹¹ 4

Right margin: 98 ¹⁹, 9 ²⁰, 9 ²¹, 14 ²², 14 ²³, 10 ²⁴, 10 ²⁵

REF.	26	27	28	29	NAME(S) OF OCCUPANTS OR WITNESSES	ADDRESS / PHONE	30	31	32	33
1	1	N	4	[redacted]	[redacted]	[redacted]	1	1	8	F
2	2	N	4	[redacted]	[redacted]	[redacted]	1	1	8	M
3										
4										
5										
6										

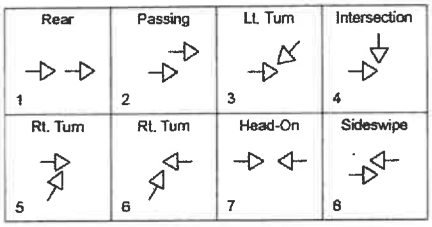
UNIT NO: 1

15 INDICATE PROBABLE POINT OF IMPACT



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

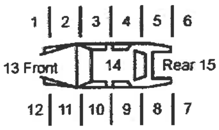
Circle numbers indicating areas damaged.



Indicate Vehicle Numbers on Arrows Above

UNIT NO: 2

INDICATE PROBABLE POINT OF IMPACT 13



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

Circle numbers indicating areas damaged.

ACCIDENT SKETCH

Indicate North

By Arrow

VEHICLES MOVED PRIOR TO POLICE ARRIVAL.

GIST OF ACCIDENT

I WAS DISPATCHED TO 875 GREENLAND RD IN PORTSMOUTH, NH FOR A 2 CAR MVA. UPON ARRIVAL, I IDENTIFIED UNIT 1 AS A BLUE 2008 SUBA OUTBACK. UNIT 1 IS REGISTERED TO [redacted] AND OPERATED BY [redacted] I IDENTIFIED UNIT 2 AS A BLUE 2011 CHEV COLORADO. UNIT 2 IS REGISTERED TO AND OPERATED BY [redacted] UNIT 1 OPERATOR REPORTED SHE WAS AT GREENLAND ROAD STOPPED AT A TRAFFIC CONTROL LIGHT WHEN UNIT 2 HIT THE REAR OF HER VEHICLE. UNIT 2 OPERATOR REPORTED HE WAS ATTEMPTING TO STOP PRIOR TO UNIT 1 BUT SLID ON THE SNOW AND COLLIDED WITH THE REAR OF UNIT 1.

THE WEATHER CONDITIONS WERE WINTER WEATHER, SNOW. THE ROADWAY CONDITIONS WERE SLIPPERY WITH SNOW AND SLUSH. THERE WERE NO INJURIES REPORTED. UNIT 1 DROVE FROM THE SCENE. UNIT 2 PARKED AND WAITED FOR AAA. UNIT 2 SUSTAINED HEAVY DAMAGE TO THE FRONT OF THE VEHICLE. VEHICLES MOVED INTO THE PARKING LOT OF ORCHARD PARK, 875 GREENLAND ROAD IN PORTSMOUTH, NH. INFORMATION WAS EXCHANGED.

END OF REPORT.
PATROL OFFICER JOSEPH I. MELANSON
PORTSMOUTH POLICE DEPARTMENT
PATROL DIVISION

SIGNATURE OF INVESTIGATING OFFICER

DATE OF REPORT 01/07/2022

REVIEWED BY

DEPARTMENT / DIVISION / TROOP Portsmouth Police Department

PHOTOS TAKEN YES ☒ NO ☐ BY:

___ Please Print or Type (Single Space) **TO BE COMPLETED AND FILED WITHIN 15 DAYS** Sheet 1 of 1 Sheets(s) 1 [12]

LOCAL USE

22-31336-AC

Amended Report ☐ Hit and Run ☐ School Bus ☐ Driver Ed. ☐

STATE OF NEW HAMPSHIRE
UNIFORM POLICE
TRAFFIC ACCIDENT REPORT

DSMV159 (Rev.04/00)

M.V. USE ONLY

No.

Date Rec'd

NR ☐ Supplemental Report ☐ Motor Carrier Report ☐

1 [13]

4 [14]

4 [15]

[1] 1 DATE OF ACCIDENT 08/17/2022 DAY OF WEEK Wednesday TIME (Military) OF ACCIDENT 1715 CITY/TOWN PORTSMOUTH

TOTAL KILLED 0 TOTAL INJURED 0 TOTAL VEHICLES 2 POLICE NOTIFIED 1715 POLICE ARRIVED 1734 AMBULANCE ARRIVED DEPARTMENT Portsmouth 1 [16]

ACCIDENT OCCURRED ON: ___ ☐ MILES ☒ FEET ☒ AT INTERSECTION WITH N ☐ S ☐ E ☐ W ☐ OF

INTERSECTING ROAD, BRIDGE, TOWN LINE (not telephone pole, house)

POSTED SPEED

[2] 1 719 GREENLAND RD — ROUTE NO. AND/OR STREET NAME

2 BORTHWICK AVE — ROUTE NO. AND/OR STREET NAME

7 [17]

Complete first node for accidents at node, complete both for accidents between nodes.

FIRST NODE DISTANCE FROM FIRST NODE TOWARD SECOND **SECOND NODE**

[3] 3 MAP ___ ZONE 10 NODE / SUF FEET MAP ___ ZONE 10 NODE / SUF

MILE-MARKER ON INTERSTATE ONLY ___ FEET N ☐ E ☐ S ☐ W ☐ MILE ___

14 [18]

UNIT NO.: 1	**INFORMATION**	**UNIT NO.: 2**	**INFORMATION**
BICYCLE ☐ PEDESTRIAN ☐ SUMMONED ☐ CHARGE: ARRESTED ☐	M.V.R. YES RECOM ☐	BICYCLE ☐ PEDESTRIAN ☐ SUMMONED ☐ CHARGE: ARRESTED ☐	M.V.R. YES RECOM ☐
DRIVER LICENSE NO. [redacted] STATE [redacted] CLASSIFICATION [redacted]		DRIVER LICENSE NO. [redacted] STATE [redacted] CLASSIFICATION [redacted]	
DRIVER'S NAME LAST, FIRST, MIDDLE [redacted]		DRIVER'S NAME LAST, FIRST, MIDDLE [redacted]	
D.O.B. [redacted] SEX [redacted]	RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐	D.O.B. [redacted] SEX [redacted]	RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐
CURRENT ADDRESS, NUMBER, AND STREET [redacted]	PHONE NO. [redacted]	CURRENT ADDRESS, NUMBER, AND STREET [redacted]	PHONE NO. [redacted]
CITY / TOWN [redacted] STATE [redacted]	ZIP CODE [redacted]	CITY / TOWN [redacted] STATE [redacted]	ZIP CODE [redacted]
PLATE NUMBER [redacted] PLATE TYPE [redacted] STATE [redacted]	TRAILER PLATE STATE	PLATE NUMBER [redacted] PLATE TYPE [redacted] STATE [redacted]	TRAILER PLATE STATE
MAKE [redacted] YEAR [redacted] COMMERCIAL VEHICLE ACCIDENT ☐	HAZARDOUS MATERIALS ☐	MAKE [redacted] YEAR [redacted] COMMERCIAL VEHICLE ACCIDENT ☐	HAZARDOUS MATERIALS ☐
V.I.N. [redacted]		V.I.N. [redacted]	
SAME AS DRIVER ☐ OWNER NAME LAST, FIRST MIDDLE [redacted]		SAME AS DRIVER ☐ OWNER NAME LAST, FIRST MIDDLE [redacted]	
CURRENT ADDRESS, NUMBER AND STREET [redacted]	PHONE NO. [redacted]	CURRENT ADDRESS, NUMBER AND STREET [redacted]	PHONE NO. [redacted]
CITY / TOWN [redacted] STATE [redacted]	ZIP CODE [redacted]	CITY / TOWN [redacted] STATE [redacted]	ZIP CODE [redacted]
INSURANCE CO. & POLICY # [redacted]	OR DSMV 385 ISSUED ☐	INSURANCE CO. & POLICY # [redacted]	OR DSMV 385 ISSUED ☒
VEHICLE TOWED ☐ BY:	TO:	VEHICLE TOWED ☐ BY:	TO:

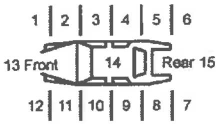
Left margin: [4] 2, [5] 3, [6] 4, [7] 1, [8] 1, [9] 2, [10] 1, [11] 3

Right margin: 20 [19], 9 [20], 9 [21], 14 [22], 14 [23], 10 [24], 10 [25]

REF.	26	27	28	29	NAME(S) OF OCCUPANTS OR WITNESSES	ADDRESS / PHONE	30	31	32	33
1	1	N	4	[redacted]	[redacted]	[redacted]	1	1	8	F
2	2	N	4	[redacted]	[redacted]	[redacted]	1	1	8	M
3	2	N	4	[redacted]	[redacted]	[redacted]	12	1	8	F
4										
5										
6										

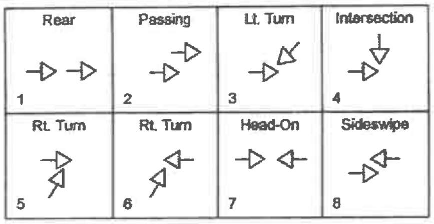
UNIT NO: 1

13 INDICATE PROBABLE POINT OF IMPACT



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

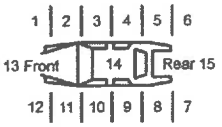
Circle numbers indicating areas damaged.



Indicate Vehicle Numbers on Arrows Above

UNIT NO: 2

INDICATE PROBABLE POINT OF IMPACT **15**



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

Circle numbers indicating areas damaged.

ACCIDENT SKETCH
Indicate North
By Arrow

Vehicles were moved
prior to arrival

GIST OF ACCIDENT

08/17/2022

Unit One was traveling westbound on Greenland Rd in the area of Borthwick and made contact with Unit Two's rear, causing moderate damage. Unit One received minor damage to the center front. Driver of Unit One stated she did not realize Unit Two was sitting at the light when she made contact. Driver of Unit One had no injuries and did not need a tow.

Unit Two was stopped at a red light on Borthwick Ave to travel Westbound on Greenland Rd and when the light just turned green, Unit One made contact with Unit Two. Unit Two had a passenger in the passenger's seat. Unit Two had a passenger in the passenger's seat. The Unit Two driver and passenger had no injuries. Unit Two did not need a tow.

SIGNATURE OF INVESTIGATING OFFICER

DATE OF REPORT
08/18/2022

REVIEWED BY

DEPARTMENT / DIVISION / TROOP
Portsmouth Police Department

PHOTOS TAKEN
YES ☐ NO ☒ BY:

Please Print or Type (Single Space) **TO BE COMPLETED AND FILED WITHIN 15 DAYS** Sheet 1 of 1 Sheets(s)

12	1
13	1
14	2
15	2
16	13
17	1
18	7
19	20
20	9
21	9
22	14
23	14
24	10
25	10

LOCAL USE

22-36395-AC

Amended Report ☐ Hit and Run ☐ School Bus ☐ Driver Ed. ☐

STATE OF NEW HAMPSHIRE UNIFORM POLICE TRAFFIC ACCIDENT REPORT

DSMV159 (Rev.04/00)

M.V. USE ONLY

No.

Date Rec'd

NR ☐ Supplemental Report ☐ Motor Carrier Report ☐

1	1
2	
3	1
4	6
5	3
6	
7	1
8	1
9	1
10	1
11	1

DATE OF ACCIDENT: 09/22/2022

DAY OF WEEK: Thursday

TIME (Military) OF ACCIDENT: 1607

CITY/TOWN: PORTSMOUTH

TOTAL KILLED: 0

TOTAL INJURED: 0

TOTAL VEHICLES: 2

POLICE NOTIFIED: 1607

POLICE ARRIVED: 1613

AMBULANCE ARRIVED:

DEPARTMENT: Portsmouth

ACCIDENT OCCURRED ON: 2 BORTHWICK AVE

ROUTE NO. AND/OR STREET NAME

☐ MILES ☐ FEET ☒ AT INTERSECTION WITH

N ☐ S ☐ E ☐ W ☐ OF

INTERSECTING ROAD, BRIDGE, TOWN LINE (not telephone pole, house): 719 GREENLAND RD

ROUTE NO. AND/OR STREET NAME

POSTED SPEED: 35

Complete first node for accidents at node, complete both for accidents between nodes.

FIRST NODE: MAP ___ ZONE 10___ NODE ___ / SUF ___

DISTANCE FROM FIRST NODE TOWARD SECOND: FEET

SECOND NODE: MAP ___ ZONE 10___ NODE ___ / SUF ___

MILE-MARKER ON INTERSTATE ONLY: ___ FEET N ☐ E ☐ S ☐ W ☐

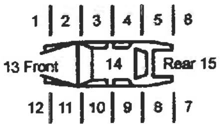
MILE

UNIT NO.: 1 INFORMATION	UNIT NO.: 2 INFORMATION
BICYCLE ☐ PEDESTRIAN ☐ SUMMONED ☐ ARRESTED ☐ CHARGE: M.V.R. YES RECOM ☐	BICYCLE ☐ PEDESTRIAN ☐ SUMMONED ☐ ARRESTED ☐ CHARGE: M.V.R. YES RECOM ☐
DRIVER LICENSE NO.: [redacted] STATE: [redacted] CLASSIFICATION: [redacted]	DRIVER LICENSE NO.: [redacted] STATE: [redacted] CLASSIFICATION: [redacted]
DRIVER'S NAME LAST, FIRST, MIDDLE: [redacted]	DRIVER'S NAME LAST, FIRST, MIDDLE: [redacted]
D.O.B.: [redacted] SEX: [redacted] RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐	D.O.B.: [redacted] SEX: [redacted] RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐
CURRENT ADDRESS, NUMBER, AND STREET: [redacted] PHONE NO.: [redacted]	CURRENT ADDRESS, NUMBER, AND STREET: [redacted] PHONE NO.: [redacted]
CITY / TOWN: [redacted] STATE: [redacted] ZIP CODE: [redacted]	CITY / TOWN: [redacted] STATE: [redacted] ZIP CODE: [redacted]
PLATE NUMBER: [redacted] PLATE TYPE: [redacted] STATE: [redacted] TRAILER PLATE: [redacted] STATE: [redacted]	PLATE NUMBER: [redacted] PLATE TYPE: [redacted] STATE: [redacted] TRAILER PLATE STATE
MAKE: [redacted] YEAR: [redacted] COMMERCIAL VEHICLE ACCIDENT ☐ HAZARDOUS MATERIALS ☐	MAKE: [redacted] YEAR: [redacted] COMMERCIAL VEHICLE ACCIDENT ☐ HAZARDOUS MATERIALS ☐
V.I.N.: [redacted]	V.I.N.: [redacted]
SAME AS DRIVER ☐ OWNER NAME LAST, FIRST MIDDLE: [redacted]	SAME AS DRIVER ☒ OWNER NAME LAST, FIRST MIDDLE
CURRENT ADDRESS, NUMBER AND STREET: [redacted] PHONE NO.: [redacted]	CURRENT ADDRESS, NUMBER AND STREET PHONE NO.
CITY / TOWN: [redacted] STATE: [redacted] ZIP CODE: [redacted]	CITY / TOWN STATE ZIP CODE
INSURANCE CO. & POLICY #: [redacted] OR DSMV 385 ISSUED ☒	INSURANCE CO. & POLICY #: [redacted] OR DSMV 385 ISSUED ☐
VEHICLE TOWED ☐ BY: TO:	VEHICLE TOWED ☐ BY: TO:

REF.	26	27	28	29	NAME(S) OF OCCUPANTS OR WITNESSES	ADDRESS / PHONE	30	31	32	33
1	1	N	4	[redacted]	[redacted]	[redacted]		1	8	M
2	2	N	4	[redacted]	[redacted]	[redacted]		1	8	M
3										
4										
5										
6										

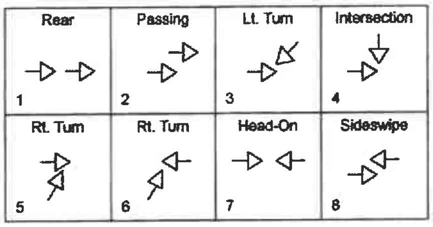
UNIT NO: 1

5 INDICATE PROBABLE POINT OF IMPACT



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

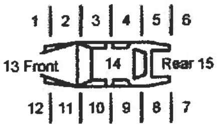
Circle numbers indicating areas damaged.



Indicate Vehicle Numbers on Arrows Above

UNIT NO: 2

INDICATE PROBABLE POINT OF IMPACT 12



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

Circle numbers indicating areas damaged.

ACCIDENT SKETCH

Indicate North

By Arrow

Vehicles moved prior to Police arrival

GIST OF ACCIDENT

Unit 1 was in the left turning lane on Rt. 33 at Borthwick Avenue. Unit 2 was in the lane to the right of Unit 1. Unit 1 attempted to change lanes and cut in front of Unit 2. In doing so, the trailer being pulled by Unit 1 struck Unit 2 on the front left corner. Unit 2 sustained damage to its front bumper. It was unclear if Unit 1 sustained any damage.

The driver of Unit 1 said he was attempted to switch lanes. He didn't account for the extra length of the trailer being towed by his vehicle. The driver of Unit 2 said they were following the road when Unit 1 pulled in front of them.

There were no injuries as a result of the accident.

END OF NARRATIVE

Patrol Officer Roland J. Dupuis
Uniformed Patrol Division
Portsmouth Police Department

SIGNATURE OF INVESTIGATING OFFICER	DATE OF REPORT 09/30/2022	REVIEWED BY
DEPARTMENT / DIVISION / TROOP Portsmouth Police Department	PHOTOS TAKEN YES ☒ NO ☐ BY:	

___ Please Print or Type (Single Space) **TO BE COMPLETED AND FILED WITHIN 15 DAYS** Sheet 1 of 1 Sheets(s) 1 [12]

LOCAL USE 22-44491-AC	**STATE OF NEW HAMPSHIRE** **UNIFORM POLICE** **TRAFFIC ACCIDENT REPORT** DSMV159 (Rev.04/00)	**M.V. USE ONLY** **No.** **Date Rec'd**
Amended Report ☐ Hit and Run ☐ School Bus ☐ Driver Ed. ☐		NR ☐ Supplemental Report ☐ Motor Carrier Report ☐

9 [13]

[14]

[15]

1 [1]

DATE OF ACCIDENT	DAY OF WEEK	TIME (Military) } OF ACCIDENT	CITY/TOWN
11/16/2022	Wednesday	1354	PORTSMOUTH

TOTAL KILLED	TOTAL INJURED	TOTAL VEHICLES	POLICE NOTIFIED	POLICE ARRIVED	AMBULANCE ARRIVED	DEPARTMENT
0	1	2	1354	1403		Portsmouth

8 [16]

[2]

ACCIDENT OCCURRED ON: 875 GREENLAND RD
ROUTE NO. AND/OR STREET NAME

_____ ☐ MILES ☐ FEET ☒ AT INTERSECTION WITH N ☐ S ☐ E ☐ W ☐ OF

INTERSECTING ROAD, BRIDGE, TOWN LINE (not telephone pole, house): BORTHWICK AVE
ROUTE NO. AND/OR STREET NAME

POSTED SPEED: 30

1 [17]

1 [3]

Complete first node for accidents at node, complete both for accidents between nodes.

FIRST NODE				DISTANCE FROM FIRST NODE TOWARD SECOND	SECOND NODE			
MAP	ZONE	NODE	SUF	FEET	MAP	ZONE	NODE	SUF
	10	/				10	/	

MILE-MARKER ON INTERSTATE ONLY _____ FEET N ☐ E ☐ S ☐ W ☐ MILE _____

14 [18]

3 [4]

UNIT NO.: 1 INFORMATION	**UNIT NO.: 2 INFORMATION**
BICYCLE ☐ PEDESTRIAN ☐ SUMMONED ☒ ARRESTED ☐ CHARGE: Mobile Device Use M.V.R. YES RECOM ☐	BICYCLE ☐ PEDESTRIAN ☐ SUMMONED ☐ ARRESTED ☐ CHARGE: M.V.R. YES RECOM ☐
DRIVER LICENSE NO. [redacted] STATE [redacted] CLASSIFICATION	DRIVER LICENSE NO. [redacted] STATE [redacted] CLASSIFICATION
DRIVER'S NAME LAST, FIRST, MIDDLE [redacted]	DRIVER'S NAME LAST, FIRST, MIDDLE [redacted]
D.O.B. [redacted] SEX [redacted] RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐	D.O.B. [redacted] SEX [redacted] RESTRICTIONS / ENDORSEMENTS COMPLIED WITH YES ☐
CURRENT ADDRESS, NUMBER, AND STREET [redacted] PHONE NO. [redacted]	CURRENT ADDRESS, NUMBER, AND STREET [redacted] PHONE NO. [redacted]
CITY / TOWN [redacted] STATE [redacted] ZIP CODE [redacted]	CITY / TOWN [redacted] STATE [redacted] ZIP CODE [redacted]
PLATE NUMBER [redacted] PLATE TYPE [redacted] STATE [redacted] TRAILER PLATE STATE	PLATE NUMBER [redacted] PLATE TYPE [redacted] STATE [redacted] TRAILER PLATE STATE
MAKE [redacted] YEAR [redacted] COMMERCIAL VEHICLE ACCIDENT ☐ HAZARDOUS MATERIALS ☐	MAKE [redacted] YEAR [redacted] COMMERCIAL VEHICLE ACCIDENT ☐ HAZARDOUS MATERIALS ☐
V.I.N. [redacted]	V.I.N. [redacted]
SAME AS DRIVER ☒ OWNER NAME LAST, FIRST MIDDLE	SAME AS DRIVER ☒ OWNER NAME LAST, FIRST MIDDLE
CURRENT ADDRESS, NUMBER AND STREET PHONE NO.	CURRENT ADDRESS, NUMBER AND STREET PHONE NO.
CITY / TOWN STATE ZIP CODE	CITY / TOWN STATE ZIP CODE
INSURANCE CO. & POLICY # [redacted] OR DSMV 385 ISSUED ☒	INSURANCE CO. & POLICY # OR DSMV 385 ISSUED ☒
VEHICLE TOWED ☐ BY: TO:	VEHICLE TOWED ☐ BY: TO:

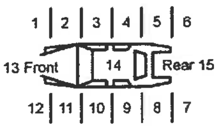
Left margin: 3 [5] 4 [6] 1 [7] 1 [8] 1 [9] 1 [10] 3 [11]

Right margin: 20 [19] 9 [20] 9 [21] 14 [22] 14 [23] 10 [24] 10 [25]

REF.	26	27	28	29	NAME(S) OF OCCUPANTS OR WITNESSES	ADDRESS / PHONE	30	31	32	33
1	1	N	4	[redacted]	[redacted]	[redacted]	1	1	8	M
2	2	B	6	[redacted]	[redacted]	[redacted]	1	1	4	M
3										
4										
5										
6										

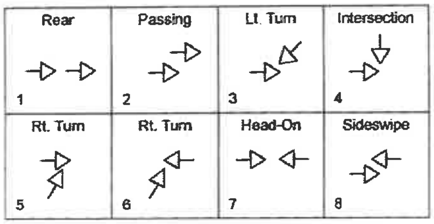
UNIT NO: 1

10 INDICATE PROBABLE POINT OF IMPACT



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

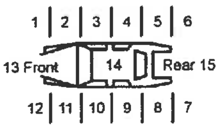
Circle numbers indicating areas damaged.



Indicate Vehicle Numbers on Arrows Above

UNIT NO: 2

INDICATE PROBABLE POINT OF IMPACT 6



16. Undercarriage
17. Rollover
18. Fire/Explosion
19. Total

Circle numbers indicating areas damaged.

ACCIDENT SKETCH

Indicate North

By Arrow

Vehicles Moved PTA of PPD

GIST OF ACCIDENT

On November 16th, 2022 I was dispatched to a motor vehicle collision at the intersection of Greenland Rd and Borthwick Ave. Upon my arrival I met with both involved parties.

V1 is a 2019 Silver Nissan Rogue operated by [redacted] and V2 is a 2007 Yamaha Moped operated by [redacted]. [redacted] is reporting an injury to his right arm/shoulder, Portsmouth Fire Paramedics evaluated [redacted] and he refused transport to the hospital.

[redacted] reported that he was coming off greenland rd and taking a left, when [redacted] went through the stop sign and struck him in the intersection. [redacted] is reporting that he was at Borthwick heading straight and [redacted] is the one that went through the stop sign. [redacted] told me that he was looking at his phone for directions prior to the collision.

[redacted] was issued NH DOS citation [redacted] for mobile electronic use while driving. Both vehicles were driven from the scene.

Officer Michael Nicoli
Patrol Division
Portsmouth NH Police

SIGNATURE OF INVESTIGATING OFFICER

DATE OF REPORT 11/24/2022

REVIEWED BY

DEPARTMENT / DIVISION / TROOP
Portsmouth Police Department

PHOTOS TAKEN
YES ☒ NO ☐ BY:

APPENDIX I

Location Map: 239200 Portsmouth, NH

Precision Data Industries, LLC 157 Washington Street, Suite 2, Hudson, MA 01749 ph: 508-875-0100 email: datarequests@pdillc.com

(1) 7-9am/ 2-6pm TMC
** 2 VCUs @ B
(1) 24HR VCU-ATRs w/ HR (Speeds)

** (4) VCUs (1) HR

Client:	Engineer:	Site Code:	Date:	PDI Job #	City, State:
TFMoran	J. Porter	47528.00	Thurs 3/9/2023	239200	Portsmouth, NH

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION
DATA
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	21	8	0	29	5	68	0	73	108	60	0	168	270
7:15 AM	40	11	0	51	13	53	0	66	125	60	0	185	302
7:30 AM	34	11	0	45	11	96	0	107	185	76	0	261	413
7:45 AM	43	22	0	65	19	106	0	125	237	129	0	366	556
Total	138	52	0	190	48	323	0	371	655	325	0	980	1541
8:00 AM	28	23	0	51	18	104	0	122	230	73	0	303	476
8:15 AM	37	15	0	52	24	115	0	139	194	83	0	277	468
8:30 AM	28	15	0	43	21	94	0	115	165	58	0	223	381
8:45 AM	33	13	0	46	23	91	0	114	159	63	0	222	382
Total	126	66	0	192	86	404	0	490	748	277	0	1025	1707
Grand Total	264	118	0	382	134	727	0	861	1403	602	0	2005	3248
Approach %	69.1	30.9	0.0		15.6	84.4	0.0		70.0	30.0	0.0		
Total %	8.1	3.6	0.0	11.8	4.1	22.4	0.0	26.5	43.2	18.5	0.0	61.7	
Exiting Leg Total				736				1521				991	3248
Cars	243	113	0	356	126	691	0	817	1345	579	0	1924	3097
% Cars	92.0	95.8	0.0	93.2	94.0	95.0	0.0	94.9	95.9	96.2	0.0	96.0	95.4
Exiting Leg Total				705				1458				934	3097
Heavy Vehicles	21	5	0	26	8	36	0	44	58	23	0	81	151
% Heavy Vehicles	8.0	4.2	0.0	6.8	6.0	5.0	0.0	5.1	4.1	3.8	0.0	4.0	4.6
Exiting Leg Total				31				63				57	151

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:30 AM	34	11	0	45	11	96	0	107	185	76	0	261	413
7:45 AM	43	22	0	65	19	106	0	125	237	129	0	366	556
8:00 AM	28	23	0	51	18	104	0	122	230	73	0	303	476
8:15 AM	37	15	0	52	24	115	0	139	194	83	0	277	468
Total Volume	142	71	0	213	72	421	0	493	846	361	0	1207	1913
% Approach Total	66.7	33.3	0.0		14.6	85.4	0.0		70.1	29.9	0.0		
PHF	0.826	0.772	0.000	0.819	0.750	0.915	0.000	0.887	0.892	0.700	0.000	0.824	0.860
Cars	133	68	0	201	68	399	0	467	813	350	0	1163	1831
Cars %	93.7	95.8	0.0	94.4	94.4	94.8	0.0	94.7	96.1	97.0	0.0	96.4	95.7
Heavy Vehicles	9	3	0	12	4	22	0	26	33	11	0	44	82
Heavy Vehicles %	6.3	4.2	0.0	5.6	5.6	5.2	0.0	5.3	3.9	3.0	0.0	3.6	4.3
Cars Enter Leg	133	68	0	201	68	399	0	467	813	350	0	1163	1831
Heavy Enter Leg	9	3	0	12	4	22	0	26	33	11	0	44	82
Total Entering Leg	142	71	0	213	72	421	0	493	846	361	0	1207	1913
Cars Exiting Leg				418				881				532	1831
Heavy Exiting Leg				15				36				31	82
Total Exiting Leg				433				917				563	1913

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class: **Cars**

PRECISION
DATA
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	20	8	0	28	5	65	0	70	99	58	0	157	255
7:15 AM	36	10	0	46	12	51	0	63	121	57	0	178	287
7:30 AM	31	10	0	41	10	92	0	102	178	75	0	253	396
7:45 AM	39	22	0	61	18	98	0	116	229	126	0	355	532
Total	126	50	0	176	45	306	0	351	627	316	0	943	1470
8:00 AM	28	22	0	50	17	101	0	118	219	73	0	292	460
8:15 AM	35	14	0	49	23	108	0	131	187	76	0	263	443
8:30 AM	27	15	0	42	18	88	0	106	158	55	0	213	361
8:45 AM	27	12	0	39	23	88	0	111	154	59	0	213	363
Total	117	63	0	180	81	385	0	466	718	263	0	981	1627
Grand Total	243	113	0	356	126	691	0	817	1345	579	0	1924	3097
Approach %	68.3	31.7	0.0		15.4	84.6	0.0		69.9	30.1	0.0		
Total %	7.8	3.6	0.0	11.5	4.1	22.3	0.0	26.4	43.4	18.7	0.0	62.1	
Exiting Leg Total				705				1458				934	3097

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:30 AM	31	10	0	41	10	92	0	102	178	75	0	253	396
7:45 AM	39	22	0	61	18	98	0	116	229	126	0	355	532
8:00 AM	28	22	0	50	17	101	0	118	219	73	0	292	460
8:15 AM	35	14	0	49	23	108	0	131	187	76	0	263	443
Total Volume	133	68	0	201	68	399	0	467	813	350	0	1163	1831
% Approach Total	66.2	33.8	0.0		14.6	85.4	0.0		69.9	30.1	0.0		
PHF	0.853	0.773	0.000	0.824	0.739	0.924	0.000	0.891	0.888	0.694	0.000	0.819	0.860
Entering Leg	133	68	0	201	68	399	0	467	813	350	0	1163	1831
Exiting Leg				418				881				532	1831
Total				619				1348				1695	3662

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

PRECISION
D A T A
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	1	0	0	1	0	3	0	3	9	2	0	11	15
7:15 AM	4	1	0	5	1	2	0	3	4	3	0	7	15
7:30 AM	3	1	0	4	1	4	0	5	7	1	0	8	17
7:45 AM	4	0	0	4	1	8	0	9	8	3	0	11	24
Total	12	2	0	14	3	17	0	20	28	9	0	37	71
8:00 AM	0	1	0	1	1	3	0	4	11	0	0	11	16
8:15 AM	2	1	0	3	1	7	0	8	7	7	0	14	25
8:30 AM	1	0	0	1	3	6	0	9	7	3	0	10	20
8:45 AM	6	1	0	7	0	3	0	3	5	4	0	9	19
Total	9	3	0	12	5	19	0	24	30	14	0	44	80
Grand Total	21	5	0	26	8	36	0	44	58	23	0	81	151
Approach %	80.8	19.2	0.0		18.2	81.8	0.0		71.6	28.4	0.0		
Total %	13.9	3.3	0.0	17.2	5.3	23.8	0.0	29.1	38.4	15.2	0.0	53.6	
Exiting Leg Total				31				63				57	151
Buses	5	3	0	8	4	3	0	7	7	4	0	11	26
% Buses	23.8	60.0	0.0	30.8	50.0	8.3	0.0	15.9	12.1	17.4	0.0	13.6	17.2
Exiting Leg Total				8				10				8	26
Single-Unit Trucks	13	2	0	15	4	25	0	29	42	17	0	59	103
% Single-Unit	61.9	40.0	0.0	57.7	50.0	69.4	0.0	65.9	72.4	73.9	0.0	72.8	68.2
Exiting Leg Total				21				44				38	103
Articulated Trucks	3	0	0	3	0	8	0	8	9	2	0	11	22
% Articulated	14.3	0.0	0.0	11.5	0.0	22.2	0.0	18.2	15.5	8.7	0.0	13.6	14.6
Exiting Leg Total				2				9				11	22

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:45 AM	4	0	0	4	1	8	0	9	8	3	0	11	24
8:00 AM	0	1	0	1	1	3	0	4	11	0	0	11	16
8:15 AM	2	1	0	3	1	7	0	8	7	7	0	14	25
8:30 AM	1	0	0	1	3	6	0	9	7	3	0	10	20
Total Volume	7	2	0	9	6	24	0	30	33	13	0	46	85
% Approach Total	77.8	22.2	0.0		20.0	80.0	0.0		71.7	28.3	0.0		
PHF	0.438	0.500	0.000	0.563	0.500	0.750	0.000	0.833	0.750	0.464	0.000	0.821	0.850
Buses	2	1	0	3	3	2	0	5	3	2	0	5	13
Buses %	28.6	50.0	0.0	33.3	50.0	8.3	0.0	16.7	9.1	15.4	0.0	10.9	15.3
Single-Unit Trucks	5	1	0	6	3	16	0	19	26	10	0	36	61
Single-Unit %	71.4	50.0	0.0	66.7	50.0	66.7	0.0	63.3	78.8	76.9	0.0	78.3	71.8
Articulated Trucks	0	0	0	0	0	6	0	6	4	1	0	5	11
Articulated %	0.0	0.0	0.0	0.0	0.0	25.0	0.0	20.0	12.1	7.7	0.0	10.9	12.9
Buses	2	1	0	3	3	2	0	5	3	2	0	5	13
Single-Unit Trucks	5	1	0	6	3	16	0	19	26	10	0	36	61
Articulated Trucks	0	0	0	0	0	6	0	6	4	1	0	5	11
Total Entering Leg	7	2	0	9	6	24	0	30	33	13	0	46	85
Buses				5				4				4	13
Single-Unit Trucks				13				27				21	61
Articulated Trucks				1				4				6	11
Total Exiting Leg				19				35				31	85

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION
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INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
7:15 AM	2	1	0	3	1	0	0	1	0	2	0	2	6
7:30 AM	0	0	0	0	0	0	0	0	2	0	0	2	2
7:45 AM	1	0	0	1	1	0	0	1	0	0	0	0	2
Total	3	1	0	4	2	0	0	2	3	2	0	5	11
8:00 AM	0	1	0	1	1	1	0	2	3	0	0	3	6
8:15 AM	1	0	0	1	0	1	0	1	0	1	0	1	3
8:30 AM	0	0	0	0	1	0	0	1	0	1	0	1	2
8:45 AM	1	1	0	2	0	1	0	1	1	0	0	1	4
Total	2	2	0	4	2	3	0	5	4	2	0	6	15
Grand Total	5	3	0	8	4	3	0	7	7	4	0	11	26
Approach %	62.5	37.5	0.0		57.1	42.9	0.0		63.6	36.4	0.0		
Total %	19.2	11.5	0.0	30.8	15.4	11.5	0.0	26.9	26.9	15.4	0.0	42.3	
Exiting Leg Total				8				10				8	26

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:15 AM	2	1	0	3	1	0	0	1	0	2	0	2	6
7:30 AM	0	0	0	0	0	0	0	0	2	0	0	2	2
7:45 AM	1	0	0	1	1	0	0	1	0	0	0	0	2
8:00 AM	0	1	0	1	1	1	0	2	3	0	0	3	6
Total Volume	3	2	0	5	3	1	0	4	5	2	0	7	16
% Approach Total	60.0	40.0	0.0		75.0	25.0	0.0		71.4	28.6	0.0		
PHF	0.375	0.500	0.000	0.417	0.750	0.250	0.000	0.500	0.417	0.250	0.000	0.583	0.667
Entering Leg	3	2	0	5	3	1	0	4	5	2	0	7	16
Exiting Leg				5				7				4	16
Total				10				11				11	32

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class: **Single-Unit Trucks**

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INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Single-Unit Trucks

	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	2	0	2	6	2	0	8	10
7:15 AM	2	0	0	2	0	2	0	2	3	1	0	4	8
7:30 AM	2	1	0	3	1	3	0	4	3	1	0	4	11
7:45 AM	3	0	0	3	0	5	0	5	8	2	0	10	18
Total	7	1	0	8	1	12	0	13	20	6	0	26	47
8:00 AM	0	0	0	0	0	2	0	2	6	0	0	6	8
8:15 AM	1	1	0	2	1	5	0	6	5	6	0	11	19
8:30 AM	1	0	0	1	2	4	0	6	7	2	0	9	16
8:45 AM	4	0	0	4	0	2	0	2	4	3	0	7	13
Total	6	1	0	7	3	13	0	16	22	11	0	33	56
Grand Total	13	2	0	15	4	25	0	29	42	17	0	59	103
Approach %	86.7	13.3	0.0		13.8	86.2	0.0		71.2	28.8	0.0		
Total %	12.6	1.9	0.0	14.6	3.9	24.3	0.0	28.2	40.8	16.5	0.0	57.3	
Exiting Leg Total				21				44				38	103

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:45 AM	3	0	0	3	0	5	0	5	8	2	0	10	18
8:00 AM	0	0	0	0	0	2	0	2	6	0	0	6	8
8:15 AM	1	1	0	2	1	5	0	6	5	6	0	11	19
8:30 AM	1	0	0	1	2	4	0	6	7	2	0	9	16
Total Volume	5	1	0	6	3	16	0	19	26	10	0	36	61
% Approach Total	83.3	16.7	0.0		15.8	84.2	0.0		72.2	27.8	0.0		
PHF	0.417	0.250	0.000	0.500	0.375	0.800	0.000	0.792	0.813	0.417	0.000	0.818	0.803
Entering Leg	5	1	0	6	3	16	0	19	26	10	0	36	61
Exiting Leg				13				27				21	61
Total				19				46				57	122

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION
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INDUSTRIES, LLC
157 Washington Street, Suite 2
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Articulated Trucks

	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	1	0	0	1	0	1	0	1	2	0	0	2	4
7:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
7:30 AM	1	0	0	1	0	1	0	1	2	0	0	2	4
7:45 AM	0	0	0	0	0	3	0	3	0	1	0	1	4
Total	2	0	0	2	0	5	0	5	5	1	0	6	13
8:00 AM	0	0	0	0	0	0	0	0	2	0	0	2	2
8:15 AM	0	0	0	0	0	1	0	1	2	0	0	2	3
8:30 AM	0	0	0	0	0	2	0	2	0	0	0	0	2
8:45 AM	1	0	0	1	0	0	0	0	0	1	0	1	2
Total	1	0	0	1	0	3	0	3	4	1	0	5	9
Grand Total	3	0	0	3	0	8	0	8	9	2	0	11	22
Approach %	100.0	0.0	0.0		0.0	100.0	0.0		81.8	18.2	0.0		
Total %	13.6	0.0	0.0	13.6	0.0	36.4	0.0	36.4	40.9	9.1	0.0	50.0	
Exiting Leg Total				2				9				11	22

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	1	0	0	1	0	1	0	1	2	0	0	2	4
7:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
7:30 AM	1	0	0	1	0	1	0	1	2	0	0	2	4
7:45 AM	0	0	0	0	0	3	0	3	0	1	0	1	4
Total Volume	2	0	0	2	0	5	0	5	5	1	0	6	13
% Approach Total	100.0	0.0	0.0		0.0	100.0	0.0		83.3	16.7	0.0		
PHF	0.500	0.000	0.000	0.500	0.000	0.417	0.000	0.417	0.625	0.250	0.000	0.750	0.813
Entering Leg	2	0	0	2	0	5	0	5	5	1	0	6	13
Exiting Leg				1				5				7	13
Total				3				10				13	26

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class: **Bicycles (on Roadway and Crosswalks)**

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	Borthwick Avenue						Greenland Road (Route 33)						Greenland Road (Route 33)						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Borthwick Avenue						Greenland Road (Route 33)						Greenland Road (Route 33)						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION
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INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Borthwick Avenue						Greenland Road (Route 33)						Greenland Road (Route 33)						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Borthwick Avenue						Greenland Road (Route 33)						Greenland Road (Route 33)						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
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INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	45	14	0	59	21	122	0	143	109	40	0	149	351
2:15 PM	39	23	0	62	29	108	0	137	128	55	0	183	382
2:30 PM	61	26	0	87	19	130	0	149	108	42	0	150	386
2:45 PM	56	26	0	82	25	111	0	136	160	36	0	196	414
Total	201	89	0	290	94	471	0	565	505	173	0	678	1533
3:00 PM	80	19	0	99	21	133	0	154	134	41	0	175	428
3:15 PM	79	20	0	99	33	153	0	186	144	39	0	183	468
3:30 PM	57	20	0	77	29	174	0	203	154	42	0	196	476
3:45 PM	76	21	0	97	15	156	0	171	134	37	0	171	439
Total	292	80	0	372	98	616	0	714	566	159	0	725	1811
4:00 PM	83	18	0	101	19	147	0	166	163	36	0	199	466
4:15 PM	58	15	0	73	21	133	0	154	151	36	0	187	414
4:30 PM	65	24	0	89	13	158	0	171	154	21	0	175	435
4:45 PM	58	17	0	75	16	160	0	176	154	23	0	177	428
Total	264	74	0	338	69	598	0	667	622	116	0	738	1743
5:00 PM	127	23	0	150	22	181	0	203	172	27	0	199	552
5:15 PM	78	14	0	92	17	149	0	166	134	22	0	156	414
5:30 PM	50	13	0	63	10	124	0	134	133	32	0	165	362
5:45 PM	39	8	0	47	21	110	0	131	160	26	0	186	364
Total	294	58	0	352	70	564	0	634	599	107	0	706	1692
Grand Total	1051	301	0	1352	331	2249	0	2580	2292	555	0	2847	6779
Approach %	77.7	22.3	0.0		12.8	87.2	0.0		80.5	19.5	0.0		
Total %	15.5	4.4	0.0	19.9	4.9	33.2	0.0	38.1	33.8	8.2	0.0	42.0	
Exiting Leg Total				886				2593				3300	6779
Cars	1031	281	0	1312	312	2208	0	2520	2233	540	0	2773	6605
% Cars	98.1	93.4	0.0	97.0	94.3	98.2	0.0	97.7	97.4	97.3	0.0	97.4	97.4
Exiting Leg Total				852				2514				3239	6605
Heavy Vehicles	20	20	0	40	19	41	0	60	59	15	0	74	174
% Heavy Vehicles	1.9	6.6	0.0	3.0	5.7	1.8	0.0	2.3	2.6	2.7	0.0	2.6	2.6
Exiting Leg Total				34				79				61	174

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

3:15 PM	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
3:15 PM	79	20	0	99	33	153	0	186	144	39	0	183	468
3:30 PM	57	20	0	77	29	174	0	203	154	42	0	196	476
3:45 PM	76	21	0	97	15	156	0	171	134	37	0	171	439
4:00 PM	83	18	0	101	19	147	0	166	163	36	0	199	466
Total Volume	295	79	0	374	96	630	0	726	595	154	0	749	1849
% Approach Total	78.9	21.1	0.0		13.2	86.8	0.0		79.4	20.6	0.0		
PHF	0.889	0.940	0.000	0.926	0.727	0.905	0.000	0.894	0.913	0.917	0.000	0.941	0.971
Cars	290	73	0	363	89	616	0	705	580	149	0	729	1797
Cars %	98.3	92.4	0.0	97.1	92.7	97.8	0.0	97.1	97.5	96.8	0.0	97.3	97.2
Heavy Vehicles	5	6	0	11	7	14	0	21	15	5	0	20	52
Heavy Vehicles %	1.7	7.6	0.0	2.9	7.3	2.2	0.0	2.9	2.5	3.2	0.0	2.7	2.8
Cars Enter Leg	290	73	0	363	89	616	0	705	580	149	0	729	1797
Heavy Enter Leg	5	6	0	11	7	14	0	21	15	5	0	20	52
Total Entering Leg	295	79	0	374	96	630	0	726	595	154	0	749	1849
Cars Exiting Leg				238				653				906	1797
Heavy Exiting Leg				12				21				19	52
Total Exiting Leg				250				674				925	1849

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class: **Cars**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
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508-875-0100 datarequests@pdillc.com

	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	44	14	0	58	21	120	0	141	101	40	0	141	340
2:15 PM	39	21	0	60	25	102	0	127	125	51	0	176	363
2:30 PM	58	21	0	79	17	127	0	144	102	42	0	144	367
2:45 PM	55	23	0	78	23	104	0	127	157	36	0	193	398
Total	196	79	0	275	86	453	0	539	485	169	0	654	1468
3:00 PM	80	17	0	97	19	131	0	150	131	39	0	170	417
3:15 PM	78	20	0	98	30	150	0	180	140	38	0	178	456
3:30 PM	54	17	0	71	27	167	0	194	151	42	0	193	458
3:45 PM	76	19	0	95	15	154	0	169	129	35	0	164	428
Total	288	73	0	361	91	602	0	693	551	154	0	705	1759
4:00 PM	82	17	0	99	17	145	0	162	160	34	0	194	455
4:15 PM	53	15	0	68	20	133	0	153	150	36	0	186	407
4:30 PM	64	24	0	88	12	155	0	167	148	20	0	168	423
4:45 PM	57	17	0	74	16	160	0	176	151	22	0	173	423
Total	256	73	0	329	65	593	0	658	609	112	0	721	1708
5:00 PM	126	22	0	148	22	181	0	203	170	26	0	196	547
5:15 PM	76	14	0	90	17	147	0	164	133	22	0	155	409
5:30 PM	50	12	0	62	10	123	0	133	131	31	0	162	357
5:45 PM	39	8	0	47	21	109	0	130	154	26	0	180	357
Total	291	56	0	347	70	560	0	630	588	105	0	693	1670
Grand Total	1031	281	0	1312	312	2208	0	2520	2233	540	0	2773	6605
Approach %	78.6	21.4	0.0		12.4	87.6	0.0		80.5	19.5	0.0		
Total %	15.6	4.3	0.0	19.9	4.7	33.4	0.0	38.2	33.8	8.2	0.0	42.0	
Exiting Leg Total				852				2514				3239	6605

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:30 PM	64	24	0	88	12	155	0	167	148	20	0	168	423
4:45 PM	57	17	0	74	16	160	0	176	151	22	0	173	423
5:00 PM	126	22	0	148	22	181	0	203	170	26	0	196	547
5:15 PM	76	14	0	90	17	147	0	164	133	22	0	155	409
Total Volume	323	77	0	400	67	643	0	710	602	90	0	692	1802
% Approach Total	80.8	19.3	0.0		9.4	90.6	0.0		87.0	13.0	0.0		
PHF	0.641	0.802	0.000	0.676	0.761	0.888	0.000	0.874	0.885	0.865	0.000	0.883	0.824
Entering Leg	323	77	0	400	67	643	0	710	602	90	0	692	1802
Exiting Leg				157				679				966	1802
Total				557				1389				1658	3604

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

PRECISION
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INDUSTRIES, LLC
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	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	1	0	0	1	0	2	0	2	8	0	0	8	11
2:15 PM	0	2	0	2	4	6	0	10	3	4	0	7	19
2:30 PM	3	5	0	8	2	3	0	5	6	0	0	6	19
2:45 PM	1	3	0	4	2	7	0	9	3	0	0	3	16
Total	5	10	0	15	8	18	0	26	20	4	0	24	65
3:00 PM	0	2	0	2	2	2	0	4	3	2	0	5	11
3:15 PM	1	0	0	1	3	3	0	6	4	1	0	5	12
3:30 PM	3	3	0	6	2	7	0	9	3	0	0	3	18
3:45 PM	0	2	0	2	0	2	0	2	5	2	0	7	11
Total	4	7	0	11	7	14	0	21	15	5	0	20	52
4:00 PM	1	1	0	2	2	2	0	4	3	2	0	5	11
4:15 PM	5	0	0	5	1	0	0	1	1	0	0	1	7
4:30 PM	1	0	0	1	1	3	0	4	6	1	0	7	12
4:45 PM	1	0	0	1	0	0	0	0	3	1	0	4	5
Total	8	1	0	9	4	5	0	9	13	4	0	17	35
5:00 PM	1	1	0	2	0	0	0	0	2	1	0	3	5
5:15 PM	2	0	0	2	0	2	0	2	1	0	0	1	5
5:30 PM	0	1	0	1	0	1	0	1	2	1	0	3	5
5:45 PM	0	0	0	0	0	1	0	1	6	0	0	6	7
Total	3	2	0	5	0	4	0	4	11	2	0	13	22
Grand Total	20	20	0	40	19	41	0	60	59	15	0	74	174
Approach %	50.0	50.0	0.0		31.7	68.3	0.0		79.7	20.3	0.0		
Total %	11.5	11.5	0.0	23.0	10.9	23.6	0.0	34.5	33.9	8.6	0.0	42.5	
Exiting Leg Total				34				79				61	174
Buses	5	3	0	8	4	1	0	5	4	4	0	8	21
% Buses	25.0	15.0	0.0	20.0	21.1	2.4	0.0	8.3	6.8	26.7	0.0	10.8	12.1
Exiting Leg Total				8				7				6	21
Single-Unit Trucks	12	16	0	28	14	38	0	52	50	7	0	57	137
% Single-Unit	60.0	80.0	0.0	70.0	73.7	92.7	0.0	86.7	84.7	46.7	0.0	77.0	78.7
Exiting Leg Total				21				66				50	137
Articulated Trucks	3	1	0	4	1	2	0	3	5	4	0	9	16
% Articulated	15.0	5.0	0.0	10.0	5.3	4.9	0.0	5.0	8.5	26.7	0.0	12.2	9.2
Exiting Leg Total				5				6				5	16

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:00 PM	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	1	0	0	1	0	2	0	2	8	0	0	8	11
2:15 PM	0	2	0	2	4	6	0	10	3	4	0	7	19
2:30 PM	3	5	0	8	2	3	0	5	6	0	0	6	19
2:45 PM	1	3	0	4	2	7	0	9	3	0	0	3	16
Total Volume	5	10	0	15	8	18	0	26	20	4	0	24	65
% Approach Total	33.3	66.7	0.0		30.8	69.2	0.0		83.3	16.7	0.0		
PHF	0.417	0.500	0.000	0.469	0.500	0.643	0.000	0.650	0.625	0.250	0.000	0.750	0.855
Buses	2	2	0	4	2	0	0	2	3	1	0	4	10
Buses %	40.0	20.0	0.0	26.7	25.0	0.0	0.0	7.7	15.0	25.0	0.0	16.7	15.4
Single-Unit Trucks	3	7	0	10	6	17	0	23	14	0	0	14	47
Single-Unit %	60.0	70.0	0.0	66.7	75.0	94.4	0.0	88.5	70.0	0.0	0.0	58.3	72.3
Articulated Trucks	0	1	0	1	0	1	0	1	3	3	0	6	8
Articulated %	0.0	10.0	0.0	6.7	0.0	5.6	0.0	3.8	15.0	75.0	0.0	25.0	12.3
Buses	2	2	0	4	2	0	0	2	3	1	0	4	10
Single-Unit Trucks	3	7	0	10	6	17	0	23	14	0	0	14	47
Articulated Trucks	0	1	0	1	0	1	0	1	3	3	0	6	8
Total Entering Leg	5	10	0	15	8	18	0	26	20	4	0	24	65
Buses				3				5				2	10
Single-Unit Trucks				6				21				20	47
Articulated Trucks				3				4				1	8
Total Exiting Leg				12				30				23	65

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	1	0	0	1	0	1	0	1	2
2:30 PM	1	1	0	2	1	0	0	1	3	0	0	3	6
2:45 PM	1	1	0	2	0	0	0	0	0	0	0	0	2
Total	2	2	0	4	2	0	0	2	3	1	0	4	10
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	1	0	0	1	0	1	0	1	0	1	0	1	3
3:30 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
3:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	1	1	0	2	1	1	0	2	1	1	0	2	6
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	1	0	0	1	1	0	0	1	0	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	1	0	0	1	0	1	0	1	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	0	0	0	0	0	1	0	1	2
Grand Total	5	3	0	8	4	1	0	5	4	4	0	8	21
Approach %	62.5	37.5	0.0		80.0	20.0	0.0		50.0	50.0	0.0		
Total %	23.8	14.3	0.0	38.1	19.0	4.8	0.0	23.8	19.0	19.0	0.0	38.1	
Exiting Leg Total				8				7				6	21

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:30 PM	1	1	0	2	1	0	0	1	3	0	0	3	6
2:45 PM	1	1	0	2	0	0	0	0	0	0	0	0	2
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	1	0	0	1	0	1	0	1	0	1	0	1	3
Total Volume	3	2	0	5	1	1	0	2	3	1	0	4	11
% Approach Total	60.0	40.0	0.0		50.0	50.0	0.0		75.0	25.0	0.0		
PHF	0.750	0.500	0.000	0.625	0.250	0.250	0.000	0.500	0.250	0.250	0.000	0.333	0.458
Entering Leg	3	2	0	5	1	1	0	2	3	1	0	4	11
Exiting Leg				2				5				4	11
Total				7				7				8	22

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
DATA
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Single-Unit Trucks

	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	1	0	0	1	0	2	0	2	7	0	0	7	10
2:15 PM	0	2	0	2	3	6	0	9	2	0	0	2	13
2:30 PM	2	3	0	5	1	3	0	4	2	0	0	2	11
2:45 PM	0	2	0	2	2	6	0	8	3	0	0	3	13
Total	3	7	0	10	6	17	0	23	14	0	0	14	47
3:00 PM	0	2	0	2	2	2	0	4	2	2	0	4	10
3:15 PM	0	0	0	0	3	2	0	5	4	0	0	4	9
3:30 PM	1	2	0	3	0	7	0	7	3	0	0	3	13
3:45 PM	0	2	0	2	0	2	0	2	4	2	0	6	10
Total	1	6	0	7	5	13	0	18	13	4	0	17	42
4:00 PM	1	1	0	2	2	2	0	4	3	2	0	5	11
4:15 PM	3	0	0	3	0	0	0	0	1	0	0	1	4
4:30 PM	1	0	0	1	1	3	0	4	5	0	0	5	10
4:45 PM	1	0	0	1	0	0	0	0	3	1	0	4	5
Total	6	1	0	7	3	5	0	8	12	3	0	15	30
5:00 PM	1	1	0	2	0	0	0	0	2	0	0	2	4
5:15 PM	1	0	0	1	0	1	0	1	1	0	0	1	3
5:30 PM	0	1	0	1	0	1	0	1	2	0	0	2	4
5:45 PM	0	0	0	0	0	1	0	1	6	0	0	6	7
Total	2	2	0	4	0	3	0	3	11	0	0	11	18
Grand Total	12	16	0	28	14	38	0	52	50	7	0	57	137
Approach %	42.9	57.1	0.0		26.9	73.1	0.0		87.7	12.3	0.0		
Total %	8.8	11.7	0.0	20.4	10.2	27.7	0.0	38.0	36.5	5.1	0.0	41.6	
Exiting Leg Total				21				66				50	137

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:00 PM	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				Total
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
2:00 PM	1	0	0	1	0	2	0	2	7	0	0	7	10
2:15 PM	0	2	0	2	3	6	0	9	2	0	0	2	13
2:30 PM	2	3	0	5	1	3	0	4	2	0	0	2	11
2:45 PM	0	2	0	2	2	6	0	8	3	0	0	3	13
Total Volume	3	7	0	10	6	17	0	23	14	0	0	14	47
% Approach Total	30.0	70.0	0.0		26.1	73.9	0.0		100.0	0.0	0.0		
PHF	0.375	0.583	0.000	0.500	0.500	0.708	0.000	0.639	0.500	0.000	0.000	0.500	0.904
Entering Leg	3	7	0	10	6	17	0	23	14	0	0	14	47
Exiting Leg				6				21				20	47
Total				16				44				34	94

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
DATA
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
2:15 PM	0	0	0	0	0	0	0	0	1	3	0	4	4
2:30 PM	0	1	0	1	0	0	0	0	1	0	0	1	2
2:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	0	1	0	1	0	1	0	1	3	3	0	6	8
3:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	2	0	0	2	1	0	0	1	0	0	0	0	3
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	2	1	0	0	1	1	0	0	1	4
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	0	0	0	0	1	0	0	1	2
5:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
5:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	0	1	0	1	2
Grand Total	3	1	0	4	1	2	0	3	5	4	0	9	16
Approach %	75.0	25.0	0.0		33.3	66.7	0.0		55.6	44.4	0.0		
Total %	18.8	6.3	0.0	25.0	6.3	12.5	0.0	18.8	31.3	25.0	0.0	56.3	
Exiting Leg Total				5				6				5	16

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:00 PM	Borthwick Avenue				Greenland Road (Route 33)				Greenland Road (Route 33)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
2:15 PM	0	0	0	0	0	0	0	0	1	3	0	4	4
2:30 PM	0	1	0	1	0	0	0	0	1	0	0	1	2
2:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	0	1	0	1	0	1	0	1	3	3	0	6	8
% Approach Total	0.0	100.0	0.0		0.0	100.0	0.0		50.0	50.0	0.0		
PHF	0.000	0.250	0.000	0.250	0.000	0.250	0.000	0.250	0.750	0.250	0.000	0.375	0.500
Entering Leg	0	1	0	1	0	1	0	1	3	3	0	6	8
Exiting Leg				3				4				1	8
Total				4				5				7	16

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**

PRECISION
DATA
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Bicycles (on Roadway and Crosswalks)**

	Borthwick Avenue						Greenland Road (Route 33)						Greenland Road (Route 33)						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						1	1

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:00 PM	Borthwick Avenue						Greenland Road (Route 33)						Greenland Road (Route 33)						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Exiting Leg						0						0						1	1
Total						0						1						1	2

PDI File #: **239200 A**
Location: **N: Borthwick Avenue**
Location: **E: Greenland Road (Route 33) W: Greenland Road (Route 33)**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
DATA
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Borthwick Avenue						Greenland Road (Route 33)						Greenland Road (Route 33)						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:00 PM

	Borthwick Avenue						Greenland Road (Route 33)						Greenland Road (Route 33)						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **239200 B**
Location: **S: Borthwick Avenue**
Location: **E: Borthwick Avenue W: Greenland Road**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION
DATA
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com
Email: datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	5	15	0	20	57	8	0	65	15	3	0	18	103
7:15 AM	5	22	0	27	60	12	0	72	28	2	0	30	129
7:30 AM	5	21	0	26	70	16	0	86	30	6	0	36	148
7:45 AM	3	27	0	30	122	21	0	143	36	10	0	46	219
Total	18	85	0	103	309	57	0	366	109	21	0	130	599
8:00 AM	7	18	0	25	76	20	0	96	33	8	0	41	162
8:15 AM	7	26	0	33	73	30	0	103	22	10	0	32	168
8:30 AM	4	27	0	31	69	13	0	82	18	5	0	23	136
8:45 AM	4	31	0	35	65	20	0	85	13	5	0	18	138
Total	22	102	0	124	283	83	0	366	86	28	0	114	604
Grand Total	40	187	0	227	592	140	0	732	195	49	0	244	1203
Approach %	17.6	82.4	0.0		80.9	19.1	0.0		79.9	20.1	0.0		
Total %	3.3	15.5	0.0	18.9	49.2	11.6	0.0	60.8	16.2	4.1	0.0	20.3	
Exiting Leg Total				641				382				180	1203
Cars	39	170	0	209	570	128	0	698	188	47	0	235	1142
% Cars	97.5	90.9	0.0	92.1	96.3	91.4	0.0	95.4	96.4	95.9	0.0	96.3	94.9
Exiting Leg Total				617				358				167	1142
Heavy Vehicles	1	17	0	18	22	12	0	34	7	2	0	9	61
% Heavy Vehicles	2.5	9.1	0.0	7.9	3.7	8.6	0.0	4.6	3.6	4.1	0.0	3.7	5.1
Exiting Leg Total				24				24				13	61

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:30 AM	5	21	0	26	70	16	0	86	30	6	0	36	148
7:45 AM	3	27	0	30	122	21	0	143	36	10	0	46	219
8:00 AM	7	18	0	25	76	20	0	96	33	8	0	41	162
8:15 AM	7	26	0	33	73	30	0	103	22	10	0	32	168
Total Volume	22	92	0	114	341	87	0	428	121	34	0	155	697
% Approach Total	19.3	80.7	0.0		79.7	20.3	0.0		78.1	21.9	0.0		
PHF	0.786	0.852	0.000	0.864	0.699	0.725	0.000	0.748	0.840	0.850	0.000	0.842	0.796
Cars	22	85	0	107	330	80	0	410	117	33	0	150	667
Cars %	100.0	92.4	0.0	93.9	96.8	92.0	0.0	95.8	96.7	97.1	0.0	96.8	95.7
Heavy Vehicles	0	7	0	7	11	7	0	18	4	1	0	5	30
Heavy Vehicles %	0.0	7.6	0.0	6.1	3.2	8.0	0.0	4.2	3.3	2.9	0.0	3.2	4.3
Cars Enter Leg	22	85	0	107	330	80	0	410	117	33	0	150	667
Heavy Enter Leg	0	7	0	7	11	7	0	18	4	1	0	5	30
Total Entering Leg	22	92	0	114	341	87	0	428	121	34	0	155	697
Cars Exiting Leg				363				202				102	667
Heavy Exiting Leg				12				11				7	30
Total Exiting Leg				375				213				109	697

PDI File #: **239200 B**
Location: **S: Borthwick Avenue**
Location: **E: Borthwick Avenue W: Greenland Road**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class: **Cars**

PRECISION
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INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
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	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	5	14	0	19	55	8	0	63	15	3	0	18	100
7:15 AM	5	19	0	24	58	10	0	68	26	2	0	28	120
7:30 AM	5	18	0	23	69	15	0	84	29	6	0	35	142
7:45 AM	3	25	0	28	119	18	0	137	34	10	0	44	209
Total	18	76	0	94	301	51	0	352	104	21	0	125	571
8:00 AM	7	17	0	24	76	18	0	94	32	7	0	39	157
8:15 AM	7	25	0	32	66	29	0	95	22	10	0	32	159
8:30 AM	4	26	0	30	66	11	0	77	18	5	0	23	130
8:45 AM	3	26	0	29	61	19	0	80	12	4	0	16	125
Total	21	94	0	115	269	77	0	346	84	26	0	110	571
Grand Total	39	170	0	209	570	128	0	698	188	47	0	235	1142
Approach %	18.7	81.3	0.0		81.7	18.3	0.0		80.0	20.0	0.0		
Total %	3.4	14.9	0.0	18.3	49.9	11.2	0.0	61.1	16.5	4.1	0.0	20.6	
Exiting Leg Total				617				358				167	1142

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:30 AM	5	18	0	23	69	15	0	84	29	6	0	35	142
7:45 AM	3	25	0	28	119	18	0	137	34	10	0	44	209
8:00 AM	7	17	0	24	76	18	0	94	32	7	0	39	157
8:15 AM	7	25	0	32	66	29	0	95	22	10	0	32	159
Total Volume	22	85	0	107	330	80	0	410	117	33	0	150	667
% Approach Total	20.6	79.4	0.0		80.5	19.5	0.0		78.0	22.0	0.0		
PHF	0.786	0.850	0.000	0.836	0.693	0.690	0.000	0.748	0.860	0.825	0.000	0.852	0.798
Entering Leg	22	85	0	107	330	80	0	410	117	33	0	150	667
Exiting Leg				363				202				102	667
Total				470				612				252	1334

PDI File #: **239200 B**
Location: **S: Borthwick Avenue**
Location: **E: Borthwick Avenue W: Greenland Road**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION
D A T A
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	0	1	0	1	2	0	0	2	0	0	0	0	3
7:15 AM	0	3	0	3	2	2	0	4	2	0	0	2	9
7:30 AM	0	3	0	3	1	1	0	2	1	0	0	1	6
7:45 AM	0	2	0	2	3	3	0	6	2	0	0	2	10
Total	0	9	0	9	8	6	0	14	5	0	0	5	28
8:00 AM	0	1	0	1	0	2	0	2	1	1	0	2	5
8:15 AM	0	1	0	1	7	1	0	8	0	0	0	0	9
8:30 AM	0	1	0	1	3	2	0	5	0	0	0	0	6
8:45 AM	1	5	0	6	4	1	0	5	1	1	0	2	13
Total	1	8	0	9	14	6	0	20	2	2	0	4	33
Grand Total	1	17	0	18	22	12	0	34	7	2	0	9	61
Approach %	5.6	94.4	0.0		64.7	35.3	0.0		77.8	22.2	0.0		
Total %	1.6	27.9	0.0	29.5	36.1	19.7	0.0	55.7	11.5	3.3	0.0	14.8	
Exiting Leg Total				24				24				13	61
Buses	0	3	0	3	3	7	0	10	5	1	0	6	19
% Buses	0.0	17.6	0.0	16.7	13.6	58.3	0.0	29.4	71.4	50.0	0.0	66.7	31.1
Exiting Leg Total				4				8				7	19
Single-Unit Trucks	1	11	0	12	17	5	0	22	2	1	0	3	37
% Single-Unit	100.0	64.7	0.0	66.7	77.3	41.7	0.0	64.7	28.6	50.0	0.0	33.3	60.7
Exiting Leg Total				18				13				6	37
Articulated Trucks	0	3	0	3	2	0	0	2	0	0	0	0	5
% Articulated	0.0	17.6	0.0	16.7	9.1	0.0	0.0	5.9	0.0	0.0	0.0	0.0	8.2
Exiting Leg Total				2				3				0	5

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	0	1	0	1	0	2	0	2	1	1	0	2	5
8:15 AM	0	1	0	1	7	1	0	8	0	0	0	0	9
8:30 AM	0	1	0	1	3	2	0	5	0	0	0	0	6
8:45 AM	1	5	0	6	4	1	0	5	1	1	0	2	13
Total Volume	1	8	0	9	14	6	0	20	2	2	0	4	33
% Approach Total	11.1	88.9	0.0		70.0	30.0	0.0		50.0	50.0	0.0		
PHF	0.250	0.400	0.000	0.375	0.500	0.750	0.000	0.625	0.500	0.500	0.000	0.500	0.635
Buses	0	2	0	2	2	3	0	5	2	1	0	3	10
Buses %	0.0	25.0	0.0	22.2	14.3	50.0	0.0	25.0	100.0	50.0	0.0	75.0	30.3
Single-Unit Trucks	1	5	0	6	10	3	0	13	0	1	0	1	20
Single-Unit %	100.0	62.5	0.0	66.7	71.4	50.0	0.0	65.0	0.0	50.0	0.0	25.0	60.6
Articulated Trucks	0	1	0	1	2	0	0	2	0	0	0	0	3
Articulated %	0.0	12.5	0.0	11.1	14.3	0.0	0.0	10.0	0.0	0.0	0.0	0.0	9.1
Buses	0	2	0	2	2	3	0	5	2	1	0	3	10
Single-Unit Trucks	1	5	0	6	10	3	0	13	0	1	0	1	20
Articulated Trucks	0	1	0	1	2	0	0	2	0	0	0	0	3
Total Entering Leg	1	8	0	9	14	6	0	20	2	2	0	4	33
Buses				3				4				3	10
Single-Unit Trucks				11				5				4	20
Articulated Trucks				2				1				0	3
Total Exiting Leg				16				10				7	33

PDI File #: **239200 B**
Location: **S: Borthwick Avenue**
Location: **E: Borthwick Avenue W: Greenland Road**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION
DATA
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	1	0	1	1	2	0	3	2	0	0	2	6
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	2	0	2	1	0	0	1	3
Total	0	1	0	1	1	4	0	5	3	0	0	3	9
8:00 AM	0	0	0	0	0	1	0	1	1	1	0	2	3
8:15 AM	0	1	0	1	1	0	0	1	0	0	0	0	2
8:30 AM	0	0	0	0	1	1	0	2	0	0	0	0	2
8:45 AM	0	1	0	1	0	1	0	1	1	0	0	1	3
Total	0	2	0	2	2	3	0	5	2	1	0	3	10
Grand Total	0	3	0	3	3	7	0	10	5	1	0	6	19
Approach %	0.0	100.0	0.0		30.0	70.0	0.0		83.3	16.7	0.0		
Total %	0.0	15.8	0.0	15.8	15.8	36.8	0.0	52.6	26.3	5.3	0.0	31.6	
Exiting Leg Total				4				8				7	19

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:15 AM	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:15 AM	0	1	0	1	1	2	0	3	2	0	0	2	6
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	2	0	2	1	0	0	1	3
8:00 AM	0	0	0	0	0	1	0	1	1	1	0	2	3
Total Volume	0	1	0	1	1	5	0	6	4	1	0	5	12
% Approach Total	0.0	100.0	0.0		16.7	83.3	0.0		80.0	20.0	0.0		
PHF	0.000	0.250	0.000	0.250	0.250	0.625	0.000	0.500	0.500	0.250	0.000	0.625	0.500
Entering Leg	0	1	0	1	1	5	0	6	4	1	0	5	12
Exiting Leg				2				5				5	12
Total				3				11				10	24

PRECISION
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INDUSTRIES, LLC
157 Washington Street, Suite 2
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PDI File #: **239200 B**
Location: **S: Borthwick Avenue**
Location: **E: Borthwick Avenue W: Greenland Road**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

Single-Unit Trucks

	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	0	0	0	0	2	0	0	2	0	0	0	0	2
7:15 AM	0	2	0	2	1	0	0	1	0	0	0	0	3
7:30 AM	0	2	0	2	1	1	0	2	1	0	0	1	5
7:45 AM	0	2	0	2	3	1	0	4	1	0	0	1	7
Total	0	6	0	6	7	2	0	9	2	0	0	2	17
8:00 AM	0	1	0	1	0	1	0	1	0	0	0	0	2
8:15 AM	0	0	0	0	5	1	0	6	0	0	0	0	6
8:30 AM	0	1	0	1	2	1	0	3	0	0	0	0	4
8:45 AM	1	3	0	4	3	0	0	3	0	1	0	1	8
Total	1	5	0	6	10	3	0	13	0	1	0	1	20
Grand Total	1	11	0	12	17	5	0	22	2	1	0	3	37
Approach %	8.3	91.7	0.0		77.3	22.7	0.0		66.7	33.3	0.0		
Total %	2.7	29.7	0.0	32.4	45.9	13.5	0.0	59.5	5.4	2.7	0.0	8.1	
Exiting Leg Total				18				13				6	37

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:30 AM	0	2	0	2	1	1	0	2	1	0	0	1	5
7:45 AM	0	2	0	2	3	1	0	4	1	0	0	1	7
8:00 AM	0	1	0	1	0	1	0	1	0	0	0	0	2
8:15 AM	0	0	0	0	5	1	0	6	0	0	0	0	6
Total Volume	0	5	0	5	9	4	0	13	2	0	0	2	20
% Approach Total	0.0	100.0	0.0		69.2	30.8	0.0		100.0	0.0	0.0		
PHF	0.000	0.625	0.000	0.625	0.450	1.000	0.000	0.542	0.500	0.000	0.000	0.500	0.714
Entering Leg	0	5	0	5	9	4	0	13	2	0	0	2	20
Exiting Leg				9				7				4	20
Total				14				20				6	40

PDI File #: **239200 B**
Location: **S: Borthwick Avenue**
Location: **E: Borthwick Avenue W: Greenland Road**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:

PRECISION
DATA
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
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Articulated Trucks

	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
7:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	2	0	0	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	0	1	1	0	0	1	0	0	0	0	2
Total	0	1	0	1	2	0	0	2	0	0	0	0	3
Grand Total	0	3	0	3	2	0	0	2	0	0	0	0	5
Approach %	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	60.0	0.0	60.0	40.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	
Exiting Leg Total				2				3				0	5

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

8:00 AM	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	0	1	1	0	0	1	0	0	0	0	2
Total Volume	0	1	0	1	2	0	0	2	0	0	0	0	3
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.250	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.375
Entering Leg	0	1	0	1	2	0	0	2	0	0	0	0	3
Exiting Leg				2				1				0	3
Total				3				3				0	6

PDI File #: **239200 B**
Location: **S: Borthwick Avenue**
Location: **E: Borthwick Avenue W: Greenland Road**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **7:00 AM**
End Time: **9:00 AM**

PRECISION
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INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class:

Bicycles (on Roadway and Crosswalks)

	Borthwick Avenue						Borthwick Avenue						Greenland Road						
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Borthwick Avenue						Borthwick Avenue						Greenland Road						
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #:	**239200 B**
Location:	**S: Borthwick Avenue**
Location:	**E: Borthwick Avenue W: Greenland Road**
City, State:	**Portsmouth, NH**
Client:	**TFMoran/ J. Porter**
Site Code:	**47528.00**
Count Date:	**Thursday, March 9, 2023**
Start Time:	**7:00 AM**
End Time:	**9:00 AM**
Class:	

PRECISION
D A T A
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Borthwick Avenue						Borthwick Avenue						Greenland Road						
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Borthwick Avenue						Borthwick Avenue						Greenland Road						
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **239200 B**
Location: **S: Borthwick Avenue**
Location: **E: Borthwick Avenue W: Greenland Road**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
DATA
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Cars and Heavy Vehicles (Combined)

	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:00 PM	4	43	0	47	41	21	0	62	14	6	0	20	129
2:15 PM	3	45	0	48	53	27	0	80	15	11	0	26	154
2:30 PM	9	68	0	77	44	20	0	64	23	7	0	30	171
2:45 PM	5	59	0	64	43	23	0	66	16	8	0	24	154
Total	21	215	0	236	181	91	0	272	68	32	0	100	608
3:00 PM	4	81	0	85	46	16	0	62	22	1	0	23	170
3:15 PM	9	80	0	89	41	31	1	73	18	4	0	22	184
3:30 PM	8	63	0	71	46	24	0	70	18	12	0	30	171
3:45 PM	9	69	0	78	30	21	0	51	24	7	0	31	160
Total	30	293	0	323	163	92	1	256	82	24	0	106	685
4:00 PM	6	82	0	88	33	22	0	55	23	3	0	26	169
4:15 PM	4	59	0	63	24	36	0	60	21	3	0	24	147
4:30 PM	8	59	0	67	20	13	0	33	24	7	0	31	131
4:45 PM	10	51	0	61	17	23	0	40	27	7	0	34	135
Total	28	251	0	279	94	94	0	188	95	20	0	115	582
5:00 PM	6	119	0	125	28	20	0	48	29	10	0	39	212
5:15 PM	2	68	0	70	19	21	0	40	25	2	0	27	137
5:30 PM	5	37	0	42	19	22	1	42	23	5	0	28	112
5:45 PM	4	33	0	37	27	19	0	46	18	6	0	24	107
Total	17	257	0	274	93	82	1	176	95	23	0	118	568
Grand Total	96	1016	0	1112	531	359	2	892	340	99	0	439	2443
Approach %	8.6	91.4	0.0		59.5	40.2	0.2		77.4	22.6	0.0		
Total %	3.9	41.6	0.0	45.5	21.7	14.7	0.1	36.5	13.9	4.1	0.0	18.0	
Exiting Leg Total				630				1358				455	2443
Cars	92	993	0	1085	506	349	2	857	329	96	0	425	2367
% Cars	95.8	97.7	0.0	97.6	95.3	97.2	100.0	96.1	96.8	97.0	0.0	96.8	96.9
Exiting Leg Total				602				1324				441	2367
Heavy Vehicles	4	23	0	27	25	10	0	35	11	3	0	14	76
% Heavy Vehicles	4.2	2.3	0.0	2.4	4.7	2.8	0.0	3.9	3.2	3.0	0.0	3.2	3.1
Exiting Leg Total				28				34				14	76

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

3:00 PM	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
3:00 PM	4	81	0	85	46	16	0	62	22	1	0	23	170
3:15 PM	9	80	0	89	41	31	1	73	18	4	0	22	184
3:30 PM	8	63	0	71	46	24	0	70	18	12	0	30	171
3:45 PM	9	69	0	78	30	21	0	51	24	7	0	31	160
Total Volume	30	293	0	323	163	92	1	256	82	24	0	106	685
% Approach Total	9.3	90.7	0.0		63.7	35.9	0.4		77.4	22.6	0.0		
PHF	0.833	0.904	0.000	0.907	0.886	0.742	0.250	0.877	0.854	0.500	0.000	0.855	0.931
Cars	29	285	0	314	154	89	1	244	79	23	0	102	660
Cars %	96.7	97.3	0.0	97.2	94.5	96.7	100.0	95.3	96.3	95.8	0.0	96.2	96.4
Heavy Vehicles	1	8	0	9	9	3	0	12	3	1	0	4	25
Heavy Vehicles %	3.3	2.7	0.0	2.8	5.5	3.3	0.0	4.7	3.7	4.2	0.0	3.8	3.6
Cars Enter Leg	29	285	0	314	154	89	1	244	79	23	0	102	660
Heavy Enter Leg	1	8	0	9	9	3	0	12	3	1	0	4	25
Total Entering Leg	30	293	0	323	163	92	1	256	82	24	0	106	685
Cars Exiting Leg				177				365				118	660
Heavy Exiting Leg				10				11				4	25
Total Exiting Leg				187				376				122	685

PDI File #: **239200 B**
Location: **S: Borthwick Avenue**
Location: **E: Borthwick Avenue W: Greenland Road**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class: **Cars**

PRECISION
DATA
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:00 PM	4	42	0	46	40	21	0	61	14	6	0	20	127
2:15 PM	3	43	0	46	48	25	0	73	15	11	0	26	145
2:30 PM	9	63	0	72	43	19	0	62	21	6	0	27	161
2:45 PM	5	57	0	62	41	23	0	64	15	8	0	23	149
Total	21	205	0	226	172	88	0	260	65	31	0	96	582
3:00 PM	4	79	0	83	42	16	0	58	22	1	0	23	164
3:15 PM	9	80	0	89	38	30	1	69	17	4	0	21	179
3:30 PM	8	59	0	67	45	22	0	67	16	11	0	27	161
3:45 PM	8	67	0	75	29	21	0	50	24	7	0	31	156
Total	29	285	0	314	154	89	1	244	79	23	0	102	660
4:00 PM	6	82	0	88	31	20	0	51	22	3	0	25	164
4:15 PM	3	57	0	60	24	35	0	59	20	2	0	22	141
4:30 PM	8	59	0	67	18	13	0	31	24	7	0	31	129
4:45 PM	8	51	0	59	16	23	0	39	26	7	0	33	131
Total	25	249	0	274	89	91	0	180	92	19	0	111	565
5:00 PM	6	118	0	124	27	20	0	47	28	10	0	38	209
5:15 PM	2	66	0	68	19	20	0	39	25	2	0	27	134
5:30 PM	5	37	0	42	18	22	1	41	22	5	0	27	110
5:45 PM	4	33	0	37	27	19	0	46	18	6	0	24	107
Total	17	254	0	271	91	81	1	173	93	23	0	116	560
Grand Total	92	993	0	1085	506	349	2	857	329	96	0	425	2367
Approach %	8.5	91.5	0.0		59.0	40.7	0.2		77.4	22.6	0.0		
Total %	3.9	42.0	0.0	45.8	21.4	14.7	0.1	36.2	13.9	4.1	0.0	18.0	
Exiting Leg Total				602				1324				441	2367

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

3:00 PM	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
3:00 PM	4	79	0	83	42	16	0	58	22	1	0	23	164
3:15 PM	9	80	0	89	38	30	1	69	17	4	0	21	179
3:30 PM	8	59	0	67	45	22	0	67	16	11	0	27	161
3:45 PM	8	67	0	75	29	21	0	50	24	7	0	31	156
Total Volume	29	285	0	314	154	89	1	244	79	23	0	102	660
% Approach Total	9.2	90.8	0.0		63.1	36.5	0.4		77.5	22.5	0.0		
PHF	0.806	0.891	0.000	0.882	0.856	0.742	0.250	0.884	0.823	0.523	0.000	0.823	0.922
Entering Leg	29	285	0	314	154	89	1	244	79	23	0	102	660
Exiting Leg				177				365				118	660
Total				491				609				220	1320

PDI File #: **239200 B**
Location: **S: Borthwick Avenue**
Location: **E: Borthwick Avenue W: Greenland Road**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)

	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:00 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
2:15 PM	0	2	0	2	5	2	0	7	0	0	0	0	9
2:30 PM	0	5	0	5	1	1	0	2	2	1	0	3	10
2:45 PM	0	2	0	2	2	0	0	2	1	0	0	1	5
Total	0	10	0	10	9	3	0	12	3	1	0	4	26
3:00 PM	0	2	0	2	4	0	0	4	0	0	0	0	6
3:15 PM	0	0	0	0	3	1	0	4	1	0	0	1	5
3:30 PM	0	4	0	4	1	2	0	3	2	1	0	3	10
3:45 PM	1	2	0	3	1	0	0	1	0	0	0	0	4
Total	1	8	0	9	9	3	0	12	3	1	0	4	25
4:00 PM	0	0	0	0	2	2	0	4	1	0	0	1	5
4:15 PM	1	2	0	3	0	1	0	1	1	1	0	2	6
4:30 PM	0	0	0	0	2	0	0	2	0	0	0	0	2
4:45 PM	2	0	0	2	1	0	0	1	1	0	0	1	4
Total	3	2	0	5	5	3	0	8	3	1	0	4	17
5:00 PM	0	1	0	1	1	0	0	1	1	0	0	1	3
5:15 PM	0	2	0	2	0	1	0	1	0	0	0	0	3
5:30 PM	0	0	0	0	1	0	0	1	1	0	0	1	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	3	0	3	2	1	0	3	2	0	0	2	8
Grand Total	4	23	0	27	25	10	0	35	11	3	0	14	76
Approach %	14.8	85.2	0.0		71.4	28.6	0.0		78.6	21.4	0.0		
Total %	5.3	30.3	0.0	35.5	32.9	13.2	0.0	46.1	14.5	3.9	0.0	18.4	
Exiting Leg Total				28				34				14	76
Buses	0	3	0	3	2	6	0	8	5	2	0	7	18
% Buses	0.0	13.0	0.0	11.1	8.0	60.0	0.0	22.9	45.5	66.7	0.0	50.0	23.7
Exiting Leg Total				4				8				6	18
Single-Unit Trucks	4	17	0	21	17	2	0	19	5	1	0	6	46
% Single-Unit	100.0	73.9	0.0	77.8	68.0	20.0	0.0	54.3	45.5	33.3	0.0	42.9	60.5
Exiting Leg Total				18				22				6	46
Articulated Trucks	0	3	0	3	6	2	0	8	1	0	0	1	12
% Articulated	0.0	13.0	0.0	11.1	24.0	20.0	0.0	22.9	9.1	0.0	0.0	7.1	15.8
Exiting Leg Total				6				4				2	12

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:15 PM	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:15 PM	0	2	0	2	5	2	0	7	0	0	0	0	9
2:30 PM	0	5	0	5	1	1	0	2	2	1	0	3	10
2:45 PM	0	2	0	2	2	0	0	2	1	0	0	1	5
3:00 PM	0	2	0	2	4	0	0	4	0	0	0	0	6
Total Volume	0	11	0	11	12	3	0	15	3	1	0	4	30
% Approach Total	0.0	100.0	0.0		80.0	20.0	0.0		75.0	25.0	0.0		
PHF	0.000	0.550	0.000	0.550	0.600	0.375	0.000	0.536	0.375	0.250	0.000	0.333	0.750
Buses	0	1	0	1	0	3	0	3	3	1	0	4	8
Buses %	0.0	9.1	0.0	9.1	0.0	100.0	0.0	20.0	100.0	100.0	0.0	100.0	26.7
Single-Unit Trucks	0	8	0	8	8	0	0	8	0	0	0	0	16
Single-Unit %	0.0	72.7	0.0	72.7	66.7	0.0	0.0	53.3	0.0	0.0	0.0	0.0	53.3
Articulated Trucks	0	2	0	2	4	0	0	4	0	0	0	0	6
Articulated %	0.0	18.2	0.0	18.2	33.3	0.0	0.0	26.7	0.0	0.0	0.0	0.0	20.0
Buses	0	1	0	1	0	3	0	3	3	1	0	4	8
Single-Unit Trucks	0	8	0	8	8	0	0	8	0	0	0	0	16
Articulated Trucks	0	2	0	2	4	0	0	4	0	0	0	0	6
Total Entering Leg	0	11	0	11	12	3	0	15	3	1	0	4	30
Buses				1				4				3	8
Single-Unit Trucks				8				8				0	16
Articulated Trucks				4				2				0	6
Total Exiting Leg				13				14				3	30

PDI File #: **239200 B**
Location: **S: Borthwick Avenue**
Location: **E: Borthwick Avenue W: Greenland Road**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Buses

	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	2	0	2	0	0	0	0	2
2:30 PM	0	1	0	1	0	1	0	1	2	1	0	3	5
2:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	1	0	1	0	3	0	3	3	1	0	4	8
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	1	0	1	1	0	0	1	2
3:30 PM	0	0	0	0	0	1	0	1	1	0	0	1	2
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	2	2	0	0	2	4
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	1	0	1	0	1	0	1	0	1	3
4:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	1	1	0	2	0	1	0	1	4
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	1	0	0	1	0	0	0	0	2
Grand Total	0	3	0	3	2	6	0	8	5	2	0	7	18
Approach %	0.0	100.0	0.0		25.0	75.0	0.0		71.4	28.6	0.0		
Total %	0.0	16.7	0.0	16.7	11.1	33.3	0.0	44.4	27.8	11.1	0.0	38.9	
Exiting Leg Total				4				8				6	18

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:00 PM	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	2	0	2	0	0	0	0	2
2:30 PM	0	1	0	1	0	1	0	1	2	1	0	3	5
2:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	0	1	0	1	0	3	0	3	3	1	0	4	8
% Approach Total	0.0	100.0	0.0		0.0	100.0	0.0		75.0	25.0	0.0		
PHF	0.000	0.250	0.000	0.250	0.000	0.375	0.000	0.375	0.375	0.250	0.000	0.333	0.400
Entering Leg	0	1	0	1	0	3	0	3	3	1	0	4	8
Exiting Leg				1				4				3	8
Total				2				7				7	16

PDI File #: **239200 B**
Location: **S: Borthwick Avenue**
Location: **E: Borthwick Avenue W: Greenland Road**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Single-Unit Trucks

	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
2:15 PM	0	2	0	2	2	0	0	2	0	0	0	0	4
2:30 PM	0	2	0	2	1	0	0	1	0	0	0	0	3
2:45 PM	0	2	0	2	2	0	0	2	0	0	0	0	4
Total	0	7	0	7	5	0	0	5	0	0	0	0	12
3:00 PM	0	2	0	2	3	0	0	3	0	0	0	0	5
3:15 PM	0	0	0	0	3	0	0	3	0	0	0	0	3
3:30 PM	0	3	0	3	1	0	0	1	0	1	0	1	5
3:45 PM	1	2	0	3	1	0	0	1	0	0	0	0	4
Total	1	7	0	8	8	0	0	8	0	1	0	1	17
4:00 PM	0	0	0	0	2	1	0	3	1	0	0	1	4
4:15 PM	1	1	0	2	0	0	0	0	1	0	0	1	3
4:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
4:45 PM	2	0	0	2	1	0	0	1	1	0	0	1	4
Total	3	1	0	4	4	1	0	5	3	0	0	3	12
5:00 PM	0	1	0	1	0	0	0	0	1	0	0	1	2
5:15 PM	0	1	0	1	0	1	0	1	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	2	0	1	0	1	2	0	0	2	5
Grand Total	4	17	0	21	17	2	0	19	5	1	0	6	46
Approach %	19.0	81.0	0.0		89.5	10.5	0.0		83.3	16.7	0.0		
Total %	8.7	37.0	0.0	45.7	37.0	4.3	0.0	41.3	10.9	2.2	0.0	13.0	
Exiting Leg Total				18				22				6	46

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:45 PM	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:45 PM	0	2	0	2	2	0	0	2	0	0	0	0	4
3:00 PM	0	2	0	2	3	0	0	3	0	0	0	0	5
3:15 PM	0	0	0	0	3	0	0	3	0	0	0	0	3
3:30 PM	0	3	0	3	1	0	0	1	0	1	0	1	5
Total Volume	0	7	0	7	9	0	0	9	0	1	0	1	17
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.000	0.583	0.000	0.583	0.750	0.000	0.000	0.750	0.000	0.250	0.000	0.250	0.850
Entering Leg	0	7	0	7	9	0	0	9	0	1	0	1	17
Exiting Leg				10				7				0	17
Total				17				16				1	34

PDI File #: **239200 B**
Location: **S: Borthwick Avenue**
Location: **E: Borthwick Avenue W: Greenland Road**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
D A T A
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Articulated Trucks

	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
2:15 PM	0	0	0	0	3	0	0	3	0	0	0	0	3
2:30 PM	0	2	0	2	0	0	0	0	0	0	0	0	2
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	2	4	0	0	4	0	0	0	0	6
3:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	1	0	1	0	1	0	1	1	0	0	1	3
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	1	1	0	2	1	0	0	1	4
4:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	0	0	0	0	1
5:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	1	0	0	0	0	1
Grand Total	0	3	0	3	6	2	0	8	1	0	0	1	12
Approach %	0.0	100.0	0.0		75.0	25.0	0.0		100.0	0.0	0.0		
Total %	0.0	25.0	0.0	25.0	50.0	16.7	0.0	66.7	8.3	0.0	0.0	8.3	
Exiting Leg Total				6				4				2	12

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:00 PM	Borthwick Avenue				Borthwick Avenue				Greenland Road				
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Total
2:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
2:15 PM	0	0	0	0	3	0	0	3	0	0	0	0	3
2:30 PM	0	2	0	2	0	0	0	0	0	0	0	0	2
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	0	2	4	0	0	4	0	0	0	0	6
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.250	0.333	0.000	0.000	0.333	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	2	0	2	4	0	0	4	0	0	0	0	6
Exiting Leg				4				2				0	6
Total				6				6				0	12

PDI File #: **239200 B**
Location: **S: Borthwick Avenue**
Location: **E: Borthwick Avenue W: Greenland Road**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**

PRECISION
DATA
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Class: **Bicycles (on Roadway and Crosswalks)**

	Borthwick Avenue						Borthwick Avenue						Greenland Road						
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:00 PM	Borthwick Avenue						Borthwick Avenue						Greenland Road						
	from East						from South						from West						Total
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **239200 B**
Location: **S: Borthwick Avenue**
Location: **E: Borthwick Avenue W: Greenland Road**
City, State: **Portsmouth, NH**
Client: **TFMoran/ J. Porter**
Site Code: **47528.00**
Count Date: **Thursday, March 9, 2023**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class:

PRECISION
DATA
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

Pedestrians

	Borthwick Avenue						Borthwick Avenue						Greenland Road						
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:00 PM	Borthwick Avenue						Borthwick Avenue						Greenland Road						
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

Sherburne Road
south of School Driveway
City, State: Portsmouth, NH
Client: TF Moran/ J. Porter
Site Code: 47528

PDI File #: 239200 ATR-A

PRECISION
D A T A
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com
Email: datarequests@pdillc.com

Count Date: **Thursday, March 9, 2023**
Direction: **NB**

AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 AM	0	0	5	0	0	0	5
12:15 AM	0	0	1	0	0	0	1
12:30 AM	0	0	1	0	0	0	1
12:45 AM	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0
1:15 AM	0	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0	0
2:00 AM	0	0	3	0	0	0	3
2:15 AM	0	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0	0
2:45 AM	0	0	2	0	0	0	2
3:00 AM	0	0	1	0	0	0	1
3:15 AM	0	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0
4:15 AM	0	0	0	0	1	0	1
4:30 AM	0	0	0	0	0	0	0
4:45 AM	0	0	0	0	0	0	0
5:00 AM	0	0	2	0	0	0	2
5:15 AM	0	0	1	0	0	0	1
5:30 AM	0	0	0	0	0	0	0
5:45 AM	0	0	0	0	0	0	0
6:00 AM	0	0	3	0	0	0	3
6:15 AM	0	0	2	0	0	0	2
6:30 AM	0	0	4	0	0	0	4
6:45 AM	0	0	5	0	0	0	5
7:00 AM	0	0	7	0	0	0	7
7:15 AM	0	0	9	2	0	0	11
7:30 AM	0	0	12	0	1	0	13
7:45 AM	0	0	11	2	0	0	13
8:00 AM	0	0	10	1	0	0	11
8:15 AM	0	0	16	0	1	0	17
8:30 AM	0	0	7	1	1	0	9
8:45 AM	0	0	6	0	0	0	6
9:00 AM	0	0	13	0	1	0	14
9:15 AM	0	0	9	0	0	0	9
9:30 AM	0	0	5	0	0	0	5
9:45 AM	0	0	7	1	0	0	8
10:00 AM	0	0	8	0	3	0	11
10:15 AM	0	0	10	0	0	0	10
10:30 AM	0	0	9	0	0	0	9
10:45 AM	0	0	8	1	1	0	10
11:00 AM	0	0	5	0	2	0	7
11:15 AM	0	0	13	1	0	0	14
11:30 AM	0	0	6	1	0	0	7
11:45 AM	0	0	11	0	0	0	11
AM Total	**0**	**0**	**212**	**10**	**11**	**0**	**233**
Percentage	**0.00%**	**0.00%**	**90.99%**	**4.29%**	**4.72%**	**0.00%**	
AM Peak	**12:00 AM**	**12:00 AM**	**7:30 AM**	**7:15 AM**	**10:00 AM**	**12:00 AM**	**7:30 AM**
Volume	**0**	**0**	**49**	**5**	**4**	**0**	**54**

PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 PM	0	0	13	0	0	0	13
12:15 PM	0	0	19	0	0	0	19
12:30 PM	0	0	16	0	0	0	16
12:45 PM	0	0	22	1	0	0	23
1:00 PM	0	0	18	0	0	0	18
1:15 PM	0	0	10	0	0	0	10
1:30 PM	0	0	15	0	1	0	16
1:45 PM	0	0	14	0	0	0	14
2:00 PM	0	0	17	0	0	0	17
2:15 PM	0	0	20	2	1	0	23
2:30 PM	0	0	18	1	0	0	19
2:45 PM	0	0	16	0	0	0	16
3:00 PM	0	0	13	0	0	0	13
3:15 PM	0	0	25	1	0	0	26
3:30 PM	0	0	21	1	0	1	23
3:45 PM	0	0	20	0	1	0	21
4:00 PM	0	0	15	0	1	0	16
4:15 PM	0	0	33	1	0	0	34
4:30 PM	0	0	14	0	0	0	14
4:45 PM	0	0	22	0	0	0	22
5:00 PM	0	0	19	0	0	0	19
5:15 PM	0	0	17	0	0	0	17
5:30 PM	0	0	24	0	0	0	24
5:45 PM	0	0	17	0	0	0	17
6:00 PM	0	0	18	0	0	0	18
6:15 PM	0	0	20	0	0	0	20
6:30 PM	0	0	15	0	0	0	15
6:45 PM	0	0	17	0	0	0	17
7:00 PM	1	0	17	0	0	0	18
7:15 PM	0	0	7	0	0	0	7
7:30 PM	0	0	13	0	0	0	13
7:45 PM	0	0	8	0	0	0	8
8:00 PM	0	0	10	0	0	0	10
8:15 PM	0	0	11	0	0	0	11
8:30 PM	0	0	7	0	0	0	7
8:45 PM	0	0	7	0	0	0	7
9:00 PM	0	0	7	0	0	0	7
9:15 PM	0	0	5	0	0	0	5
9:30 PM	0	0	4	0	0	0	4
9:45 PM	0	0	9	0	0	0	9
10:00 PM	0	0	6	0	0	0	6
10:15 PM	0	0	4	0	0	0	4
10:30 PM	0	0	1	0	0	0	1
10:45 PM	0	0	2	0	0	0	2
11:00 PM	0	0	3	0	0	0	3
11:15 PM	0	0	0	0	0	0	0
11:30 PM	0	0	1	0	0	0	1
11:45 PM	0	0	1	0	0	0	1
PM Total	**1**	**0**	**631**	**7**	**4**	**1**	**644**
Percentage	**0.16%**	**0.00%**	**97.98%**	**1.09%**	**0.62%**	**0.16%**	
PM Peak	**6:15 PM**	**12:00 PM**	**3:30 PM**	**1:45 PM**	**1:30 PM**	**2:45 PM**	**3:30 PM**
Volume	**1**	**0**	**89**	**3**	**2**	**1**	**94**
Day Total	**1**	**0**	**843**	**17**	**15**	**1**	**877**
Percentage	**0.11%**	**0.00%**	**96.12%**	**1.94%**	**1.71%**	**0.11%**	

Sherburne Road
south of School Driveway
City, State: Portsmouth, NH
Client: TF Moran/ J. Porter
Site Code: 47528

PRECISION
D A T A
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com
Email: datarequests@pdillc.com

PDI File #: 239200 ATR-A

Count Date: **Thursday, March 9, 2023**
Direction: **SB**

AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total	PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
12:00 AM	0	0	0	0	0	0	0	12:00 PM	0	0	13	0	0	0	13
12:15 AM	0	0	0	0	0	0	0	12:15 PM	0	0	9	0	0	0	9
12:30 AM	0	0	1	0	0	0	1	12:30 PM	0	0	13	0	0	0	13
12:45 AM	0	0	1	0	0	0	1	12:45 PM	0	0	14	0	3	0	17
1:00 AM	0	0	0	0	0	0	0	1:00 PM	0	0	17	0	0	0	17
1:15 AM	0	0	0	0	0	0	0	1:15 PM	0	0	11	0	0	0	11
1:30 AM	0	0	1	0	0	0	1	1:30 PM	0	0	13	0	0	0	13
1:45 AM	0	0	0	0	0	0	0	1:45 PM	0	0	14	0	1	0	15
2:00 AM	0	0	1	0	0	0	1	2:00 PM	0	0	15	0	0	0	15
2:15 AM	0	0	1	0	0	0	1	2:15 PM	0	0	18	0	0	0	18
2:30 AM	0	0	1	0	0	0	1	2:30 PM	0	0	16	2	0	0	18
2:45 AM	0	0	0	0	0	0	0	2:45 PM	0	0	9	1	0	0	10
3:00 AM	0	0	0	0	0	0	0	3:00 PM	0	0	10	0	0	0	10
3:15 AM	0	0	2	0	0	0	2	3:15 PM	0	0	15	1	0	0	16
3:30 AM	0	0	0	0	0	0	0	3:30 PM	0	0	17	1	0	1	19
3:45 AM	0	0	1	0	0	0	1	3:45 PM	0	0	17	0	0	0	17
4:00 AM	0	0	1	0	0	0	1	4:00 PM	0	0	14	0	1	0	15
4:15 AM	0	0	0	0	1	0	1	4:15 PM	0	0	9	1	0	0	10
4:30 AM	0	0	3	0	0	0	3	4:30 PM	0	0	19	0	0	0	19
4:45 AM	0	0	3	0	0	0	3	4:45 PM	0	0	15	0	0	0	15
5:00 AM	0	0	4	0	0	0	4	5:00 PM	0	0	16	0	0	0	16
5:15 AM	0	0	5	0	0	0	5	5:15 PM	0	0	17	0	0	0	17
5:30 AM	0	0	3	0	0	0	3	5:30 PM	0	0	14	0	0	0	14
5:45 AM	0	0	14	0	0	0	14	5:45 PM	0	0	12	0	0	0	12
6:00 AM	0	0	3	0	0	0	3	6:00 PM	0	0	5	0	0	0	5
6:15 AM	0	0	12	0	0	0	12	6:15 PM	0	0	12	0	0	0	12
6:30 AM	0	0	9	0	0	0	9	6:30 PM	0	0	12	0	0	0	12
6:45 AM	0	0	10	0	0	0	10	6:45 PM	0	0	12	0	0	0	12
7:00 AM	0	0	16	0	0	0	16	7:00 PM	0	0	9	0	0	0	9
7:15 AM	0	0	24	2	0	0	26	7:15 PM	0	0	11	0	0	0	11
7:30 AM	0	0	29	0	1	0	30	7:30 PM	0	0	8	0	0	0	8
7:45 AM	0	0	38	1	1	0	40	7:45 PM	0	0	5	0	0	0	5
8:00 AM	0	0	31	2	0	0	33	8:00 PM	0	0	4	0	0	0	4
8:15 AM	0	0	29	0	0	0	29	8:15 PM	0	0	3	0	0	0	3
8:30 AM	0	0	16	0	1	0	17	8:30 PM	0	0	2	0	0	0	2
8:45 AM	0	0	14	1	1	0	16	8:45 PM	0	0	2	0	0	0	2
9:00 AM	0	0	11	0	0	0	11	9:00 PM	0	0	2	0	0	0	2
9:15 AM	0	0	14	0	0	0	14	9:15 PM	0	0	5	0	0	0	5
9:30 AM	0	0	13	0	0	0	13	9:30 PM	0	0	3	0	0	0	3
9:45 AM	0	0	13	1	0	0	14	9:45 PM	0	0	1	0	0	0	1
10:00 AM	0	0	9	0	0	0	9	10:00 PM	0	0	3	0	0	0	3
10:15 AM	0	0	4	0	0	0	4	10:15 PM	0	0	0	0	0	0	0
10:30 AM	0	0	13	0	0	0	13	10:30 PM	0	0	1	0	0	0	1
10:45 AM	0	0	17	1	0	0	18	10:45 PM	0	0	0	0	0	0	0
11:00 AM	0	0	4	0	1	0	5	11:00 PM	0	0	2	0	0	0	2
11:15 AM	0	0	12	1	2	0	15	11:15 PM	0	0	0	0	0	0	0
11:30 AM	0	0	14	1	0	0	15	11:30 PM	0	0	3	0	0	0	3
11:45 AM	0	0	9	0	0	0	9	11:45 PM	0	0	1	0	0	0	1
AM Total	**0**	**0**	**406**	**10**	**8**	**0**	**424**	**PM Total**	**0**	**0**	**443**	**6**	**5**	**1**	**455**
Percentage	**0.00%**	**0.00%**	**95.75%**	**2.36%**	**1.89%**	**0.00%**		**Percentage**	**0.00%**	**0.00%**	**97.36%**	**1.32%**	**1.10%**	**0.22%**	
AM Peak	12:00 AM	12:00 AM	7:30 AM	7:15 AM	10:30 AM	12:00 AM	7:30 AM	**PM Peak**	12:00 PM	12:00 PM	4:30 PM	2:30 PM	12:00 PM	2:45 PM	3:15 PM
Volume	**0**	**0**	**127**	**5**	**3**	**0**	**132**	**Volume**	**0**	**0**	**67**	**4**	**3**	**1**	**67**
								Day Total	**0**	**0**	**849**	**16**	**13**	**1**	**879**
								Percentage	**0.00%**	**0.00%**	**96.59%**	**1.82%**	**1.48%**	**0.11%**	

Sherburne Road
just south of School Driveway
City, State: Portsmouth, NH
Client: TF Moran/ J. Porter
Site Code: 47528.00

PRECISION
D A T A
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com
Email: datarequests@pdillc.com

PDI File #: 239200 ATR-A (Speed)

Count Date
Thursday, March 9, 2023

Speed (60-minute)

NB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	1	1	3	2	0	0	0	0	0	0	0	7	35.1	30.0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
2:00 AM	1	0	1	4	0	0	0	0	0	0	0	0	0	6	28.3	23.3
3:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	1	29.0	29.0
4:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	22.0	22.0
5:00 AM	0	0	1	1	1	0	0	0	0	0	0	0	0	3	29.2	25.3
6:00 AM	0	0	1	5	7	1	0	0	0	0	0	0	0	14	34.0	30.1
7:00 AM	0	0	9	21	10	1	0	0	0	0	0	0	0	41	31.0	27.7
8:00 AM	0	0	12	23	8	0	0	0	0	0	0	0	0	43	30.0	26.5
9:00 AM	0	0	4	19	14	0	0	0	0	0	0	0	0	37	32.0	28.5
10:00 AM	0	1	6	23	8	1	1	0	0	0	0	0	0	40	30.2	27.1
11:00 AM	1	0	5	15	15	1	0	0	0	0	0	0	0	37	32.6	27.9
12:00 PM	0	1	14	28	25	1	0	0	0	0	0	0	0	69	32.0	27.9
1:00 PM	0	1	6	19	25	3	0	0	0	0	0	0	0	54	33.0	29.4
2:00 PM	0	1	10	38	22	1	0	0	0	0	0	0	0	72	33.0	27.9
3:00 PM	0	1	7	37	33	3	0	0	0	0	0	0	0	81	32.0	28.8
4:00 PM	0	0	12	39	24	3	1	0	0	0	0	0	0	79	32.0	28.4
5:00 PM	0	0	12	26	33	4	0	0	0	0	0	0	0	75	32.9	29.0
6:00 PM	0	0	8	34	19	5	0	0	0	0	0	0	0	66	32.0	28.7
7:00 PM	0	0	5	25	15	0	0	0	0	0	0	0	0	45	31.4	28.1
8:00 PM	1	0	8	16	7	1	1	0	0	0	0	0	0	34	31.0	27.2
9:00 PM	0	0	6	11	6	1	0	0	0	0	0	0	0	24	31.6	27.1
10:00 PM	0	0	0	8	4	1	0	0	0	0	0	0	0	13	31.2	29.2
11:00 PM	0	0	2	2	0	1	0	0	0	0	0	0	0	5	33.0	27.8
Total	3	5	131	396	279	30	3	0	0	0	0	0	0	847	32.0	28.2
Percent	0.35%	0.59%	15.47%	46.75%	32.94%	3.54%	0.35%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
AM Peak	2:00 AM	10:00 AM	8:00 AM	8:00 AM	11:00 AM	12:00 AM	10:00 AM							8:00 AM		
Volume	1	1	12	23	15	2	1	0	0	0	0	0	0	43		
PM Peak	8:00 PM	12:00 PM	12:00 PM	4:00 PM	3:00 PM	6:00 PM	4:00 PM							3:00 PM		
Volume	1	1	14	39	33	5	1	0	0	0	0	0	0	81		

15th Percentile:	24.0 MPH	Average Speed:	28.2 MPH	Posted Speed Limit:	25 MPH
50th Percentile:	28.0 MPH	10 MPH Pace:	24 to 33 MPH	Number of Vehicles > 25 MPH:	649
85th Percentile:	32.0 MPH	Number in Pace:	696	Percent of Vehicles > 25 MPH:	76.6%
95th Percentile:	34.0 MPH	Percent in Pace:	82.2%		

Sherburne Road
just south of School Driveway
City, State: Portsmouth, NH
Client: TF Moran/ J. Porter
Site Code: 47528.00

PRECISION
D A T A
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: 239200 ATR-A (Speed)

Count Date
Thursday, March 9, 2023

Speed (60-minute)

SB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	2	26.6	25.5
1:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	1	25.0	25.0
2:00 AM	0	0	2	1	0	0	0	0	0	0	0	0	0	3	24.7	23.3
3:00 AM	0	0	2	0	1	0	0	0	0	0	0	0	0	3	28.2	25.3
4:00 AM	0	1	3	3	0	0	0	0	0	0	0	0	0	7	28.0	24.3
5:00 AM	0	3	10	9	4	1	0	0	0	0	0	0	0	27	30.0	25.0
6:00 AM	0	1	13	17	3	1	0	0	0	0	0	0	0	35	29.0	25.8
7:00 AM	2	5	45	48	9	2	0	0	1	0	0	0	0	112	28.0	25.2
8:00 AM	2	6	38	38	6	3	0	0	0	0	0	0	0	93	28.2	24.9
9:00 AM	0	2	24	21	4	0	0	0	0	0	0	0	0	51	28.0	24.9
10:00 AM	0	2	18	18	5	1	0	0	0	0	0	0	0	44	29.0	25.2
11:00 AM	2	6	16	17	4	0	0	1	0	0	0	0	0	46	29.0	24.5
12:00 PM	0	8	24	22	2	2	0	0	0	0	0	0	0	58	28.0	24.4
1:00 PM	0	2	30	18	4	2	0	0	0	0	0	0	0	56	29.0	25.1
2:00 PM	1	9	28	13	10	0	0	0	0	0	0	0	0	61	30.0	23.9
3:00 PM	2	7	27	17	2	0	0	0	0	0	0	0	0	55	26.0	22.6
4:00 PM	1	3	29	20	7	0	0	0	0	0	0	0	0	60	29.0	24.5
5:00 PM	0	2	32	22	1	4	0	0	0	0	0	0	0	61	28.0	24.9
6:00 PM	1	6	20	11	3	1	0	0	0	0	0	0	0	42	27.0	23.3
7:00 PM	0	0	17	14	2	0	0	0	0	0	0	0	0	33	28.0	25.2
8:00 PM	0	2	5	4	1	0	0	0	0	0	0	0	0	12	27.0	23.6
9:00 PM	0	0	7	4	0	0	0	0	0	0	0	0	0	11	26.5	24.3
10:00 PM	0	0	2	2	0	0	0	0	0	0	0	0	0	4	26.6	25.0
11:00 PM	0	0	4	2	0	0	0	0	0	0	0	0	0	6	27.3	24.8
Total	11	65	397	323	68	17	0	1	1	0	0	0	0	883	28.0	24.6
Percent	1.25%	7.36%	44.96%	36.58%	7.70%	1.93%	0.00%	0.11%	0.11%	0.00%	0.00%	0.00%	0.00%			
AM Peak	7:00 AM	8:00 AM	7:00 AM	7:00 AM	7:00 AM	8:00 AM		11:00 AM	7:00 AM					7:00 AM		
Volume	2	6	45	48	9	3	0	1	1	0	0	0	0	112		
PM Peak	3:00 PM	2:00 PM	5:00 PM	12:00 PM	2:00 PM	5:00 PM								2:00 PM		
Volume	2	9	32	22	10	4	0	0	0	0	0	0	0	61		

15th Percentile:	21.0 MPH	Average Speed:	24.6 MPH	Posted Speed Limit:	25 MPH
50th Percentile:	24.0 MPH	10 MPH Pace:	20 to 29 MPH	Number of Vehicles > 25 MPH:	341
85th Percentile:	28.0 MPH	Number in Pace:	720	Percent of Vehicles > 25 MPH:	38.6%
95th Percentile:	32.0 MPH	Percent in Pace:	81.5%		

Sherburne Road
just south of School Driveway
City, State: Portsmouth, NH
Client: TF Moran/ J. Porter
Site Code: 47528.00

PRECISION
D A T A
INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
508-875-0100 datarequests@pdillc.com

PDI File #: 239200 ATR-A (Speed)

Count Date
Thursday, March 9, 2023

Speed (60-minute)
Combined NB and SB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	2	2	3	2	0	0	0	0	0	0	0	9	34.2	29.0
1:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	1	25.0	25.0
2:00 AM	1	0	3	5	0	0	0	0	0	0	0	0	0	9	27.6	23.3
3:00 AM	0	0	2	1	1	0	0	0	0	0	0	0	0	4	29.6	26.3
4:00 AM	0	1	4	3	0	0	0	0	0	0	0	0	0	8	28.0	24.0
5:00 AM	0	3	11	10	5	1	0	0	0	0	0	0	0	30	30.0	25.1
6:00 AM	0	1	14	22	10	2	0	0	0	0	0	0	0	49	31.0	27.0
7:00 AM	2	5	54	69	19	3	0	0	1	0	0	0	0	153	29.2	25.8
8:00 AM	2	6	50	61	14	3	0	0	0	0	0	0	0	136	29.0	25.4
9:00 AM	0	2	28	40	18	0	0	0	0	0	0	0	0	88	31.0	26.4
10:00 AM	0	3	24	41	13	2	1	0	0	0	0	0	0	84	30.0	26.1
11:00 AM	3	6	21	32	19	1	0	1	0	0	0	0	0	83	31.0	26.0
12:00 PM	0	9	38	50	27	3	0	0	0	0	0	0	0	127	31.0	26.3
1:00 PM	0	3	36	37	29	5	0	0	0	0	0	0	0	110	32.0	27.2
2:00 PM	1	10	38	51	32	1	0	0	0	0	0	0	0	133	31.0	26.0
3:00 PM	2	8	34	54	35	3	0	0	0	0	0	0	0	136	31.0	26.3
4:00 PM	1	3	41	59	31	3	1	0	0	0	0	0	0	139	31.0	26.7
5:00 PM	0	2	44	48	34	8	0	0	0	0	0	0	0	136	31.0	27.1
6:00 PM	1	6	28	45	22	6	0	0	0	0	0	0	0	108	31.0	26.6
7:00 PM	0	0	22	39	17	0	0	0	0	0	0	0	0	78	30.5	26.9
8:00 PM	1	2	13	20	8	1	1	0	0	0	0	0	0	46	31.0	26.3
9:00 PM	0	0	13	15	6	1	0	0	0	0	0	0	0	35	30.0	26.2
10:00 PM	0	0	2	10	4	1	0	0	0	0	0	0	0	17	31.0	28.2
11:00 PM	0	0	6	4	0	1	0	0	0	0	0	0	0	11	28.5	26.2
Total	14	70	528	719	347	47	3	1	1	0	0	0	0	1730	31.0	26.3
Percent	0.81%	4.05%	30.52%	41.56%	20.06%	2.72%	0.17%	0.06%	0.06%	0.00%	0.00%	0.00%	0.00%			
AM Peak	11:00 AM	8:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	10:00 AM	11:00 AM	7:00 AM					7:00 AM		
Volume	3	6	54	69	19	3	1	1	1	0	0	0	0	153		
PM Peak	3:00 PM	2:00 PM	5:00 PM	4:00 PM	3:00 PM	5:00 PM	4:00 PM							4:00 PM		
Volume	2	10	44	59	35	8	1	0	0	0	0	0	0	139		

15th Percentile:	22.0 MPH	Average Speed:	26.3 MPH	Posted Speed Limit:	25 MPH
50th Percentile:	26.0 MPH	10 MPH Pace:	22 to 31 MPH	Number of Vehicles > 25 MPH:	990
85th Percentile:	31.0 MPH	Number in Pace:	1327	Percent of Vehicles > 25 MPH:	57.2%
95th Percentile:	33.0 MPH	Percent in Pace:	76.7%		

Sherburne Road
south of School Driveway
City, State: Portsmouth, NH
Client: TF Moran/ J. Porter
Site Code: 47528
Count Date: Thursday, March 9, 2023

TURNS COUNTED BY VIDEO OBSERVATION

	EXISTING SCHOOL DRIVEWAY					
AM	**WBL**	**WBR**	**NBT**	**NBR**	**SBL**	**SBT**
7:30 AM	1,		11	1, 1,		29
7:45 AM	1 (LBus),	-	9	1, 1, 1, 1(LBus),	-	39
8:00 AM	1, 1, 1(BBus),	-	7	1, 1(BBus), 1, 1,	-	30
8:15 AM	1, 1, 1, 1, 1, 1, 1, 1,	1,	10	1, 1, 1, 1, 1, 1, 1,	-	21
AM Total	**13**	**1**	**37**	**17**	**0**	**119**
PM	**WBL**	**WBR**	**NBT**	**NBR**	**SBL**	**SBT**
3:30 PM	1, 1,	-	22	1,	-	17
3:45 PM	1, 1, 1, 1,	-	20	1,	-	13
4:00 PM	-	-	16	-	-	15
4:15 PM	-	-	33	1,	-	10
PM Total	**6**	**0**	**91**	**3**	**0**	**55**

	NB						
AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
7:30 AM	0	0	12	0	1	0	13
7:45 AM	0	0	11	2	0	0	13
8:00 AM	0	0	10	1	0	0	11
8:15 AM	0	0	16	0	1	0	17
AM Total	**0**	**0**	**49**	**3**	**2**	**0**	**54**
PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
3:30 PM	0	0	21	1	0	1	23
3:45 PM	0	0	20	0	1	0	21
4:00 PM	0	0	15	0	1	0	16
4:15 PM	0	0	33	1	0	0	34
PM Total	**0**	**0**	**89**	**2**	**2**	**1**	**94**

	SB						
AM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
7:30 AM	0	0	29	0	1	0	30
7:45 AM	0	0	38	1	1	0	40
8:00 AM	0	0	31	2	0	0	33
8:15 AM	0	0	29	0	0	0	29
AM Total	**0**	**0**	**127**	**3**	**2**	**0**	**132**
PM	Bicycles	Motorcycle	Cars & Light Goods	Buses	Single Unit Heavy	Multi Unit Heavy	Total
3:30 PM	0	0	17	1	0	1	19
3:45 PM	0	0	17	0	0	0	17
4:00 PM	0	0	14	0	1	0	15
4:15 PM	0	0	9	1	0	0	10
PM Total	**0**	**0**	**57**	**2**	**1**	**1**	**61**

Intersection of Sherburne Road and School Driveway in Portsmouth, NH

Date of Observation: 9-Mar-23 TFM Job # 47258.00

Sherburne Road Peak Hour: 7:45 AM & 4:15 PM

	Cars and Heavy Vehicles (Combined)									
	SB			WB			NB			
Time	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right
7:30 AM		29	0	0		1	2	11		
7:45 AM		39	0	0		1	4	9		
8:00 AM		30	0	0		3	4	7		
8:15 AM		21	0	1		8	7	10		
Sum=	0	119	0	1	0	13	17	37	0	0

AM PEAK HOUR	**0**	**119**	**0**	**1**	**0**	**13**	**17**	**37**	**0**	**0**

	SB			WB			NB			
Time	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right
3:30 PM		17	0	0		2	1	22		
3:45 PM		13	0	0		4	1	20		
4:00 PM		15	0	0		0	0	16		
4:15 PM		10	0	0		0	1	33		
Sum=	0	55	0	0	0	6	3	91	0	0

PM PEAK HOUR	**0**	**55**	**0**	**0**	**0**	**6**	**3**	**91**	**0**	**0**

Intersection of Sherburne Roa

Date of Observation: 9-Mar-23
Sherburne Road Peak Hour: 7:45 AM & 4:15

EB		Totals
Through	Left	Sum
		43
		53
		44
		47
0	0	187
0	**0**	**187**

AM ROADWAY PEAK					
	SB			App TTI	
TIME	Right	Through	Left	APPR.	Right
7:30 AM	0	29	0	29	0
7:45 AM	0	39	0	39	0
8:00 AM	0	30	0	30	0
8:15 AM	0	21	0	21	1
AVE. 15 MIN	0	29.75	0	29.75	0.25
Peak 15 Min	0	39	0	39	1
APPROACH PHF				0.763	

EB		Totals
Through	Left	Sum
		42
		38
		31
		44
0	0	155
0	**0**	**155**

PM ROADWAY PEAK					
	SB			App TTI	
TIME	Right	Through	Left	APPR.	Right
3:30 PM	0	17	0	17	0
3:45 PM	0	13	0	13	0
4:00 PM	0	15	0	15	0
4:15 PM	0	10	0	10	0
AVE. 15 MIN	0	13.75	0	13.75	0
Peak 15 Min	0	17	0	17	0
APPROACH PHF				0.809	

d and School Driveway in Portsmouth, NH

TFM Job # 47258.00

PM

WB		App TTl	NB			App TTl	EB			App TTl
Through	Left	APPR.	Right	Through	Left	APPR.	Right	Through	Left	APPR.
0	1	1	2	11	0	13	0	0	0	0
0	1	1	4	9	0	13	0	0	0	0
0	3	3	4	7	0	11	0	0	0	0
0	8	9	7	10	0	17	0	0	0	0
0	3.25	3.5	4.25	9.25	0	13.5	0	0	0	0
0	8	9	7	11	0	17	0	0	0	0
		0.389				0.794				#DIV/0!

WB		App TTl	NB			App TTl	EB			App TTl
Through	Left	APPR.	Right	Through	Left	APPR.	Right	Through	Left	APPR.
0	2	2	1	22	0	23	0	0	0	0
0	4	4	1	20	0	21	0	0	0	0
0	0	0	0	16	0	16	0	0	0	0
0	0	0	1	33	0	34	0	0	0	0
0	1.5	1.5	0.75	22.75	0	23.5	0	0	0	0
0	4	4	1	33	0	34	0	0	0	0
		0.375				0.691				#DIV/0!

APPENDIX J

NH DOT - SEQUENCE AND TIMING CHART

4/16/2025 1:02:46 PM

CITY/TOWN: PORTSMOUTH **SIGNAL ID#:** S-379-14

LOCATION: NH 33

INTERSECT: BORTHWICK AVE

CABINET TYPE: P TYPE-1 Peek

METER NUMBER and MFR: 27 415 153 ES

CONTROLLER INFO PEEK 3000E

INSTALL DATE: 10/14/1963

FIRE PREEMPT 3M Opticom Model 754

*****CONTROLLER TIMINGS*****

	PH 1	PH 2	PH 3	PH 6
INITIAL	8	8	8	8
PASSAGE	4	4	4	4
YELLOW	4	4	4	4
ALL RED	2	2	2	2
MAXIMUM 1	15	25	50	25
MAXIMUM 2	30	40	30	40
MAXIMUM 3				
MAXIMUM EXT				
RECALL	NL	MIN	NL	MIN
WALK				
DON'T WALK				
FL YEL ARROW				
MOVEMENT	ELT	33W	BORTH	33E
TIME TO REDUCE				
REDUCE BY				
MIN GAP				
DYN MAX LIMI				
DYN MAX STEP				

NOTES:

PRE-EMPT 3M 760 OPTI-COM
PEEK CLP SYSTEM
SYS LOCAL ID 5

1/1/1 80 OFF = 72
24s 28s 28s; 52s 28s

2/1/1 90 OFF = 51
36, 31, 23, 67, 23

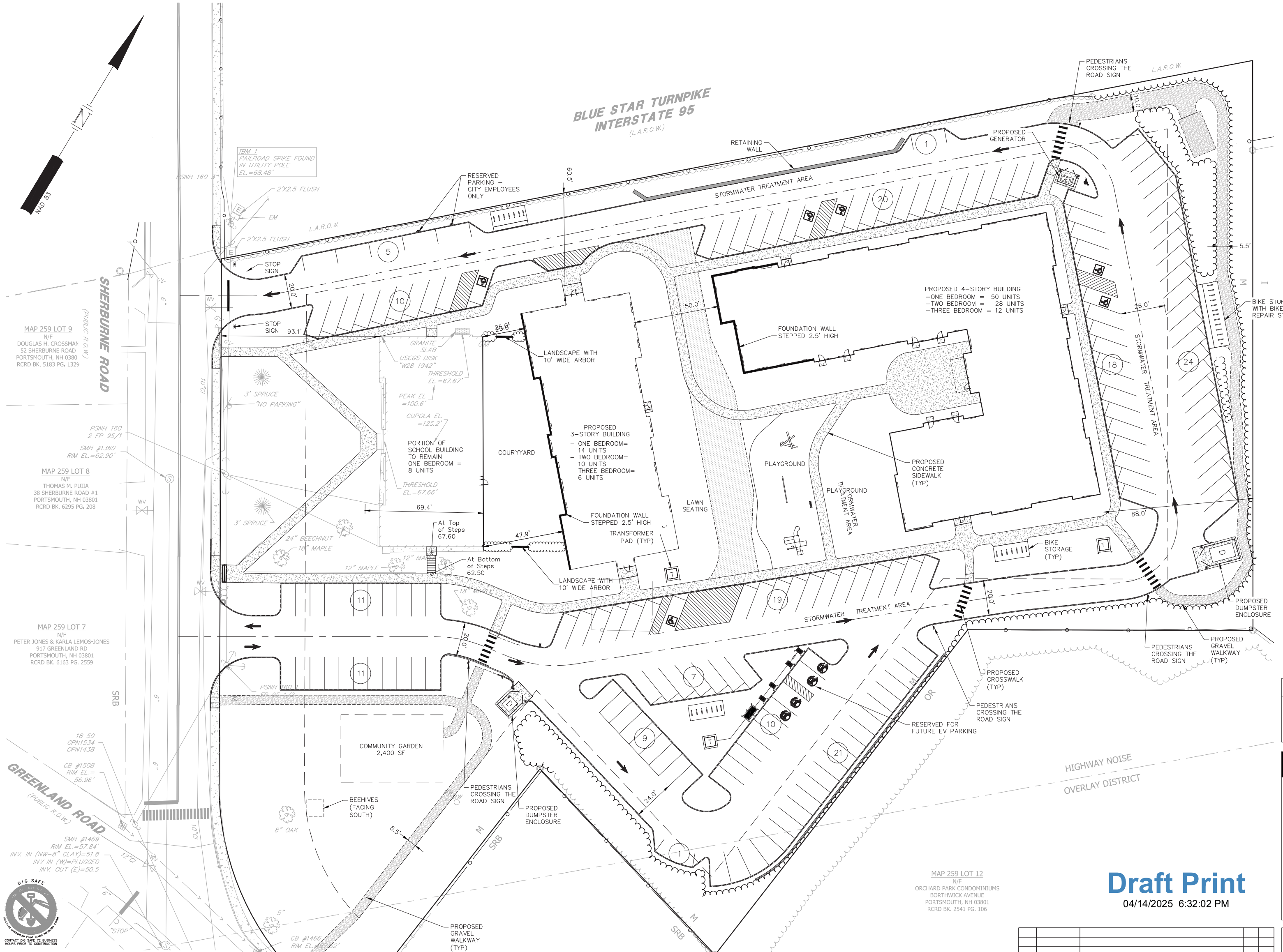
3/1/1 80 OFF = 75
26s 28s 26s; 54s 26s

M - F 06:00 1/1/1
07:00 2/1/1
09:00 3/1/1
16:00 4/1/1
18:00 1/1/1

SAT 10:00 3/1/1

SUN 11:00 3/1/1

APPENDIX K



DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Apr 14, 2025 - 6:31pm
F:\MSC Projects\47528 Sherburne Road, Portsmouth, NH\47528-00 Sherburne Road, Portsmouth, NH\Design\PRODUCTION DRAWINGS\47528-00_Site Layout_Alt-Entr.dwg

SITE DATA

OWNER OF RECORD OF MAP 259 LOT 10: CITY OF PORTSMOUTH SCHOOLS, PO BOX 628, PORTSMOUTH, NH 03802
DEED REFERENCE TO PARCEL IS BK 2389 PG 1272
AREA OF PARCEL = 232,175± SF OR 5.33± ACRES

ZONED: MUNICIPAL
EXISTING USE: SCHOOL
PROPOSED USE: MIXED USE

THE PURPOSE OF THIS PLAN IS TO CONSTRUCT WORK FORCE HOUSING. ASSOCIATED IMPROVEMENTS INCLUDE AND ARE NOT LIMITED TO ACCESS, GRADING, STORMWATER MANAGEMENT SYSTEMS, UTILITIES, LIGHTING, AND LANDSCAPING.

DIMENSIONAL REQUIREMENTS (CURRENT ZONING)

	REQUIRED:	PROVIDED:
MINIMUM LOT DIMENSIONS:		
LOT AREA	XXX,XXX SF (X.XXX± AC)	232,175± SF (5.33± AC)
LOT FRONTAGE	XXX FT	471.79 FT
DEPTH	XXX FT	606 FT
MINIMUM YARD DIMENSIONS:		
FRONT	NA	XXX FT
SIDE	NA	XXX FT
REAR	NA	XXX FT
MAXIMUM STRUCTURE DIMENSIONS:		
STRUCTURE HEIGHT	NA	38.8 FEET
STRUCTURE STORIES	NA	4 STORIES
ROOF APPURTENANCE HEIGHT	NA	44.1 FT
LOT COVERAGE	NA	54%
MINIMUM SETBACKS/BUFFER:		
BUILDING FRONT	XXX FT	93.1 FT
BUILDING SIDE	XXX FT	48.8 FT
BUILDING REAR	XXX FT	89.5 FT
MINIMUM OPEN SPACE	XXX%	XXX%

PARKING REQUIREMENTS

RESIDENTIAL		
PARKING SPACES (SEE CALCULATION)	170 SPACES	170 RESIDENTIASPACES
OFFICE		
OFFICE	1 SPACES	1 SPACES
MUNICIPAL		
FOR CITY EMPLOYEES	NA	2 SPACE
TOTAL		173 SPACES
ACCESSIBLE SPACES (REQ'D BY ADA)	6 SPACES	6 SPACES
PARKING SPACE SIZE	8.5 FT X 19 FT	8.5 FT X 19 FT
AISLE WIDTH	18–24 FT	18–24 FT

PARKING CALCULATIONS

REQUIRED PARKING RATIO:
RESIDENTIAL: 1.3 SPACES PER UNIT > 750 SF
1 SPACE PER UNIT 600–750 SF
1 VISITOR SPACE PER 5 UNITS OR PORTION THEREOF
OFFICE:
1 SPACES PER UNIT > 350 SF
TOTAL REQUIRED = 59 UNITS * 1.3 SPACES/UNIT = 69.0 SPACES
69 UNITS * 1 SPACE = 53.3 SPACES
128 UNITS * 1 SPACE/5 UNITS = 26.0 SPACES
1 OFFICE * 1 SPACE/OFFICE = 1.0 SPACES

TOTAL = 171.3 SPACES

NOTES

1. SEE NOTES ON SHEET C–02.
2. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS NOTED OTHERWISE.
3. LIGHTING, SIGNAGE, LANDSCAPING, AND SCREENING SHALL MEET THE REQUIREMENTS OF THE PORTSMOUTH, NH ZONING ORDINANCE AND SITE PLAN REVIEW REGULATIONS.
4. SNOW SHALL NOT BE STOCKPILED IN STORMWATER BMP'S, WETLAND BUFFERS, OR WETLANDS. SEE SNOW STORAGE LOCATIONS. IN THE EVENT THAT THE SNOW STORAGE AREAS PROVIDED ON THE SITE ARE COMPLETELY UTILIZED, EXCESS SNOW SHALL BE TRANSPORTED OFF SITE FOR DISPOSAL IN ACCORDANCE WITH NHDES REGULATION. IF SNOW IS STORED WITHIN PARKING AREA, KEEP CATCH BASINS CLEAR.

CITY OF PORTMOUTH PLANNING BOARD

CHAIRPERSON DATE

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10
SITE LAYOUT PLAN
PROPOSED HOUSING DEVELOPMENT
35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH SCHOOLS
PREPARED FOR
PORTSMOUTH HOUSING AUTHORITY
1"=60' (11"X17")
SCALE: 1"=30' (22"X34")
JANUARY 29, 2025

Draft Print
04/14/2025 6:32:02 PM

REV	DATE	DESCRIPTION	DR	CK

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	DR	JKC	FB		
47528.00	CK	JJM	CAD 47528-00_SITE LAYOUT_ALT-ENTR		C–03

SRW
Environmental Consulting, LLC

Noise Assessment

Date: April 15, 2025

Subject Property: Sherburne School Property Redevelopment, Sherburne Road, Portsmouth< NH

Proposed Development: The proposed project at the Sherburne School property includes three distinct areas of development, including the construction of a new four story 90 unit affordable housing apartment building on the eastern end of the property, demolition of a portion of the existing school building and redevelopment with 8 units of housing, and the construction of a new 3-story building with 30 units of affordable housing between the existing school and proposed 4 story building. The project is expected to use funding from the US Department of Housing and Urban Development (HUD) among other sources.

Regulatory Requirements: The property is located on the southeast side of Interstate 95, and within the Portsmouth Highway Noise Overlay District. Standards used by Portsmouth include an interior noise level of 45 decibels for dwellings, and a 65 decibel requirement for outdoor activities, measured at the edge of the active use area closest to the highway. Portsmouth's noise requirements match those of HUD when considered during the completion of an Environmental Review. Note that while HUD requires indoor noise levels of 45 decibels, it also includes a 3 decibel buffer when *assessing* for future for interior noise levels, so that calculated indoor noise levels must be at or less than 42 decibels. Aside from indoor and outdoor noise level requirements, HUD also has Site Acceptability Standards which includes the following categories.

1. **Acceptable:** Site Noise Levels not exceeding 65 decibels. No special approvals or requirements are required.

2. **Normally Unacceptable:** Noise levels between 65 decibels and 75 decibels. Environmental Assessment (EA) level Environmental Review and attenuation required for new construction and strongly recommended for major rehabilitation.

3. **Unacceptable:** Noise levels above 75 decibels. Environmental Impact Statement (EIS) level Environmental Review or EIS waiver and EA level Environmental Review. Attenuation required for new construction.

Portsmouth building regulations require a noise analysis by a registered engineer or qualified analysis, and HUD requires noise analysis using their DNL calculator and documented traffic data.

In fact, HUD prefers calculations over an actual sound measurement assessment. Regarding it's calculator, HUD makes the following statement:

> *The Office of Environmental and Energy (OEE) has developed an electronic assessment tool that calculates the Day/Night Noise Level (DNL) site exposure. This is a web-based application of the existing Noise Assessment Guidelines (NAG). It is the basic noise assessment tool; most assessments start here. The DNL Calculator calculates noise from road and railway activity levels. It then combines the noise with airport projections and incorporates the effects of loud, impulsive sound for a site exposure at any Noise Assessment Location. The user-friendly DNL Calculator can document compliance or aid in site planning.*

SRW has assessed noise at hundreds of locations funded via HUD, and in fact, performed the noise analysis at a property in Bellows Falls, Vermont, that HUD uses for training purposes. This HUD Noise Assessment is considered to be a qualified analysis.

Selection of Noise Assessment Locations (NALs):

The topography at the southwestern side of the property where the current building exists includes a berm which blocks the direct line of sight of the highway from a 6 foot tall observer, and acts as a natural noise buffer. The northeastern side of the property, where the four story building is proposed is more level and the highway can be seen by a 6 foot tall observer. SRW has selected the western wall of the proposed 4 story building as NAL #1 as it is the closest to Interstate I-95 and is not blocked by local topography. NAL #2 is the proposed location of the outdoor activity area (playground).

Noise Sources:

Four major noise sources are considered in the typical HUD Noise Assessment including rail traffic, airport noise, road traffic and loud impulsive sounds. Only road traffic is a major noise source at the subject property, as described below.

Rail traffic is assessed if the active railway is located within 3,000 feet of the subject property. The CSX railway tracks are located approximately 3,000 feet from the eastern edge of the subject property and include only a single daily train. The property is not within the train whistle zone, and there are many natural and manmade buffers to any rail noise between the tracks and subject property. A USDOT Crossing Inventory report for the rail line, which shows the average daily train counts, rail speed, etc., is attached.

Airport noise is assessed based on the noise contours of civil airports. The nearest end of the Pease International Tradeport is runway is located approximately 3,400 feet to the northwest of the subject property. The subject property is located well outside the 60 decibel contour. A conservative estimated noise contour at the subject property, by extrapolation, would be 55 decibels. SRW has used 55 decibels as a noise level in the HUD noise assessment.

Road noise is assessed based on recorded annual average daily traffic AADT, defined as the mean traffic volume across all days for a year for a given location along a roadway. The most current AADT for Interstate Highway close to the subject property has been computed by the NH Department of Transportation (NHDOT) to be 103,079 in 2024. For the purposes of this assessment, the AADT has been increased by 10% to estimate future noise levels. The 2024 data does not include classification counts which are needed for the HUD DNL calculator. When vehicle classifications are not available, general functional class averages are used to determine the percentage of cars, medium truck and heavy trucks. For the purposes of this assessment 2022 Functional Class Averages were used to determine vehicle classifications for an interstate highway. This data, and the data from the airport, was fed into HUD's DNL Calculator to determine the estimated DNL at both NALs. Note that nighttime traffic is estimated to be 15%, which is HUD's default value. The road grade is estimated to be "0" (using the USGS National Map the average grade of I95 adjacent to the subject property is 0.2-0.3 percent). Results of the DNL calculation are as follows:

NAL #1, Proposed New Building: The computed DNL is 75 decibels from traffic, 33 decibels from rail and 55 decibels from airport noise, for a combined DNL of 75 decibels. The building location is within HUD's Normally Unacceptable Zone. The results indicate that the building must achieve a noise reduction of 30 decibel to meet Portsmouth's Highway Noise Overley District requirements, and 33 decibel to meet HUD's noise assessment requirements.

NAL #2, Proposed Outdoor Activity Area (Playground): The computed DNL is 73 decibels from traffic, 33 decibels from rail and 55 decibels from airport noise, for a combined DNL of 73 decibels. The Outdoor Activity Area is within HUD's Normally Unacceptable Zone. The results indicate that the site's natural and man-made barriers (new buildings) must achieve a noise reduction of 8 decibels to meet Portsmouth's Highway Noise Overley District and HUD's noise requirements.

SRW notes that noise levels at similar frequencies and decibel levels when combined, amplify noise levels to the receiver much more so than the same noises at much different decibel levels. HUD's DNL calculator considers the individual decibel levels in their calculations and automatically adds corrections when needed.

Loud impulse sounds when assessed in accordance with 24 CFR Part 51.103 require that "On an interim basis, when loud impulsive sounds, such as explosions or sonic booms, are experienced at a site, the day-night average sound level produced by the loud impulsive sounds alone shall have 8 decibels added to it in assessing the acceptability of the site." The subject is not subject to loud impulsive sounds.

Copies of the HUD DNL calculations are attached.

Anticipated Indoor Noise Levels :

The worst case noise level at the building exterior has been calculated to be 75 decibels, and this data was used in HUD's Sound Transmission Classification Assessment Tool (STraCAT). STraCAT is used to document sound attenuation performance of wall systems. Based on wall, window. and door Sound Transmission Classification (STC values, the STraCAT generates a composite STC value for the wall assembly as a whole). Variables for our STraCAT analysis include the lowest STC values for standard construction materials to be ultra conservative, but actual building materials may have higher, sometimes significantly higher, STC values. Thus, the results of the STraCAT analysis is considered to be the minimal requirements to meet Portsmouth and HUD regulations. For the proposed 4 story building, construction materials considered include a standard 2 x 6 wood construction with fiberglass insulation for exterior walls (STC of 38), and fifty-six (56) 4' x 3' windows facing the noise source (using an STC of 27). Results of the STraCAT analysis indicates an attenuation of approximately 33.1 decibels, which would result in an interior noise level of approximately 41.9 decibels. Any materials with higher STC ratings will increase the total STC of the wall unit. For example, in general, replacing fiberglass bats with dense cellulose results in an increase of approximately 5 STC points for wall consrtuction.

Note that the STCs of the wall unit components are estimated using information from the National Gypsum Acoustical Assembly Guide. STCs of window and door units were provided by one vendor (Marvin Industries), which are representative STC ratings throughout the window and door industry.

The purpose of the STraCAT analysis is to show what sound reduction is possible using readily available materials, and that interior noise levels of 45 decibels is easily achievable. It does not represent what materials are actually being considered for the project. Additional noise mitigation is possible if choosing higher noise reducing materials. Given the easily achievable interior noise level of 45 decibels, the project will meet the indoor noise requirements of the City of Portsmouth and HUD.

A copy of HUD's STraCAT analysis is attached.

Anticipated Outdoor Activity Area Noise Levels:

Since calculated outdoor noise levels at the Outdoor Activity Area is expected to be 73 decibels, the HUD barrier module was completed. This module provides a measure on the barrier's effectiveness on noise reduction. The purpose of the noise barrier is to provide mitigation to the noise observer, which in this case is considered a 6 foot person standing at the edge of the outdoor activity area closest to Interstate 95. The barrier heigh input is based on the natural berm on the northwestern side of the property, which provides much lower noise attenuation than the buildings will. For the purposes of worst case calculations, the same barrier height (the height of the berm) is assumed along the entire length of the western side of the property, even though a large portion of the property will have a much higher barrier height from the buildings. The barrier module, using only the berm height and no buildings, calculates the noise exposure at the Outdoor Activity Area to be approximately 64 decibels. In reality, given the increased height of the barrier, the new buildings will provide additional *significant* attenuation, up to another 5 decibels, which will result in a much lower noise exposure after completion of all phases of the project.

Given the easily achievable exterior noise level of 65 decibels at Outdoor Activity Areas, the project will meet the outdoor noise requirements of the City of Portsmouth and HUD.

A copy of the barrier module calculations is attached.

Summary: The proposed project is within the Portsmouth Highway Noise Overlay District and with HUD's Normally Unacceptable zone. However, it has been shown that interior noise levels will meet the 45 decibel standard, and that outdoor Areas of Activities will meet the 65 decibel standards of both the City of Portsmouth and HUD upon completion. Details of actual construction and site layout will be required to use building materials with at least the STC ratings of the materials used when completing this assessment.

SRW Environmental Consulting, LLC

Todd Scheffer

Todd Scheffer, P.G.
Principal

Property Location within Highway Noise District Overlay

Highway Noise Overlay

Property Information

Property ID	0259-0010-0000
Location	35 SHERBURNE RD
Owner	CITY OF PORTSMOUTH

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Geometry updated 09/26/2024

Print map scale is approximate. Critical layout or measurement activities should not be done using this resource.

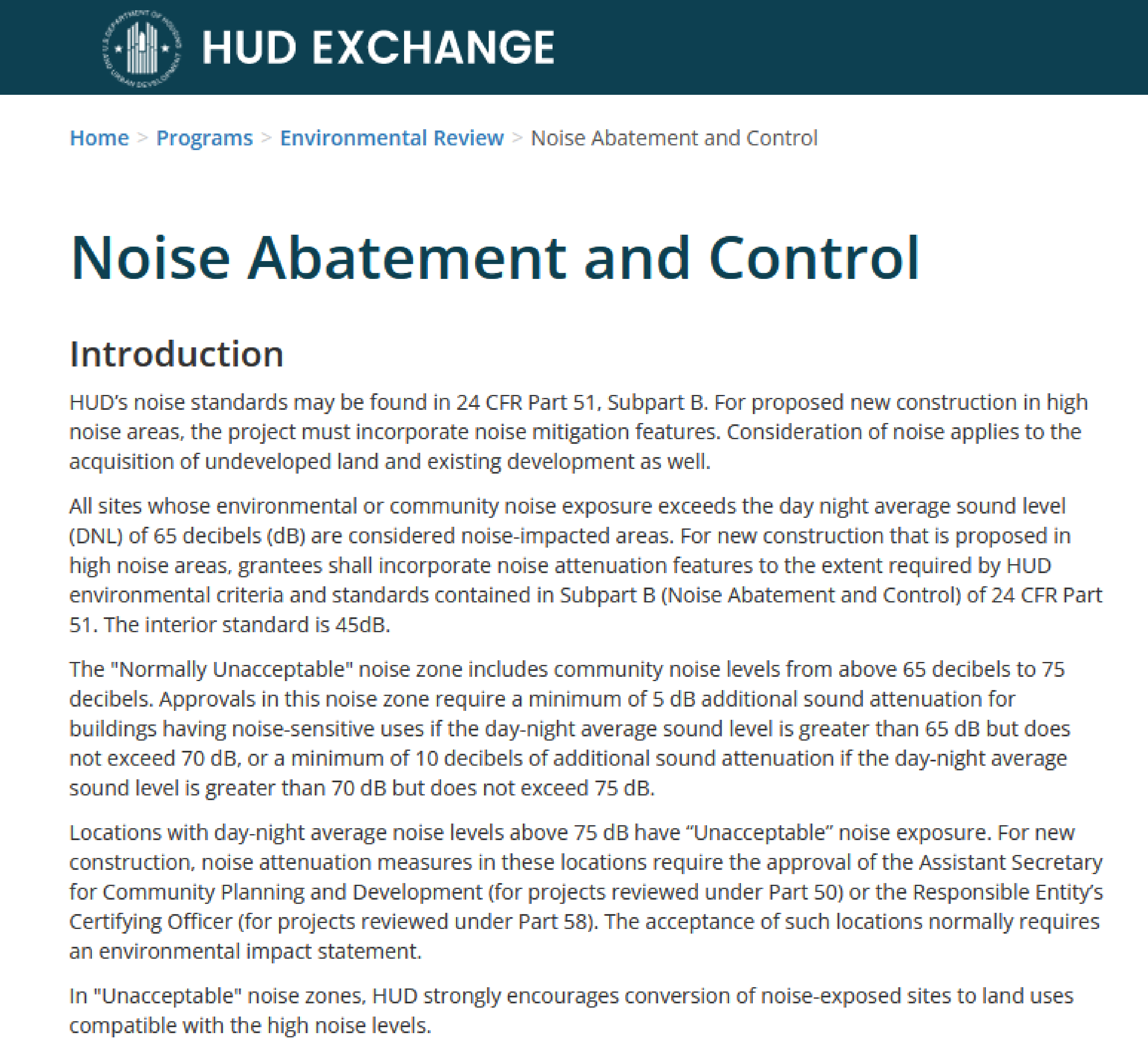
Portsmouth and HUD Noise Requirements

Standards

Structures and Uses	**Loudest Traffic Hour Sound Level**
Interior of dwelling, institutional residence or care facility, hospital or lodging establishment	45 dBA
Interior of other noise sensitive use	55 dBA
Uses with outdoor activities, measured at edge of the active use area closest to the highway	65 dBA

Requirements

- Conditional use permit required for all noise sensitive uses
  - Exceptions: addition to or expansion of a single-family or two-family dwelling that does not increase the footprint by more than 25% (similar to existing exception for conditional uses in wetland buffers)
- Noise analysis by registered engineer or qualified analysis
- Mitigation where necessary to achieve noise level standards



HUD EXCHANGE

Home > Programs > Environmental Review > Noise Abatement and Control

Noise Abatement and Control

Introduction

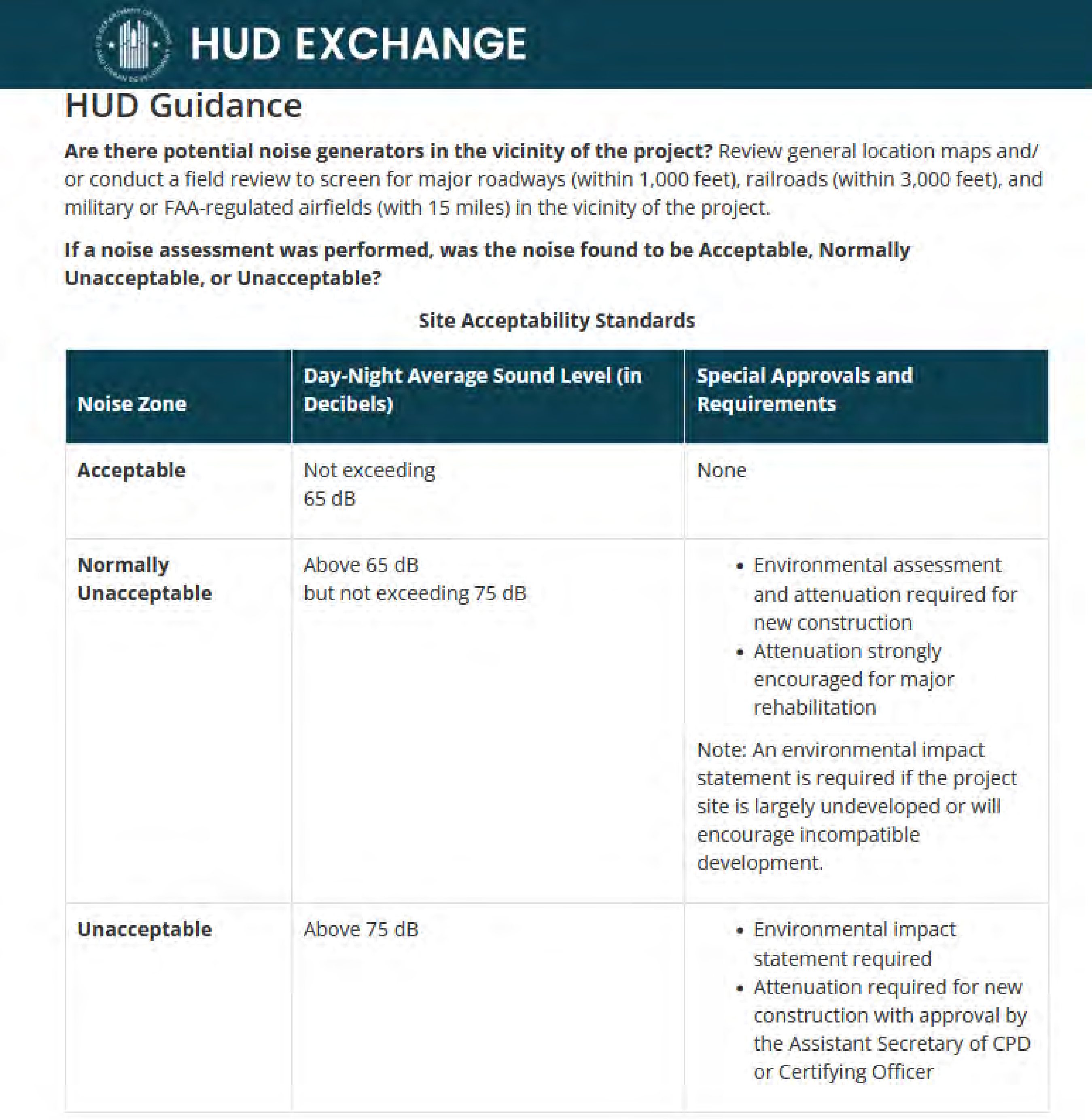
HUD's noise standards may be found in 24 CFR Part 51, Subpart B. For proposed new construction in high noise areas, the project must incorporate noise mitigation features. Consideration of noise applies to the acquisition of undeveloped land and existing development as well.

All sites whose environmental or community noise exposure exceeds the day night average sound level (DNL) of 65 decibels (dB) are considered noise-impacted areas. For new construction that is proposed in high noise areas, grantees shall incorporate noise attenuation features to the extent required by HUD environmental criteria and standards contained in Subpart B (Noise Abatement and Control) of 24 CFR Part 51. The interior standard is 45dB.

The "Normally Unacceptable" noise zone includes community noise levels from above 65 decibels to 75 decibels. Approvals in this noise zone require a minimum of 5 dB additional sound attenuation for buildings having noise-sensitive uses if the day-night average sound level is greater than 65 dB but does not exceed 70 dB, or a minimum of 10 decibels of additional sound attenuation if the day-night average sound level is greater than 70 dB but does not exceed 75 dB.

Locations with day-night average noise levels above 75 dB have "Unacceptable" noise exposure. For new construction, noise attenuation measures in these locations require the approval of the Assistant Secretary for Community Planning and Development (for projects reviewed under Part 50) or the Responsible Entity's Certifying Officer (for projects reviewed under Part 58). The acceptance of such locations normally requires an environmental impact statement.

In "Unacceptable" noise zones, HUD strongly encourages conversion of noise-exposed sites to land uses compatible with the high noise levels.



HUD EXCHANGE

HUD Guidance

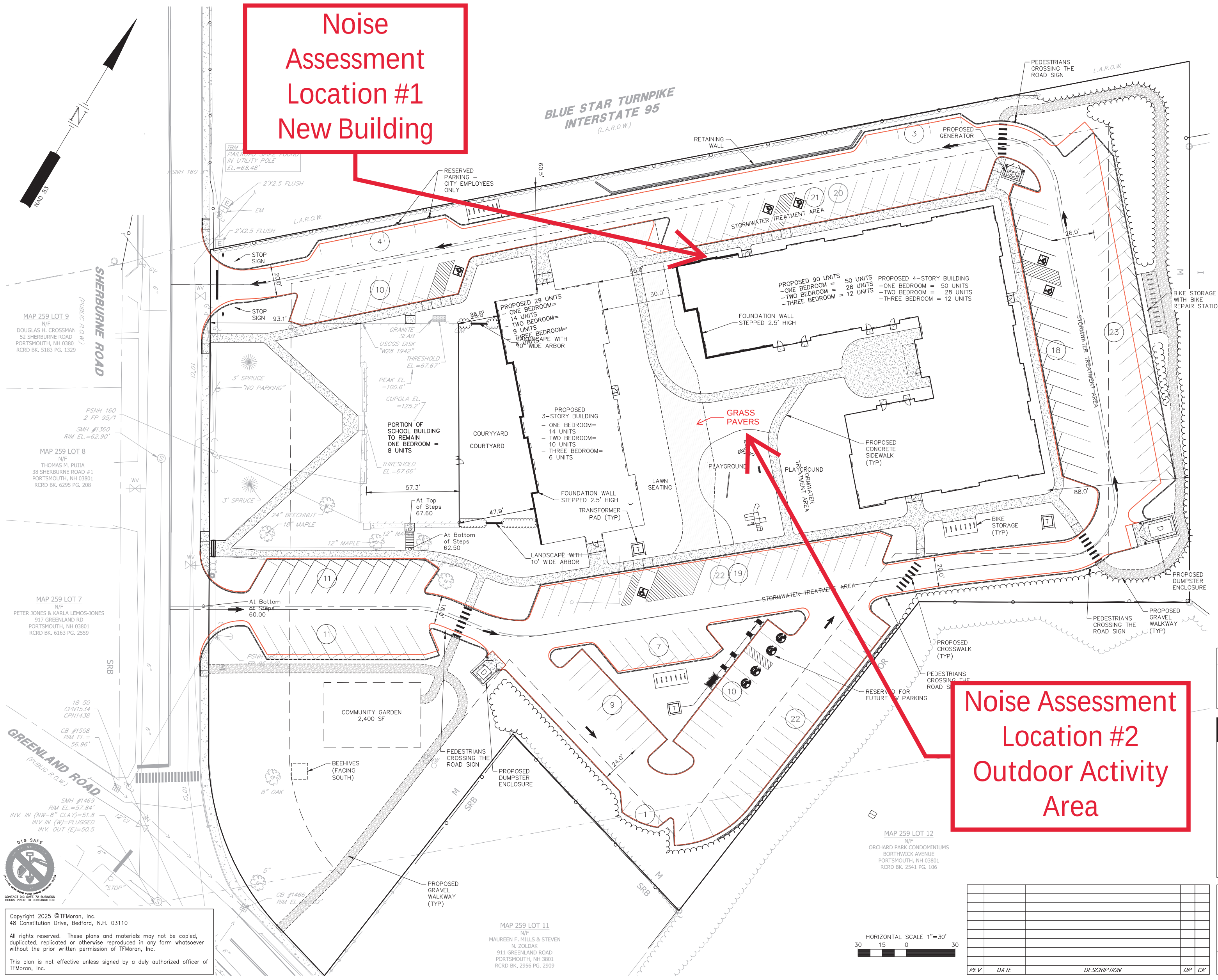
Are there potential noise generators in the vicinity of the project? Review general location maps and/or conduct a field review to screen for major roadways (within 1,000 feet), railroads (within 3,000 feet), and military or FAA-regulated airfields (with 15 miles) in the vicinity of the project.

If a noise assessment was performed, was the noise found to be Acceptable, Normally Unacceptable, or Unacceptable?

Site Acceptability Standards

Noise Zone	Day-Night Average Sound Level (in Decibels)	Special Approvals and Requirements
Acceptable	Not exceeding 65 dB	None
Normally Unacceptable	Above 65 dB but not exceeding 75 dB	• Environmental assessment and attenuation required for new construction • Attenuation strongly encouraged for major rehabilitation Note: An environmental impact statement is required if the project site is largely undeveloped or will encourage incompatible development.
Unacceptable	Above 75 dB	• Environmental impact statement required • Attenuation required for new construction with approval by the Assistant Secretary of CPD or Certifying Officer

Noise Assessment Location Map



Apr 07, 2025 - 10:30pm
F:\MSC Projects\47528 Sherburne Road, Portsmouth, NH\47528-00 Sherburne Road, Portsmouth, NH\Design\PRODUCTION DRAWINGS\47528-00_Site Layout.dwg

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BUILDING SIDE	XXX FT	48.8 FT
BUILDING REAR	XXX FT	89.5 FT
MINIMUM OPEN SPACE	XXX%	XXX%

PARKING REQUIREMENTS

RESIDENTIAL		
PARKING SPACES (SEE CALCULATION)	170 SPACES	170 RESIDENTIASPACES
OFFICE		
OFFICE	1 SPACES	1 SPACES
MUNICIPAL		
FOR CITY EMPLOYEES	NA	2 SPACE
TOTAL		173 SPACES
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AISLE WIDTH	18–24 FT	18–24 FT

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1 OFFICE * 1 SPACE/OFFICE = 1.0 SPACES

TOTAL = 171.3 SPACES

NOTES

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CITY OF PORTMOUTH PLANNING BOARD

CHAIRPERSON ____________ DATE ____________

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10
SITE LAYOUT PLAN
PROPOSED HOUSING DEVELOPMENT
35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH SCHOOLS
PREPARED FOR
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SCALE: 1"=30' (22"X34") **JANUARY 29, 2025**

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FILE	DR	JKC	FB		
47528.00	CK	JJM	CADFILE	47528–00_SITE LAYOUT	C–03

SITE LAYOUT PLAN

HUD DNL Calculator Results

Noise Assessment Location #1 New Building

Site ID	Sherburne School
Record Date	04/14/2025
User's Name	TAS

Road # 1 Name: **Interstate I95**

Road #1

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	216	216	216
Distance to Stop Sign			
Average Speed	55	55	55
Average Daily Trips (ADT)	96560	8312	7790
Night Fraction of ADT	15	15	15
Road Gradient (%)			0
Vehicle DNL	68	67	73
Calculate Road #1 DNL	75	Reset	

Railroad #1 Track Identifier: **CSX Transportation**

Rail # 1

Train Type **Electric** ☐ **Diesel** ☑

Effective Distance		3000
Average Train Speed		10
Engines per Train		2
Railway cars per Train		50
Average Train Operations (ATO)		1
Night Fraction of ATO		0
Railway whistles or horns?	Yes: ☐ No: ☐	Yes: ☐ No: ☑
Bolted Tracks?	Yes: ☐ No: ☐	Yes: ☑ No: ☐
Train DNL	0	33
Calculate Rail #1 DNL	33	Reset

Add Road Source Add Rail Source

Airport Noise Level	55
Loud Impulse Sounds?	○**Yes** ●**No**

Combined DNL for all Road and Rail sources	**75**
Combined DNL including Airport	**75**
Site DNL with Loud Impulse Sound	

Calculate Reset

Noise Assessment Location #2 Playground

Site ID Sherburne School

Record Date 04/14/2025

User's Name TAS

Road # 1 Name: **Interstate I95**

Road #1

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	316	316	316
Distance to Stop Sign			
Average Speed	55	55	55
Average Daily Trips (ADT)	96560	8312	7790
Night Fraction of ADT	15	15	15
Road Gradient (%)			0
Vehicle DNL	66	65	71
Calculate Road #1 DNL	73	Reset	

Railroad #1 Track Identifier: **CSX Transportation**

Rail # 1

Train Type **Electric** ☐ **Diesel** ☑

Effective Distance		3000
Average Train Speed		10
Engines per Train		2
Railway cars per Train		50
Average Train Operations (ATO)		1
Night Fraction of ATO		0
Railway whistles or horns?	Yes: ☐ No: ☐	Yes: ☐ No: ☑
Bolted Tracks?	Yes: ☐ No: ☐	Yes: ☑ No: ☐
Train DNL	0	33
Calculate Rail #1 DNL	33	Reset

Add Road Source Add Rail Source

Airport Noise Level	55
Loud Impulse Sounds?	○**Yes** ●**No**

Combined DNL for all Road and Rail sources	**73**
Combined DNL including Airport	**73**
Site DNL with Loud Impulse Sound	

Calculate Reset

USDOT Railroad Crossing Inventory

U. S. DOT CROSSING INVENTORY FORM

DEPARTMENT OF TRANSPORTATION

FEDERAL RAILROAD ADMINISTRATION

OMB No. 2130-0017

Instructions for the initial reporting of the following types of new or previously unreported crossings: For public highway-rail grade crossings, complete the entire inventory Form. For private highway-rail grade crossings, complete the Header, Parts I and II, and the Submission Information section. For public pathway grade crossings (including pedestrian station grade crossings), complete the Header, Parts I and II, and the Submission Information section. For Private pathway grade crossings, complete the Header, Parts I and II, and the Submission Information section. For grade-separated highway-rail or pathway crossings (including pedestrian station crossings), complete the Header, Part I, and the Submission Information section. For changes to existing data, complete the Header, Part I Items 1-3, and the Submission Information section, in addition to the updated data fields. Note: For private crossings only, Part I Item 20 and Part III Item 2.K. are required unless otherwise noted. An asterisk * denotes an optional field.

A. Revision Date *(MM/DD/YYYY)* 10 / 24 / 2023

B. Reporting Agency ☒ Railroad ☐ Transit ☐ State ☐ Other

C. Reason for Update *(Select only one)* ☒ Change in Data ☐ New Crossing ☐ Closed ☐ No Train Traffic ☐ Quiet Zone Update ☐ Re-Open ☐ Date Change Only ☐ Change in Primary Operating RR ☐ Admin. Correction

D. DOT Crossing Inventory Number 054410Y

Part I: Location and Classification Information

1. Primary Operating Railroad CSX Transportation [CSX]

2. State NEW HAMPSHIRE

3. County ROCKINGHAM

4. City / Municipality ☒ In ☐ Near PORTSMOUTH

5. Street/Road Name & Block Number BARBERRY LN | *(Street/Road Name)* | * *(Block Number)*

6. Highway Type & No. LS-258

7. Do Other Railroads Operate a Separate Track at Crossing? ☐ Yes ☒ No
If Yes, Specify RR ____, ____, ____, ____

8. Do Other Railroads Operate Over Your Track at Crossing? ☐ Yes ☒ No
If Yes, Specify RR ____, ____, ____, ____

9. Railroad Division or Region ☐ None NEW ENGLAND

10. Railroad Subdivision or District ☐ None PORTLAND

11. Branch or Line Name ☐ None PORTSMOUTH BR

12. RR Milepost PMT | 0004.923 | ____ *(prefix)* | *(nnnn.nnn)* | *(suffix)*

13. Line Segment *

14. Nearest RR Timetable Station * EMERY

15. Parent RR *(if applicable)* ☒ N/A

16. Crossing Owner *(if applicable)* ☒ N/A

17. Crossing Type ☒ Public ☐ Private

18. Crossing Purpose ☒ Highway ☐ Pathway, Ped. ☐ Station, Ped.

19. Crossing Position ☒ At Grade ☐ RR Under ☐ RR Over

20. Public Access *(if Private Crossing)* ☐ Yes ☐ No

21. Type of Train ☒ Freight ☐ Transit ☐ Intercity Passenger ☐ Shared Use Transit ☐ Commuter ☐ Tourist/Other

22. Average Passenger Train Count Per Day ☐ Less Than One Per Day ☐ Number Per Day 0

23. Type of Land Use ☐ Open Space ☐ Farm ☒ Residential ☐ Commercial ☐ Industrial ☐ Institutional ☐ Recreational ☐ RR Yard

24. Is there an Adjacent Crossing with a Separate Number? ☐ Yes ☒ No If Yes, Provide Crossing Number ____

25. Quiet Zone *(FRA provided)* ☒ No ☐ 24 Hr ☐ Partial ☐ Chicago Excused Date Established ____

26. HSR Corridor ID ____ ☒ N/A

27. Latitude in decimal degrees *(WGS84 std: nn.nnnnnnn)* 43.0657219

28. Longitude in decimal degrees *(WGS84 std: -nnn.nnnnnnn)* -70.7793485

29. Lat/Long Source ☒ Actual ☐ Estimated

30.A. Railroad Use *

31.A. State Use * AADT ESTIMATED

30.B. Railroad Use *

31.B. State Use *

30.C. Railroad Use *

31.C. State Use *

30.D. Railroad Use * Original MP: P 9.0766

31.D. State Use *

32.A. Narrative *(Railroad Use)* *

32.B. Narrative *(State Use)* * VERIFIED

33. Emergency Notification Telephone No. *(posted)* 800-232-0144

34. Railroad Contact *(Telephone No.)* 904-366-3051

35. State Contact *(Telephone No.)* 603-271-2468

Part II: Railroad Information

1. Estimated Number of Daily Train Movements

1.A. Total Day Thru Trains *(6 AM to 6 PM)* 1

1.B. Total Night Thru Trains *(6 PM to 6 AM)* 0

1.C. Total Switching Trains 0

1.D. Total Transit Trains 0

1.E. Check if Less Than One Movement Per Day ☐ How many trains per week? ____

2. Year of Train Count Data *(YYYY)* 2023

3. Speed of Train at Crossing
3.A. Maximum Timetable Speed *(mph)* 10
3.B. Typical Speed Range Over Crossing *(mph)* From 10 to 10

4. Type and Count of Tracks
Main 1 Siding 0 Yard 0 Transit 0 Industry 0

5. Train Detection *(Main Track only)*
☐ Constant Warning Time ☐ Motion Detection ☐AFO ☐ PTC ☐ DC ☐ Other ☒ None

6. Is Track Signaled? ☐ Yes ☒ No

7.A. Event Recorder ☐ Yes ☒ No

7.B. Remote Health Monitoring ☐ Yes ☒ No

U. S. DOT CROSSING INVENTORY FORM

A. Revision Date *(MM/DD/YYYY)* 10/24/2023

PAGE 2

D. Crossing Inventory Number *(7 char.)* 054410Y

Part III: Highway or Pathway Traffic Control Device Information

1. Are there Signs or Signals? ☒ Yes ☐ No

2. Types of Passive Traffic Control Devices associated with the Crossing

2.A. Crossbuck Assemblies *(count)* 2

2.B. STOP Signs *(R1-1)* *(count)* 2

2.C. YIELD Signs *(R1-2)* *(count)* 0

2.D. Advance Warning Signs *(Check all that apply; include count)* ☒ None
☐ W10-1 ________ ☐ W10-3 _________ ☐ W10-11 __________
☐ W10-2 ________ ☐ W10-4 _________ ☐ W10-12 __________

2.E. Low Ground Clearance Sign *(W10-5)* ☐ Yes *(count_______)* ☒ No

2.F. Pavement Markings ☐ Stop Lines ☐ Dynamic Envelope ☐ RR Xing Symbols ☒ None

2.G. Channelization Devices/Medians ☐ All Approaches ☐ Median ☐ One Approach ☒ None

2.H. EXEMPT Sign *(R15-3)* ☐ Yes ☒ No

2.I. ENS Sign *(I-13)* Displayed ☒ Yes ☐ No

2.J. Other MUTCD Signs ☐ Yes ☒ No
Specify Type _______________ Count __________
Specify Type _______________ Count __________
Specify Type _______________ Count __________

2.K. Private Crossing Signs *(if private)* ☐ Yes ☐ No

2.L. LED Enhanced Signs *(List types)*

3. Types of Train Activated Warning Devices at the Grade Crossing ***(specify count of each device for all that apply)***

3.A. Gate Arms *(count)* Roadway 0 Pedestrian 0

3.B. Gate Configuration ☐ 2 Quad ☐ 3 Quad ☐ 4 Quad ☐ Full *(Barrier)* Resistance ☐ Median Gates

3.C. Cantilevered *(or Bridged)* Flashing Light Structures *(count)* Over Traffic Lane 0 ☐ Incandescent Not Over Traffic Lane 0 ☐ LED

3.D. Mast Mounted Flashing Lights *(count of masts)* 0 ☐ Incandescent ☐ LED ☐ Back Lights Included ☐ Side Lights Included

3.E. Total Count of Flashing Light Pairs 0

3.F. Installation Date of Current Active Warning Devices: *(MM/YYYY)* ______/___________ ☒ Not Required

3.G. Wayside Horn ☐ Yes Installed on *(MM/YYYY)* ______/__________ ☒ No

3.H. Highway Traffic Signals Controlling Crossing ☐ Yes ☒ No

3.I. Bells *(count)* 0

3.J. Non-Train Active Warning ☐ Flagging/Flagman ☐ Manually Operated Signals ☐ Watchman ☐ Floodlighting ☒ None

3.K. Other Flashing Lights or Warning Devices Count 0 Specify type ______________________

4.A. Does nearby Hwy Intersection have Traffic Signals? ☐ Yes ☒ No

4.B. Hwy Traffic Signal Interconnection ☒ Not Interconnected ☐ For Traffic Signals ☐ For Warning Signs

4.C. Hwy Traffic Signal Preemption ☐ Simultaneous ☐ Advance

5. Highway Traffic Pre-Signals ☐ Yes ☒ No Storage Distance * ____________ Stop Line Distance * ____________

6. Highway Monitoring Devices *(Check all that apply)* ☐ Yes - Photo/Video Recording ☐ Yes – Vehicle Presence Detection ☒ None

Part IV: Physical Characteristics

1. Traffic Lanes Crossing Railroad ☐ One-way Traffic ☒ Two-way Traffic ☐ Divided Traffic Number of Lanes 1

2. Is Roadway/Pathway Paved? ☒ Yes ☐ No

3. Does Track Run Down a Street? ☐ Yes ☒ No

4. Is Crossing Illuminated? *(Street lights within approx. 50 feet from nearest rail)* ☐ Yes ☒ No

5. Crossing Surface *(on Main Track, multiple types allowed)* Installation Date * *(MM/YYYY)* _______/__________ Width * ______________ Length * _______________
☐ 1 Timber ☒ 2 Asphalt ☐ 3 Asphalt and Timber ☐ 4 Concrete ☐ 5 Concrete and Rubber ☐ 6 Rubber ☐ 7 Metal
☐ 8 Unconsolidated ☐ 9 Composite ☐ 10 Other *(specify)* ____

6. Intersecting Roadway within 500 feet? ☐ Yes ☒ No If Yes, Approximate Distance *(feet)* _________________

7. Smallest Crossing Angle ☐ 0° – 29° ☒ 30° – 59° ☐ 60° - 90°

8. Is Commercial Power Available? * ☒ Yes ☐ No

Part V: Public Highway Information

1. Highway System
☐ (01) Interstate Highway System
☐ (02) Other Nat Hwy System (NHS)
☐ (03) Federal AID, Not NHS
☒ (08) Non-Federal Aid

2. Functional Classification of Road at Crossing ☐ (0) Rural ☒ (1) Urban
☐ (1) Interstate ☐ (5) Major Collector
☐ (2) Other Freeways and Expressways
☐ (3) Other Principal Arterial ☐ (6) Minor Collector
☐ (4) Minor Arterial ☒ (7) Local

3. Is Crossing on State Highway System? ☐ Yes ☒ No

4. Highway Speed Limit 30 MPH ☒ Posted ☐ Statutory

5. Linear Referencing System *(LRS Route ID)* *

6. LRS Milepost *

7. Annual Average Daily Traffic *(AADT)* Year 2009 AADT 000560

8. Estimated Percent Trucks 00 %

9. Regularly Used by School Buses? ☐ Yes ☒ No Average Number per Day ___________

10. Emergency Services Route ☐ Yes ☐ No

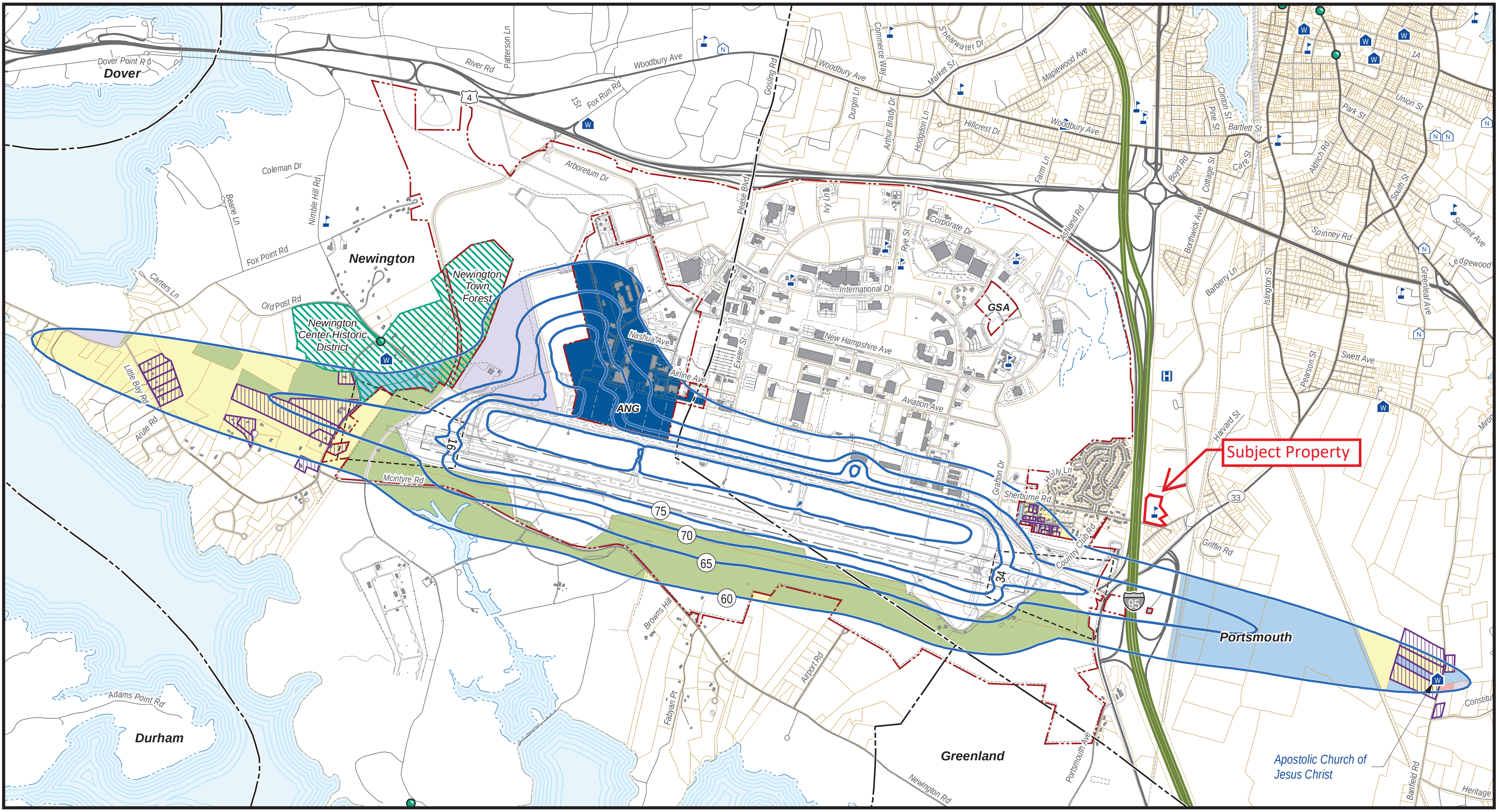
Submission Information - *This information is used for administrative purposes and is not available on the public website.*

Submitted by _________________________________ Organization ______________________________________ Phone _______________ Date _____________

Public reporting burden for this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed and completing and reviewing the collection of information. According to the Paperwork Reduction Act of 1995, a federal agency may not conduct or sponsor, and a person is not required to, nor shall a person be subject to a penalty for failure to comply with, a collection of information unless it displays a currently valid OMB control number. The valid OMB control number for information collection is 2130-0017. Send comments regarding this burden estimate or any other aspect of this collection, including for reducing this burden to: Information Collection Officer, Federal Railroad Administration, 1200 New Jersey Ave. SE, MS-25 Washington, DC 20590.

DNL Map Pease International Tradeport

Path: G:\Projects\305XXX\305310_PSM_NEM\GIS\305310_PSM_Figure4-2_2019_Forecast_Condition_NEM.mxd



▭ 2019 DNL Contour

Airport Boundary (Approximate)

Municipal Boundary

Water

Highway

Major Roads

Local Roads

Railroad

School

🅆 Place of Worship

🅷 Hospital

Ⓝ Nursing Home/Assisted Living

🟨 Residential Use

🟦 Public Use

🟥 Commercial Use

🟪 Manufacturing and Production

🟩 Recreational / Open Space

■ Air National Guard

▨ Sound Insulated

☐ Parcel Boundary

● National Register Historic Place

▨ National Register Historic District

Note: Land uses within the 65 dB DNL contour marked as "Sound Insulated" are compatible.

N E S W

0 2,000 4,000 Feet

PORTSMOUTH INTERNATIONAL AIRPORT

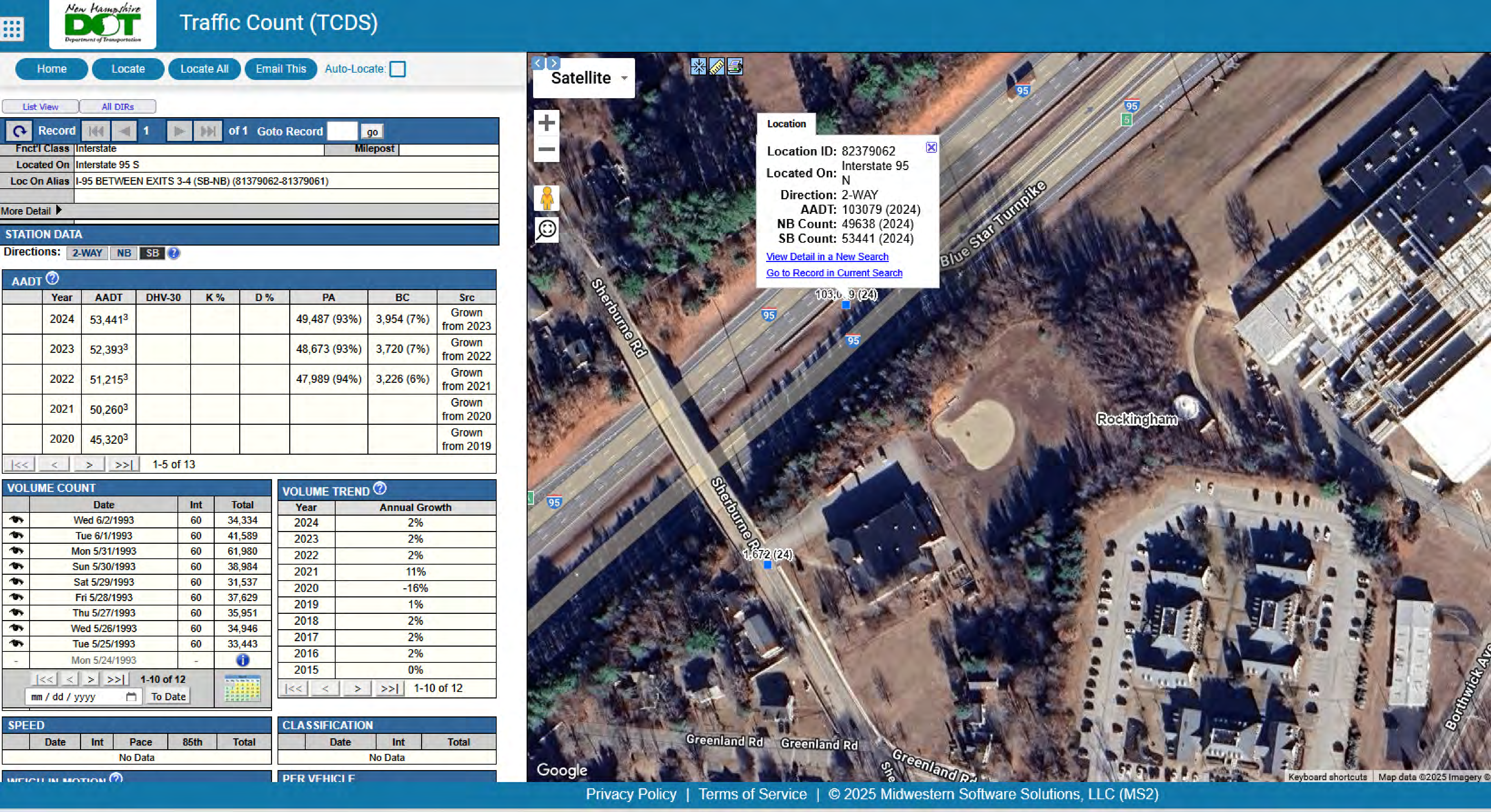
Portsmouth, New Hampshire

2019 Five-Year Forecast Conditions Noise Exposure Map

Figure 4-2

HARRIS MILLER MILLER & HANSON INC.

Data for Road Noise Calculations
NHDOT AADT Data, 2022 Vehicle Classification Averages
Road Grade (USGS National Map)



Traffic Count (TCDS)

Fnct'l Class	Interstate	**Milepost**	
Located On	Interstate 95 S		
Loc On Alias	I-95 BETWEEN EXITS 3-4 (SB-NB) (81379062-81379061)		

More Detail

STATION DATA

Directions: 2-WAY NB SB

AADT

	Year	AADT	DHV-30	K %	D %	PA	BC	Src
	2024	53,441[3]				49,487 (93%)	3,954 (7%)	Grown from 2023
	2023	52,393[3]				48,673 (93%)	3,720 (7%)	Grown from 2022
	2022	51,215[3]				47,989 (94%)	3,226 (6%)	Grown from 2021
	2021	50,260[3]						Grown from 2020
	2020	45,320[3]						Grown from 2019

|<< < > >>| 1-5 of 13

VOLUME COUNT

	Date	Int	Total
👁	Wed 6/2/1993	60	34,334
👁	Tue 6/1/1993	60	41,589
👁	Mon 5/31/1993	60	61,980
👁	Sun 5/30/1993	60	38,984
👁	Sat 5/29/1993	60	31,537
👁	Fri 5/28/1993	60	37,629
👁	Thu 5/27/1993	60	35,951
👁	Wed 5/26/1993	60	34,946
👁	Tue 5/25/1993	60	33,443
-	Mon 5/24/1993	-	ⓘ

|<< < > >>| 1-10 of 12

mm / dd / yyyy To Date

VOLUME TREND

Year	Annual Growth
2024	2%
2023	2%
2022	2%
2021	11%
2020	-16%
2019	1%
2018	2%
2017	2%
2016	2%
2015	0%

|<< < > >>| 1-10 of 12

SPEED

Date	Int	Pace	85th	Total
No Data				

CLASSIFICATION

Date	Int	Total
No Data		

WEIGH IN MOTION

PER VEHICLE

Location

Location ID: 82379062
Located On: Interstate 95 N
Direction: 2-WAY
AADT: 103079 (2024)
NB Count: 49638 (2024)
SB Count: 53441 (2024)

View Detail in a New Search
Go to Record in Current Search

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Definitions

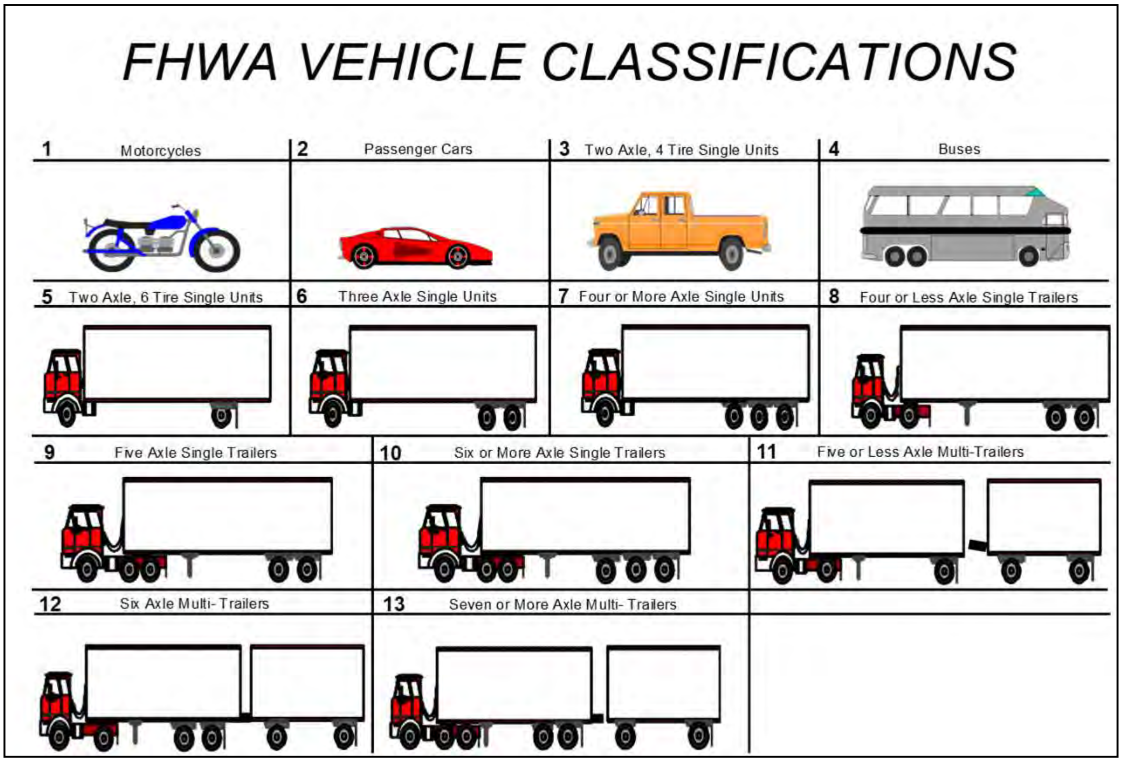
Location: Automatic Traffic Recorder Station ID assigned by VTrans
FC: Functional Classification (designates road use characteristics)
- 1 = Interstate
- 2 = Principal Arterial - Other Freeways & Expressways
- 3 = Principal Arterial - Other
- 4 = Minor Arterial
- 5 = Major Collector
- 6 = Minor Collector
- 7 = Local

MM: Mile Marker
R/U: U (urban) designates a location within the Federal Aid Urban Area Boundary
R (rural) designates a location outside the Federal Aid Urban Area Boundary
AADT: Annual Average Daily Traffic for the Year shown

FHWA Vehicle Classes

Class	Heading	Description
1	MC	Motorcycle
2	Car	Passenger car
3	Pickup	Pickup truck/sports utility
4	Bus	Full size school and transit busses
5	2A SU	2 axle six tire, delivery type van or heavy duty pick up
6	3A SU	3 axle single unit, short haul delivery truck, dump truck
7	>3A SU	4 axle single unit, short haul delivery truck, concrete truck
8	<5A 2U	<5 axle tractor/single trailer, medium haul delivery
9	5A 2U	5 axle tractor/single trailer, "18 Wheeler"
10	>5A 2U	> 5 axle tractor/single trailer, tanker truck, logging truck
11	<6A >2U	<6 axle multi trailer truck
12	6A >2U	6 axle multi trailer truck
13	>6A >2U	>6 axle multi trailer truck

TRUCK: FHWA Vehicle Class 4-13
MED: Single Unit truck (FHWA Vehicle Class 4-7)
HEAVY: Tractor-trailer truck (FHWA Vehicle Class 8-13)


FHWA VEHICLE CLASSIFICATIONS
1 Motorcycles
2 Passenger Cars
3 Two Axle, 4 Tire Single Units
4 Buses
5 Two Axle, 6 Tire Single Units
6 Three Axle Single Units
7 Four or More Axle Single Units
8 Four or Less Axle Single Trailers
9 Five Axle Single Trailers
10 Six or More Axle Single Trailers
11 Five or Less Axle Multi-Trailers
12 Six Axle Multi- Trailers
13 Seven or More Axle Multi- Trailers

Total Cars

Cars

Trucks

2022 FUNCTIONAL CLASS AVERAGES

DAILY

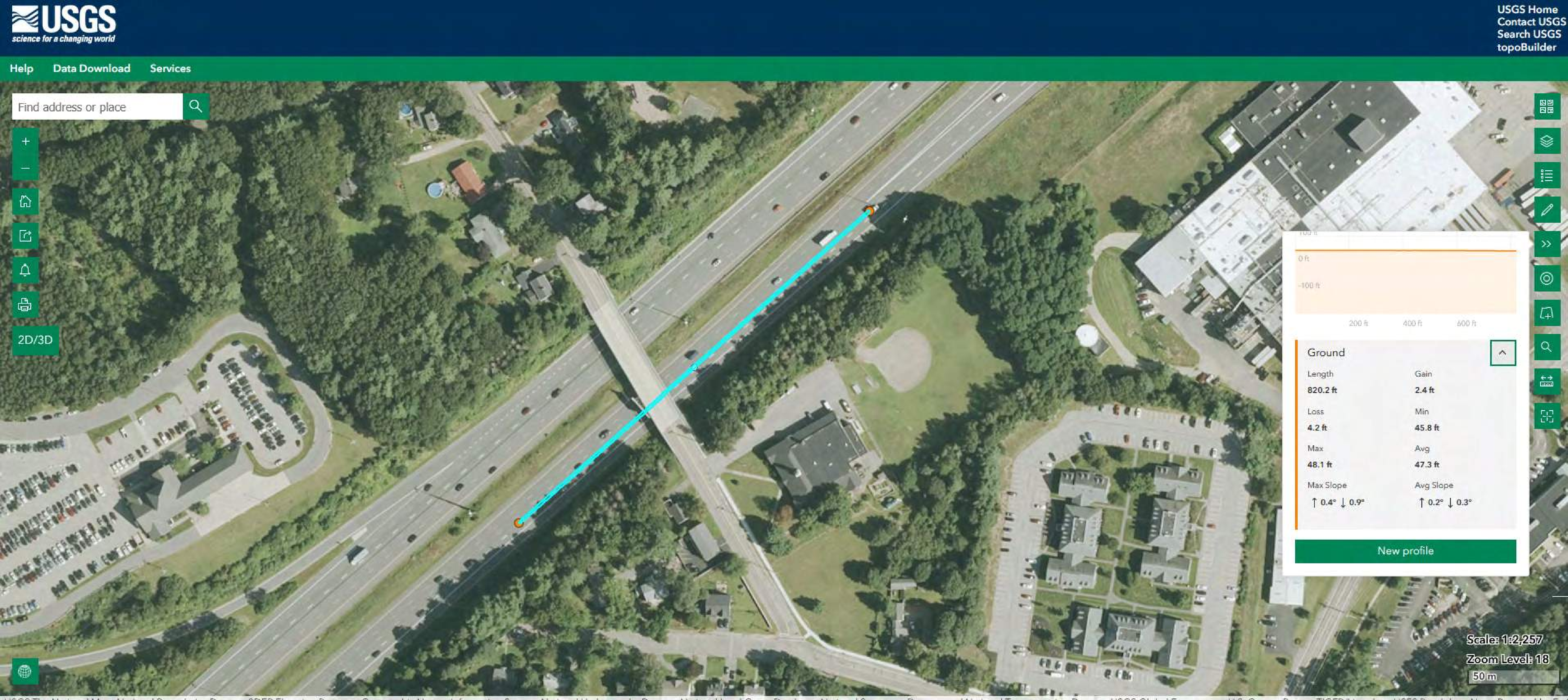
		Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13		TRUCKS	
	RURAL	MC	Car	Pickup	Bus	2A SU	3A SU	>3A SU	<5A 2U	5A 2U	>5A 2U	<6A >2U	6A >2U	>6A >2U	TOTAL	MED	HEAVY
1	FC1 AVG	0.64%	67.54%	17.62%	1.46%	4.09%	1.23%	0.55%	1.72%	3.44%	1.54%	0.05%	0.01%	0.12%	14.20%	7.33%	6.87%
	FC2 AVG																
	FC3 AVG	1.55%	70.53%	19.21%	0.99%	3.56%	0.80%	0.16%	1.15%	1.56%	0.46%	0.01%	0.00%	0.01%	8.71%	5.51%	3.20%
	FC4 AVG	2.45%	68.70%	21.32%	0.79%	3.53%	0.84%	0.12%	1.06%	0.81%	0.37%	0.00%	0.00%	0.01%	7.53%	5.28%	2.25%
	FC5 AVG	2.45%	68.24%	22.49%	0.68%	3.69%	0.76%	0.11%	0.85%	0.46%	0.27%	0.00%	0.00%	0.01%	6.82%	5.23%	1.59%
	FC6 AVG	1.63%	67.39%	24.40%	0.26%	3.85%	1.44%	0.20%	0.57%	0.19%	0.07%	0.00%	0.00%	0.00%	6.58%	5.76%	0.83%
	FC7 AVG	1.11%	69.03%	23.96%	0.51%	4.18%	0.61%	0.04%	0.43%	0.08%	0.04%	0.00%	0.00%	0.00%	5.89%	5.33%	0.56%

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13		TRUCKS	
URBAN	MC	Car	Pickup	Bus	2A SU	3A SU	>3A SU	<5A 2U	5A 2U	>5A 2U	<6A >2U	6A >2U	>6A >2U	TOTAL	MED	HEAVY
FC1 AVG	0.68%	73.61%	17.09%	0.91%	3.64%	0.67%	0.19%	1.24%	1.55%	0.31%	0.06%	0.03%	0.04%	8.62%	5.40%	3.22%
FC2 AVG																
FC3 AVG	1.40%	73.63%	18.27%	0.77%	3.72%	0.48%	0.07%	0.82%	0.67%	0.16%	0.00%	0.00%	0.01%	6.70%	5.03%	1.67%
FC4 AVG	1.42%	73.14%	19.49%	0.61%	3.16%	0.79%	0.15%	0.49%	0.48%	0.26%	0.00%	0.00%	0.00%	5.94%	4.71%	1.24%
FC5 AVG	1.22%	72.91%	19.66%	0.62%	3.66%	0.88%	0.11%	0.38%	0.37%	0.20%	0.00%	0.00%	0.01%	6.22%	5.27%	0.95%
FC6 AVG	1.60%	70.18%	23.30%	0.18%	3.06%	0.57%	0.17%	0.91%	0.05%	0.00%	0.00%	0.00%	0.00%	4.92%	3.97%	0.95%
FC7 AVG	0.81%	70.66%	24.53%	0.39%	2.98%	0.29%	0.05%	0.24%	0.04%	0.00%	0.00%	0.00%	0.01%	4.00%	3.70%	0.29%

PEAK HOUR

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13		TRUCKS	
RURAL	MC	Car	Pickup	Bus	2A SU	3A SU	>3A SU	<5A 2U	5A 2U	>5A 2U	<6A >2U	6A >2U	>6A >2U	TOTAL	MED	HEAVY
FC1 AVG	0.17%	70.87%	15.64%	1.93%	3.33%	0.69%	0.12%	1.69%	4.19%	1.30%	0.06%	0.00%	0.02%	13.32%	6.06%	7.26%
FC2 AVG																
FC3 AVG	1.11%	68.33%	22.06%	0.93%	3.99%	0.63%	0.09%	1.20%	1.24%	0.34%	0.01%	0.01%	0.06%	8.51%	5.65%	2.86%
FC4 AVG	2.28%	65.81%	23.15%	0.80%	4.64%	0.96%	0.08%	1.32%	0.70%	0.24%	0.02%	0.00%	0.01%	8.77%	6.48%	2.29%
FC5 AVG	2.22%	67.32%	22.76%	0.87%	4.87%	0.63%	0.03%	0.79%	0.37%	0.15%	0.00%	0.00%	0.00%	7.71%	6.40%	1.30%
FC6 AVG	0.74%	69.82%	24.00%	0.29%	4.32%	0.51%	0.00%	0.30%	0.01%	0.00%	0.00%	0.00%	0.01%	5.44%	5.11%	0.33%
FC7 AVG	1.39%	68.43%	24.34%	0.53%	4.05%	0.33%	0.16%	0.55%	0.14%	0.07%	0.00%	0.00%	0.00%	5.84%	5.08%	0.76%

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13		TRUCKS	
URBAN	MC	Car	Pickup	Bus	2A SU	3A SU	>3A SU	<5A 2U	5A 2U	>5A 2U	<6A >2U	6A >2U	>6A >2U	TOTAL	MED	HEAVY
FC1 AVG	2.85%	72.84%	16.91%	0.72%	3.16%	0.49%	0.19%	1.43%	1.06%	0.29%	0.02%	0.01%	0.04%	7.40%	4.56%	2.84%
FC2 AVG																
FC3 AVG	1.13%	74.37%	17.91%	1.23%	3.67%	0.44%	0.06%	0.71%	0.34%	0.13%	0.00%	0.00%	0.01%	6.60%	5.40%	1.19%
FC4 AVG	1.47%	72.39%	18.72%	0.99%	4.68%	0.52%	0.07%	0.54%	0.56%	0.06%	0.00%	0.00%	0.00%	7.42%	6.26%	1.16%
FC5 AVG	1.36%	72.69%	18.81%	0.38%	4.97%	0.58%	0.11%	0.63%	0.25%	0.21%	0.00%	0.00%	0.00%	7.14%	6.05%	1.09%
FC6 AVG	2.04%	69.82%	24.45%	0.06%	2.41%	0.24%	0.00%	0.98%	0.00%	0.00%	0.00%	0.00%	0.00%	3.69%	2.71%	0.98%
FC7 AVG	1.04%	69.26%	25.15%	0.05%	3.88%	0.05%	0.05%	0.52%	0.01%	0.00%	0.00%	0.00%	0.00%	4.55%	4.01%	0.53%

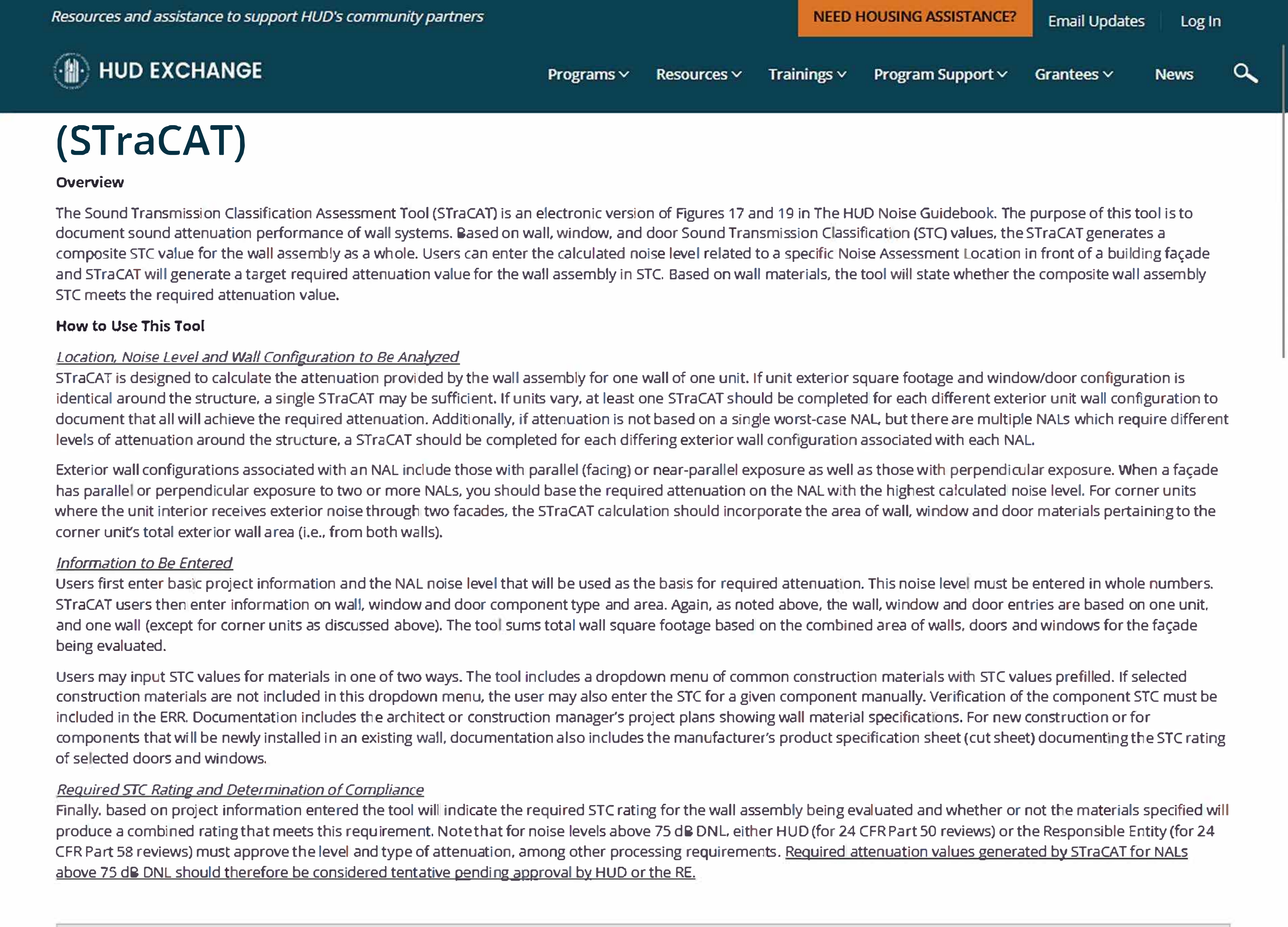


Ground

Length 820.2 ft	Gain 2.4 ft
Loss 4.2 ft	Min 45.8 ft
Max 48.1 ft	Avg 47.3 ft
Max Slope ↑ 0.4° ↓ 0.9°	Avg Slope ↑ 0.2° ↓ 0.3°

New profile

Indoor Noise Level Calculations
HUD Sound Transmission Classification Assessment Tool
Calculations and General STC Ratings from
"The Sound Book" and Marvin INdustries



(STraCAT)

Overview

The Sound Transmission Classification Assessment Tool (STraCAT) is an electronic version of Figures 17 and 19 in The HUD Noise Guidebook. The purpose of this tool is to document sound attenuation performance of wall systems. Based on wall, window, and door Sound Transmission Classification (STC) values, the STraCAT generates a composite STC value for the wall assembly as a whole. Users can enter the calculated noise level related to a specific Noise Assessment Location in front of a building façade and STraCAT will generate a target required attenuation value for the wall assembly in STC. Based on wall materials, the tool will state whether the composite wall assembly STC meets the required attenuation value.

How to Use This Tool

Location, Noise Level and Wall Configuration to Be Analyzed

STraCAT is designed to calculate the attenuation provided by the wall assembly for one wall of one unit. If unit exterior square footage and window/door configuration is identical around the structure, a single STraCAT may be sufficient. If units vary, at least one STraCAT should be completed for each different exterior unit wall configuration to document that all will achieve the required attenuation. Additionally, if attenuation is not based on a single worst-case NAL, but there are multiple NALs which require different levels of attenuation around the structure, a STraCAT should be completed for each differing exterior wall configuration associated with each NAL.

Exterior wall configurations associated with an NAL include those with parallel (facing) or near-parallel exposure as well as those with perpendicular exposure. When a façade has parallel or perpendicular exposure to two or more NALs, you should base the required attenuation on the NAL with the highest calculated noise level. For corner units where the unit interior receives exterior noise through two facades, the STraCAT calculation should incorporate the area of wall, window and door materials pertaining to the corner unit's total exterior wall area (i.e., from both walls).

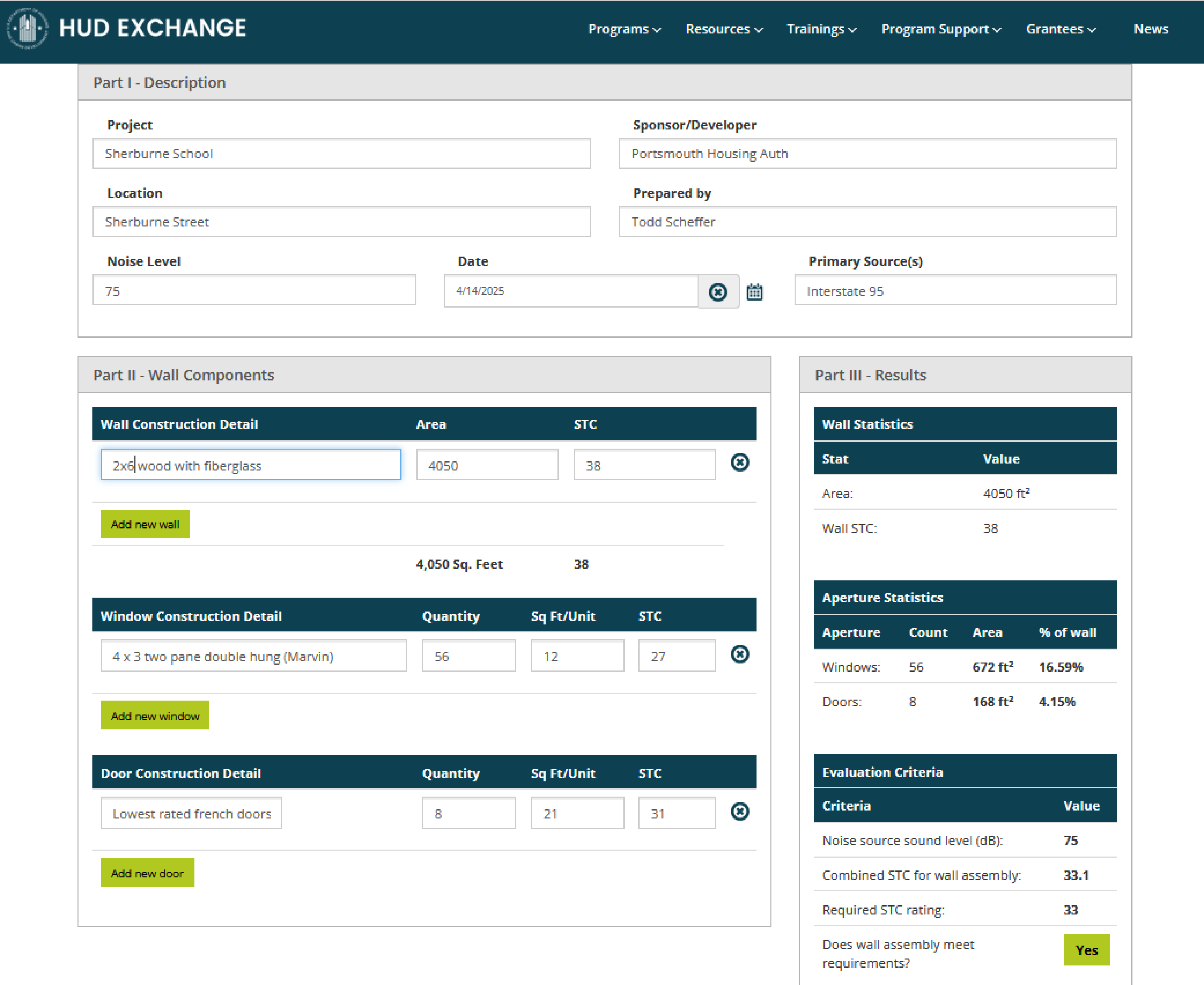
Information to Be Entered

Users first enter basic project information and the NAL noise level that will be used as the basis for required attenuation. This noise level must be entered in whole numbers. STraCAT users then enter information on wall, window and door component type and area. Again, as noted above, the wall, window and door entries are based on one unit, and one wall (except for corner units as discussed above). The tool sums total wall square footage based on the combined area of walls, doors and windows for the façade being evaluated.

Users may input STC values for materials in one of two ways. The tool includes a dropdown menu of common construction materials with STC values prefilled. If selected construction materials are not included in this dropdown menu, the user may also enter the STC for a given component manually. Verification of the component STC must be included in the ERR. Documentation includes the architect or construction manager's project plans showing wall material specifications. For new construction or for components that will be newly installed in an existing wall, documentation also includes the manufacturer's product specification sheet (cut sheet) documenting the STC rating of selected doors and windows.

Required STC Rating and Determination of Compliance

Finally, based on project information entered the tool will indicate the required STC rating for the wall assembly being evaluated and whether or not the materials specified will produce a combined rating that meets this requirement. Note that for noise levels above 75 dB DNL, either HUD (for 24 CFR Part 50 reviews) or the Responsible Entity (for 24 CFR Part 58 reviews) must approve the level and type of attenuation, among other processing requirements. Required attenuation values generated by STraCAT for NALs above 75 dB DNL should therefore be considered tentative pending approval by HUD or the RE.



Part I - Description

Project: Sherburne School

Sponsor/Developer: Portsmouth Housing Auth

Location: Sherburne Street

Prepared by: Todd Scheffer

Noise Level: 75

Date: 4/14/2025

Primary Source(s): Interstate 95

Part II - Wall Components

Wall Construction Detail	Area	STC
2x6 wood with fiberglass	4050	38
	4,050 Sq. Feet	**38**

Window Construction Detail	Quantity	Sq Ft/Unit	STC
4 x 3 two pane double hung (Marvin)	56	12	27

Door Construction Detail	Quantity	Sq Ft/Unit	STC
Lowest rated french doors	8	21	31

Part III - Results

Wall Statistics

Stat	Value
Area:	4050 ft^2
Wall STC:	38

Aperture Statistics

Aperture	Count	Area	% of wall
Windows:	56	**672 ft^2**	**16.59%**
Doors:	8	**168 ft^2**	**4.15%**

Evaluation Criteria

Criteria	Value
Noise source sound level (dB):	**75**
Combined STC for wall assembly:	**33.1**
Required STC rating:	**33**
Does wall assembly meet requirements?	**Yes**

The SoundBook™

Acoustical Assembly Guide

National Gypsum®

Acoustical Terms and Concepts

Transmission of Airborne Sound

Airborne sound is acoustical energy generated by a source and transmitted by vibration through the air. The vibrations create sound pressure fluctuations that are detected by a receiver. Sound is characterized by its frequency, which determines the pitch of the sound, and by the intensity of the pressure fluctuations, which determines how loud the sound is perceived to be.

Sound Transmission				
Energy Generated by a Source	►	Transmitted Through a Medium	►	Detected by a Receiver
Drumstick strikes drumhead creating vibrations	►	Vibrations transmitted through the air as pressure fluctuations	►	Ear receives pressure fluctuations and perceives them as sound

The frequency of sound refers to the number of sound pressure fluctuations or cycles that occur at a fixed point in one second. The unit of measure for frequency is the hertz (Hz), which is one cycle per second. The human auditory system is capable of detecting sound frequencies between 20 Hz and 20,000 Hz, but humans are typically most sensitive to sounds within the range of 500 Hz and 4,000 Hz. Sound frequency is perceived by humans as pitch. The lowest note on a piano has a frequency of 27.5 Hz, while the highest note on the piano is 4,186 Hz.

The intensity of sound, or loudness, is measured in decibels (dB). A quiet whisper might register at 20 dB, compared to about 60 dB for normal conversation, and 75 dB for loud singing. The decibel scale is logarithmic, not linear. A sound level change of 1 to 2 dB will be difficult to perceive while a change of 5 dB will be clearly noticeable. Sound is perceived to double in intensity for every 10 dB increase and quadruple for every 20 dB increase.

Human Sensitivity to Changes in Sound Intensity Levels	
1 dB	Generally not perceptible
3 dB	Just perceptible
5 dB	Clearly noticeable
10 dB	Twice as loud
20 dB	Four times as loud

Rating	Activity	Sound Level (dB)
Painful	Jet Engine	120+
Very Loud	Industrial Machinery	100
Loud	Stock Trading Floor	80
Moderate	Normal Speech	65
Quiet	Suburban Home	45
Very Quiet	Barely Audible	25

Sound Transmission Class

The Sound Transmission Class (STC) is a single number rating of the effectiveness of a material or construction assembly to retard the transmission of airborne sound. The STC provides an indication of how loud transmitted sound is perceived to be by the listener. Partitions with higher STC values are more effective at reducing sound transmission.

STC values are derived by conducting a test in accordance with ASTM E90, *Standard Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions*. The test data collected is analyzed using ASTM E413, *Classification for Rating Sound Insulation,* and results in a single-number acoustical rating. The rating assesses the airborne sound transmission performance at a range of frequencies from 125 Hz to 4000 Hz, which is consistent with the frequency range of the human ear. An STC rating of 50 has been designated as the minimum allowable design rating for unit-to-unit multifamily construction in the International Building Code.

Design Considerations for Acoustical Partitions

The goal of a high STC rated partition is to decrease the amount of sound transmission through the partition. The following five variables can have an impact on the ability of the partition to retard the sound transmission.

Mass

Increasing the mass of a partition increases the amount of material airborne sound waves must penetrate to reach the adjoining room and can be accomplished by installing multiple layers of gypsum board.

Stiffness

Decreasing the stiffness of a partition will increase the amount of sound transmission loss. For this reason metal studs outperform wood studs, and framing that is 24" o.c. outperforms framing that is 16" o.c.

Damping

Damping, or the ability to dissipate the vibrational energy produced by sound waves, reduces the amount of energy to pass through the partition.

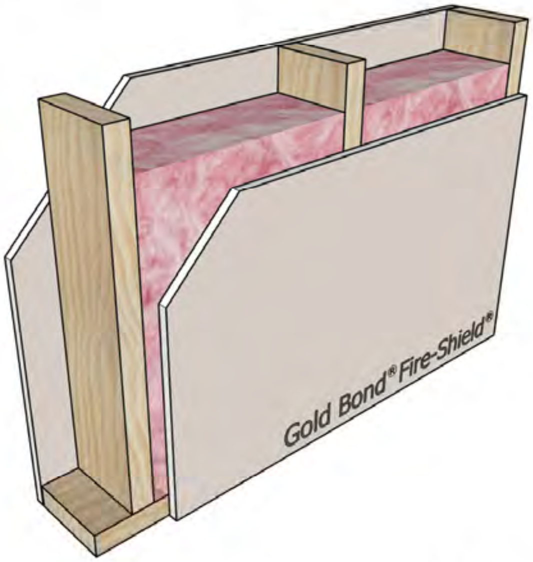
Cavity Depth

Increasing the depth of the cavity of the partition can increase the amount of sound transmission loss, especially when the cavity is filled with acoustical insulation.

Cavity Absorption

Increasing the thickness of sound-absorbing material such as fiberglass or mineral fiber insulation in the cavity of a partition will increase the amount of sound transmission loss. The thickness of the insulation has a greater effect on sound transmission loss than the density.

Figure 114

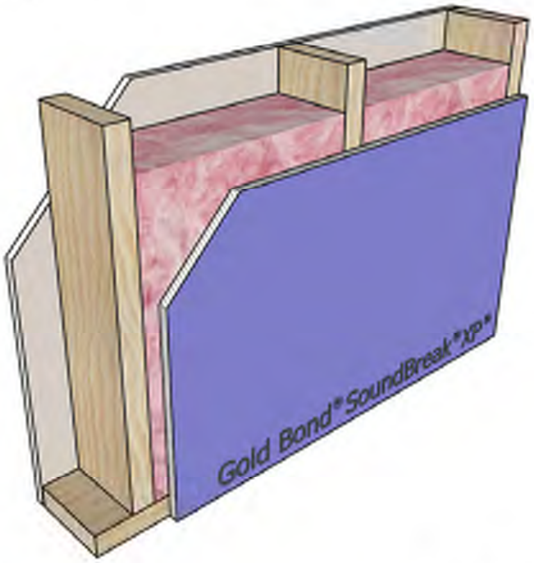


STC-38 **NGC 2008032**

Framing: 2x6 wood studs, 16" o.c.
Insulation: 5-1/2" glass fiber
Side 1: 5/8" Fire-Shield Gypsum Board
Side 2: 5/8" Fire-Shield Gypsum Board

UL Design: U305 - 1 hour

Figure 115

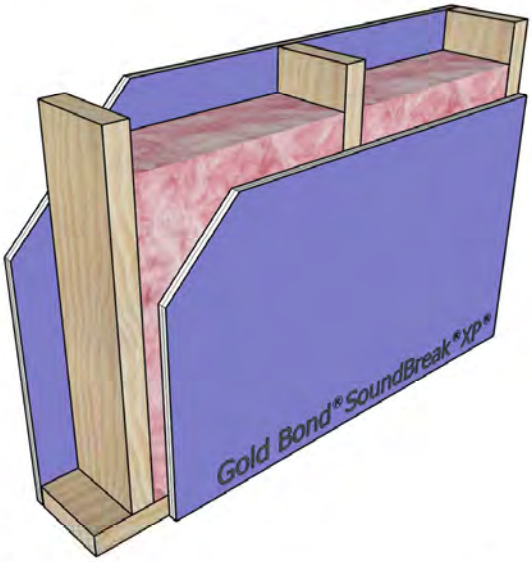


STC-42 **NGC 2009008**

Framing: 2x6 wood studs, 16" o.c.
Insulation: 5-1/2" glass fiber
Side 1: 5/8" Fire-Shield Gypsum Board
Side 2: 5/8" SoundBreak XP Gypsum Board

UL Design: U305 - 1 hour

Figure 116

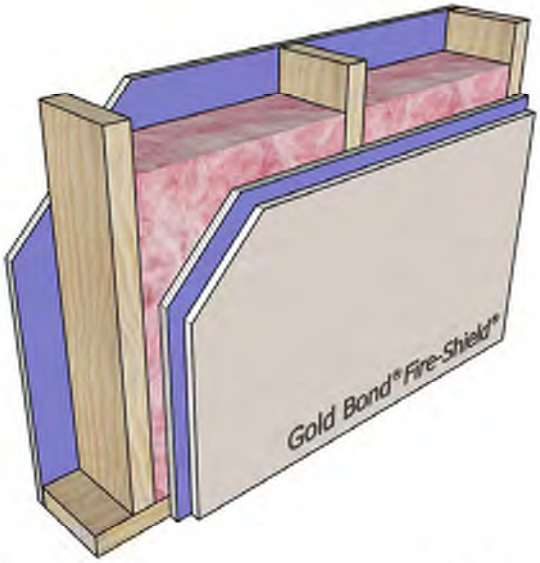


STC-44 **NGC 2009012**

Framing: 2x6 wood studs, 16" o.c.
Insulation: 5-1/2" glass fiber
Side 1: 5/8" SoundBreak XP Gypsum Board
Side 2: 5/8" SoundBreak XP Gypsum Board

UL Design: U305 - 1 hour

Figure 117



STC-46 **NGC 2009010**

Framing: 2x6 wood studs, 16" o.c.
Insulation: 5-1/2" glass fiber
Side 1: 5/8" SoundBreak XP Gypsum Board
Side 2: 5/8" Fire-Shield Gypsum Board on
5/8" SoundBreak XP Gypsum Board
UL Design: U305 - 1 hour

STC and OITC Class Values

Marvin Sound Transmission Class and Outdoor - Indoor Transmission Class Values

Product Type	Exterior Glazing	Airspace	Interior Glazing	STC	OITC	Additional Information	STC Report #
Clad Ultimate Double Hung - NG							
CUDH-NG (47 3/16 x 59 1/8)	1/8" (3.1) Annealed	5/8" (16.0)	1/8" (3.1) Annealed	27	23		ESP018375P-2
CUDH-NG (47 3/16 x 59 1/8)	1/8" (3.1) Annealed	1/4" (6.5)	1/8" (3.1) Annealed	28	24	Tri-pane: two 1/4" air spaces with 1/8" center pane	ESP016170P-2
CUDH-NG (47 3/16 x 59 1/8)	1/8" (3.1) Annealed	19/32" (14.5)	3/16" (4.7) Annealed	30	26		ESP020753P-2
CUDH-NG (47 3/16 x 59 1/8)	1/4" (5.7) Annealed	3/8" (9.8)	1/4" (6.0) Lami	30	27		ESP016170P-4
CUDH-NG (47 3/16 x 59 1/8)	1/4" (6.0) Lami	3/8" (9.8)	1/4" (6.0) Lami	31	27		ESP016170P-5
CUDH-NG (47 3/16 x 59 1/8)	1/8" (3.1) Annealed	7/16" (11.5)	5/16" (7.8) Lami	31	26	CE	ESP020753P-1
CUDH-NG (47 3/16 x 59 1/8)	9/32" (7.0) Lami	5/16" (8.0)	9/32" (7.0) Lami	31	27	CE	ESP016170P-7
CUDH-NG (47 3/16 x 59 1/8)	1/8" (3.1) Annealed	7/16" (11.5)	11/32" (8.6) Lami	31	27	IZ3	ESP018375P-5
CUDH-NG (47 3/16 x 59 1/8)	3/16" (4.7) Annealed	7/16" (11.5)	1/4" (6.0) Lami	31	28		ESP018375P-3
CUDH-NG (47 3/16 x 59 1/8)	1/4" (5.9) Annealed	5/16" (8.0)	5/16" (7.8) Lami	31	29	CE	ESP016170P-6
CUDH-NG (47 3/16 x 59 1/8)	3/16" (4.7) Annealed	5/16" (8.0)	11/32" (8.6) Lami	32	29	IZ3	ESP018375P-7
CUDH-NG (47 3/16 x 59 1/8)	1/8" (3.1) Annealed	5/8" (16.0)	1/8" (3.1) Annealed	35	28	1/8" Clad Storm Combination	ESP016170P-14
CUDH-NG (47 3/16 x 59 1/8)	1/8" (3.1) Annealed	1/4" (6.5)	1/8" (3.1) Annealed	36	30	Tri-pane: two 1/4" air spaces w/ 1/8" center pane, 1/8" Clad Storm Comb	ESP016170P-15
CUDH-NG (47 3/16 x 59 1/8)	1/4" (5.7) Annealed	3/8" (9.8)	1/4" (6.0) Lami	39	32	1/8" Clad Storm Combination	ESP016170P-19
CUDH-NG (47 3/16 x 59 1/8)	1/4" (6.0) Lami	3/8" (9.8)	1/4" (6.0) Lami	40	33	1/8" Clad Storm Combination	ESP016170P-17
CUDH-NG (47 3/16 x 59 1/8)	3/16" (4.7) Annealed	7/16" (11.5)	1/4" (6.0) Lami	40	33	1/8" Clad Storm Combination	ESP016170P-18
CUDH-NG (47 3/16 x 59 1/8)	9/32" (7.0) Lami	5/16" (8.0)	9/32" (7.0) Lami	40	33	1/8" Clad Storm Combination CE	ESP016170P-12
CUDH-NG (47 3/16 x 59 1/8)	1/4" (5.9) Annealed	5/16" (8.0)	5/16" (7.8) Lami	41	35	1/8" Clad Storm Combination CE	ESP016170P-16
CUDHP-NG (47 3/16 x 59 1/8)	1/8" (3.1) Annealed	5/8" (16.0)	1/8" (3.1) Annealed	29	23		ESP016170P-21
CUDHP-NG (47 3/16 x 59 1/8)	1/8" (3.1) Annealed	1/4" (6.5)	1/8" (3.1) Annealed	30	25	Tri-pane: two 1/4" air spaces with 1/8" center pane	ESP016170P-24
CUDHP-NG (47 3/16 x 59 1/8)	1/4" (5.7) Annealed	3/8" (9.8)	1/4" (6.0) Lami	34	29		ESP016170P-26
CUDHP-NG (47 3/16 x 59 1/8)	1/4" (6.0) Lami	3/8" (9.8)	1/4" (6.0) Lami	35	30		ESP016170P-25
CUDHP-NG (47 3/16 x 59 1/8)	3/16" (4.7) Annealed	7/16" (11.5)	1/4" (6.0) Lami	35	29		ESP016170P-23
CUDHP-NG (47 3/16 x 59 1/8)	1/4" (5.9) Annealed	5/16" (8.0)	5/16" (7.8) Lami	35	31	CE	ESP016170P-22
CUDHP-NG (47 3/16 x 59 1/8)	9/32" (7.0) Lami	5/16" (8.0)	9/32" (7.0) Lami	35	30	CE	ESP016170P-27
CUDHP-NG (47 3/16 x 59 1/8)	1/8" (3.1) Annealed	1/4" (6.5)	9/16" (13.6) Lami	35	31		ESP016170P-29
Ultimate Double Hung							
WUDH 3026	1/8″ (3.1) Annealed	7/16″ (11.5)	1/8″ (3.1) Annealed	35	26	3/32″ (2) Wood Storm Comb	66263-4
WUDH 3026	3/16″ (4.7) Annealed	3/8″ (9.8)	1/8″ (3.1) Annealed	36	27	3/32″ (2) Wood Storm Comb	66263-5
WUDH 3026	5/32″ (3.9) Annealed	3/8″ (9.8)	1/4″ (6) Lami	37	28	3/32″ (2) Wood Storm Comb	66263-6
WUDHP 6878	1/4″ (5.7) Annealed	9/16″ (14.5)	1/4″ (6) Lami	34	27	2″ (51) Sash	66263-7
Ultimate Double Hung Magnum							
CUDHM FS 48″(1219) X 60″(1524) (7/8)	1/4″ (6) LAMI	3/8″ (9.8)	1/4″ (6) LAMI	33	28		ESP-015798P-3
CUDHM FS 48″(1219) X 60″(1524) (7/8)	1/4″ (6) LAMI	5/16″ (8)	5/16″ (8.6) LAMI	34	29		ESP-015798P-2
CUDHM FS 48″(1219) X 60″(1524) (7/8)	1/8″ (3.1) Annealed	1/4″ (6.5)	1/8″ (3.1) Annealed	28	24	Tri-pane: two 1/4" air spaces with 1/8" center pane	ESP-015798P-1
CUDHM FS 47 7/8 X 88 (11/16)	1/8″ (3.1) Annealed	7/16″ (11.5)	1/8″ (3.1) Annealed	27	22		76430
CUDHM FS 47 7/8 X 88 (11/16)	3/16″ (4.7) Annealed	3/8″ (9.8)	1/8″ (3.1) Annealed	30	25		
CUDHM FS 47 7/8 X 88 (11/16)	1/4″ (5.7) Annealed	5/16″ (8)	5/32" (3.9) Annealed	31	26		
CUDHM FS 47 7/8 X 88 (11/16)	1/4″ (6) LAMI	9/32″ (7)	3/16″ (4.7) Annealed	31	26		
WUDHM FS 48″ (1219) X 60″(1524)	1/4″ (6) LAMI	3/8″ (9.8)	1/4″ (6) LAMI	33	27		ESP-015798P-6
WUDHM FS 48″ (1219) X 60″(1524)	1/4″ (6) LAMI	5/16″ (8)	5/16″ (8.6) LAMI	34	29		ESP-015798P-5
WUDHM FS 48″ (1219) X 60″(1524)	1/8″ (3.1) Annealed	1/4″ (6.5)	1/8″ (3.1) Annealed	28	24	Tri-pane: two 1/4" air spaces with 1/8" center pane	ESP-015798P-4

STC and OITC Class Values

Marvin Sound Transmission Class and Outdoor - Indoor Transmission Class Values

Product Type	Exterior Glazing	Airspace	Interior Glazing	STC	OITC	Additional Information	STC Report #
Ultimate Casement							
Values for wood and clad product UCA, UCART, UPCA, UCAP, UCARTP, UPCAP							
UCA 2460 3/4″ (19)	1/8″ (3.1) Annealed	1/2″ (13)	1/8″ (3.1) Annealed	29	23		TCT005872P-1
UCA 2460 3/4″ (19)	1/4″ (5.7) Annealed	5/16″ (8)	1/4″ (6) LAMI	34	29		ESP016574P-2
UCA 2460 3/4″ (19)	1/4″ (6) LAMI	9/32″ (7)	1/4″ (6) LAMI	35	30		ESP016574P-3
UCA 2460 3/4″ (19)	1/8″ (3.1) Annealed	5/16″ (8)	11/32" (8.6) PVB	35	31	IZ3	ESP017287P-4
UCA 2460 3/4″ (19)	3/16″ (4.7) Annealed	5/16″ (8)	1/4″ (6) LAMI	35	30		ESP016574P-4
UCA 2460 3/4″ (19)	3/16″ (4.7) Annealed	1/4″ (6.5)	11/32" (8.6) PVB	37	31	IZ3	ESP017287P-1
UCA 2460 3/4″ (19)	1/8″ (3.1) Annealed	1/2″ (13)	1/8″ (3.1) Annealed	46	34	interior sash 1/8″ glass, 4 1/4″ airspace	TCT005872P-1
UCA 2460 1″ (25)	1/8″ (3.1) Annealed	5/16″ (8)	1/8″ (3.1) Annealed	30	25	Tri-pane: two 5/16 air spaces, with 1/8" center	ESP016574P-5
UCA 2460 1″ (25)	1/4″ (5.7) Annealed	1/2″ (13)	1/4″ (6) LAMI	34	28		ESP016574P-10
UCA 2460 1″ (25)	3/16″ (4.7) Annealed	9/16″ (14.5)	1/4″ (5.7) Annealed	34	27		TCT005872P-1
UCA 2460 1″ (25)	1/4″ (6) LAMI	1/2″ (13)	1/4″ (6) LAMI	35	28		ESP016574P-11
UCA 2460 1″ (25)	9/32" (7) Lami	7/16″ (11.5)	9/32" (7) Lami	35	29	CE	ESP016574P-13
UCA 2460 1″ (25)	1/4″ (5.9) Annealed	7/16″ (11.5)	5/16" (7.8) Lami	37	32	CE	ESP017287P-3
UCA 2460 1″ (25)	3/16″ (4.7) Annealed	9/32″ (7)	17/32" (13.6) Lami	37	34		ESP016574P-9
UCA 2460 1″ (25)	3/16″ (4.7) Annealed	9/16″ (14.5)	1/4″ (6) LAMI	37	30		ESP016574P-12
UCA 2460 1″ (25)	3/16″ (4.7) Annealed	7/16″ (11.5)	11/32" (8.6) PVB	37	31	IZ3	ESP017287P-2
UCA 2460 1″ (25)	3/16″ (4.7) Annealed	3/8″ (9.8)	13/32" (10.1) PVB	38	33	IZ3	ESP017287P-6
UCA 2460 1″ (25)	3/16″ (4.7) Annealed	9/16″ (14.5)	1/4″ (5.7) Annealed	47	36	interior sash 1/8″ glass, 4 1/4″ airspace	TCT005872P-1
UCAP 4860 1″ (25)	3/16″ (4.7) Annealed	9/16″ (14.5)	1/4″ (6) LAMI	36	30		ESP016574P-15
UCAP 4860 1″ (25)	1/4″ (5.7) Annealed	1/2″ (13.0)	1/4″ (6) LAMI	34	29		ESP016574P-16
UCAP 4860 1″ (25)	1/4″ (6) LAMI	1/2″ (13.0)	1/4″ (6) LAMI	35	29		ESP016574P-17
UCAP 4860 1″ (25)	3/16″ (4.7) Annealed	9/32″ (7)	17/32" (13.6) Lami	36	33		ESP016574P-18
UCAP 4860 1″ (25)	1/8″ (3.1) Annealed	5/16″ (8)	1/8″ (3.1) Annealed	29	24	Tri-pane: two 5/16" air spaces, with 1/8" center	ESP016574P-19
UCAP 4860 1″ (25)	9/32" (7) Lami	7/16″ (11.5)	9/32" (7) Lami	36	32	CE	ESP016574P-23
UCAP 4860 1″ (25)	1/4″ (5.9) Annealed	7/16″ (11.5)	5/16" (7.8) Lami	36	30	CE	ESP016574P-22
UCAP 4860 1″ (25)	3/16″ (4.7) Annealed	5/8″ (16)	3/16″ (4.7) Annealed	31	25		TCT005872P-2
UCAP 4860 1″ (25)	3/16″ (4.7) Annealed	9/16″ (14)	1/4″ (5.7) Annealed	34	28		
CUGL 5040	1/8″ (3.1) Annealed	7/16″ (11.5)	1/8″ (3.1) Annealed	27	22		TCT006299P-CUGL
CUGL 5040	1/8″ (3.1) Annealed	3/8″ (10)	3/16″ (4.7) Annealed	32	26		
CUGL 5040	1/8″ (3.1) Annealed	7/16″ (11.5)	1/8″ (3.1) Annealed	33	25	1/8″ Combination to the exterior	
CUGL 5040	1/8″ (3.1) Annealed	3/8″ (10)	3/16″ (4.7) Annealed	37	27	1/8″ Combination to the exterior	
CUGL 5040	3/16″ (4.7) Annealed	9/32" (7.0)	1/4" (6.0) Lami	32	29		ESP020754P-4rev1
CUGL 5040	5/32" (3.9)	9/32" (7.0)	9/32" (7.0) Lami	30	27	CE	ESP020754P-5
CUGL 5040	3/16″ (4.7) Annealed	9/32" (7.0)	1/4" (6.0) Lami	37	31	1/8″ Combination to the exterior	ESP020754P-2rev1
CUGL 5040	5/32" (3.9)	9/32" (7.0)	9/32" (7.0) Lami	37	30	CE 1/8″ Combination to the exterior	ESP020754P-3
CUGLP 4050	3/16″ (4.7) Annealed	5/16″ (8)	3/16″ (4.7) Annealed	31	26		TCT006299P-CUGLP
CUGLP 4050	1/8″ (3.1) Annealed	3/8″ (10)	3/16″ (4.7) Annealed	31	26		
CUGLP 4050	3/16″ (4.7) Annealed	9/32″ (7)	1/4" (6.0) Lami	34	30		ESP020754P-1
Direct Glaze							
CDG Rect FS 47 3/16″ x 59 3/32″	5/32″ (3.9) Annealed	7/16″ (11.5)	5/32″ (3.9) Annealed	28	24		ESP014020-2
CDG Rect FS 47 3/16″ x 59 3/32″	1/4″ (5.7) Annealed	7/16″ (11.5)	1/4″ (6.0) Lami	33	27		ESP014020-3
CDG Rect FS 47.2 x 59.1	1/8" (3.1) Annealed	7/16" (11.5)	1/8" (3.1) Annealed	27	23		ESP019269P-4
CDG Rect FS 47.2 x 59.1	3/16" (4.7) Annealed	7/16" (11.5)	3/16" (4.7) Annealed	29	26		ESP019269P-9
CDG Rect FS 47.2 x 59.1	1/4" (5.7) Annealed	7/16" (11.5)	1/4" (5.7) Annealed	30	26		ESP019269P-8
CDG Rect FS 47.2 x 59.1	5/32" (3.9)Annealed	7/16" (11.5)	3/16" (4.7) Annealed	32	28		ESP019269P-5
CDG Rect FS 47.2 x 59.1	3/16" (4.7) Annealed	7/16" (11.5)	1/4" (6.0) Lami	34	29		ESP019269P-2
CDG Rect FS 47.2 x 59.1	1/4" (6.0) Lami	7/16" (11.5)	1/4" (6.0) Lami	33	28		ESP019269P-11
CDG Rect FS 47.2 x 59.1	1/8" (3.1) Annealed	5/16" (8.0)	1/8" (3.1) Annealed	27	23	tripane- two 5/16" airspaces with 1/8" center	ESP019269P-7
CDG Rect FS 47.2 x 59.1	1/8" (3.1) Annealed	5/16" (8.0)	1/4" (6.0) Lami	33	27	tripane- two 5/16" airspaces with 1/8" center	ESP019269P-6
CDG Rect FS 47.2 x 59.1	3/16" (4.7) Annealed	3/8" (9.8)	13/32" (10.1) SGP	34	30	IZ3	ESP019269P-3
CDG Rect FS 47.2 x 59.1	9/32" (7.0) Lami	7/16" (11.5)	9/32" (7.0) Lami	36	30	CE	ESP019269P-1
CDG Rect FS 47.2 x 59.1	15/64" (5.9) Annealed	7/16" (11.5)	5/16" (7.8) Lami	36	31	CE	ESP019269P-10
Magnum Tilt Turn							
CMTT FS 48″ (1219) x 72″ (1829)	1/8″ (3) Annealed	5/8″ (16)	1/8″ (3) Annealed	31	25		66263-24
CMTT FS 48″ (1219) x 72″ (1829)	3/16″ (5) Annealed	15/32″ (12)	1/4″ (6) Lami	36	29		66263-25

STC and OITC Class Values

Marvin Sound Transmission Class and Outdoor - Indoor Transmission Class Values

Product Type	Exterior Glazing	Airspace	Interior Glazing	STC	OITC	Additional Information	STC Report #
Sliding Patio Door							
CSPD 6068	1/8″ (3.1) Tempered	1/2" (12.7)	1/8″ (3.1) Tempered	29	24		ESP023470P-12
CSPD 6068	1/8″ (3.1) Tempered	7/16" (11.0)	3/16" (4.7) Tempered	31	26		ESP023470P-20
CSPD 6068	1/8″ (3.1) Tempered	3/8″ (9.3)	1/4″ (5.7) Tempered	31	27		ESP023470P-14
CSPD 6068	5/32" (3.9) Tempered	7/16" (11.0)	5/32" (3.9) Tempered	30	25		ESP023470P-18
CSPD 6068	1/4″ (5.7) Tempered	5/16″ (8.1)	1/4″ (5.7) Tempered	31	28		ESP023470P-19
CSPD 6068	1/8″ (3.1) Tempered	3/8″ (9.8)	1/4″ (6) Lami	31	27		ESP023470P-15
CSPD 6068	3/16″ (4.7) Tempered	5/16″ (8.0)	1/4″ (6) Lami	31	28		ESP023470P-17
CSPD 6068	1/4″ (5.7) Tempered	5/16″ (8.0)	1/4″ (6) Lami	31	28		ESP023470P-13
CSPD 6068	1/4″ (6) Lami	9/32″ (7.0)	1/4″ (6) Lami	32	29		ESP023470P-16
CSPD 6068	1/8″ (3.1) Tempered	5/16″ (8.0)	5/16″ (7.8) Lami	31	28	CE	ESP023470P-22
CSPD 6068	5/32" (3.9) Tempered	5/16″ (8.0)	5/16″ (7.8) Lami	31	28	CE	ESP023470P-21
Ultimate Sliding French Door							
WSFD 6068	1/4″ (6) Lami	3/8″ (10)	1/8″ (3.1)″ Tempered	32	28		66263-9
CUSFD 6068	1/8″ (3.1) Tempered	1/2" (12.7)	1/8″ (3.1) Tempered	30	26		ESP023470P-1
CUSFD 6068	1/8″ (3.1) Tempered	7/16" (11.0)	3/16" (4.7) Tempered	31	27		ESP023470P-10
CUSFD 6068	1/8″ (3.1) Tempered	3/8″ (9.3)	1/4″ (5.7) Tempered	31	28		ESP023470P-5
CUSFD 6068	5/32" (3.9) Tempered	7/16" (11.0)	5/32" (3.9) Tempered	30	27		ESP023470P-7
CUSFD 6068	1/4″ (5.7) Tempered	5/16″ (8.1)	1/4″ (5.7) Tempered	31	28		ESP023470P-11
CUSFD 6068	1/8″ (3.1) Tempered	3/8″ (9.8)	1/4″ (6) Lami	32	28		ESP023470P-3
CUSFD 6068	3/16″ (4.7) Tempered	5/16″ (8.0)	1/4″ (6) Lami	32	29		ESP023470P-8
CUSFD 6068	1/4″ (5.7) Tempered	5/16″ (8.0)	1/4″ (6) Lami	32	29		ESP023470P-9
CUSFD 6068	1/4″ (6) Lami	9/32″ (7.0)	1/4″ (6) Lami	31	29		ESP023470P-2
CUSFD 6068	1/8″ (3.1) Tempered	5/16″ (8.0)	5/16″ (7.8) Lami	32	29	CE	ESP023470P-4
CUSFD 6068	5/32" (3.9) Tempered	5/16″ (8.0)	5/16″ (7.8) Lami	32	29	CE	ESP023470P-6
Clad Ultimate Sliding French Door IZ3							
CUSFD 6068	5/32" (3.9) Tempered	5/16″ (8.0)	9/32″ (6.9) SGP LAMI	32	29	IZ	ESP023470P-23
CUSFD 6068	3/16" (4.7) Tempered	9/32″ (7.0)	9/32″ (6.9) SGP LAMI	32	29	IZ	ESP023470P-24
Clad Ultimate Inswing French Door IZ3							
CUIFD 6068 IZ3	1/8″ (3.1) Tempered	9/32″ (7)	11/32" (8.6) SGP	33	30		ESP018204P-1
CUIFD 6068 IZ3	3/16″ (4.7) Tempered	1/4" (6.5)	11/32" (8.6) SGP	34	31		ESP018204P-2
Clad Ultimate Inswing French Door							
CUIFD 6068	1/8″ (3.1) Tempered	1/2" (13)	1/8″ (3.1) Tempered	31	26		ESP018204P-6
CUIFD 6068	1/8″ (3.1) Tempered	7/16" (11.5)	5/32" (3.9) Tempered	33	28		ESP018204P-8
CUIFD 6068	1/8″ (3.1) Tempered	3/8″ (9.8)	1/4″ (5.7) Tempered	34	30		ESP018204P-10
CUIFD 6068	1/4″ (5.7) Tempered	5/16″ (8)	1/4″ (5.7) Tempered	34	29		ESP018204P-12
CUIFD 6068	1/8″ (3.1) Tempered	3/8″ (9.8)	1/4″ (6) Lami	35	30		ESP018204P-14
CUIFD 6068	3/16″ (4.7) Tempered	5/16″ (8)	1/4″ (6) Lami	35	30		ESP018204P-18
CUIFD 6068	1/4″ (5.7) Tempered	5/16″ (8)	1/4″ (6) Lami	35	30		ESP018204P-16
CUIFD 6068	1/4″ (6) Lami	9/32″ (7)	1/4″ (6) Lami	35	30		ESP018634P-1
CUIFD 6068 3/4 lite stmpd rsd pnls	1/8″ (3.1) Tempered	1/2" (13)	1/8″ (3.1) Tempered	32	26	3/4 lite stamped raised panels	ESP018204P-22
CUIFD 6068 3/4 lite stmpd rsd pnls	3/16″ (4.7) Tempered	5/16″ (8)	1/4″ (6) Lami	34	30	3/4 lite stamped raised panels	ESP018204P-24
CUIFD 6068	1/8″ (3.1) Tempered	1/2" (13)	1/8″ (3.1) Tempered	40	30	1/8" storm combination on exterior	ESP018204P-7
CUIFD 6068	1/8″ (3.1) Tempered	7/16" (11.5)	5/32" (3.9) Tempered	42	32	1/8" storm combination on exterior	ESP018204P-9
CUIFD 6068	1/8″ (3.1) Tempered	3/8″ (9.8)	1/4″ (5.7) Tempered	43	33	1/8" storm combination on exterior	ESP018204P-11
CUIFD 6068	1/4″ (5.7) Tempered	5/16″ (8)	1/4″ (5.7) Tempered	42	34	1/8" storm combination on exterior	ESP018204P-13
CUIFD 6068	1/8″ (3.1) Tempered	3/8″ (9.8)	1/4″ (6) Lami	44	33	1/8" storm combination on exterior	ESP018204P-15
CUIFD 6068	3/16″ (4.7) Tempered	5/16″ (8)	1/4″ (6) Lami	43	34	1/8" storm combination on exterior	ESP018204P-19
CUIFD 6068	1/4″ (5.7) Tempered	5/16″ (8)	1/4″ (6) Lami	43	35	1/8" storm combination on exterior	ESP018204P-17
CUIFD 6068	1/4″ (6) Lami	9/32″ (7)	1/4″ (6) Lami	44	33	1/8" storm combination on exterior	ESP018634P-2
CUIFD 6068 3/4 lite stmpd rsd pnls	1/8″ (3.1) Tempered	1/2" (13)	1/8″ (3.1) Tempered	41	31	1/8" storm combination on exterior	ESP018204P-23
CUIFD 6068 3/4 lite stmpd rsd pnls	3/16″ (4.7) Tempered	5/16″ (8)	1/4″ (6) Lami	43	34	1/8" storm combination on exterior	ESP018204P-25

STC and OITC Class Values

Marvin Sound Transmission Class and Outdoor - Indoor Transmission Class Values

Product Type	Exterior Glazing	Airspace	Interior Glazing	STC	OITC	Additional Information	STC Report #
Clad Ultimate Outswing French Door							
CUOFD 6068	1/8″ (3.1) Tempered	1/2" (13)	1/8″ (3.1) Tempered	31	26		ESP018204P-26
CUOFD 6068	1/8″ (3.1) Tempered	7/16" (11.5)	5/32" (3.9) Tempered	33	28		ESP018204P-27
CUOFD 6068	1/8″ (3.1) Tempered	3/8″ (9.8)	1/4″ (5.7) Tempered	35	30		ESP018204P-28
CUOFD 6068	1/4″ (5.7) Tempered	5/16″ (8)	1/4″ (5.7) Tempered	34	29		ESP018204P-29
CUOFD 6068	1/8″ (3.1) Tempered	3/8″ (9.8)	1/4″ (6) Lami	36	30		ESP018204P-30
CUOFD 6068	3/16″ (4.7) Tempered	5/16″ (8)	1/4″ (6) Lami	36	30		ESP018204P-32
CUOFD 6068	1/4″ (5.7) Tempered	5/16″ (8)	1/4″ (6) Lami	35	30		ESP018204P-33
CUOFD 6068	1/4″ (6) Lami	9/32″ (7)	1/4″ (6) Lami	36	31		ESP018204P-31
Clad Ultimate Outswing French Door IZ3							
COFD 6068 IZ3	1/8″ (3.1) Tempered	9/32″ (7)	11/32" (8.6) SGP	33	29	IZ3	ESP018204P-3
COFD 6068 IZ3	3/16″ (4.7) Tempered	1/4" (6.5)	11/32" (8.6) SGP	34	31	IZ3	ESP018204P-4
Clad Ultimate Marvin Multi Slide Door / Stacked							
Multi Panel Sliding Door CN6070 OX	3/16″ (4.7) Tempered	9/16" (14.5)	3/16″ (4.7) Tempered	30	27		ESP021984P-1
Multi Panel Sliding Door CN6070 OX	3/16″ (4.7) Tempered	1/2" (13.0)	1/4″ (5.7) Tempered	32	29		ESP021984P-3
Multi Panel Sliding Door CN6070 OX	1/4″ (5.7) Tempered	7/16″ (11.5)	1/4″ (5.7) Tempered	31	28		ESP021984P-4
Multi Panel Sliding Door CN6070 OX	3/16″ (4.7) Tempered	1/2" (13.0)	1/4″ (6.0) Lami	33	30		ESP021984P-5
Multi Panel Sliding Door CN6070 OX	1/4″ (6.0) Lami	9/32″ (7)	1/4″ (6.0) Lami	33	30		ESP021984P-2
Multi Panel Sliding Door CN6070 OX	3/16″ (4.7) Tempered	1/4" (11.5)	11/32" (8.6) SGP	31	29	IZ3	ESP021984P-7
Multi Panel Sliding Door CN6070 OX	1/4″ (5.7) Tempered	1/2" (13.0)	15/32" (11.7) SGP	32	30	IZ3	ESP021984P-6
Clad Simulated Double Hung Hopper							
CSDHHOP (1") FS 40 X 59.1"	3/16″ (4.7) Annealed	5/8″ (16)	3/16″ (4.7) Annealed	33	28	Tri-pane: two 5/16" air space with 1/8" center	ESP017948P-1
CSDHHOP (1") FS 40 X 59.1"	1/8″ (3.1) Annealed	5/16″ (8)	1/8″ (3.1) Annealed	32	28		ESP017948P-3
CSDHHOP (1") FS 40 X 59.1"	3/16″ (4.7) Annealed	9/16″ (14.5)	1/4″ (6) LAMI	36	32		ESP017948P-7
CSDHHOP (1") FS 40 X 59.1"	1/4" (5.7) Annealed	1/2″ (13)	1/4″ (6) LAMI	36	32		ESP017948P-5
CSDHHOP (1") FS 40 X 59.1"	1/4″ (6) LAMI	1/2″ (13)	1/4″ (6) LAMI	37	32		ESP017948P-17

Outdoor Areas of Activity Noise Level Calculations
HUD Barrier Performance Module
and Elevation Data from USGS National Map

Home (/) > Programs (/programs/) > Environmental Review (/programs/environmental-review/) > Barrier Performance Module (BPM) Calculator

Barrier Performance Module (BPM) Calculator

This module provides to the user a measure on the barrier's effectiveness on noise reduction. A list of the input/output variables and their definitions, as well as illustrations of different scenarios are provided.

Calculator

View Day/Night Noise Level Calculator (/programs/environmental-review/dnl-calculator/)

View Descriptions of the Input/Output variables.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the Input and Output variables with the mouse.

WARNING: If there is direct line-of-sight between the Source and the Observer, the module will report erroneous attenuation. “Direct line-of-sight” means if the 5’ tall Observer can see the noise Source (cars, trucks, trains, etc.) over the Barrier (wall, hill/excavation, building, etc.), the current version of Barrier Performance Module will not accurately calculate the attenuation provided. In this instance, there is unlikely to be any appreciable attenuation.

Note: Barrier height must block the line of sight

Input Data

H	20	**R^1**	126
S	10	**D^1**	165
O	16	**α**	180

Calculate Output

Output Data

h	7	**R**	126
D	165	**FS**	9.2043

Reduction From Barrier (dB):

-9.2043

Note: If you have separate Road and Rail DNL values, please enter the values below to calculate the new combined Road/Rail DNL :

Road DNL:

73

Rail DNL:

Calculate

Combined Road/Rail DNL with Barrier Reduction:

63.7957

Input/Output Variables

Input Variables

The following variables and definitions from the barrier being assessed are the input required for the web-based barrier performance module:

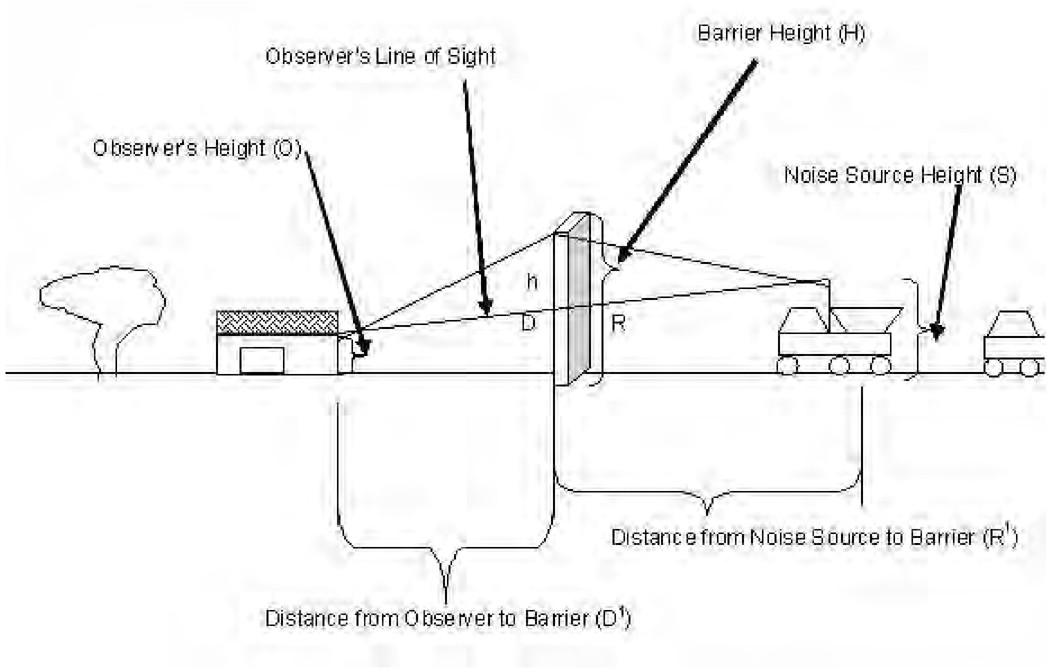
- H = Barrier Height
- S = Noise Source Height
- O = Observer Height (known as the receiver)
- R^1 = Distance from Noise Source to Barrier
- D^1 = Distance from the Observer to the Barrier
- α = Line of sight angle between the Observer and the Noise Source, subtended by the barrier at observer's location

Output Variables

Definitions of the output variables from the mitigation module of the Day/Night Noise Level Assessment Tools as part of the Assessment Tools for Environmental Compliance:

- h = The shortest distance from the barrier top to the line of sight from the Noise source to the Observer.
- R = Slant distance along the line of sight from the Barrier to the Noise Source
- D = Slant distance along the line of sight from the Barrier to the Observer

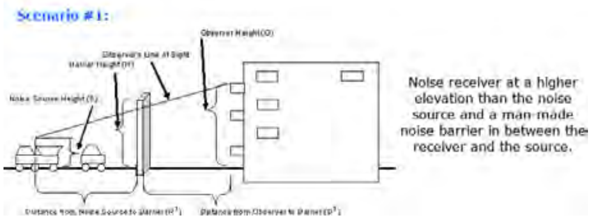
The “actual barrier performance for barriers of finite length” is noted on the worksheets(in the Guidebook) as **FS**.



Barrier Implementation Scenarios

Locate the cursor on the following thumbnails to enlarge the respective scenario as implementation examples of the barrier performance module.

Scenario #1:

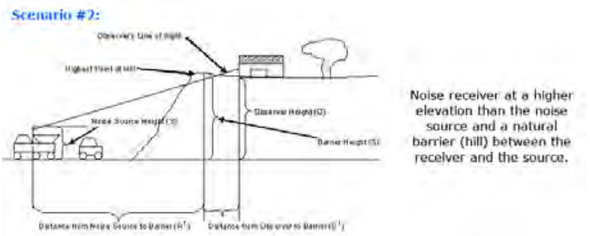


(https://www.hudexchange.info/resources/documents/Barrier-Performance-Module-Barrier-Implementation-Scenario-1.gif)

view larger version of image (/resource/3841/barrier-performance-module-bpm-barrier-implementation-scenarios/)

Noise receiver at a higher elevation than the noise source and a man-made noise barrier in between the receiver and the source.

Scenario #2:

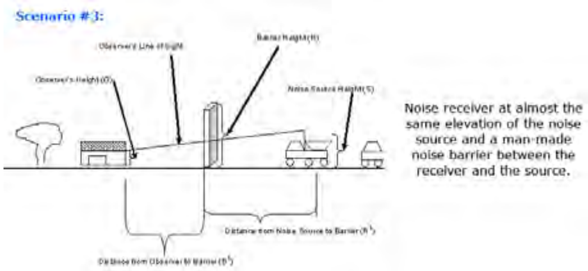


Noise receiver at a higher elevation than the noise source and a natural barrier (hill) between the receiver and the source.

documents/Barrier-Performance-Module-Barrier-Implementation-Scenario-2.gif)

view larger version of image (/resource/3841/barrier-performance-module-bpm-barrier-implementation-scenarios/)

Scenario #3:

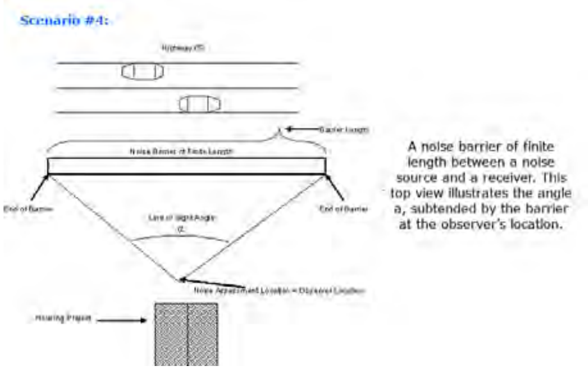


Noise receiver at almost the same elevation of the noise source and a man-made noise barrier between the receiver and the source.

(https://www.hudexchange.info/resources/documents/Barrier-Performance-Module-Barrier-Implementation-Scenario-3.gif)

view larger version of image (/resource/3841/barrier-performance-module-bpm-barrier-implementation-scenarios/)

Scenario #4:

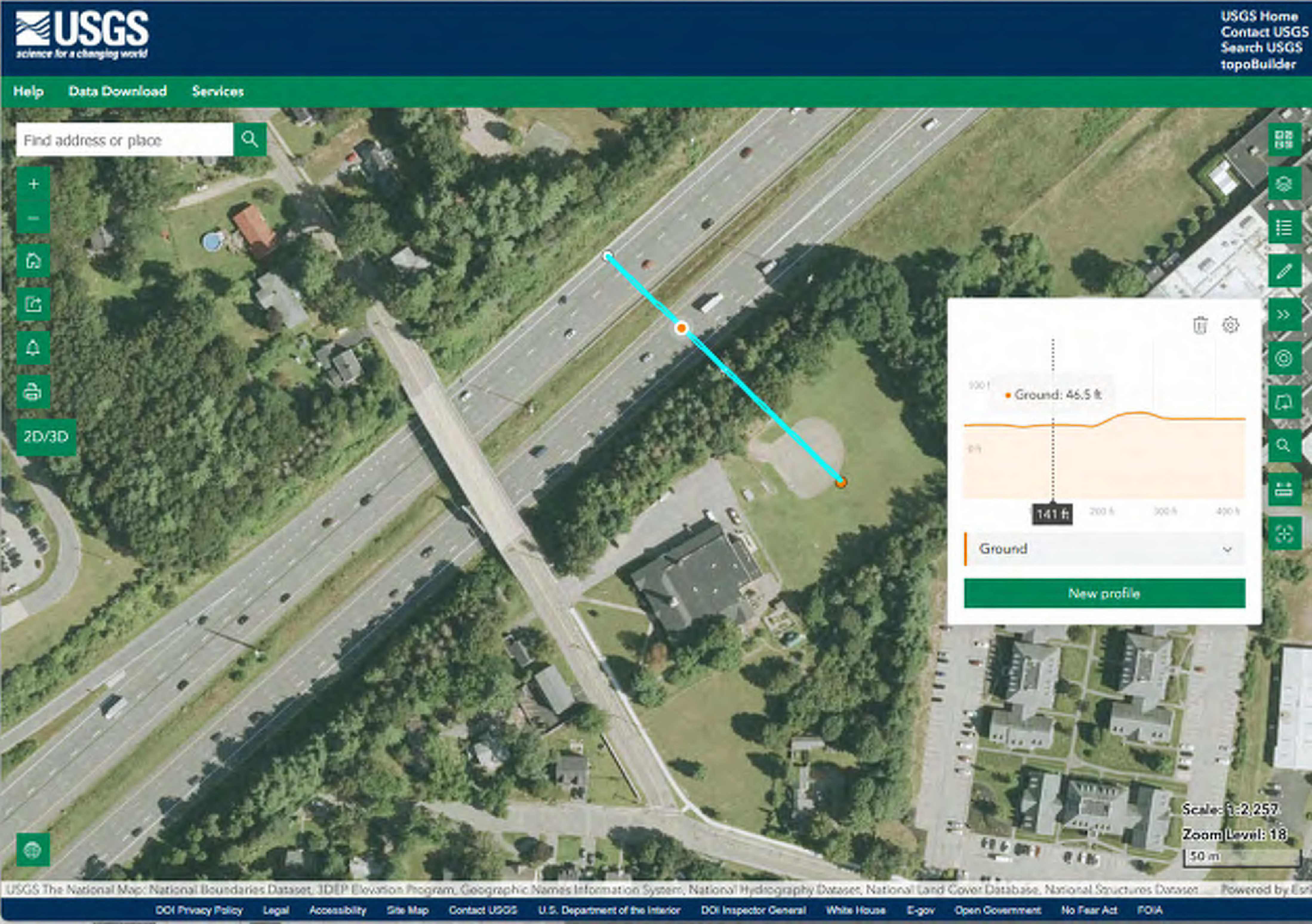


A noise barrier of finite length between a noise source and a receiver. This top view illustrates the angle α, subtended by the barrier at the observer’s location.

(https://www.hudexchange.info/resources/documents/Barrier-Performance-Module-Barrier-Implementation-Scenario-4.gif)

view larger version of image (/resource/3841/barrier-performance-module-bpm-barrier-implementation-scenarios/)

Contents

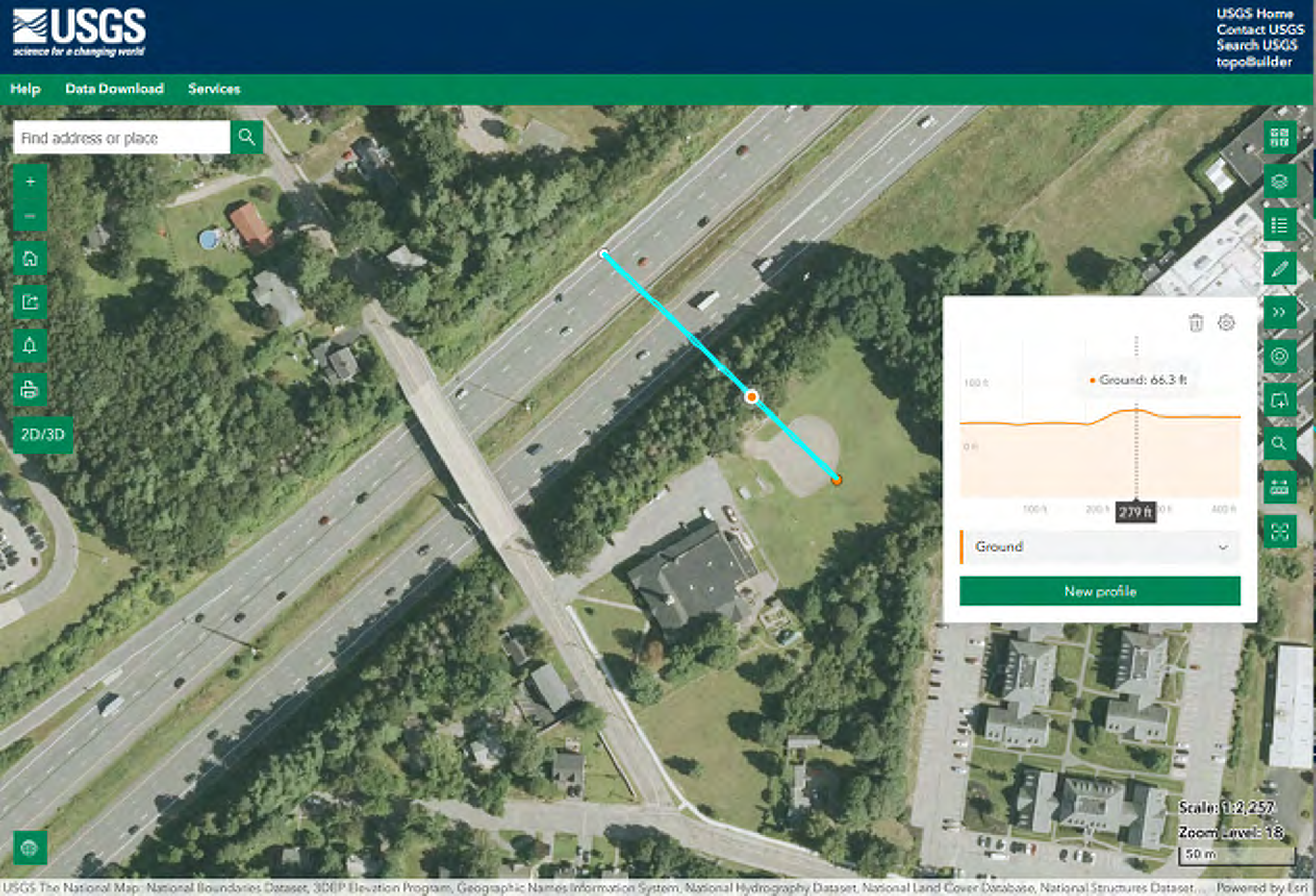


Ground: 46.5 ft

Scale: 1:2,257

Zoom Level: 18

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset ... Powered by Esri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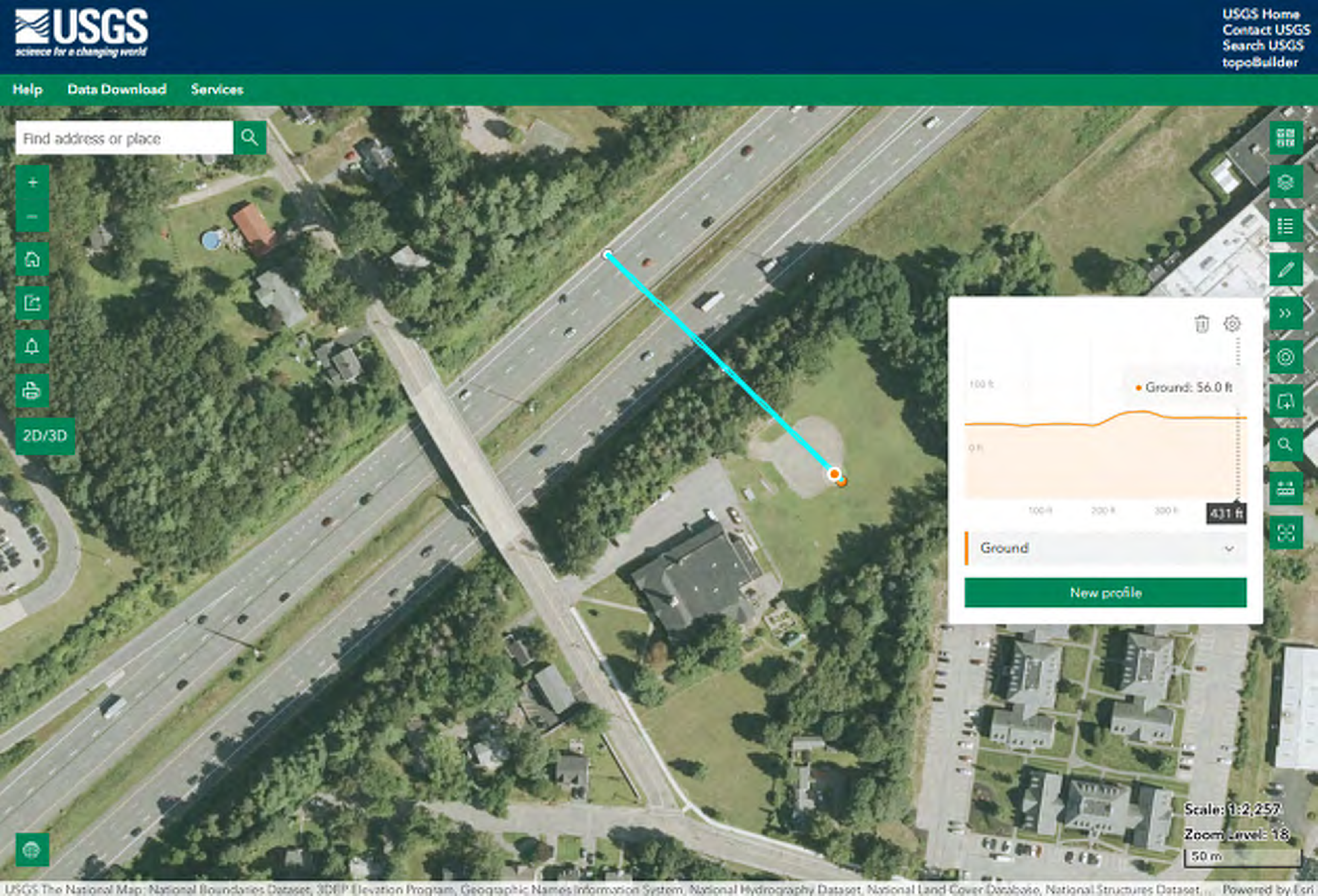
2D/3D
● Ground: 66.3 ft
100 ft
0 ft
100 ft
200 ft
279 ft
400 ft
Ground
New profile
Scale: 1:2,257
Zoom Level: 18
50 m
USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, ... Powered by Esri



Scale: 1:2,257

Zoom Level: 18

50 m

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, ... Powered by Esri

SRW
Environmental Consulting, LLC

April 16, 2025

Mark Lentz
Facilities Director
Portsmouth Housing Authority
245 Middle Street
Portsmouth, NH 03801

Re: Sherburne School, 35 Sherburne Street, Portsmouth, New Hampshire

Dear Mr. Lentz:

SRW is currently completing research and preparing documentation for above referenced property as part of an upcoming Environmental Review assessment. This letter is to provide you with an up dated review of the subject property for the "Site Contamination" resource of the environmental review. As you recall, we completed a Phase I Environmental Site Assessment of the property on January 4, 2023, in which we identified the following recognized environmental condition (REC):

** Potential bedrock aquifer impacts under the subject property from PFOA (perfluorooctanoic acid), PFOS (perfluorooctane sulfonate), PFHxS (perfluorohexanesulfonic acid) and PFNA (perfluorononanoic acid), a group of regulated substances commonly associated with fire fighting foam, from the nearby Pease Air Force Base National Priorities List property. Currently, it does not appear that there is, in fact, an impact, and the bedrock contamination plume appears to be essentially confined to the Pease Air Force Base site itself. However, a bedrock monitoring well was installed at the subject property at the end of 2022 and laboratory analysis results from groundwater collected from that well have not been released.*

SRW has updated our review of site files, NHDES and EPA lists and databases, and has conducted an updated site inspection. During this update, SRW has not identified any additional RECs.

Regarding the REC identified during the 2023 Phase I ESA, additional information was available for review, including test results of the monitoring well at the subject property. According to the most recent AIMS Optimization, Maintenance, and Monitoring Report, low levels of PFOS, PFNA and PFHxS have been observed in the monitoring well at the subject property (well # PSW-1). Since 2019, concentrations of PFHxS and PFOS have shown a slightly increasing concentration trend, while PFOA has shown no trend. Even so, concentrations of each compound is generally an order of magnitude lower than NH Department of Environmental Services (NHDES) ambient groundwater quality standards (AGQS).

A treatment system to intercept the most highly contaminated PFHxS, PFOS and PFOA plume at the Pease International Tradeport property has been installed. The system includes groundwater extraction wells on the southern, hydraulically downgradient side of the most highly contaminated plume, and injection wells (of treated groundwater) on the northernmost, hydraulically upgradient side of the plume. However, contaminated groundwater which has already migrated beyond the extraction wells will continue to migrate to the south and toward the subject property. As a result, there has been and may continue to be a slightly increasing trend of contamination levels at the subject property, until the contamination plume passes by the subject property.

SRW concludes that the REC that was identified in the 2023 Phase I ESA still remains and will remain for the foreseeable future. However, since groundwater is not used at the site, the contamination plume should continue to pose no significant risk of impact to current and future site users.

Select pages from NHDES documents including the current groundwater contamination plume maps, historic groundwater analysis results table and trend analysis table are attached.

Please let me know if you have any questions.

Sincerely,
SRW Environmental Consulting, LLC

Todd Scheffer

Todd Scheffer, P.G.
Principal

SYMBOL KEY

Composite PFAS in Bedrock Groundwater:

- ○ Non-Detect
- 🟢 Detected Below RSL or AGQS
- 🟠 Detected Above RSL or AGQS
- 🔴 Detected Above 10x RSL or AGQS
- 🟣 Detected Above 100x RSL or AGQS
- ● Detected Above 1000x RSL or AGQS
- ⊕ PMP Well with Recent (2022 or newer) PFAS Data

Screened Lithology

- ⊕ Deep Bedrock Monitoring Well

08-5157 Additional Sampling Location Not Previously Sampled for PFAS

08-50570 Non-Validated Data

Composite PFAS in Bedrock Groundwater Above RSL or AGQS

(dashed where inferred)

Surface Water Bodies

Great Bay National Wildlife Refuge (NWR)

Interpreted Bedrock Trough

Pease Development Authority (PDA) Property Boundary

Note:

AGQS: New Hampshire Department of Environmental Services Ambient Groundwater Quality Standards

PMP: Performance Monitoring Program

RSL: United States Environmental Protection Agency Tapwater Regional Screening Level for exposure to HFPO-DA, PFOS, PFOA, PFNA, PFHxA, PFHxS, PFBA, and PFBS from ingestion and dermal contact with potable water (USEPA, November 2023). USEPA toxicity values and the associated RSLs were adopted by the Department of Defense in August 2023 with a March 2024 addendum.

RES47 is an irrigation well on the Pease Golf Course property

Air Force Civil Engineer Center

2261 Hughes Ave., Suite 163
JBSA Lackland, TX 78236

N

Figure 2
Deep Bedrock
Groundwater Boundary Sampling Locations

Remedial Investigation Plume Boundary Groundwater Sampling Technical Memorandum
Former Pease Air Force Base, Portsmouth, New Hampshire

0 125 250 500 750 1,000 Meters

0 500 1,000 2,000 3,000 4,000 Feet

NOTES:
-Aerial Imagery obtained through ESRI Online Services

11/20/2024	Boundary_GW_WP	
Drawn: JSW	Chk: FMD	PROJ: 775361602

Note:

AGQS: New Hampshire Department of Environmental Services Ambient Groundwater Quality Standards

PMP: Performance Monitoring Program

RSL: United States Environmental Protection Agency Tapwater Regional Screening Level for exposure to HFPO-DA, PFOS, PFOA, PFNA, PFHxA, PFHxS, PFBA, and PFBS from ingestion and dermal contact with potable water (USEPA, November 2023). USEPA toxicity values and the associated RSLs were adopted by the Department of Defense in August 2023 with a March 2024 addendum.

SYMBOL KEY

Composite PFAS in Overburden Groundwater:
- ○ Non-Detect
- ● Detected Below RSL or AGQS
- ● Detected Above RSL or AGQS
- ● Detected Above 10x RSL or AGQS
- ● Detected Above 100x RSL or AGQS
- ● Detected Above 1000x RSL or AGQS
- ⊕ PMP Well with Recent (2022 or newer) PFAS Data

Composite PFAS in Seep Groundwater:
- ◇ Non-Detect
- ◆ Detected Below RSL or AGQS
- ◆ Detected Above RSL or AGQS
- ◆ Detected Above 10x RSL or AGQS
- ◆ Detected Above 100x RSL or AGQS
- ◆ Detected Above 1000x RSL or AGQS

Screened Lithology
- ◓ Upper Sand Monitoring Well
- ◒ Lower Sand Monitoring Well
- ⊕ Overburden Monitoring Well
- ◐ Hybrid Monitoring Well
- ⊕ Fractured Bedrock Monitoring Well

08-5157	Additional Sampling Location Not Previously Sampled for PFAS
08-50570	Non-Validated Data
—	Composite PFAS in Overburden Groundwater Above RSL or AGQS (dashed where inferred)
—	Surface Water Bodies
▭	Great Bay National Wildlife Refuge (NWR)
▭	Interpreted Bedrock Trough
▭	Pease Development Authority (PDA) Property Boundary

Air Force Civil Engineer Center
2261 Hughes Ave., Suite 163
JBSA Lackland, TX 78236

N

Figure 1
Overburden/Fractured Bedrock Groundwater Boundary Sampling Locations

Remedial Investigation Plume Boundary Groundwater Sampling Technical Memorandum
Former Pease Air Force Base, Portsmouth, New Hampshire

0 125 250 500 750 1,000 Meters
0 500 1,000 2,000 3,000 4,000 Feet

NOTES:
-Aerial Imagery obtained through ESRI Online Services

11/20/2024	Boundary_GW_WP	
Drawn: JSW	Chk: FMD	PROJ: 775361602

Table 5-1
Performance Monitoring Sampling Plan and Well Construction Details

Optimization, Maintenance, and Monitoring Report July - December 2022
Former Pease Air Force Base
Portsmouth, New Hampshire

Location Details						Lithologic Unit						Sampling Frequency				
Location Identification	Latitude	Longitude	Well Diameter (inches)	Total depth (feet bgs)	Screened Interval (feet bgs)	US	LS	OB	HYB	FBR	DBR	Baseline Groundwater Sampling	Monthly	Quarterly	Semi-Annually	Annually
TAXIWAY B AREA																
34-5021	43.07522925	-70.81151546	4	20	9-19	■						P, B			P, B	P, B
34-6020	43.07511836	-70.81145023	4	49.6	39.6-49.6					■		P, B			P, B	P, B
34-6010	43.07507866	-70.81139573	6	63	50-63						■	P, B			P, B	P, B
HY3-5312	43.07391044	-70.81429912	2	38.61	4.22-14.22		■					P, WC, B			P, WC, B	P, WC, B
15-5557	43.07153198	-70.82025642	2	31.39	7.8-22.8			■				P, WC			P	P, WC
177-6024	43.07153198	-70.82025642	2	74	64-74					■		P, WC			P	P, WC
HY1-8887	43.07045363	-70.80919003	1	15.5	5.5-15.5	■						P, WC, B			P, WC, B	P, WC, B
PH2-5627	43.07027754	-70.81295959	2	41	35-40		■					P, B			P, B	P, B
PH2-6627	43.07028628	-70.81296463	2	67	56-66					■		P, B			P, B	P, B
PH1-5321	43.06958692	-70.81474076	2	32	22-32		■					P, WC, B			P, WC, B	P, WC, B
PH1-6507	43.06957841	-70.81470345	4	79.1	69-79					■		P, WC, B			P, WC, B	P, WC, B
FLPZ-06	43.06957178	-70.81483722	2	51.43	UNK	■						P, WC, B			P, WC, B	P, WC, B
OUTSIDE OF AIMS INFLUENCE AND SOUTHERN WELL FIELD AREA																
177-3016	43.0590849	-70.80893887	1	28.04	17.9-27.9	■						P			P	P
177-5008	43.06565355	-70.80812013	2	79	30-40		■					P, V		P	P, B	P, B
177-5009	43.068323	-70.80675318	2	12.6	6.6-11.6		■					P, V			P, B	P, B
177-5010	43.07078701	-70.80489753	2	45	8-18		■					P			P	P
177-5011	43.06152155	-70.80875459	2	57	47-57		■					P			P	P
177-5016	43.0590849	-70.80893887	2	105.5	66-76		■					P				P
177-5025	43.06617716	-70.80466532	2	83.5	30-40		■					P		P	P	P
177-5026	43.06131355	-70.80509152	2	97	59-69		■					P		P	P	P
177-6008	43.06565355	-70.80812013	2	79	66-76					■		P, V		P	P, B	P, B
177-6009	43.068323	-70.80675318	2	45	24-44					■		P, V			P, B	P, B
177-6010	43.07078701	-70.80489753	2	45	33-43					■		P			P	P
177-6011	43.06152155	-70.80875459	2	84	62-82					■		P			P	P
177-6016	43.0590849	-70.80893887	2	105.5	93-103					■		P				P
177-6025	43.06617716	-70.80466532	2	83.5	63-83					■		P		P	P	P
OUTSIDE OF AIMS INFLUENCE AND SOUTHERN WELL FIELD AREA (Continued)																
177-6026	43.06131355	-70.80509152	2	100	80-100		■					P		P	P	P
177-7008D	43.06565355	-70.80812013	2	272.5	257-267						■	P		P	P	P
177-7008S	43.06565355	-70.80812013	2	132.5	107-117						■	P		P	P	P
177-7009S	43.068323	-70.80675318	2	128.2	111-121						■	P			P	P
177-7009D	43.068323	-70.80675318	2	272.5	242-252						■	P				P
177-7025D	43.06617716	-70.80466532	2	257	237-247						■	P		P	P	P
177-7025S	43.06617716	-70.80466532	2	116.5	104-114						■	P		P	P	P
177-7026D	43.06131355	-70.80509152	2	340	238-248						■	P		P	P	P
177-7026S	43.06131355	-70.80509152	2	155	140-150						■	P		P	P	P
CSW-1D	43.06361383	-70.79052035	2				■							P	P	P
CSW-1S	43.06361383	-70.79052035	2			■								P	P	P
CSW-2R	43.05992296	-70.79100183	2	30	23-28		■					P		P	P	P
CSW-3S^2	43.05920752	-70.8037279	2	46.4	36.1 - 46.1		■					P		P	P	P
CSW-3D^2	43.05920752	-70.8037279	2	65.5	55.2-65.2					■		P		P	P	P
HMW-14	43.06320639	-70.8085705	2	44	37-47		■					P, WC, V			P, WC, B	P, WC, B
HMW-15	43.06648449	-70.80732126	2	46	23-28		■					P, WC, V		P	P, WC, B	P, WC, B
HMW-16	43.06648449	-70.80732126	2	68.3	58.1-68.1					■		P, WC, V		P	P, WC, B	P, WC, B
HMW-8R	43.06735269	-70.8057214	2	34	26-33		■					P, WC, V		P	P, WC, B	P, WC, B
PSW-1	43.05922277	-70.79938219	2	56	35-55		■					P		P	P	P
PSW-2	43.05885832	-70.79620537	2				■							P	P	P
PSW-3S^2	43.05920752	-70.8037279	2	39.9	29.5 - 39.5		■					P		P	P	P
PSW-3D^2	43.05920752	-70.8037279	2	60.9	50.5 - 60.5					■		P		P	P	P
SMW-1	43.06151066	-70.80634721	2	34	27-37		■					P		P	P	P
SMW-13	43.0627085	-70.80460761	1	31	29.5-34.5		■					P		P	P	P
PSW-4S^2	43.05904317	-70.80144553	2	35	35-25			■				P		P	P	P
PSW-4D^2	43.05904317	-70.80144553	2	58	55-45					■		P		P	P	P
PSW-5US^2	43.05858763	-70.79952711	2	17.35	17.4-7.4	■						P		P	P	P
PSW-5S^2	43.05815273	-70.7992747	2	50.8	50.8-40.8		■					P		P	P	P
PSW-5D^2	43.05815249	-70.79927549	2	84.5	84.5-74.5					■		P		P	P	P

Created by: LJD 09/03/2021
Checked by: AMC 01/04/2022
Revised by: JW 1/12/24

Appendix J
Historical Performance Monitoring PFAS Analytical Results

AIMS Optimization, Maintenance, and Monitoring Report
July - December 2022
Former Pease Air Force Base
Portsmouth, New Hampshire

					Analyte:	6:2 Fluorotelomer sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonate (8:2 FTS)	Hexafluoropropylene oxide dimer acid (HFPO-DA)	Perfluorobutanesulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluoroheptanesulfonic (PFHpS)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanesulfonic acid (PFHxS)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (PFOSA)	Perfluorooctanesulfonic acid (PFOS)	Perfluorooctanoic acid (PFOA)	Perfluoropentanoic acid (PFPeA)
					NH AGQS:	NA	NA	NA	NA	NA	NA	NA	0.018	NA	0.011	NA	0.015	0.012	NA
Location	Latitude	Longitude	Sample ID	Sample Date	Sample Type	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
HMW-8R	43.06735269	-70.8057214	HMW-8R-GW_20190404	4/4/2019	N	0.0084 J	0.015 U	NA	0.015 U	0.010 J	0.01 U	0.011 J	0.065	0.023	0.01 U	0.015 U	0.020 J	0.020 J	0.024
			HMW-8R-GW_20190612	6/12/2019	N	0.0089 J	0.015 U	NA	0.0065 J	0.012 J	0.0072 J	0.013 J	0.074	0.026	0.010 U	0.015 U	0.027	0.024	0.027
			DUP-32-GW_20190612	6/12/2019	FD	0.0076 J	0.015 U	NA	0.0061 J	0.012 J	0.0073 J	0.012 J	0.072	0.026	0.010 U	0.015 U	0.026	0.023	0.026
			HMW-8R-GW_20190918	9/18/2019	N	0.031 J	0.015 UJ	NA	0.0075 J	0.015 J	0.010 UJ	0.016 J	0.070 J	0.028 J	0.010 UJ	0.015 UJ	0.027 J	0.024 J	0.030 J
			HMW-8R-GW_20191204	12/4/2019	N	0.0060 J	0.015 U	NA	0.015 U	0.0092 J	0.010 U	0.0099 J	0.075	0.026	0.010 U	0.015 U	0.026	0.024	0.028
			DUP-53-GW_20191204	12/4/2019	FD	0.0085 J	0.015 U	NA	0.015 U	0.0095 J	0.010 U	0.011 J	0.076	0.026	0.010 U	0.015 U	0.028	0.024	0.028
			HMW-8R-GW_20200325	3/25/2020	N	0.0143 J	0.0083 U	NA	0.0037 J	0.0104 J	0.0042 U	0.0104	0.0605	0.0225	0.0042 U	0.0042 U	0.0345	0.0214	0.0231
			HMW-8R-GW_20200624	6/24/2020	N	0.0108 J	0.0077 U	NA	0.0051 J	0.0105 J	0.0025 J	0.0101	0.0681	0.0237	0.0038 U	0.0038 U	0.0361	0.0231	0.0262
			HMW-8R-GW_20200930	9/30/2020	N	0.0050 J	0.0083 U	NA	0.0046 J	0.0107 J	0.0032 J	0.0125	0.0885	0.0283	0.0042 U	0.0042 U	0.0518	0.0247	0.0321
			HMW-8R-GW_20201215	12/15/2020	N	0.0218	0.008 U	NA	0.0056 J	0.0135 J	0.0042 J	0.0126	0.084	0.0287	0.004 U	0.004 U	0.0486	0.027	0.0333
			DUP-53-GW_20201215	12/15/2020	FD	0.0221	0.008 U	NA	0.0057 J	0.0129 J	0.0034 J	0.0118	0.0787	0.0275	0.004 U	0.004 U	0.0463	0.0256	0.0319
			HMW-8R-GW_20210325	3/25/2021	N	0.0333	0.0080 U	NA	0.0029 J	0.0111 J	0.0033 J	0.0089	0.0500	0.0164	0.0040 U	0.0040 U	0.0455	0.0167	0.0185
			HMW-8R-GW_20210921	9/21/2021	N	0.0140	0.0040 U	NA	0.0041	0.0100	0.0026 J	0.0120	0.0820	0.0260	0.00091 J	0.0040 UJ	0.0450	0.0250	0.0270
			HMW-8R-GW_20211215	12/15/2021	N	0.0242	0.0083 U	NA	0.0030 J	0.0091 J	0.0025 J	0.0085	0.0552	0.0166	0.0042 U	0.0042 U	0.0435	0.0183	0.0210
			DUP45-GW_20211215	12/15/2021	FD	0.0239	0.0083 U	NA	0.0037 J	0.0087 J	0.0027 J	0.0088	0.0531	0.0169	0.0042 U	0.0042 U	0.0424	0.0184	0.0213
			HMW-8R-GW_20220324	3/24/2022	N	0.0020 J	0.0016 U	NA	0.0010 J	0.0032	0.00069 J	0.0027	0.0160	0.0059	0.0016 U	0 R	0.0100	0.0048	0.0066
			HMW-8R-GW_20220622	6/22/2022	N	0.0062	0.0016 U	0.0020 U	0.0023	0.0055	0.0010 J	0.0062	0.0390	0.0130	0.0016 U	0.0020 U	0.0270	0.0120	0.0150
			HMW-8R-GW_20220923	9/23/2022	N	0.0041	0.0014 U	0.0014 U	0.0028	0.0062	0.0014 J	0.0072	0.0420	0.0140	0.00081 J	0.0014 U	0.0320	0.0130	0.0160
			HMW-8R-GW_20221221	12/21/2022	N	0.0180	0.0015 U	NA	0.0027	0.0076	0.0016 J	0.0083	0.0490	0.0150	0.00091 J	0.0015 U	0.0400	0.0140	0.0200
			DUP49-GW_20221221	12/21/2022	FD	0.0180	0.0014 U	NA	0.0029	0.0080	0.0016 J	0.0083	0.0480	0.0150	0.0010 J	0.0014 U	0.0410	0.0150	0.0190
OUTSIDE OF DIRECT AIMS INFLUENCE AND SOUTHERN WELL FIELD AREA																			
PSW-1	43.05922277	-70.79938219	PSW-1-GW_20190404	4/4/2019	N	0.015 U	0.015 U	NA	0.015 U	0.015 U	0.01 U	0.015 U	0.015 U	0.015 U	0.01 U	0.015 U	0.015 U	0.015 U	0.01 U
			PSW-1-GW_20190917	9/17/2019	N	0.015 U	0.015 U	NA	0.013 J	0.0076 J	0.010 U	0.0073 J	0.015 U	0.0084 J	0.010 U	0.015 U	0.015 U	0.0079 J	0.0074 J
			DUP-49-GW_20190917	9/17/2019	FD	0.015 U	0.015 U	NA	0.013 J	0.0073 J	0.010 U	0.015 U	0.015 U	0.0079 J	0.010 U	0.015 U	0.015 U	0.0080 J	0.0069 J
			PSW-1-GW_20200325	3/25/2020	N	0.0091 U	0.0091 U	NA	0.0045 U	0.0091 U	0.0045 U	0.0045 U	0.0032 J	0.0027 J	0.0045 U	0.0045 U	0.0045 U	0.0044 J	0.0045 U
			PSW-1-GW_20200929	9/29/2020	N	0.0080 U	0.0080 U	NA	0.0040 U	0.0080 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0022 J	0.0022 J	0.0022 J
			DUP85-GW_20200929	9/29/2020	FD	0.0080 U	0.0080 U	NA	0.0040 U	0.0080 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0023 J
			PSW-1-GW_20210204	2/4/2021	N	0.008 U	0.008 U	NA	0.004 U	0.008 U	0.004 U	0.004 U	0.0032 J	0.0025 J	0.004 U	0.004 U	0.004 U	0.0031 J	0.0025 J
			PSW-1-GW_20210325	3/25/2021	N	0.0080 U	0.0080 U	NA	0.0035 J	0.0080 U	0.0040 U	0.0040 U	0.0022 J	0.0020 J	0.0040 U	0.0040 U	0.0030 J	0.0028 J	0.0020 J
			PSW-1-GW_20210921	9/21/2021	N	0.0040 U	0.0040 U	NA	0.0014 J	0.0020 U	0.0040 U	0.0014 J	0.0032 J	0.0021 J	0.0040 U	0.0040 U	0.0011 J	0.0027 J	0.0024 J
			PSW-1-GW_20211214	12/14/2021	N	0.0430 U	0.0086 U	NA	0.0043 U	0.0086 U	0.0220 U	0.0220 U	0.0220 U	0.0220 U	0.0043 U	0.0220 U	0.0043 U	0.0031 J	0.0043 U
			PSW-1-GW_20220324	3/24/2022	N	0.0016 U	0.0018 U	NA	0.0015 J	0.0021 J	0.0013 U	0.0012 J	0.0028	0.0019 J	0.0018 U	0.0022 U	0.00095 J	0.0022	0.0022 J
			PSW-1-GW_20220621	6/21/2022	N	0.0016 U	0.0016 U	0.0020 U	0.0018 J	0.0014 J	0.0012 U	0.0012 J	0.0030	0.0015 J	0.0016 U	0.0020 UJ	0.00070 J	0.0025	0.0015 J
			DUP27-GW_20220621	6/21/2022	FD	0.0016 U	0.0016 U	0.0020 U	0.00099 J	0.0013 J	0.0012 U	0.00091 J	0.0025	0.0012 J	0.0016 U	0.0020 UJ	0.00045 J	0.0020	0.0013 J
			PSW-1-GW_20220921	9/21/2022	N	0.0015 U	0.0015 U	0.0015 U	0.0013 J	0.0015 J	0.0011 U	0.0015 J	0.0033	0.0014 J	0.0011 U	0.0015 U	0.0025	0.0036	0.00097 J
			DUP45-GW_20220921	9/21/2022	FD	0.0015 U	0.0015 U	0.0015 U	0.00059 J	0.00093 J	0.0011 U	0.00080 J	0.0025	0.0012 J	0.0011 U	0.0015 U	0.00085 J	0.0029	0.00046 J
			PSW-1-GW_20221220	12/20/2022	N	0.00078 J	0.0016 U	NA	0.0016 J	0.0018 J	0.0012 U	0.0014 J	0.0028	0.002 U	0.0012 U	0.0016 U	0.0017 J	0.0028	0.0019 J

Prepared By: AKN, 04/18/2023
QA/QC By: MG 04/18/2023
Reviewed by: JW 1/12/24

Appendix J
Historical Performance Monitoring PFAS Analytical Results

AIMS Optimization, Maintenance, and Monitoring Report
July - December 2022
Former Pease Air Force Base
Portsmouth, New Hampshire

					Analyte:	6:2 Fluorotelomer sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonate (8:2 FTS)	Hexafluoropropylene oxide dimer acid (HFPO-DA)	Perfluorobutanesulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluoroheptanesulfonic (PFHpS)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanesulfonic acid (PFHxS)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (PFOSA)	Perfluorooctanesulfonic acid (PFOS)	Perfluorooctanoic acid (PFOA)	Perfluoropentanoic acid (PFPeA)
					NH AGQS:	NA	NA	NA	NA	NA	NA	NA	0.018	NA	0.011	NA	0.015	0.012	NA
Location	Latitude	Longitude	Sample ID	Sample Date	Sample Type	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PSW-5US	43.05858763	-70.79952711	PSW-5US-GW_20210519	5/19/2021	N	0.0080 U	0.0080 U	NA	0.0155	0.0080 U	0.0040 U	0.0040 U	0.0023 J	0.0040 U	0.0040 U	0.0040 U	0.0037 J	0.0032 J	0.0040 U
			PSW-5US-GW_20210923	9/23/2021	N	0.0040 U	0.0040 U	NA	0.0110	0.0011 U	0.0040 U	0.00080 J	0.0024 J	0.0040 U	0.0040 U	0.0040 UJ	0.0024 J	0.0026 J	0.00072 J
			PSW-5US-GW_20211215	12/15/2021	N	0.0100 U	0.0100 U	NA	0.0104	0.0100 U	0.0050 U	0.0050 U	0.0027 J	0.0050 U	0.0050 U	0.0050 U	0.0027 J	0.0031 J	0.0050 U
			PSW-5US-GW_20220323	3/23/2022	N	0.0016 U	0.0016 U	NA	0.0100	0.0010 J	0.0012 U	0.00052 J	0.0013 J	0.0014 U	0.0016 U	0.0020 U	0.0024	0.0023	0.0012 U
			PSW-5US-GW_20220621	6/21/2022	N	0.0016 U	0.0016 U	0.0020 U	0.0130	0.0016 J	0.0012 U	0.00096 J	0.0017 J	0.00097 J	0.0016 U	0.0020 U	0.0024	0.0032	0.00091 J
			PSW-5US-GW_20220922	9/22/2022	N	0.0015 U	0.0015 U	0.0015 U	0.0110	0.0013 J	0.0011 U	0.00099 J	0.0017 J	0.00093 J	0.00056 J	0.0015 U	0.0032	0.0021 J	0.00092 J
			PSW-5US-GW_20221220	12/20/2022	N	0.0015 U	0.0015 U	NA	0.0110	0.0013 J	0.0011 U	0.00064 J	0.0014 J	0.00057 J	0.0011 U	0.0015 U	0.0042	0.0019 J	0.00054 J
PSW-5S	43.05815273	-70.7992747	PSW-5S-GW_20210519	5/19/2021	N	0.0080 U	0.0080 U	NA	0.0040 U	0.0080 U	0.0040 U	0.0035 J	0.0021 J	0.0029 J	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0058 J
			PSW-5S-GW_20210923	9/23/2021	N	0.0040 U	0.0040 U	NA	0.0011 J	0.0018 U	0.0040 U	0.0036 J	0.0020 J	0.0022 J	0.0040 U	0.0040 UJ	0.0040 U	0.0012 J	0.0034 J
			PSW-5S-GW_20211215	12/15/2021	N	0.0100 U	0.0100 U	NA	0.0050 U	0.0100 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0030 J
			PSW-5S-GW_20220323	3/23/2022	N	0.0016 U	0.0016 U	NA	0.0013 J	0.0011 J	0.0012 U	0.0011 J	0.0020	0.0011 J	0.0016 U	0.0020 U	0.0012 U	0.00077 J	0.0015 J
			PSW-5S-GW_20220621	6/21/2022	N	0.0016 U	0.0016 U	0.0020 U	0.0011 J	0.0017 J	0.0012 U	0.0035	0.0017 J	0.0029	0.0016 U	0.0020 U	0.0012 U	0.00092 J	0.0039
			PSW-5S-GW_20220922	9/22/2022	N	0.0015 U	0.0015 U	0.0015 U	0.0011 J	0.0024	0.0011 U	0.0057	0.0021 J	0.0042	0.0011 U	0.0015 U	0.0011 U	0.0016 J	0.0062
			PSW-5S-GW_20221220	12/20/2022	N	0.0015 U	0.0015 U	NA	0.0014 J	0.0024	0.0011 U	0.0048	0.0025	0.0039	0.0011 U	0.0015 U	0.00067 J	0.0019 J	0.0058
PSW-5D	43.05815249	-70.79927549	PSW-5D-GW_20210520	5/20/2021	N	0.0080 U	0.0080 U	NA	0.0022 J	0.0080 U	0.0040 U	0.0040 U	0.0028 J	0.0040 U	0.0040 U	0.0040 U	0.0035 J	0.0027 J	0.0059 J
			PSW-5D-GW_20210923	9/23/2021	N	0.0021 J	0.0040 U	NA	0.0010 J	0.00092 U	0.0040 U	0.0011 J	0.0028 J	0.0018 J	0.0040 U	0.0040 U	0.0022 J	0.0025 J	0.0022 J
			PSW-5D-GW_20211215	12/15/2021	N	0.0091 U	0.0091 U	NA	0.0039 J	0.0049 J	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0045 U	0.0023 J	0.0045 U
			PSW-5D-GW_20220323	3/23/2022	N	0.0016 U	0.0016 U	NA	0.00072 J	0.0015 J	0.0012 U	0.0012 U	0.0020	0.00082 J	0.0016 U	0.0020 U	0.00077 J	0.0015 J	0.0011 J
			PSW-5D-GW_20220621	6/21/2022	N	0.0069	0.0016 U	0.0020 U	0.0018 J	0.0027	0.0012 U	0.0038	0.0026	0.0051	0.0016 U	0.0020 U	0.0012 U	0.0034	0.0065
			PSW-5D-GW_20220922	9/22/2022	N	0.0010 J	0.0014 U	0.0014 U	0.00096 J	0.0017 J	0.0010 U	0.0012 J	0.0026	0.0018 J	0.0010 U	0.0014 U	0.0014 J	0.0024	0.0023
			PSW-5D-GW_20221220	12/20/2022	N	0.0015 U	0.0015 U	NA	0.0012 J	0.0015 J	0.0011 U	0.00090 J	0.0027	0.0015 U	0.0011 U	0.0015 U	0.0042	0.0026	0.0020 J
STORMWATER OUTFALL																			
McIntyre Brook Outfall (177-1002)	43.0738845	-70.82375323	177-1002-ST_20190401	4/1/2019	N	0.013 J	0.015 U	NA	0.0084 J	0.012 J	0.01 U	0.012 J	0.28	0.05	0.01 U	0.015 U	0.25	0.035	0.017 J
			177-1002-ST_20190917	9/17/2019	N	0.015 UJ	0.015 UJ	NA	0.0088 J	0.011 J	0.0071 J	0.011 J	0.27 J	0.034 J	0.0062 J	0.015 UJ	0.30 J	0.034 J	0.014 J
			177-1002-ST_20200324	3/24/2020	N	0.0119 J	0.0077 U	NA	0.0059 J	0.0093 J	0.0048 J	0.0107	0.145	0.0322	0.0038 U	0.0038 U	0.206	0.0292	0.0179
			177-1002-ST_20200925	9/25/2020	N	0.0080 U	0.0080 U	NA	0.0090	0.0083 J	0.0072 J	0.0104	0.388	0.0534	0.0035 J	0.0040 U	0.454	0.0418	0.0169
			177-1002-ST_20210325	3/25/2021	N	0.0080 U	0.0080 U	NA	0.0086	0.0082 J	0.0067 J	0.0083	0.336	0.0397	0.0023 J	0.0040 U	0.375	0.0316	0.0100
			177-1002-ST_20210923	9/23/2021	N	0.0011 J	0.0040 U	NA	0.0079	0.0100	0.0058	0.0110	0.300	0.0430	0.0044	0.0040 UJ	0.500	0.0360	0.0180
			177-1002-GW_20220421	4/21/2022	N	0.0710	0.0350 J	NA	0.0087 J	0.0270	0.0110 J	0.0250	0.200	0.0740	0.0160 U	0.0200 U	1.30	0.0580	0.0710
			177-1002-GW_20220921	9/21/2022	N	0.0380	0.110	0.0070 U	0.0110	0.0380	0.0130	0.0300	0.240	0.0830	0.0083 J	0.0040 J	2.10	0.0750	0.0990

Notes:
All concentrations in micrograms per liter (µg/L)
NH AGQS - New Hamphsire Ambient Groundwater Quality Standards (July 2020)
NH AGQS for groundwater only and therefore not compared to stormwater samples collected from the McIntyre Brook Outfall
Grey text indicates the parameter was not detected.
🟪 = concentration exceeds the applicable NH AGQS
FD = duplicate sample
ID = Identification
J = The result is an estimated value.
N = parent sample
NA = Not Applicable
ND = Not Detected
R = Sample is considered unusable due to QC failures
U = The analyte was analyzed for, but was not detected above the reported limit of detection (LOD).
UJ = Analyte was not detected above the LOD and the result is an estimated value
Due to inconsistencies between December 2019 results and historical results, HMW-15 and HMW-16 were resampled in January 2020.

Prepared By: AKN, 04/18/2023
QA/QC By: MG 04/18/2023
Reviewed by: JW 1/12/24

Table 5-2
PFOS, PFOA, PFNA and PFHxS Trend Analysis

AIMS Optimization, Maintenance, and Monitoring Report
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Former Pease Air Force Base
Portsmouth, New Hampshire

					PFHxS	PFNA	PFOS	PFOA
TAXIWAY H AREA								
39-MWE-1S	43.07774648	-70.81269852	OB	Monitoring Well	S	NT	S	NT
39-MWE-1D	43.07774648	-70.81269852	DBR	Monitoring Well	NT	NT	NT	NT
39-MW18S	43.07919984	-70.81307291	OB	Monitoring Well	S	NT	NT	S
39-MW18D	43.07919984	-70.81307291	FBR	Monitoring Well	I	PI	I	NT
39-6084	43.0760241	-70.81517186	FBR	Monitoring Well	NT	NT	NT	NT
39-5102	43.0760431	-70.8151454	LS	Monitoring Well	S	ND	I	S
39-5081	43.07802237	-70.81676484	OB	Monitoring Well	NT	NT	NT	NT
34-6011	43.07674065	-70.81255548	DBR	Monitoring Well	S	NT	NT	D
33-750	43.08038561	-70.81430672	US	Monitoring Well	NT	S	S	NT
32-4254	43.07684827	-70.80980076	LS	Monitoring Well	D	S	S	PD
IMW/HAVEN WELL AREA								
39-5082	43.07803362	-70.81680211	LS	Monitoring Well	S	ND	NT	NT
PH5-6506	43.07746301	-70.82125646	FBR	Monitoring Well	PI	NT	NT	NT
PH5-5345	43.07713689	-70.81945317	LS	Monitoring Well	I	I	I	I
PH5-5333	43.0771148	-70.81943476	US	Monitoring Well	S	ND	NT	I
PH5-5319	43.07749316	-70.8212523	LS	Monitoring Well	NT	ND	NT	ND
PH4-4779	43.07584593	-70.81814978	US	Monitoring Well	D	ND	NT	I
IMW	43.07631233	-70.81861259	EXTRACTION	Monitoring Well	D	D	D	D
HY4-5355	43.0771912	-70.81678752	LS	Monitoring Well	D	NT	PD	PD
15-7535	43.07668539	-70.81887552	US	Monitoring Well	PD	NT	D	PD
15-7533	43.07580132	-70.81916467	LS	Monitoring Well	D	D	D	D
15-7532	43.07671025	-70.81889764	LS	Monitoring Well	S	S	PD	S
15-6522	43.07573563	-70.81807641	FBR	Monitoring Well	S	S	S	D
15-6144	43.07577726	-70.81813946	DBR	Monitoring Well	NT	I	NT	S
TAXIWAY B AREA								
15-5557	43.07153198	-70.82025642	OB	Monitoring Well	S	PI	PI	S
177-6024	43.07153198	-70.82025642	FBR	Monitoring Well	NT	NT	NT	NT
34-5021	43.07522925	-70.81151546	US	Monitoring Well	D	I	S	D
34-6010	43.07507866	-70.81139573	DBR	Monitoring Well	I	ND	I	I
34-6020	43.07511836	-70.81145023	FBR	Monitoring Well	I	NT	NT	NT
FLPZ-06	43.06957178	-70.81483722	US	Monitoring Well	D	D	D	D
HY1-8887	43.07045363	-70.80919003	US	Monitoring Well	D	NT	NT	D
HY3-5312	43.07391044	-70.81429912	LS	Monitoring Well	D	D	D	D
PH1-5321	43.06958692	-70.81474076	LS	Monitoring Well	NT	ND	PI	NT
PH1-6507	43.06957841	-70.81470345	FBR	Monitoring Well	D	I	PD	D
PH2-5627	43.07027754	-70.81295959	LS	Monitoring Well	S	ND	PI	S
PH2-6627	43.07028628	-70.81296463	LS	Monitoring Well	S	PI	NT	PI
SOUTHERN WELL FIELD AREA								
HMW-14	43.06320639	-70.8085705	LS	Monitoring Well	S	ND	NT	NT
HMW-15	43.06648449	-70.80732126	LS	Monitoring Well	S	I	NT	S
HMW-8R	43.06735269	-70.8057214	LS	Monitoring Well	S	PI	NT	S
SMW-1	43.06151066	-70.80634721	LS	Monitoring Well	S	NT	PI	S
SMW-13	43.0627085	-70.80460761	LS	Monitoring Well	I	I	I	NT
177-3016	43.0590849	-70.80893887	OB	Monitoring Well	NT	ND	NT	NT
177-5008	43.06565355	-70.80812013	OB	Monitoring Well	D	I	PI	D
177-5009	43.068323	-70.80675318	OB	Monitoring Well	NT	NT	NT	NT
177-5010	43.07078701	-70.80489753	OB	Monitoring Well	NT	ND	NT	NT
177-5011	43.06152155	-70.80875459	OB	Monitoring Well	PD	NT	ND	NT
177-5025	43.06617716	-70.80466532	OB	Monitoring Well	S	NT	PI	S
177-5026	43.06131355	-70.80509152	OB	Monitoring Well	S	ND	NT	NT
177-6008	43.06565355	-70.80812013	FBR	Monitoring Well	NT	I	I	PD
177-6009	43.068323	-70.80675318	FBR	Monitoring Well	S	NT	NT	D
177-6010	43.07078701	-70.80489753	FBR	Monitoring Well	S	NT	NT	S
177-6011	43.06152155	-70.80875459	FBR	Monitoring Well	I	ND	PI	I
177-6025	43.06617716	-70.80466532	LS	Monitoring Well	I	NT	PI	NT
177-6026	43.06131355	-70.80509152	OB	Monitoring Well	NT	ND	ND	ND
177-7008D	43.06565355	-70.80812013	DBR	Monitoring Well	S	ND	S	NT
177-7008S	43.06565355	-70.80812013	DBR	Monitoring Well	I	NT	PI	I
177-7009D	43.068323	-70.80675318	DBR	Monitoring Well	PI	ND	NT	PI
177-7009S	43.068323	-70.80675318	DBR	Monitoring Well	S	ND	NT	D
177-7025D	43.06617716	-70.80466532	DBR	Monitoring Well	NT	NT	PI	I
177-7025S	43.06617716	-70.80466532	DBR	Monitoring Well	NT	NT	NT	S
177-7026D	43.06131355	-70.80509152	DBR	Monitoring Well	S	NT	NT	PI
177-7026S	43.06131355	-70.80509152	DBR	Monitoring Well	I	NT	I	I
CSW-1S	43.06361383	-70.79052035	US	Monitoring Well	NT	I	S	I
CSW-2R	43.05992296	-70.79100183	LS	Monitoring Well	NT	ND	ND	ND
CSW-3D	43.06223429	-70.79877172	FBR	Monitoring Well	I	NT	S	PI
CSW-3S	43.06223429	-70.79877172	OB	Monitoring Well	I	NT	NT	I
HMW-16	43.06843449	-70.80792126	FBR	Monitoring Well	I	NT	PI	I
PSW-1	43.05922277	-70.79938219	LS	Monitoring Well	I	ND	I	NT
PSW-2	43.05885832	-70.79620537	LS	Monitoring Well	NT	ND	NT	S
PSW-3D	43.05920752	-70.8037279	FBR	Monitoring Well	I	NT	S	S
PSW-3S	43.05920752	-70.8037279	OB	Monitoring Well	PI	S	PD	S
PSW-4D	43.05904317	-70.80144553	FBR	Monitoring Well	D	ND	PD	NT
PSW-4S	43.05904317	-70.80144553	OB	Monitoring Well	NT	ND	S	S
PSW-5D	43.05815249	-70.79927549	FBR	Monitoring Well	S	ND	S	NT
PSW-5S	43.05815273	-70.7992747	OB	Monitoring Well	PI	ND	NT	I

Created By: AMC 2/23/2023
QC/QC:MASV 3/16/2023
Revised: AMC 6/12/2023

Table 5-2
PFOS, PFOA, PFNA and PFHxS Trend Analysis

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July - December 2022
Former Pease Air Force Base
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					PFHxS	PFNA	PFOS	PFOA
MUNICIPAL SUPPLY WELLS								
Collins Well	43.05951437	-70.7891811	LS	Municipal Supply Well	I	NT	I	NT
Harrison Well	43.06588655	-70.80443948	LS	Municipal Supply Well	I	I	I	I
Portsmouth Well	43.05723381	-70.79765888	LS	Municipal Supply Well	I	PI	I	I
Smith Well	43.06105354	-70.80493321	LS	Municipal Supply Well	I	PI	I	I
TAXIWAY E AREA								
15-7506	43.08256789	-70.82073334	LS	Monitoring Well	NT	S	NT	NT
177-4035	43.08260154	-70.82086438	FBR	Monitoring Well	NT	NT	NT	NT
177-4162	43.08389694	-70.81754831	US	Monitoring Well	NT	I	S	S
177-5039	43.083206	-70.819644	LS	Monitoring Well	NT	S	I	NT
177-5042	43.08322289	-70.81849779	LS	Monitoring Well	NT	S	S	S
177-6035	43.08260154	-70.82086438	US	Monitoring Well	PD	S	S	PD
177-6039	43.08321457	-70.81964432	LS	Monitoring Well	PI	NT	I	D
177-6042	43.08322289	-70.81849779	LS	Monitoring Well	S	S	S	PD
31-546	43.08494599	-70.81865425	OB	Monitoring Well	NT	I	NT	S
31-547	43.08477734	-70.81961366	LS	Monitoring Well	PD	S	S	PD
76-5508	43.08658412	-70.81742292	OB	Monitoring Well	D	ND	NT	PI
81-5530	43.08246775	-70.81510014	LS	Monitoring Well	S	PI	PI	S
HY7-4976	43.08259082	-70.82197945	US	Monitoring Well	S	PI	S	S
HY7-5375	43.08254511	-70.82220665	OB	Monitoring Well	NT	NT	NT	NT
HY8-4974	43.08358096	-70.82342194	US	Monitoring Well	I	I	I	I
HY8-5382	43.08494665	-70.82333213	US	Monitoring Well	D	S	PD	D
PH8-5376	43.08303686	-70.8236802	US	Monitoring Well	NT	NT	NT	NT

Notes:

Mann Kendall Trends:
D = Decreasing
I = Increasing
ND = Non-Detect
NR= No Mann Kendall results for this analyte
NT = No Trend
PD = Probably Decreasing
PFHxS= Perfluorohexanesulphonic acid
PFNA= Perfluorononanoic acid
PFOA= Perfluorooctanoic acid
PFOS = Perfluorooctanesulfonic acid
PI = Probably Increasing
S = Stable

Lithological Units:
DBR - Deep Bedrock
FBR - Fractured bedrock
LS - Lower sand
OB - Overburden
US - Upper Sand
Trend analysis confidence levels are presented in Appendix H

6.0 CONCLUSIONS AND RECOMMENDATIONS

During the July to December 2022 reporting period, AIMS experienced minimal down time and offtime. Offtime reported 27 August 2022 to 01 September 2022 was due to the ion exchange resin replacement in vessels T-3205, T-3405, and T-3605. Downtime during the reporting period was due to shutdowns caused by severe weather.

Waste generated onsite during the reporting period consisted of PFAS waste including bag filters, PPE, and spent ion exchange resin. Waste was transported by ACV Environmental Services to Emelle, AL for disposal.

The frequency of process monitoring samples for PFAS compounds was changed to be collected monthly beginning in November 2022. The system has been operating predictably for greater than three years generating an extensive PFAS data set. The existing data set provides a basis to run AIMS predictably, sampling monthly, while discharging water with PFAS concentrations below the NHDES AGQSs. Ion exchange resin breakthrough occurs gradually and can take more than one year at full system capacity. Sampling PFAS compounds monthly is sufficient to track effluent compliance, removal performance, and process unit breakthrough for the treatment system.

The AIMS MMF Testing Plan was finalized on 23 September 2022. MMF performance sampling demonstrated that the MMF effectively decreases turbidity, iron concentration, and manganese concentration.

On 21 December 2022, a low-pressure leak test was performed on the four Bravo injection lines from the IMW building to the injection wells to determine if the source of the sand in these wells is due to a line breakage. The test concluded that there were no issues with the injection lines. Further investigation is ongoing.

Control modifications completed during the reporting period were made to allow the IMW water level to be “averaged”. This will smooth out IMW pump operation and reduce flow surges. These changes will be tested when the IMW is turned on in January 2023. Changes were also made to the IX resin booster pump operations. The booster pumps were changed from flow-based pump control to pressure differential-based control to smooth out surges and to improve operability when the IMW is operating. Changes also included adding operator adjustable flow cut in setpoints and establishing a target pressure differential for the booster pump operation.

Groundwater contour maps are consistent with the initial hydraulic models created for the AIMS system. The contour maps show that the AIMS is functioning as designed and has been effective at intercepting PFOS, PFOA, PFHxS, and PFNA contaminated groundwater. However, there is an increasing trend in PFAS in the Southern Wellfield area as contaminated groundwater that was already downgradient of the extraction system continues a southerly migration.

FLOW
ASSESSMENT SERVICES

TF Moran
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Attn: Jack McTigue, PE, CPESC

April 15, 2025

Re: Portsmouth, NH
Flow Monitoring
March – April 2025

Dear Mr. McTigue,

This letter is written to present the flow monitoring data collected in Portsmouth, NH. The meters were installed on 03/07/25. This letter presents the data from 03/07/25 to 04/10/25. The meters were removed 04/10/25.

Site configuration information:

Site	Location	Meter
1	Borthwick Avenue at Greenland Road	Level Meter installed with a 6” Palmer- Bowlus Flume in an existing 8” diameter line.
2	1 Highliner Avenue	Level Meter installed with a 6” Palmer- Bowlus Flume in an existing 8” diameter line.
3	155 Borthwick Avenue	Level Meter installed with a 6” Palmer- Bowlus Flume in an existing 8” diameter line.

The Level Meter senses depth. This depth information is stored in the meter’s memory. The recorded data is uploaded from the flow meters with a laptop computer. During the installation, maintenance visits and removal, the depth and velocity information is confirmed, and calibration measurements are noted.

This report contains a summary flow report and flow analysis graph for each meter site. The summary flow report presents minimum, peak, and total daily flow based on the recorded 5-minute interval readings. The flow analysis graph data is presented averaged hourly to make it easier to visualize the overall flow pattern during the monitoring period.

Additionally, this report contains meter site investigation sketches for each meter site.

The final data is also included in Excel format in its recorded 5-minute intervals. All data is recorded and presented in Eastern Standard Time.

The rainfall data presented in the summary flow reports and flow analysis graphs was collected by a tipping bucket type rain gauge installed at Lafayette Road Pump Station in Portsmouth, NH.

Site & Data Observations

Site 1	The ultrasonic level sensor failed from 3/24 @ 16:00 to 3/26 @ 19:10 and again from 4/1 @ 00:05 to 4/5 @ 06:20. To compensate for the loss of data, the metering was extended a few days.

If you have any questions or require anything additional, please feel free to contact me via email or phone.

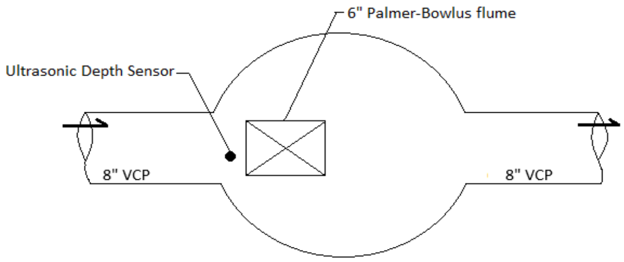
Sincerely,

John Sokol
Data Manager

METER SITE INFORMATION FIELD LOG

PROJECT: Portsmouth, NH
DATE: March 7, 2025
JOB#: 25022
LOCATION: 1 Highliner Ave., adjacent to Borthwick Ave.
MH#: SMH 484
METER SITE: 2
GPS/COMMENTS: 43.0603932, -70.7951186

	Size (")	Material	Flow Depth (")	Debris	Shape	MH Depth
Incoming	8	VCP	0.3	0	Circular	05' 08"
Incoming						
Incoming						
Outgoing	8	VCP	0.3	0	Circular	05' 09"

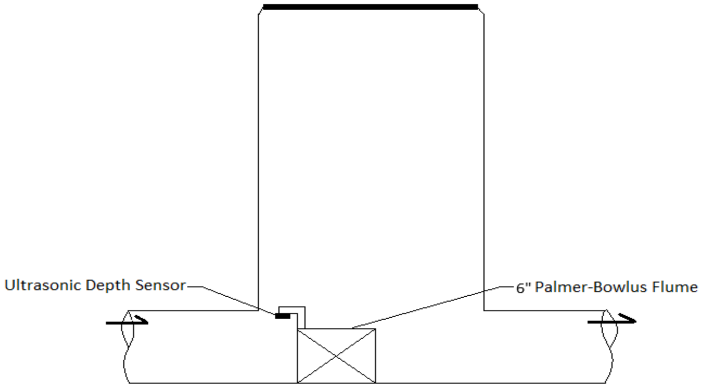


SURCHARGE INFORMATION

SURCHARGE NONE EVIDENT: X
SURCHARGED MARKS TO:
SURCHARGE CURRENTLY TO:

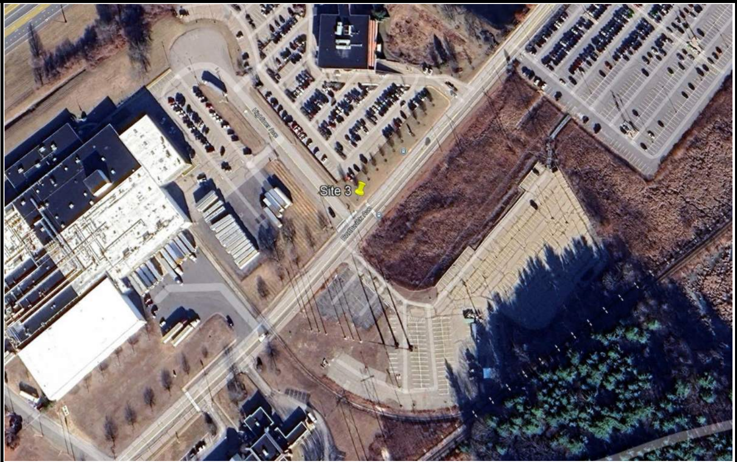
WEIR INFORMATION

LENGTH:
BREADTH:
LEVEL:
HEIGHT ABOVE WEIR:
OVERFLOW OCCURS AT:

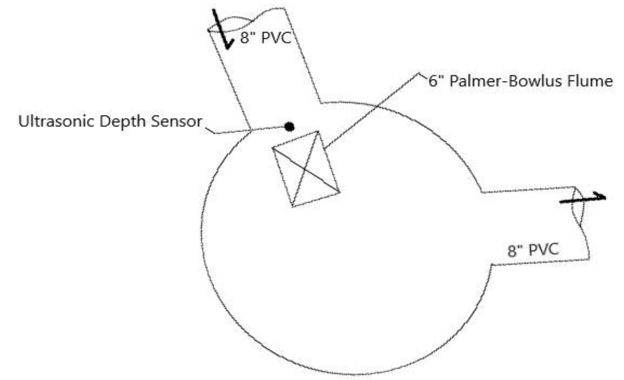


METER SITE INFORMATION FIELD LOG

PROJECT: Portsmouth, NH
DATE: March 7, 2025
JOB#: 25022
LOCATION: 155 Borthwick Avenue
MH#: SMH
METER SITE: 3
GPS/COMMENTS: 43.0611823, -70.7939116



	Size (")	Material	Flow Depth (")	Debris	Shape	MH Depth
Incoming	8	PVC	0.9	0	Circular	11' 09"
Incoming						
Incoming						
Outgoing	8	PVC	0.9	0	Circular	11' 10"

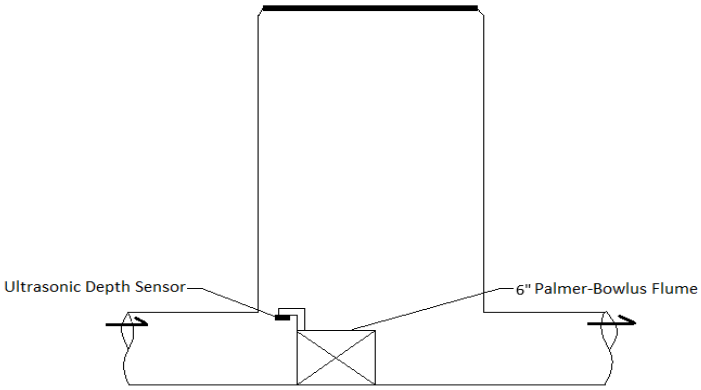


SURCHARGE INFORMATION

SURCHARGE NONE EVIDENT: X
SURCHARGED MARKS TO:
SURCHARGE CURRENTLY TO:

WEIR INFORMATION

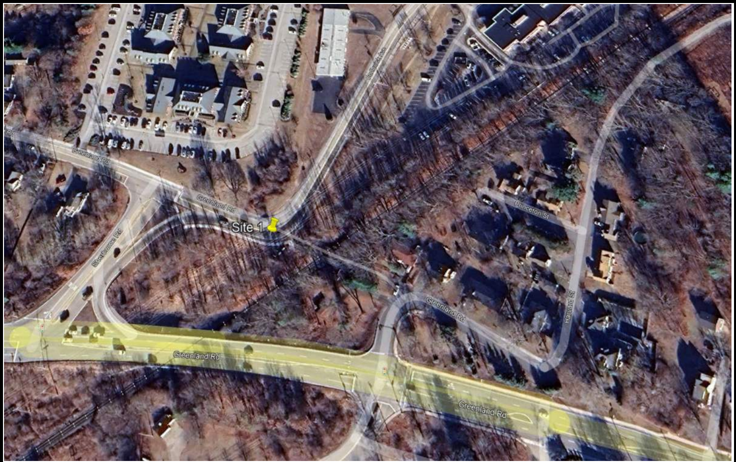
LENGTH:
BREADTH:
LEVEL:
HEIGHT ABOVE WEIR:
OVERFLOW OCCURS AT:



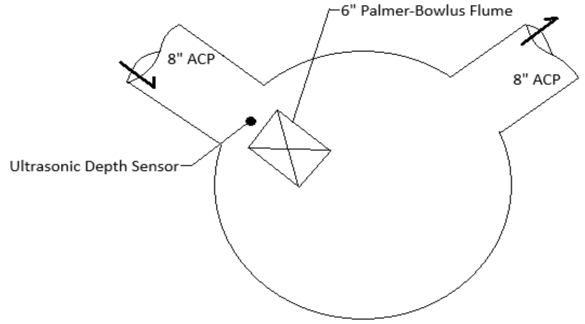
FLOW
ASSESSMENT SERVICES

METER SITE INFORMATION FIELD LOG

PROJECT: Portsmouth, NH
DATE: March 7, 2025
JOB#: 25022
LOCATION: Borthwick Avenue/Greenland Rd.(on sidewalk)
MH#: SMH 480
METER SITE: 1
GPS/COMMENTS: 43.0581025, -70.7970501



	Size (")	Material	Flow Depth (")	Debris	Shape	MH Depth
Incoming	8	ACP	0.9	0	Circular	12' 09"
Incoming						
Incoming						
Outgoing	8	ACP	0.9	0	Circular	12' 10"

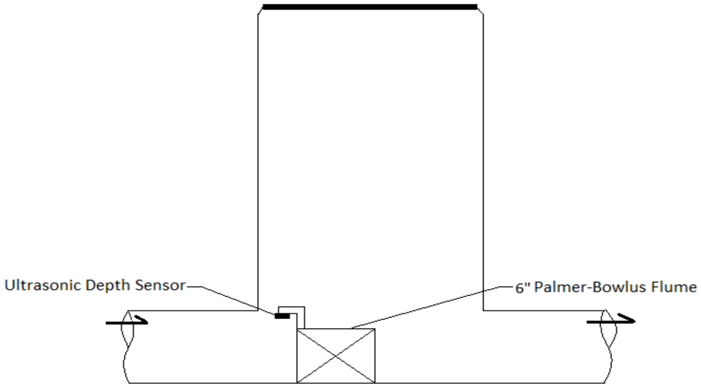


SURCHARGE INFORMATION

SURCHARGE NONE EVIDENT: X
SURCHARGED MARKS TO:
SURCHARGE CURRENTLY TO:

WEIR INFORMATION

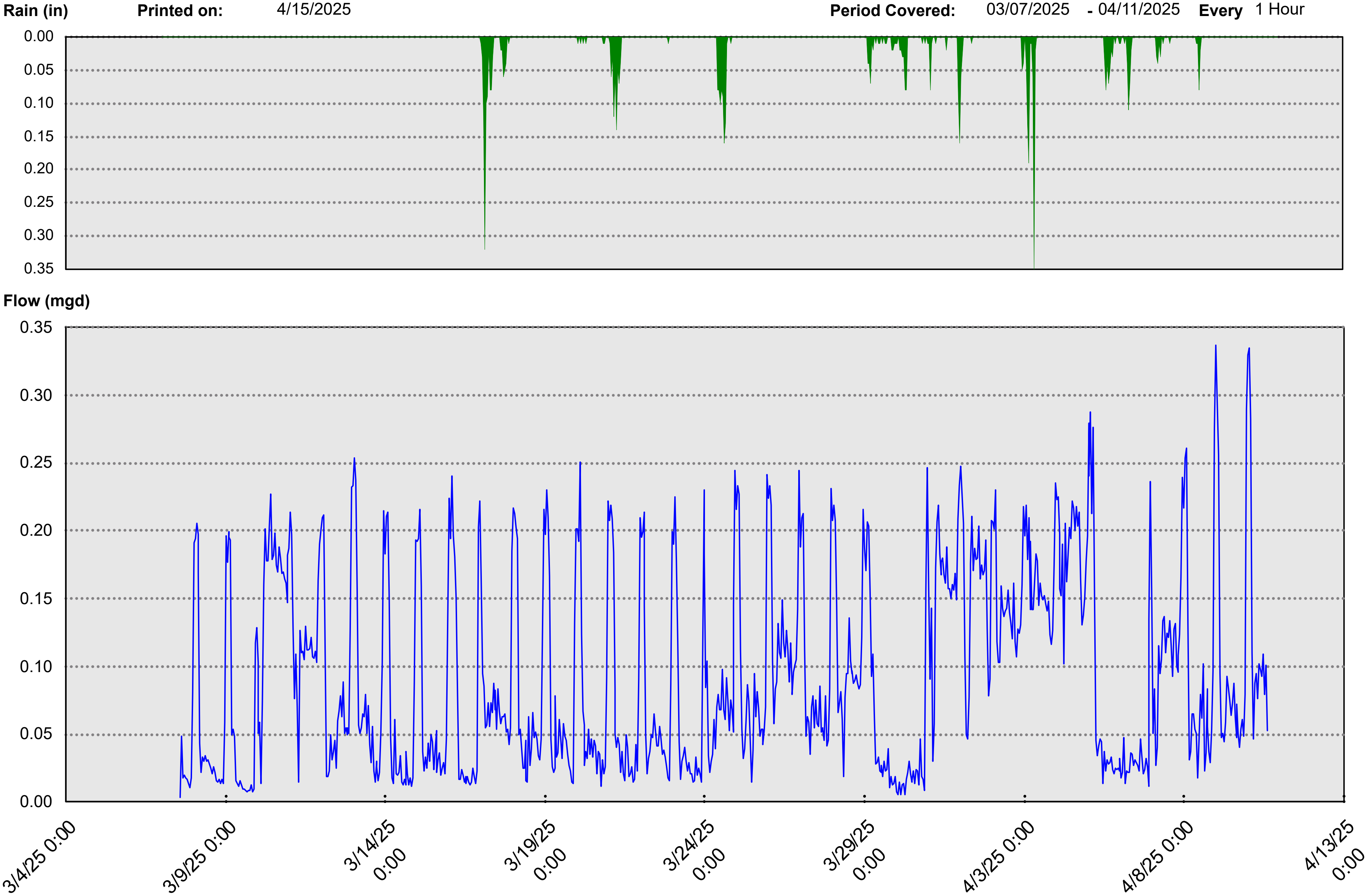
LENGTH:
BREADTH:
LEVEL:
HEIGHT ABOVE WEIR:
OVERFLOW OCCURS AT:



Flow Analysis Graph

Site:
Site 3
155 Borthwick Ave.   Portsmouth, NH   6" Parlmer Bowlus Flume in a 8" line

Printed on: 4/15/2025   **Period Covered:** 03/07/2025 - 04/11/2025   **Every** 1 Hour



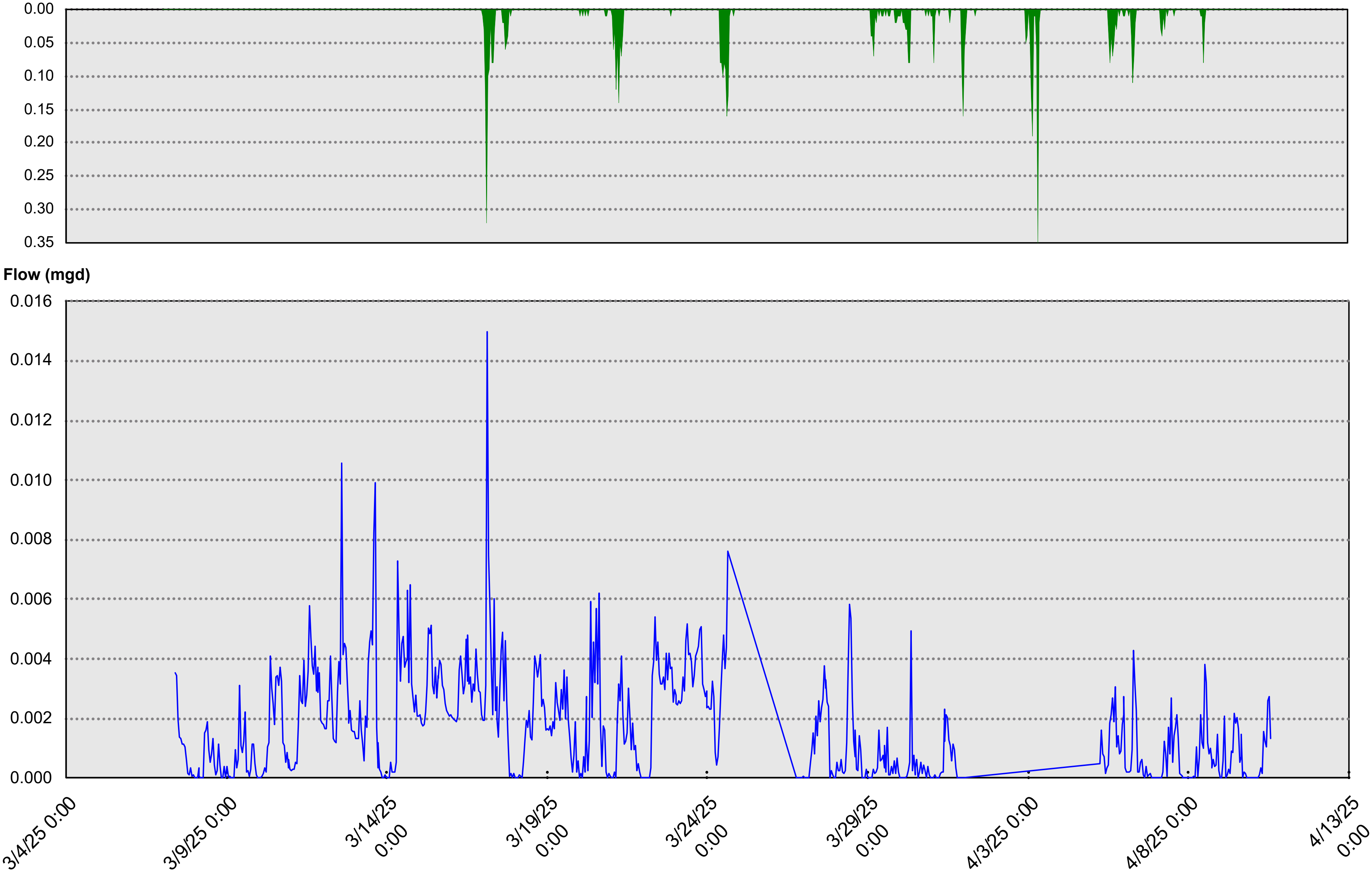
Flow Analysis Graph

Site:

Site 1

Borthwick Ave. Portsmouth, NH 6" Parlmer Bowlus Flume in a 8" line

Rain (in) **Printed on:** 4/15/2025 **Period Covered:** 03/07/2025 - 04/11/2025 **Every** 1 Hour

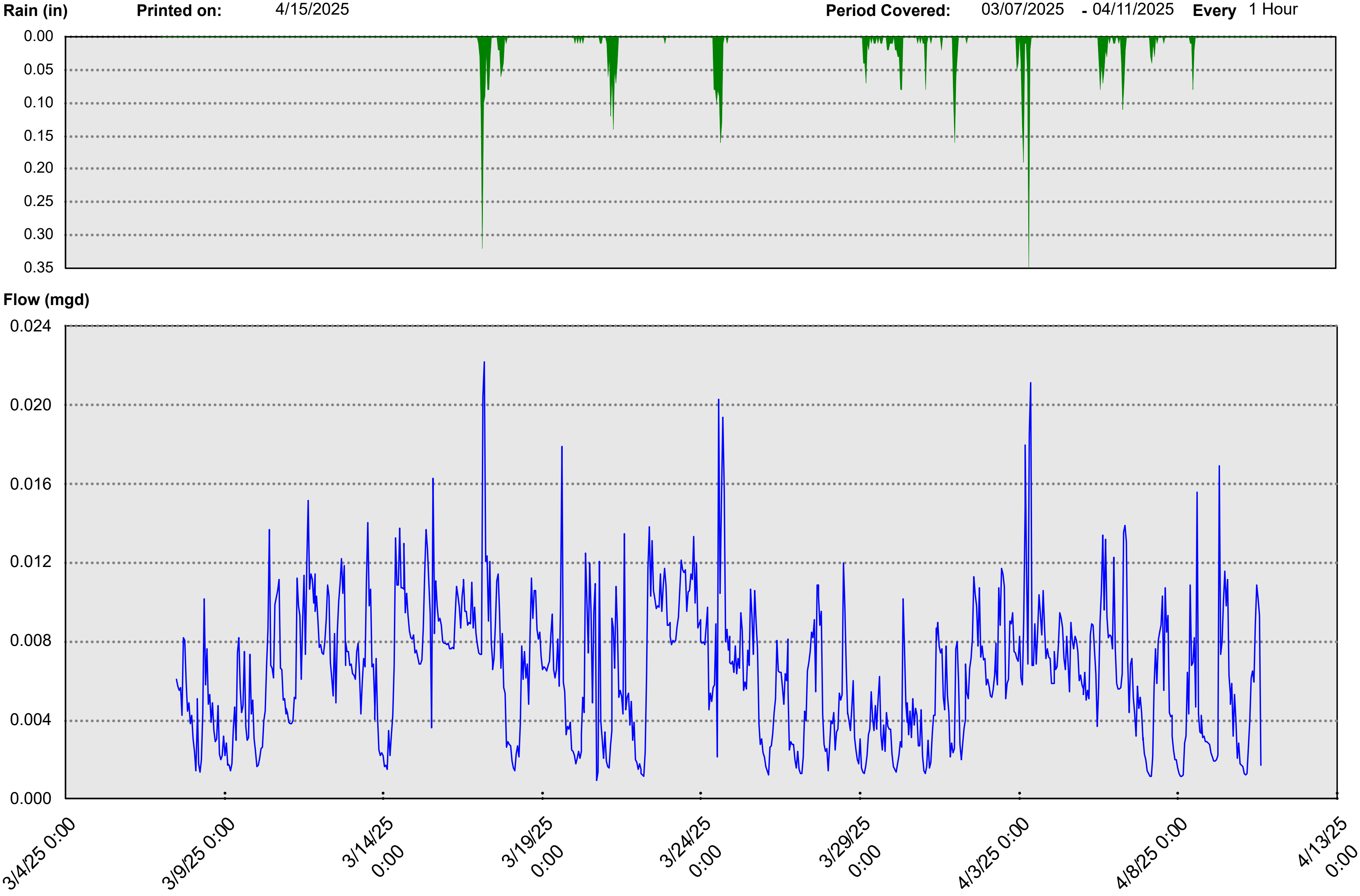


Flow Analysis Graph

Site:
Site 2

1 Highliner Ave. Portsmouth, NH 6" Parlmer Bowlus Flume in a 8" line

Printed on: 4/15/2025 **Period Covered:** 03/07/2025 - 04/11/2025 **Every** 1 Hour



Summary Flow Report

Site:
Site 1
Borthwick Ave. Portsmouth, NH 6" Parlmer Bowlus Flume in a 8" line

Date	Minimum Flow (mgd)	Peak Flow (mgd)	Total Daily Flow (mg)	Total Rain (in)	Peak Hourly Rain (in)	Peak Interval Rain (in)
3/7/2025 (Fri)	**0.000**	0.013	0.001	0.00	0.00	0.00
3/8/2025 (Sat)	**0.000**	0.009	0.000	0.00	0.00	0.00
3/9/2025 (Sun)	**0.000**	0.013	0.001	0.00	0.00	0.00
3/10/2025 (Mon)	**0.000**	0.011	0.002	0.00	0.00	0.00
3/11/2025 (Tue)	0.000	0.012	0.003	0.00	0.00	0.00
3/12/2025 (Wed)	0.000	0.041	0.003	0.00	0.00	0.00
3/13/2025 (Thu)	**0.000**	0.039	0.002	0.00	0.00	0.00
3/14/2025 (Fri)	**0.000**	**0.046**	0.003	0.00	0.00	0.00
3/15/2025 (Sat)	0.002	0.010	0.003	0.00	0.00	0.00
3/16/2025 (Sun)	0.002	0.009	0.003	0.00	0.00	0.00
3/17/2025 (Mon)	**0.000**	0.030	0.003	**1.08**	0.32	**0.05**
3/18/2025 (Tue)	**0.000**	0.010	0.002	0.00	0.00	0.00
3/19/2025 (Wed)	**0.000**	0.013	0.002	0.00	0.00	0.00
3/20/2025 (Thu)	**0.000**	0.024	0.002	0.06	0.01	0.01
3/21/2025 (Fri)	**0.000**	0.012	0.001	0.58	0.17	0.03
3/22/2025 (Sat)	**0.000**	0.012	0.003	0.01	0.01	0.01
3/23/2025 (Sun)	0.002	0.013	**0.004**	0.00	0.00	0.00
3/24/2025 (Mon)	**0.000**	0.012	0.002	0.74	0.17	0.02
3/25/2025 (Tue)				0.00	0.00	0.00
3/26/2025 (Wed)	**0.000**	0.000	0.000	0.00	0.00	0.00
3/27/2025 (Thu)	**0.000**	0.010	0.001	0.00	0.00	0.00
3/28/2025 (Fri)	**0.000**	0.023	0.001	0.00	0.00	0.00
3/29/2025 (Sat)	**0.000**	0.007	0.000	0.29	0.09	0.02
3/30/2025 (Sun)	**0.000**	0.014	0.000	0.30	0.11	0.02
3/31/2025 (Mon)	**0.000**	0.011	0.001	0.23	0.09	0.02
4/1/2025 (Tue)	**0.000**	0.000	0.000	0.26	0.16	0.03
4/2/2025 (Wed)				0.05	0.05	0.01
4/3/2025 (Thu)				0.85	**0.35**	**0.05**
4/4/2025 (Fri)				0.00	0.00	0.00
4/5/2025 (Sat)	**0.000**	0.007	0.001	0.34	0.09	0.02
4/6/2025 (Sun)	**0.000**	0.010	0.001	0.27	0.13	0.02
4/7/2025 (Mon)	**0.000**	0.008	0.001	0.13	0.04	0.01
4/8/2025 (Tue)	**0.000**	0.009	0.001	0.12	0.08	0.02
4/9/2025 (Wed)	**0.000**	0.010	0.001	0.00	0.00	0.00
4/10/2025 (Thu)	**0.000**	0.010	0.000	0.00	0.00	0.00
		Total for period	0.046	5.31		
		Min:	0.000			
		Avg:	0.001			
		Max:	0.046			

Summary Flow Report

Site:
Site 2
1 Highliner Ave. Portsmouth, NH 6" Parlmer Bowlus Flume in a 8" line

Date	Minimum Flow (mgd)	Peak Flow (mgd)	Total Daily Flow (mg)	Total Rain (in)	Peak Hourly Rain (in)	Peak Interval Rain (in)
3/7/2025 (Fri)	0.001	0.038	0.003	0.00	0.00	0.00
3/8/2025 (Sat)	**0.000**	0.026	0.004	0.00	0.00	0.00
3/9/2025 (Sun)	0.001	0.024	0.004	0.00	0.00	0.00
3/10/2025 (Mon)	0.001	0.028	0.006	0.00	0.00	0.00
3/11/2025 (Tue)	0.003	0.023	0.009	0.00	0.00	0.00
3/12/2025 (Wed)	0.001	0.039	0.008	0.00	0.00	0.00
3/13/2025 (Thu)	0.002	0.022	0.007	0.00	0.00	0.00
3/14/2025 (Fri)	0.001	0.058	0.008	0.00	0.00	0.00
3/15/2025 (Sat)	0.001	0.056	0.009	0.00	0.00	0.00
3/16/2025 (Sun)	0.007	0.015	0.009	0.00	0.00	0.00
3/17/2025 (Mon)	0.001	0.036	0.009	**1.08**	0.32	**0.05**
3/18/2025 (Tue)	0.001	0.024	0.006	0.00	0.00	0.00
3/19/2025 (Wed)	0.001	0.047	0.007	0.00	0.00	0.00
3/20/2025 (Thu)	0.001	0.057	0.005	0.06	0.01	0.01
3/21/2025 (Fri)	0.001	0.042	0.005	0.58	0.17	0.03
3/22/2025 (Sat)	0.001	0.017	0.008	0.01	0.01	0.01
3/23/2025 (Sun)	0.007	0.017	**0.010**	0.00	0.00	0.00
3/24/2025 (Mon)	0.001	0.070	0.009	0.74	0.17	0.02
3/25/2025 (Tue)	0.002	0.017	0.007	0.00	0.00	0.00
3/26/2025 (Wed)	0.001	0.021	0.004	0.00	0.00	0.00
3/27/2025 (Thu)	0.001	0.019	0.006	0.00	0.00	0.00
3/28/2025 (Fri)	0.001	0.021	0.004	0.00	0.00	0.00
3/29/2025 (Sat)	0.001	0.022	0.003	0.29	0.09	0.02
3/30/2025 (Sun)	0.001	0.024	0.004	0.30	0.11	0.02
3/31/2025 (Mon)	0.001	0.015	0.005	0.23	0.09	0.02
4/1/2025 (Tue)	0.002	0.021	0.007	0.26	0.16	0.03
4/2/2025 (Wed)	0.001	0.029	0.008	0.05	0.05	0.01
4/3/2025 (Thu)	0.004	0.032	0.010	0.85	**0.35**	**0.05**
4/4/2025 (Fri)	0.004	0.020	0.007	0.00	0.00	0.00
4/5/2025 (Sat)	0.003	0.028	0.008	0.34	0.09	0.02
4/6/2025 (Sun)	0.002	0.021	0.006	0.27	0.13	0.02
4/7/2025 (Mon)	0.001	0.035	0.005	0.13	0.04	0.01
4/8/2025 (Tue)	0.001	0.054	0.004	0.12	0.08	0.02
4/9/2025 (Wed)	0.001	**0.075**	0.005	0.00	0.00	0.00
4/10/2025 (Thu)	0.001	0.041	0.003	0.00	0.00	0.00
		Total for period	0.221	5.31		
		Min:	0.000			
		Avg:	0.006			
		Max:	0.075			

Summary Flow Report

Site:
Site 3
155 Borthwick Ave. Portsmouth, NH 6" Parlmer Bowlus Flume in a 8" line

Date	Minimum Flow (mgd)	Peak Flow (mgd)	Total Daily Flow (mg)	Total Rain (in)	Peak Hourly Rain (in)	Peak Interval Rain (in)
3/7/2025 (Fri)	0.009	0.259	0.010	0.00	0.00	0.00
3/8/2025 (Sat)	0.012	0.246	0.061	0.00	0.00	0.00
3/9/2025 (Sun)	**0.002**	0.305	0.063	0.00	0.00	0.00
3/10/2025 (Mon)	0.008	0.309	0.155	0.00	0.00	0.00
3/11/2025 (Tue)	0.007	0.256	0.122	0.00	0.00	0.00
3/12/2025 (Wed)	0.013	0.264	0.082	0.00	0.00	0.00
3/13/2025 (Thu)	0.009	0.264	0.083	0.00	0.00	0.00
3/14/2025 (Fri)	0.003	0.252	0.060	0.00	0.00	0.00
3/15/2025 (Sat)	0.015	0.236	0.064	0.00	0.00	0.00
3/16/2025 (Sun)	0.010	0.325	0.082	0.00	0.00	0.00
3/17/2025 (Mon)	0.034	0.238	0.075	**1.08**	0.32	**0.05**
3/18/2025 (Tue)	0.011	0.275	0.079	0.00	0.00	0.00
3/19/2025 (Wed)	0.008	0.270	0.076	0.00	0.00	0.00
3/20/2025 (Thu)	0.009	0.289	0.073	0.06	0.01	0.01
3/21/2025 (Fri)	0.008	0.275	0.072	0.58	0.17	0.03
3/22/2025 (Sat)	0.014	0.269	0.073	0.01	0.01	0.01
3/23/2025 (Sun)	0.012	0.276	0.071	0.00	0.00	0.00
3/24/2025 (Mon)	0.014	0.290	0.080	0.74	0.17	0.02
3/25/2025 (Tue)	0.006	0.274	0.088	0.00	0.00	0.00
3/26/2025 (Wed)	0.024	0.279	0.126	0.00	0.00	0.00
3/27/2025 (Thu)	0.020	0.281	0.087	0.00	0.00	0.00
3/28/2025 (Fri)	0.008	0.275	0.110	0.00	0.00	0.00
3/29/2025 (Sat)	0.007	0.307	0.065	0.29	0.09	0.02
3/30/2025 (Sun)	0.004	0.286	0.032	0.30	0.11	0.02
3/31/2025 (Mon)	0.015	0.293	0.160	0.23	0.09	0.02
4/1/2025 (Tue)	0.004	0.281	0.159	0.26	0.16	0.03
4/2/2025 (Wed)	0.040	0.297	0.147	0.05	0.05	0.01
4/3/2025 (Thu)	0.099	0.270	0.163	0.85	**0.35**	**0.05**
4/4/2025 (Fri)	0.018	0.295	**0.184**	0.00	0.00	0.00
4/5/2025 (Sat)	0.011	**0.370**	0.083	0.34	0.09	0.02
4/6/2025 (Sun)	0.006	0.305	0.041	0.27	0.13	0.02
4/7/2025 (Mon)	0.010	0.277	0.114	0.13	0.04	0.01
4/8/2025 (Tue)	0.013	0.323	0.090	0.12	0.08	0.02
4/9/2025 (Wed)	0.020	0.364	0.103	0.00	0.00	0.00
4/10/2025 (Thu)	0.023	0.359	0.083	0.00	0.00	0.00
		Total for period	3.217	5.31		
		Min:	0.002			
		Avg:	0.092			
		Max:	0.370			

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Job #47528.00

NHDES

Application for Sewer Connection Permit

FOR

Sherburne School Development

Sherburne Road
Portsmouth, New Hampshire
Rockingham County

Tax Map 259, Lot 10

June 16, 2025

Prepared By:

TFM®
Since 1968

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

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TFM
Since 1968
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

NEW HAMPSHIRE 200

June 16, 2025

TFM Project No: 47528.00

John J. Muras, PE
NHDES WWEB
PO Box 95
Concord, NH 03302-0095

Re: Sewer Connection Permit – 35 Sherburne Road – Tax Map 259-10
Work Force Housing
TFM PIN: 47528.00

Dear Mr. Muras,

On behalf of Portsmouth Housing Authority Development, LLC., we respectfully submit an Application for Sewer Connection Permit relative for the above-mentioned project. The following materials are included in this submission:

- Application for Sewer Connection Permit – Signed by the City of Portsmouth ___;
- Check for the amount of $2,251.00 for the Sewer Connection Permit;
- Table 1008-1, Unit Design Flow from Pages 47-49 from the NH Code of Administrative Rules, ENV-Wq 1000;
- Calculated Design Sewer Flow
- Full Flow and Approximate Partial Flow Calculations for gravity sewer, Dated September 27, 2021;
- Cover Sheet, Existing Conditions, Site Plans, Road Plan and Profiles, Utility Plans and Sewer Details of the Site Plan Set titled, "Site Development Plans, Lot 10, Proposed Housing Development, 35 Sherburne Road, Portsmouth, New Hampshire, Owned by the City of Portsmouth, Prepared for PHA Housing Development LTD, dated January, last Revised June 16, 2025.

This project consists of a 90-unit apartment, a 29-unit apartment and the conversion of part of Sherburn School into an 8- unit apartment. The units are serviced by gravity sewers.

The proposed project consists of 538 linear feet of 8” SDR 35 gravity sewer main, 2 proposed sewer manholes and 2 cleanouts for the low-pressure lines.

The City of Portsmouth concurrently reviewing this application. Any revisions based on their comments will be circled on the plans and forwarded to you.

On behalf of our client, we respectfully request review of the application package for approval.

Sincerely,
MSC a division of TFMoran, Inc.

John J McTigue

Jack McTigue, PE, CPESC
Project Manager

cc: Rick Green (Green and Company), Michael Green (Green and Company), Jenna Green (Green and Company), and Peter Britz (City of Portsmouth)

SEWER CONNECTION APPLICATION

Instructions and Procedures

Rev. 2-7-2020

1. A complete application with plans and specifications must be submitted to Michael Finn, DPW Dispatcher, by email (mpfinn@cityofportsmouth.com) or delivered to the DPW office at 680 Peverly Hill Road. The application, plans and specifications will be reviewed for completeness by staff and must be completed at least 2 weeks in advance of anticipated service inspection. Property owner is responsible for the sewer lateral from the building to the main including the connection.

2. If application and materials are deemed incomplete, the applicant will be notified and the application will be placed on hold. If materials are deemed complete, the applicant will be directed to contact Jim Tow, General Foreman, to schedule a meeting.

3. Once the applicant has met with Jim Tow and paid all fees in full, the applicant can schedule an inspection. The area of work must be exposed and uncovered for City staff to inspect.

4. The Public Works Department reserves the right to refuse applications which do not meet these minimum requirements. The Public Works Department may also require additional information to illustrate the scope of the project.

5. The Applicant is encouraged to consider the following when completing the application:

   - Complete application using Adobe Acrobat Reader
   - Plans and specifications must be in PDF format if submitted electronically
   - Provide neat and clearly legible plans and copies
   - Use of color or highlights is encouraged in order to identify pertinent areas on plans

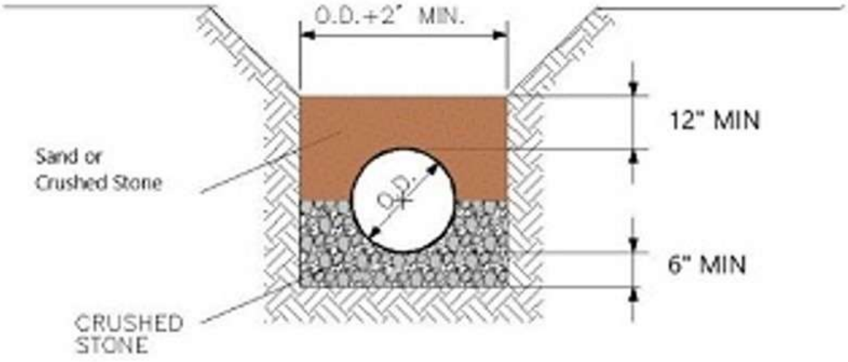
City of Portsmouth
Sewer Installation Guidelines

The following guideline will illustrate the City’s requirements for sewer installation.

1. All sewer pipe and fittings will be PVC type SDR-35 with rubber gasketed joints. <u>NO</u> glued fittings are allowed for outside plumbing.

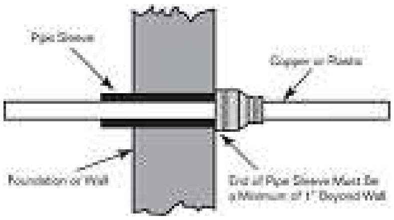
2. Rubber “Fernco” style couplings will only be allowed for connecting to clay or asbestos “Transite” pipe. PVC to PVC or schedule 40 pipe must always use solid sleeve couplings.

3. All sewer pipe will have no less than 6” of 3/4'” crushed stone base to at least the spring line of the pipe. <u>The base stone will be laid before the pipe</u>. From the spring line of the pipe to 1 foot over the pipe may be ¾” stone or sand followed by miscellaneous clean fill and 12” of crushed gravel. Pavement, if applicable, shall be restored to its original depth.



PIPE BEDDING AND HAUNCHING DETAILS

4. The foundation penetration should be schedule 40 PVC and should extend no more than 5 feet outside the wall. The seal shall be flexible, such as a Linkseal or a pipe sleeve with a Fernco type coupling.



CITY OF PORTSMOUTH
DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD, PORTSMOUTH NH 03801
(603) 427-1530

Sewer Connection Application

To the City of Portsmouth:

The undersigned, being the Applicant, Owner, etc.: Owner ▾ Print Name: PHA Housing Development LTD. of the property located at Street Number: 35 Street Name: Sherburne Road does hereby request a permit to install and connect a sewer service to the (Residence, Commercial Building, etc.): Workforce Housing 127 Units at said location.

1. Contractor Information:

Contractor's Company Name: Eckman Construction
Contractor's Address: 84 Palomino Lane Bedford, NH 03110
Phone Number: (603) 623-1713
Contact Person: John Deloia
Email: deloia@eckmanconstruction.c
Drain Layers Number:

2. Plans and specifications for the proposed sewer connection are attached as Exhibit "A".

In consideration of the granting of this permit, the undersigned agrees:

1. To accept and abide by all provisions of the Sewer Ordinance of the City of Portsmouth, and of all other pertinent ordinances or regulations that may be adopted in the future.
2. To maintain the building sewer at no expense to the City.
3. To contact the Utility Department at 427-1530 to request an inspection and connection to the public sewer system, but before any portion of the work is covered.

☑ By selecting this box, the undersigned acknowledges to have read the application instructions and confirms all information provided is correct and true.

Applicant's Signature:
Applicant's Address: 245 Middle Street, Portsmouth, NH 03801

Applicant's Name: Craig Welch
Date: 06/16/2025

City Representative:
Notes:

Project	**Sherburne School Development**	Date:	6/16/2025
Location	**Sherburn Road**		
	Portsmouth, NH		

Unit Sewer Flows

Total Number of Units	127

90-Unit Buding	# Units	GPD	GPD
1 Bedroom	51	225	11,475
2-Bedroom	31	300	9,300
3-Bedroom	8	450	3,600
Gallons Perd Day for 90-Unit Housing			24,375

29-Unit Buding	# Units	GPD	GPD
1 Bedroom	13	225	2,925
2-Bedroom	10	300	3,000
3-Bedroom	6	450	2,700
Gallons Perd Day for 90-Unit Housing			8,625

Old School Buding	# Units	GPD	GPD
1 Bedroom	5	225	1,125
2-Bedroom	3	300	900
3-Bedroom	-	450	-
Gallons Perd Day for 90-Unit Housing			2,025

Design Sewer Flows

	Number of Units	GPD
90-Unit Buding	90	24,375
29-Unit Buding	29	8,625
Old School Buding	8	2,025
Total Design Flow		35,025

State Fee

Cost per GPD	$ 0.10	10,000	$ 1,000.00
In Excess of 10,000 GPD	$ 0.05	25,025	$ 1,251.25
Pump Station	$200.00	-	$ -
Total Cost			$ 2,251.25

(2) Metered water readings for uses that are as similar as possible to the proposed use, taking into consideration factors such as occupancy and frequency of use, determined as specified in (d), below.

(d) Design flows based on metered water readings shall be calculated:

(1) By finding the average of water meter readings over a period of time that is representative of the volume of water used and multiplying the average by a minimum peaking factor of 2 for commercial light flow or a maximum peaking factor of 3 for commercial heavy flow; or

(2) By measuring not less than 6 months of consecutive daily meter readings, including the month(s) of heaviest use for uses that are seasonal in nature, and using the highest daily flow without application of a peaking factor;

(e) The unit design flow figures referenced in (b) and (c), above, shall be as listed in Table 1008-1, below, subject to (f), below:

Table 1008-1: Unit Design Flow Figures

Use	**Unit Design Flow**
AIRPORTS	5 GPD/Transient plus 10 GPD/Employee
APARTMENTS	See Dwellings
BARS, LOUNGES	See Food Service
BED & BREAKFAST	60 GPD/Guest, based on the greater of 2 guests per room or the actual number of guests the room is designed to accommodate, plus 10 GPD/Employee
BUNKHOUSE	60 GPD/Person
CAMPS:	
Campground with Central Comfort Station	45 GPD/site, plus 20 GPD/Site for the dump station
Recreational Campgrounds with 3-way hookups	60 GPD/Site
Construction Camps	50 GPD/Person
Day Camps (not including meals)	15 GPD/Person
Dining Facility	3 GPD/Person/meal
Residential Youth Recreation Camps	25 GPD/Person plus 3 GPD/Person/meal
CATERERS – Function Rooms	12 GPD/patron
CHURCHES:	
Sanctuary Seating	3 GPD/Seat
Church Suppers	12 GPD/Seat
COUNTRY CLUBS – PRIVATE	
Dining Room	10 GPD/Seat
Snack Bar	10 GPD/Seat
Locker & Showers	20 GPD/Locker
DAY CARE CENTERS	10 GPD/Person
DENTISTS	10 GPD/Chair plus 35 GPD/Staff Member
DOCTOR’S OFFICES	250 GPD/Doctor
DOG KENNELS	50 GPD/Kennel, with one dog per kennel
DWELLINGS:	
Apartment - Studio or One-Bedroom	225 GPD
Apartment - 2 or More Bedrooms	150 GPD/Bedroom
Residence - Single-Family	300 GPD plus 150 GPD for each bedroom over 2
Residence - Duplex	300 GPD plus 150 GPD for each bedroom over 2 for each unit
Rooming House – With Meals	60 GPD/Person
Rooming House – Without Meals	40 GPD/Person
Senior Housing	See Senior Housing

Use	**Unit Design Flow**
FACTORIES (Exclusive of Industrial Waste):	
Without Cafeteria or Showers	10 GPD/Person
With Cafeteria, No Showers	15 GPD/Person
With Cafeteria and Showers	20 GPD/Person
Warehouses	10 GPD/Person
FIRE STATIONS – Without full-time employees; without floor drains or food preparation	5 GPD/Person
FOOD SERVICE:	
Cafeteria or table service, plus toilet and kitchen waste	40 GPD/Seat plus 20 GPD/Employee
Cafeteria or table service, paper service, plus toilet and kitchen waste	20 GPD/Seat plus 20 GPD/Employee
Ice cream dipper	100 GPD/dipper plus 20 GPD/Employee
Kitchen Waste only	3 GPD/Meal served plus 20 GPD/Employee
Bars and lounges	20 GPD/Seat plus 20 GPD/Employee
Function Rooms	12 GPD/Seat plus 20 GPD/Employee
GYMS	10 GPD/participant plus 3 GPD/Spectator seat
HAIRDRESSERS	150 GPD/Chair plus 20 GPD/Employee
HOSPITALS	200 GPD/Bed plus 20 GPD/Employee
HOTELS AND MOTELS	200 GPD/Room plus 10 GPD/Employee
INSTITUTIONS OTHER THAN HOSPITALS	See Residential Institutions
LAUNDROMATS, COIN-OPERATED	500 GPD/Machine
LOUNGES	See Food Service, Bars/Lounges
MANUFACTURED HOUSING PARKS	150 GPD/ Bedroom/Site with 300 GPD/Site minimum
MOTELS, see HOTELS	
NURSING HOMES	125 GPD/Bed plus 20 GPD/Employee
OFFICE BUILDINGS:	
Without Cafeteria	10 GPD/Employee
With Cafeteria	15GPD/ Employee
Unspecified Office Space	5 GPD/100 ft^2
PICNIC PARKS	See Recreational Facilities
RECREATIONAL FACILITIES	
Toilet Waste Only	5 GPD/person
With Showers and Toilets	10 GPD/person
RESIDENTIAL INSTITUTIONS OTHER THAN HOSPITALS AND NURSING HOMES	135 GPD/Bed plus 20 GPD/Employee
RESTAURANTS	See Food Service
SCHOOLS:	
Boarding	100 GPD/resident student or employee plus Day School loading for non-resident students and employees
Day, Without Gym, Cafeteria, or Showers	10 GPD/student or employee
Day, Without Gyms or Showers, with Cafeteria	15 GPD/student or employee
Day, With Gyms, Showers, and Cafeteria	25 GPD/student plus 15 GPD/employee
SENIOR HOUSING	125 GPD/2 Bedroom unit, maximum 2 person occupancy
SERVICE STATIONS	75 GPD/Island plus 10 GPD/Employee
SKATING RINKS	See Gyms
SKI AREAS	See Recreational Facilities

Use	Unit Design Flow
STORES:	
Dry Goods	5 GPD/100 ft^2 plus 10 GPD/employee
Supermarkets with Meat Dept. without Garbage Grinder	7.5 GPD/100 ft^2
Supermarkets with Meat Dept. with Garbage Grinder	11 GPD/100 ft^2
SWIMMING POOLS, Public	See Recreational Facilities
TENNIS COURTS	See Recreational Facilities
THEATERS	3 GPD/Auditorium Seat/Show
TOWN HALLS	5 GPD/Seat for total seating capacity
TOWN OFFICES	10 GPD/Office employee plus 5 GPD /Transient
TRAVEL TRAILER PARKS	See Camps
WAREHOUSES	See Factories

(f) For any combination of uses, such as a day camp that serves meals, a recreational facility with a cafeteria, a ski area that also has a day care, or a single-family residence with a studio or 1-bedroom apartment, the loading shall be the combined total of the loading for the separate uses.

(g) For any structure where the use is not listed in Table 1008-1, the permitted designer shall submit documentation to support the estimated maximum daily flow.

Source. (See Revision Notes #1 and #2 at chapter heading) #11184, eff 10-1-16

Env-Wq 1008.04 Minimum Distances.

(a) The minimum separation distance in feet between components of an ISDS and the identified receptors shall be as specified in Table 1008-2, subject to (b) through (j), below:

Table 1008-2: Minimum Separation Distances (in Feet)

Component→ Receptor↓	Septic Tank	Bed	Sewer Line
Surface Water	75	75	
Poorly Drained Jurisdictional Wetland	50	50	
Very Poorly Drained Jurisdictional Wetland	75	75	
Open Drainage	75	75	
Culvert, Tight Pipe	10	25	
Catch Basin	35	35	
Reservoir	75	75	
Water Lines, pressure	10	25	10
Water lines, suction	50	50	50
Property lines	5	10	5
Foundation, any type, with Foundation Drains	5	15	
Foundation, full cellar, without Foundation Drains	5	10	
Foundation, slab, without Foundation Drains	5	5	
Foundation Drains Outfall Pipe (Solid)	5	5	
Foundation Drain Outfall (Discharge)	25	25	
Top of Natural Embankment or Natural Steep Slope	5	20	
Stormwater Pond intercepting SHWT	50	75	
Stormwater Pond not intercepting SHWT	25	35	
Geothermal well, open loop	75	75	
Geothermal well, closed loop	25	25	
Upgradient swale to divert surface water from EDA not intercepting SHWT, below finished grade of EDA	10	25	

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Sewer Flow Calculations
Sherburne Work Force Housing
PIN # 47528.00

6/13/2025

Areas to be filled in are highlighted in yellow

P_f	6	Peak Factor		
I/I	300	gpd/in/mile	Q =	5.275E-07 cfs
n_f	0.010	Manning		
k	1.485	Converstion Factor		

Q_{full}	Full Pipe Flow
Q_{cal}	Calculated Flow - Based on Flow Height
Q_{needed}	Required Flow ($Q_{per\text{-}use}$+Q_{inf})
Q_{inf}	Flow needed for infiltration
$Q_{per\text{-}use}$	Flow Needed Per Use
ΔQ	Difference between Q_{needed} and Q_{cal}

V_{cal1}	Velocity from the approximate flow depth
V_{cal2}	Velocity based on the iterative flow depth
K_h	Constant used to calculate the approximate flow depth Based on an approximation method presented by Esen (1993)
y	Depth of flow
∅	Angle of partial flow based on flow depth
A	Area of partial flow
P	Wetted Perimeter
R_h	Hydraulic Radius

		Flow (cfs)	Flow with Peaking Factor
90- Unit Building	24,375 gpd	0.0377 cfs	0.2263 cfs
27- Unit Building	8,625 gpd	0.0133 cfs	0.0801 cfs
Old School	2,025 gpd	0.0031 cfs	0.0188 cfs

d	8.00 in
A	0.35 sf
S	0.004 ft/ft
R	0.17

M Form 0.990 cfs 0.640 mgd (Full Flow)

TABLE 1 - FULL FLOW AND APPROXIMATE PARTIAL FLOW CALCULATIONS

								Full Flow												Partial Flow				
From	To	Length	Inverts		Slope	Dia		V_{full}	Q_{full}	K_h	∅ full	∅	y/Y	y	A	Units (#)				Q (cfs)			V_{cal1}	Notes
		(ft)	Out	In	(ft/ft)	(in)	(ft)	fps	cfs		rad.	rad.		ft	sf	1 Bed	2 Bed	3 Bed	Offe	$Q_{per\text{-}use}$	Q_{inf}	Q_{needed}	fps	
90 UNIT	PSMH-2	53	53.50	53.20	0.006	8	0.67	3.38	1.18	0.060	2.32	2.32	0.30	0.20	0.09	1	0	0	0.00	0.226	0.0002	0.227	2.56	
PSMH-2	PSMH-1	521	53.10	50.29	0.005	8	0.67	3.30	1.15	0.089	2.60	2.60	0.37	0.24	0.12	0	1	1	0.00	0.099	0.0022	0.328	2.84	
PSMH-1	EXISTING	100	50.19	-	0.004	8	0.67	2.84	0.99	0.103	2.72	2.72	0.39	0.26	0.13	0	0	0	0.00	0.000	0.0004	0.328	2.56	

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GEOTECHNICAL REPORT

SHERBURNE ROAD HOUSING DEVELOPMENT
35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE

April 8, 2025

GSI Project No. 225144

Prepared for:

Jack McTigue, PE, CPESC
Project Manager
TF Moran, Inc.
170 Commerce Way, Ste 102
Portsmouth, NH 03801

Prepared by:

Geotechnical Services, Inc.
55 North Stark Highway
Weare, NH 03281

Geotechnical Services Inc.

Geotechnical Engineering ◣ Environmental Studies ◣ Materials Testing ◣ Construction Monitoring

GSI GEOTECHNICAL SERVICES INC.
Geotechnical Engineering Environmental Studies Materials Testing Construction Monitoring

April 8, 2025

Jack McTigue, PE, CPESC
TF Moran, Inc.
170 Commerce Way, Ste 102
Portsmouth, NH 03801
Email: jmctigue@tfmoran.com

RE: Geotechnical Report
Sherburne Rd Housing Development
35 Sherburne Road,
Portsmouth, NH 03801

GSI Project No. 225144

Dear Mr. McTigue:

This report presents the results of a geotechnical investigation completed by Geotechnical Services, Inc. (GSI) for the construction of the proposed Housing Development in Portsmouth, New Hampshire. The objective of the geotechnical investigation was to explore subsurface conditions within the proposed development area and formulate geotechnical engineering recommendations for the design and construction of foundations, and floor slabs. Included are the findings of our subsurface exploration program and an engineering evaluation of the subsurface conditions encountered. The contents of this report are subject to the Limitations included in Appendix A.

PURPOSE AND SCOPE

The scope of services performed by GSI to meet the above-stated objectives for geotechnical engineering services included the following:

1. Coordination and observation of eleven (11) test borings at the locations illustrated on the attached Figure 2;

2. Performance of nine (9) borehole permeability tests at the locations illustrated on the attached Figure 2;

3. Evaluation of appropriate foundation systems based on subsurface conditions encountered. Formulation of design parameters for spread footing foundation and slab on-grade construction, including allowable bearing pressure and prediction of long-term settlement values;

4. Formulation of earthwork and foundation construction procedures to be followed during the construction phase of this project;

5. Establishment of seismic design parameters and liquefaction potential based on the subsurface profile and the proposed structure;

6. Preparation of this geotechnical engineering report which summarizes our findings and recommendations.

SITE AND PROJECT INFORMATION

The project involves the construction of a proposed housing development at 35 Sherburne Road in Portsmouth, New Hampshire. The development will consist of two separate apartment buildings and the surrounding parking areas. Currently, a single-story school occupies the site, which consists of the brick school building, parking areas and a ball field. The site is relatively level, with the existing building and parking areas at an approximate elevation of 66 feet. The site then slopes down approximately 10 feet to the ball field to an elevation of about 56 feet. The site is abutted by I-95 to the northwest, commercial properties to the northeast and east, Sherburne Road to the southwest, and Greenland Road to the south. Project information was provided on TF Moran's test pit and boring layout plan, dated January 29, 2025, as well as draft site and grading plans, dated April 2, 2025.

SUBSURFACE INVESTIGATION

GSI observed a series of eleven (11) test borings located within the proposed building area designated GSI-1 through GSI-11. The borings were advanced to depths of 10 to 30 feet below ground surface. The subsurface explorations classified the on-site soils according to their color, grain size, and other material properties. The test boring program was conducted by Miller Engineering and Testing, Inc. of Manchester, New Hampshire.

Soil explorations were performed in accordance with methods prescribed by ASTM D1586. Soil samples were obtained at the surface and at five-foot intervals with a 1⅜ inch diameter split-spoon sampler. Standard Penetration Tests (SPTs) were performed at the sampling intervals in accordance with ASTM D1586. Field descriptions of the soils encountered, observed depth to groundwater while drilling when observed, and other pertinent observations are contained in the attached test boring logs. The test boring locations are illustrated on Figure 2 of this report. GSI test boring logs are presented in Appendix B.

SUBSURFACE CONDITIONS

Topsoil/ Subsoil

The majority of the test borings were advanced within grassy areas. At ground surface, approximately 4 to 12 inches of topsoil was observed, which was visually classified as dark brown, fine to medium Sand, little Silt, with various grass and plant roots. The topsoil and organic materials will be removed prior to development.

Bituminous Concrete

GSI-3 and GSI-8 were advanced within paved areas. At ground surface, approximately 4 inches of bituminous asphalt concrete was observed. This material will be removed prior to development.

Silty Sand

Test borings GSI-1, GSI-9, and GSI-10 encountered a Silty Sand, which was visually classified as Medium Dense to Very Dense, fine to medium Sand, little to some Silt. This material was observed at depths of 2 to 4 feet and extended to termination depths of 20 feet. N-Values within the silty sand ranged from 28 to over 50 blows per foot.

Sand and Gravel

The predominant soil encountered during the test borings was sand and gravel. The sand and gravel was present from depths of 2 to 4 feet and continued to test boring termination depth of approximately 31-feet. The soil was visually classified as medium dense to very dense, fine to coarse Sand, some Gravel, little Silt. SPT "N" values varied from 15 to over 50 blows per foot.

Groundwater

Groundwater was observed at GSI-4, GSI-5 and GSI-7 following the completion of the test borings at depths ranging from 17.5 to 23 feet below ground surface. Redox activity appears present at 5 feet in B-11, but it is believed to be "relic mottling" as groundwater was not encountered at 10 feet and other borings encountered groundwater at 17 to 23 feet. The ESHWT descends deeper than the infiltration test depths.

Groundwater observations should not be considered long-term, equilibrated groundwater levels, but rather an approximate indication of the likely groundwater elevation during construction. Groundwater levels should be anticipated to fluctuate from those measured during drilling operations in response to differences in equilibrated time, rainfall, snowmelt, and seasonal changes.

LABORATORY RESULTS

A total of five soil samples, one from GSI-2, GSI-3, GSI-4, GSI-5, and GSI-7, were submitted to GSI's laboratory for sieve analysis testing (ASTM D422), to determine the particle size distribution. This test involves passing a sample through a series of standardized sieves with progressively smaller openings. The amount of material retained on each sieve is weighed, and the results are used to calculate the percentage of material in each size range, providing a detailed particle size distribution curve. The laboratory test results indicate that the soils are typically classified as SP (poorly graded sand) based on the Unified Soil Classification System (USCS). Detailed laboratory results are provided in Appendix D.

FOUNDATION DESIGN RECOMMENDATIONS

GSI recommends that building walls, columns and other structural elements be supported by reinforced concrete spread or strip footings bearing directly upon the native soils described above or structural fill. An allowable bearing pressure of 2 tons per square foot (4,000psf) may then be assumed for design. With regards to footing geometry, the minimum footing width of column and strip footings should be 4 feet and 2 feet, respectively. The spread footings should be founded at least 4 feet below exterior grade to obviate frost action in the bearing strata. If the construction occurs during the winter months, it will be necessary to provide temporary insulation and/or heat application to the foundations.

At the recommended bearing pressures, we anticipate that the total settlement of individual footings under static loading conditions and constructed as recommended herein, will not exceed 1 in., with differential settlements between adjacent footings not exceeding ¾ in. Most of the settlement will likely occur elastically during construction as structure dead loads are placed on the foundations. The live load contribution to foundation settlement is expected to be less than 50% of the dead load thus post construction settlements are not expected to be problematic

ENGINEERING PARAMETER OF ON-SITE SOILS

Based on results of our subsurface exploration program, the following engineering properties of soils that will be supporting foundation elements are estimated as follows:

On-Site Soil Engineering Design Parameters
(TABLE 1)

Soil Type	Friction Angle φ (Degrees)	Cohesion c (psf)	Unit Weight γ (pcf)	Coeff. Of Sliding Friction Soil to Concrete (tan δ)
Silty Sand	32	0	115	0.40
Sand and Gravel	34	0	125	0.45

SEISMIC DESIGN PARAMETERS

Seismic design parameters have been reviewed with respect to the 2021 Edition of the International Building Code. Upon review of the subsurface soils data, the site is to be associated with Site Class “D” and the design of structural elements should reflect this distinction. The subsurface conditions are also not deemed susceptible to earthquake induced “liquefaction.” A Summary of USGS Design Maps is included as Appendix E.

CONCRETE FLOOR SLAB

We recommend that ground floor slabs be designed as slabs-on-grade designed in accordance with ACI 360R-10. The slab should bear directly upon an 8-inch (minimum) layer of compacted Base Course Soil. The subgrade will consist of compacted structural fill or proof-compacted undisturbed soil. The floor slab may thus be designed following the ACI “elastic support” approach, using a modulus of subgrade reaction value, k = 250 pci.

Slabs should be designed to act independently of foundation walls and column footings with isolation joints. Shrinkage cracking may be controlled with welded wire fabric, reinforcing steel, or contraction joints. Contraction joints in plain concrete should not be spaced a distance greater than 30 times the slab thickness. Saw cuts should be made within 12 hours of slab finishing and penetrate at least ¼ the slab thickness or a minimum of 1 inch. Welded wire fabric or reinforcing steel may also be used to widen the control joint spacing.

For moisture sensitive environments, ACI indicates that a sub-slab vapor retarder may be used beneath the concrete slab. The vapor retarder should be at a minimum; 10-mil polyethylene with joints lapped at a minimum of 12 inches. It is emphasized that these are recommendations and that the final decision on the use and location of the sub-slab vapor retarder whether in direct contact with the slab or beneath the layer of compacted Structural Fill should be made considering specific conditions for the project. Factors which may affect this decision include moisture sensitivity of the planned floor finishes, anticipated moisture conditions, including precipitation and exposure before the slab is constructed, and the potential effects of slab curling and cracking. Design guidance is provided in ACI 360R-10, Design of Slabs on Grade, Figure 3-7.

FOUNDATION DRAINAGE, ROOF DRAINAGE, AND SLAB-ON-GRADE DAMP PROOFING RECOMMENDATIONS

Foundation drains are not required as below grade space is not expected to be incorporated into the existing structure. The ground surface immediately adjacent to the foundation should be sloped away from the building to allow for positive drainage. It is recommended that the surficial materials adjacent to the building be relatively impermeable to reduce the volume of precipitation infiltrating into the subsurface. Such impermeable materials may include Portland cement concrete, bituminous concrete, or vegetated silty topsoil. Roof drainage is recommended for the collection of run off because of stormwater. It is recommended that roof drainage and stormwater feature not discharge into foundation drains as applicable.

CONCRETE SIDEWALKS

Where concrete exterior sidewalks are provided, they shall be formed upon a minimum of 12 inches of slab base course or structural fill, which shall be increased to a minimum of 18 inches in the vicinity of exterior doorways, ramps, or other openings for frost protection at building entry points.

BOREHOLE PERMEABILITY TESTING

To evaluate the in-situ hydraulic conductivity of the existing soils in the area of the proposed stormwater systems, borehole permeability testing was performed in accordance with the NHDES Stormwater Manual, Volume Two. For each test, a 4-inch diameter solid pipe was installed to a depth of 6 feet below ground surface at nine locations. After installation, 24 inches of water was added to each pipe and allowed to pre-soak for 24 hours. The following day, each pipe was refilled with 24 inches of water and the drop in water level was measured after one hour (measured from the top of the casing). This process was repeated four times, and the results were averaged. The results of the borehole permeability tests are presented in the table below. Testing locations are outline in Figure 2.

Borehole Permeability Test Results (TABLE 2)

Location	K_{sf} (in/hr)
INF-1	1.3
INF-2	1.4
INF-3	0.8
INF-4	1.1
INF-5	3.0
INF-6	3.5
INF-7	1.6
INF-8	8.4
INF-9	2.6
AVERAGE	**2.6**

Borehole permeability tests were considered appropriate for this project as the area under investigation is an active softball field. Visual examination of the subsurface profile with excavated test pits was therefore precluded due to safety considerations. In the event that NHDES requires test pits be performed, this effort would require that the softball field be abandoned. Test pits result in destruction of the existing landscaping and GSI cannot be held responsible for complete repair.

EARTHWORK RECOMMENDATIONS

Foundation Subgrade Preparation

Prior to foundation construction, any topsoil, subsoil, or loose-fill soils encountered within the building footprint and foundation zone of influence should be removed. Foundation and floor slab subgrades should be proof compacted using a heavy vibratory plate or drum roller prior to foundation construction or placing additional fill in order to densify disturbed soils resulting from excavation and preload the subgrade.

Recommended proof compaction should include 4 passes with a minimum of a 10-ton vibratory roller. During the proof rolling process, the subgrade should be observed by a qualified Geotechnical Engineer to identify areas exhibiting weaving or excessive reaction. Any soils exhibiting excessive reaction should be locally excavated and replaced with free draining structural fill or crushed stone. The foundation subgrade should be observed by a qualified Geotechnical Engineer to verify competency.

Protection of Foundation Subgrades

The contractor must maintain stable, dewatered subgrades for foundations, pavement areas, and utility trenches. Subgrades may be disturbed by improper excavation methods, moisture, precipitation, groundwater control, and construction activities. The contractor should take precautions to protect the bearing subgrade against disturbance from construction traffic and weathering. If necessary, dewatering can be accomplished via open pumping utilizing submersible pumps and temporary stone lined sump pits.

A lift of compacted crushed stone is recommended to protect the subgrade surface from wear and disturbance should water be present within the excavation. The subgrade must still be verified for competency prior to the placement of concrete or backfill materials within the building footprint. If construction activities are to take place during winter months, the contractor should protect the work area from freezing, which may necessitate the use of soil blankets or tents and heaters to protect the subgrade surface.

Construction Dewatering

The site contractor should be prepared to remove any standing water from foundation excavations. If the sumps are unable to control the development of groundwater within the excavation, supplemental dewatering in the form of deep wells or wellpoints may be required. Stormwater runoff developed from storm events should be diverted away from excavation areas to minimize any impoundment in the excavation or disturbance to the foundation subgrades. It is anticipated that groundwater and stormwater may be controlled by localized dewatering efforts employing sumps and pumps.

The groundwater elevation should be maintained at least 12 inches below the foundation grade until backfilling is complete. A lift of crushed stone or free draining structural fill at foundation grade may be utilized if required to facilitate dewatering and provide a dry and stable subgrade during construction.

Backfilling

Backfill in the building area should be placed and compacted in lifts immediately after final excavation to limit disturbance to the subgrade surface. Except for zones requiring special backfill such as directly beneath pavements or exterior slabs, the exterior of foundation walls and other site areas may be backfilled with Common Fill. Placement of compacted fills should not be conducted when air temperatures are low enough (approximately 30ºF, or below) to cause freezing of the moisture in the fill during or before placement. Fill materials should not be placed on snow, ice, or uncompacted frozen soil. Compacted fill should not be placed on frozen soil.

No fill should be allowed to freeze prior to compaction. At the end of each day's operations, the last lift of fill, after compaction, should be rolled by a smooth-wheeled roller to eliminate ridges of uncompacted soil.

Minimum compaction requirements for all fill materials are as follows:

Minimum Compaction Requirements
(TABLE 2)

Location or Area	Standard Proctor Density (ASTM D698)	Modified Proctor Density (ASTM D1557)	Testing Frequency One Test Per Lift Per
Building and Slab Subgrades	100%	95%	1,000 ft^2 or 100 lineal feet
Retaining Walls	95%	92%	1,000 ft^2
Pavements (up to 3-ft below finished grade)	95%	92%	2,000 ft^2 or 50 lineal feet
Pavements (in the upper 3-ft)	100%	95%	2,000 ft^2 or 50 lineal feet
Trenches	95%	92%	150 lineal feet
Structures and Walkways	95%	92%	2,000 ft^2
Lawns and Unimproved Areas	92%	90%	20,000 ft^2

Structural Fill

Structural Fill, if required, should consist of clean sand and gravel free of organic material, snow, ice, or other objectionable materials and should be well-graded within the following limits:

Sieve Size	Percent Finer by Weight
4 in.	100
No. 4	30-70
No. 40	10-50
No. 200	0-12.

Other materials could be acceptable for Structural Fill and should be evaluated by the Geotechnical Engineer on a case-by-case basis if proposed by the Contractor.

Structural Fill should be placed in lift thickness not exceeding 12 in. loose measure. Cobbles and boulders having a size exceeding 2/3 of the loose lift thickness should be removed prior to compaction. Compaction in open areas should consist of self-propelled vibratory rollers such as a BoMag BW-60S or equivalent.

In confined areas, hand guided equipment such as a large vibratory plate compactor, should be used and the loose lift thickness should not exceed 6 in. A minimum of four systematic passes of the compaction equipment should be used to compact each lift. Compaction effort should be verified by field density testing.

Common Fill

Common fill may be used to raise grades in paved and landscaped areas, subject to pavement design criteria and landscape planting or drainage requirements. Common fill should be granular mineral soil free from organic materials, loam, wood, trash, snow, ice, frozen soil, and other compressible materials. Common fill should not contain stones larger than 2/3 of the placement lift thickness, and have a maximum 80 percent passing the No. 40 sieve, and a maximum of 30 percent passing the No. 200 sieve. These soils typically would require moisture control during placement and compaction.

Slab Base Course

Slab Base Course beneath building slabs should consist of bank-run sand and gravel, free of organic material, snow, ice, or other unsuitable materials and should be well-graded within the following limits:

Sieve Size	Percent Finer by Weight
2 in.	100
No. 4	40-70
No. 40	25-45
No. 200	0-10

Other materials could be acceptable for compacted Slab Base Course and should be evaluated by the Geotechnical Engineer on a case-by-case basis if proposed by the Contractor.

Slab Base Course should be placed in lift thicknesses not exceeding 8-inches loose measure. In confined areas, hand-guided equipment such as a vibratory plate compactor should be used, and the loose lift thickness should not exceed 6 inches. A minimum of four systematic passes of the compaction equipment should be used to compact each lift.

CONSTRUCTION MONITORING

It is strongly recommended that GSI be retained to provide construction monitoring and testing services in conformance with the requirements of the International Building Code. GSI has the Geotechnical Engineers and Technicians trained and experienced in all facets of monitoring earthwork excavation and construction materials testing, as well as a full-service soils and materials laboratory. As a guide, we have enclosed a Recommended Program for Structural Tests and Inspections for Soils and Foundations, attached as Appendix F of this report.

These services may include:

- Construction Materials Testing of Soils, Aggregates, Concrete, Steel, and Asphalt.
- Design Phase engineering services including preparation of final earthwork specifications, review of contractor submittals, and plan review.
- Construction Phase engineering services on Geotechnical issues and/or differing conditions encountered during construction.

CLOSURE

We trust that you find this report consistent with your needs. Should you have any questions with regard to this report, please do not hesitate to contact our office.

Very truly yours,

GEOTECHNICAL SERVICES, INC.

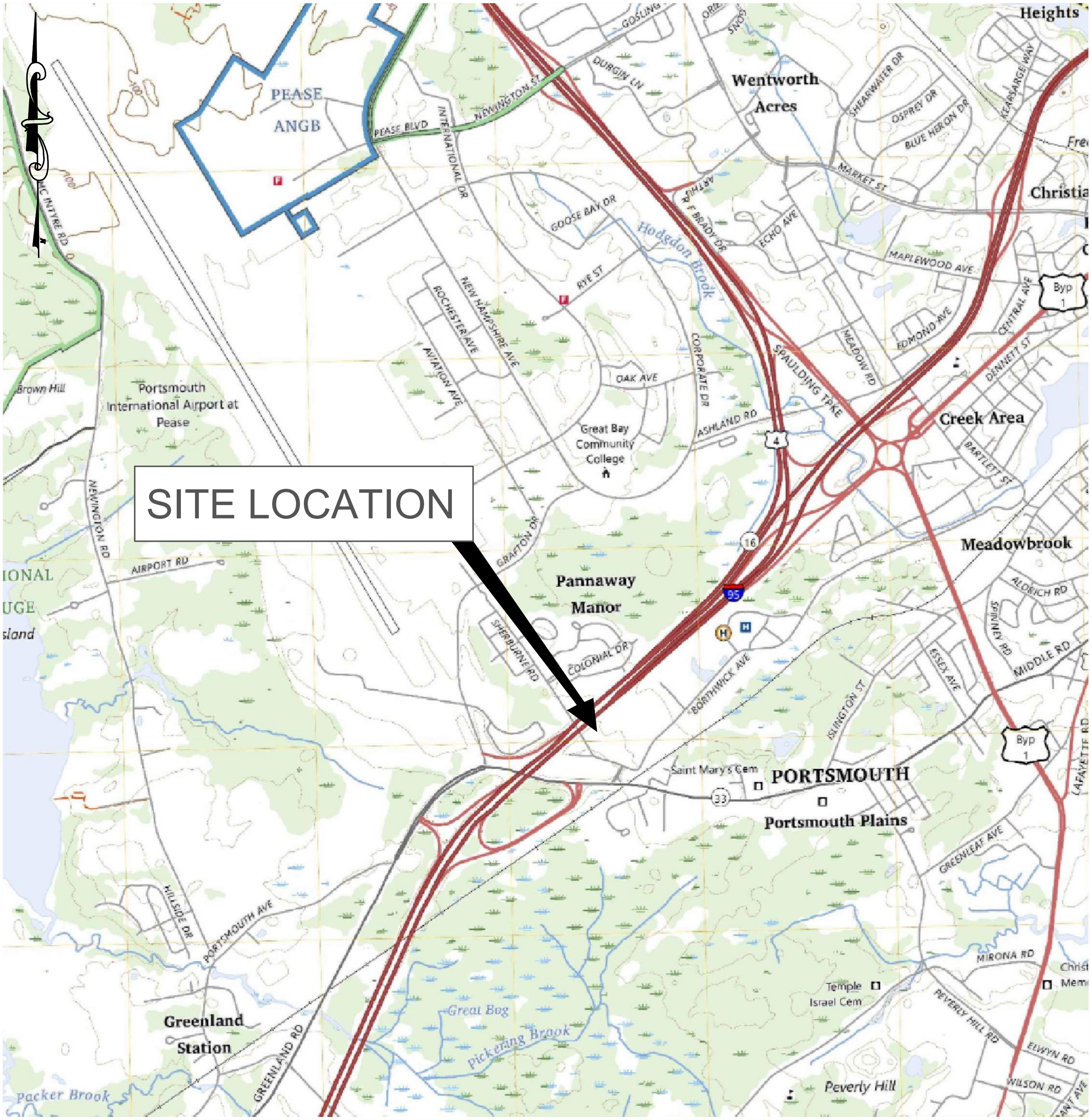
Charles A. Wetherbee, EIT
Staff Engineer

Harry K. Wetherbee, P.E.
Principal Engineer

Attachments:

Figure 1: Locus Map
Figure 2: Exploration Location Plan

Appendix A: Limitations
Appendix B: Exploration Logs
Appendix C: Subsurface Exploration Key
Appendix D: Laboratory Results
Appendix E: USGS Seismic Design Maps
Appendix F: Draft Earthwork Specifications



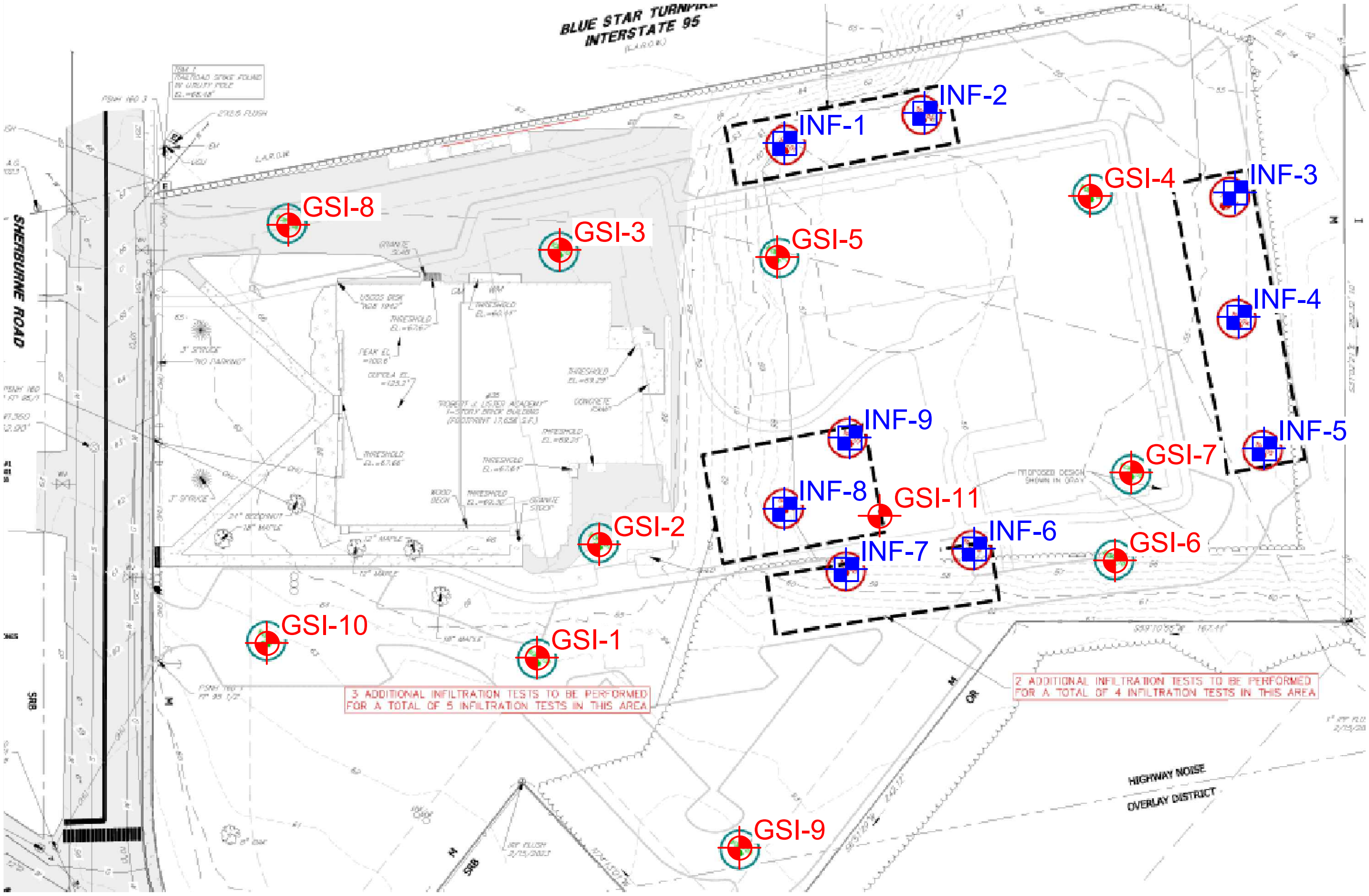
LOCUS MAP

GEOTECHNICAL SERVICES INC.
55 NORTH STARK HIGHWAY, WEARE, NH 03281
TEL. (603) 529-7766 FAX. (603) 529-7780

Sherburne Housing Development
Portsmouth, New Hampshire

DRAWN BY: CAW
DATE: April 2025
CHECKED BY: HKW
SCALE: NTS
FILE NAME: Sherburne Housing.dwg
PROJECT NO.: 225147

FIGURE NO. 1



GSI-1 Test Boring Location (Approximate)

INF-1 Borehole Permeability Test Location (Approximate)

EXPLORATION LOCATION PLAN

GEOTECHNICAL SERVICES INC.
55 NORTH STARK HIGHWAY, WEARE, NH 03281
TEL. (603) 529-7766 FAX. (603) 529-7780

Sherburne Housing Development
Portsmouth, New Hampshire

DRAWN BY: CAW
DATE: April 2025
CHECKED BY: HKW
SCALE: NTS
FILE NAME: Sherburne Housing.dwg
PROJECT NO.: 225147

FIGURE NO. 2

APPENDIX A

LIMITATIONS

LIMITATIONS

Explorations

1. The analyses, recommendations, and designs submitted in this report are based in part upon the data obtained from preliminary subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretation of widely spaced explorations and samples; actual soil transitions are probably more gradual. For specific information, refer to the individual test pit and/or boring logs.

3. Water level readings have been made in the test pits and/or test borings under conditions stated on the logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other factors differing from the time the measurements were made.

Review

4. It is recommended that this firm be given the opportunity to review final design drawings and specifications to evaluate the appropriate implementation of the recommendations provided herein.

5. In the event that any changes in the nature, design, or location of the proposed areas are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of the report modified or verified in writing by Geotechnical Services, Inc.

Construction

6. It is recommended that this firm be retained to provide geotechnical engineering services during the earthwork phases of the work. This is to observe compliance with the design concepts, specifications, and recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

Use of Report

7. This report has been prepared for the exclusive use of the above and their assigns, in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

8. This report has been prepared for this project by Geotechnical Services, Inc. This report was completed for preliminary design purposes and may be limited in its scope to complete an accurate bid. Contractors wishing a copy of the report may secure it with the understanding that its scope is limited to evaluation considerations only.

APPENDIX B

EXPLORATION LOGS

TEST BORING LOG

Boring No.

GSI-1

Page 1 of 1

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/25/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data						Stratum Change (ft)	**Soil-Rock Visual Classification and Description** (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)		
0		S-1	0-2	20	4 5 7 7	12			Topsoil Tan, fine to medium Sand, some Gravel
5		S-2	4-6	22	9 23 30 30	53			Very Dense, Tan, fine to medium Sand, some Silt
10		S-3	9-11	22	22 24 34 29	58			Very Dense, Tan, fine to medium Sand, little Silt **Test Boring Terminated at 11 feet**
15									
20									

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/25	E.O.D.	11'	11'	N/E

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-1

TEST BORING LOG

Boring No.

GSI-2

Page 1 **of** 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/25/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							**Soil-Rock Visual Classification and Description** (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
0		S-1	0-2	16	4 8 11 9	19			4" Topsoil Brown, fine to coarse Sand, and Gravel
5		S-2	4-6	18	2 4 3 4	7			Loose, Tan/ Orange, fine to medium Sand, some to little Silt (Appear to be a Subsoil)
10		S-3	9-11	22	7 12 13 13	25			Medium Dense, light Tan, fine to medium Sand, trace Silt
15		S-4	14-16	24	8 12 17 17	29			Medium Dense, Tan, medium to fine Sand, little to trace Silt
20		S-5	19-21	16	2 28 21 23	49			Dense, Tan, fine to coarse Sand, little to trace Gravel, trace Silt

Water Level Data

Date	Time	Depth (ft) to:		
		Bott. of Casing	Bott. of Hole	Water
3/25	E.O.D.	31'	31'	N/E

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-2

TEST BORING LOG

Boring No. GSI-2

Page 2 of 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/25/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
25		S-6	24-26	16	11 20 23 34	43			Dense, Tan, fine to coarse Sand, little Gravel, trace Silt
30		S-7	29-31	16	5 21 40 50	61			Dense, Tan, fine to coarse Sand, little Gravel, trace Silt Sampler Refusal at 31 feet **Test Boring Terminated at 31 feet**
35									
40									
45									

Water Level Data

Date	Time	Depth (ft) to: Bott. of Casing	Bott. of Hole	Water
3/25	E.O.D.	31'	31'	N/E

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-2

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TEST BORING LOG

Boring No.
GSI-3
Page 1 of 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/25/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data						Stratum Change (ft)	Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)		
0		S-1	0-2	12	- 14 14 13	28			4" Asphalt Black/ Brown, fine to coarse Sand, some Gravel, Brick
5		S-2	4-6	14	3 6 4 2	10			Loose, Brown/Black, Sand and Asphalt
10		S-3	9-11	12	2 2 1 1	3			Very Loose, Tan, fine to coarse Sand, and Gravel, little Silt
15		S-4	14-16	18	6 21 35 55	56			Very Dense, Tan, fine to coarse Sand, little Gravel, trace Silt
20		S-5	19-21	20	30 32 25 25	57			Very Dense, Tan, fine to coarse Sand, little to trace Gravel, trace Silt

Water Level Data				
Date	Time	Depth (ft) to: Bott. of Casing	Bott. of Hole	Water
3/25	E.O.D.	31'	31'	N/E

Sample Identification	Cohesive Soils N-Value	Granular Soils N- Value
O = Open Ended Rod	0 to 2: Very Soft	0 to 4: Very Loose
U = Undisturbed	2 to 4: Soft	4 to 10: Loose
S = Split Spoon	4 to 8: Medium Stiff	11 to 30: Medium Dense
C = Rock Core	8 to 15: Stiff	31 to 50: Dense
G = Geoprobe	15 to 30 Very Stiff	Over 50: Very Dense
	Over 30: Hard	

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-3

Geotechnical Services, Inc. 55 North Stark Highway, Weare, NH 03281 Phone 603/529-7766 Fax 603/5297080 - 30 Newbury St. 3rd Floor, Boston, MA 02116 Phone 617/455-4248 Fax 617/745-4308

TEST BORING LOG

Boring No.

GSI-3

Page 2 of 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/25/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							**Soil-Rock Visual Classification and Description** (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
25		S-6	24-26	18	7 13 20 24	33			Medium Dense, Tan, fine to coarse d Sand, trace Gravel, trace Silt
30		S-7	29-31	18	5 22 23 25	45			Medium Dense, Tan, fine to coarse d Sand, trace Gravel, trace Silt **Test Boring Terminated at 31 feet**
35									
40									
45									

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/25	E.O.D.	31'	31'	N/E

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value	Granular Soils N- Value
0 to 2: Very Soft	0 to 4: Very Loose
2 to 4: Soft	4 to 10: Loose
4 to 8: Medium Stiff	11 to 30: Medium Dense
8 to 15: Stiff	31 to 50: Dense
15 to 30 Very Stiff	Over 50: Very Dense
Over 30: Hard	

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-3

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TEST BORING LOG

Boring No.
GSI-4
Page 1 **of** 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/25/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	**Soil-Rock Visual Classification and Description** (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
0		S-1	0-2	14	1 4 5 5	9			10" Topsoil 10" Tan, Sand and Gravel, little Silt
5		S-2	4-6	16	1 2 1 2	3			Very Loose, Dark Tan, fine to medium Sand, little to some Silt, little Gravel
10		S-3	9-11	12	3 3 7 6	10			Loose, Dark Tan, fine to medium Sand, little to some Silt, little Gravel
15		S-4	14-16	12	39 25 40 22	65			Very Dense, Tan, fine to coarse Sand, some Gravel, trace Silt
20		S-5	19-21	18	11 16 18 19	34			Dense, Tan, fine to coarse Sand, some Gravel, trace Silt

Water Level Data

Date	Time	Depth (ft) to: Bott. of Casing	Bott. of Hole	Water
3/25	E.O.D.	25.5'	25.5'	17.5'

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-4

Geotechnical Services, Inc. 55 North Stark Highway, Weare, NH 03281 Phone 603/529-7766 Fax 603/5297080 - 30 Newbury St. 3rd Floor, Boston, MA 02116 Phone 617/455-4248 Fax 617/745-4308

TEST BORING LOG

Boring No.
GSI-4

Page 2 **of** 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/25/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							**Soil-Rock Visual Classification and Description** (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
25		S-6	24-26	20	14 30 56 -	86			Very Dense, Brown/ Tan, fine to coarse d Sand, little Gravel, little to trace Silt, Rock, WET Sampler Refusal at 25.5 feet **Test Boring Refusal at 25.5 feet**
30									
35									
40									
45									

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/25	E.O.D.	25.5'	25.5'	17.5'

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-4

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TEST BORING LOG

Boring No.
GSI-5

Page 1 of 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							**Soil-Rock Visual Classification and Description** (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
0		S-1	0-2	16	1 3 5 12	8			12" Topsoil 4" Tan, fine to coarse Sand, some Gravel, little Silt
5		S-2	4-6	18	4 7 8 9	15			Medium Dense, Tan, fine to coarse Sand, trace Gravel, trace Silt
10		S-3	9-11	1	20 22 25 25	47			Sand (Spoon Pushed Rock)
15		S-4	14-16	18	4 18 20 26	38			Dense, Tan, fine to coarse Sand, little Gravel, trace Silt
20		S-5	19-21	22	14 25 39 67	64			Very Dense, Tan, fine to coarse Sand, little Gravel, trace Silt

Water Level Data

Date	Time	Depth (ft) to: Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	31'	31'	23.5'

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-5

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TEST BORING LOG

Boring No.

GSI-5

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Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/25/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	**Soil-Rock Visual Classification and Description** (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
25		S-6	24-26	14	8 29 41 64	70			Very Dense, Tan/Brown, fine to coarse Sand, little Gravel, little to trace Silt, WET
30		S-7	29-31	18	9 21 22 27	43			Dense, Brown, fine to coarse Sand, little Gravel, little to trace Silt, WET **Test Boring Terminated at 31 feet**
35									
40									
45									

Water Level Data

Date	Time	Depth (ft) to: Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	31'	31'	23.5'

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-5

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TEST BORING LOG

Boring No. **GSI-6**

Page **1** **of** **1**

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/26/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
0		S-1	0-2	10	1 14 17 16	31			6" Topsoil Gravel
5		S-2	4-6	12	5 10 12 14	22			Medium Dense, Brown/ Tan, fine to coarse Sand, some Gravel, trace Silt
10		S-3	9-11	6	15 17 15 16	32			Medium Dense, Tan/Brown, fine to coarse Sand, little Gravel, little Silt
15		S-4	14-16	12	6 10 10 10	20			Tan, Gravel, some fine to coarse Sand, little to trace Silt
20		S-5	19-21	12	5 8 9 10	17			Tan, Gravel, some fine to coarse Sand, little to trace Silt

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	21'	21'	N/E

Sample Identification	Cohesive Soils N-Value	Granular Soils N- Value
O = Open Ended Rod	0 to 2: Very Soft	0 to 4: Very Loose
U = Undisturbed	2 to 4: Soft	4 to 10: Loose
S = Split Spoon	4 to 8: Medium Stiff	11 to 30: Medium Dense
C = Rock Core	8 to 15: Stiff	31 to 50: Dense
G = Geoprobe	15 to 30 Very Stiff	Over 50: Very Dense
	Over 30: Hard	

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-6

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TEST BORING LOG

Boring No.
GSI-7

Page 1 **of** 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/26/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							**Soil-Rock Visual Classification and Description** (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
0		S-1	0-2	14	1 6 6 5	12			Topsoil Brown, Sand and Gravel
5		S-2	4-6	12	1 2 1 1	3			Very Loose, Brown, fine to coarse Sand, little Gravel, little Silt
10		S-3	9-11	12	3 9 17 17	26			Medium Dense, Brown, fine to coarse Sand, some Gravel, little Silt
15		S-4	14-16	16	4 6 79 -	85			Very Dense, Tan, fine to coarse Sand, little Gravel, little to trace Silt
20		S-5	19-21	12	5 9 15 14	24			Medium Dense, Brown/Gray, Gravel and Crushed Rock, little Sand, trace Silt

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	31'	31'	23'

Sample Identification	Cohesive Soils N-Value	Granular Soils N- Value
O = Open Ended Rod	0 to 2: Very Soft	0 to 4: Very Loose
U = Undisturbed	2 to 4: Soft	4 to 10: Loose
S = Split Spoon	4 to 8: Medium Stiff	11 to 30: Medium Dense
C = Rock Core	8 to 15: Stiff	31 to 50: Dense
G = Geoprobe	15 to 30 Very Stiff	Over 50: Very Dense
	Over 30: Hard	

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-7

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TEST BORING LOG

Boring No.
GSI-7
Page 2 of 2

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/26/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							**Soil-Rock Visual Classification and Description** (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
25		S-6	24-26	14	18 21 17 21	38			Very Dense, Brown, Gravel and Rock, little Sand, little Silt, WET
30		S-7	29-31	20	6 15 11 14	26			Very Dense, Brown, Gravel and Rock, little Sand, little Silt, WET
									Test Boring Terminated at 31 feet
35									
40									
45									

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	31'	31'	23'

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-7

TEST BORING LOG

Boring No. **GSI-8**

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Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/26/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

		Hammer Type:
☑ Truck	☐ Skid	☑ Safety Hammer
☐ Track	☐ ATV	☐ Doughnut
☐ Bomb.	☐ Geoprobe	☐ Automatic
☐ Tripod	☐ Other	

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
0		S-1	0-2	18	- 10 8 17	18			Asphalt Black to Brown, fine to coarse Sand, little Gravel, little to trace Silt
5		S-2	4-6	18	2 3 3 10	6			Loose, Tan, fine to coarse Sand, trace Silt
10		S-3	9-11	18	10 17 20 24	37			Dense, Tan, fine to medium Sand, trace Silt
15		S-4	14-16	22	5 9 15 18	24			Medium Dense, Tan, fine to medium Sand, trace Silt
20		S-5	19-21	20	7 20 25 36	45			Dense, Tan, fine to medium Sand, trace Silt **Test Boring Terminated at 21 feet**

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	21'	21'	N/E

Sample Identification	Cohesive Soils N-Value	Granular Soils N- Value
O = Open Ended Rod	0 to 2: Very Soft	0 to 4: Very Loose
U = Undisturbed	2 to 4: Soft	4 to 10: Loose
S = Split Spoon	4 to 8: Medium Stiff	11 to 30: Medium Dense
C = Rock Core	8 to 15: Stiff	31 to 50: Dense
G = Geoprobe	15 to 30 Very Stiff	Over 50: Very Dense
	Over 30: Hard	

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:

E.O.D. = End Of Drilling

N/E = None Encountered

GSI-8

TEST BORING LOG

Boring No. **GSI-9**

Page **1** **of** **1**

Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/26/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	CME	Rig Model	45C

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
0		S-1	0-2	6	2 2 3 3	5			6" Topsoil Gravel and Rock
5		S-2	4-6	18	4 13 15 17	28			Medium Dense, Tan, fine to medium Sand, little Silt
10		S-3	9-11	22	8 23 31 39	54			Very Dense, Tan, fine to medium Sand, little Silt
15		S-4	14-16	20	7 23 36 39	59			Very Dense, Tan, fine to medium Sand, little Silt
20		S-5	19-21	20	12 42 70 -	112			Very Dense, Tan, fine to medium Sand, little Silt Sampler Refusal at 20.5' **Test Boring Terminated at 20.5 feet**

Water Level Data

Date	Time	Depth (ft) to: Bott. of Casing	Depth (ft) to: Bott. of Hole	Water
3/26	E.O.D.	20.5'	20.5'	N/E

Sample Identification	Cohesive Soils N-Value	Granular Soils N- Value
O = Open Ended Rod	0 to 2: Very Soft	0 to 4: Very Loose
U = Undisturbed	2 to 4: Soft	4 to 10: Loose
S = Split Spoon	4 to 8: Medium Stiff	11 to 30: Medium Dense
C = Rock Core	8 to 15: Stiff	31 to 50: Dense
G = Geoprobe	15 to 30 Very Stiff	Over 50: Very Dense
	Over 30: Hard	

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-9

TEST BORING LOG

Boring No. **GSI-10**

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Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/26/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	CME	Rig Model	45C

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Depth (ft)	Casing (Blows/ft)	Sample Data							Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
0		S-1	0-2	16	2 3 4 6	7			Topsoil Tan, fine to medium Sand, little to trace Silt
5		S-2	4-6	16	7 23 28 19	51			Very Dense, Tan, fine to medium Sand, little to trace Silt
10		S-3	9-11	8	15 52 50/0" -	-			Very Dense, Tan, fine to coarse Sand, little to trace Silt
15		S-4	14-16	20	12 31 47 19	78			Very Dense, Tan, fine to medium Sand, little Silt
20		S-5	19-21	20	8 30 24 22	54			Very Dense, Tan, fine to medium Sand, little Silt **Test Boring Terminated at 21 feet**

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	21'	21'	N/E

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-10

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TEST BORING LOG

Boring No.
GSI-11
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Project	Sherburne Housing	GSI Project No.	225144	Elevation	Existing Grade
Location	Portsmouth, NH	Project Mgr.	Charles Wetherbee	Datum	-
Client	TF Moran, Inc.	Inspector	Charles Wetherbee	Date Started	3/26/2025
Contractor	Miller Engineering and Testing	Checked By	Harry Wetherbee	Date Finished	3/26/2025
Driller	Bob Marcoux	Rig Make & Model	Diedrich	Rig Model	D-50

Item:	Auger	Casing	Sampler	Core Barrel
Type	HS Aug		SS	
Inside Diameter (in.)	2.25"		1-3/8"	
Hammer Weight (lb)			140	
Hammer Fall (in.)			30"	

☑ Truck ☐ Skid
☐ Track ☐ ATV
☐ Bomb. ☐ Geoprobe
☐ Tripod ☐ Other
☐ Winch ☑ Cat Head ☐ Roller Bit ☑ Cutting Head

Hammer Type:
☑ Safety Hammer
☐ Doughnut
☐ Automatic

Depth (ft)	Casing (Blows/ft)	Sample Data							Soil-Rock Visual Classification and Description (Soils - Burmister System) (Rock - U.S. Corps of Engineers System)
		No.	Depth (ft)	Rec (in.)	SPT (Bl./ 6-in.)	"N" Value	PID Rdg. (ppm)	Stratum Change (ft)	
0		S-1	0-2	20	1 4 4 6	8			
3		S-2	2-4	20	11 14 16 25	30			
5		S-3	4-6	18	4 13 17 10	-			
7		S-4	6-8	10	18 19 17 12	36			
9		S-5	8-10	22	15 14 16 17	30			

Water Level Data				
		Depth (ft) to:		
Date	Time	Bott. of Casing	Bott. of Hole	Water
3/26	E.O.D.	10'	10'	N/E

Sample Identification
O = Open Ended Rod
U = Undisturbed
S = Split Spoon
C = Rock Core
G = Geoprobe

Cohesive Soils N-Value
0 to 2: Very Soft
2 to 4: Soft
4 to 8: Medium Stiff
8 to 15: Stiff
15 to 30 Very Stiff
Over 30: Hard

Granular Soils N- Value
0 to 4: Very Loose
4 to 10: Loose
11 to 30: Medium Dense
31 to 50: Dense
Over 50: Very Dense

Trace (0 to 5%), Little (10 to 20%), Some (20 to 35%), And (35 to 50%)

Notes:
E.O.D. = End Of Drilling
N/E = None Encountered

GSI-11

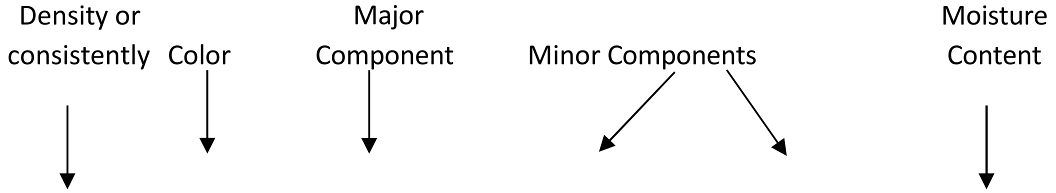
Geotechnical Services, Inc. 55 North Stark Highway, Weare, NH 03281 Phone 603/529-7766 Fax 603/5297080 - 30 Newbury St. 3rd Floor, Boston, MA 02116 Phone 617/455-4248 Fax 617/745-4308

APPENDIX C

SUBSURFACE EXPLORATION KEY

FIELD DESCRIPTION AND CLASSIFICATION OF SOIL - Burmister System

Soil descriptions indicated on the test boring logs are based on Standard Penetration Test (SPT) results and observation of the soil samples obtained. Soil samples generally described and classified as illustrated in the following example:



Dense, brown, f-m SAND, some Gravel, trace Silt, moist.

1.0 DENSITY OR CONSISTENCY – The density or consistency is determined from the Standard Penetration Test (ASTM 1586), which corresponds to the number of blows required to drive a standard 2-inch outside diameter split-spoon sampler from the 6 to 18-inch depth of a 24-inch sample using a 140-pound weight falling freely for 30 inches.

Density of Granular Soil	Penetration Resistance (N-blows/ft)		Consistency of Composite Clay Soil
Very Loose	0 - 4	< 2	Very soft
Loose	4 - 10	2 - 4	Soft
Medium Dense	10 - 30	4 - 8	Medium soft
Dense	30 - 50	8 - 15	Stiff
Very Dense	> 50	15 - 30	Very stiff
		> 30	Hard

2.0 COLOR – Visual

3.0 SOIL COMPONENTS – The description and classification is based on the following criteria.

3.1 DESCRIPTION – The components of a soil sample are described by visually estimating the percentage of each component by weight of the total sample.

Major Component – The major component (>50%) is written with upper case letters for granular soil (SAND, GRAVEL), and a combination of upper and lower case letters for composite soil (Silty CLAY, Clayey SILT).

Minor Component – The minor soil components (≤50%) are written with the first letter of each material in upper case, and the remaining letters in lower case (Gravel, Silt). The minor components are identified and prefaced in the description based on the following percentages:

Description	Percentage
and	35 - 50%
some	20 - 35%
little	10 - 20%
trace	0 - 10%

Other Components – The other components within the soil which may be encountered include glass, bricks, trash, etc. The other components are identified and follow the major and minor soil components.

3.2 CLASSIFICATION

Granular Soil by Sieve Size – A granular soil sample is classified by visually estimating the particle size as referenced to a Standard Sieve.

Material*		Standard Sieve Limit Upper	Lower
GRAVEL	- coarse	3-inch	3/4-inch
	- fine	3/4-inch	No. 4
SAND	- coarse	No. 4	No. 10
	- medium	No. 10	No. 40
	- fine	No. 40	No. 200
SILT		No. 200	

Granular Soil by Visual Identification

Material	Visual ID
Silts and Clays	Too small to see.
Fine Sand	Finest visible grain.
Medium Sand	1/64” to 1/16”
Coarse Sand	1/16” to 1/4”
Fine Gravel	1/4" to 3/4"
Coarse Gravel	3/4" to 3”
Cobbles	3” to 6”
Boulders	Greater than 6”

*The Gravel/Sand portions of a granular soil are further divided based on the following proportions:

Gravel/Sand	Proportion
fine to coarse	> 10% all factions
coarse	< 10% fine and medium
medium to coarse	< 10% fine
medium	< 10% fine and coarse
fine to medium	< 10% coarse
fine	< 10% medium and coarse

Composite Clay Soil – A composite clay soil sample is classified by determining the smallest diameter thread that can be rolled manually.

Material	Smallest Thread Diameter	Degree of Plasticity
SILT	None	Nonplastic
Clayey SILT	1/4-inch	Slight
SILT & CLAY	1/8-inch	Low
CLAY & SILT	1/16-inch	Medium
Silty CLAY	1/32-inch	High
CLAY	1/64-inch	Very High

Organic Soil – An organic soil sample is classified by observation of the sample structure.

Material

Topsoil - surficial soils that support plant life and which contain a high percentage of organic matter.

Fibrous Peat - deposits of plant remains in which the original plant fibers are still visible.

Amorphous Peat - deposits of plant remains in which the original plant fibers have been destroyed. Usually found underlying fibrous peat.

Organic Silt - fine grained marine soils which have been transported due to erosion and deposited in still water below the zone of wave action. May contain shell fragments, organic odor, high sand content, nonplastic.

Clayey Organic Silt - similar to Organic Silt, low sand content, plastic.

4.0 ADDITIONAL DETAILS AND DISCRIPTIVE TERMS

SOIL STRUCTURE – produced by deposition of sediments.

Stratified - random soil deposits of varying components or color.

Varved - alternating soil deposits of varying thickness (i.e. clays or silts).

Stratum - soil deposit greater than 12 inches thick.

Layer - soil deposit 3 inches to 12 inches thick.

Seam - soil deposit 1/8 inch to 3 inches thick.

Parting/lens - soil deposit less than 1/8 inch thick.

MOISTURE CONTENT

Dry - moisture not apparent, dusty, dry to the touch.

Moist - damp, but no visible water.

Wet - visible free water.

5.0 UNIFIED SOIL CLASSIFICATION SYMBOL AND DISCRIPTION

CL	Lean Clay	GW	Well Graded Gravel
ML	Silt	GP	Poorly Graded Gravel
OL	Organic Silt/ Clay Low Plasticity	GM	Silty Gravel
CH	Fat Clay	GC	Clayey Gravel
MH	Plastic Silt	SW	Well Graded Sand
OH	Organic Silt/Clay High Plasticity	SP	Poorly Graded Sand
PT	Peat	SM	Silty Sand
		SC	Clayey Sand

GUIDELINES TO CLASSIFICATION AND IDENTIFICATION OF ROCK

A. WEATHERING

Fresh	Fresh rock, crystals bright, few joints, may show slight staining. Rock rings under hammer if crystalline.
Slightly Weathered	Rock generally fresh, joints stained and discoloration extends into rock up to 1 inch. Joints may contain clay or gouge. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.
Moderately Weathered	Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some look clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.
Highly Weathered	All rock is discolored or stained. In granitoid rocks all feldspars are dull and discolored and majority shows kaolinization. Rock shows severe loss of strength and can be excavated with a geologists pick. A clunking sound when struck with a hammer.
Disintegrate Rock	Rock texture clear and evident, but reduced in strength to strong soil. Some fragments of strong rock usually left.

B. FRACTURING AND BEDDING

Spacing	Fracturing	Bedding and Foliation
More than 3 feet	Massive	Thick
1 foot – 3 feet	Slightly Fractured	Medium
2 inches – 1 foot	Moderately Fractured	Thin
Less than 2 inches	Highly fractured	Very Thin

C. GRAIN SIZE

Fine	Visible to naked eye to 1/16-inch diameter.
Medium	1/16-inch to 1/4-inch diameter.
Coarse	Greater than 1/4-inch diameter.

D. HARDNESS

Very Hard	Cannot be scratched with a knife or sharp pick. Breaking of hand specimens requires several hard blows with a geologists pick.
Hard	Can be scratched with a knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.
Moderately Hard	Can be scratched with a knife or pick. Gouges or grooves to ¼ inch deep can be excavated with hard blows of a geologists pick. Hand specimens can be detached by a moderate blow.
Medium	Can be grooved to a 1/16-inch deep by firm pressure on a knife or pick point. Can be excavated in small chips to pieces approximately 1-inch maximum size by hard blows of the point of a geologists pick.
Soft	Can be gouged or grooved easily with a knife or pick point. Can be excavated in chips to pieces several inches in size. Small thin pieces can be broken by finger pressure.
Very Soft	Can be carved with a knife. Can be excavated easily with the point of a pick. Pieces 1 inch or more in thickness can be broken with finger pressure.

E. ROCK QUALITY DESIGNATION (RQD)

RQD (Percent)	Diagnostic Description
Exceeding 90	Excellent
75 – 90	Good
50 – 75	Fair
25 – 50	Poor
0 – 25	Very Poor

Comments: RQD is applicable to NX core only. The diameter of an NX core is 2.16 inches. RQD is expressed as a percentage and is determined by dividing the length of the run by the total length of the recovered cores pieces measuring 4-inches or greater. Core recovery is reported as a percentage and is determined by dividing the length of the core recovered (all pieces) by the length of the run.

APPENDIX D

LABORATORY TEST RESULTS

Particle Size Distribution Report

ASTM D422

% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	1.3	2.4	3.6	13.4	71.9	7.4

Test Results (ASTM D422)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
6"	100.0			
4"	100.0			
3"	100.0			
2"	100.0			
1.5"	100.0			
1"	100.0			
0.75"	100.0			
0.5"	98.7			
0.375"	98.7			
#4	97.9			
#8	96.6			
#10	96.3			
#16	95.2			
#30	92.7			
#40	90.1			
#50	86.0			
#100	52.6			
#200	7.4			

* (no specification provided)

Material Description

med to fine SAND, trace Silt, trace med to fine Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.4222	D_{85}= 0.2906	D_{60}= 0.1710
D_{50}= 0.1434	D_{30}= 0.1049	D_{15}= 0.0841
D_{10}= 0.0781	C_u= 2.19	C_c= 0.83

Classification

USCS= AASHTO=

Test Remarks

Location: GSI-2; S-2

Sample Number: L-185-25 **Depth:** 4' to 6' **Sample Date:** 3/25/2025

GEOTECHNICAL SERVICES, INC.

Weare, New Hampshire

Client: TF Moran, Inc.

Project: Sherburn Road Housing Development
Portsmouth, New Hampshire

Project No: 225144 **Figure**

Tested By: S.Andrews

Particle Size Distribution Report

ASTM D422

% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	4.1	9.5	11.7	26.3	40.3	8.1

Test Results (ASTM D422)				
Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
6"	100.0			
4"	100.0			
3"	100.0			
2"	100.0			
1.5"	100.0			
1"	100.0			
0.75"	100.0			
0.5"	97.1			
0.375"	95.9			
#4	92.5			
#8	87.6			
#10	86.4			
#16	82.6			
#30	74.7			
#40	67.3			
#50	56.0			
#100	26.4			
#200	8.1			

* (no specification provided)

Material Description

coarse to fine SAND, little med to fine Gravel, trace Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 3.2976	D_{85}= 1.6155	D_{60}= 0.3354
D_{50}= 0.2592	D_{30}= 0.1653	D_{15}= 0.0995
D_{10}= 0.0807	C_u= 4.15	C_c= 1.01

Classification

USCS= AASHTO=

Test Remarks

Location: GSI-3; S-3

Sample Number: L-186-25 **Depth:** 9' to 11' **Sample Date:** 3/25/2025

GEOTECHNICAL SERVICES, INC.

Weare, New Hampshire

Client: TF Moran, Inc.

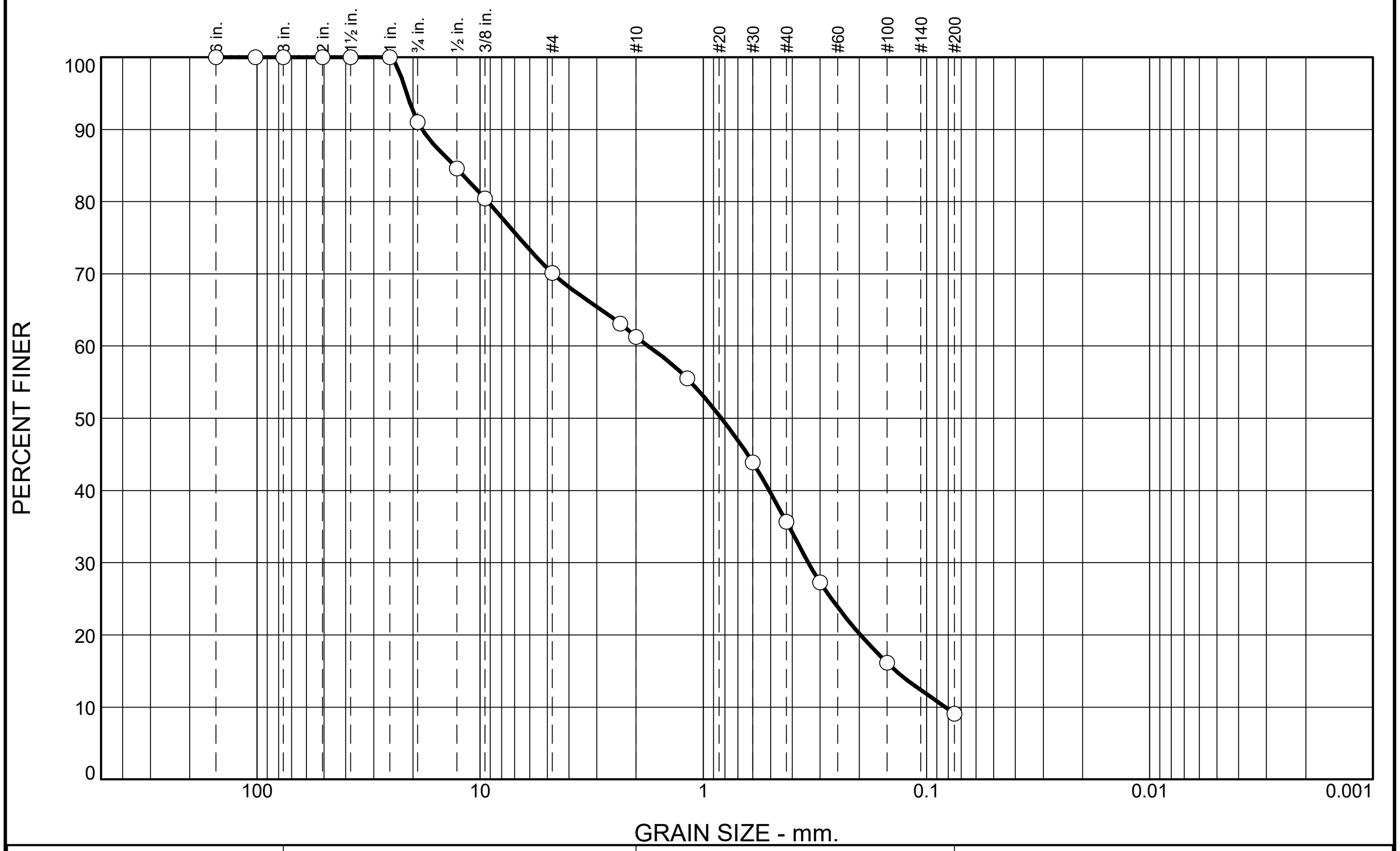
Project: Sherburn Road Housing Development
Portsmouth, New Hampshire

Project No: 225144 **Figure**

Tested By: S.Andrews

Particle Size Distribution Report

ASTM D422



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	19.5	19.2	17.4	20.0	14.8	9.1

Test Results (ASTM D422)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
6"	100.0			
4"	100.0			
3"	100.0			
2"	100.0			
1.5"	100.0			
1"	100.0			
0.75"	91.0			
0.5"	84.6			
0.375"	80.5			
#4	70.1			
#8	63.1			
#10	61.3			
#16	55.5			
#30	43.9			
#40	35.7			
#50	27.3			
#100	16.1			
#200	9.1			

* (no specification provided)

Material Description

coarse to fine SAND, and med to fine Gravel, trace Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 18.1854	D_{85}= 13.0641	D_{60}= 1.7690
D_{50}= 0.8298	D_{30}= 0.3386	D_{15}= 0.1369
D_{10}= 0.0822	C_u= 21.52	C_c= 0.79

Classification

USCS= AASHTO=

Test Remarks

Location: GSI-4; S-2

Sample Number: L-187-25 **Depth:** 4' to 6' **Sample Date:** 3/25/2025

GEOTECHNICAL SERVICES, INC.

Weare, New Hampshire

Client: TF Moran, Inc.

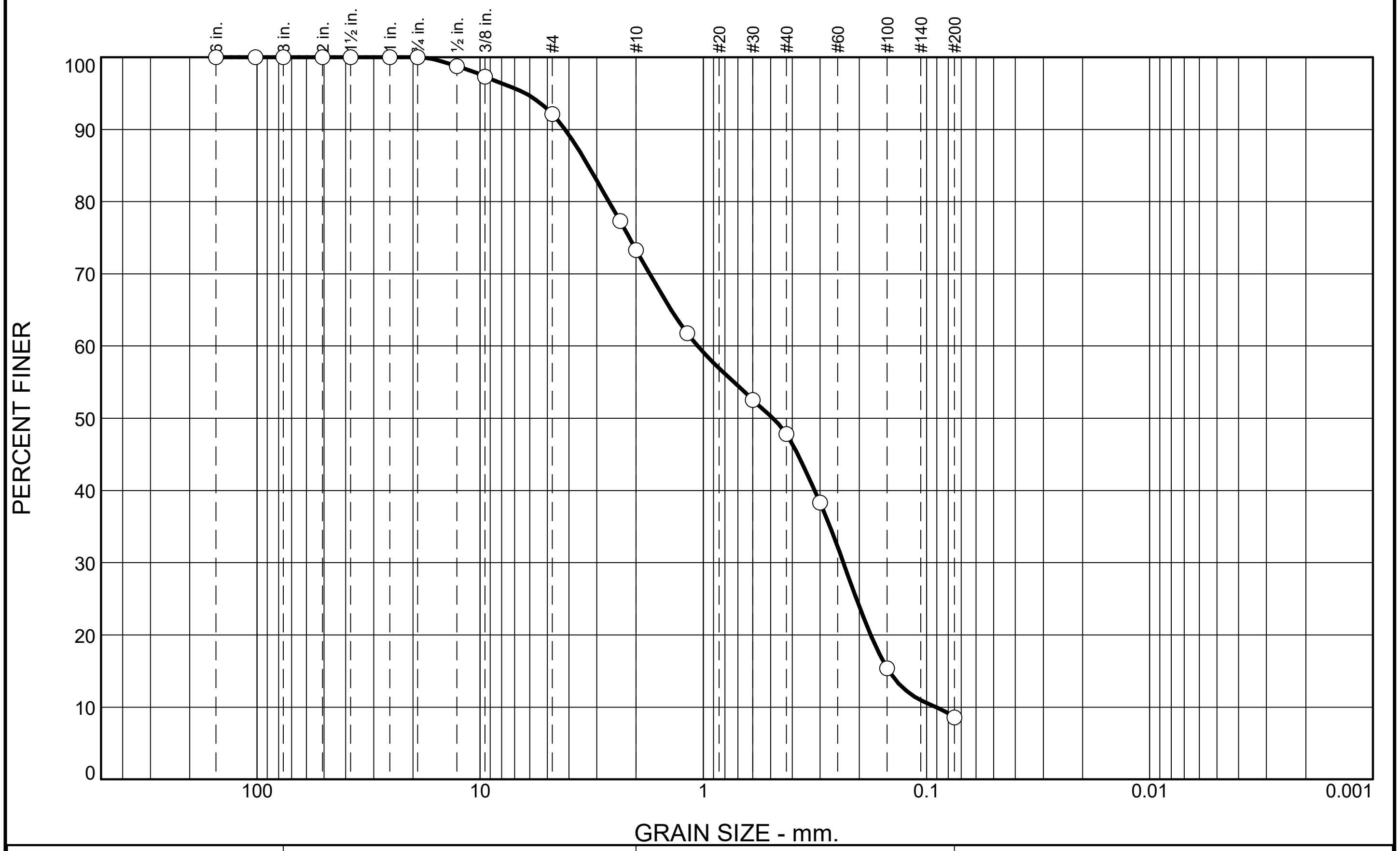
Project: Sherburn Road Housing Development
Portsmouth, New Hampshire

Project No: 225144 **Figure**

Tested By: S.Andrews

Particle Size Distribution Report

ASTM D422



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	2.7	24.0	20.8	20.3	23.6	8.6

Test Results (ASTM D422)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
6"	100.0			
4"	100.0			
3"	100.0			
2"	100.0			
1.5"	100.0			
1"	100.0			
0.75"	100.0			
0.5"	98.8			
0.375"	97.3			
#4	92.1			
#8	77.3			
#10	73.3			
#16	61.8			
#30	52.5			
#40	47.8			
#50	38.3			
#100	15.4			
#200	8.6			

* (no specification provided)

Material Description

coarse to fine SAND, some med to fine Gravel, trace Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 4.1690 D_{85}= 3.2812 D_{60}= 1.0607
D_{50}= 0.4868 D_{30}= 0.2357 D_{15}= 0.1473
D_{10}= 0.0906 C_u= 11.71 C_c= 0.58

Classification

USCS= AASHTO=

Test Remarks

Location: GSI-5; S-4
Sample Number: L-188-25 **Depth:** 14' to 16' **Sample Date:** 3/26/2025

GEOTECHNICAL SERVICES, INC.

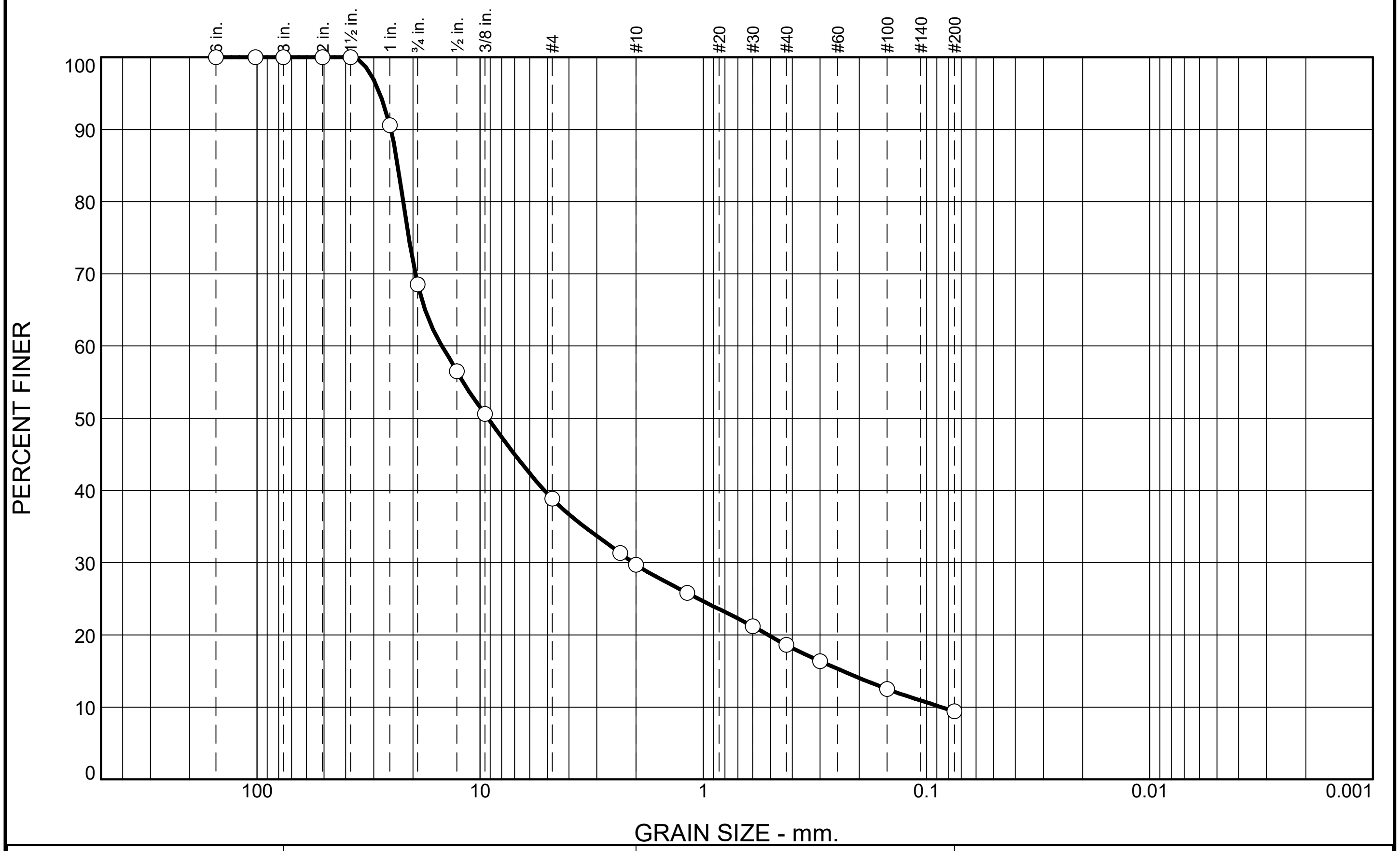
Weare, New Hampshire

Client: TF Moran, Inc.
Project: Sherburn Road Housing Development
Portsmouth, New Hampshire
Project No: 225144 **Figure**

Tested By: S.Andrews

Particle Size Distribution Report

ASTM D422



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	9.4	40.0	20.9	8.5	5.9	5.9	9.4

Test Results (ASTM D422)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
6"	100.0			
4"	100.0			
3"	100.0			
2"	100.0			
1.5"	100.0			
1"	90.6			
0.75"	68.5			
0.5"	56.5			
0.375"	50.6			
#4	38.9			
#8	31.3			
#10	29.7			
#16	25.8			
#30	21.2			
#40	18.6			
#50	16.4			
#100	12.5			
#200	9.4			

* (no specification provided)

Material Description

coarse to fine GRAVEL some, coarse to fine Sand, trace Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 25.1170	D_{85}= 23.3900	D_{60}= 14.8389
D_{50}= 9.2228	D_{30}= 2.0666	D_{15}= 0.2377
D_{10}= 0.0858	C_u= 173.03	C_c= 3.36

Classification

USCS= AASHTO=

Test Remarks

Location: GSI-7; S-3
Sample Number: L-189-25 **Depth:** 9' to 11' **Sample Date:** 3/26/2025

GEOTECHNICAL SERVICES, INC.

Weare, New Hampshire

Client: TF Moran, Inc.
Project: Sherburn Road Housing Development
Portsmouth, New Hampshire
Project No: 225144 **Figure**

Tested By: S.Andrews

APPENDIX E

USGS SEISMIC DESIGN MAPS

USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in *timeout* error.
USGS web services are now operational so this tool should work as expected.

Sherburne Housing Development

35 Sherburne Rd, Portsmouth, NH 03801, USA

Latitude, Longitude: 43.0597624, -70.799723

Date	4/1/2025, 1:42:48 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S_S	0.331	MCE_R ground motion. (for 0.2 second period)
S_1	0.075	MCE_R ground motion. (for 1.0s period)
S_{MS}	0.508	Site-modified spectral acceleration value
S_{M1}	0.18	Site-modified spectral acceleration value
S_{DS}	0.339	Numeric seismic design value at 0.2 second SA
S_{D1}	0.12	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	C	Seismic design category
F_a	1.535	Site amplification factor at 0.2 second
F_v	2.4	Site amplification factor at 1.0 second
PGA	0.205	MCE_G peak ground acceleration
F_{PGA}	1.395	Site amplification factor at PGA
PGA_M	0.286	Site modified peak ground acceleration
T_L	6	Long-period transition period in seconds
SsRT	0.331	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	0.357	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.075	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.081	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)

Type	Value	Description
PGAd	0.5	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.205	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.928	Mapped value of the risk coefficient at short periods
C_{R1}	0.932	Mapped value of the risk coefficient at a period of 1 s
C_V	0.921	Vertical coefficient

DISCLAIMER

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APPENDIX F

DRAFT EARTHWORK SPECIFICATIONS

SECTION 02200
EARTHWORK

DRAFT

PART I- GENERAL

1.01 GENERAL REQUIREMENTS

1. Include GENERAL CONDITIONS and SUPPLEMENTARY CONDITIONS as part of this Section.

2. Examine all other Sections of the Specifications for requirements, which affect work of this Section whether or not such work is specifically mentioned in this Section.

3. Coordinate work with trades affecting, or affected by, work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 WORK INCLUDED

1. Perform all work required to complete the work of the Section, as indicated. Such work includes, but is not limited to, the following:

    1. Excavation, filling, grading and compaction
    2. Supplying of fill materials
    3. Construction Dewatering
    4. Sheeting, shoring and bracing
    5. Rock excavation/blasting

1.03 RELATED WORK UNDER OTHER SECTIONS

1. Erosion And Sediment Control
2. Site Preparation
3. Bituminous Concrete Paving
4. Site Water Lines
5. Storm Drainage System
6. Sanitary Sewer System
7. Site Furnishings
8. Site Irrigation
9. Lawns
10. Planting

1.04 SUBMITTALS

1. Issue submittals in accordance with Division 1. Submittals under this Section shall include manufacturer's specifications and installation instructions.

1.05 SAMPLES AND TESTING

1. A 50 lb. sample of each off-site material proposed for use, and of any on-site material when so requested by the Architect or Geotechnical Engineer, shall be submitted for

approval.

1. Samples shall be delivered to office of the Geotechnical Engineer, as directed.
2. Samples required in connection with compaction tests will be taken and transported by the Geotechnical Engineer.
3. Product Data: Submit location of pits for all borrow material.

1.06 COORDINATION

1. The work of this Section shall be coordinated with that of other trades affecting, or affected by, this work, as necessary to assure the steady progress of all work of the Contract.

2. Prior to the start of earthwork, the Contractor shall arrange an on-site meeting with the Architect and Geotechnical Engineer for the purpose of establishing Contractor's schedule of operations and scheduling inspection procedures and requirements.

3. As construction proceeds, the Contractor shall be responsible for notifying the Architect prior to start of earthwork operations requiring inspection and/or testing.

1.09 INFORMATION

1. It is hereby understood that the Contractor has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.

2. Plans, surveys, measurements and dimensions under which the work is to be performed are believed to be correct to the best of the Architect's knowledge, but the Contractor shall have examined them for himself during the bidding period, as no allowance will be made for any errors or inaccuracies that may be found herein.

3. Information on the Drawings, Reference Drawings, and in the Specifications relating to subsurface conditions, natural phenomena, and existing utilities and structures is from the best sources presently available. Such information is furnished only for the information and convenience of the Contractor, and the accuracy or completeness of this information is not guaranteed.

1.10 EXISTING CONDITIONS

1. The Contractor shall become thoroughly familiar with the site, consult records and drawings of adjacent structures and of existing utilities, and note all conditions, which may influence the work of this Section.

2. By submitting a bid, the Contractor affirms that he has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.

3. The Contractor may, at his own expense, conduct additional subsurface testing as required for his own information after approval by the Owner.

1.11 SUBSURFACE CONDITIONS AND SPECIAL SITE CONSIDERATIONS

1. Soil borings have been made by a qualified Contractor prior to this Contract. This information shall be made available to bidders as specified under other Sections. The final results of these subsurface explorations were prepared by Geotechnical Services, Inc., consulting geotechnical engineers, and are hereby attached to this specification for

information only. Procedures for dewatering, areas to receive special fill and other methods and procedures specified herein shall be supplemented by this information. For purposes of this specification, this information will be referred to as the report. Where procedures within the report vary from procedures as specified herein, this specification shall override. The results and recommendations are available in the geotechnical report prepared by Geotechnical Services. Copies of this report are available from the Architect. Soil samples may be examined at the office of the Geotechnical Engineer.

2. It is the responsibility of the Contractor under this Contract to do the excavation, filling, grading and rough grading to bring the existing grades to subgrade and parallel to finished grades as specified herein and as shown on the Drawings for this Work. The Contractor shall visit the site prior to submitting a bid to become familiar with the extent of the work to be done under this Contract. The Contractor shall be responsible for determining the quantities of earth materials necessary to complete the work under this Section. All earth materials shall be included in the Contractor's base bid.

3. Site Information - data on indicated subsurface conditions are not representations or warrants of continuity of such conditions between subsurface explorations. It is expressly understood that the Owner will not be responsible for interpretations or conclusions drawn there from by the Contractor. Data are made available for the convenience of the Contractor. Neither the Owner nor the Geotechnical Engineer assumes responsibility for accuracy of the data other than at the particular locations and at the time the explorations were made.

4. The subsurface data was gathered and report prepared by Geotechnical Services, Inc. The elevations indicated on the drill holes, borings and test pits refer to existing conditions. A copy of this report may be seen at the office of the Architect during normal working hours.

1.12 QUALITY ASSURANCE

1. The Owner will retain a Geotechnical Engineer to perform on-site observations and testing during the following phases of the construction operations. The services of the Geotechnical Engineer may include, but not be limited to the following:

    1. Observation during excavation and dewatering of building areas, parking areas and controlled fill areas.
    2. Observation and testing during placement and compaction of fills within the building area, parking area, and controlled fill areas.
    3. Laboratory testing and analysis of fill and bedding materials specified, as required.
    4. Observation, construction and performance of water content, gradation, and compaction tests at a frequency and at locations to assure conformance of this Specification. The results of these tests will be submitted to the Architect; copy to the Contractor, on a timely basis so that the Contractor can take such action as is required to remedy indicated deficiencies. During the course of construction, the Geotechnical Engineer will advise the Architect, in writing, with copy to Contractor if, at any time, in his opinion, the work is not in substantial conformity with the Contract Documents.

2. The Geotechnical Engineer's presence does not include supervision or direction of the actual work by the Contractor, his employees or agents. Neither the presence of the Geotechnical Engineer, nor any observations and testing performed by him, nor any notice or failure to give notice shall excuse the Contractor from defects discovered in his work.

3. The Owner reserves the right to modify or waive Geotechnical Engineer services.

1.13 PERMITS, CODES AND SAFETY REQUIREMENTS

1. All work shall conform to the Drawings and Specifications and shall comply with applicable codes and regulations.

2. Comply with the rules, regulations, laws and ordinances of town and state agencies and all other authorities having jurisdiction. Coordinate all work done within town and State rights of way with the appropriate agencies. Provide all required traffic control and safety measures, including uniformed police officers per town and State requirements. All labor, materials, equipment and services necessary to make the work comply with such requirements shall be provided without additional cost to the Owner.

3. Comply with the provisions of the Manual of Accident Prevention in Construction of the Associated General Contractors of America, Inc. and the requirements of the Occupational Safety and Health Administration (OSHA), United States Department of Labor.

4. The Contractor shall procure and pay for all permits and licenses required for the complete work specified herein and shown on the Drawings.

5. The Contractor shall not close or obstruct any street, sidewalk, or passageway unless authorized in writing by the Architect. The Contractor shall so conduct his operations as to interfere as little as possible with the use ordinarily made of roads, driveways, sidewalks or other facilities near enough to the work to be affected hereby. The Contractor shall comply with the time limits established by the terms for trucking onto and off of the site.

6. Any apparent conflict between the Drawings and Specifications and the applicable codes and regulations shall be referred to the Architect in writing, for resolution before the work is started.

1.14 LAYOUTS AND GRADES

1. All line and grade work not presently established at the site shall be laid out by a survey team under the supervision of a Registered Land Surveyor or Professional Engineer employed by the Contractor in accordance with Drawings and Specifications. The Contractor shall establish permanent benchmarks and replace as directed any which are destroyed or disturbed.

2. The words "finished grades" as used herein shall mean final grade elevations indicated on the Drawings. Spot elevations shall govern over proposed contours. Where not otherwise indicated, project site areas outside of the building shall be given uniform slopes between points for which finished grades are indicated or between such points and existing grades.

3. The word "subgrade" as used herein, means the required surface of excavated area, subsoil, borrow fill or compacted fill. This surface is immediately beneath the site improvements; fill materials as dimensioned on the Drawings, or other proposed surface material.

1.15 DISPOSITION OF EXISTING UTILITIES

1. Active utilities existing on the site and work areas shall be carefully protected from damage and relocated or removed as required by the work. When an active utility line is

exposed during construction, its location and elevation shall be plotted on the record drawings as described in this Section and both Architect and Utility Owner notified in writing.

2. Inactive or abandoned utilities encountered during construction shall be removed if within the building area or grouted, plugged or capped. The location of such utilities shall be noted on the record drawings and reported in writing to the Architect.

3. The Contractor shall notify "Dig Safe" and local utility companies prior to the start of construction. The "Dig Safe" number shall be submitted by the Contractor in writing to the Architect prior to construction.

1.16 SHORING, SHEETING, AND BRACING

1. Provide shoring, sheeting, and/or bracing at excavations, as required, to ensure complete safety against collapse of earth at sides of excavations.

2. If, at any place, sufficient or proper supports have not been provided, additional supports shall be placed at the expense of the Contractor. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and compacted.

3. All sheeting and bracing not ordered left in place shall be carefully removed in such a manner as not to endanger the construction of other structures, utilities or property whether public or private. All voids left after withdrawal of sheeting shall be immediately refilled with sand and rammed with tools adapted to that purpose or otherwise compacted as directed to achieve the required density.

4. Shoring or sheeting shall not constitute a condition for which an increase may be made in the contract price with the exception that if the Architect directs in writing that certain shoring or sheeting shall be left in place, the contract price will be adjusted in accordance with General Conditions.

5. Excavation support systems shall be designed to support the earth pressures, hydrostatic pressures, surcharge loads and other forces from existing site conditions, stored material and construction equipment.

6. Shoring and bracing of trenches and other excavations shall, at a minimum, be in accordance with the latest requirements of the Department of Labor and Industries Bulletin No. 12, Section 10, and all subsequent amendments.

7. Shoring and sheeting shall be designed by a Registered Professional Engineer and paid for by the Contractor. The contractor shall submit an earth shoring and bracing plan to the Architect for review by the Geotechnical Engineer at least 2 weeks prior to installation. The submittal shall include calculations and plans drawn to scale.

1.17 DRAINAGE

1. The Contractor shall control the grading in areas under construction on the site so that the surface of the ground will properly slope to prevent accumulation of water in excavated areas and adjacent properties.

2. The Contractor shall excavate interceptor swales and ditches where shown on the Drawings and as otherwise necessary prior to the start of major earthmoving operations to insure minimal erosion and to keep areas as free from surface water as possible.

3. Should surface, rain or ground water be encountered during the operations, the Contractor shall furnish and operate pumps or other equipment and provide all necessary piping to keep all excavations clear of water at all times and shall be responsible for any damage to work or adjacent properties for such water. All piping exposed above surface for this use, shall be properly covered to allow foot traffic and vehicles to pass without obstruction.

4. Presence of ground water in soil will not constitute a condition for which an increase in the contract price may be made. Under no circumstances place concrete fill, soil fill, lay piping or install appurtenances in excavation containing free water. Keep utility trenches free of water until pipe joint material has hardened and backfilled to prevent flotation.

1.18 FROST PROTECTION

1. Do not excavate to full-indicated depth when freezing temperatures may be expected, unless work can be completed to subgrade or piping can be installed and backfilled the same day. Protect the excavation from frost if placing of concrete or piping is delayed.

2. The Contractor shall keep the operations under this Contract clear and free of accumulation of snow within the limits of Contract Lines as required to carry out the work.

3. No work shall be installed on frozen ground.

4. Provide heat and/or insulation to slab, footings, foundation walls, and other elements during freezing conditions to prevent damage from frost heaving.

1.19 DISTURBANCE OF EXCAVATED AND FILLED AREAS DURING CONSTRUCTION

1. The Contractor shall take the necessary steps to avoid disturbance of subgrade and underlying natural soils/compacted fill during excavation and filling operations. Methods of excavation and filling operations shall be revised as necessary to avoid disturbance of the subgrade and underlying natural soils/compacted fill, including restricting the use of certain types of construction equipment and their movement over sensitive or unstable materials. The Contractor shall coordinate with the Architect or Geotechnical Engineer to modify his operations as necessary to minimize disturbance and protect bearing soils.

2. All excavated or filled areas disturbed during construction, all loose or saturated soil, and other areas that will not meet compaction requirements as specified herein shall be removed and replaced with compacted structural fill or crushed stone. Fill that cannot be compacted within 48 hours because of excess moisture shall be removed and replaced with compacted structural fill or crushed stone. Costs of removal of disturbed material and replacement with gravel fill or crushed stone shall be borne by the Contractor.

3. If requested by the Geotechnical Engineer, the Contractor shall place a six-inch layer of crushed stone or 4-inch concrete mud mat over natural underlying soil to stabilize the disturbed areas during construction. The placement of crushed stone layer or mud mat as well as material costs shall be borne by the Contractor.

1.20 PROTECTION OF BEARING SUBGRADES

1. The Contractor shall be required to maintain stable, dewatered, and frost fee subgrades for foundations, pavement areas, utility trenches, and other areas as directed by the Architect or Geotechnical Engineer.

2. The Contractor shall take precautions to reduce subgrade disturbance. Such precautions may include diverting storm water runoff away from construction areas, reducing traffic in

sensitive areas, thermal protection during cold weather periods, and maintaining an effective dewatering operation.

3. Soils exhibiting weaving/instability or which become frozen, as determined by the Geotechnical Engineer, shall be over-excavated (removed) to competent bearing material and replaced with compacted gravel fill or lean concrete at no additional cost to the Owner.

1.21 DEWATERING

1. Based on subsurface investigations conducted prior to this Contract, it is anticipated that excavation may be carried out below existing groundwater levels. The Contractor shall be required to implement ground water control measures to maintain the ground water level a minimum of one foot below all final excavation levels or to propose alternative methods for placement of fill over existing undisturbed material with ground water at or near the surface in such a manner that the existing materials will not be disturbed. The Contractor will be required to implement ground water control measures adequate to maintain the excavation sufficiently dry to allow efficient use of normal excavation equipment and to provide a borrow material suitable for placement and compaction as specified or as directed by the Geotechnical Engineer. The moisture content shall not exceed 3% above the optimum moisture content as determined by modified Proctor test (ASTM DI557). The Contractor shall furnish all labor, equipment and materials in connection with handling ground water and surface water encountered during construction and placement of compacted granular fill or other material as specified.

2. Not less than 14 days prior to the scheduled start of work, the Contractor shall submit his proposed method of dewatering and maintaining dry conditions to the Geotechnical Engineer for review. The submittal shall include calculations, plans, sketches, pump curves, method of sediment control, and disposal. The dewatering plan shall be prepared by a licensed Civil Engineer. Review by the Architect of the Contractor's proposed method of dewatering shall not relieve the Contractor of responsibility for the satisfactory performance of the dewatering system. The Contractor is responsible for correcting any disturbance of natural bearing soils or damage to structures caused by an inadequate dewatering system or by interruption of the continuous operation of the system as specified.

3. The Contractor shall make the entire excavation for this work in the dry. The water level is to be maintained continuously one foot below bottom of excavation for the length of time to complete the work. The Contractor shall place all fill materials and proposed improvements in the dry.

4. The Contractor shall, at all times during construction, provide and maintain proper equipment and facilities to remove promptly and dispose of properly, all water entering excavations and keep such excavations dry so as to obtain a satisfactory undisturbed bottom of excavation or subgrade condition. Dewatering shall be in operation until the fill, or the proposed surface condition has been completed to such extent that it will not be floated or otherwise damaged by allowing water levels to return to natural elevations.

5. In excavations below the ground water level, it is expected that dewatering trenches or deep sumps will be required for pre-drainage of the soils prior to final excavation, and for maintaining the lowered groundwater level until construction has been completed to such an extent that floating, slumping or damage to excavations or materials placed does not occur. Monitoring of adjacent ground water levels by observation wells or other satisfactory means may be required.

6. The Contractor shall discharge all pumped water away from the work area, and in

accordance with all applicable local codes and laws. Requirements specified herein for Erosion and Siltation Control shall be met during this process.

7. All fill material shall be placed and compacted in the dry. The Contractor shall dewater excavated areas as required to perform the work and in such a manner as to preserve the undisturbed Commonwealth of the natural inorganic or other subgrade soils.

8. The Contractor shall verify that the construction and/or operation of his dewatering system will not adversely affect any well, pond, stream structure, utility, etc., on or adjacent to the area being dewatered.

PART 2 - PRODUCTS

2.01 MATERIALS

1. Fill material shall be obtained from required on-site cut to the extent suitable material is available and off-site to the extent suitable material is not available from on-site cuts.

2. On-site material for use in compacted fill shall be natural inorganic granular soil taken from areas of cut after removal of pavement, topsoil, or other unsuitable materials.

3. Fill materials shall be well-graded within specified gradation limits. Gradation of backfill materials shall be determined in accordance with ASTM D-422.

4. Crushed Stone: Crushed stone processed from a stone quarry, washed, graded, free of organic materials. Gradation is as follows:

    1. 1/2" Crushed Stone

U. S. SIEVE NO.	% PASSING BY WEIGHT
2"	100
1/2"	85-100
3/8"	15-45
#4	0-15
#8	0-5

    2. 3/4" Crushed Stone

U.S. SIEVE NO.	% PASSING BY WEIGHT
1"	100
3/4"	90-100
1/2"	10-50
3/8"	0-20
# 4	0-5

    3. 1-1/2" Crushed Stone

U.S. SIEVE NO.	% PASSING BY WEIGHT
2"	100
1-1/2"	95-100
1”	35-70
3/4"	0-25

4. Structural Fill: Well-graded, hard, durable, natural sand and gravel, free from ice and snow, roots, sod, rubbish, and other deleterious or organic matter. Material shall conform to the following gradation requirements:

U.S. SIEVE NO.	% PASSING BY WEIGHT
4"	100
#4	40-70
#40	25-45
#200	0-12

6. Ordinary/Common Fill: Well-graded, natural, inorganic soil approved by the Architect and meeting the following requirements:

    1. It shall have less than 3% organic matter, free from weak, compressible, or frozen materials, and of stones larger than eight inches in dimension. It shall not contain granite block, concrete, masonry rubble, roots, stumps or other similar materials.

    2. It shall be of such nature and character that it can be compacted to the specified densities.

    3. Topsoil and the zone directly below the topsoil indicated on the borings as "subsoil" shall not be considered Ordinary Fill nor shall topsoil, or subsoil stockpiled on the site. Where subsoil is encountered, it shall be stripped separately from the topsoil and the granular material directly beneath the subsoil. This excavated material shall only be utilized in lawn areas, playfield areas or other non-structural areas, and shall be placed in these areas at distances away from adjacent site improvements as specified herein or as directed by the Architect.

    4. Material from excavations on the site may be used as Ordinary Fill if it is deemed acceptable by the Geotechnical Engineer.

7. Unsuitable Material which is classified as "unsuitable" shall be material having at least one of the following properties:

    1. Material with a maximum unit dry weight per cubic foot less than 90 lbs., as determined by ASTM D1557.
    2. Material containing greater than 3% organic matter by weight, organic silt, peat, construction debris, roots and stumps.
    3. Material deemed unsuitable by the Geotechnical Engineer based on its inherent inability to perform satisfactorily as a bearing stratum.
    4. Soil, which is allowed to become frozen, saturated, or unstable because of the contractor’s failure to employ appropriate dewatering, excavation methods, or weather protection is not deemed unsuitable soil but rather represents a condition in which the subgrade was not adequately prepared and/or protected.

8. Blast Rock Fill: Shall be broadly graded blasted rock with a maximum size of 12 inches, 25% smaller than six inches and 10% finer than 3/4 inch. Occasional boulders up to 18 inches will be permitted near the base of the fill.

    1. General site rock fill (outside the building area) may be placed up to within 42 inches of finish grade in pavement areas and to within 18 inches of inverts of utility lines. First lift over the top of rock fill shall be a choke stone layer 18 inches thick. Compaction shall be by minimum of four coverages of a self-propelled vibratory drum roller in each direction (i.e. north-south and east-west). The minimum weight of the drum shall be 10,000 lbs. Compaction may also be by four coverages of heavy track equipment such as a CAT D8 Bulldozer or other heavy track equipment approved by the Geotechnical Engineer.
    2. Rock shall not be placed within a five-foot horizontal distance on either side of

any proposed utility line. The intent is to leave a zone of granular fill that can later be excavated for installation of utilities. Also, large rock fragments shall be kept away from utility pipes.

9. Choke Stone: Shall have a maximum rock size of nine inches and shall have 50% finer than 1-1/2 inch and 25% finer than 3/4 inch.

10. Sand Fill: Shall consist of well-graded natural sand, free from organic, other weak or compressible materials, or frozen materials, Conforming to the following gradation:

U.S. SIEVE NO.	% PASSING BY WEIGHT
#4	100
#50	15-40
#100	2-10
#200	0-5

11. Slab Base Course : Shall be hard, durable, natural sand and gravel, free from ice and snow, roots, sod, rubbish, or organic matter. Material shall conform to the following gradation requirements:

U.S. SIEVE NO.	% PASSING BY WEIGHT
2"	100
#4	40-70
#40	25-45
#200	0-10

PART 3 - EXECUTION

3.01 GENERAL EXCAVATION

1. Excavate all materials encountered to allow construction of the proposed building and structures, utilities and site work as shown on the Drawings and as hereinafter specified.

2. Excavate to levels shown for footings and structures, as required to provide working clearance and to allow adequate inspection and to subgrades outside of buildings and structures as specified herein and as shown on Drawings.

3. In planted areas, remove ledge, boulders and other obstructions to a depth of at least two feet below finished grade.

4. Remove from the site and legally dispose of all debris and other excavated material not needed for, or suitable for, fill except as otherwise specified herein. Remove all materials subject to rot or attack by termites.

5. In general, the Contractor will be permitted to use machine excavation to the bottom of fill under concrete slabs on grade. The final three inches under footings and foundations shall be excavated using a straight blade bucket. If the final three inches cannot be satisfactorily excavated using a straight blade bucket without disturbing subgrades, the Contractor shall use alternative methods, including hand excavations. Alternative methods shall be subject to approval by the Architect or Geotechnical Engineer.

6. Unsuitable Soil Conditions:

   a. If unsuitable bearing materials are encountered at the specified subgrade depths, the Contractor shall notify the Architect. The Contractor shall carry excavation deeper and replace the excavated material with compacted fill or concrete as directed by the Architect or Geotechnical Engineer. Soil subgrades, which are unstable due to inadequate construction dewatering or excessive subgrade disturbance, are not deemed unsuitable soils.

b. Removal of such material and its replacement as directed will be paid for as extra compensation in quantity approved by the Architect. Only changes in the work authorized in advance by the Architect in writing shall constitute an adjustment in the Contract Price.

c. Material that is not within +\- 3% optimum moisture for compaction of the particular material in place as determined by the Architect or the Geotechnical Engineer and is disturbed by the Contractor during construction operations so that proper compaction cannot be reached shall not be construed as unsuitable bearing materials. This material shall be removed and replaced with lean concrete or structural fill as directed by the Architect or Geotechnical Engineer at no additional cost to the Owner.

d. The Contractor shall follow a construction procedure, which permits visual identification of firm natural ground.

e. The volume of unsuitable material shall be measured by profiling the in-place topography and calculation by the average-end-area method or other method deemed acceptable by the Geotechnical Engineer. The contractor’s Licensed Surveyor or Professional Engineer shall prepare the calculations. Payment limits shall be for rock excavation.

7. Excessive Excavation: If any part of the general or trench excavation is carried, through error, beyond the depth and the dimensions indicated on the Drawings or called for in the Specifications, the Contractor at his own expense, shall furnish and install compacted gravel fill, concrete, or take other remedial measures as directed by the Architect to bring fill material up to the required level.

3.02 TRENCH EXCAVATION

1. Excavate as necessary for all footings, structures, pipes, storm and sanitary drainage, electrical, gas, water, related structures and appurtenances, and for any other trenching necessary to complete the work. Unless otherwise indicated, provide separate trench for each utility.

2. Definitions:

    1. "Trench excavation" shall be defined as an excavation in which the bottom width does not exceed seven feet, and the top width does not exceed twice the depth or where footings are excavated by backhoe. Refer to Drawings for any special trenching conditions for utilities, structures, etc.

    2. The words "invert" or "invert elevation" as used herein mean the elevation at the inside bottom of pipe or channel.
    3. The words "bottom of the pipe" as used herein means the elevation at the base of the pipe at its outer surface.

3. In general, machine excavation of trenches will be permitted with the exception of preparation of pipe beds, which will be handwork. Excavate by hand or machine methods at least six inches below the bottom of all utilities.

4. Trench excavation shall include the removal of all materials encountered. During excavation, materials determined to be suitable for backfilling shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. All excavated materials not required or unsuitable for backfill

shall be removed and legally disposed of off the site. The banks of trenches shall be cut as near vertical as practicable to the extent allowed by OSHA.

5. The Contractor shall provide, at his own expense, suitable bridges over trenches where required for accommodation and safety of the traveling public and as necessary to satisfy the required permits and codes.

6. Trenches shall be excavated to the necessary width and depth for proper laying of pipe or other utility and shall have vertical sides or slopes as required by codes. Minimum width of trenches shall provide clearance between the sides of the trench and the outside face of the utility. Maximum trench sizes are as shown on the Drawings or as specified herein. The depth of the trench shall be six inches below the bottom of the pipe barrel or respective utility. If the existing soil is not suitable, the Architect or Geotechnical Engineer may approve removal and replacement of material. Costs for removal and replacement materials will be based on Unit Prices.

7. Coordinate all utility and trench backfilling with the trades involved.

3.03 ROCK EXCAVATION

1. Definitions and Classifications: The following classifications of excavation will be made only when rock excavation is required.

    1. "Earth Excavation" consists of removal and disposal of pavement and other obstructions visible on ground surface; underground structures and utilities indicated to be demolished and removed; material of any classification indicated in data on subsurface conditions; and other materials encountered that are not classified as rock excavation.
    2. "Rock Excavation" consists of removal and disposal of materials encountered that cannot be excavated without continuous and systematic drilling and blasting or continuous use of a ripper or other special equipment, except such materials that are classed as earth excavation. Typical of materials classified as rock excavation are as follows:

        1. Consolidated Bedrock.

        2. Boulders on site, outside trench limits, exceeding two cubic yards in volume.
        3. Boulders within trench limits, exceeding one cubic yard in volume.

    3. Should highly fractured or weathered bedrock be encountered during excavation, the following shall apply:

        1. When the material is encountered in trenching operations or under footings, it shall be excavated or ripped with a hydraulic backhoe equal to or larger than a Caterpillar 235 excavator and will be classified as Earth Excavation. When it is demonstrated to the satisfaction of the Architect and the Geotechnical Engineer that this material can no longer be removed with a hydraulic backhoe and requires drilling and blasting, this material shall be classified as Rock Excavation. - For excavation procedures when this material is encountered under footings, refer to paragraph below.

    4. Intermittent drilling and ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as Earth Excavation.

    5. Allowance for Rock Excavation: The Contractor shall carry in the Base Bid an allowance for xxx cubic yards of rock encountered in trench excavation removed from the site. The Contractor shall also carry in the Base Bid an allowance of xxx cubic yards of open rock excavation removed from the site. The Base Bid shall cover all costs relating to such rock excavation, including blasting, removal and placement of the excavated material, overhead and profit. The Owner for excavation herein defined will pay no amount other than that herein specified.

        1. If the total quantity of Rock Excavation, open and/or trench, exceeds the amount of Rock Excavation included in the Contract as listed above, the Owner shall pay the excess excavation at the unit prices as indicated in the contract.
        2. If the total quantity of Rock Excavation, open and/or trench, is less than the amount of Rock Excavation included in the Contract as listed above, the Contract sum will be decreased by the difference in Rock Excavation multiplied by the unit prices listed in the contract.

2. Measurements:

    1. When, during the process of excavation, rock is encountered, such material shall be uncovered and exposed in such a manner that the unbroken ledge surface is clearly visible, and the Contractor shall notify the Architect, before proceeding further. The areas in question shall then be cross sectioned as hereinafter specified.
    2. Failure on the part of the Contractor to uncover such material and to notify the Architect and proceeding by the Contractor with the rock excavation before cross-sections are taken, will forfeit the Contractor's right of claim towards the stated allowance or additional payment over and above the stated allowance at the quoted unit price.
    3. The Contractor shall employ and pay for a licensed Registered Civil Engineer or Land Surveyor to take cross-sections of rock before removal and to make computations of volume of rock encountered within the Payment Lines. Cross-sections shall be taken in the presence of the Geotechnical Engineer and the computations approved by the Architect. The volume calculations shall be by the average end area method. The Owner has the option to perform independent cross-sections and computations of rock quantities.
    4. Where removal of boulder or ledge is required outside the established payment lines, the Architect shall determine the extent of this removal and basis of payment.

3. Blasting: Obtain written permission and approval of method from local authorities before proceeding with rock excavation. Explosives shall be stored, handled, and employed in accordance with state and local regulations or, in the absence of such, in accordance with the provisions of the "Manual of Accident Prevention of Construction" of the Associated General Contractors of America, Inc.

    1. Notify the Architect at least 48 hours before any intended blasting and do no blasting without his specific approval of each blasting operation.
    2. Contractor shall present evidence that his insurance includes coverage for blasting operations before doing any blasting work. A pre-blast survey shall be performed for all buildings and utilities within a radius of 150 feet from the blasting zone or conforming to the ordinance governing blasting and the Fire Department regulations.
    3. All rock blasting shall be well covered with heavy mats or timbers chained together and the Contractor shall take great care to do no damage to existing structures, utility lines and trees to remain.

    4. Any damage caused by the work of this Contractor shall be repaired to the full satisfaction of the Architect at no additional cost to the Owner.
    5. Any rock fragments or loose material from blasting operations shall be removed. All voids shall be filled with a leveling mat of structural fill or lean concrete as directed by the Geotechnical Engineer.
    6. At least 2 weeks prior to blasting the contractor shall submit a blasting plan indicating blasting agents to be used, drill hole depths and spacing, powder factors, personnel, vibration limits and method of measurement, for review by the Geotechnical Engineer.

4. Complaints:

    1. Report all blasting complaints to the Architect within 24 hours of receipt thereof. Include the name, address, date, time received, date and time of blast complained about, and a brief description of the alleged damages or other circumstances upon which the complaint is predicated. Assign each complaint a number, and number all complaints consecutively in order of receipt.
    2. Submit a summary report to the Architect each month which indicates the date, time and name of person investigating the complaint, and the amount of settlement, if any.
    3. When settlement of a claim is made, furnish the Architect with a copy of the release of claim by the claimant.
    4. Immediately notify the Architect, throughout the statutory period of liability, of any formal claim or demands made by attorneys on behalf of claimants, or of serving of any notice, summons, subpoena, or other legal documents incidental to litigation, and of any out-of- court settlement or court verdict resulting from litigation.
    5. Immediately notify the Architect of any investigations, hearings, or orders received from any governmental agency, board or body claiming to have authority to regulate blasting operations.

5. If ledge is encountered within the limits of the Proposed Building Area, the Contractor shall excavate this material 18 inches below subgrade of footings and 12 inches below subgrade of slabs unless otherwise directed by the Architect or Geotechnical Engineer. All loose or shaken rock shall be removed and replaced with compacted gravel fill or lean concrete as specified herein.

6. Rock excavation for foundations outside of the Building Area: Remove rock to foundation or footing subgrade. All rock bottoms for foundations shall be carefully examined. Loose or shaken rock shall be removed to solid bearing, and the rock surface leveled, or shelved to a slope not exceeding one inch per two feet, or as directed.

7. Excavate rock encountered in grading under paved areas, lawns and plant beds to subgrade as specified herein and shown on the Drawings. All boulders or protruding rock outcrops shall remain undisturbed at lawns and plant beds when so directed by the Architect. Rock shall be fractured six inches below subgrade of paved areas, but this six-inch layer shall remain in place.

8. If any part of the rock excavation at footings be carried beyond the depth and the dimensions indicated on the Drawings or called for in the Specifications, the Contractor shall, at his own expense, furnish and install concrete of same strength as footings to the required subgrade level of the footings as shown on the Drawings. Doweling or other corrective structural measures as directed by the Architect may also be required to properly anchor or reinforce the concrete. If rock excavation is carried beyond the depth and dimensions to subgrade in other areas, the Contractor shall, at his own expense, furnish and install compacted gravel fill to subgrade as directed by the Architect.

9. Basis of Payment: The total amount of rock excavation will be based upon the volume of rock excavated within and/or above the lines referred to in the next paragraph as "Payment Lines". The payment lines are only to be used as a basis of payment and are not to be used as limits of excavation. Limits of excavation area as shown on the Drawings and as specified herein.

10. Payment Lines for Rock Excavation:

    1. Payment lines for columns and footings within the building shall be a vertical line one foot from the toe of the footings; the depth shall be measured at 24 inches below the bottom elevations shown on the Drawings. If rock is to remain directly below the bottom of the footings within the Building Area, payment lines shall be six inches below the bottom elevation of the footing as shown on the Drawings. Payment lines for walls to be damp- proofed shall be a vertical line two feet outside the walls. Payment lines for footings outside of the building shall be six inches below the bottom of footings. Vertical payment lines shall be as specified hereinafter.
    2. Payment lines for manholes and catch basins shall be one foot outside of the outer wall and six inches below subgrade beneath the structure.
    3. Payment lines for rock excavation under slabs on grade shall be six inches below the bottom elevation of the specified gravel base course outside of the building and 12 inches below subgrade for slabs within the building.
    4. Payment lines for rock excavation at paved areas and lawns shall be six inches below respective subgrades.
    5. Payment lines for rock excavation under pipes within the building and for utility trenches outside the building lines shall in no case be calculated as greater in width than the outside diameter of the pipe plus two feet for pipes up to 18 inches. For pipes 18 inches and larger payment lines shall in no case be calculated as greater in width than the outside diameter of the pipe plus three feet. Payment lines at bottom of all pipe and utility trenches shall be six inches below subgrade.

3.04 PROOF-ROLLING

1. Contractor shall be required to proof roll foundation and pavement subgrades prior to foundation construction or the placement and compaction of fill materials.

2. Proof rolling of foundation subgrades shall include at least ten passes of a small vibratory plate compactor for trench excavations or six passes of a heavy vibratory roller for open areas.

3. Proof rolling of pavement subgrades shall include four passes of a heavy vibratory roller.

4. If groundwater is located within two feet of foundation or pavement subgrade, proof rolling may be eliminated. However, the Contractor shall demonstrate care during excavation so as to minimize subgrade disturbance.

5. The Geotechnical Engineer shall visually observe Proof rolling. Foundation construction or replacement of fill materials shall not commence until the Geotechnical Engineer has witnessed subgrade conditions and proof rolling operations.

6. Soils which exhibit weaving or instability during the proof rolling operations as determined by the Geotechnical Engineer shall be removed and replaced with compacted Structural Fill or Crushed Stone at no additional cost to the Owner.

3.05 FILLING AND GRADING

1. Samples and Testing:

    1. All fill materials, and their placement shall be subject to quality control testing. The Owner shall pay for all testing except that the Contractor will bear cost of testing materials, which fail to conform to Specifications. Test results and laboratory recommendations will be available to Contractor. All sieve analyses for conformance of on-site and off-site fill materials to be used in the work shall be done by means of a mechanical wet sieve analysis and in accordance with ASTM D-422.
    2. The Owner will retain a Geotechnical Engineer to provide personnel, qualified by training and experience, to be at the site to observe preparation for the placement of compacted fills, to observe excavation and dewatering required for the work, and to observe earthwork operations and report on the conformity of operations with these Specifications. All service and approvals given by the Geotechnical Engineer shall not relieve the Contractor of his responsibility for performing the work in accordance with these Specifications. The Contractor agrees to accept as final the results of field and laboratory tests performed by the above representatives. As stated hereinbefore, the Owner reserves the right to modify or waive Geotechnical Engineer's services.
    3. Excavated material taken directly from on-site cuts that will meet these Specifications may be used as Ordinary Fill or Structural Fill provided the Contractor obtains written approval from the Architect. No such fill material shall be put in place until approved for use by the Architect in writing.
    4. Field density tests will be made by the Geotechnical Engineer in accordance with the Method of Test for ASTM Designation D1556 or D2944, to determine the adequacy of compaction; the location and frequency of such field tests shall be at the Geotechnical Engineer's discretion.
    5. The Contractor shall notify the Architect or the Geotechnical Engineer when an area is ready for compaction testing. This notification shall be 48 hours in advance of placing or final compaction so that the Geotechnical Engineer has adequate time to take compaction tests.
    6. The Architect or his designated representative shall have the right to observe the installation of all controlled compacted fills.
    7. Testing of materials as delivered may be made from time to time. Materials in question may not be used, pending test results. Tests of compacted materials will be made regularly. Remove rejected materials and replace them with new, whether in stockpiles or in place.
    8. Cooperate with the Geotechnical Engineer in obtaining field samples of in-place materials after compaction. Furnish incidental field labor in connection with these tests. The Contractor will be informed by the Geotechnical Engineer of areas of unsatisfactory density which may require improvement by removal and replacement, or by scarifying, aerating, sprinkling (as needed), and re-compaction prior to the placement of the new lift. No additional compensation shall be paid for work required to achieve proper compaction.
    9. The Geotechnical Engineer's presence does not include supervision or direction of the actual work by the Contractor, his employees, or agents. Neither the presence of the Geotechnical Engineer nor any observations and testing performed by him shall excuse the Contractor from defects discovered in his work.
    10. In no case will frozen material be allowed for use in fill, backfill, or rough grading material.
    11. Stones or rock fragments larger than four inches in their greatest dimension shall not be permitted within the top six inches of subgrade of any fills or embankments.

2. Placing, Spreading and Compacting Fill Material:

    1. Fill materials are to be placed as designated herein and as indicated on the Contract Drawings.

        1. Crushed Stone shall be placed as follows and compacted as specified herein:

            1.) Under and around utility structures and around foundation drains and underdrains.
            2.) Behind retaining walls, and under rip rap.
            3.) Where otherwise shown on Drawings or as directed by the Architect.

        2. Structural Fill shall be placed as follows and compacted in lifts to a minimum of 95% maximum dry density per the Modified Proctor Test (ASTM D 1557) as specified herein: (Refer to table specified herein for compaction methods and lift requirements.)

            1.) Within building pad areas.
            2.) As a subgrade fill for all material to be placed controlled compacted fills under exterior concrete slabs, foundations, on grade stairs, and other soil bearing situations.
            3.) Wherever a structural fill is called for or shown on the Drawings.

        3. Ordinary Fill shall be placed as follows and compacted as specified herein:
            1.) In general, areas such as lawn or parking islands except where Structural Fill is shown.
            2.) Wherever Ordinary Fill is called for and as specified hereinbefore.
            3.) Wherever Structural Fill, Crushed Stone, Sand Fill or Topsoil is not required herein or on the Drawings.

        4. Blast Rock Fill may be placed up to within three feet of finish grade in pavement areas and within two feet of finish grade in lawns, and to within 30 inches of inverts of utility lines and proposed utility routes. First lift over the top of rock fill shall be choked stone layer 18 inches thick which shall be a well-graded mixture of sand, gravel, and blasted rock with maximum stone size less than nine inches. Compaction shall be by minimum of six coverages of a self-propelled vibratory drum roller in each direction (i.e. north-south and east-west). The minimum weight of the drum shall be 1 0,000 lbs. Compaction may also be by four coverages of heavy track machinery such as a Caterpillar D8 or other track machinery approved by the Geotechnical Engineer.

            1.) Blast Rock Fill shall not be placed within 30 inches vertically of exterior concrete slabs (i.e. sidewalks, loading docks, etc.
            2.) Rock shall not be placed within a five-foot horizontal distance on either side of any proposed utility line. The intent is to leave a zone of granular fill that can later be excavated for installation of utilities. Also keep large rock fragments away from any utility lines.
            3.) Place woven filter fabric (Mirafi 500X or equivalent) over Blast Rock Fill.

5. Sand Fill shall be placed as follows and compacted as specified for the particular item:

    1.) As a bedding material for PVC electrical conduit where concrete is not required, telephone-cable, primary electric service and gas pipe.
    2.) Where otherwise specified or shown on the Drawings.

6. Slab Base Fill shall be placed in minimum 6-inch lift under concrete floor slabs.

7. Subsoil shall be used only under lawn areas and athletic fields. This material shall not be placed closer to areas being otherwise prepared than a 1:1 angle of repose x depth of fill for the particular area. For instance, if a fill is four feet deep, subsoil may not be placed closer than four feet to the area being otherwise prepared.

    1.) Unsuitable Earth Materials shall be removed from the site.
    2.) The fill material shall be placed in uniform horizontal layers and compacted as specified herein.

8. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to obtain uniformity of material in each layer. So far as practicable, each layer of material shall extend the entire length and width of the area being filled plus two additional feet horizontally along each side for every one foot of fill required.

3. All fill material shall be placed and compacted in the dry. The Contractor shall dewater excavated areas as required to perform the work, and in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of a day's operation. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment.
4. The Contractor shall not place a layer of compacted fill on soil that was permitted to freeze prior to compaction or on snow or ice. Removal of these unsatisfactory materials will be required as directed by the Owner.
5. When the moisture content of the fill material is below optimal moisture necessary for compaction as specified herein, water shall be added until the moisture content is as specified.
6. When the moisture content of the fill material is above the optimal moisture necessary for compaction as specified herein, the fill material shall be aerated by blending, mixing, or other satisfactory methods until the moisture content is as specified.
7. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to the specified density. Compaction shall be continuous over the entire area and the equipment shall make sufficient passes to ensure that the desired density is obtained. A minimum of four coverages with acceptable compaction equipment described hereinafter is a requirement. These coverages are to be provided as systematic compactive effort; incidental coverages due to construction vehicle traffic through the area will not be included.

3. Structural Fill: All fills within the building area shall be made with Structural Fill as defined herein and shown on the Footing Zone of Influence detail included herein. No excavated

on-site material will be acceptable as Structural Fill unless specifically approved by testing as specified herein.

4. Allowance for Unsuitable Materials and replacement with Structural Fill: The Contractor shall include in his base bid xxx cubic yards for the removal of Unsuitable Materials and Structural Fill in place and graded as specified herein to be used as directed by the Architect or the Geotechnical Engineer. This quantity of Structural Fill is in addition to the requirements for Structural Fill in areas as specified herein and as shown on the Contract Documents and is to be used at the discretion of the Architect or the Geotechnical Engineer.

5. Backfilling of Trenches, Structures and Foundations:

    1. Areas to be backfilled shall be free of construction debris, refuse, compressible or decayable materials and standing water. Do not place fill when temperature is below 30 degrees F and when fill materials or layers below it are frozen unless specifically approved by the Geotechnical Engineer.
    2. Requirement of description, placement, compaction and spreading of fill materials as specified herein shall be applicable to backfilling operations.
    3. Structural Fill shall be used as Backfill around manholes and other structures. Excavated material may be used if approved by the Architect or Geotechnical Engineer.
    4. Backfilling of foundations, structures and retaining walls shall not commence until construction finish grade has been approved, forms removed, and the excavation cleaned of trash and debris. Backfill shall not be placed against walls until they are braced or cured sufficiently to develop the strength necessary to withstand, without damage, the pressure that will result from backfilling and compacting operations. If fill is required on both sides of a wall, it shall be brought up simultaneously and evenly on both sides. Avoid damage to the walls and to damp-proofing and waterproofing and other work in place. Allow seven days from the date of application of waterproofing before backfilling. Stones larger than four inches maximum dimension shall not be permitted in the upper six inches of fill or horizontally within 12 inches of walls.
    5. Do not commence backfilling operations of utility trenches until all piping, conduits, etc. have been installed, tested and approved and the locations of all pipe and appurtenances have been recorded. Backfill carefully by hand around pipe to depth of one foot above top of pipe using material specified herein and tamping firmly in layers not exceeding six-inch layers, compacting by hand rammers or mechanical tampers. When a manufacturer of utility line materials suggests backfill materials and methods other than those specified herein, such requirements shall govern providing the finished work equals or exceeds the result obtained by the materials and methods specified herein. Water mains shall be hand backfilled to a minimum cover of 18 inches before mechanical equipment can be used to backfill trench.
    6. Sand Bedding will be required below all pipe unless otherwise shown on the Drawings or specified herein. Crushed Stone is required under utility structures where shown on the Drawings. Gravel Bedding, Sand Bedding or Crushed Stone shall be placed to the full width of the trench and under utility structure foundations as indicated on the Drawings. After a pipe is bedded, the trench shall be filled to the centerline of the pipe with Gravel Fill or Sand Bedding except at the joint. After the joint is inspected, that portion shall be filled in with Sand Bedding. Material under and around the pipe shall be carefully and thoroughly tamped.
    7. From the centerline of the pipe to a point 12 inches above the top of the pipe the backfill shall be Structural Fill or Sand Fill placed by hand and hand tamped. Above this point, backfill shall be placed in layers six inches deep and each layer

shall be compacted with mechanical tampers to not less than 95% of maximum density at optimum moisture of the material. This backfill shall be carried up to the bottom of materials specified to be placed for surfacing requirements.

8. Utilities shall not be laid directly on ledge, boulders or other hard material. This material shall be removed as specified herein within trench limits, and within vertical planes one foot outside of structure walls. Backfill will be placed in eight-inch lifts and thoroughly compacted. If hand guided compaction equipment is used, fill shall be placed in six-inch lifts. All rock excavation shall be considered unsuitable for backfill around utilities. Ordinary fill may be used as backfill in areas specified herein.
9. Coordinate all utility and trench backfilling with the trades involved.

6. Compaction Equipment:

    1. Compaction shall be accomplished by vibratory rollers, multiple wheel pneumatic tired rollers or other types of approved compacting equipment. Loaded trucks, low beds, water wagons and the like shall not be considered as acceptable compaction equipment unless specifically approved by the Architect or Geotechnical Engineer for a particular location. Equipment shall be of any such design that it will be able to compact the fill to the specified density in a reasonable length of time. All compaction equipment shall be subject to the approval of the Geotechnical Engineer.

7. Compaction Requirements:

    1. The following table lists minimum compactive efforts and lift weights which are required for all fill materials. Compaction of each lift shall be completed before compaction of the next lift is started. The compaction equipment shall make an equal number of transverse and longitudinal coverages of each lift. Allow the Geotechnical Engineer sufficient time to make necessary observations and tests. The degree of compaction for fill placed in various areas shall be as follows:

    Relative Compaction

    1. Within buildings and structures:

-Under footings	95%
-under slab	95%

    2. Outside building areas:

-within paved areas	95%
-within lawn areas and playing fields	85%

- Percent of maximum dry density of the material at optimum moisture content as determined by methods or tests for ASTM designation D 1557.

8. Methods: The compaction alternatives given below are stated to provide minimum compaction standards only and in no way relieves the Contractor of his obligation to achieve the specified degree of compaction by whatever additional effort is necessary.

    1. All fill to be placed "in-the-dry" with the exception specified hereinafter. If, in the opinion of the Architect or the Geotechnical Engineer, the Contractor has followed a logical sequence of construction procedures, has employed the proper and necessary equipment, and has otherwise conducted himself in a workmanlike manner, but still cannot effectively dewater the excavation, the Architect or the Geotechnical Engineer may permit the Contractor to place a first

lift of Gravel or Crushed Stone fill "in-the-wet". Fill placed in-the-wet must meet the gradation and placement requirements specified herein. The quantity of fill placed in-the-wet must be no greater than deemed necessary by the Architect and must be limited to the lowermost lift.

9. Moisture Control:

    1. Variation of moisture content in fill and backfill materials shall be limited to Optimum Moisture (-l% to +2%). Moisture content shall be as uniformly distributed as practicable within each lift and shall be adjusted as necessary to obtain the specified compaction.
    2. Material which does not contain sufficient moisture to be compacted to the specified densities shall be moisture conditioned by sprinkling, discing, windrowing, or other method approved by the Geotechnical Engineer.

    1. Material conditioned by sprinkling shall have water added before compaction. Uniformly apply water to surface of subgrade or layer of soil material to obtain sufficient moisture content. The Contractor shall maintain sufficient hoses and/or water distributing equipment at the site for this purpose.

    3. Material containing excess moisture shall be dried to required Optimum Moisture before it is placed and compacted. Excessively moist soils shall be removed and replaced and shall be scarified by use of plows, discs, or other approved methods, and air-dried to meet the above requirements.
    4. Materials, which are within the moisture requirements specified above, but which display pronounced elasticity or deformation under the action of earthmoving and compaction equipment, shall be reduced to Optimum Moisture Content, or below, to secure stability.
    5. In the event of sudden downpours or other inclement weather, exposed subgrades and fills which, in the opinion of the Geotechnical Engineer, become inundated or excessively moistened shall have excess water removed and soil dried as specified above.

3.06 ROUGH GRADING

1. Rough grading shall include the shaping, trimming, rolling and finishing the surface of the sub- base, shoulders, and earth slopes, and the preparation of the sub-base for loam, seeding and paved surfaces. The grading of shoulders and sloped areas may be done by machine methods. Up to two inches in 100" tolerance will be permitted on slopes and one inch in 100" on lawn areas provided the slopes are uniform in appearance and without abrupt changes. All ruts shall be eliminated. Grading of subgrades for paved areas shall be finished at the required depth below and parallel to the proposed surface within 3/8 inch in 100" tolerance.

2. If, during the progress of rough grading work, water pipe, sewer conduit, drain, or other construction is damaged due to operations under this Contract, the Contractor shall repair all such damage at no additional cost to the Owner and restore damaged areas to their original condition.

3. Do all other cutting, filling and rough grading to the lines and grades indicated on the Drawings. Grade evenly to within the dimensions required for finished grades shown on the Drawings. No stone larger than three inches in largest dimension shall be placed in upper 12 inches of fill.

4. Grades shall be brought below finished grades in accordance with the various depths specified below:

    1. Under slabs-on-grade, as specified herein and as shown on the Drawings.
    2. Under paved areas, bottom of base course as shown on Drawings.
    3. Under seeded areas, six inches.
    4. Under cattail marsh area and pond bottom, 12 inches.

5. No rubbish of any description shall be allowed to enter fill material. Such material shall be removed from the site.

6. Complete the grading operations after the building has been finished, the utilities installed, site improvements constructed, and all materials, rubbish and debris removed from the site. Leave subgrade for lawns clean at required grades. There must be sufficient grade staking to provide correct lines and grades.

3.07 DEFICIENCY OF FILL MATERIAL

1. Provide required additional fill material from offsite sources to complete the work if a sufficient quantity of suitable material is not available from the required excavation on the project site.

3.08 SURPLUS OF FILL MATERIAL

1. Surplus fill which is not required to fulfill the requirements of the Contract shall be removed from the site and legally disposed of.

3.09 DUST AND EROSION CONTROL

1. The Contractor shall take all necessary measures and provide equipment and/or materials to minimize dust from rising and blowing across the site and also to control surface water throughout the operation so that it does not run onto paved ways without being filtered. In addition, the Contractor shall control all dust created by construction operations and movement of construction vehicles, both on the site and on paved ways. Provide additional crushed stone where necessary to provide traps or pads for construction vehicles carrying sediment. Provide temporary swales and interceptor ditches to control surface runoff water where necessary.

2. If dust control is required off-site due to work under this Contract, in addition to watering, sweeping and other methods, the Contractor shall apply calcium chloride in the required amounts to properly control dust. These amounts shall be approved by the City Engineer prior to application.

3.10 RESTORATION OF SITE ITEMS

1. Wherever streets, lawns or other items within the Contract Limit Lines have been excavated in fulfilling the work required under the Contract, the Contractor shall furnish and install all material at no cost to the Owner to bring finish surface level with the existing adjacent conditions. All work shall be installed to match the existing conditions.

END OF SECTION 02200

New Hampshire Natural Heritage Bureau
NHB DataCheck Results Letter

To: Irina Donskaia, MSC a division of TFMoran, Inc.
170 Commerce Way, Suite 102

Portsmouth, NH 03801

From: NH Natural Heritage Bureau
Date: 1/31/2023 (valid until 1/31/2024)
Re: Review by NH Natural Heritage Bureau of request submitted 1/23/2023
Permits: USEPA - Stormwater Pollution Prevention

NHB ID: **NHB23-0240** **Applicant:** Irina Donskaia

Location: Portsmouth
35 Sherburne Road

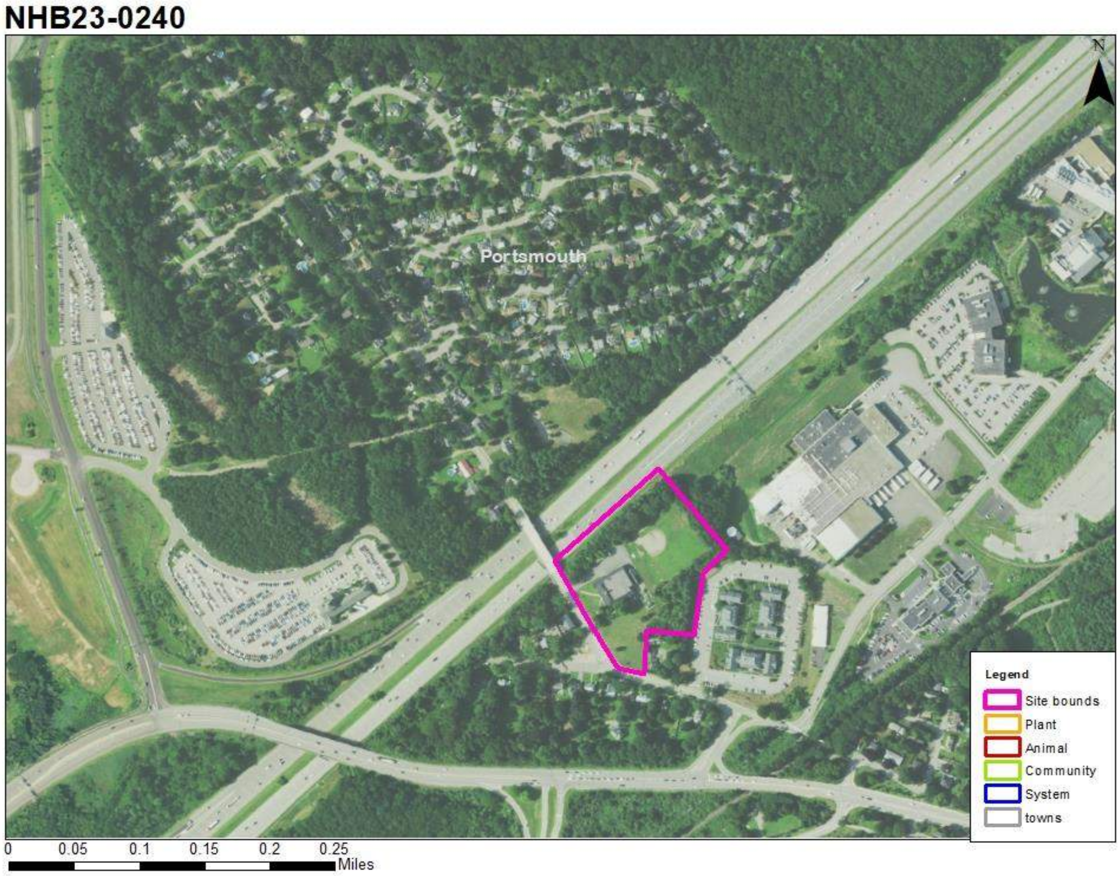
Project Description: Redevelopment of a School and associated property. To become multifamily unit workforce housing.

The NH Natural Heritage database has been checked by staff of the NH Natural Heritage Bureau and/or the NH Nongame and Endangered Species Program for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government.

It was determined that, although there was a NHB record (e.g., rare wildlife, plant, and/or natural community) present in the vicinity, we do not expect that it will be impacted by the proposed project. This determination was made based on the project information submitted via the NHB Datacheck Tool on 1/23/2023 10:59:32 AM, and cannot be used for any other project.

Based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

MAP OF PROJECT BOUNDARIES FOR: **NHB23-0240**



Robert J. Harbeson, AIA
Market Square Architects, LLC
104 Congress Street, Suite 203
Portsmouth, NH 03801
VIA EMAIL: rharbeson@markesquarearchitects.com

March 20, 2025

**Re:	Preliminary Structural Review**
35 Sherburne Road, Portsmouth, NH 03801
TFM Project #: 47528.01

Dear Mr. Harbeson:

On February 27, 2025 and March 3, 2015, personnel from TFMoran Inc. (TFM) visited the property at the above referenced address to review, observe, and document the visible existing conditions of the structural components at the vacant school building. The purpose of the review is to help the design and development team assess whether the building could be repurposed for new multi-tenant residential use.

GENERAL DESCRIPTION

The school building was constructed around 1941 with a gym addition later constructed around 1980. The original school building (hereinafter referred to as “the school”) is one-story with a partial basement area containing the boiler equipment room, coal storage bin, and a storage room. The remainder of the school footprint has a crawl space below the floor level. The school has a “U” shaped footprint with a total floor area of approximately 14,500 square feet (including the basement). For this assessment, the school is subdivided and referred to herein as the north, south and west wings. The north and south wings represent both parallel legs of the “U” shape. The north wing has a length of approximately 139’-10”. The south wing has a length of approximately 119’-9”. The west wing represents the base of the “U” shape. This wing has a length of approximately 123’-6”. The west wing is also the original main entrance to the school building aligned parallel with Sherburne Road. [Appendix B]

The gym addition (hereinafter referred to as “the gym”) is a one-story clear span structure of approximately 5,500 square feet with no crawl space or basement. The gym was constructed to the east of the west wing and encloses the previously undeveloped area between the north and south wings of the school. The gym has a length of approximately 76’-8”. There is a shorter kitchen area along the full width of the east end of the gym for a length of approximately 17’-0”. [Appendix B]

It is understood the school and gym were until recently inhabited by the Robert J. Lister Academy in an institutional capacity. The building was vacated over the summer of 2024 and is currently being conditioned and used as temporary light storage for the City of Portsmouth.

Existing design drawings of both the school building and gym addition are available and were referenced during our review. The school building architectural and structural drawings were prepared by Wells, Hudson & Granger Architects dated October 1941. The gym building architectural and structural design drawings were prepared by Philip Schuyler Tambling, AIA Architect and Swift Engineering dated October 10, 1980.

Reference Appendices A & B for photographs and a project locus plan SK-1.

STRUCTURAL SYSTEMS

School Building:

The framing for the school building is a combination of conventional timber and heavy timber framing, with masonry veneer and exterior wood stud load bearing walls with punched window openings.

1. Roofs: The roofs are asphalt shingles on a 7:12 pitched gable with a centered symmetrical ridge and corresponding hips and valleys at the intersecting lower north and south wing roofs. There is an open-air cupola and widow's walk centered on the west wing roof. Typical roof construction is 1x6 plank with the board dimension laid perpendicular to the 2x of varying depth (10", 12", & 14") roof rafters spaced 16" center to center typical. The roof rafters have at least one row of diagonal cross bridging at rafter mid-span. The ridge is a typical 2x of varying depth (8", 10", 12", & 14") with rafters aligned each side of the ridge pole. The north and south wing rafter framing spans from the exterior wall to the ridge to the opposite exterior wall. The South wing has an additional heavy timber header truss and valley beams to frame a perpendicular gable classroom extension to the southeast. The west wing framing is divided into three bays across the width. Typical rafter framing spans from the exterior walls to an interior heavy timber beams, purlins, and post framing bay centered in the roof above the corridor walls below. No rafter collar ties were observed.

2. Attic/Ceilings: The attic space above the ceiling is accessible through a scuttle in the former nurse's office adjacent to the bathroom. The ceilings are plaster and lathe supported by 2x6 ceiling joists spaced at 16" center to center typical. A second dropped acoustic tile ceiling was added below the original. The original ceiling joists are supported by the exterior walls and interior corridor walls as well as from the roof rafters above with 1x6 hangers. Not every ceiling joist has a hanger. The ceiling is insulated with two different layers of insulation. There is one layer of loose laid insulation as well as a newer top layer of batt insulation. No vapor barrier was observed. Attic ventilation appeared to be at the exterior wall soffits and gable ends only.

3. Walls: Exterior walls and framing could only be observed outside, in the attic above the ceiling, and below the first floor in the crawl space. The exterior walls are clay masonry veneer with an unknown sheathing on 2x6 studs spaced 16" center to center. Headers at windows achieved with 2x6 diagonals cut into the studs above the window opening. The existing wall framing differs greatly and is likely a value-based change from the existing construction drawings. The construction documents specify load- bearing masonry walls.

4. Floors: The typical first floor framing is elevated and can only be observed from below in the crawl space. Typical floor construction is 1x6 plank with the board dimension laid diagonally to the 2x of varying depth (10", 12", & 14") floor joists with various spacing of 12" to 16" center to center typical. No vapor barrier observed. The floor joists have at least one row of diagonal cross bridging at the joist mid-span. Floor joists are supported by the exterior foundation wall and interior multi-ply 2x wood beams on concrete piers. The north and south wing floor framing is divided into three bays across the width. The west wing framing is

divided into five bays. The typical floor joist span averages approximately 10'-6". The typical floor beam span averages approximately 11'-0".

The basement level boiler and storage room floors are cast-in place concrete slab on grade. The elevated classroom and bathroom floor framing above the boiler and storage rooms consists of more fire-resistive construction. The floor construction in this area is a 4" cast-in-place elevated concrete slab supported by single span concrete ribs space at approximately 24" center to center. The concrete rib clear span from the exterior to the interior concrete foundation walls with a span of approximately 22'-6".

5. Foundations: Foundations are conventional cast-in-place concrete frost walls and retaining walls. The exterior concrete foundation walls could only be observed from the boiler and storage rooms as well as the crawl space areas. Wall footings could not be observed but assumed to be continuous concrete strip footings as detailed. Interior foundations supporting floor beams are isolated 12"x12" concrete piers. Pier footings could not be observed, but it is assumed the concrete piers are supported by concrete spread footings as detailed at frost depth.

6. Lateral Resisting Elements: Light-framed wood stud exterior walls and corridor walls with 2x6 diagonal bracing cut into the studs.

Gym Building:

1. Roofs: Flat roof pitched to drain at perimeter scuppers to ground or the adjacent north and south wing school roofs. Typical roof construction is gravel ballast on membrane, rigid insulation, over 1 ½" steel roof decking. Steel decking at the gym is supported by pre-engineered open web steel joists spaced at 5'-0" center to center. Roof deck bearing elevation is approximately 24'-3" above the gym floor. The roof joists span approximately 15'-4" between cold rolled wide flange W27x84 steel girders. The typical girder clear spans the gym width of 58'-8" and cantilevers over both the school building north and south wings approximately 14'-0" to each existing ridge, respectively. The steel girders are supported near each end by TS7x7x1/4 tube steel columns adjacent to the original school building exterior walls. The westerly portion of the gym flat roof is plywood on 2x8's spaced at 16" center to center supported on a 2x4 bearing walls bearing at mid-span on the existing west wing roof rafters. Steel decking at the kitchen low roof is supported by pre-engineered open web steel joists spaced at 3'-0" center to center. Kitchen roof deck bearing elevation is approximately 12'-4" above the gym floor. The joists span approximately 17'-0" between load bearing cmu walls.

2. Walls: The west, north, and south side of the gym is surrounded by the original school building exterior walls. The east wall of the gym is 12" cmu and the walls at the kitchen 8" and 12" load bearing cmu with clay masonry exterior veneer.

3. Floors: Gym and kitchen area floor are concrete slab on grade.

4. Foundations: Foundations are conventional cast-in-place concrete frost walls and retaining walls. The concrete foundation walls could only be observed from exterior above grade. Wall footings could not be observed but assumed to be continuous concrete strip footings as detailed. Steel columns are supported by the existing school buildings' north and south wing concrete foundation walls.

5. Lateral Resisting Elements: Partial ordinary cmu shear walls for the gym area. Ordinary cmu shear walls at the low roof kitchen area.

OBSERVATIONS AND ISSUES

School Building:

1. Lumber species and Gradation

The existing lumber species and grades are unknown. Retention of a wood scientist should be considered to provide additional wood testing for rafters, joists, and beams in the building if this project moves forward with preservation and renovations. Testing will help to positively identify the wood species and provide an estimate of the wood's ultimate flexural/tensile strength. This information is required to accurately determine the floor and roof load capacities. For the purposes of this preliminary review, calculations have been performed on specific repetitive roof rafter and floor joists members of the school framing. The calculations are based on the timbers assumed to be Douglas Fir-Larch, No. 1, or better based on notes on the original drawings and experience. Species identification and grading will provide for a more accurate analysis of the floor and roof load capacities and may provide justification for the use of higher allowable stresses for timber species other than the assumed Douglas Fir-Larch, No. 1.

2. Lumber Condition – Rot, Checking and Splitting

The majority of the existing floor and roof framing are in good condition. There is light water staining at various locations on several roof rafters, beams, and posts as well as floor joists along exterior walls. There is also at least one area in the south wing that water intrusion has made it through the roof to the ceiling level and failed the plaster ceiling. There are several contributing factors to the water intrusion including: open air cupola, missing roof shingles, open windows, unpainted wood surfaces, voids and rotted exterior wood surfaces and trim, voids in unsealed masonry and mortar. Wood rot was not observed at many structural components but should be evaluated further especially at the higher roof levels of the cupola tower area, as this area was not safely accessible. [Figures 1, 2 , & 3]

Common checking and splitting of wood framing components were observed throughout the building. Most of the conditions seen are typical and should be expected of a building this age. The checking observed is minor in nature and not something that requires additional reinforcement. A few first-floor joists were split at the end connections to the supporting walls/beams. The splitting at these members was severe enough to negatively impact the performance of the joists. It is recommended that these joists be reinforced by sistering a new 2x along the full length of the affected joists. [Figures 4 & 5]

3. Fire damage

Fire damage was observed localized to one area in the north wing directly below the cupola at the ceiling level. Several ceiling joists are severely damaged to the point of total section loss and failure. These joists should be temporary shored and will require replacement during renovations. One of the four cupola heavy timber framing posts is also damaged. This damage has reduced the structural integrity of the heavy timber framing post below the cupola tower and should be temporarily shored and repaired/replaced during renovations. [Figures 6 & 7]

4. Exterior Envelope/Masonry Condition

The exterior envelope has not been maintained for a prolonged period and is in poor condition. This is evident by the peeling paint, and bare and rotted condition of the wood trim and siding. A wood post at the exterior door canopy on the south wing appears to be missing. The decorative exterior finials and railing for the widow's walk at the cupola have broken off and are missing. A few pre-cast concrete windowsills were noted in poor condition with spalling and exposed rebar. The exterior masonry walls are in fair to poor condition. There are some stepped cracks in the masonry at the east end of the south wing above the window and at the exterior corner. There may be some minor shifting due to water intrusion from the roof valley above as well as mortar softening or loss. On both the north and south wings there are localized areas of water intrusion at the roof fascia, and again at the base of the wall due to water runoff from the gym roof scuppers. The masonry defects could be alleviated by collecting and redirecting the roof water runoff water intrusion and repairing cracks, repointing, and sealing the masonry. Repointing around the exterior perimeter should also be considered during renovation. [Figures 8, 9, 10, 11, 12, 13, 14, 15, & 16]

5. Foundations and Concrete Condition

The foundations are in good condition with minor exceptions. There are a couple minor exterior wall cracks under 1/8" in width that can be sealed and made watertight. There is at least one concrete pier in the crawl space that was constructed with a significant notch. The notch reduces the strength of the pier by at least 50%. Recommend this notch be grouted solid with a 5,000 psi non-shrink grout. At the north wing main entrance, the entry vestibule shows evidence of excessive deflection. The entrance landing wood floor framing has deflected approximately ½" and there is subsequent cracking to the interior finish of both exterior walls of the vestibule. At the east end of the south wing there is some evidence of slight settlement and concrete spalling at an exterior foundation corner. This area is subject to excessive roof water running off, and it is assumed that the roof drainage is slowly undermining the soil below the foundation in this area. Further foundation undermining and settlement could be alleviated by collecting and redirecting the roof water runoff and pressure injecting or underpinning the foundations. [Figures 17, 18, 19, 20, & 21]

The exterior concrete slabs, retaining walls, and stairs at the north wing boiler room exterior entrance are in poor condition. The concrete aggregate is exposed due to wear, slabs and stair treads concrete are spalling, and there are cracks in the retaining walls, especially at the steel handrails embedded into the top of the wall. The exterior basement wall between the boiler room and the coal chute has efflorescence and water staining. There are voids in the curb on the hoist way to the coal chute. The concrete damage is likely due to water exposure and infiltration over an extended period. The joints between the exterior slabs and wall cracks should be repaired and sealed. Slabs, stairways, and retaining wall surfaces should be patched, repaired, and sealed. [Figures 22, 23, 24 & 25]

6. Roof Load Capacity

Our office performed preliminary calculations of a typical roof rafter to estimate the available roof snow load capacity. This calculation is dependent on our existing lumber species and grade assumptions previously noted. The existing roof rafters have capacity for 35 psf roof snow loading which is appropriate for this project location. It is fortunate the original slate roof appears to have previously been removed and replaced with lighter asphalt shingles. Based on our calculations, the existing rafters would not have the required snow live load capacity in combination with a real slate roof.

Approximately 75% of the roof rafters have hangers that support the 2x6 ceiling below. These rafters are approximately 10% overstressed. This is due to the previous modifications and addition of the acoustic ceiling and second layer of insulation. Removal of redundant ceiling finishes will help to return the roof rafters to their original capacity. Otherwise, roof rafter reinforcement should be considered during renovation. [Figure 26]

The west wing roof rafters under the gym flat roof are 40% overstressed. The weight of the additional gym flat roof construction and concentrated roof snow loading at the rafter mid-span far exceeds its original design capacity. The rafters in this area will need to be reinforced to meet the minimum roof snow and live load requirements during renovation. [Figure 27]

The north and south wing roof snow loading was modified with the gym addition. The new gym flat roof supports the snow loading above the existing roof. This created an unbalanced snow loading on the existing school roof rafters. This creates a horizontal thrust force at the base of the rafter/top of the stud wall. There are no rafter-to-rafter collar ties or horizontal ties at the base of the rafters/top of load bearing wall to resist the horizontal thrust created under an unbalanced snow loading. This will have to be analyzed further prior to renovation and may identify the need for new horizontal ties to resist the horizontal thrust forces from the unbalanced snow loading condition.

7. Ceiling Dead Load Capacity

Our office performed preliminary calculations of a typical ceiling joist to estimate the available attic capacity. This calculation is dependent on our existing lumber species and grade assumptions previously noted. The existing ceiling joists have a dead load capacity for 15 psf and no attic live load capacity. Previous modifications to the ceiling include adding a second dropped acoustical tile ceiling and a second layer of batt insulation. The self-weight of these additional ceiling materials exceeds the capacity of the roof rafters supporting them as noted above. Recommend removal of redundant ceiling finishes during the renovation. [Figure 28]

8. Floor Live Load Capacity

Our office performed preliminary calculations of typical floor joists and beams. These calculations are dependent on our existing lumber species and grade assumptions previously noted. Minimum live load requirements for the proposed residential occupancy live loading are 40 psf for the units and 100 psf for the corridors. Since institutional and residential occupancy live load requirements are similar, all the minimum live load requirements for the existing floor framing components are met with one exception. The west wing corridor joists only have an available live load capacity of 80 psf. The joists in this corridor area will need to be reinforced to meet the minimum live load requirements during renovation.

9. Seismic Load Capacity – Wood Floor/Roof diagrams and light framed shear walls

Renovation of the existing school building is anticipated to meet the renovation classification as a Level III Alteration under the 2021 International Existing Building Code (IEBC) and NH State Building Code. The introduction of residential apartments would be classified as a Change of Occupancy from Institutional Group I to Residential Group R-2. This represents a reduction in the occupancy risk; however, the alteration classification may require compliance with the current building code depending on any proposed changes to the existing lateral resisting systems that result in the removal of existing lateral systems or an increase in greater than 10 percent of the lateral stresses. Anticipated seismic design category C, depending on the existing geotechnical soils classification.

Based on the construction era, the existing school building was designed or constructed with the current building code requirements in mind. Therefore, there are existing weaknesses relative to the building's ability to resist seismic forces that may need to be addressed during the renovation or alterations. These items include:

a. Roof, floor, and wall diaphragms. The existing 1x6 wood plank is not effective as a diaphragm. A likely solution would be to add a layer of plywood over the existing plank to create shear transfer elements in selective areas only where needed.

If the school building is considered eligible for listing on the National Historic Registry, then a historical exception to seismic upgrades in the IEBC may be applicable.

Gym Building:

1. Lumber species and Gradation

The existing lumber species and grades are unknown. Retention of a wood scientist should be considered to provide additional wood testing for rafters, joists, and beams in the building. Testing will help to positively identify the wood species and provide an estimate of the ultimate flexural/tensile strength. This information required to accurately determine the floor and roof load capacities. For the purposes of this preliminary review, calculations have been performed on specific repetitive roof rafter and floor joists members of the school framing. The calculations are based on the lumber assumed to be available at the time of construction such as Spruce-Pine-Fir, No. 1/2, or better. Species identification and grading will provide for a more accurate analysis of the floor and roof load capacities and may provide justification for the use of higher allowable stresses for timber species other than the assumed SPF, No. 1/2.

2. Lumber Condition – Rot, Checking and Splitting

The wood framing components for the newer flat gym roofs are in a concealed space above the existing school roofs and cannot be observed. It is recommended that temporary access be provided and this area observed during the renovation design period prior to construction.

3. Exterior Envelope/Masonry Condition

The exterior envelope is in fair/poor condition. The wood siding is in poor condition. This is evident by the peeling paint, and bare and rotted condition of the wood trim and siding. The exterior masonry walls are in fair condition. There is one stepped crack in the masonry at the southeast end of the gym above the kitchen area. There may be some minor shifting due to deflection of the header beam below. The masonry cracks should be repaired and the masonry sealed during renovation. The roof of the gym was not accessed during our observations. Drainage from the gym roof was observed flowing onto the school roof in unintended areas. The drainage of the gym roof should be further evaluated prior to renovation to ensure there is no improper ponding on the roof and excessive runoff on adjacent low roofs. [Figure 29]

4. Foundations and Concrete Condition

The foundations are in good condition. The concrete slab on grade surface could not be observed due to floor finishes in the gym, kitchen, and bathroom areas. No cracking was observed through the finishes, therefore, the concrete slab on grade is assumed to be in good condition as well. There was no settlement issue observed.

5. Roof Load Capacity

The original drawings specify a design live load of 40 psf plus drifting snow. Our office performed preliminary calculations of a typical wood roof joist to confirm the available roof snow load capacity. This calculation is dependent on our existing lumber species and grade assumptions previously noted. The existing roof rafters have capacity for 40 psf roof snow loading which is appropriate for this project location. We also performed preliminary calculations for the steel wide flange girders and open web steel joists. The joist chord yield strength is based on 50 ksi and the web yield strength is based on 36 ksi for all “H” series joists. The W27x84 girders and the 14H3 roof joist live load capacity in the gym exceeds the 40 psf minimum snow loading specification. Design of both elements is controlled by deflection limitations. The 16H4 joists in the kitchen are also designed for a uniform snow load exceeding 40 psf plus the drifted snow due to the gym’s high roof.

6. Seismic Resistance

The existing gym building was constructed prior to the inclusion of earthquake design requirements in the building code. And it was not constructed with the current building code requirements in mind. Therefore, there are concerns related to the building’s ability to resist seismic forces that may need to be addressed during the renovation or alterations. These items include:

a. Foundations

The gym addition steel column foundation support is a concern for stability. The steel columns are supported by the existing school perimeter frost wall foundations. No extra support, such as pier reinforcement or spread footings, was added at the time of the gym construction to accommodate these columns. The original foundation system was designed to support load-bearing stud walls, not the long clear span concentrated roof loading reactions at the steel columns. While the exact reinforcement details of the existing wall and footings are unknown, it is expected that they do not provide sufficient shear strength to properly support the full-service column loads. This issue will require further structural review during design. It is expected that additional structural foundation elements will need to be added to reinforce the existing conditions.

b. Lateral resistance systems

The kitchen area’s current lateral support system consists of a steel roof deck diaphragm and standard perimeter cmu shear wall. However, it is unclear whether these CMU walls are grouted and reinforced. Depending on the scope of the proposed renovations, additional lateral reinforcement may be necessary, which could involve adding grout and reinforcement to the existing CMU walls.

The main gym's existing lateral system is incomplete. The roof consists of a steel deck diaphragm, but lateral support and connection to the roof diaphragm is limited. The southeast corner of the gym has ordinary cmu shear walls along the east elevation and a short section along the south elevation. However, the north, west, and parts of the south elevations are constructed above the original school building’s exterior walls. These added sections are constructed with light-framed wood stud walls and homasote sheathing, which do not contribute to the lateral structural integrity. It is expected that additional lateral framing components will need to be added to if the proposed renovations require compliance with the current building code requirements.

If the gym building is considered eligible for listing on the National Historic Registry, then a historical exception to seismic upgrades in the IEBC may be applicable.

SUMMARY

Based on our preliminary observations, the existing structure is a fair candidate for adaptive re-use as a multi-tenant residential structure, but the costs associated with additional repairs, and reinforcing will certainly need to be evaluated against other alternatives during the design phase.

The design and development team should further assess the following key findings to inform future capital project planning for any residential occupancy renovations to this structure:

1. The school building has limited floor live load, ceiling dead load, and roof snow load capacity. Framing upgrades or a combination of upgrades plus the removal of additional ceiling materials will be required to meet roof snow and ceiling dead load requirements. Additional floor framing or reinforcing will be required to meet the corridor live load requirement associated with a Multi-family residential occupancy.

2. Several existing roof, ceiling, and floor members are damaged with reduced structural capacity. The damage varies from wood shrinkage checking and splitting, to broken floor joists, water damage, and fire damage. Further investigation is necessary to confirm that framing members that show evidence of water staining do not have a reduction in structural capacity due to rot or fungal growth. Fire damaged areas will need to be fully defined and evaluated. All these areas will require further analysis and reinforcement to return them to service.

3. Areas of the exterior wall masonry, siding, and trim need repairs and replacement due to their poor condition. Full depth masonry repair will be necessary to address cracked bricks and mortar joints. Partial depth repointing is anticipated for approximately 10% of the exterior perimeter. Much of the wooden trim and siding is rotted and will require replacement.

4. Foundation concrete is in good condition with minor exceptions. There are a couple of minor exterior foundation wall cracks that require repair and sealing. One concrete pier in the crawl space will require reinforcement. The school entry will require further evaluation due to undermining and settlement. This area may require pressure injection or underpinning to true the slab on grade and foundation walls. The exterior concrete slabs, retaining walls, and stairs at the school north wing surfaces are in poor condition and will require crack repair and the surfaces will need to be patched, repaired, and sealed.

5. The gym addition steel column foundation support is a concern for vertical stability. This issue will require further structural review during design. It is expected that additional structural foundation elements will need to be added to reinforce the existing conditions.

6. Both school and gym buildings predate requirements for seismic design. The school building has a limited capacity for lateral forces and is not anticipated to meet the requirements of the current building code. Should the proposed renovations trigger requirements for seismic compliance with the current building code additional lateral resisting elements will need to be added. The gym addition's lateral system is incomplete as well as built upon the lateral weaknesses of the school building. It is expected that additional lateral framing components will need to be added to both buildings if the proposed renovations require compliance with the current building code requirements. Application for a historic exception should also be considered.

Please feel free to contact us with any questions or concerns you may have regarding this summary.

Sincerely,
TFMoran, Inc.

Kyle E. Roy, PE
Principal/Senior Structural Engineer

KYLE
E.
ROY
No. 10679
3/20/2025

Limitations

Observations are based solely on visible conditions at the time of the visit, without removing finishes or soil. This evaluation does not include a comprehensive analysis or structural calculations for all structural elements. It is assumed that all original structural systems were designed by a qualified professional in accordance with the building codes and requirements applicable at the time of original construction.

APPENDIX A

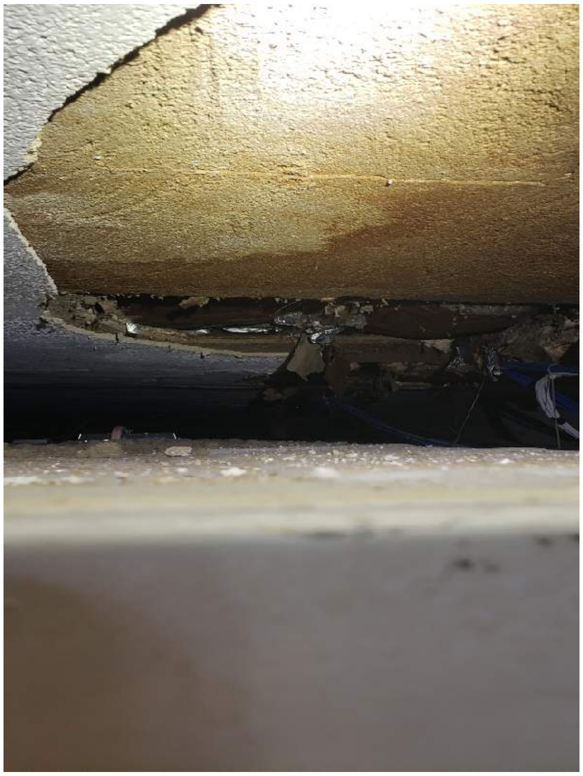


Figure 1 – Water damage ceiling

Figure 2 - Missing roof shingles

Figure 3 – Water-stained cupola tower framing

Figure 4 - Floor joist split end

Figure 5 – Floor joist split end

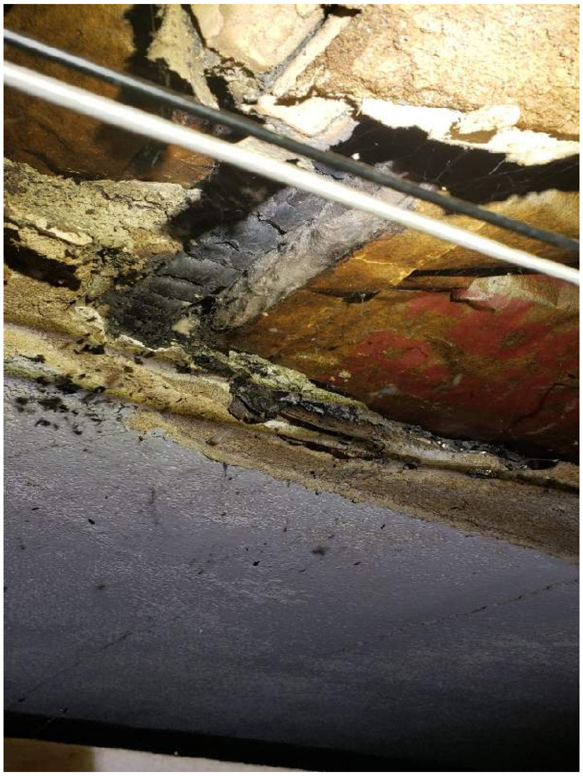


Figure 6 -Ceiling joist fire damage

Figure 7 – Cupola tower and ceiling joists fire damage

Figure 8 – Exterior wood siding and trim rot

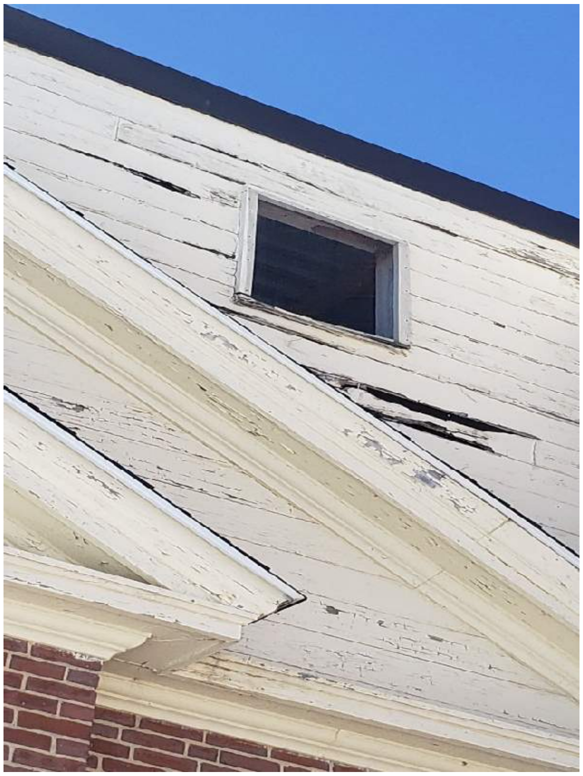


Figure 9 – Exterior wood siding and trim rot

Figure 10 – Exterior masonry mortar loss and water damage

Figure 11 – Exterior masonry vertical stepped crack

Figure 12 – Missing wood post at corner

Figure 13 – Exterior eave trim wood rot and water damage

Figure 14 – Exterior concrete sill damage and broken window

Figure 15 – Cupola railing and finials missing

Figure 16 – Roof drainage away from scuppers

Figure 17 – Vestibule floor gap below baseboard

Figure 18 – Vestibule wall vertical stepped cracks

Figure 19 – Crawl space pier notch

Figure 20 – Exterior foundation and masonry vertical crack

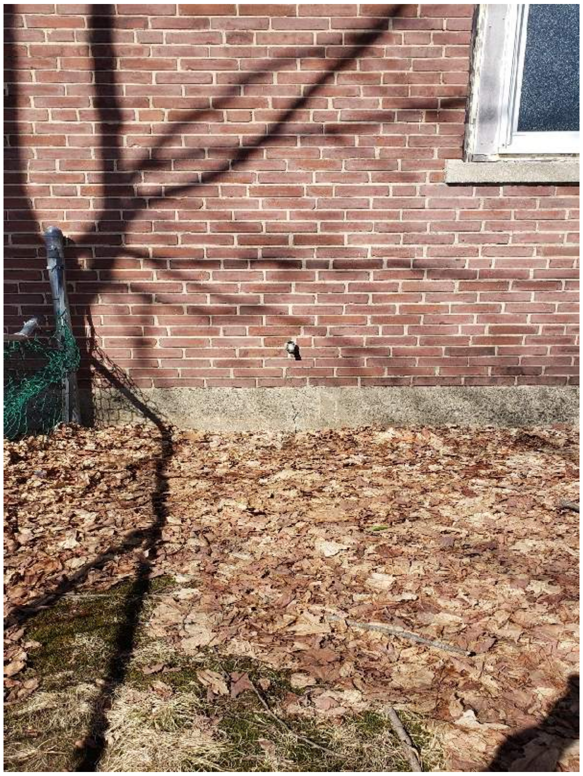


Figure 21 – Exterior foundation vertical crack below spigot

Figure 22 – Basement concrete wall efflorescence

Figure 23 – Exterior Basement concrete stairs

Figure 24 – Exterior stairway vertical wall crack and tread damage

Figure 25 – Exterior coal chute failed concrete

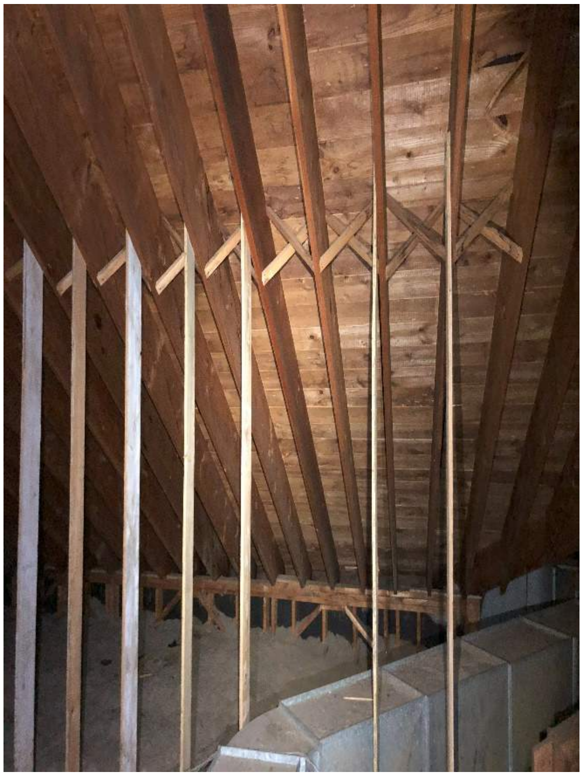


Figure 26 – Ceiling joist hangars at roof rafters

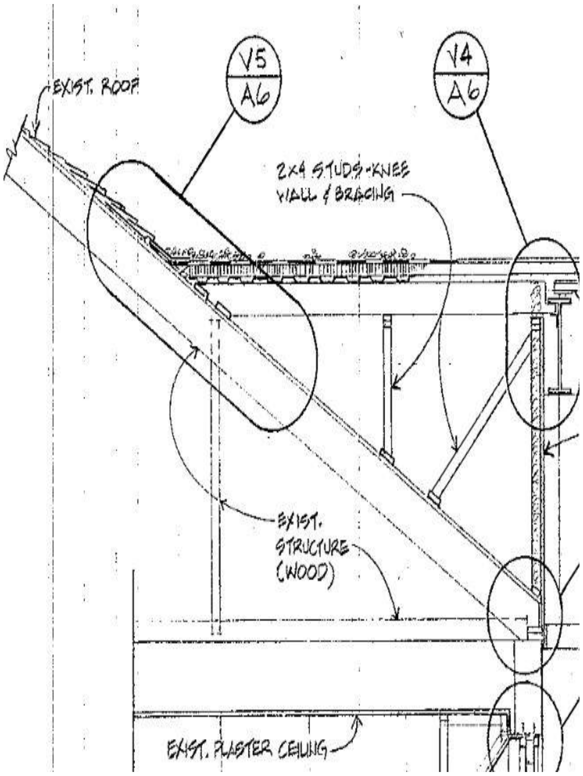
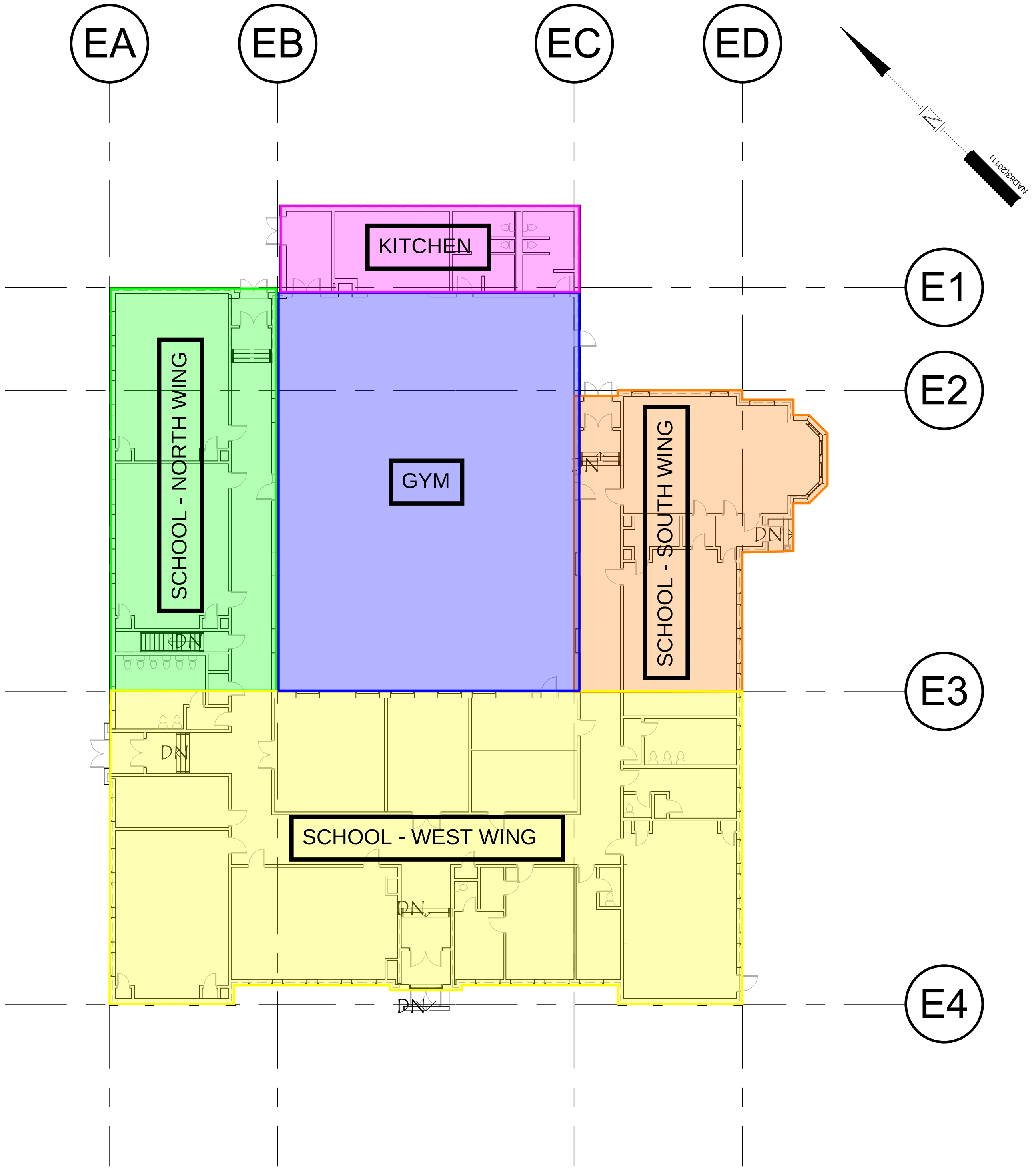


Figure 27 – Gym roof overbuild detail

Figure 28 – Exterior vertical stepped masonry crack at gym

Figure 29 – Gym exterior masonry vertical stepped crack



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PHA SHERBURNE SCHOOL - EXISTING

35 Sherburne Road, Portsmouth, NH

PREPARED FOR
MARKET SQUARE ARCHITECTS

LOCUS PLAN - APPENDIX B

REF. DWG.:
SCALE: 1" = 30'-0"
PROJECT #: 47528.01
DATE: 03/20/25
CHK. BY: KER
DR. BY: AMG

SK-1

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Date of Test: March 19. 2025
Time: 9:30 AM
Project: Sherburne School
Project ID: 47528.00

Fire Hydrant Information Sheet

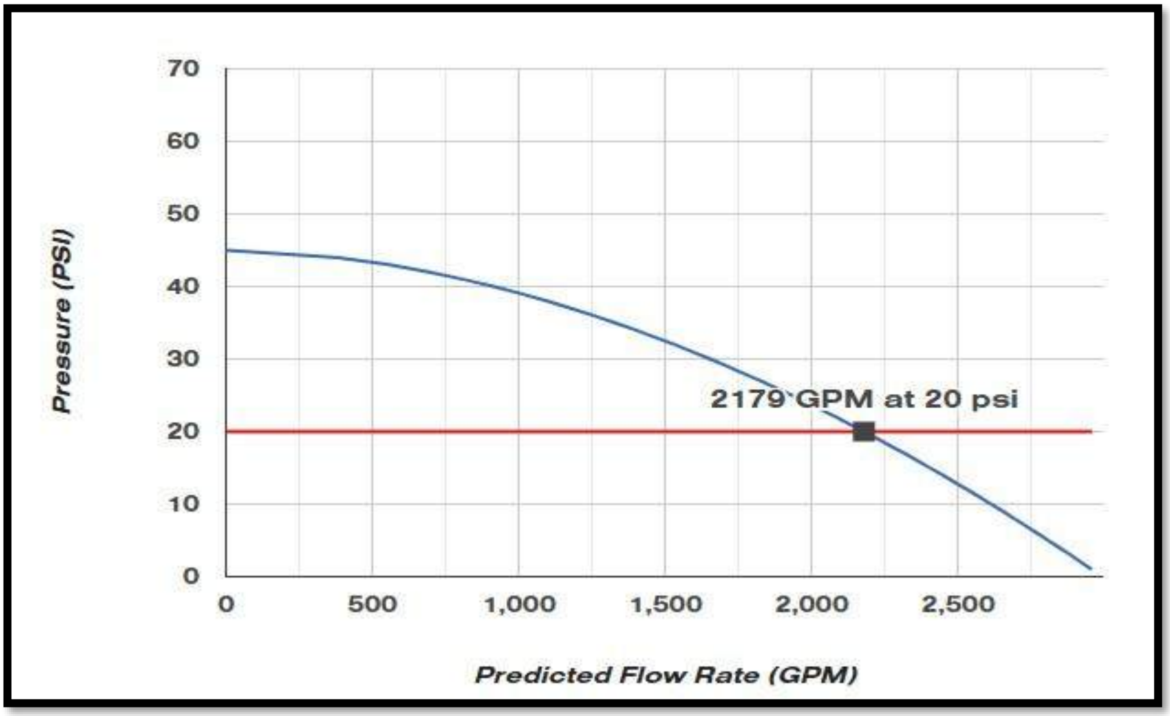
Hydrant A ID:	**342**		Manufactuer:	Kennedy
Address:	35		Model:	Guardian
Street:	Sherburne Road		Year:	-
Cross Street:	Greenland Rd		Installation Date:	-
Town/City:	Portsmouth, NH		Installed By:	City of Portsmouth
Main Diameter:	10	in	Static Pressure:	45
Depth	5'±	ft	Ownership:	City of Portsmouth
Number of Nozzles	3			
Nozzle Diameter	2.5			
Cofficient of Disch (c)	0.9			

Fire Flow Data

Pilot Pressure:	23.5	psi	Hydrant B ID:	---	
Measured Flow	810	gpm	Static Pressure:	45	psi
20 psi Residual Flow	2,179	gpm	Residual Pressure:	41	psi

Tester: Ben Shibley

$$Q_{20}= Q_t \times (P_s - P_{20})^{0.54} /(P_s - P_t)^{0.54}$$



“CALCULATE RATED CAPACITY AT 20 PSI.” *HoseMonster* , hosemonster.com/hydrant-flow-test-calculator-calculate-rated-capacity-at-20-psi/.

Fire Hydrant - 35 Sherburne Rd

Fire Hydrant - Fire Hydrant - 200 Sherburne Rd

Imate Capture: September 2019 @2020 Google United States

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PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE

JANUARY 29, 2025
LAST REVISED JUNE 16, 2025

GENERAL INFORMATION

OWNER
MAP 259 LOT 10
CITY OF PORTSMOUTH
PO BOX 628
PORTSMOUTH, NH 03801

APPLICANT
PHA HOUSING DEVELOPMENT LTD.
CRAIG WELCH
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PETER BRITZ, DIRECTOR

BUILDING DEPARTMENT
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603–610–7243
SHANTI WOLPH, CHIEF BUILDING INSPECTOR

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PETER RICE, DIRECTOR

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MARK NEWPORT, CHIEF

FIRE DEPARTMENT
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603–427–1515
WILLIAM MCQUILLEN, FIRE CHIEF

NHDES AOT
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CONCORD, NH 03302–0095
603–271–3503

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PORTSMOUTH, NH 03801
603–330–3537
ROBERT HARBESON, AIA, PRINCIPAL

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ROCHESTER, NH 03867
TODD SCHEFFER, P.G., PRINCIPAL
603–330–3537

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WEARE, NH 03281
HARRY K. WETHERBEE, PE, PRINCIPAL
603–529–7766

TRAFFIC ENGINEER
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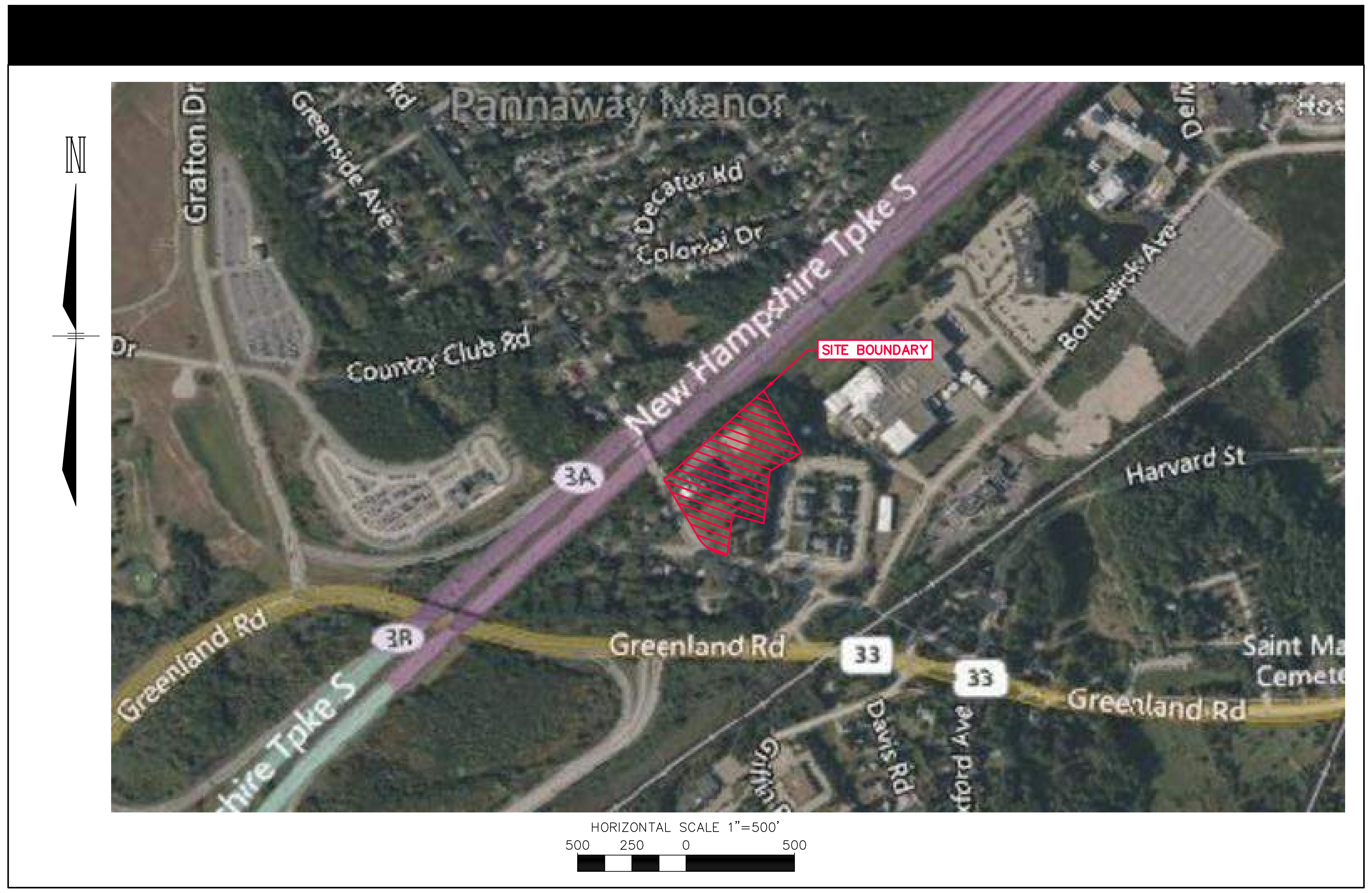
603–472–4488
JENNIFER PORTER, TRAFFIC ENGINEER

LIGHTING DESIGN
EXPOSURE
501 ISLINGTON ST., UNIT 1A
PORTSMOUTH, NH 03801
603 759–1043
KEN SWEENEY, APPLICATION ENGINEER



INDEX OF SHEETS

PERMITS/APPROVALS

	NUMBER	APPROVED	EXPIRES
PORTSMOUTH PLANNING BOARD SITE PLAN REVIEW APPROVAL	–	–	–
NHDES AOT PERMIT	–	–	–
NHDES SEWER CONNECTION PERMIT	–	–	–
EPA NPDES ENOI CGP & SWPPP	–	–	–

APPROVED BY THE CITY/TOWN OF PORTSMOUTH PLANNING BOARD

ON ____________________

BOARD MEMBER ____________________ *AND*

BOARD MEMBER ____________________

JOHN J. McTIGUE
No. 14950

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10
COVER
PROPOSED HOUSING DEVELOPMENT
35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH
PREPARED FOR
PHA HOUSING DEVELOPMENT LTD.

SCALE: NTS **JANUARY 29, 2025**

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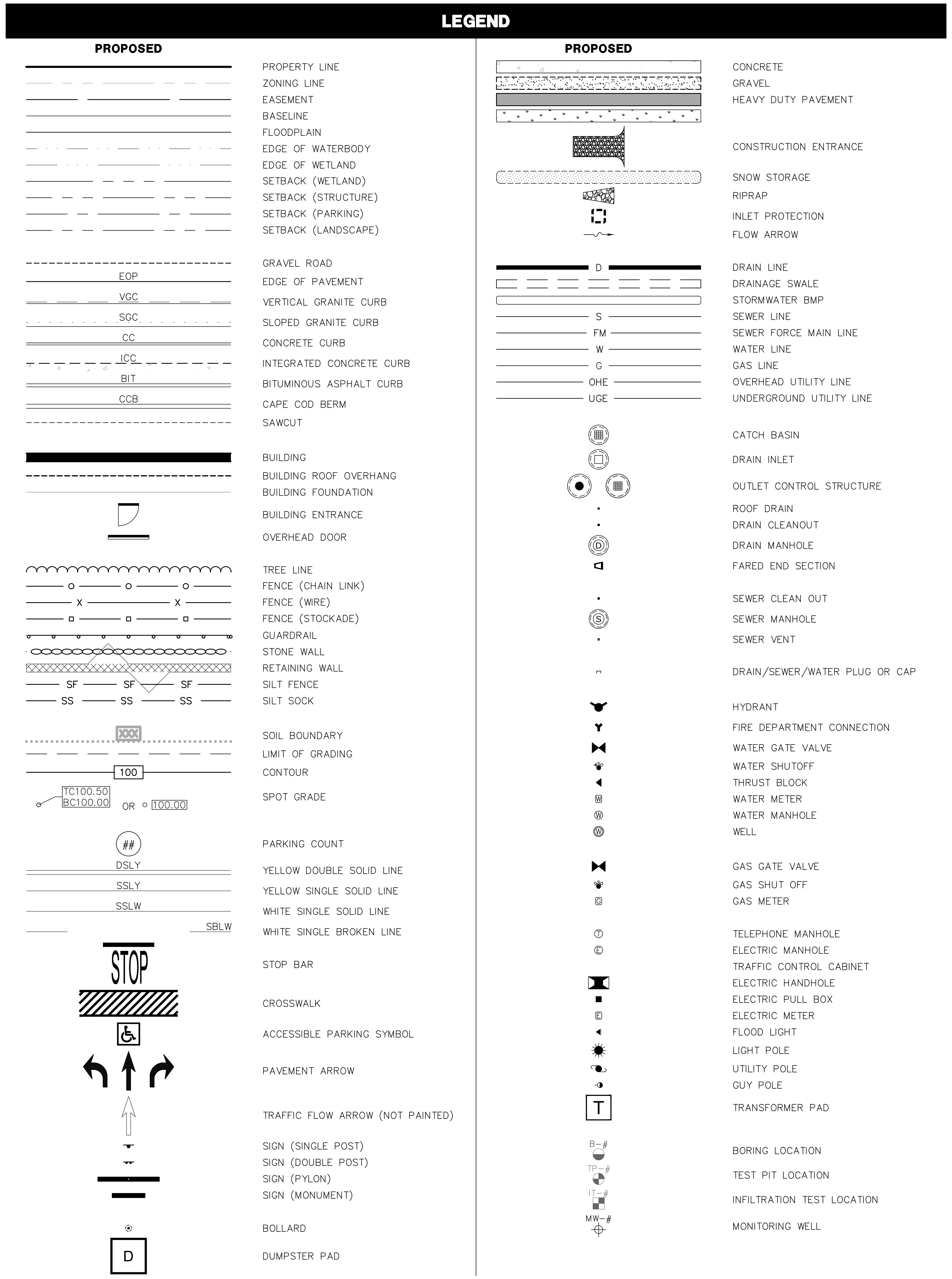
REV	DATE	DESCRIPTION	DR	CK
1	6/16/2025	REVISED PER TAC WORKSHOP	DKS	JJM

FILE	DR	JKC	FB		
47528.00	CK	JJM	CADFILE	47528–00_COVER	C–00

THESE PLANS ARE PERMIT DRAWINGS ONLY AND HAVE NOT BEEN DETAILED FOR CONSTRUCTION OR BIDDING.

CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

LEGEND



ABBREVIATIONS

GENERAL

ABAN	ABANDON
AC	ACRES
ADJ	ADJUST
APPROX	APPROXIMATE
BC	BOTTOM OF CURB
BIT	BITUMINOUS
BK/PG	BOOK & PAGE
BLDG	BUILDING
BMP	BEST MANAGEMENT PRACTICE
BS	BOTTOM OF SLOPE
BW	BOTTOM OF WALL
CONC	CONCRETE
COORD	COORDINATE
DIA	DIAMETER
ELEV	ELEVATION
EP	EDGE OF PAVEMENT
EXIST	EXISTING
FFE	FINISHED FLOOR ELEVATION
FND	FOUNDATION
HP	HIGH POINT
INV	INVERT ELEVATION
IT	INFILTRATION TEST
L	LENGTH
LF	LINEAR FEET
LSA	LANDSCAPE AREA
MAX	MAXIMUM
MIN	MINIMUM
N/F	NOW OR FORMERLY
NHFG	NEW HAMPSHIRE FISH & GAME
NTS	NOT TO SCALE
OC	ON CENTER
PAVE	PAVEMENT
PERF	PERFORATED
PROP	PROPOSED
R	RADIUS
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
REM	REMOVE
RET	RETAIN
RIM	RIM ELEVATION
ROW	RIGHT OF WAY
S	SLOPE
SF	SQUARE FEET
SW	SIDEWALK
TBM	TEMPORARY BENCHMARK
TC	TOP OF CURB
TP	TEST PIT
TW	TOP OF WALL
TYP	TYPICAL
UG	UNDERGROUND
WCR	ACCESSIBLE WHEELCHAIR RAMP
W/	WITH

UTILITIES

CB	CATCH BASIN
CIP	CAST IRON PIPE
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
COND	CONDUIT
DCB	DOUBLE CATCH BASIN
DIP	DUCTILE IRON PIPE
DMH	DRAIN MANHOLE
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FES	FLARED END SECTION
GT	GREASE TRAP
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HH	HANDHOLE
HW	HEADWALL
HYD	HYDRANT
LP	LIGHT POLE
OCS	OUTLET CONTROL STRUCTURE
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
SMH	SEWER MANHOLE
SOS	SEDIMENT OIL SEPARATOR
TSV	TAPPING SLEEVE, VALVE, AND BOX
UP	UTILITY POLE

GENERAL NOTES

1. THESE PLANS WERE PREPARED UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER. TFMORAN, INC. ASSUMES NO LIABILITY AS A RESULT OF ANY CHANGES OR NON-CONFORMANCE WITH THESE PLANS EXCEPT UPON THE WRITTEN APPROVAL OF THE ENGINEER OF RECORD.

2. THE SITE CONTRACTOR SHALL NOTIFY THE ENGINEER ONE WEEK IN ADVANCE OF CONSTRUCTION OF EACH STORMWATER FACILITY TO COORDINATE REQUIRED INSPECTIONS. THE CONTRACTOR SHALL TAKE PROGRESS PHOTOS DURING CONSTRUCTION OF ALL STORMWATER DRAINAGE COMPONENTS AND SEND TO THE ENGINEER.

3. SEE EXISTING CONDITIONS PLAN FOR THE HORIZONTAL AND VERTICAL DATUM. VERIFY TBM ELEVATIONS PRIOR TO CONSTRUCTION.

4. CONTACT EASEMENT OWNERS PRIOR TO COMMENCING ANY WORK WITHIN EASEMENTS.

5. PRIOR TO COMMENCING ANY SITE WORK, ALL LIMITS OF WORK SHALL BE CLEARLY MARKED IN THE FIELD.

6. SITE WORK SHALL BE CONSTRUCTED FROM A COMPLETE SET OF PLANS, NOT ALL FEATURES ARE DETAILED ON EVERY PLAN. THE ENGINEER IS TO BE NOTIFIED OF ANY CONFLICT WITHIN THIS PLAN SET.

7. TFMORAN, INC. ASSUMES NO LIABILITY FOR WORK PERFORMED WITHOUT AN ACCEPTABLE PROGRAM OF TESTING AND INSPECTION AS APPROVED BY THE ENGINEER OF RECORD.

8. PRIOR WRITTEN PERMISSION FROM THE LOCAL PERMITTING AUTHORITY IS REQUIRED IF CLOSURE/OBSTRUCTIONS TO ROADS, STREET, WALKWAYS, AND OTHERS IS DEEMED NECESSARY. CONTRACTOR TO PROVIDE ALTERNATE ROUTES AROUND CLOSURES/OBSTRUCTIONS PER LOCAL/STATE/FEDERAL REGULATIONS.

9. REFER TO ARCHITECTURAL PLANS FOR LAYOUT OF BUILDING FOUNDATIONS AND CONCRETE ELEMENTS WHICH ABUT THE BUILDING SUCH AS STAIRS, SIDEWALKS, LOADING DOCK RAMPS, PADS, AND COMPACTOR PADS. DO NOT USE SITE PLANS FOR LAYOUT OF FOUNDATIONS.

10. IN THE EVENT OF A CONFLICT BETWEEN PLANS, SPECIFICATIONS, AND DETAILS, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR CLARIFICATION.

11. IF CONDITIONS AT THE SITE ARE DIFFERENT THAN SHOWN ON THE PLANS, THE ENGINEER SHALL BE NOTIFIED PRIOR TO PROCEEDING WITH THE AFFECTED WORK.

12. CONTRACTOR'S GENERAL RESPONSIBILITIES:

    A. BID AND PERFORM THE WORK IN ACCORDANCE WITH ALL LOCAL, STATE, AND NATIONAL CODES, SPECIFICATIONS, REGULATIONS, AND STANDARDS AND CONDITIONS OF ALL PROJECT-SPECIFIC PERMITS AND APPROVALS AS LISTED ON THE COVER SHEET TO THESE PLANS OR OTHERWISE REQUIRED.

    B. NOTIFY ENGINEER IN WRITING OF ANY DISCREPANCIES IN PROPOSED LAYOUT AND IN EXISTING FEATURES.

    C. EMPLOY A LICENSED SURVEYOR TO DETERMINE ALL LINES AND GRADES AND LAYOUT OF SITE ELEMENTS AND BUILDINGS.

    D. THE CONTRACTOR SHALL BE RESPONSIBLE TO BECOME FAMILIAR WITH THE SITE AND ALL SURROUNDING CONDITIONS. NOTIFY ALL APPROPRIATE AUTHORITY OF CONSTRUCTION ACTIVITIES REQUIRING TESTS OR INSPECTIONS IN ADVANCE.

    E. TAKE APPROPRIATE MEASURES TO MINIMIZE NOISE, DUST, AND DEBRIS. CONSTRUCTION ACTIVITIES SHALL BE CARRIED OUT BETWEEN THE HOURS OF 7:00 AM AND 5:00 PM, MONDAY THROUGH FRIDAY IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, PORTSMOUTH, NEW HAMPSHIRE.

    F. MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY WORK AT ALL TIMES.

    G. IN ACCORDANCE WITH RSA 430:53 AND AGR 3800, THE CONTRACTOR SHALL NOT TRANSPORT INVASIVE SPECIES OFF THE PROPERTY, AND SHALL DISPOSE OF INVASIVE SPECIES ON-SITE IN A LEGAL MANNER.

    H. COORDINATE WITH ALL UTILITY COMPANIES AND CONTACT DIGSAFE (811 OR 888-344-7233) AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION.

    I. PROTECT NEW AND EXISTING BURIED UTILITIES DURING ALL SITE WORK. DAMAGED UTILITIES SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE OWNER.

    J. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR CONDITIONS AT THE SITE. THESE PLANS, PREPARED BY TFMORAN, INC., DO NOT EXTEND TO OR INCLUDE SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR THEIR EMPLOYEES, AGENTS, OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE SURVEYOR OR ENGINEER HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED INTO THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS WHICH MAY BE REQUIRED BY THE US OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND/OR LOCAL REGULATIONS.

    K. WRITTEN DIMENSIONS HAVE PRECEDENCE OVER SCALED OR COORDINATE DIMENSIONS. IN CASE OF CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWING AND/OR SPECIFICATION, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR CLARIFICATIONS.

    L. PROVIDE AN AS-BUILT PLAN AT THE COMPLETION OF THE PROJECT AS REQUIRED BY CITY REGULATIONS.

    M. IF ANY DEVIATIONS FROM THE APPROVED PLANS AND SPECIFICATIONS HAVE BEEN MADE, THE SITE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS STAMPED BY A LICENSED SURVEYOR OR QUALIFIED ENGINEER ALONG WITH A LETTER STAMPED BY A QUALIFIED ENGINEER DESCRIBING ALL SUCH DEVIATIONS, AND BEAR ALL COSTS FOR PREPARING AND FILING ANY NEW PERMITS OR PERMIT AMENDMENTS THAT MAY BE REQUIRED.

    N. THE CONTRACTOR SHALL PROVIDE THE FOLLOWING DOCUMENTATION TO OWNER AND ENGINEER:
        1) ADVANCE WRITTEN NOTICE AT LEAST ONE WEEK PRIOR TO COMMENCING ANY WORK UNDER THE PERMIT AND NOTIFICATION TO AOT VIA THE START OF CONSTRUCTION FORM.
        2) IF ANY UNDERGROUND DETENTION SYSTEMS, INFILTRATION SYSTEMS, OR FILTERING SYSTEMS WERE INSTALLED, FOR EACH SUCH SYSTEM:
            A) REPRESENTATIVE PHOTOGRAPHS OF THE SYSTEM AFTER COMPLETION BUT PRIOR TO BACKFILLING; AND
            B) A LETTER SIGNED BY THE ENGINEER WHO OBSERVED THE SYSTEM PRIOR TO BACKFILLING, THAT THE SYSTEM CONFORMS TO THE APPROVED PLANS AND SPECIFICATIONS.
        3) UPON COMPLETION OF CONSTRUCTION, WRITTEN CERTIFICATION THAT:
            A) ALL WORK HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS.
            B) IF ANY DEVIATIONS FROM THE APPROVED PLANS WERE MADE, WRITTEN DESCRIPTIONS AND AS-BUILT DRAWINGS OF ALL SUCH DEVIATIONS, STAMPED BY A QUALIFIED ENGINEER, SHALL BE PROVIDED.

GRADING & DRAINAGE NOTES

1. THE CONTRACTOR SHALL ENSURE THAT ALL WORK INCLUDING INSPECTIONS AND TESTS IS PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF NHDES ENV-WQ 1500 AS APPLICABLE.

2. THE CONTRACTOR SHALL PREPARE, MAINTAIN, AND EXECUTE A S.W.P.P.P. IN ACCORDANCE WITH EPA REGULATIONS AND THE CONSTRUCTION GENERAL PERMIT.

3. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO SUBMIT AN eNOI AT LEAST 14 DAYS IN ADVANCE OF ANY EARTHWORK ACTIVITIES AT THE SITE.

4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CHECK THE ACCURACY OF THE TOPOGRAPHY AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO ANY EARTHWORK BEING PERFORMED ON THE SITE. NO CLAIM FOR EXTRA WORK WILL BE CONSIDERED FOR PAYMENT AFTER EARTHWORK HAS COMMENCED.

5. THE CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT FOR INFORMATION ABOUT SOIL AND GROUNDWATER CONDITIONS. THE CONTRACTOR SHALL FOLLOW THE GEOTECHNICAL ENGINEER'S RECOMMENDED METHODS TO ADDRESS ANY SOIL AND GROUNDWATER ISSUES THAT ARE FOUND ON SITE, INCLUDING AND NOT LIMITED TO DEWATERING METHODS, PERIMETER DRAINS AND TIE INTO STORMWATER MANAGEMENT SYSTEM, ETC.

6. COORDINATE WITH GEOTECHNICAL/STRUCTURAL PLANS FOR SITE PREPARATION AND OTHER BUILDING INFORMATION.

7. COORDINATE WITH ARCHITECTURAL PLANS FOR DETAILED LAYOUT AND GRADING AT BUILDING, AND SIZE AND LOCATION OF ALL BUILDING SERVICES, FOOTING DRAINS, AND ROOF DRAIN INFORMATION.

8. LIMITS OF WORK ARE SHOWN AS APPROXIMATE. THE CONTRACTOR SHALL COORDINATE ALL WORK TO PROVIDE SMOOTH TRANSITIONS. THIS INCLUDES GRADING, PAVEMENT, CURBING, SIDEWALKS, AND ALIGNMENTS.

9. THE CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCE, RAMPS, AND LOADING AREAS.

10. THE SITE SHALL BE GRADED SO ALL FINISHED PAVEMENT HAS POSITIVE DRAINAGE AND SHALL NOT POND WATER.

11. ALL ELEVATIONS SHOWN AT CURB ARE TO THE BOTTOM OF CURB UNLESS OTHERWISE NOTED. CURBS HAVE A 6" REVEAL UNLESS OTHERWISE NOTED.

12. ALL SIDEWALK AND OTHER CURB REVEALS SHALL BE 6" WITH A TOLERANCE OF PLUS OR MINUS 3/8". WHERE SIDEWALK IS TO BE FLUSH, THE PAVEMENT REVEAL SHALL BE WITHIN 1/4".

13. THE FINISHED GRADE AT BOTTOM OF ALL ACCESSIBLE RAMPS SHALL BE FLUSH WITH PAVEMENT WITH A TOLERANCE OF PLUS OR MINUS 1/4".

14. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE PRIOR TO INSTALLATION OF FINISHED PAVEMENT.

15. ROAD AND DRAINAGE CONSTRUCTION SHALL CONFORM TO THE TYPICAL SECTIONS AND DETAILS SHOWN ON THE PLANS AND SHALL MEET LOCAL STANDARDS AND THE REQUIREMENTS OF THE LATEST NHDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGE CONSTRUCTION AND THE NHDOT STANDARD STRUCTURE DRAWINGS UNLESS OTHERWISE NOTED.

16. STORMWATER DRAINAGE SYSTEM SHALL BE CONSTRUCTED TO LINE AND GRADE AS SHOWN ON THE PLANS. CONSTRUCTION METHODS SHALL CONFORM TO NHDOT STANDARD SPECIFICATIONS, SECTION 603. CATCH BASINS AND DRAIN MANHOLES SHALL CONFORM TO SECTION 604. ALL CATCH BASIN GRATES SHALL BE TYPE B AND CONFORM TO NHDOT STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED.

17. NO FILL SHALL BE PLACED IN ANY WETLAND AREA WITHOUT A WETLANDS PERMIT.

18. ALL EXCAVATIONS SHALL BE THOROUGHLY SECURED ON A DAILY BASIS BY THE CONTRACTOR AT THE COMPLETION OF CONSTRUCTION OPERATIONS IN THE IMMEDIATE AREA.

19. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED, FERTILIZER, AND MULCH.

20. DENSITY REQUIREMENTS:

MINIMUM DENSITY*	LOCATION
95%*	BELOW PAVED OR CONCRETE AREAS
95%**	TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL
90%**	BELOW LOAM AND SEED AREAS

ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT.

* ASTM D-1557

** ASTM D-698.

UTILITY NOTES

1. LENGTH OF PIPE IS FOR CONVENIENCE ONLY. ACTUAL PIPE LENGTH SHALL BE DETERMINED IN THE FIELD.

2. ALL PROPOSED UTILITY WORK, INCLUDING MATERIAL, INSTALLATION, TERMINATION, EXCAVATION, BEDDING, BACKFILL, COMPACTION, TESTING, CONNECTIONS, AND CONSTRUCTION SHALL BE COORDINATED WITH AND COMPLETED IN ACCORDANCE WITH THE APPROPRIATE REQUIREMENTS, CODES, AND STANDARDS OF ALL CORRESPONDING UTILITY ENTITIES AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE, AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS, PRIOR TO THE START OF ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION BE AGREED TO BY THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT "DIGSAFE" (811) AT LEAST 72 HOURS BEFORE DIGGING.

4. COORDINATE ALL WORK ADJACENT TO PROPOSED BUILDINGS WITH ARCHITECTURAL BUILDING DRAWINGS. CONFIRM UTILITY PENETRATIONS AND INVERT ELEVATIONS ARE COORDINATED PRIOR TO INSTALLATION.

5. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES OWNING UTILITIES, EITHER OVERHEAD OR UNDERGROUND, WITHIN THE CONSTRUCTION AREA AND SHALL COORDINATE AS NECESSARY WITH THE UTILITY COMPANIES OF SAID UTILITIES. THE PROTECTION OR RELOCATION OF UTILITIES IS ULTIMATELY THE RESPONSIBILITY OF THE CONTRACTOR.

6. THE EXACT LOCATION OF NEW UTILITY CONNECTIONS SHALL BE DETERMINED BY THE CONTRACTOR IN COORDINATION WITH UTILITY COMPANY, COUNTY AGENCY, AND/OR PRIVATE UTILITY COMPANY.

7. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER THE UTILITY INSTALLATION COMPLETE AND OPERATIONAL.

8. ALL UTILITY COMPANIES REQUIRE INDIVIDUAL CONDUITS. CONTRACTOR TO COORDINATE WITH TELEPHONE, CABLE, AND ELECTRIC COMPANIES REGARDING NUMBER, SIZE, AND TYPE OF CONDUITS REQUIRED PRIOR TO INSTALLATION OF ANY CONDUIT.

9. SANITARY SEWER SHALL BE CONSTRUCTED TO THE STANDARDS AND SPECIFICATIONS AS SHOWN ON THESE PLANS. ALL SEWER MAINS AND FITTINGS SHALL BE PVC AND SHALL CONFORM TO ASTM F 679 (SDR 35 MINIMUM). FORCE MAINS AND FITTINGS SHALL CONFORM TO NH CODE OF ADMINISTRATIVE RULES ENV-WQ 700. ALL SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH NH CODE OF ADMINISTRATIVE RULES ENV-WQ 700. SANITARY MANHOLES SHALL CONFORM TO NHDES WATER DIVISION WASTEWATER ENGINEERING BUREAU STANDARDS AND SPECIFICATIONS SHOWN HEREON.

10. ON-SITE WATER DISTRIBUTION SHALL BE TO CITY OF PORTSMOUTH STANDARDS AND SPECIFICATIONS. WATER MAINS SHALL HAVE A MINIMUM OF 5.5' COVER. WHERE WATER PIPES CROSS SEWER LINES A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN THE TWO OUTSIDE PIPE WALLS SHALL BE OBSERVED. HORIZONTAL SEPARATION BETWEEN WATER AND SEWER SHALL BE 10' MINIMUM. WHERE A SANITARY LINE CROSSES A WATER LINE, SEWER LINE MUST BE CONSTRUCTED OF FORCE MAIN MATERIALS (PER ENV-WQ 704.08) FROM BUILDING OR MANHOLE TO MANHOLE, OR SUBSTITUTE RUBBER-GASKETED PRESSURE PIPE FOR THE SAME DISTANCE. WHEN SANITARY LINES PASS BELOW WATER LINES, LAY PIPE SO THAT NO JOINT IN THE SANITARY LINE WILL BE CLOSER THAN 6' HORIZONTALLY TO THE WATER LINE.

11. THRUST BLOCKS SHALL BE PROVIDED AT ALL LOCATIONS WHERE WATER LINE CHANGES DIRECTIONS OR CONNECTS TO ANOTHER WATER LINE.

12. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CONDUIT AND WIRING TO ALL SIGNS AND LIGHTS. CONDUIT TO BE A MINIMUM OF 24" BELOW FINISH GRADE.

13. ALL PROPOSED UTILITIES SHALL BE UNDERGROUND. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES.

14. THE CONTRACTOR SHALL ARRANGE AND PAY FOR ALL INSPECTIONS, TESTING, AND RELATED SERVICES AND SUBMIT COPIES OF ACCEPTANCE TO THE OWNER, UNLESS OTHERWISE INDICATED.

15. PROVIDE PERMANENT PAVEMENT REPAIR FOR ALL UTILITY TRENCHES IN EXISTING ROAD OR PAVEMENT TO REMAIN. SAW CUT TRENCH, PAVEMENT, AND GRANULAR BASE THICKNESS TO MATCH EXISTING PAVEMENT. OBTAIN ALL PERMITS REQUIRED FOR TRENCHING.

16. UNLESS OTHERWISE SPECIFIED, ALL UNDERGROUND STRUCTURES, PIPES, CHAMBERS, ETC. SHALL BE COVERED WITH A MINIMUM OF 18" OF COMPACTED SOIL BEFORE EXPOSURE TO VEHICLE LOADS.

17. THE PROPERTY WILL BE SERVICED BY THE FOLLOWING:

DRAINAGE	MUNICIPAL
SEWER	MUNICIPAL
WATER	MUNICIPAL
GAS	UNITIL
ELECTRIC	EVERSOURCE
TELEPHONE	CONSOLIDATED COMMUNICATIONS FKA FAIRPOINT COMMUNICATIONS
CABLE	COMCAST XFINITY

JOHN J. McTIGUE
No. 14950

REV	DATE	DESCRIPTION	DR	CK
1	6/16/2025	REVISED PER TAC WORKSHOP	DKS	JJM

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

NOTES & LEGEND

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH
PREPARED FOR
PHA HOUSING DEVELOPMENT LTD.

SCALE: NTS

JANUARY 29, 2025

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FILE	47528.00	DR	JKC	FB		C-01
		CK	JJM	CADFILE	47528-00_COVER	

Jun 16, 2025 - 4:29pm
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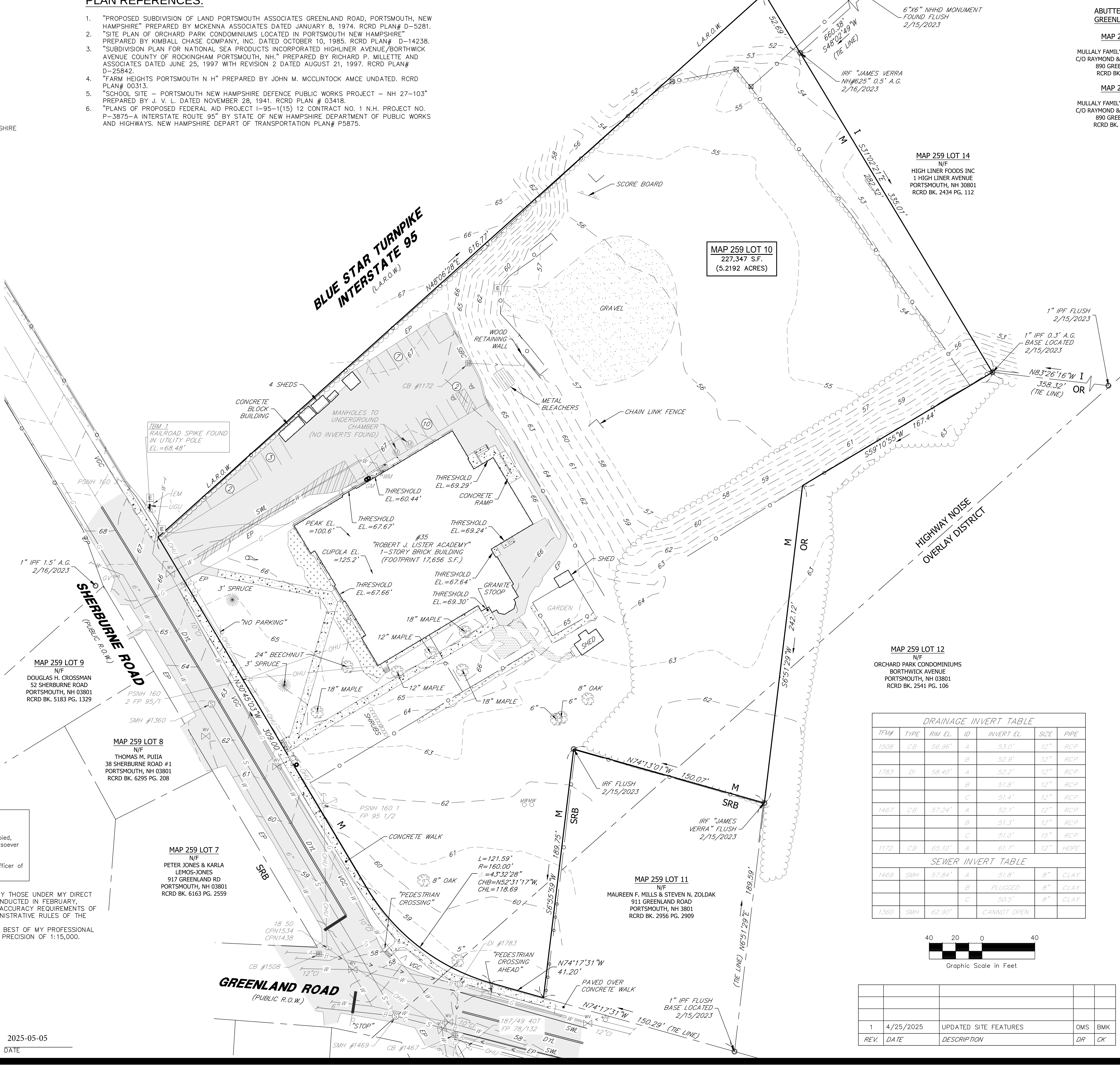
LEGEND:

MAP 259 LOT 10	ASSESSORS MAP/ LOT NUMBER
A.G.	ABOVE GRADE
BK. PG.	BOOK/PAGE
CI	CAST IRON
DI	DROP INLET
DYL	DOUBLE YELLOW LINE
EL.	ELEVATION
EM	ELECTRIC METER
EP	EDGE OF PAVEMENT
FP	FAIR POINT
GM	GAS METER
IPF	IRON PIPE FOUND
IRF	IRON ROD FOUND
L.A.R.O.W.	LIMITED ACCESS RIGHT OF WAY
MW	MONITORING WELL
N/F	NOW OR FORMERLY
PSNH	PUBLIC SERVICE OF NEW HAMPSHIRE
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
R.O.W.	RIGHT OF WAY
S.F.	SQUARE FEET
SBC	SLOPED BITUMINOUS CURB
SMH	SEWER MANHOLE
SWL	SINGLE WHITE LINE
TBM	TEMPORARY BENCHMARK
VGC	VERTICAL GRANITE CURB
VCC	VERTICAL CONCRETE CURB
WM	WATER METER
I	INDUSTRIAL
M	MUNICIPAL
OR	OFFICE RESEARCH
SRB	SINGLE RESIDENCE B
⦿	BOLLARD
▦	CATCH BASIN
Ⓓ	DROP INLET
E	ELECTRIC BOX
⟜	GUY WIRE
◎	IRON PIPE/ROD FOUND
⊸	UTILITY POLE
☒	POST
⊸	FLAG POLE
✳	CONIFEROUS TREE
✿	DECIDUOUS TREE
CO	CLEAN OUT
Ⓢ	SEWER MANHOLE
GV ⋈	GAS VALVE
♿	HANDICAP PARKING
MW ○	MONITORING WELL
HYD	HYDRANT
WV ⋈	WATER GATE VALVE
⊖	SIGN
③	PARKING COUNT
━━━	BOUNDARY LINE
─── ─ ───	APPROX. ABUTTERS LINE
── ─ ─ ──	ZONE LINE
──○──○──	CHAINLINK FENCE
⌒⌒⌒⌒	TREE LINE
──S──	SEWER LINE
──G──	GAS LINE
──W──	WATER LINE
──OHU──	OVERHEAD UTILITIES
──> ──>	DRAINAGE LINE
— — 100 — —	EXISTING CONTOUR
▨	CONCRETE
▨	CRUSHED STONE
▨	GRAVEL
▨	PAVEMENT
▨	LANDSCAPED AREA
▨	TRACTION MAT

PLAN REFERENCES:

1. "PROPOSED SUBDIVISION OF LAND PORTSMOUTH ASSOCIATES GREENLAND ROAD, PORTSMOUTH, NEW HAMPSHIRE" PREPARED BY MCKENNA ASSOCIATES DATED JANUARY 8, 1974. RCRD PLAN# D-5281.
2. "SITE PLAN OF ORCHARD PARK CONDOMINIUMS LOCATED IN PORTSMOUTH NEW HAMPSHIRE" PREPARED BY KIMBALL CHASE COMPANY, INC. DATED OCTOBER 10, 1985. RCRD PLAN# D-14238.
3. "SUBDIVISION PLAN FOR NATIONAL SEA PRODUCTS INCORPORATED HIGHLINER AVENUE/BORTHWICK AVENUE COUNTY OF ROCKINGHAM PORTSMOUTH, NH." PREPARED BY RICHARD P. MILLETTE AND ASSOCIATES DATED JUNE 25, 1997 WITH REVISION 2 DATED AUGUST 21, 1997. RCRD PLAN# D-25842.
4. "FARM HEIGHTS PORTSMOUTH N H" PREPARED BY JOHN M. MCCLINTOCK AMCE UNDATED. RCRD PLAN# 00313.
5. "SCHOOL SITE – PORTSMOUTH NEW HAMPSHIRE DEFENCE PUBLIC WORKS PROJECT – NH 27-103" PREPARED BY J. V. L. DATED NOVEMBER 28, 1941. RCRD PLAN # 03418.
6. "PLANS OF PROPOSED FEDERAL AID PROJECT I-95-1(15) 12 CONTRACT NO. 1 N.H. PROJECT NO. P-3875-A INTERSTATE ROUTE 95" BY STATE OF NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS. NEW HAMPSHIRE DEPART OF TRANSPORTATION PLAN# P5875.



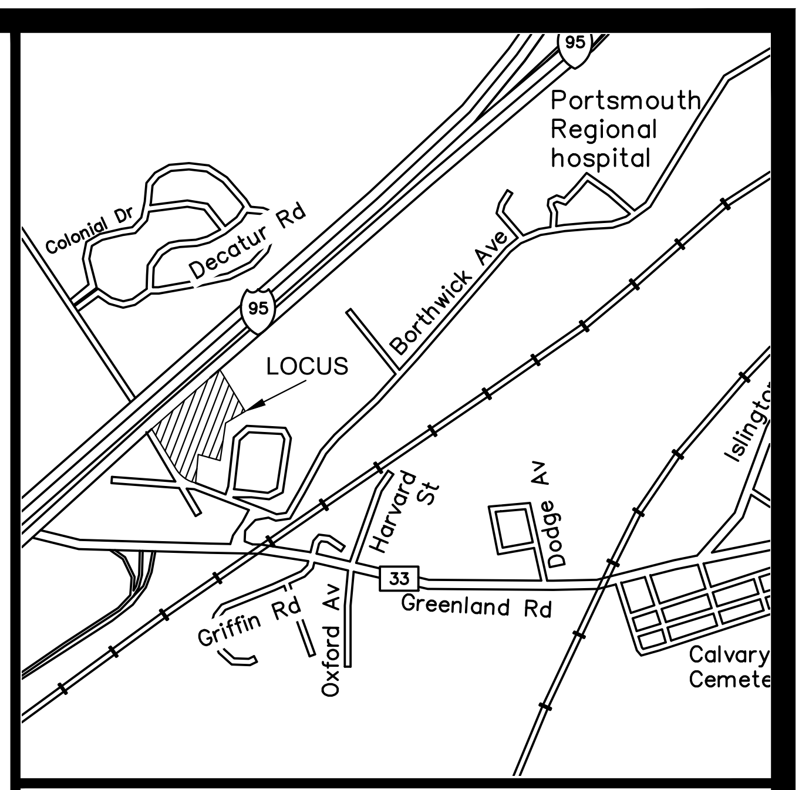
ABUTTERS ACROSS GREENLAND ROAD:

MAP 262 LOT 1
N/F
MULLALY FAMILY REVOCABLE TRUST
C/O RAYMOND & SHIRLEY J. MULLALY
890 GREENLAND ROAD
RCRD BK. 5461 PG. 47

MAP 259 LOT 4
N/F
MULLALY FAMILY REVOCABLE TRUST
C/O RAYMOND & SHIRLEY J. MULLALY
890 GREENLAND ROAD
RCRD BK. 4252 PG. 2877

N

NAD83(2011)



LOCATION PLAN

NOTES:

1. THE PARCEL IS LOCATED IN THE MUNICIPAL (M) ZONING DISTRICT AND THE HIGHWAY NOISE OVERLAY DISTRICT.
2. THE PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 259 AS LOT 10.
3. THE PARCEL IS LOCATED IN FLOOD ZONE X, AS SHOWN ON NATIONAL FLOOD INSURANCE PROGRAM (NFIP), FLOOD INSURANCE RATE MAP (FIRM) ROCKINGHAM COUNTY, NEW HAMPSHIRE, PANEL 270 OF 681, MAP NUMBER 33015C0270F, MAP REVISED JANUARY 21, 2021.
4. PER THE CITY OF PORTSMOUTH ZONING ORDINANCE ARTICLE 5 SECTION 10.560 LOTS AND BUILDINGS IN THE MUNICIPAL DISTRICT ARE EXEMPT FROM ALL DIMENSIONAL AND INTENSITY REGULATIONS.
5. OWNER OF RECORD:
   MAP 259 LOT 10:
   CITY OF PORTSMOUTH
   PO BOX 628
   PORTSMOUTH, NH 03802
   RCRD BK#2389 PG#1272
6. PARCEL AREA:
   MAP 259 LOT 10:
   227,347 S.F.
   (5.2192 ACRES)
7. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH THE CURRENT LEGAL DESCRIPTIONS. IT IS NOT AN ATTEMPT TO DEFINE THE EXTENT OF OWNERSHIP OR DEFINE THE LIMITS OF TITLE.
8. THE PURPOSE OF THIS PLAN IS TO SHOW THE BOUNDARY LINES, TOPOGRAPHY AND CURRENT SITE CONDITIONS OF MAP 259 LOT 10.
9. FIELD SURVEY COMPLETED BY TCE & RJB IN FEBRUARY, 2023 & APRIL 24, 2025 USING A LEICA TS-16, A TOPCON HIPER-V AND CARLSON DATA COLLECTION SOFTWARE.
10. HORIZONTAL DATUM IS NAD83 (2011) PER NETWORK RTK GPS OBSERVATIONS. THE VERTICAL DATUM IS NAVD88 PER NETWORK RTK GPS OBSERVATIONS. THE CONTOUR INTERVAL IS 1 FOOT.
11. EASEMENTS, RIGHTS, AND RESTRICTIONS SHOWN OR IDENTIFIED ARE THOSE WHICH WERE FOUND DURING RESEARCH PERFORMED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS. OTHER RIGHTS, EASEMENTS, OR RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF SUBJECT PARCEL(S) WOULD DETERMINE.
12. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. TFMORAN, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UNDERGROUND UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE.

DRAINAGE INVERT TABLE

TFM#	TYPE	RIM EL.	ID	INVERT EL.	SIZE	PIPE
1508	CB	56.96'	A	53.0'	12"	RCP
			B	52.9'	12"	RCP
1783	DI	58.40'	A	52.2'	12"	RCP
			B	51.8'	12"	RCP
			C	51.4'	12"	RCP
1467	CB	57.24'	A	52.1'	12"	RCP
			B	51.3'	12"	RCP
			C	51.0'	15"	RCP
1172	CB	65.10'	A	61.7'	12"	HDPE

SEWER INVERT TABLE

1469	SMH	57.84'	A	51.8'	8"	CLAY
			B	PLUGGED	8"	CLAY
			C	50.5'	8"	CLAY
1360	SMH	62.90'		CANNOT OPEN		

40 20 0 40

Graphic Scale in Feet

DIG SAFE

MA ME NH RI VT

UTILITIES UNDER GROUND PLANT DAMAGE PREVENTION SYSTEM

CALL 811 TOLL FREE

CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY THOSE UNDER MY DIRECT SUPERVISION AND ARE THE RESULT OF A FIELD SURVEY CONDUCTED IN FEBRUARY, 2023 & APRIL 24, 2025. THIS SURVEY CONFORMS TO THE ACCURACY REQUIREMENTS OF AN URBAN SURVEY OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS.
I FURTHER CERTIFY THAT THIS SURVEY IS CORRECT TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, AND THE FIELD TRAVERSE SURVEY EXCEEDS A PRECISION OF 1:15,000.

STATE OF NEW HAMPSHIRE
No. 01037
BRENDA M. KOLBOW
LICENSED LAND SURVEYOR
Brenda Kolbow
SIGNATURE

LICENSED LAND SURVEYOR

2025-05-05
DATE

1	4/25/2025	UPDATED SITE FEATURES	OMS	BMK
REV.	DATE	DESCRIPTION	DR	CK

TAX MAP 259 LOT 10

EXISTING CONDITIONS PLAN
PORTSMOUTH HOUSING AUTHORITY
35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
COUNTY OF ROCKINGHAM
OWNED BY
CITY OF PORTSMOUTH

SCALE: 1" = 40' (22x34)
1" = 80' (11x17)

March 10, 2023

Seacoast Division

TFM®

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.tfmoran.com

FILE	47528-00	DR	RJB	FB	593	S-1
		CK	BMK	CADFILE		

May 05, 2025 - 11:11am
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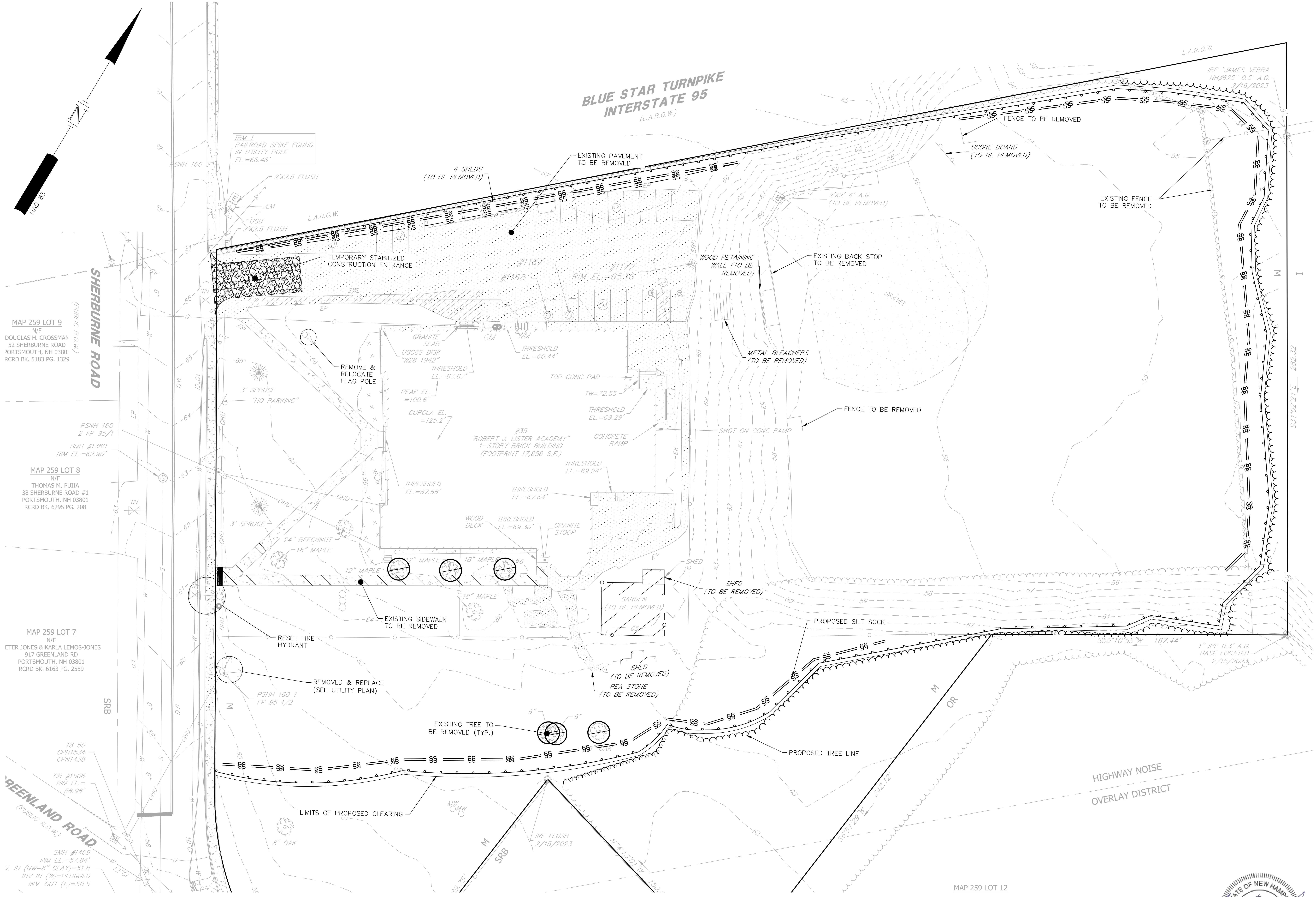

NOTES

1. SEE NOTES ON SHEET C-01.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATIONS, SIZE, AND ELEVATIONS OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS PRIOR TO THE START OF ANY DEMOLITION. THE LOCATIONS SHOWN ON THESE PLANS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES INTERFERING WITH THE PROPOSED DEMOLITION TO DETERMINE APPROPRIATE ACTION TO BE TAKEN BEFORE PROCEEDING WITH THE WORK. IT IS ALSO THE CONTRACTOR'S RESPONSIBILITY TO ANTICIPATE CONFLICTS AND REPAIR EXISTING UTILITIES AS NECESSARY TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
3. THE CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY WORK AT ALL TIMES.
4. THE CONTRACTOR SHALL VERIFY ALL SURVEY INFORMATION IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO THE START OF CONSTRUCTION.
5. EXISTING UTILITY SERVICES TO BE DISCONTINUED ARE TO BE CAPPED AS REQUIRED BY THE RESPECTIVE UTILITY COMPANIES.
6. CONSTRUCTION DEBRIS AND INVASIVE SPECIES SHALL BE REMOVED FROM SITE AND DISPOSED OF IN A LEGAL MANNER.
7. PRIOR TO THE START OF WORK, THE CONTRACTOR SHALL PLACE ORANGE CONSTRUCTION FENCING AROUND EACH TREE TO BE RETAINED THROUGHOUT CONSTRUCTION. NO STOCKPILES OF MATERIAL ARE PERMITTED WITHIN THE DRIP LINE OF THE TREES TO BE SAVED.
8. CONTACT THE LANDSCAPE ARCHITECT IMMEDIATELY IF ANY TREES ARE DAMAGED DURING CONSTRUCTION.

CONSTRUCTION SEQUENCE NOTES

TO MINIMIZE EROSION AND SEDIMENTATION DUE TO CONSTRUCTION, CONSTRUCTION SHALL FOLLOW THIS GENERAL CONSTRUCTION SEQUENCE.

MODIFICATIONS TO THE SEQUENCE NECESSARY DUE TO THE CONTRACTOR'S SCHEDULE SHALL INCLUDE APPROPRIATE TEMPORARY AND PERMANENT EROSION AND SEDIMENTATION CONTROL MEASURES.

THE CONTRACTOR SHALL SCHEDULE WORK SUCH THAT ANY CONSTRUCTION AREA IS STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE EXCEPT AS NOTED BELOW. NO MORE THAN 5 ACRES OF DISTURBED LAND SHALL BE UNSTABILIZED AT ANY ONE TIME.

THE PROJECT SHALL BE MANAGED SO THAT IT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER ARG 3800 RELATIVE TO INVASIVE SPECIES.

DO NOT TRAFFIC EXPOSED SOIL SURFACE OF INFILTRATION SYSTEMS WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.

DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO STORMWATER BMP'S. STORMWATER RUNOFF MUST BE DIRECTED TO TEMPORARY PRACTICES UNTIL STORMWATER BMP'S ARE STABILIZED.

DO NOT PLACE STORMWATER BMP'S INTO SERVICE UNTIL THE CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.

AFTER THE INFILTRATION SYSTEM IS EXCAVATED TO THE FINAL DESIGN ELEVATION, THE FLOOR SHOULD BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW TO RESTORE THE INFILTRATION RATES, FOLLOWED BY A PASS WITH A LEVELING DRAG.

1. NOTIFY EASEMENT OWNERS PRIOR TO COMMENCEMENT OF WORK.
2. INSTALL ALL PERIMETER EROSION PROTECTION MEASURES AS INDICATED ON THE PLANS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
3. STORMWATER TREATMENT PONDS AND SWALES SHALL BE INSTALLED BEFORE ROUGH GRADING THE SITE.
4. DURING CONSTRUCTION EVERY EFFORT SHALL BE MADE TO MANAGE SURFACE RUNOFF QUALITY.
5. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, SILT BARRIERS, SEDIMENT TRAPS, ETC. MULCH AND SEED AS REQUIRED. (TEMPORARY SEED MIXTURE OF WINTER RYE APPLIED AT A RATE OF 2.5 LBS/1000 SF SHALL BE USED).
6. CONDUCT MAJOR EARTHWORK, INCLUDING CLEARING AND GRUBBING, WITHIN THE LIMITS OF WORK. ALL CUT AND FILL SLOPES SHALL BE SEEDED WITHIN 72 HOURS AFTER GRADING.
7. ALL STRIPPED TOPSOIL AND OTHER EARTH MATERIALS SHALL BE STOCKPILED OUTSIDE THE IMMEDIATE WORK AND WETLAND AREAS. A SILT BARRIER SHALL BE CONSTRUCTED AROUND THESE PILES IN A MANNER TO PROVIDE ACCESS AND AVOID SEDIMENT OUTSIDE OF THE WORK AREA.
8. CONSTRUCT BUILDING PAD AND COMMENCE NEW BUILDING CONSTRUCTION.
9. CONSTRUCT TEMPORARY CULVERTS AND DIVERSIONS AS REQUIRED.
10. BEGIN PERMANENT AND TEMPORARY INSTALLATION OF SEED AND MULCH.
11. PERFORM EARTHWORK NECESSARY TO ESTABLISH ROUGH GRADING AROUND PARKING FIELDS AND ACCESS DRIVES. MANAGE EXPOSED SOIL SURFACES TO AVOID TRANSPORTING SEDIMENTS INTO WETLANDS. PARKING LOTS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
12. INSTALL SUBSURFACE UTILITIES (WATER, SEWER, GAS, ELECTRIC, COMMUNICATIONS, DRAINAGE, DRAINAGE FACILITIES, ETC.).
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14. COMPLETE BUILDING AND ALL OFF-SITE IMPROVEMENTS.
15. COMPLETE SEEDING AND MULCHING. SEED TO BE APPLIED WITH BROADCAST SPREADER OR BY HYDRO-SEEDING, THEN ROLLED, RAKED, OR DRAGGED TO ASSURE SEED/SOIL CONTACT.
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18. SEE WINTER CONSTRUCTION SEQUENCE FOR WORK CONDUCTED AFTER OCTOBER 15TH.

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

SITE PREPARATION & DEMOLITION PLAN PHASE 1

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH
PREPARED FOR
PHA HOUSING DEVELOPMENT LTD.
1"=60' (11"X17")
SCALE: 1"=30' (22"X34")
JANUARY 29, 2025

JOHN J. McTIGUE No. 14950

CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

HORIZONTAL SCALE 1"=30'
30 15 0 30

REV	DATE	DESCRIPTION	DR	CK
1	6/16/2025	REVISED PER TAC WORKSHOP	DKS	JJM

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

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Bedford, NH 03110
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Fax (603) 472-9747
www.tfmoran.com

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	CK	JJM	CADFILE	47528-00_SITE PREP_PHASE 1	

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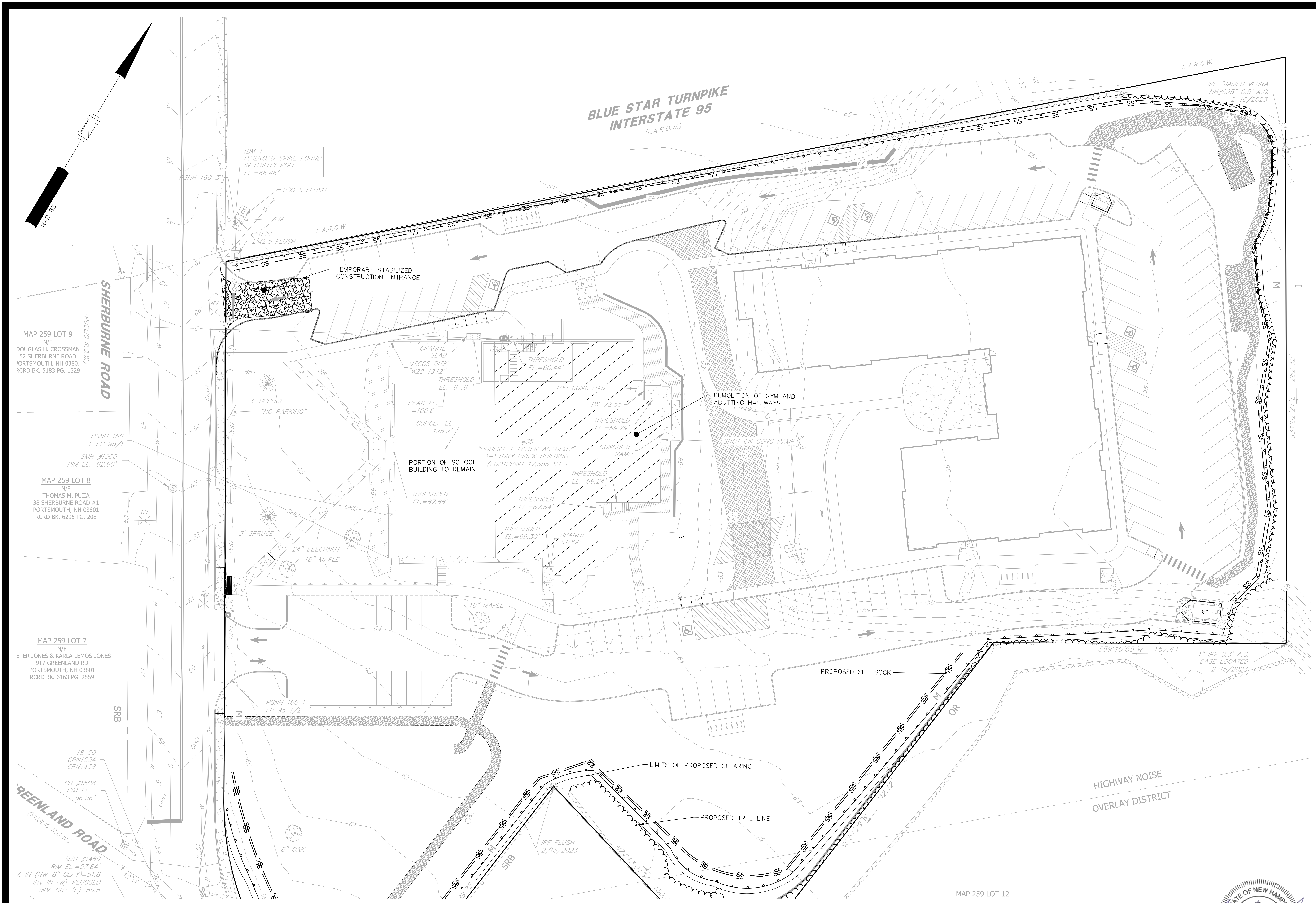

NOTES

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9. CONSTRUCT TEMPORARY CULVERTS AND DIVERSIONS AS REQUIRED.
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18. SEE WINTER CONSTRUCTION SEQUENCE FOR WORK CONDUCTED AFTER OCTOBER 15TH.

CONSTRUCTION SEQUENCE NOTES (FOR ALTERATION OF TERRAIN)

1. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO BMP'S DURING ANY STAGE OF CONSTRUCTION.
2. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.
3. AFTER INFILTRATION SYSTEMS ARE EXCAVATED TO THE FINAL DESIGN ELEVATION, THE FLOOR SHOULD BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW TO RESTORE INFILTRATION RATES, FOLLOWED BY A PASS WITH A LEVELING DRAG.
4. DO NOT PLACE STORMWATER BMP'S INTO SERVICE UNTIL THE CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
5. DO NOT PLACE STORMWATER BMP'S INTO SERVICE UNTIL THE BMP HAS BEEN PLANTED, IF NECESSARY, AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.

DIG SAFE
CONTACT DIG SAFE 72 BUSINESS
HOURS PRIOR TO CONSTRUCTION

Jun 16, 2025 - 4:29pm
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HORIZONTAL SCALE 1"=30'
30 15 0 30

JOHN J. McTIGUE
No. 14950

REV	DATE	DESCRIPTION	DR	CK
1	6/16/2025	REVISED PER TAC WORKSHOP	DKS	JJM

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

SITE PREPARATION & DEMOLITION PLAN PHASE 2

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH
PREPARED FOR
PHA HOUSING DEVELOPMENT LTD.
1"=60' (11"X17")
SCALE: 1"=30' (22"X34")
JANUARY 29, 2025

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FILE 47528.00
DR JKC FB
CK JJM CADFILE 47528-00_SITE PREP_PHASE 2

C-03

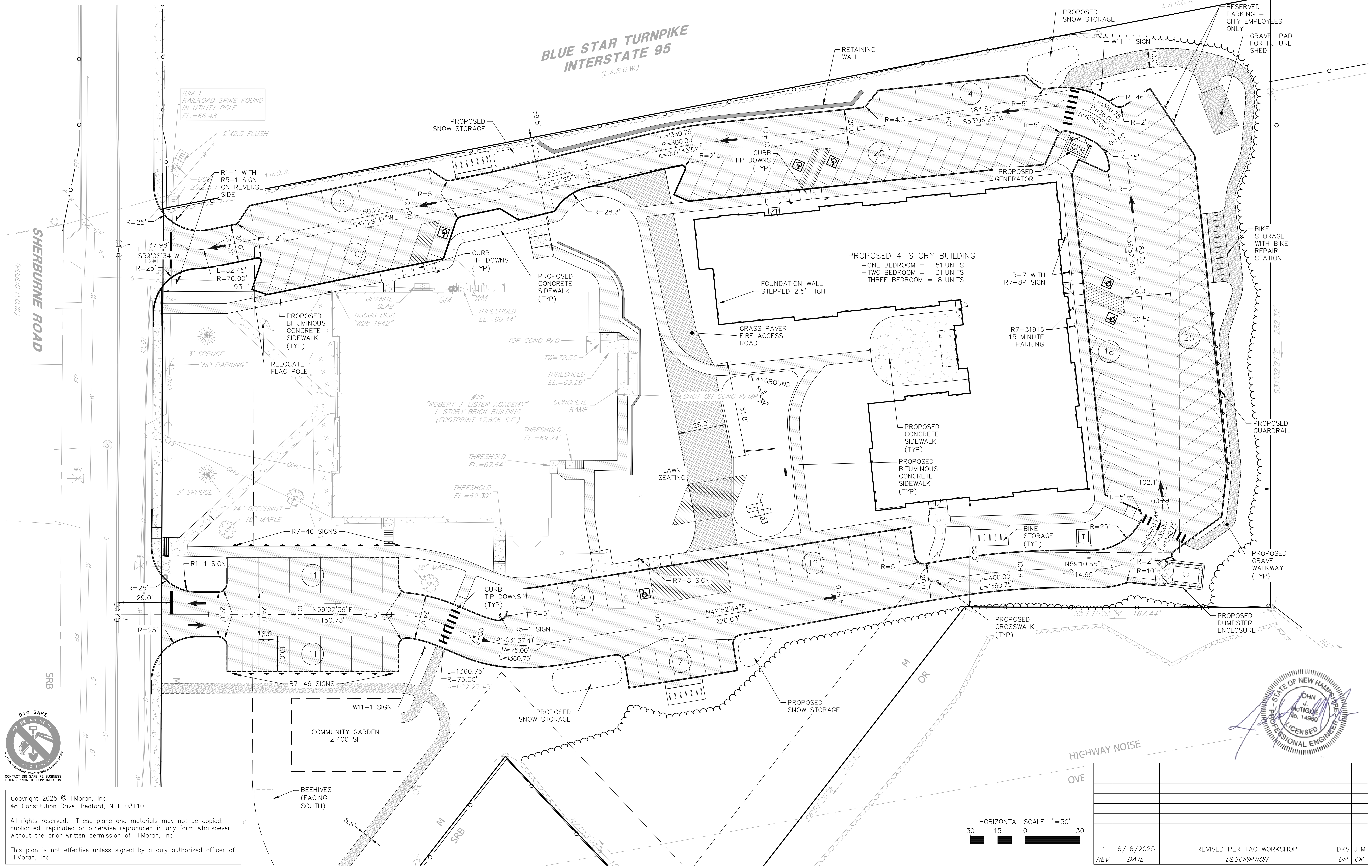
SIGN LEGEND

ID	SIGN	SIZE (INCHES)		DESIGN (COLORING, TEXT SIZE, SPACING, SHAPE, RETROFLECTIVITY, ETC.)	NO. OF SIGNS
		WIDTH	HEIGHT		
R1–1	STOP	30	30	REFER TO THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS	1
R7–8[1]	RESERVED PARKING ♿ ↔	12	18		1
R7–8P[2]	VAN ACCESSIBLE	18	9		1
W11–1	🚶	30	30		1

SIGN LEGEND

ID	SIGN	SIZE (INCHES)		DESIGN (COLORING, TEXT SIZE, SPACING, SHAPE, RETROFLECTIVITY, ETC.)	NO. OF SIGNS
		WIDTH	HEIGHT		
R5–1	DO NOT ENTER	30	30	REFER TO THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS	1
R7–M11	15 MIN. PARKING	12	18		1
H–3543	EMPLOYEE PARKING ONLY	12	18		1
R7–46	VISITOR PARKING ONLY	12	18		1

NOTE:
1. HANDICAP PARKING SIGNS SHALL BE IN ACCORDANCE WITH CITY OF PORTSMOUTH STANDARDS AND ADA REGULATIONS.
2. PER ADA STANDARDS, A "VAN ACCESSIBLE" PLAQUE DOES NOT RESTRICT USE OF ACCESSIBLE SPACES TO VAN USERS ONLY.



SITE DATA

OWNER OF RECORD OF MAP 259 LOT 10: CITY OF PORTSMOUTH SCHOOLS, PO BOX 628, PORTSMOUTH, NH 03802
DEED REFERENCE TO PARCEL IS BK 2389 PG 1272
AREA OF PARCEL = 227,347± SF OR 5.22± ACRES

ZONED: MUNICIPAL
EXISTING USE: SCHOOL
PROPOSED USE: MIXED USE

THE PURPOSE OF THIS PLAN IS TO DEPICT A 90 UNIT WORK FORCE HOUSING BUILDING WITH ASSOCIATED IMPROVEMENTS INCLUDING ACCESS, GRADING, STORMWATER MANAGEMENT SYSTEMS, UTILITIES, LIGHTING, AND LANDSCAPING.

DIMENSIONAL REQUIREMENTS (CURRENT ZONING)

	REQUIRED:	PROVIDED:
MINIMUM LOT DIMENSIONS:		
LOT AREA	NA SF	227,347± SF (5.22± AC)
LOT FRONTAGE	NA FT	471.79 FT
DEPTH	NA FT	606 FT
MAXIMUM STRUCTURE DIMENSIONS:		
STRUCTURE HEIGHT	NA	38.8 FEET
STRUCTURE STORIES	NA	4 STORIES
ROOF APPURTENANCE HEIGHT	NA	44.1 FT
LOT COVERAGE	NA	52.7%
MINIMUM SETBACKS/BUFFER:		
BUILDING FRONT	NA FT	93.1 FT
BUILDING SIDE	NA FT	58.0 FT
BUILDING REAR	NA FT	102.1 FT
MINIMUM OPEN SPACE	NA	33.8%

PHASE 1 – PARKING REQUIREMENTS

RESIDENTIAL (SEE CALCULATION)	120 SPACES	131 RESIDENTIAL SPACES
OFFICE	1 SPACES	2 SPACES
TOTAL	121 SPACES	132 SPACES
ACCESSIBLE SPACES (REQ'D BY ADA)	6 SPACES	6 SPACES
PARKING SPACE SIZE	8.5 FT X 19 FT	8.5 FT X 19 FT
AISLE WIDTH	18–24 FT	18–24 FT

PHASE 1 – PARKING CALCULATIONS

REQUIRED PARKING RATIO:
RESIDENTIAL: 1.3 SPACES PER UNIT > 750 SF
1 SPACE PER UNIT 600–750 SF
1 VISITOR SPACE PER 5 UNITS OR PORTION THEREOF
OFFICE:
1 SPACE REQUIRED
TOTAL REQUIRED = 51 UNITS * 10 SPACES/UNIT = 51.0 SPACES
39 UNITS * 1 SPACE = 50.7 SPACES
90 UNITS * 1 SPACE/5 UNITS = 18.0 SPACES
1 OFFICE * 1 SPACE/OFFICE = 1.0 SPACES

TOTAL = 120.7 SPACES

NOTES

1. SEE NOTES ON SHEET C–01.
2. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS NOTED OTHERWISE.
3. LIGHTING, SIGNAGE, LANDSCAPING, AND SCREENING SHALL MEET THE REQUIREMENTS OF THE PORTSMOUTH, NH ZONING ORDINANCE AND SITE PLAN REVIEW REGULATIONS.
4. SNOW SHALL NOT BE STOCKPILED IN STORMWATER BMP'S, WETLAND BUFFERS, OR WETLANDS. SEE SNOW STORAGE LOCATIONS. IN THE EVENT THAT THE SNOW STORAGE AREAS PROVIDED ON THE SITE ARE COMPLETELY UTILIZED, EXCESS SNOW SHALL BE TRANSPORTED OFF SITE FOR DISPOSAL IN ACCORDANCE WITH NHDES REGULATION. IF SNOW IS STORED WITHIN PARKING AREA, KEEP CATCH BASINS CLEAR.
5. THE 3' PANEL ALONG THE PARKING LOT EDGE & DRIVE SHALL BE USED FOR SNOW STORAGE.
6. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
7. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
8. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

CITY OF PORTMOUTH PLANNING BOARD

CHAIRPERSON

DATE

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10
SITE LAYOUT PLAN PHASE 1
PROPOSED HOUSING DEVELOPMENT
35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH
PREPARED FOR
PHA HOUSING DEVELOPMENT LTD.
1"=60' (11"X17")
SCALE: 1"=30' (22"X34")
JANUARY 29, 2025

JOHN J. McTIGUE
No. 14950

REV	DATE	DESCRIPTION	DR	CK
1	6/16/2025	REVISED PER TAC WORKSHOP	DKS	JJM

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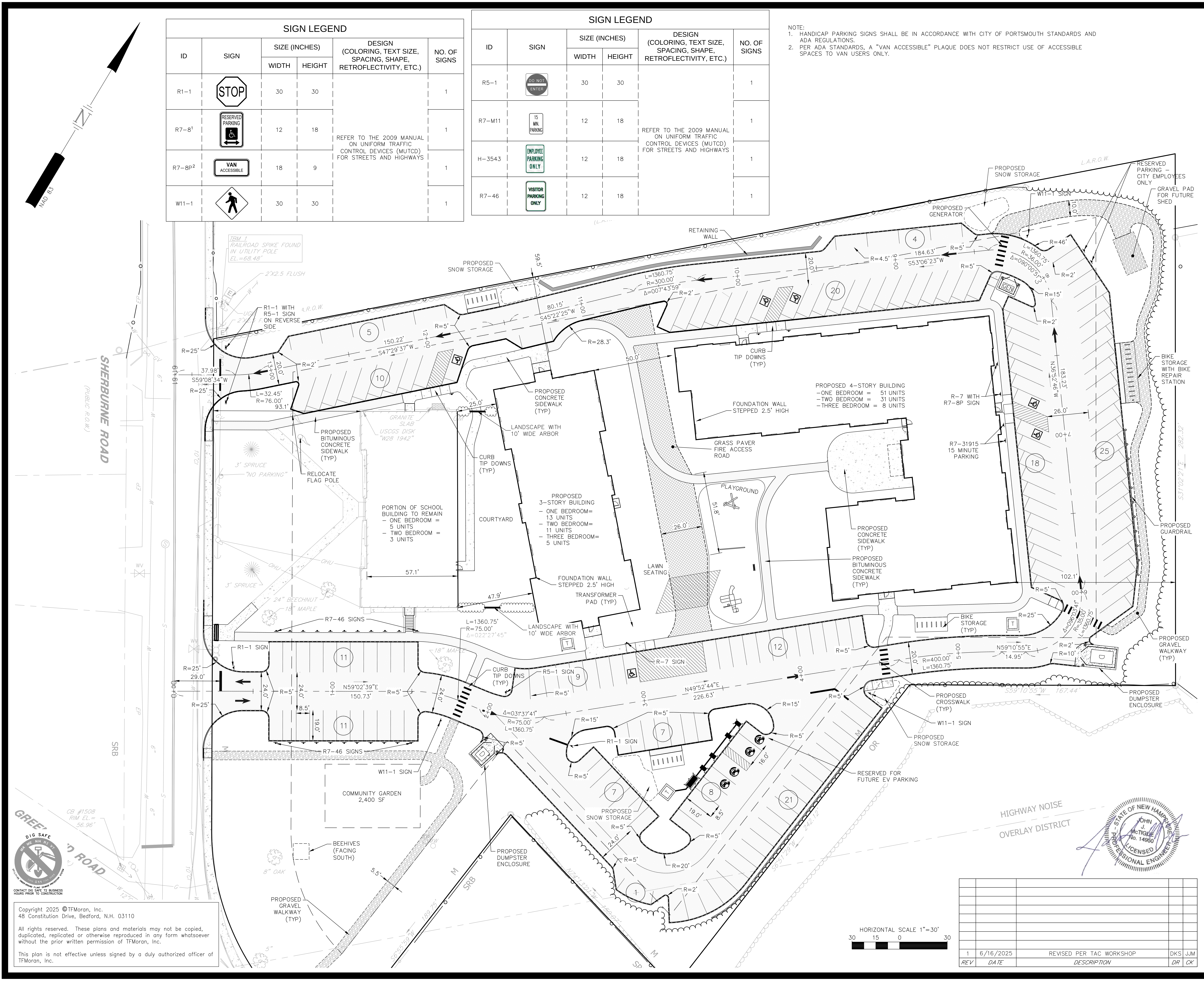

SIGN LEGEND

ID	SIGN	SIZE (INCHES)		DESIGN (COLORING, TEXT SIZE, SPACING, SHAPE, RETROFLECTIVITY, ETC.)	NO. OF SIGNS
		WIDTH	HEIGHT		
R1-1	STOP	30	30	REFER TO THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS	1
R7-8[1]	RESERVED PARKING	12	18		1
R7-8P[2]	VAN ACCESSIBLE	18	9		1
W11-1		30	30		1

SIGN LEGEND

ID	SIGN	SIZE (INCHES)		DESIGN (COLORING, TEXT SIZE, SPACING, SHAPE, RETROFLECTIVITY, ETC.)	NO. OF SIGNS
		WIDTH	HEIGHT		
R5-1	DO NOT ENTER	30	30	REFER TO THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS	1
R7-M11	15 MIN. PARKING	12	18		1
H-3543	EMPLOYEE PARKING ONLY	12	18		1
R7-46	VISITOR PARKING ONLY	12	18		1

NOTE:
1. HANDICAP PARKING SIGNS SHALL BE IN ACCORDANCE WITH CITY OF PORTSMOUTH STANDARDS AND ADA REGULATIONS.
2. PER ADA STANDARDS, A "VAN ACCESSIBLE" PLAQUE DOES NOT RESTRICT USE OF ACCESSIBLE SPACES TO VAN USERS ONLY.

SITE DATA

OWNER OF RECORD OF MAP 259 LOT 10: CITY OF PORTSMOUTH SCHOOLS, PO BOX 628, PORTSMOUTH, NH 03802
DEED REFERENCE TO PARCEL IS BK 2389 PG 1272
AREA OF PARCEL = 232,175± SF OR 5.33± ACRES

ZONED: MUNICIPAL
EXISTING USE: SCHOOL
PROPOSED USE: MIXED USE

THE PURPOSE OF THIS PLAN IS TO CONSTRUCT WORK FORCE HOUSING. ASSOCIATED IMPROVEMENTS INCLUDE AND ARE NOT LIMITED TO ACCESS, GRADING, STORMWATER MANAGEMENT SYSTEMS, UTILITIES, LIGHTING, AND LANDSCAPING.

DIMENSIONAL REQUIREMENTS (CURRENT ZONING)

	REQUIRED:	PROVIDED:
MINIMUM LOT DIMENSIONS:		
LOT AREA	NA SF	232,175± SF (5.33± AC)
LOT FRONTAGE	NA FT	471.79 FT
DEPTH	NA FT	606 FT
MAXIMUM STRUCTURE DIMENSIONS:		
STRUCTURE HEIGHT	NA	38.8 FEET
STRUCTURE STORIES	NA	4 STORIES
ROOF APPURTENANCE HEIGHT	NA	44.1 FT
LOT COVERAGE	NA	59.1%
MINIMUM SETBACKS/BUFFER:		
BUILDING FRONT	NA FT	93.1 FT
BUILDING SIDE	NA FT	48.8 FT
BUILDING REAR	NA FT	89.5 FT
MINIMUM OPEN SPACE	NA	40.9%

PARKING REQUIREMENTS

	REQUIRED:	PROVIDED:
RESIDENTIAL		
PARKING SPACES (SEE CALCULATION)	165 SPACES	165 RESIDENTIAL SPACES
OFFICE		
OFFICE	1 SPACE	1 SPACE
	166 SPACES	168 SPACES
TOTAL		
ACCESSIBLE SPACES (REQ'D BY ADA)	6 SPACES	6 SPACES
PARKING SPACE SIZE	8.5 FT X 19 FT	8.5 FT X 19 FT
AISLE WIDTH	18–24 FT	18–24 FT

PARKING CALCULATIONS

REQUIRED PARKING RATIO:
RESIDENTIAL: 1.3 SPACES PER UNIT > 750 SF
1 SPACE PER UNIT 600–750 SF
1 VISITOR SPACE PER 5 UNITS OR PORTION THEREOF
OFFICE:
1 SPACE REQUIRED
TOTAL REQUIRED = 53 UNITS * 1.3 SPACES/UNIT = 74.0 SPACES
74 UNITS * 1 SPACE = 65.9 SPACES
127 UNITS * 1 SPACE/5 UNITS = 25.4 SPACES
1 OFFICE * 1 SPACE/OFFICE = 1.0 SPACES

TOTAL = 166.3 SPACES

NOTES

1. SEE NOTES ON SHEET C–01.
2. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS NOTED OTHERWISE.
3. LIGHTING, SIGNAGE, LANDSCAPING, AND SCREENING SHALL MEET THE REQUIREMENTS OF THE PORTSMOUTH, NH ZONING ORDINANCE AND SITE PLAN REVIEW REGULATIONS.
4. SNOW SHALL NOT BE STOCKPILED IN STORMWATER BMP'S, WETLAND BUFFERS, OR WETLANDS. SEE SNOW STORAGE LOCATIONS. IN THE EVENT THAT THE SNOW STORAGE AREAS PROVIDED ON THE SITE ARE COMPLETELY UTILIZED, EXCESS SNOW SHALL BE TRANSPORTED OFF SITE FOR DISPOSAL IN ACCORDANCE WITH NHDES REGULATION. IF SNOW IS STORED WITHIN PARKING AREA, KEEP CATCH BASINS CLEAR.
5. THE 3' PANEL ALONG THE PARKING LOT EDGE & DRIVE SHALL BE USED FOR SNOW STORAGE
6. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
7. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
8. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

CITY OF PORTMOUTH PLANNING BOARD

CHAIRPERSON ____________ DATE ____________

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10
SITE LAYOUT PLAN PHASE 2
PROPOSED HOUSING DEVELOPMENT
35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
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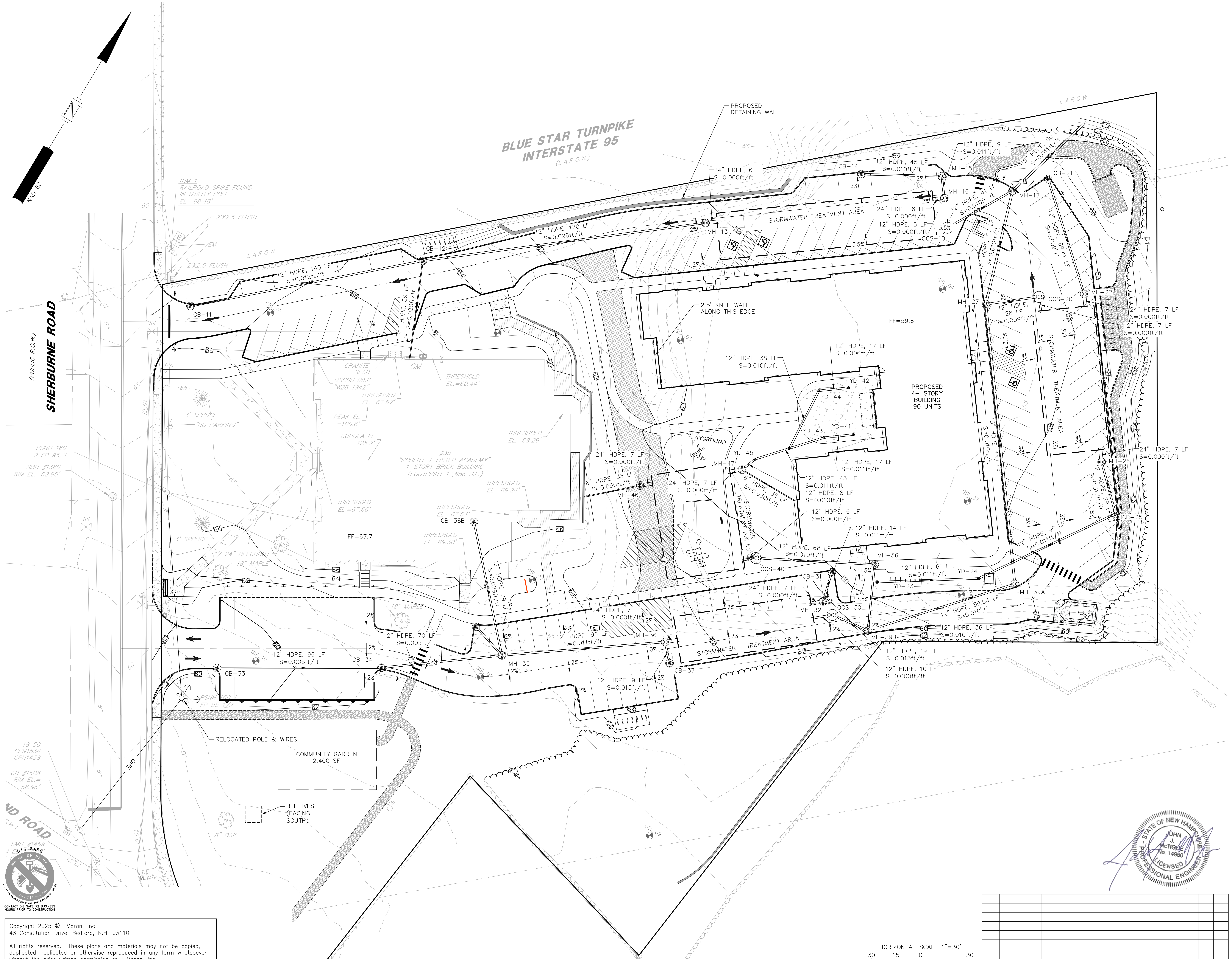

NOTES

1. SEE NOTES ON SHEET C–01.
2. ALL DOORS AND ENTRANCES SHALL BE AT FINISHED FLOOR ELEVATION UNLESS OTHERWISE NOTED.
3. PROPOSED SPOT GRADES ARE PROVIDED TO THE NEAREST 0.05. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE FINISHED GRADES MEET ADA STANDARDS FOR WHEEL CHAIR RAMPS, HANDICAP SPACES AND ACCESS AISLES, CROSSWALKS, SIDEWALKS, ETC.
4. ALL ELEVATIONS SHOWN AT CURB ARE TO THE BOTTOM OF CURB UNLESS OTHERWISE NOTED. CURBS HAVE A 6" REVEAL UNLESS OTHERWISE NOTED.
5. LENGTH OF PIPE IS FOR CONVENIENCE ONLY. ACTUAL PIPE LENGTH SHALL BE DETERMINED IN THE FIELD.
6. DRAINAGE PIPES WITH LESS THAN 3' COVER SHALL BE INSULATED (SEE UTILITY TRENCH DETAIL) AND DRAINAGE CATCH BASINS WITH LESS THAN 3.5' OF COVER OVER INVERTS SHALL USE SLAB TOP CATCH BASIN (SEE DETAILS).
7. THE CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT AND ARCHITECTURAL PLANS FOR SUBDRAINAGE SYSTEMS FOR THE BUILDING FOUNDATION. SUBDRAINAGE MUST DAYLIGHT OR TIE INTO THE STORMWATER MANAGEMENT SYSTEM.

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

GRADING & DRAINAGE PLAN PHASE 1

PROPOSED HOUSING DEVELOPMENT
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C-06

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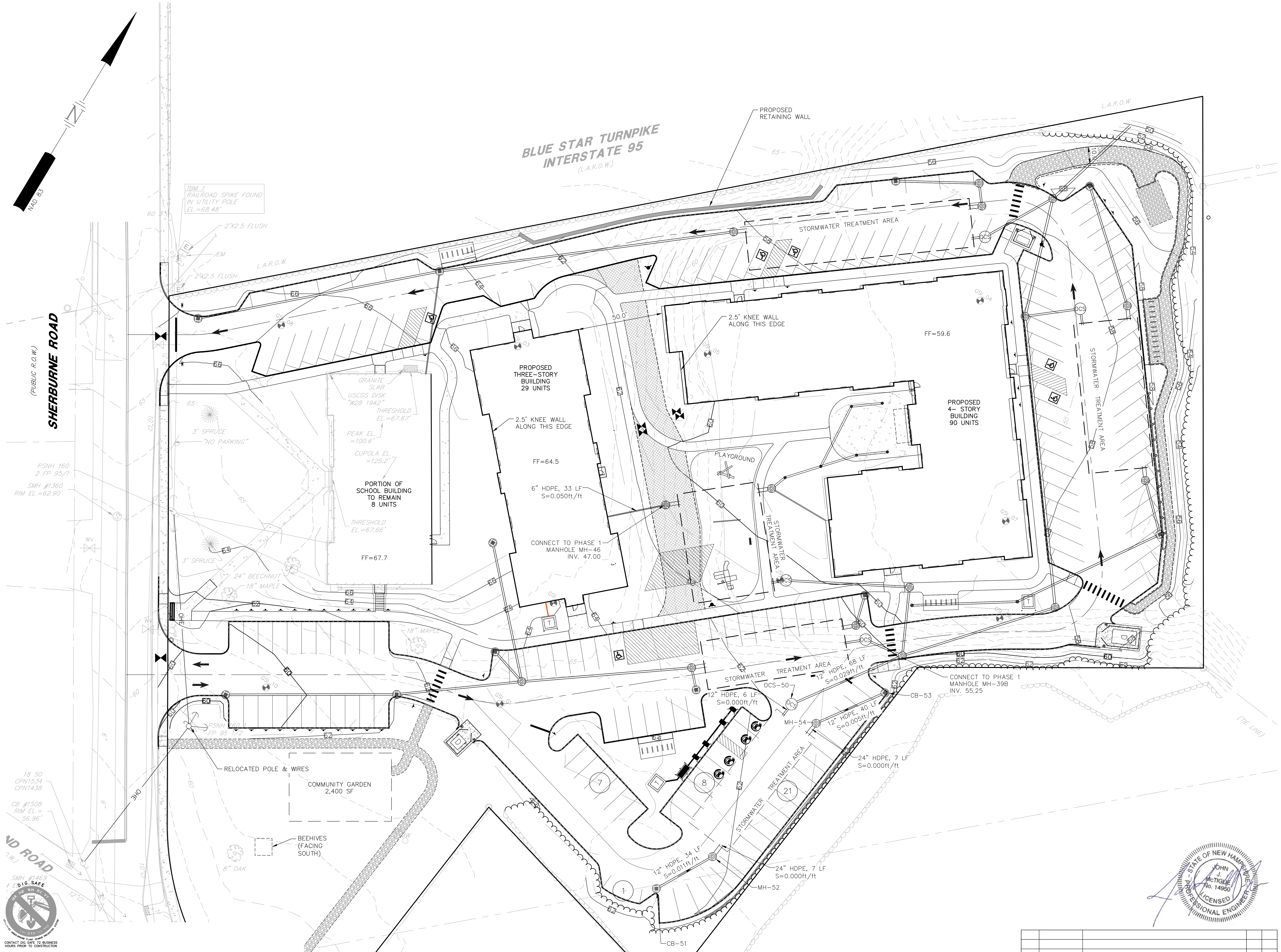

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STRUCTURE TABLE

STRUCTURE NAME	STRUCTURE DETAILS
CB–51	RIM = 62.47 CB–51 INV OUT = 58.30
CB–53	RIM = 60.04 CB–53 INV OUT = 55.90
MH–52	RIM = 62.22 CB–51 INV IN = 57.90 MH–52 INV OUT = 54.10
MH–54	RIM = 61.06 CB–53 INV IN = 55.68 MH–54 INV OUT = 54.10
OCS–50	RIM = 61.41 ST–50 INV IN = 54.10 OCS–50 INV OUT = 57.30

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

GRADING & DRAINAGE PLAN PHASE 2

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
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HORIZONTAL SCALE 1"=30'
30 15 0 30

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C–07

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STRUCTURE TABLE	
STRUCTURE NAME	STRUCTURE DETAILS
CB–11	RIM = 65.15 CB–11 INV OUT = 60.75
CB–12	RIM = 64.45 CB–11 INV IN = 59.05 RL–39 INV IN = 59.65 CB–12 INV OUT = 57.75
CB–14	RIM = 56.48 CB–14 INV OUT = 52.40
CB–21	RIM = 57.08 CB–21 INV OUT = 53.00
CB–25	RIM = 56.63 YD–24 INV IN = 52.90 CB–25 INV OUT = 52.90
CB–31	RIM = 59.68 CB–31 INV OUT = 55.45
CB–33	RIM = 59.11 CB–33 INV OUT = 55.00
CB–34	RIM = 61.38 CB–33 INV IN = 54.45 CB–34 INV OUT = 54.35
CB–37	RIM = 62.70 CB–37 INV OUT = 58.65
CB–38A	RIM = 62.80 CB–38A INV OUT = 58.40
CB–38B	RIM = 67.13 CB–38B INV OUT = 61.65
MH–13	RIM = 58.32 CB–12 INV IN = 53.15 MH–13 INV OUT = 49.55
MH–15	RIM = 57.02 CB–14 INV IN = 51.90 MH–15 INV OUT = 51.80
MH–16	RIM = 57.29 MH–15 INV IN = 51.65 MH–16 INV OUT = 49.55

STRUCTURE TABLE	
STRUCTURE NAME	STRUCTURE DETAILS
MH–17	RIM = 57.51 OCS–10 INV IN = 53.15 MH–27 INV IN = 50.60 MH–17 INV OUT = 50.70
MH–22	RIM = 57.73 CB–21 INV IN = 52.35 MH–22 INV OUT = 50.10
MH–26	RIM = 57.06 CB–25 INV IN = 52.35 MH–26 INV OUT = 50.10
MH–27	RIM = 58.94 OCS–20 INV IN = 53.95 MH–39A INV IN = 51.40 MH–27 INV OUT = 51.30
MH–32	RIM = 60.08 CB–31 INV IN = 55.25 MH–32 INV OUT = 52.50
MH–35	RIM = 63.35 CB–34 INV IN = 53.95 CB–38B INV IN = 59.20 CB–38A INV IN = 58.00 MH–35 INV OUT = 53.85
MH–36	RIM = 62.64 CB–37 INV IN = 58.45 MH–35 INV IN = 52.80 MH–36 INV OUT = 52.50
MH–39A	RIM = 58.14 MH–39B INV IN = 53.45 MH–39A INV OUT = 53.15
MH–39B	RIM = 59.94 OCS–30 INV IN = 55.50 MH56 INV IN = 54.50 MH–39B INV OUT = 54.40
MH–46	RIM = 61.07 RL–48 INV IN = 57.00 MH–46 INV OUT = 51.50
MH–47	RIM = 58.65 YD–45 INV IN = 53.60 RL–47 INV IN = 53.80 MH–47 INV OUT = 51.50
MH–56	RIM = 59.33 OCS–40 INV IN = 55.00 MH56 INV OUT = 54.90
OCS–10	RIM = 57.66 ST–10 INV IN = 49.55 OCS–10 INV OUT = 53.60
OCS–20	RIM = 58.28 ST–20 INV IN = 50.10 OCS–20 INV OUT = 54.25

STRUCTURE TABLE	
STRUCTURE NAME	STRUCTURE DETAILS
OCS–30	RIM = 60.13 ST–30 INV IN = 52.50 OCS–30 INV OUT = 55.80
OCS–40	RIM = 60.65 ST–40 INV IN = 51.50 OCS–40 INV OUT = 55.75
Y–1	RIM = 58.91 YD–44 INV IN = 54.56
YD–23	RIM = 59.23 YD–23 INV OUT = 54.75
YD–24	RIM = 58.51 YD–23 INV IN = 54.05 YD–24 INV OUT = 53.95
YD–41	RIM = 58.88 YD–41 INV OUT = 55.25
YD–42	RIM = 58.88 YD–42 INV OUT = 55.15
YD–43	RIM = 58.88 YD–41 INV IN = 55.05 YD–43 INV OUT = 54.80
YD–44	RIM = 58.88 YD–42 INV IN = 55.05 YD–44 INV OUT = 54.95
YD–45	RIM = 58.10 YD–43 INV IN = 54.30 YD–45 INV OUT = 53.70

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JOHN J. McTIGUE
No. 14950

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SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

DRAINAGE STRUCTURE TABLE

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
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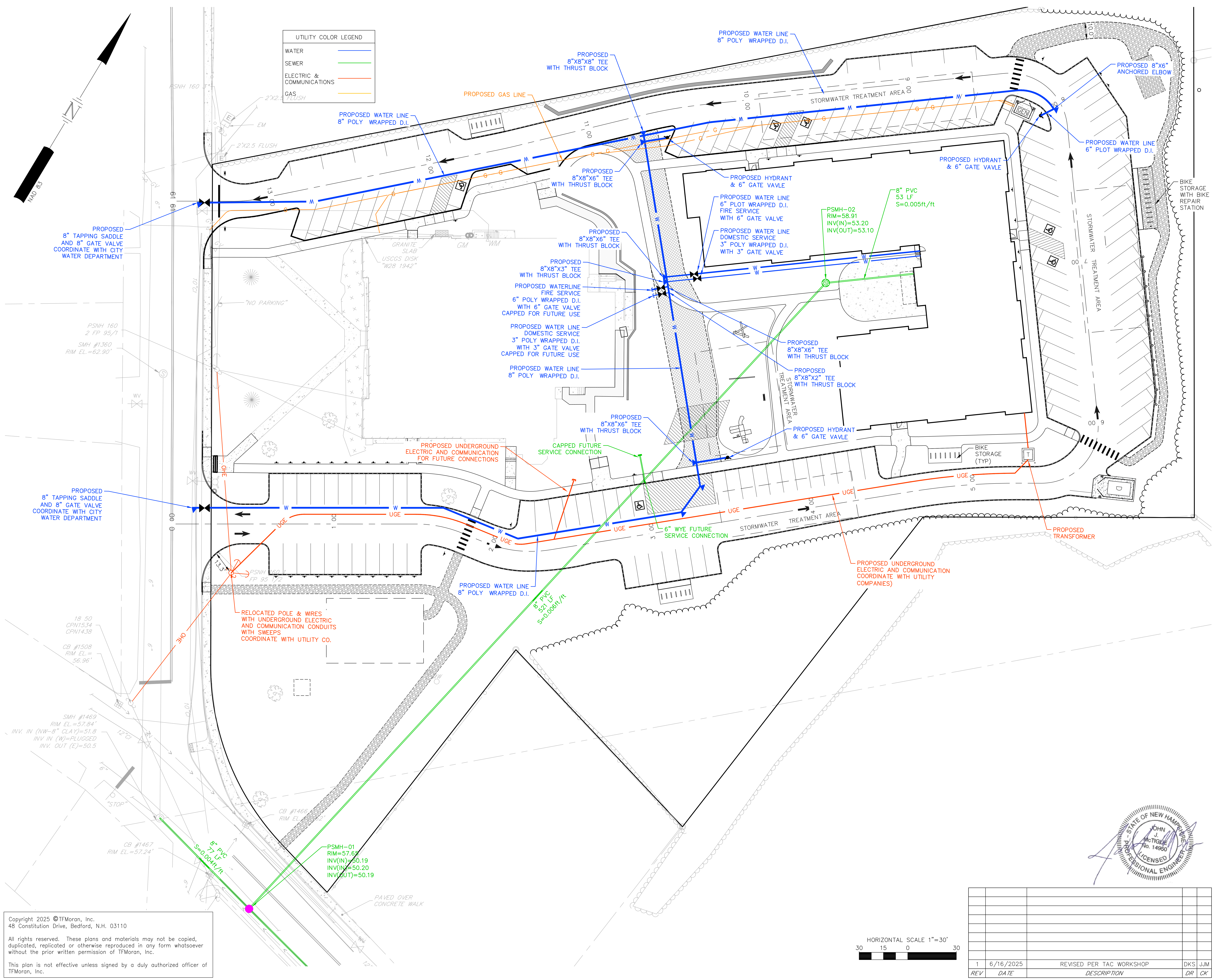

NOTES

1. SEE NOTES ON SHEET C-01.
2. THE PROPERTY WILL BE SERVICED BY THE FOLLOWING:

DRAINAGE	MUNICIPAL
SEWER	MUNICIPAL
WATER	MUNICIPAL
GAS	UNITIL
ELECTRIC	EVERSOURCE
TELEPHONE	CONSOLIDATED COMMUNICATIONS FKA FAIRPOINT COMMUNICATIONS
CABLE	COMCAST

3. THIRD PARTY INSPECTOR SHALL BE ON SITE TO INSPECT THE INSTALLATION OF UTILITIES.
4. SDR-35 SHALL BE USED FOR ALL GRAVITY SEWER LINES.
5. CONTRACTOR SHALL PROVIDE 18" MINIMUM VERTICAL CLEARANCE BETWEEN WATER MAIN/SERVICES AND SEWER MAIN/SERVICES AT CROSSINGS, WATER OVER SEWER (UNLESS OTHERWISE NOTED) WHERE 18" VERTICAL CLEARANCE CANNOT BE ACHIEVED, CONTRACTOR SHALL PROVIDE SDR-21 PVC PIPE FOR SEWER MAIN PIPE BETWEEN STRUCTURES.
6. CONTRACTOR SHALL PROVIDE 24" MINIMUM VERTICAL CLEARANCE BETWEEN SEWER MAIN/SERVICES AND STORM DRAIN LINES. WHERE 24" VERTICAL CLEARANCE CANNOT BE ACHIEVED, CONTRACTOR SHALL PROVIDE INSULATION PER DETAIL ON SHEET C-76.
7. CONTRACTOR SHALL PROVIDE 24" MINIMUM VERTICAL CLEARANCE BETWEEN WATER MAIN/SERVICES AND STORM DRAIN LINES. WHERE 24" VERTICAL CLEARANCE CANNOT BE ACHIEVED, CONTRACTOR SHALL PROVIDE INSULATION PER DETAIL ON SHEET C-76.
8. CONTRACTOR SHALL PROVIDE 5' MINIMUM COVER OVER WATER MAIN/SERVICES. WHERE 5' COVER CANNOT BE ACHIEVED, CONTRACTOR SHALL PROVIDE INSULATION.
9. CONTRACTOR SHALL PROVIDE 2' MINIMUM HORIZONTAL CLEARANCE BETWEEN UTILITY MAIN/SERVICES AND STRUCTURES.

JOHN J. McTIGUE No. 14950

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10
UTILITY PLAN PHASE 1
PROPOSED HOUSING DEVELOPMENT
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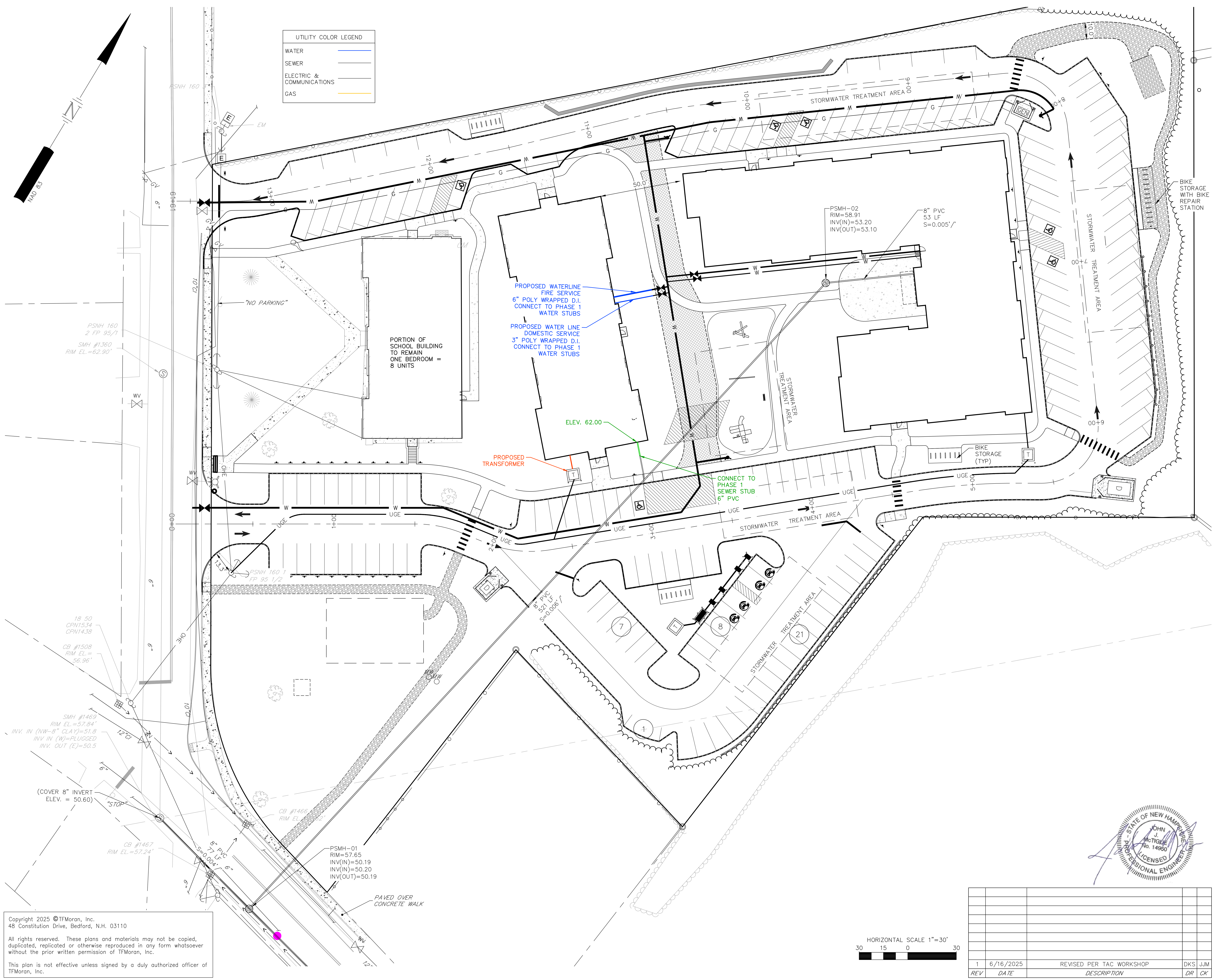

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TELEPHONE	CONSOLIDATED COMMUNICATIONS FKA FAIRPOINT COMMUNICATIONS
CABLE	COMCAST

3. THIRD PARTY INSPECTOR SHALL BE ON SITE TO INSPECT THE INSTALLATION OF UTILITIES.
4. SDR-35 SHALL BE USED FOR ALL GRAVITY SEWER LINES.
5. CONTRACTOR SHALL PROVIDE 18" MINIMUM VERTICAL CLEARANCE BETWEEN WATER MAIN/SERVICES AND SEWER MAIN/SERVICES AT CROSSINGS, WATER OVER SEWER (UNLESS OTHERWISE NOTED) WHERE 18" VERTICAL CLEARANCE CANNOT BE ACHIEVED, CONTRACTOR SHALL PROVIDE SDR-21 PVC PIPE FOR SEWER MAIN PIPE BETWEEN STRUCTURES.
6. CONTRACTOR SHALL PROVIDE 24" MINIMUM VERTICAL CLEARANCE BETWEEN SEWER MAIN/SERVICES AND STORM DRAIN LINES. WHERE 24" VERTICAL CLEARANCE CANNOT BE ACHIEVED, CONTRACTOR SHALL PROVIDE INSULATION PER DETAIL ON SHEET C-76.
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8. CONTRACTOR SHALL PROVIDE 5' MINIMUM COVER OVER WATER MAIN/SERVICES. WHERE 5' COVER CANNOT BE ACHIEVED, CONTRACTOR SHALL PROVIDE INSULATION.
9. CONTRACTOR SHALL PROVIDE 2' MINIMUM HORIZONTAL CLEARANCE BETWEEN UTILITY MAIN/SERVICES AND STRUCTURES.

CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

SITE DEVELOPMENT PLANS

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UTILITY PLAN PHASE 2
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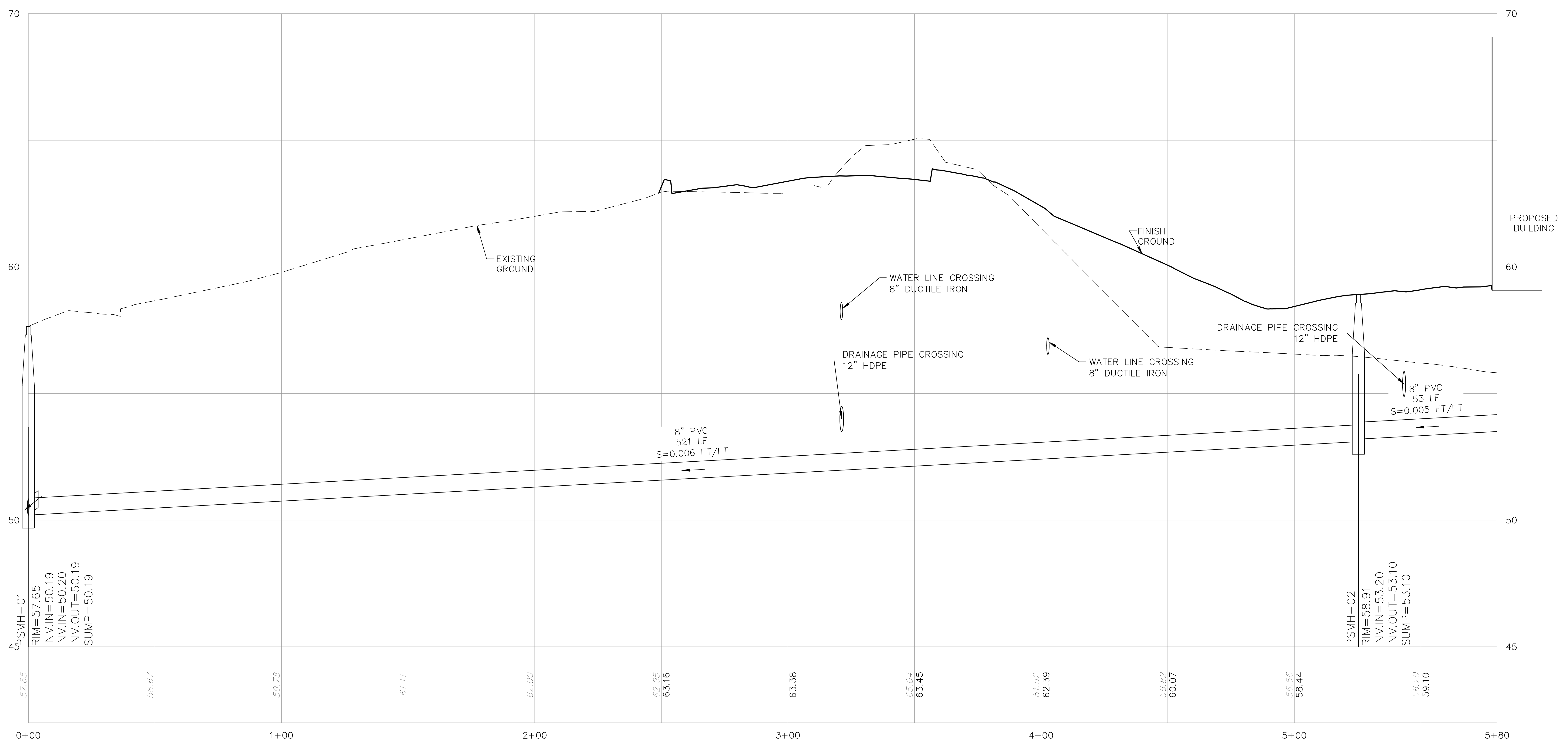
NOTES

1. CONTRACTOR SHALL PROVIDE 18" MINIMUM VERTICAL CLEARANCE BETWEEN WATER MAIN/SERVICES AND SEWER MAIN/SERVICES AT CROSSINGS, WATER OVER SEWER (UNLESS OTHERWISE NOTED) WHERE 18" VERTICAL CLEARANCE CANNOT BE ACHIEVED, CONTRACTOR SHALL PROVIDE SDR–21 PVC PIPE FOR SEWER MAIN PIPE BETWEEN STRUCTURES.
2. CONTRACTOR SHALL PROVIDE 24" MINIMUM VERTICAL CLEARANCE BETWEEN SEWER MAIN/SERVICES AND STORM DRAIN LINES. WHERE 24" VERTICAL CLEARANCE CANNOT BE ACHIEVED, CONTRACTOR SHALL PROVIDE INSULATION PER DETAIL ON SHEET C–76.
3. CONTRACTOR SHALL PROVIDE 24" MINIMUM VERTICAL CLEARANCE BETWEEN WATER MAIN/SERVICES AND STORM DRAIN LINES. WHERE 24" VERTICAL CLEARANCE CANNOT BE ACHIEVED, CONTRACTOR SHALL PROVIDE INSULATION PER DETAIL ON SHEET C–76.
4. CONTRACTOR SHALL PROVIDE 5' MINIMUM COVER OVER WATER MAIN/SERVICES. WHERE 5' COVER CANNOT BE ACHIEVED, CONTRACTOR SHALL PROVIDE INSULATION.
5. CONTRACTOR SHALL PROVIDE 2' MINIMUM HORIZONTAL CLEARANCE BETWEEN UTILITY MAIN/SERVICES AND STRUCTURES.
6. SDR–35 PIPE SHALL BE USED FOR GRAVITY SEWER LINES.



P–SEWER

HORIZONTAL SCALE 1"=30'
30 15 0 30

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

SEWER PROFILE

PROPOSED HOUSING DEVELOPMENT
35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH
PREPARED FOR
PHA HOUSING DEVELOPMENT LTD.
1"=60' (11"X17")
SCALE: 1"=30' (22"X34") **JANUARY 29, 2025**

JOHN J. McTIGUE No. 14950

REV	DATE	DESCRIPTION	DR	CK
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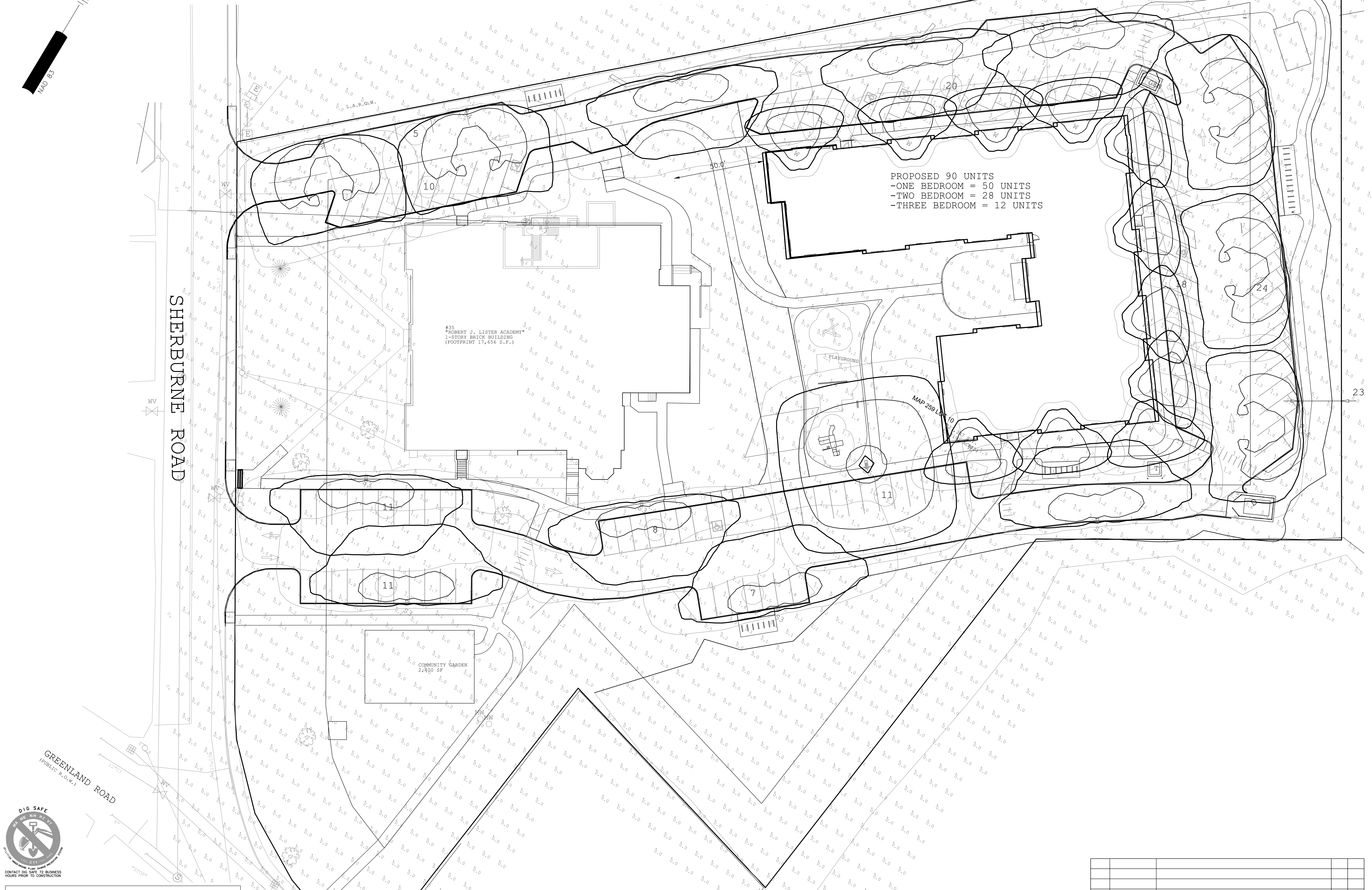
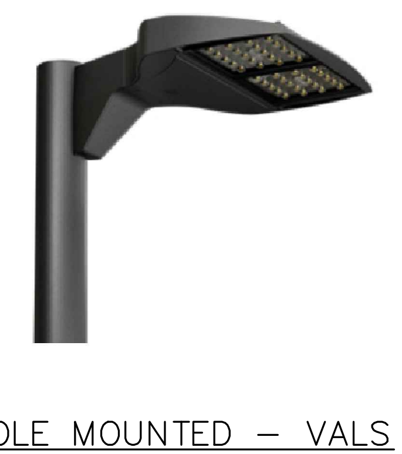
Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Description	Tag	[MANUFAC]
⊟	8	S3	Single	VALS-09L-3W-UNV-30K8-IS-CXX / 4SQ B3 S11G20 S AB 4BC	20' POLE	LSI INDUSTRIES, INC.
⊟	5	S4	Single	VALS-09L-4F-UNV-30K8-IS-CXX / 4SQ B3 S11G20 S AB 4BC	20' POLE	LSI INDUSTRIES, INC.
⊟⊟	1	S5-2	Back-Back	VALS-06L-5M-UNV-30K8-CXX / 4SQ B3 S11G20 D180 CXX AB 4BC	20' POLE	LSI INDUSTRIES, INC.
▫	11	W	Single	XWS-LED-02L-SIL-3-UNV-DIM-30-70CRI-CXX	WALL MOUNTED 12' AFG	LSI INDUSTRIES, INC.

PHASE I

Illuminance (Fc)
Average = 1.11
Maximum = 2.4
Minimum = 0.4
Avg/Min Ratio = 2.78
Max/Min Ratio = 6.00




WALL MOUNTED – XWS-LED


POLE MOUNTED – VALS

HORIZONTAL SCALE 1"=30'
30 15 0 30

CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

CITY OF PORTSMOUTH PLANNING BOARD

CHAIRPERSON *DATE*

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

LIGHTING PLAN PHASE 1

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
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PHA HOUSING DEVELOPMENT LTD.
1"=60' (11"X17")
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Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	Tag	[MANUFAC]
⊟	11	S3	Single	VALS-09L-3W-UNV-30K8-IS-CXX / 4SQ B3 S11G20 S AB 4BC	20' POLE	LSI INDUSTRIES, INC.
⊟	7	S4	Single	VALS-09L-4F-UNV-30K8-IS-CXX / 4SQ B3 S11G20 S AB 4BC	20' POLE	LSI INDUSTRIES, INC.
⊟⊟	1	S5-2	Back-Back	VALS-06L-5M-UNV-30K8-CXX / 4SQ B3 S11G20 D180 CXX AB 4BC	20' POLE	LSI INDUSTRIES, INC.
⊡	11	W	Single	XWS-LED-02L-SIL-3-UNV-DIM-30-70CRI-CXX	WALL MOUNTED 12' AFG	LSI INDUSTRIES, INC.

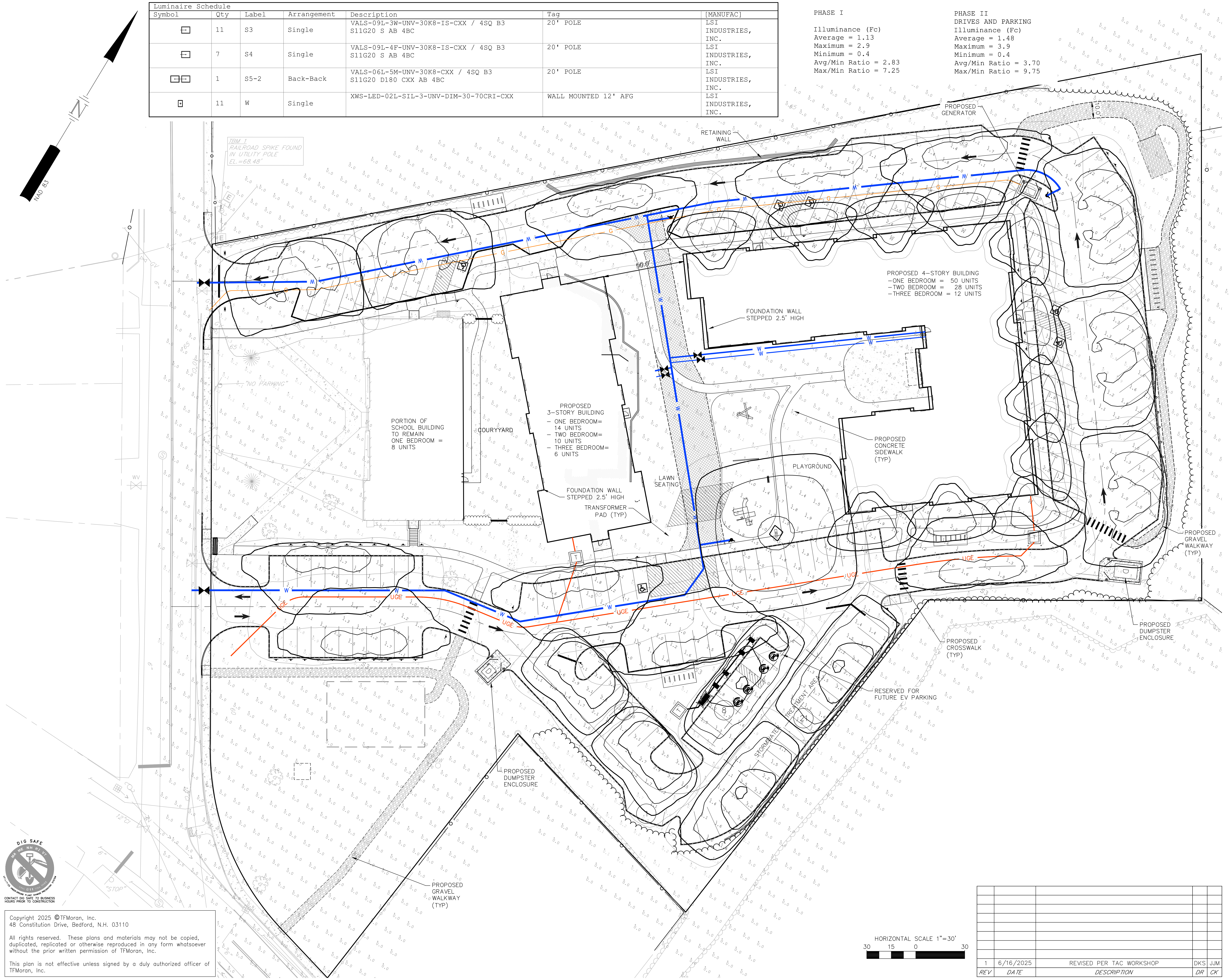
PHASE I

Illuminance (Fc)
Average = 1.13
Maximum = 2.9
Minimum = 0.4
Avg/Min Ratio = 2.83
Max/Min Ratio = 7.25

PHASE II
DRIVES AND PARKING
Illuminance (Fc)
Average = 1.48
Maximum = 3.9
Minimum = 0.4
Avg/Min Ratio = 3.70
Max/Min Ratio = 9.75


WALL MOUNTED – XWS–LED


POLE MOUNTED – VALS



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CITY OF PORTSMOUTH PLANNING BOARD

CHAIRPERSON
DATE

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10
LIGHTING PLAN PHASE 2
PROPOSED HOUSING DEVELOPMENT
35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
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JANUARY 29, 2025

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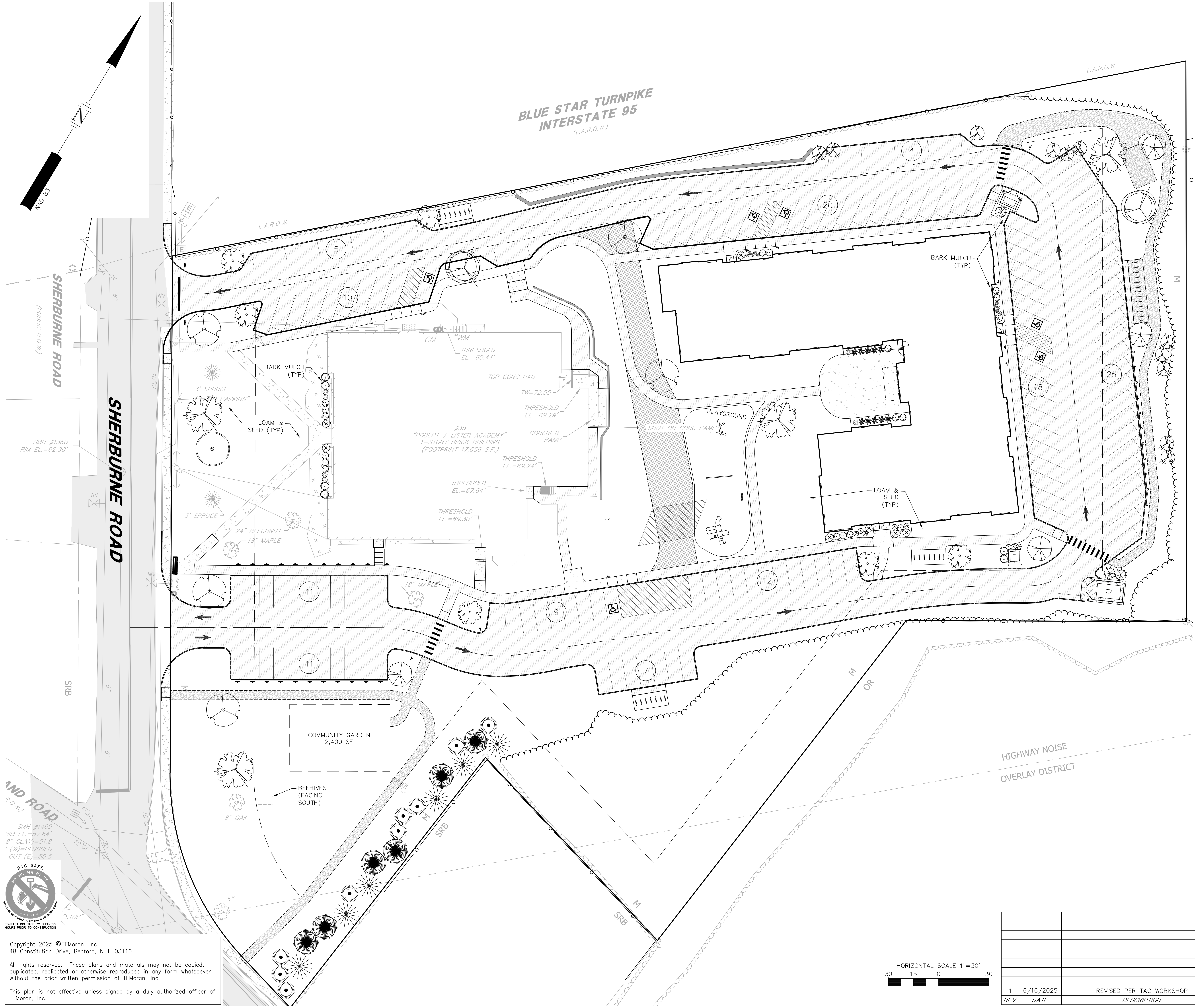

LANDSCAPE LEGEND

SYMBOL	QTY	BOTANICAL NAME COMMON NAME	SIZE	REMARKS	MATURE HEIGHT/ SPREAD	GROWTH HABIT
✿	6	ACER RUBRUM 'BOWHALL' BOWHALL RED MAPLE	2" TO 2 1/2" CAL.	B&B	40' TO 60' 10' TO 15'	UPRIGHT
✿	4	ACER RUBRUM 'OCTOBER GLORY' OCTOBER GLORY RED MAPLE	2" TO 2 1/2" CAL.	B&B	40' TO 60' 30' TO 40'	OVAL
⊛	4	AMELANCHIER X GRANDIFLORA 'ROBIN HILL' ROBIN HILL SERVICEBERRY	2" TO 2 1/2" CAL.	B&B	15' TO 20' 10' TO 15'	UPRIGHT
◎	2	BETULA NIGRA 'DURA HEAT' DURA HEAT RIVER BIRCH	8' TO 10' CLUMP	B&B	40' TO 60' 20' TO 30'	PYRAMIDAL
○	4	PLATANUS X ACERIFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANETREE	2" TO 2 1/2" CAL.	B&B	60' + 60' +	ROUNDED
⊕	1	QUERCUS ALBA WHITE OAK	2" TO 2 1/2" CAL.	B&B	60' + 60' +	BROAD
●	6	JUNIPERUS VIRGINIANA EASTERN RED CEDAR	6' TO 7'	B&B	30' TO 40' 15' TO 20'	UPRIGHT
✳	6	PICEA GLAUCA WHITE SPRUCE	6' TO 7'	B&B	40' TO 60' 15' TO 20'	PYRAMIDAL
☀	9	THUJA OCCIDENTALIS 'NIGRA' DARK AMERICAN ARBORVITAE	6' TO 7'	B&B	20' TO 30' 10' TO 15'	PYRAMIDAL
⊕	10	ASTILBE 'MONTGOMERY' MONTGOMERY ASTILBE	1 GAL	CONT.	18" TO 24" 18" TO 24"	MOUNDED
⊗	8	CLETHRA ALNIFOLIA 'SIXTEEN CANDLES' SIXTEEN CANDLES SUMMERSWEET	3 GAL.	CONT.	4' TO 5' 2' TO 3'	COMPACT
⊘	11	FORSYTHIA 'LYNWOOD GOLD' LYNWOOD GOLD FORSYTHIA	3 GAL.	CONT.	6' TO 8' 6' TO 8'	ROUNDED
⊙	17	HYDRANGEA ENDLESS SUMMER 'B.B.' BLUSHING BRIDE HYDRANGEA	3 GAL.	CONT.	3' TO 4' 3' TO 4'	MOUNDED
⊙	6	ILEX GLABRA 'DENSA' DENSA INKBERRY	3 GAL.	CONT.	5–6' 4–5'	ROUNDED
⊕	8	JUNIPERUS H. 'PLUMOSA COMPACTA' YOUNGSTOWN JUNIPER	3 GAL.	CONT.	12" TO 24" 6' TO 8'	SPREADING
✱	10	PANICUM VIRGATUM 'SHENANDOAH' SHENANDOAH SWITCH GRASS	1 GAL.	CONT.	3' TO 4' 3' TO 4'	CLUMPING
✵	3	THUJA OCCIDENTALIS 'TECHNY' MISSION ARBORVITAE	4' TO 5'	B&B	10' TO 15' 6' TO 8'	PYRAMIDAL
◎	6	SALVIA 'BLUE HILL' BLUE HILL SAGE	1 GAL.	CONT.	12" TO 24" 2' TO 3'	COMPACT

* ALL PLANTS CONTAINED IN LEGEND HAVE BEEN SELECTED FOR URBAN GROWING CONDITIONS.

SEE DETAILS FOR LANDSCAPE NOTES

CITY OF PORTMOUTH PLANNING BOARD

CHAIRPERSON
DATE

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10
LANDSCAPE PLAN PHASE 1
PROPOSED HOUSING DEVELOPMENT
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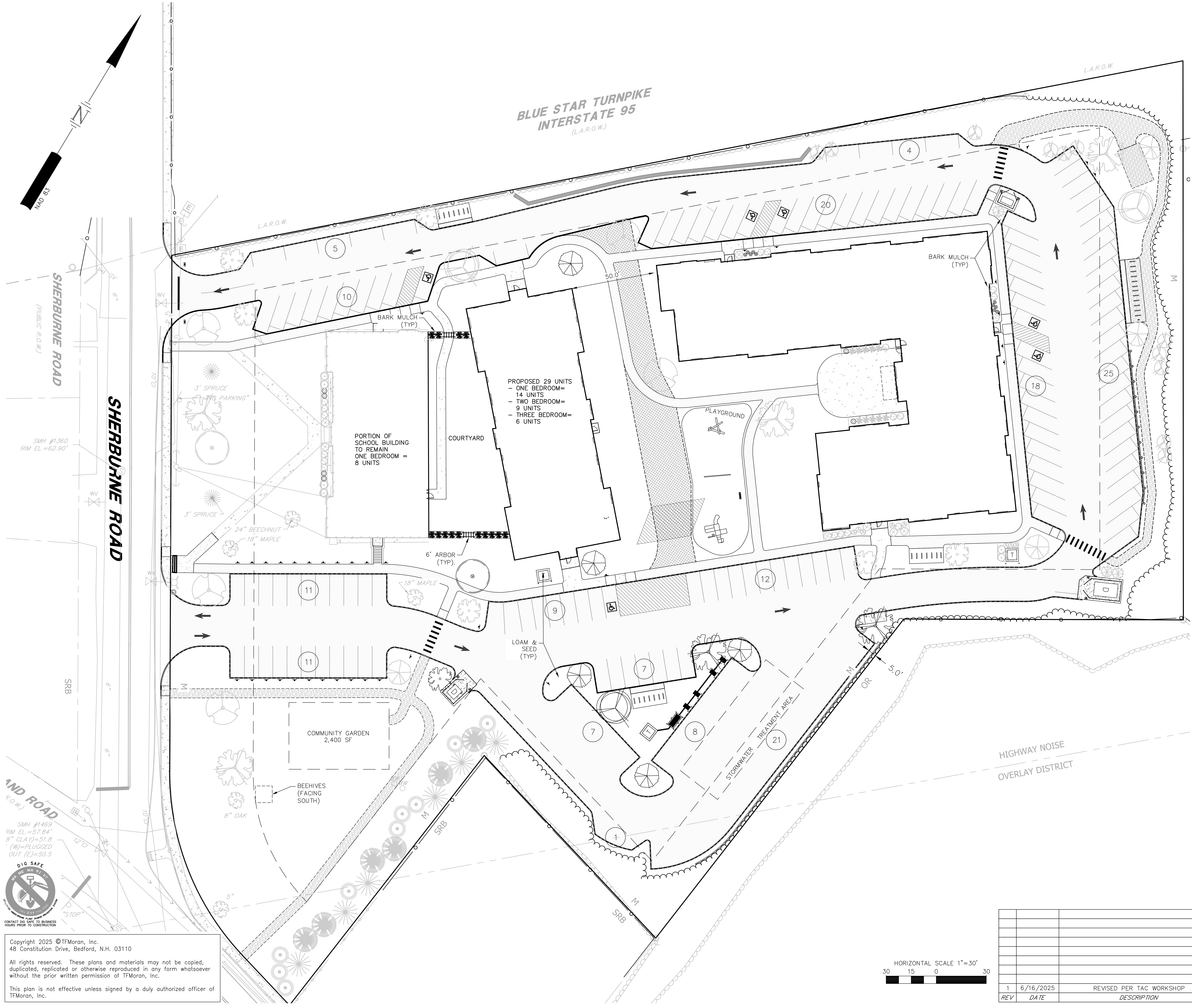

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LANDSCAPE LEGEND

SYMBOL	QTY	BOTANICAL NAME COMMON NAME	SIZE	REMARKS	MATURE HEIGHT/ SPREAD	GROWTH HABIT
✿	1	ACER RUBRUM 'BOWHALL' BOWHALL RED MAPLE	2" TO 2 1/2" CAL.	B&B	40' TO 60' 10' TO 15'	UPRIGHT
✿	2	ACER RUBRUM 'OCTOBER GLORY' OCTOBER GLORY RED MAPLE	2" TO 2 1/2" CAL.	B&B	40' TO 60' 30' TO 40'	OVAL
⊛	5	AMELANCHIER X GRANDIFLORA 'ROBIN HILL' ROBIN HILL SERVICEBERRY	2" TO 2 1/2" CAL.	B&B	15' TO 20' 10' TO 15'	UPRIGHT
◎	1	BETULA NIGRA 'DURA HEAT' DURA HEAT RIVER BIRCH	8' TO 10' CLUMP	B&B	40' TO 60' 20' TO 30'	PYRAMIDAL
⊕	1	QUERCUS ALBA WHITE OAK	2" TO 2 1/2" CAL.	B&B	60' + 60' +	BROAD
✹	14	ILEX CRENATA 'CHESAPEAKE' CHESAPEAKE JAPANESE HOLLY	3 GAL.	CONT.	6' TO 8' 3' TO 4'	PYRAMIDAL

* ALL PLANTS CONTAINED IN LEGEND HAVE BEEN SELECTED FOR URBAN GROWING CONDITIONS.

SEE DETAILS FOR LANDSCAPE NOTES

CITY OF PORTMOUTH PLANNING BOARD

CHAIRPERSON

DATE

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

LANDSCAPE PLAN PHASE 2

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD

PORTSMOUTH, NEW HAMPSHIRE

OWNED BY

CITY OF PORTSMOUTH

PREPARED FOR

PHA HOUSING DEVELOPMENT LTD.

1"=60' (11"X17")

SCALE: 1"=30' (22"X34") **JANUARY 29, 2025**

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LANDSCAPE NOTES

GENERAL

1. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE RULES, REGULATIONS, LAWS, AND ORDINANCES HAVING JURISDICTION OVER THIS PROJECT SITE.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND NOTIFY OWNER'S REPRESENTATIVE OF CONFLICTS.
3. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES SHOWN ON PLANS BEFORE PRICING THE WORK. ANY DIFFERENCE IN QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT FOR CLARIFICATION. LANDSCAPE QUANTITIES SHOWN ON THE PLAN SHALL SUPERCEDE QUANTITIES LISTED IN LANDSCAPE LEGEND.
4. THE CONTRACTOR SHALL CONTACT THE LANDSCAPE ARCHITECT PRIOR TO STARTING WORK AND VERIFY THAT THE PLANS IN THE CONTRACTOR'S POSSESSION ARE THE MOST CURRENT PLANS AVAILABLE AND ARE THE APPROVED PLAN SET FOR USE IN CONSTRUCTION.
5. ALL PLANT MATERIALS INSTALLED SHALL MEET OR EXCEED THE SPECIFICATIONS OF THE "AMERICAN STANDARDS FOR NURSERY STOCK" AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
6. ALL PLANTS SHALL BE FIRST CLASS AND SHALL BE REPRESENTATIVE OF THEIR NORMAL SPECIES AND/OR VARIETIES. ALL PLANTS MUST HAVE GOOD, HEALTHY, WELL–FORMED UPPER GROWTH AND A LARGE, FIBEROUS, COMPACT ROOT SYSTEM.
7. ALL PLANTS SHALL BE FREE FROM DISEASE AND INSECT PESTS AND SHALL COMPLY WITH ALL APPLICABLE STATE AND FEDERAL LAWS PERTAINING TO PLANT DISEASES AND INFESTATIONS.
8. ALL TREES SHALL BE BALLED AND BURLAPPED (B & B) UNLESS OTHERWISE NOTED OR APPROVED BY LANDSCAPE ARCHITECT.
9. IF APPLICABLE, THE CONTRACTOR SHALL HAVE ALL FALL TRANSPLANTING HAZARD PLANTS DUG IN THE SPRING AND STORED FOR FALL PLANTING.
10. ALL INVASIVE PLANT SPECIES FROM THE "NEW HAMPSHIRE PROHIBITED INVASIVE PLANT SPECIES LIST", TO BE REMOVED SHALL BE DONE SO IN ACCORDANCE WITH THE "INVASIVE SPECIES ACT, HB 1258–FN."

GUARANTEE

THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL LANDSCAPE WORK FOR A PERIOD OF ONE YEAR, BEGINNING AT THE START OF THE MAINTENANCE PERIOD.

LANDSCAPE SPECIFICATIONS

SITE AND SOIL PREPARATION

1. WHEN CONDITIONS DETRIMENTAL TO PLANT GROWTH ARE ENCOUNTERED, SUCH AS RUBBLE FILL, ADVERSE DRAINAGE CONDITIONS, OR LEDGE, NOTIFY LANDSCAPE ARCHITECT/ENGINEER BEFORE PLANTING.
2. ALL DISTURBED AREAS & PLANTING AREAS, INCLUDING AREAS TO BE SODDED, SHALL RECEIVE THE FOLLOWING SOIL PREPARATION PRIOR TO PLANTING: A MINIMUM OF 6 INCHES OF LIGHTLY COMPACTED TOPSOIL SHALL BE INSTALLED OVER THE SUBSOIL IF TOPSOIL HAS BEEN REMOVED OR IS NOT PRESENT.
3. LOAM SHALL CONSIST OF LOOSE FRIABLE TOPSOIL WITH NO ADMIXTURE OF REFUSE OR MATERIAL TOXIC TO PLANT GROWTH. LOAM SHALL BE FREE FROM STONES, LUMPS, STUMPS, OR SIMILAR OBJECTS LARGER THAN TWO INCHES (2") IN GREATEST DIAMETER, SUBSOIL, ROOTS, AND WEEDS. THE MINIMUM AND MAXIMUM PH VALUE SHALL BE FROM 5.5 TO 7.6. LOAM SHALL CONTAIN A MINIMUM OF THREE PERCENT (3%) AND A MAXIMUM OF TWENTY PERCENT (20%) ORGANIC MATTER AS DETERMINED BY LOSS BY IGNITION. NOT MORE THAN SIXTY–FIVE PERCENT (65%) SHALL PASS A NO. 200 SIEVE AS DETERMINED BY THE WASH TEST IN ACCORDANCE WITH ASTM D1140. IN NO INSTANCE SHALL MORE THAN 20% OF THAT MATERIAL PASSING THE #4 SIEVE CONSIST OF CLAY SIZE PARTICLES.
4. NATURAL TOPSOIL NOT CONFORMING TO THE PARAGRAPH ABOVE OR CONTAINING EXCESSIVE AMOUNTS OF CLAY OR SAND SHALL BE TREATED BY THE CONTRACTOR TO MEET THOSE REQUIREMENTS.
5. SUBMIT TEST RESULTS OBTAINED FROM SOURCE TO ENGINEER/LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL, PRIOR TO SPREADING OPERATIONS.
6. APPROVAL BY THE ENGINEER/LANDSCAPE ARCHITECT TO USE THE TOPSOIL WILL DEPEND UPON THE RESULTS OF THE SOIL TESTS.
7. THE BURDEN OF PROOF OF SOIL AMENDMENT INSTALLATION RESTS WITH THE CONTRACTOR. SOIL TESTS MAY BE REQUIRED AT THE CONTRACTOR'S EXPENSE IN ORDER TO CONFIRM AMENDMENT INSTALLATION.

PLANTING

1. EXCAVATE PITS, PLANTERS, BEDS AND TRENCHES WITH VERTICAL SIDES AND WITH BOTTOM OF EXCAVATION SLIGHTLY RAISED AT CENTER TO PROVIDE PROPER DRAINAGE. LOOSEN HARD SUBSOIL IN BOTTOM OF EXCAVATION.
2. ANY LEDGE OR RUBBLE MATERIAL SHALL BE FRACTURED TO A DEPTH OF 3 FEET AND EXCAVATED TO A DEPTH OF 30 INCHES FOR TREE POCKETS AND 18 INCHES FOR SHRUB BEDS. THIS PROCEDURE SHALL BE HANDLED BY THE SITE CONTRACTOR. SITE TOPSOIL SHALL BE DEPOSITED IN ALL EXCAVATED POCKETS.
3. DISPOSE OF SUBSOIL REMOVED FROM PLANTING EXCAVATIONS. DO NOT MIX WITH PLANTING SOIL OR USE AS BACKFILL.
4. FILL EXCAVATIONS FOR TREES AND SHRUBS WITH WATER AND ALLOW TO PERCOLATE OUT BEFORE PLANTING.
5. DISH TOP OF BACKFILL TO ALLOW FOR MULCH – PLANT SAUCERS SHALL BE AS SHOWN ON DETAIL SHEETS; 6' DIAMETER FOR ALL DECIDUOUS TREES, AND FOR EVERGREEN TREES A RADIUS 2' BEYOND THE OUTER MOST BRANCHES.
6. MULCH TREES, SHRUBS, PLANTERS AND BEDS. PROVIDE NOT LESS THAN 3" THICKNESS OF BARK MULCH, 3/8"–2" OF WIDTH, AND WORK INTO TOP OF BACKFILL. FINISH LEVEL WITH ADJACENT FINISH GRADES AS DIRECTED IN THE FIELD.
7. STAKE AND GUY TREES IMMEDIATELY AFTER PLANTING (TREE SUPPORT STAKES SHALL BE 2" X 3" X 8', WOOD STAKES. GUYING WIRE SHALL BE NO. 12 GAUGE GALVANIZED SOFT STEEL WIRE. HOSE FOR COVERING WIRE SHALL BE NEW OR USED TWO PLY RUBBER HOSE NOT LESS THAN 1/2 INCH INSIDE DIAMETER. (PLASTIC "CINCH–TIES" OR EQUIVALENT FASTENING DEVICE MAY BE AN ACCEPTABLE GUY WIRE AND HOSE PROTECTOR SUBSTITUTE.)
8. TREEGATOR WATERING SYSTEM OR APPROVED EQUAL SHALL BE INSTALLED FOR ALL DECIDUOUS TREES AT TIME OF PLANTING AND REMOVED BEFORE FROST. WATERING RATE TO BE APPLIED PER MANUFACTURER'S SPECIFICATIONS.
9. ALL PLANT MATERIALS SHALL HAVE DEAD OR DAMAGED BRANCHES REMOVED AT TIME OF PLANTING. ALL TAGS AND RIBBONS SHALL BE REMOVED AT THIS TIME.
10. TREES TO REMAIN STAKED FOR 1 FULL GROWING SEASON.
11. THE CONTRACTOR SHALL REQUEST A FINAL OBSERVATION BY THE OWNER'S REPRESENTATIVE UPON COMPLETION OF INSTALLATION.

SEEDING

1. SLOPES UP TO AND INCLUDING 3:1 GRADE, SEED WILL BE NEW ENGLAND EROSION CONTROL & RESTORATION MIX PER NEW ENGLAND WETLANDS PLANTS INC., AMHERST, MA.
2. SLOPES STEEPER THAN 3:1 GRADE, SEED WILL BE NEW ENGLAND EROSION CONTROL & RESTORATION MIX PER NEW ENGLAND WETLANDS PLANTS INC., AMHERST, MA. SEE CIVIL FOR ADDITIONAL EROSION CONTROL MEASURES.
3. GENERAL SEED WILL BE NHDOT SPECIFICATION SECTION 644, TABLE 644–1–PARK SEED TYPE 15, INCLUDING NOTES TO TABLE 1, 2 & 3.

CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

This plan is not effective unless signed by a duly authorized officer of TFMoran, Inc.

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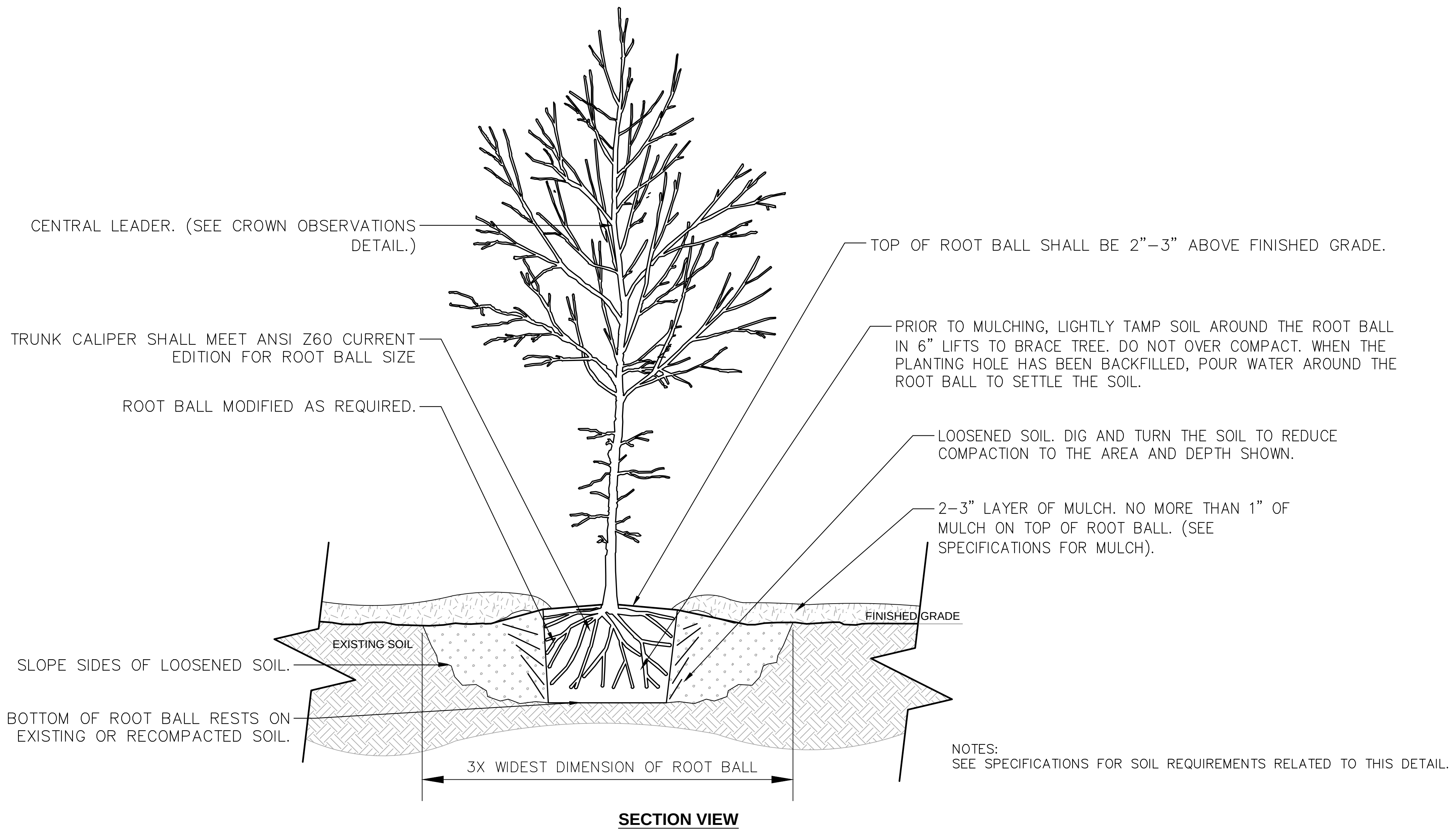
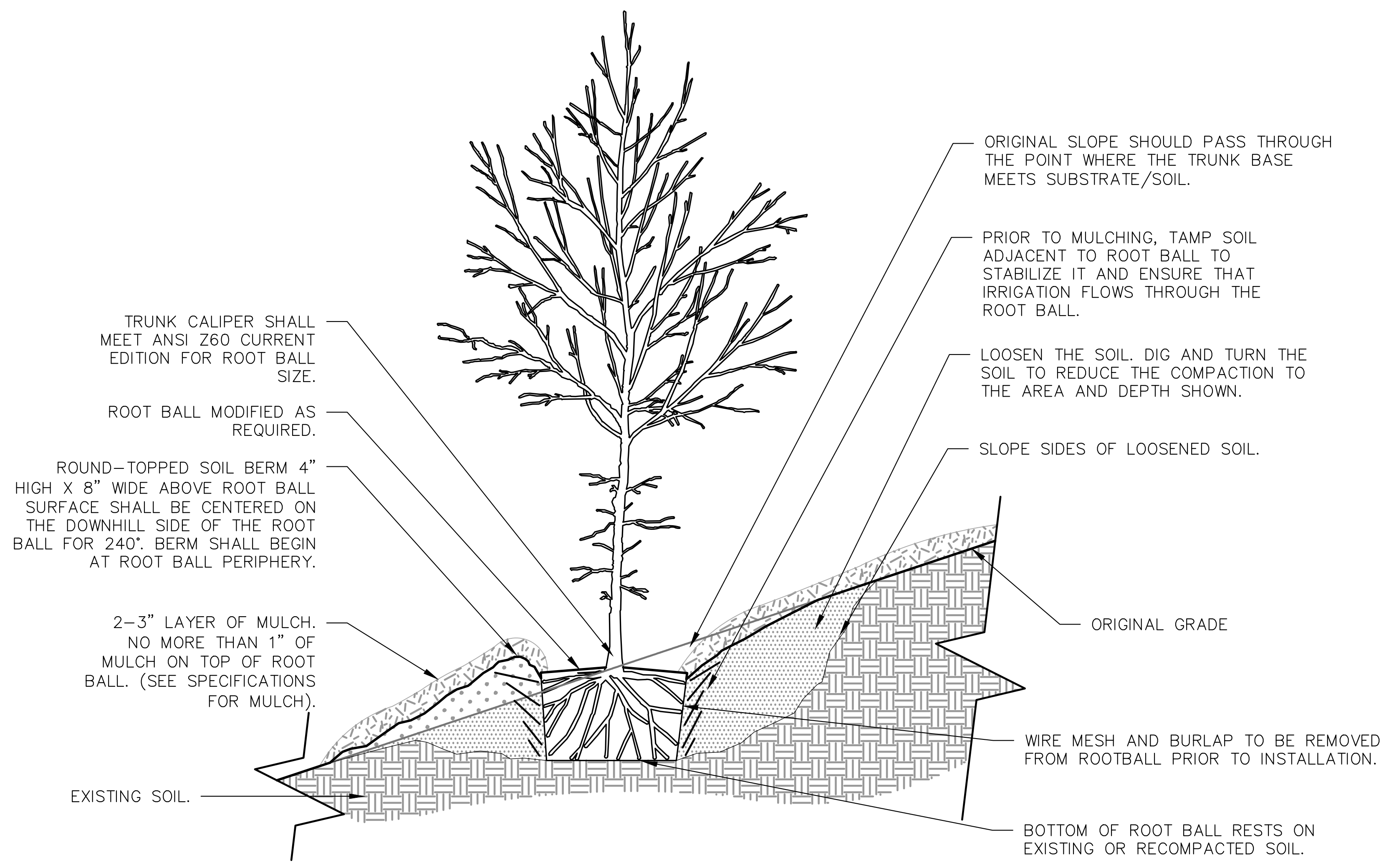


NOTES:
SEE SPECIFICATIONS FOR SOIL REQUIREMENTS RELATED TO THIS DETAIL.

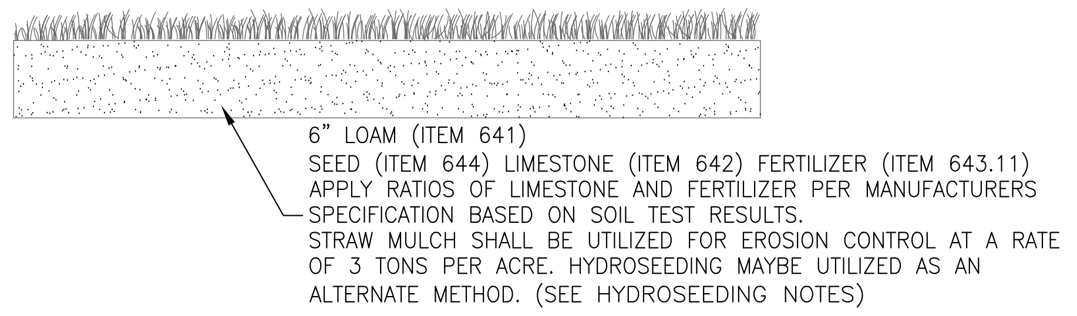
TREE WITH BERM

NOT TO SCALE



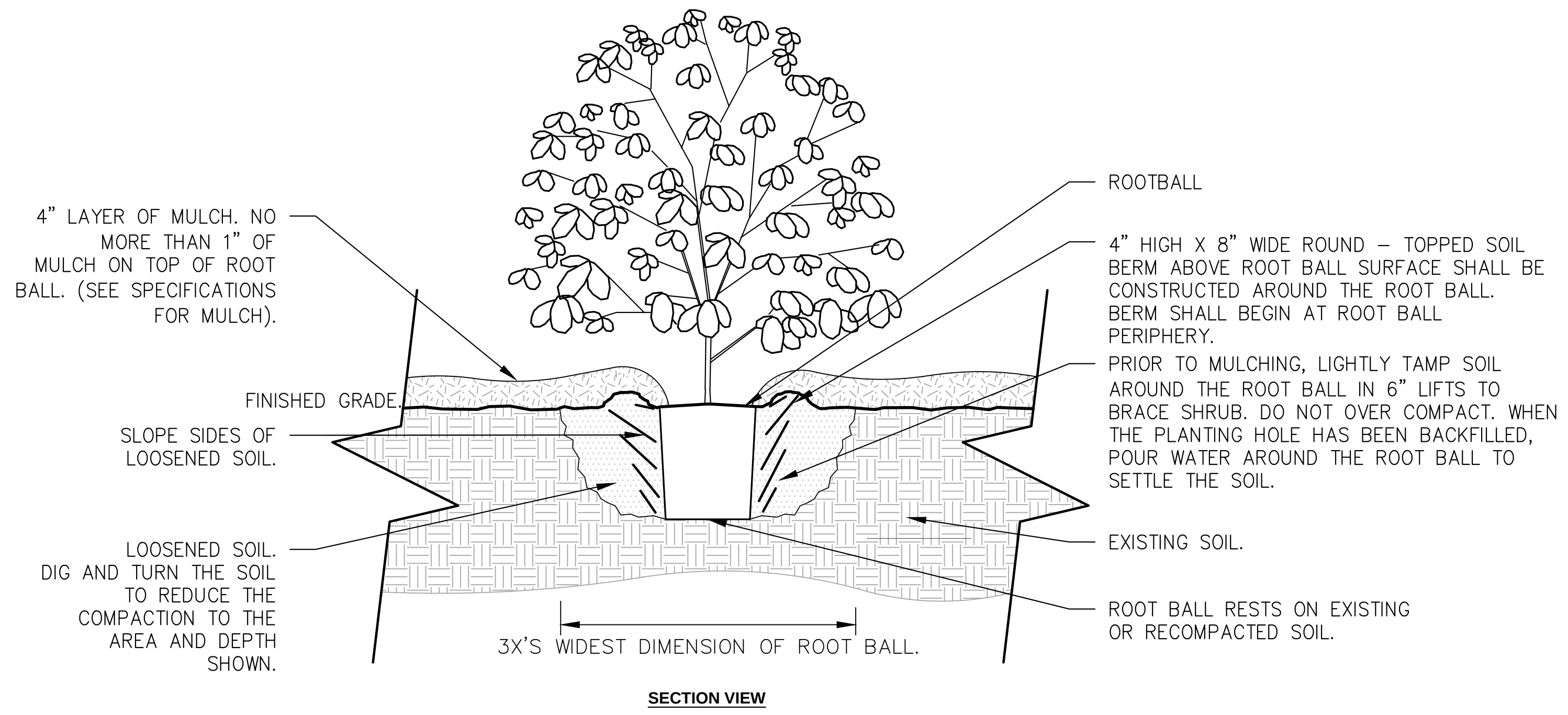
TREE ON SLOPE 5% (20:1) TO 50% (2:1)

NOT TO SCALE



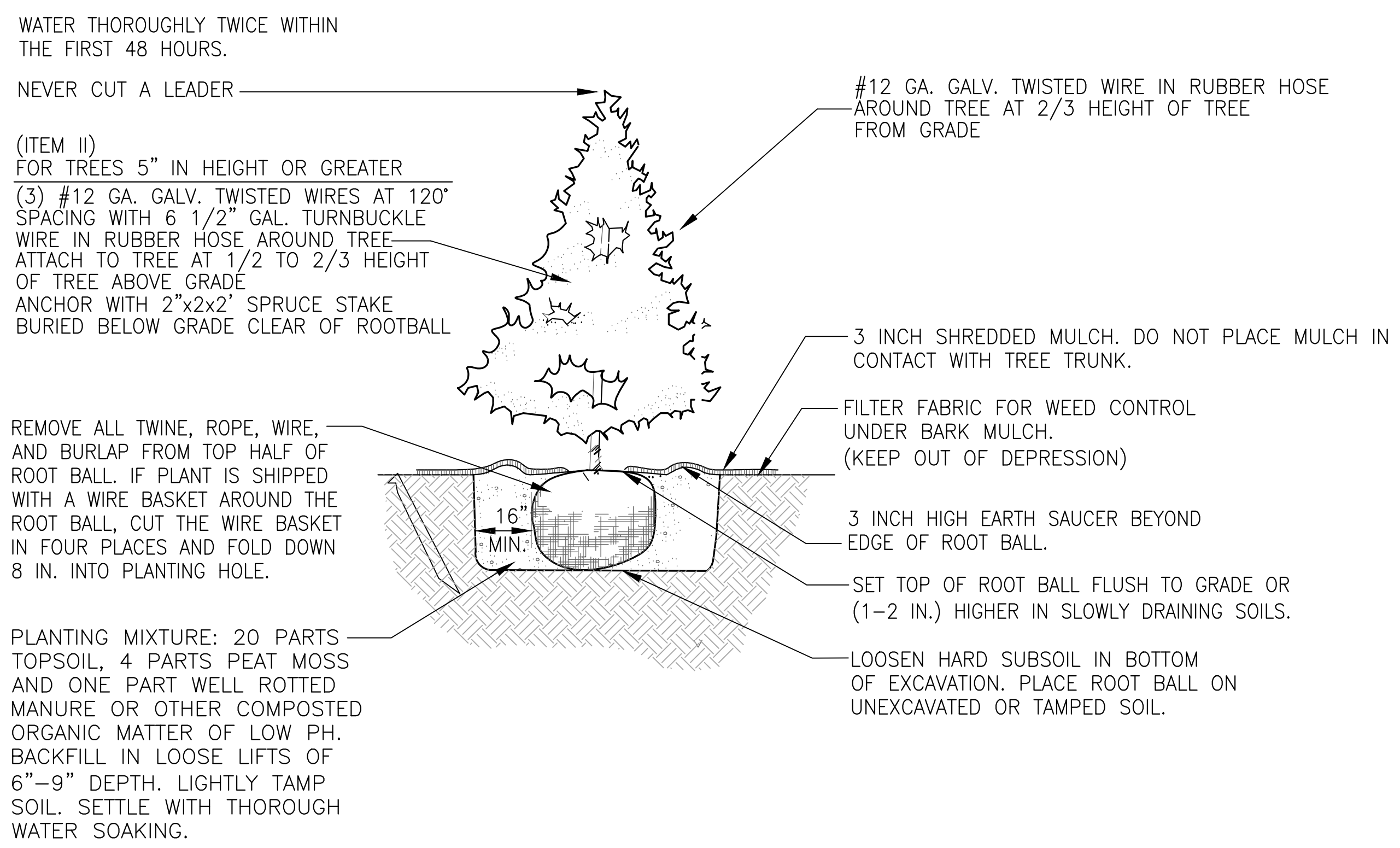
LOAM & SEED

NOT TO SCALE



SHRUB PLANTING

NOT TO SCALE



EVERGREEN PLANTING

NOT TO SCALE

CITY OF PORTMOUTH PLANNING BOARD

CHAIRPERSON
DATE

HORIZONTAL SCALE 1"=30'
30 15 0 30

JOHN J. McTIGUE No. 14950

REV	DATE	DESCRIPTION	DR	CK
1	6/16/2025	REVISED PER TAC WORKSHOP	DKS	JJM

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

LANDSCAPE DETAILS

PROPOSED HOUSING DEVELOPMENT
35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH
PREPARED FOR
PHA HOUSING DEVELOPMENT LTD.
1"=60' (11"X17")
SCALE: 1"=30' (22"X34")
JANUARY 29, 2025

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
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Fax (603) 472–9747
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FILE 47528.00
DR JKC FB
CK JJM CADFILE 47528–00_LANDSCAPING_PHASE 1
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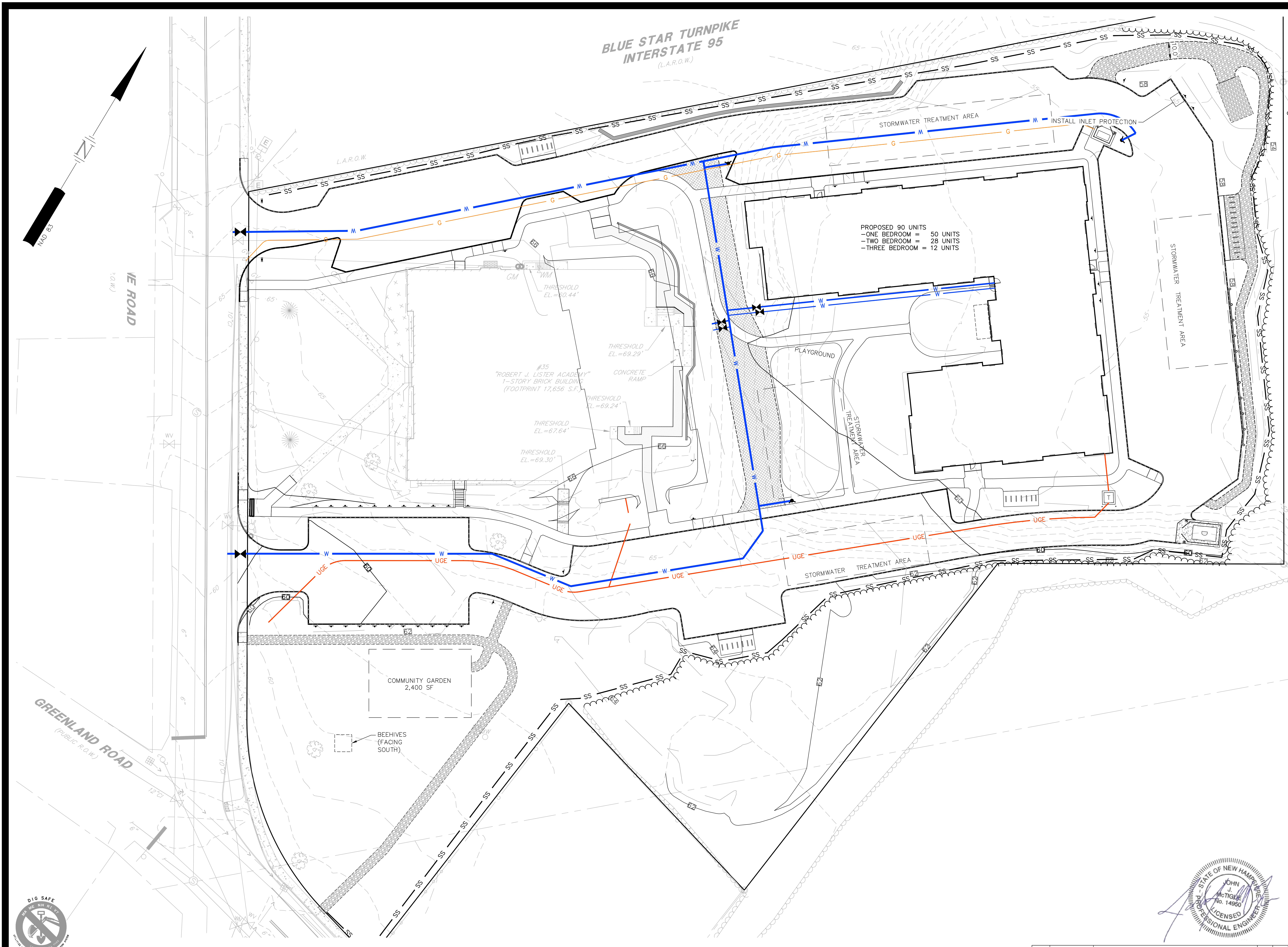
SITE LAYOUT PLAN



HORIZONTAL SCALE 1"=30'
30 15 0 30

NOTES

1. INSTALL SILT BARRIER ALONG THE PERIMETER OF THE AREA TO BE DISTURBED AS FIRST ORDER OF WORK.
2. PROVIDE INLET PROTECTION BARRIERS AROUND ALL EXISTING AND PROPOSED STORM DRAINAGE INLETS WITHIN THE WORK LIMITS AND MAINTAIN FOR THE DURATION OF THE PROJECT UNTIL PAVEMENT HAS BEEN INSTALLED. INLET PROTECTION BARRIERS SHALL BE IN PLACE AT ALL CATCH BASINS PRIOR TO THE DISTURBANCE OF SOIL.
3. DUST CONTROL SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. IT SHALL BE ACCOMPLISHED BY THE UNIFORM APPLICATION OF CALCIUM CHLORIDE AT THE RATE OF 1–1/2 POUNDS PER SQUARE YARD BY MEANS OF A LIME SPREADER OR OTHER APPROVED METHOD. WATER MAY ALSO BE USED FOR DUST CONTROL, AND APPLIED BY SPRINKLING WITH WATER TRUCK DISTRIBUTORS, AS REQUIRED.
4. THE SITE WILL REQUIRE A USEPA NPDES PERMIT FOR STORMWATER DISCHARGE FOR THE SITE CONSTRUCTION IF THE DISTURBANCE EXCEEDS ONE ACRE. THE CONSTRUCTION SITE OPERATOR SHALL DEVELOP AND IMPLEMENT A CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH EPA REGULATIONS AND THE CONSTRUCTION GENERAL PERMIT WHICH SHALL REMAIN ON SITE AND MADE ACCESSIBLE TO THE PUBLIC. THE SITE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO SUBMIT AN eNOI AT LEAST 14 DAYS IN ADVANCE OF ANY EARTHWORK ACTIVITIES AT THE SITE. A COMPLETED NOTICE OF TERMINATION (NOT) SHALL BE SUBMITTED TO NPDES PERMITTING AUTHORITY WITHIN 30 DAYS AFTER EITHER OF THE FOLLOWING CONDITIONS HAVE BEEN MET: FINAL STABILIZATION HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE FOR, OR ANOTHER OPERATOR/PERMITTEE HAS ASSUMED CONTROL OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED.
5. SILT PROTECTION MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS CONTAINED IN THIS PLAN SET.
6. CONSTRUCT JUTE MATTING ON ALL SLOPES STEEPER THAN 3:1, DISTURBED AREAS SLOPING TOWARDS WETLANDS AND ALL LOCATIONS SHOWN ON PLAN.
7. INSPECT EROSION CONTROL MEASURES WEEKLY AND AFTER EACH RAIN STORM OF 0.10" OR GREATER. REPAIR/MODIFY SILT BARRIER AS NECESSARY TO MAXIMIZE FILTER EFFICIENCY. REMOVE SEDIMENT WHEN SEDIMENT IS 1/3 THE STRUCTURE HEIGHT.
8. PROVIDE SILT BARRIERS AT THE BASE OF CUT AND FILL SLOPES UNTIL COMPLETION OF THE PROJECT OR UNTIL VEGETATION BECOMES ESTABLISHED ON SLOPES. EROSION PROTECTION BELOW FILL SLOPES SHALL BE PLACED IMMEDIATELY AFTER CLEARING, PRIOR TO EMBANKMENT CONSTRUCTION.
9. ALL DISTURBED AREAS SHALL BE REVEGETATED AS QUICKLY AS POSSIBLE. ALL CUT AND FILL SLOPES SHALL BE SEEDED WITHIN 72 HOURS AFTER GRADING.
10. ALL WORK AREAS TO BE STABILIZED AT THE END OF EACH WORK DAY AND PRIOR TO ANY PREDICTED SIGNIFICANT RAIN EVENT.
11. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
    A. BASE COURSE GRAVELS, WHICH MEET THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2, ARE INSTALLED IN AREAS TO BE PAVED
    B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
    C. A MINIMUM OF 3" OF NON–EROSIVE MATERIAL SUCH AS STONE OR RIP RAP HAS BEEN INSTALLED
    D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED
13. ALL CATCH BASINS, MANHOLES, AND DRAIN LINES SHALL BE THOROUGHLY CLEANED OF ALL SEDIMENT AND DEBRIS AFTER ALL AREAS HAVE BEEN STABILIZED.
14. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING SLOPE STABILITY DURING CONSTRUCTION.
15. THE EROSION CONTROL PRACTICES SHOWN ON THESE PLANS ARE ILLUSTRATIVE ONLY AND SHALL BE SUPPLEMENTED BY THE SITE CONTRACTOR AS NEEDED.
16. SEE ADDITIONAL NOTES NEXT SHEET.

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

EROSION CONTROL PLAN PHASE 1

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH
PREPARED FOR
PHA HOUSING DEVELOPMENT LTD.
1"=60' (11"X17")
SCALE: 1"=30' (22"X34") **JANUARY 29, 2025**

JOHN J. McTIGUE
No. 14950

1	6/16/2025	REVISED PER TAC WORKSHOP	DKS	JJM
REV	*DATE*	*DESCRIPTION*	*DR*	*CK*

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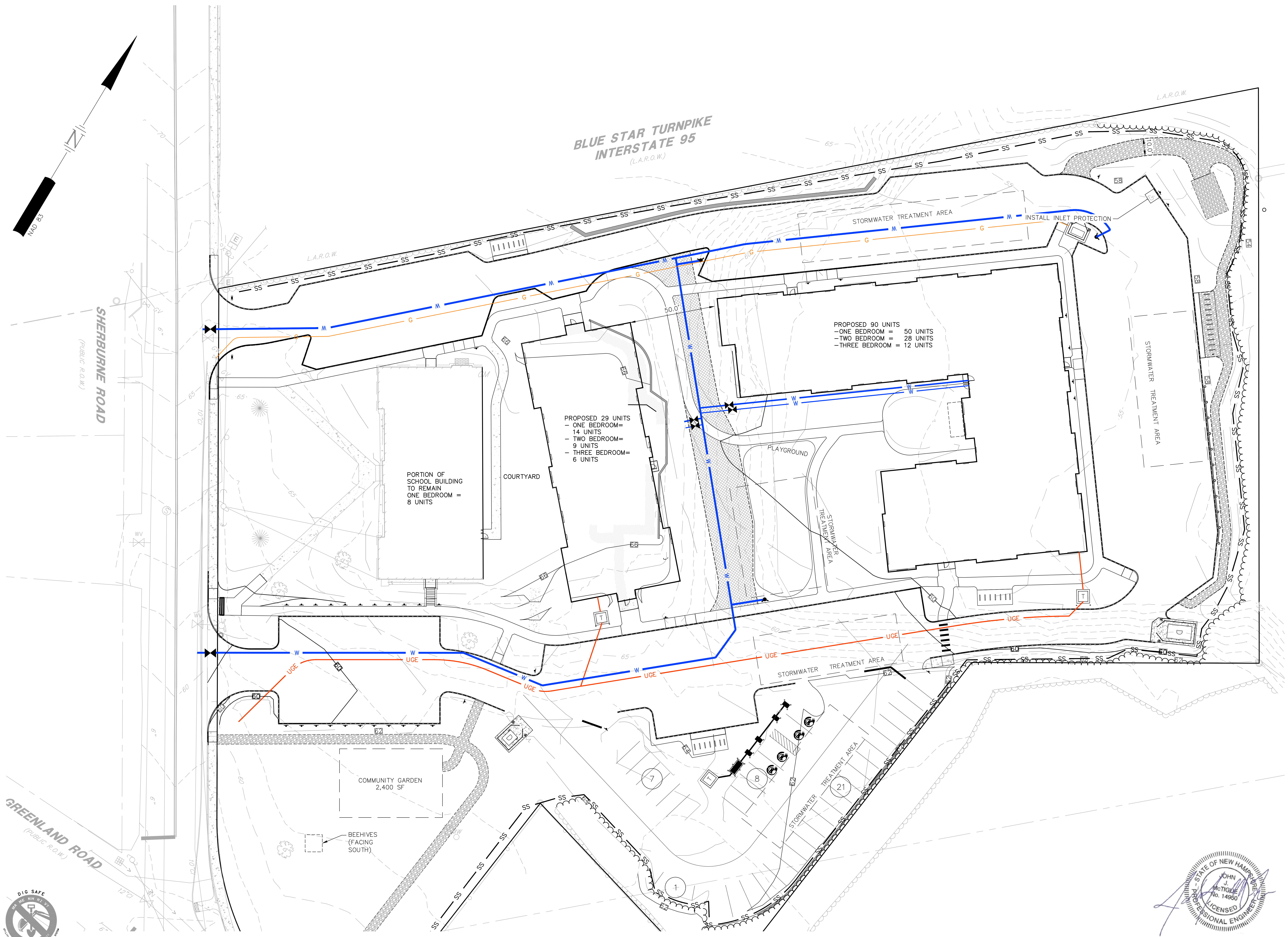

HORIZONTAL SCALE 1"=30'
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CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

NOTES

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SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

EROSION CONTROL PLAN PHASE 2

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
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This plan is not effective unless signed by a duly authorized officer of TFMoran, Inc.

SOIL CHARACTERISTICS

THE SOIL IN THE VICINITY OF THE SITE CONSIST OF XXX, THE MAJORITY OF THE SOIL IS HSG TYPE B.

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 183,500 SQUARE FEET (4.21 ACRES). CONSTRUCTION SHALL BE PHASED TO LIMIT DISTURBED AREAS TO LESS THAN 5 ACRES.

CRITICAL NOTE: THIS DRAWING IS PROVIDED FOR GENERAL GUIDANCE. ALL SPECIAL EROSION CONTROL MEASURES MUST BE EXECUTED IN ACCORDANCE WITH APPLICABLE CURRENT STATE AND LOCAL REGULATIONS, APPROVED SWPPP, AND PERMIT REQUIREMENTS.

SEQUENCE OF MAJOR ACTIVITIES

1. INSTALL PERIMETER CONTROLS, STABILIZED CONSTRUCTION ENTRANCE, AND TEMPORARY EROSION CONTROL MEASURES PER APPROVED SITE DEVELOPMENT PLANS, PERMITS, OR SWPPP IF REQUIRED, PRIOR TO EARTH MOVING OPERATIONS.
2. DEMOLISH EXISTING SITE WORK DESIGNATED FOR REMOVAL.
3. INSTALL STORMWATER TREATMENT PONDS AND SWALES BEFORE ROUGH GRADING THE SITE.
4. COMPLETE MAJOR GRADING OF SITE.
5. CONSTRUCT BUILDING PAD, STORMWATER SYSTEM, AND SITE UTILITIES.
6. CONSTRUCT PARKING AREAS.
7. WHEN ALL CONSTRUCTION ACTIVITY IS COMPLETE AND SITE IS STABILIZED, REMOVE ALL INLET PROTECTION, SILT BARRIERS, AND SEDIMENT THAT HAS BEEN TRAPPED BY THESE DEVICES.
8. CONSULT APPLICABLE REGULATIONS, PERMITS, CONDITIONS, AND APPROVED SWPPP FOR CONDITIONS RELATED TO NOTICE OF TERMINATION, IF REQUIRED.

EROSION AND SEDIMENT CONTROLS AND STABILIZATION PRACTICES

STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES AND DISTURBED AREAS WHERE CONSTRUCTION ACTIVITY WILL NOT OCCUR FOR MORE THAN TWENTY ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:

1. BASE COURSE GRAVELS, WHICH MEET THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2, HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
2. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
3. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED; OR
4. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT BARRIERS. ALL STORM DRAIN INLETS SHALL BE PROVIDED WITH BARRIER FILTERS. STONE RIPRAP SHALL BE PROVIDED AT THE OUTLETS OF DRAINAGE PIPES WHERE EROSIVE VELOCITIES ARE ENCOUNTERED.

OFF SITE VEHICLE TRACKING

STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED.

INSTALLATION, MAINTENANCE, AND INSPECTION OF EROSION AND SEDIMENT CONTROLS

A. GENERAL

THESE ARE THE GENERAL INSPECTION AND MAINTENANCE PRACTICES THAT WILL BE USED TO IMPLEMENT THE PLAN.

1. STABILIZATION OF ALL SWALES, DITCHES, AND PONDS IS REQUIRED PRIOR TO DIRECTING FLOW TO THEM.
2. THE SMALLEST PRACTICAL PORTION OF THE SITE WILL BE DENUDED AT ONE TIME. (5 AC MAX)
3. ALL CONTROL MEASURES WILL BE INSPECTED IN ACCORDANCE WITH APPLICABLE REGULATIONS, PERMITS, AND CONDITIONS AND AT LEAST EVERY 7 DAYS AND AFTER A 0.5 INCH RAIN EVENT OR GREATER, AND INSPECTIONS SHALL BE CONDUCTED BY THE ENVIRONMENTAL MONITOR IF ONE IS REQUIRED, PURSUANT TO ENV-WQ 1505.03(B).
4. ALL MEASURES WILL BE MAINTAINED IN GOOD WORKING ORDER. IF A REPAIR IS NECESSARY, IT WILL BE INITIATED WITHIN 24 HOURS OF REPORT.
5. BUILT UP SEDIMENT WILL BE REMOVED FROM SILT BARRIER WHEN IT HAS REACHED ONE THIRD THE HEIGHT OF THE BARRIER.
6. ALL DIVERSION DIKES WILL BE INSPECTED AND ANY BREACHES PROMPTLY REPAIRED.
7. TEMPORARY SEEDING AND PLANTING WILL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND UNHEALTHY GROWTH.
8. A MAINTENANCE INSPECTION REPORT WILL BE MADE AFTER EACH INSPECTION.
9. THE CONTRACTOR WILL BE RESPONSIBLE FOR ENSURING AN ENVIRONMENTAL MONITOR, IF ONE IS REQUIRED, PURSUANT TO ENV-WQ 1505.03(B), IS CONTRACTED.

B. FILTERS / BARRIERS

1. SILT SOCKS

   A. KNOTTED MESH NETTING MATERIAL SHALL BE DELIVERED TO SITE IN A 5 MIL CONTINUOUS, TUBULAR, HDPE 3/8" MATERIAL, FILLED WITH COMPOST CONFORMING TO THE FOLLOWING REQUIREMENTS:

PHYSICAL PROPERTY	TEST	REQUIREMENTS
PH	TMECC 04.11-A	5.0 TO 8.0
PARTICLE SIZE	TMECC 02.02-B	2" SIEVE AND MIN. 60% GREATER THAN THE $\frac{3}{8}$" SIEVE
MOISTURE CONTENT		STND TESTING < 60%

   MATERIAL SHALL BE RELATIVELY FREE OF INERT OR FOREIGN MAN-MADE MATERIALS

   MATERIAL SHALL BE WEED FREE AND DERIVED FROM A WELL-DECOMPOSED SOURCE OF ORGANIC MATTER, FREE FROM ANY REFUSE, CONTAMINANTS OR OTHER MATERIALS TOXIC TO PLANT GROWTH.

   B. SEDIMENT COLLECTED AT THE BASE OF THE SILT SOCK SHALL BE REMOVED ONCE IT HAS REACHED 1/3 OF THE EXPOSED HEIGHT OF THE SILT SOCK.

   C. SILT BARRIER SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREAS HAS BEEN PERMANENTLY STABILIZED.

2. SEQUENCE OF INSTALLATION

   SEDIMENT BARRIERS SHALL BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM.

3. MAINTENANCE

   A. SILT BARRIERS SHALL BE INSPECTED WEEKLY AND IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. THEY SHALL BE REPAIRED IF THERE ARE ANY SIGNS OF EROSION OR SEDIMENTATION BELOW THEM. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY. IF THERE ARE SIGNS OF UNDERCUTTING AT THE CENTER OR THE EDGES, OR IMPOUNDING OF LARGE VOLUMES OF WATER BEHIND THEM, SEDIMENT BARRIERS SHALL BE REPLACED WITH A TEMPORARY CHECK DAM.

   B. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.

   C. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE THIRD (1/3) THE HEIGHT OF THE BARRIER.

   D. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFIRM WITH THE EXISTING GRADE, PREPARED AND SEEDED.

C. MULCHING

1. TIMING

   IN ORDER FOR MULCH TO BE EFFECTIVE, IT MUST BE IN PLACE PRIOR TO MAJOR STORM EVENTS. THERE ARE TWO (2) TYPES OF STANDARDS WHICH SHALL BE USED TO ASSURE THIS:

   A. APPLY MULCH PRIOR TO ANY STORM EVENT.

   THIS IS APPLICABLE WHEN WORKING WITHIN 100' OF WETLANDS. IT WILL BE NECESSARY TO CLOSELY MONITOR WEATHER PREDICTIONS, USUALLY BY CONTACTING THE NATIONAL WEATHER SERVICE, TO HAVE ADEQUATE WARNING OF SIGNIFICANT STORMS.

   B. REQUIRED MULCHING WITHIN A SPECIFIED TIME PERIOD.

   THE TIME PERIOD CAN RANGE FROM 14 TO 21 DAYS OF INACTIVITY ON AN AREA, WHERE THE LENGTH OF TIME VARIES WITH SITE CONDITIONS. PROFESSIONAL JUDGMENT SHALL BE USED TO EVALUATE THE INTERACTION OF SITE CONDITIONS (SOIL ERODIBILITY, SEASON OF YEAR, EXTENT OF DISTURBANCE, PROXIMITY TO SENSITIVE RESOURCES, ETC.) AND THE POTENTIAL IMPACT OF EROSION ON ADJACENT AREAS TO CHOOSE AN APPROPRIATE TIME RESTRICTION.

2. GUIDELINES FOR WINTER MULCH APPLICATION.

   WHEN MULCH IS APPLIED TO PROVIDE PROTECTION OVER WINTER (PAST THE GROWING SEASON) IT SHALL BE AT A RATE OF 6,000 POUNDS OF HAY OR STRAW PER ACRE. A TACKIFIER MAY BE ADDED TO THE MULCH.

3. MAINTENANCE

   ALL MULCHES MUST BE INSPECTED PERIODICALLY, IN PARTICULAR AFTER RAINSTORMS, TO CHECK FOR RILL EROSION. IF LESS THAN 90% OF THE SOIL SURFACE IS COVERED BY MULCH, ADDITIONAL MULCH SHALL BE IMMEDIATELY APPLIED.

D. VEGETATIVE PRACTICE

1. AFTER ROUGH GRADING OF THE SUBGRADE HAS BEEN COMPLETED AND APPROVED, THE SUB GRADE SURFACE SHALL BE SCARIFIED TO A DEPTH OF 4". THEN, FURNISH AND INSTALL A LAYER OF LOAM PROVIDING A ROLLED THICKNESS AS SPECIFIED IN THESE PLANS. ANY DEPRESSIONS WHICH MAY OCCUR DURING ROLLING SHALL BE FILLED WITH ADDITIONAL LOAM, REGRADED AND REROLLED UNTIL THE SURFACE IS TRUE TO THE FINISHED LINES AND GRADES. ALL LOAM NECESSARY TO COMPLETE THE WORK UNDER THIS SECTION SHALL BE SUPPLIED BY THE SITE SUBCONTRACTOR.
2. ALL LARGE STIFF CLODS, LUMPS, BRUSH, ROOTS, DEBRIS, GLASS, STUMPS, LITTER, AND OTHER FOREIGN MATERIAL, AS WELL AS STONES OVER 1" IN DIAMETER, SHALL BE REMOVED FROM THE LOAM AND DISPOSED OF OFF SITE. THE LOAM SHALL BE RAKED SMOOTH AND EVEN.
3. THE LOAM SHALL BE PREPARED TO RECEIVE SEED BY REMOVING STONES, FOREIGN OBJECTS AND GRADING TO ELIMINATE WATER POCKETS AND IRREGULARITIES PRIOR TO PLACING SEED. FINISH GRADING SHALL RESULT IN STRAIGHT UNIFORM GRADES AND SMOOTH, EVEN SURFACES WITHOUT IRREGULARITIES TO LOW POINTS.
4. SHAPE THE AREAS TO THE LINES AND GRADES REQUIRED. THE SITE SUBCONTRACTOR'S ATTENTION IS DIRECTED TO THE SCHEDULING OF LOAMING AND SEEDING OF GRADED AREAS TO PERMIT SUFFICIENT TIME FOR THE STABILIZATION OF THESE AREAS. IT SHALL BE THE SITE SUBCONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE AREAS DURING THE CONSTRUCTION PERIOD AND REGRADE, LOAM AND RESEED ANY DAMAGED AREAS.
5. ALL AREAS DISTURBED BY CONSTRUCTION WITHIN THE PROPERTY LINES AND NOT COVERED BY STRUCTURES, PAVEMENT, OR MULCH SHALL BE LOAMED AND SEEDED.
6. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF 2 TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 6.5.
7. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 500 POUNDS PER ACRE OF 10-20-20 FERTILIZER.
8. SOIL CONDITIONERS AND FERTILIZER SHALL BE APPLIED AT THE RECOMMENDED RATES AND SHALL BE THOROUGHLY WORKED INTO THE LOAM. LOAM SHALL BE RAKED UNTIL THE SURFACE IS FINELY PULVERIZED, SMOOTH AND EVEN, AND THEN COMPACTED TO AN EVEN SURFACE CONFORMING TO THE REQUIRED LINES AND GRADES WITH APPROVED ROLLERS WEIGHING BETWEEN 4 1/2 POUNDS AND 5 1/2 POUNDS PER INCH OF WIDTH.
9. SEED SHALL BE SOWN AT THE RATE SHOWN BELOW. SOWING SHALL BE DONE ON A CALM, DRY DAY, PREFERABLY BY MACHINE, BUT IF BY HAND, ONLY BY EXPERIENCED WORKMEN. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4" AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH.
10. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AT A RATE OF 1.5 TO 2 TONS PER ACRE. MULCH THAT BLOWS OR WASHES AWAY SHALL BE REPLACED IMMEDIATELY AND ANCHORED USING APPROPRIATE TECHNIQUES FROM THE EROSION AND SEDIMENT CONTROL HANDBOOK.
11. THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED WITH GRASS SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED.
12. THE SITE SUBCONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED, INCLUDING CUTTING, AS SPECIFIED HEREIN AFTER UNDER MAINTENANCE AND PROTECTION.
13. UNLESS OTHERWISE APPROVED, SEEDING SHALL BE DONE DURING THE APPROXIMATE PERIODS OF EARLY SPRING TO SEPTEMBER 30, WHEN SOIL CONDITIONS AND WEATHER ARE SUITABLE FOR SUCH WORK. IN NO CASE SHALL THE WEED CONTENT EXCEED 1 PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. FOR TEMPORARY PLANTINGS AFTER SEPTEMBER 30, TO EARLY SPRING AND FOR TEMPORARY PROTECTION OF DISTURBED AREAS:

   A. FOLLOW ABOVE SLOPE, LOAM DEPTH AND GRADING REQUIREMENTS.
   B. FERTILIZER SHALL BE SPREAD AND WORKED INTO THE SURFACE AT A RATE OF 500 POUNDS PER ACRE.

MULCHING AND SEEDING SHALL BE APPLIED AT THE FOLLOWING RATES:

WINTER RYE (FALL SEEDING)	2.5 LBS/1,000 SF
OATS (SPRING SEEDING)	2.0 LBS/1,000 SF
MULCH	1.5 TONS/ACRE

E. CATCH BASIN INLET PROTECTION

1. INLET BASKET STRUCTURE

   A. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY PRIOR TO DISTURBING PAVEMENT AND SHALL REMAIN IN PLACE AND MAINTAINED UNTIL PAVEMENT BINDER COURSE IS COMPLETE.

   B. MOLD 6X6, 42 LB. WIRE SUPPORT AROUND INLET FRAME AND GRATE AND EXTEND 6" BEYOND SIDES. SECURE FILTER FABRIC TO WIRE SUPPORT.

   C. THE FILTER FABRIC SHALL BE A GEOTEXTILE FABRIC; POLYESTER, POLYPROPYLENE, STABILIZED NYLON, POLYETHYLENE OR POLYVINYLIDENE CHLORIDE MEETING THE FOLLOWING SPECIFICATIONS:

   GRAB STRENGTH: 45 LB. MINIMUM IN ANY PRINCIPAL DIRECTION (ASTM D1682)
   MULLEN BURST STRENGTH: MIN. 60PSI (ASTM D774)

   D. THE FABRIC SHALL HAVE AN OPENING NO GREATER THAN A NUMBER 20 U.S. STANDARD SIEVE AND A MINIMUM PERMEABILITY OF 120 GPM.

   E. THE INLET PROTECTION SHALL BE INSPECTED WITHIN 24 HOURS AFTER EACH RAINFALL OR DAILY DURING EXTENDED PERIODS OF PRECIPITATION. REPAIRS SHALL BE MADE IMMEDIATELY, AS NECESSARY, TO PREVENT PARTICLES FROM REACHING THE DRAINAGE SYSTEM AND/OR CAUSING SURFACE FLOODING.

   F. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT, OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED.

F. WINTER CONSTRUCTION SEQUENCE

1. ALL PROPOSED POST-DEVELOPMENT LANDSCAPED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1 AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE PLACEMENT OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENT.
2. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
3. AFTER OCTOBER 15TH, INCOMPLETE PARKING AREAS WHERE ACTIVE CONSTRUCTION HAS STOPPED FOR THE WINTER ALL TRAVEL SURFACES SHALL BE PROTECTED WITH A MINIMUM OF 3" OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOWFALL AFTER EACH STORM EVENT.

TIMING OF CONTROLS/MEASURES

AS INDICATED IN THE SEQUENCE OF MAJOR ACTIVITIES, SILT BARRIERS SHALL BE INSTALLED PRIOR TO COMMENCING ANY CLEARING OR GRADING OF THE SITE. STRUCTURAL CONTROLS SHALL BE INSTALLED CONCURRENTLY WITH THE APPLICABLE ACTIVITY. AREAS WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES FOR MORE THAN TWENTY ONE (21) DAYS WILL BE STABILIZED WITH A TEMPORARY SEED AND MULCH WITHIN FOURTEEN (14) DAYS OF THE LAST DISTURBANCE. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN AREA, SILT BARRIERS AND ANY EARTH/DIKES WILL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.

FOR SINGLE/DUPLEX FAMILY SUBDIVISIONS, WHEN LOT DEVELOPMENT IS NOT PART OF THE PERMIT, THEN LOT DISTURBANCE, OTHER THAN THAT SHOWN ON THE APPROVED PLANS, SHALL NOT COMMENCE UNTIL AFTER THE ROADWAY HAS THE BASE COURSE TO DESIGN ELEVATION AND THE ASSOCIATED DRAINAGE IS COMPLETE AND STABLE.

WASTE DISPOSAL

1. WASTE MATERIALS
   ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN A DUMPSTER. NO CONSTRUCTION WASTE MATERIALS WILL BE BURIED ON SITE. ALL PERSONNEL WILL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
2. HAZARDOUS WASTE
   ALL HAZARDOUS WASTE MATERIALS WILL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER. SITE PERSONNEL WILL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
3. SANITARY WASTE
   ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

SPILL PREVENTION

1. MATERIAL MANAGEMENT PRACTICES
   THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT WILL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:

   GOOD HOUSEKEEPING:
   THE FOLLOWING GOOD HOUSEKEEPING PRACTICES WILL BE FOLLOWED ON SITE DURING THE CONSTRUCTION PROJECT:

   A. AN EFFORT WILL BE MADE TO STORE ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB.

   B. ALL MATERIALS STORED ON SITE WILL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE.

   C. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL WILL BE FOLLOWED.

   D. THE SITE SUPERINTENDENT WILL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS.

   E. SUBSTANCES WILL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.

   F. WHENEVER POSSIBLE ALL OF A PRODUCT WILL BE USED UP BEFORE DISPOSING OF THE CONTAINER.

   HAZARDOUS PRODUCTS:
   THE FOLLOWING PRACTICES WILL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:

   A. PRODUCTS WILL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE.

   B. ORIGINAL LABELS AND MATERIAL SAFETY DATA WILL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION.

   C. SURPLUS PRODUCT THAT MUST BE DISPOSED OF WILL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.

2. PRODUCT SPECIFICATION PRACTICES
   THE FOLLOWING PRODUCT SPECIFIC PRACTICES WILL BE FOLLOWED ON SITE:

   PETROLEUM PRODUCTS:
   ALL ON SITE VEHICLES WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE WILL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

   FERTILIZERS:
   FERTILIZERS USED WILL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS. ONCE APPLIED, FERTILIZER WILL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER. STORAGE WILL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER WILL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.

   PAINTS:
   ALL CONTAINERS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. EXCESS PAINT WILL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM BUT WILL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.

   CONCRETE TRUCKS:
   CONCRETE TRUCKS WILL DISCHARGE AND WASH OUT SURPLUS CONCRETE OR DRUM WASH WATER IN A CONTAINED AREA DESIGNATED ON SITE.

SPILL CONTROL PRACTICES

IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION THE FOLLOWING PRACTICES WILL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:

A. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP WILL BE CLEARLY POSTED AND SITE PERSONNEL WILL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES.

B. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP WILL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS WILL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST, AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE.

C. ALL SPILLS WILL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY.

D. THE SPILL AREA WILL BE KEPT WELL VENTILATED AND PERSONNEL WILL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.

E. SPILLS OF TOXIC OR HAZARDOUS MATERIAL WILL BE REPORTED TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY, REGARDLESS OF THE SIZE.

F. THE SPILL PREVENTION PLAN WILL BE ADJUSTED TO INCLUDE MEASURES TO PREVENT THIS TYPE OF SPILL FROM RECURRING AND HOW TO CLEANUP THE SPILL IF IT RECURS. A DESCRIPTION OF THE SPILL, ITS CAUSE, AND THE CLEANUP MEASURES WILL BE INCLUDED.

G. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY-TO-DAY SITE OPERATIONS WILL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.

DUST CONTROL

THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST THROUGHOUT THE CONSTRUCTION PERIOD. DUST CONTROL METHODS SHALL INCLUDE, BUT NOT LIMITED TO SPRINKLING WATER ON EXPOSED AREAS, COVERING LOADED DUMP TRUCKS LEAVING THE SITE, AND TEMPORARY MULCHING. DUST CONTROL MEASURES SHALL BE UTILIZED SO AS TO PREVENT THE MIGRATION OF DUST FROM THE SITE TO ABUTTING AREAS.

CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

JOHN J. McTIGUE No. 14950

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SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

EROSION CONTROL NOTES

PROPOSED HOUSING DEVELOPMENT

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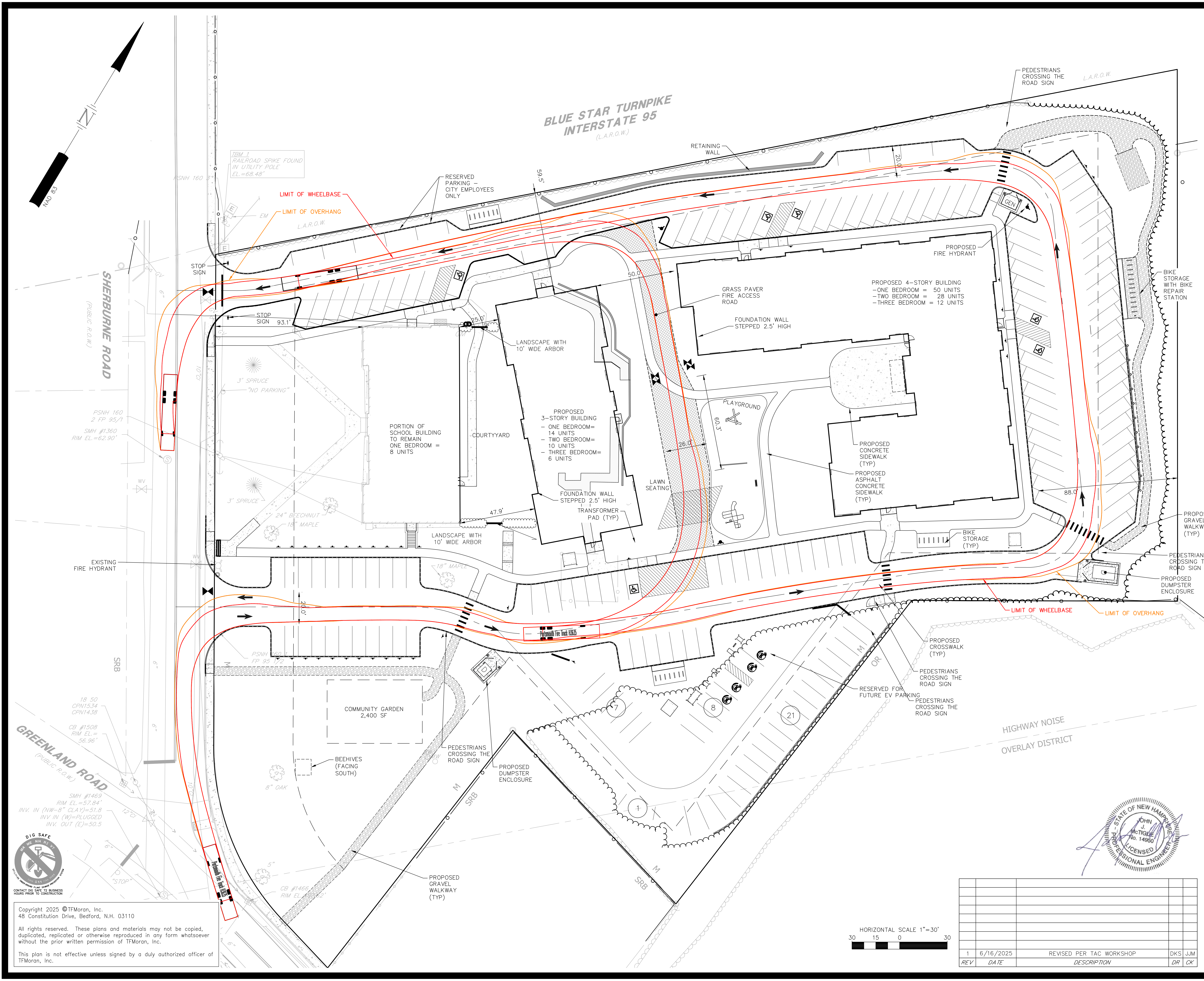

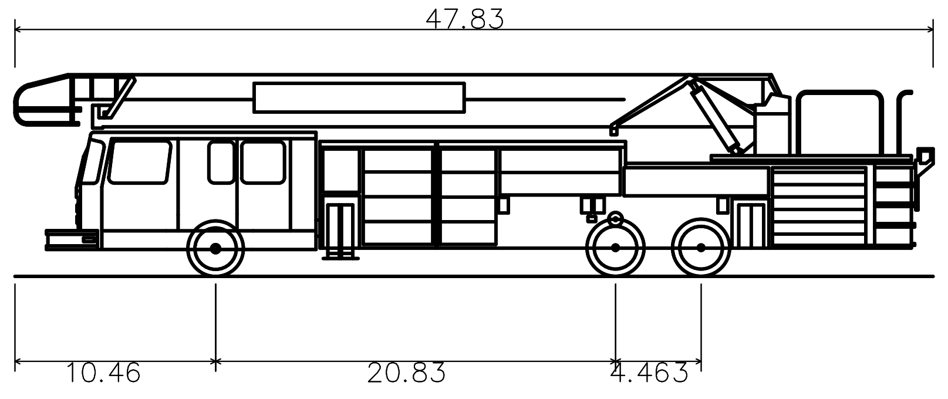

Portsmouth Fire Truck H3635

Overall Length	47.830ft
Overall Width	8.500ft
Overall Body Height	10.505ft
Min Body Ground Clearance	0.935ft
Max Track Width	8.500ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	38.00°

CITY OF PORTMOUTH PLANNING BOARD

CHAIRPERSON

DATE

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

TRUCK TURN - FIRE

PROPOSED HOUSING DEVELOPMENT

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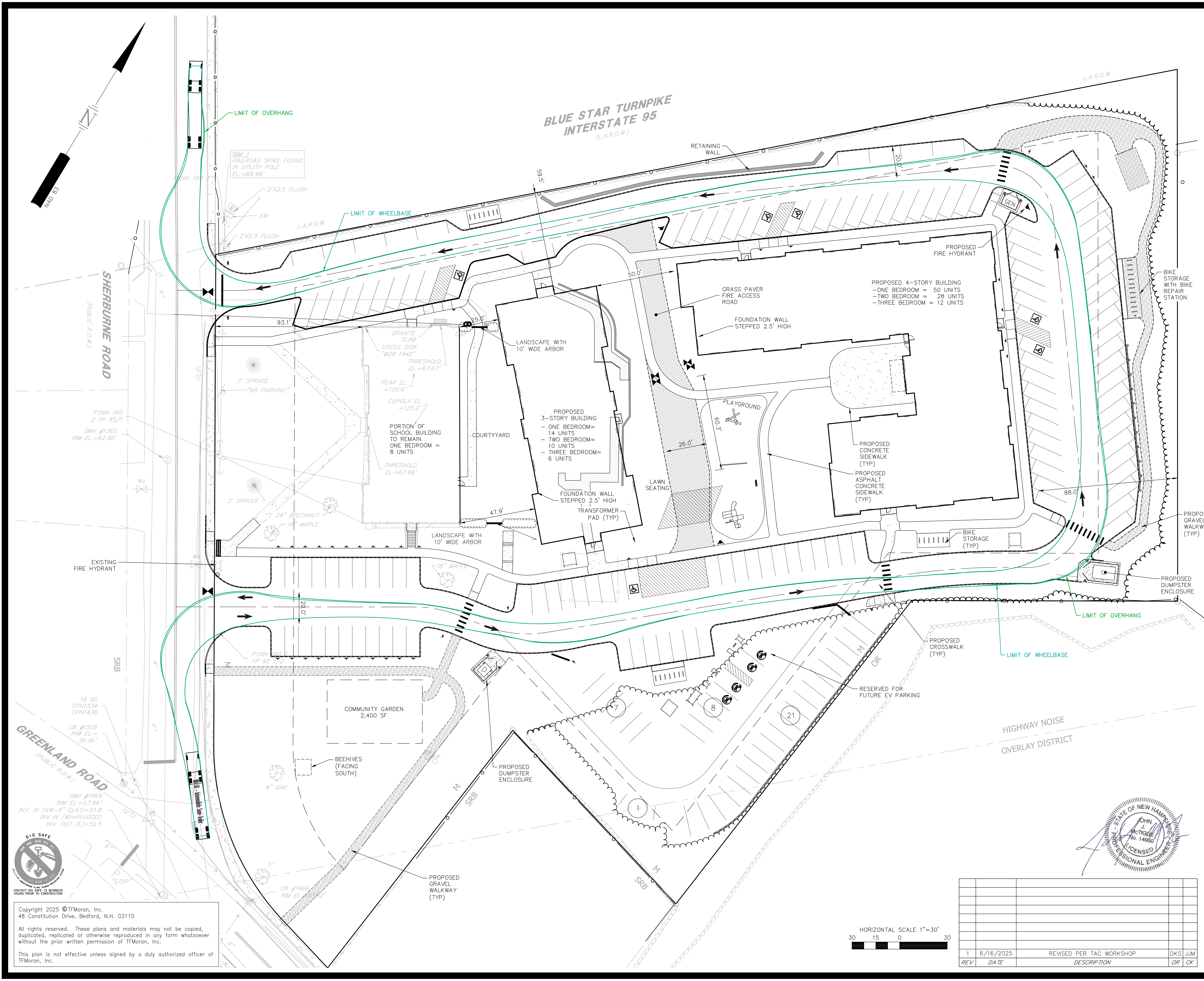
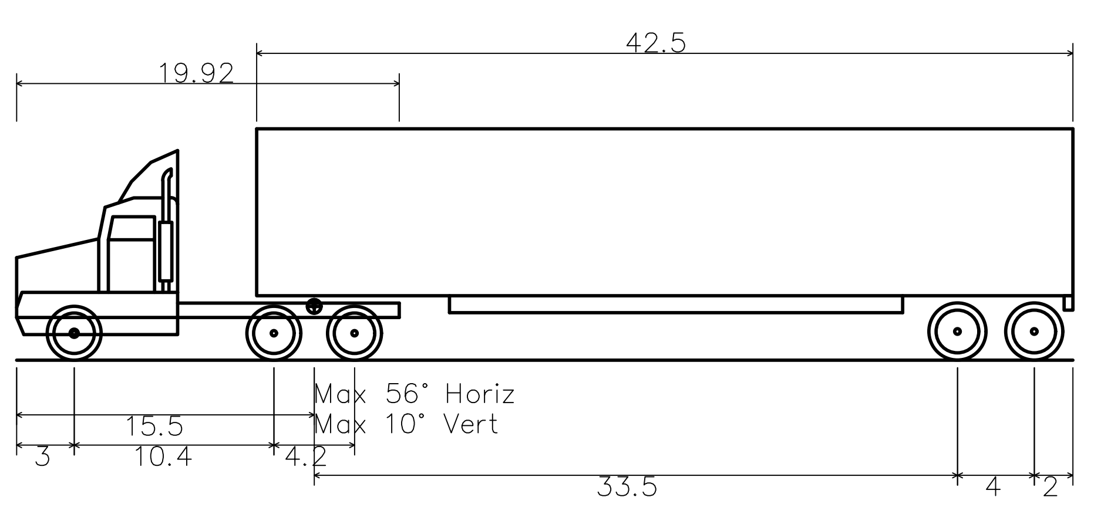
SITE LAYOUT PLAN





WB-50 - Intermediate Semi-Trailer

Overall Length	55.000ft
Overall Width	8.500ft
Overall Body Height	12.052ft
Min Body Ground Clearance	1.334ft
Max Track Width	8.500ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	17.90°

CITY OF PORTMOUTH PLANNING BOARD

CHAIRPERSON
DATE

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10
TRUCK TURN - WB-50
PROPOSED HOUSING DEVELOPMENT
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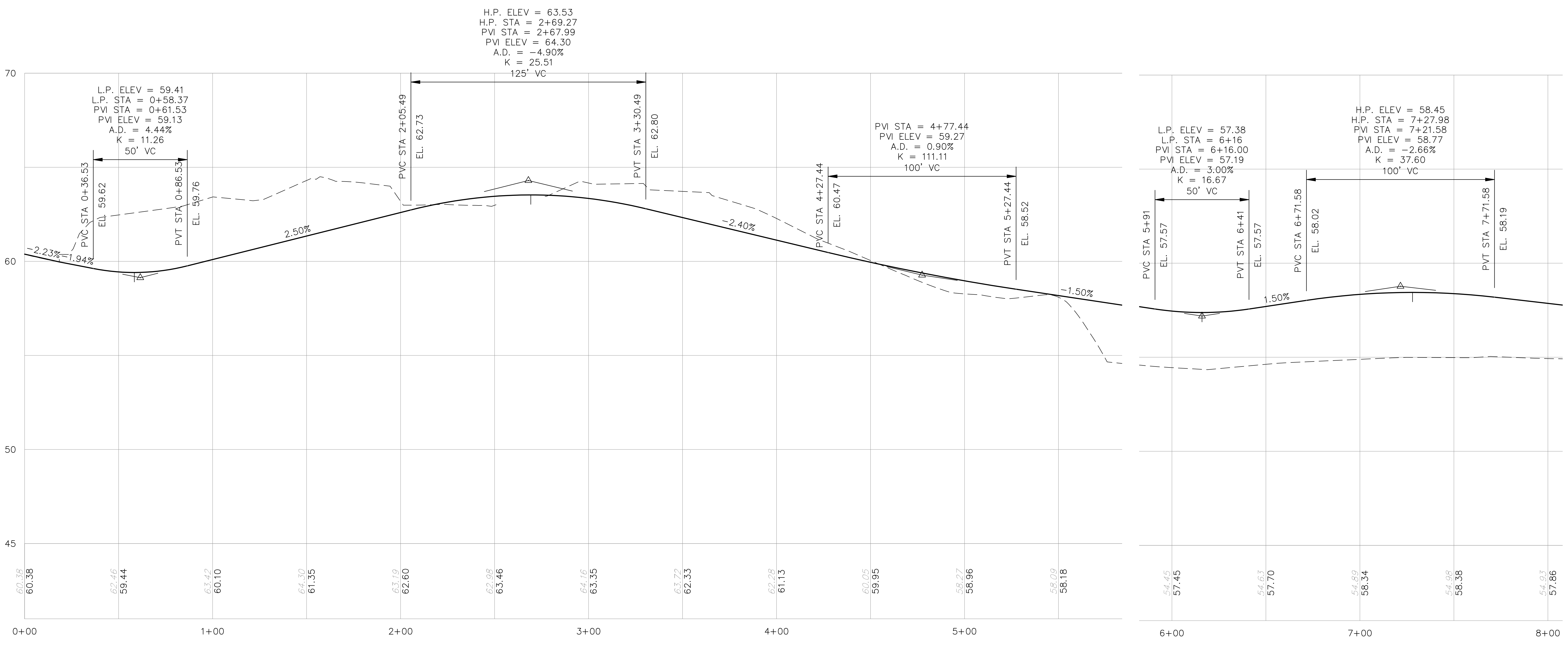

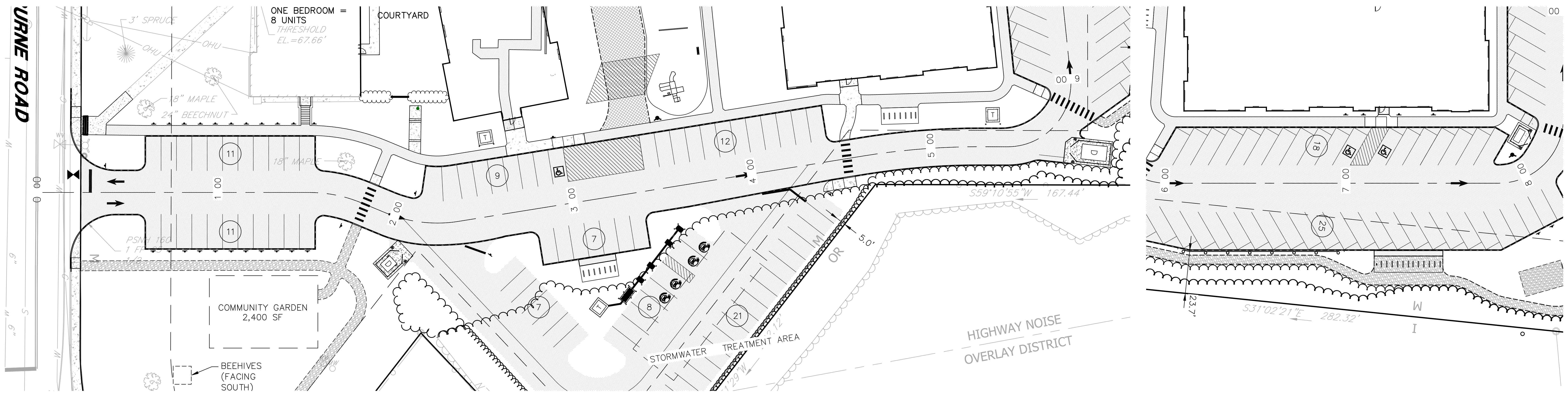

HORIZONTAL SCALE 1"=40'

40 20 0 40

4 0 4

VERTICAL SCALE 1"=4'

JOHN J. McTIGUE No. 14950 LICENSED

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SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

DRIVE PROFILE A

PROPOSED HOUSING DEVELOPMENT

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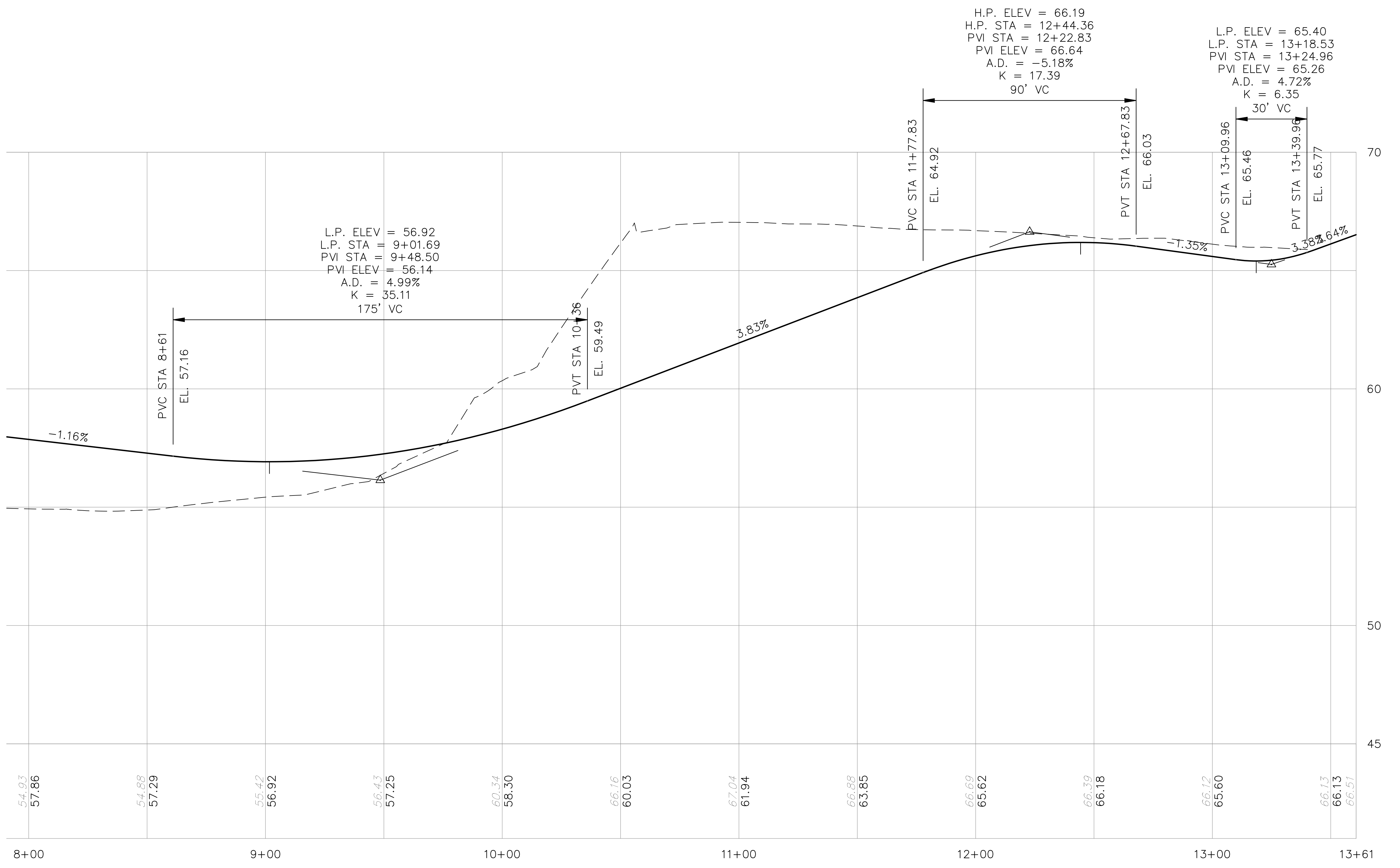

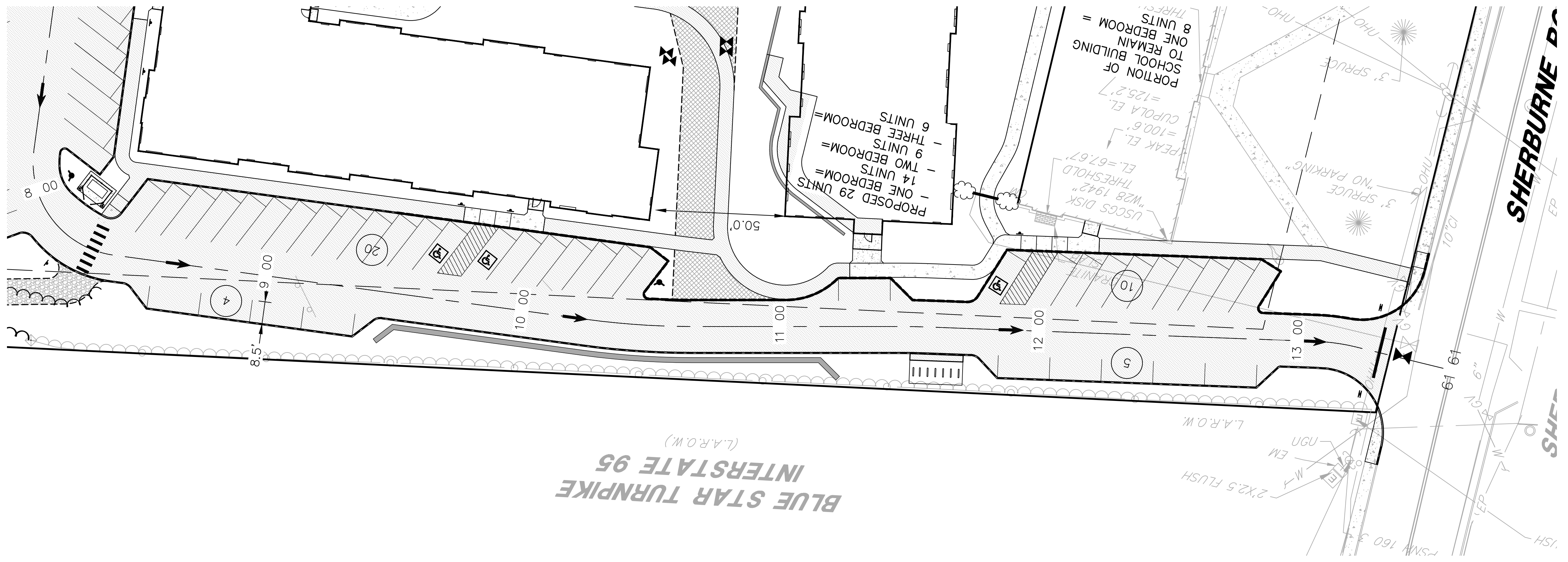

HORIZONTAL SCALE 1"=40'
40 20 0 40
4 0 4
VERTICAL SCALE 1"=4'

JOHN J. McTIGUE No. 14950

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SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

DRIVE PROFILE B

PROPOSED HOUSING DEVELOPMENT

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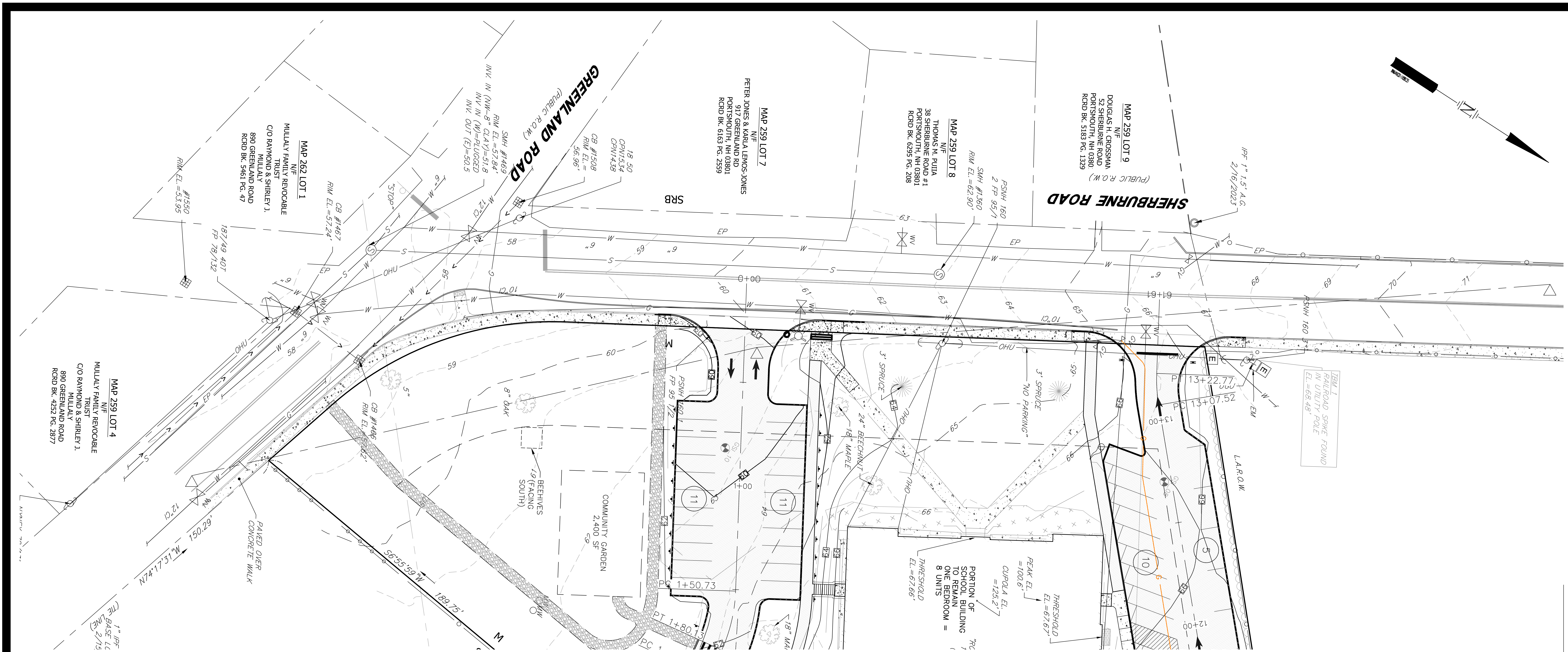

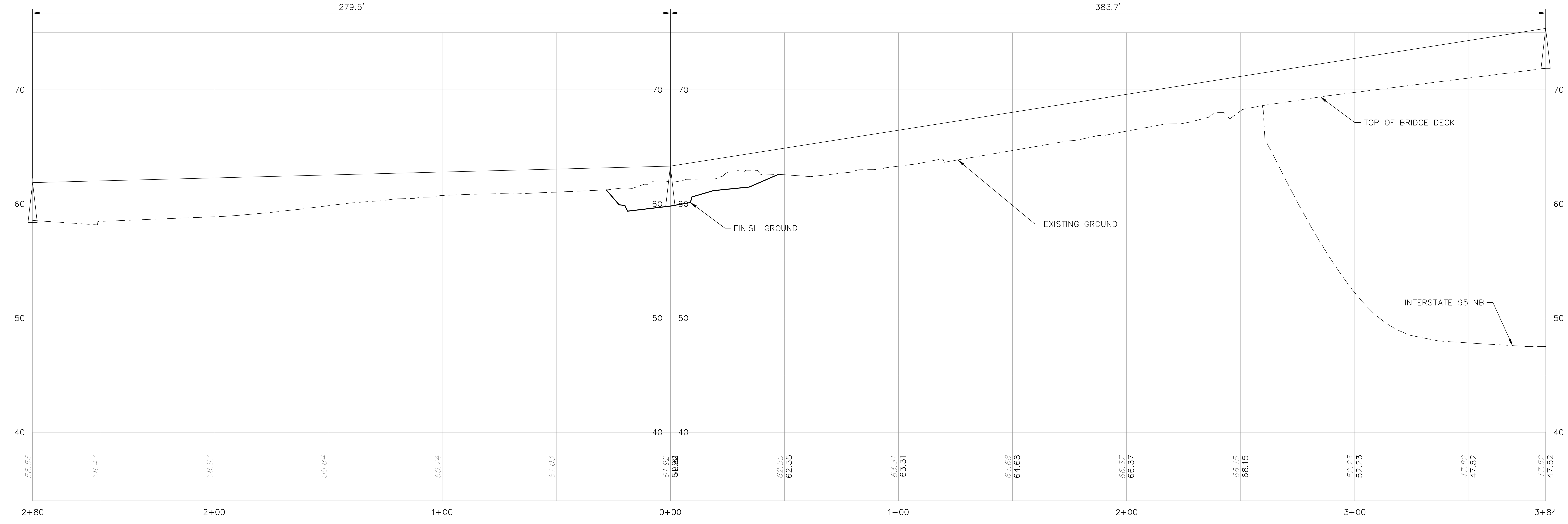

JOHN J. McTIGUE
No. 14950

APPROVED BY THE CITY/TOWN OF XXX PLANNING BOARD

ON ____________________

BOARD MEMBER ____________________ *AND*

BOARD MEMBER ____________________

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

SITE DISTANCE PLAN

PROPOSED HOUSING DEVELOPMENT

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HORIZONTAL SCALE 1"=30'
30 15 0 30
3 0 3
VERTICAL SCALE 1"=3'

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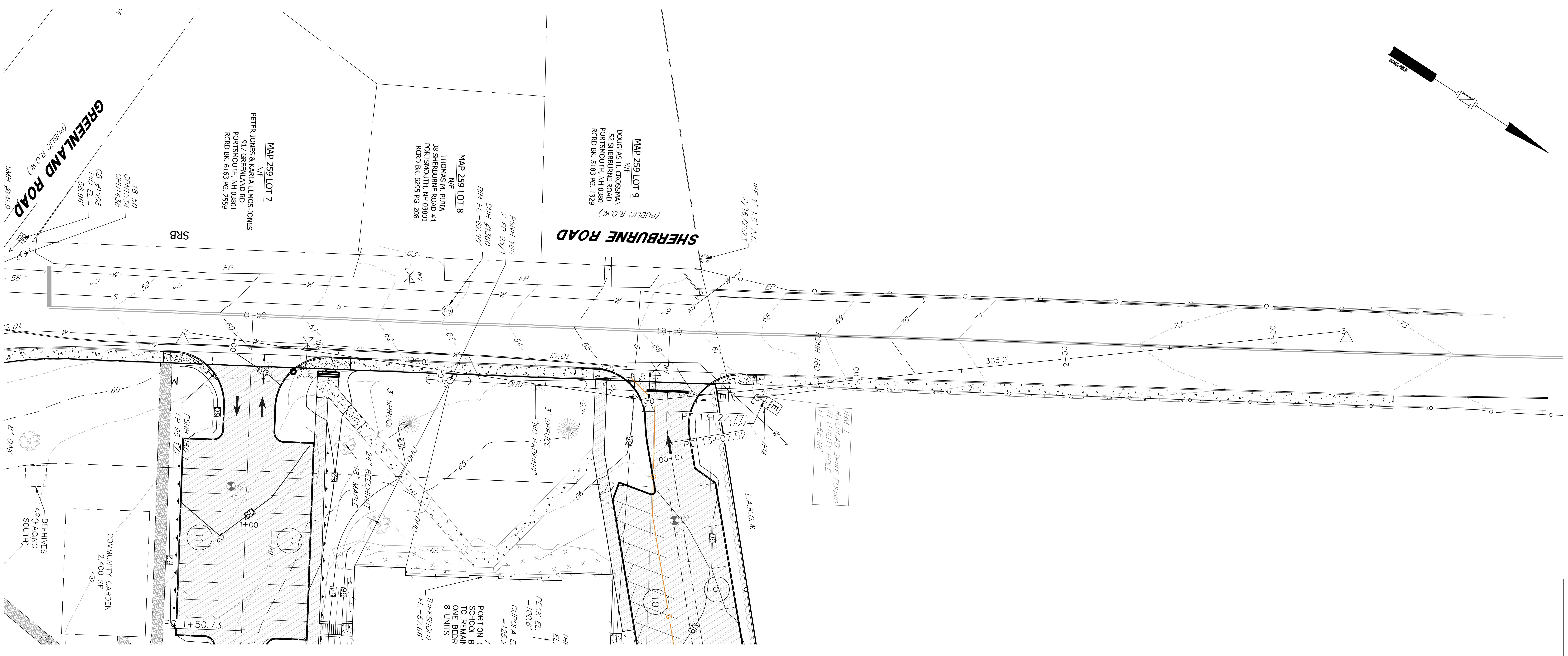

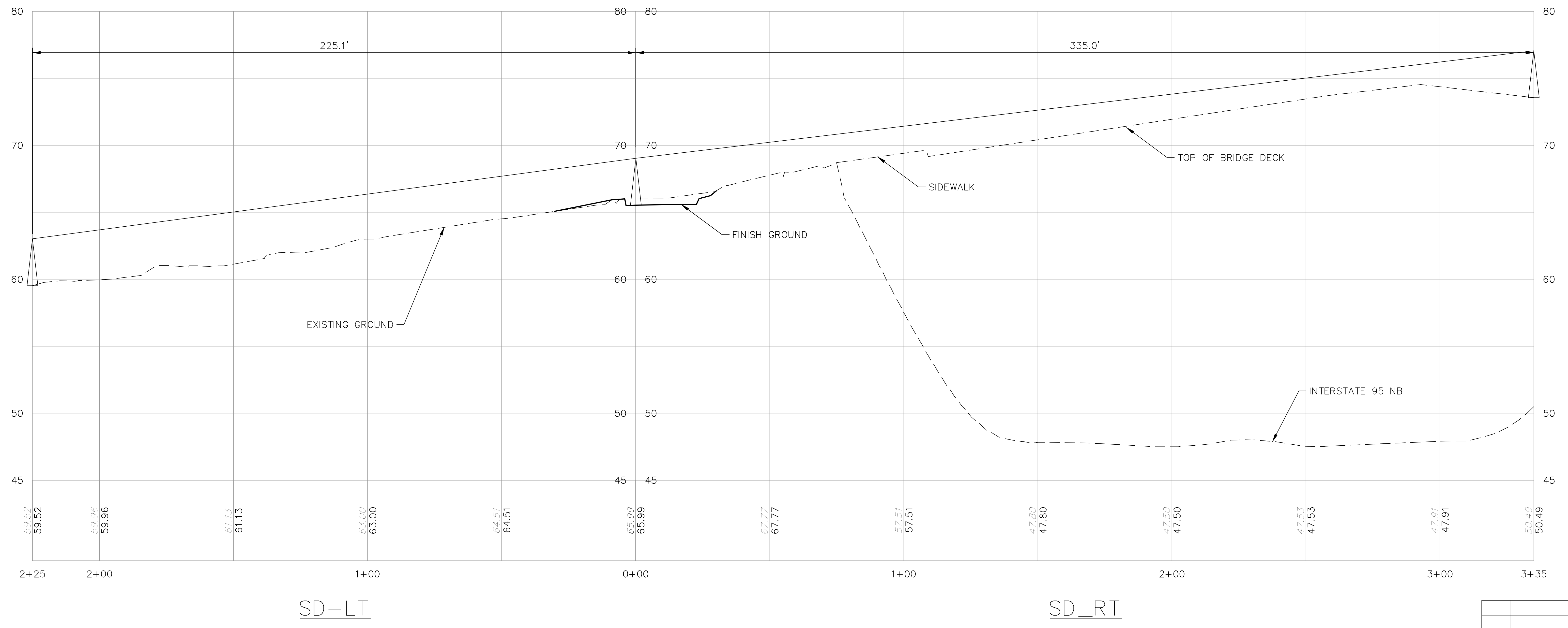

HORIZONTAL SCALE 1"=30'
30 15 0 30
3 0 3
VERTICAL SCALE 1"=3'

CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

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SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

SITE DISTANCE PLAN

PROPOSED HOUSING DEVELOPMENT

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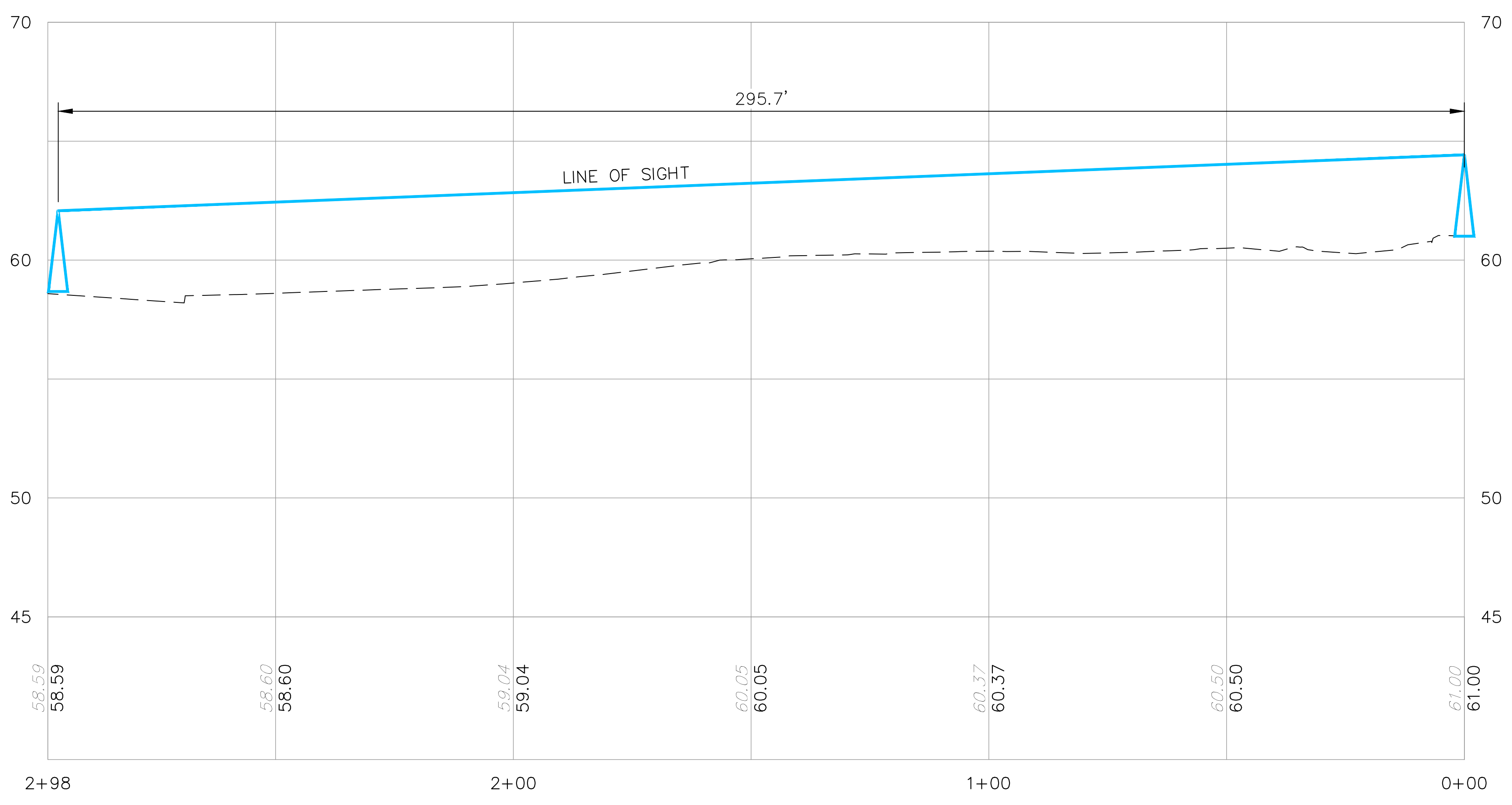
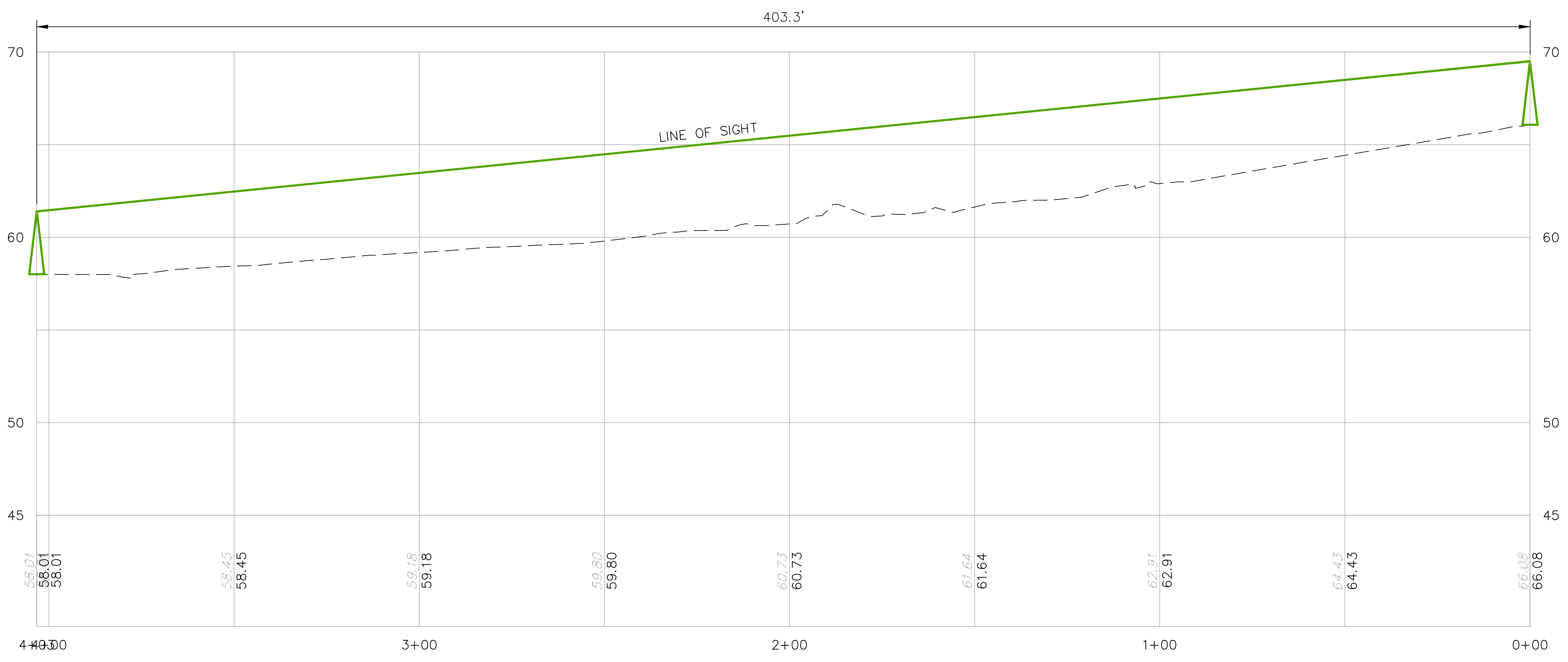
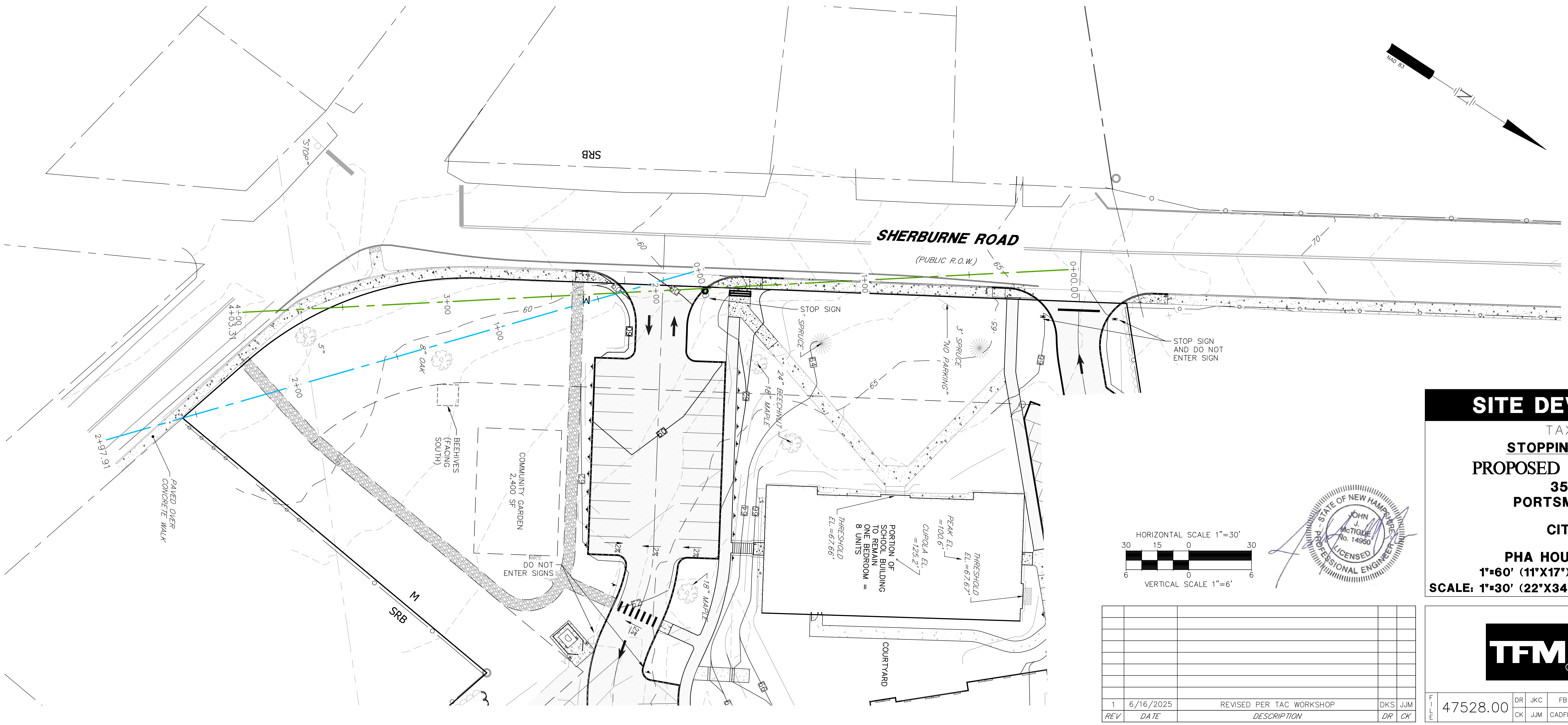


SOUTHERN ENTRANCE



NORTHERN ENTRANCE



SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

STOPPING SIGHT DISTANCE PLAN

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH
PREPARED FOR
PHA HOUSING DEVELOPMENT LTD.
1"=60' (11"X17")
SCALE: 1"=30' (22"X34") **JANUARY 29, 2025**

JOHN J. McTIGUE No. 14950

1	6/16/2025	REVISED PER TAC WORKSHOP	DKS	JJM
REV	*DATE*	*DESCRIPTION*	*DR*	*CK*

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		CK	JJM	CADFILE	47528-00_SIGHT-DIST_TWO-WAY	

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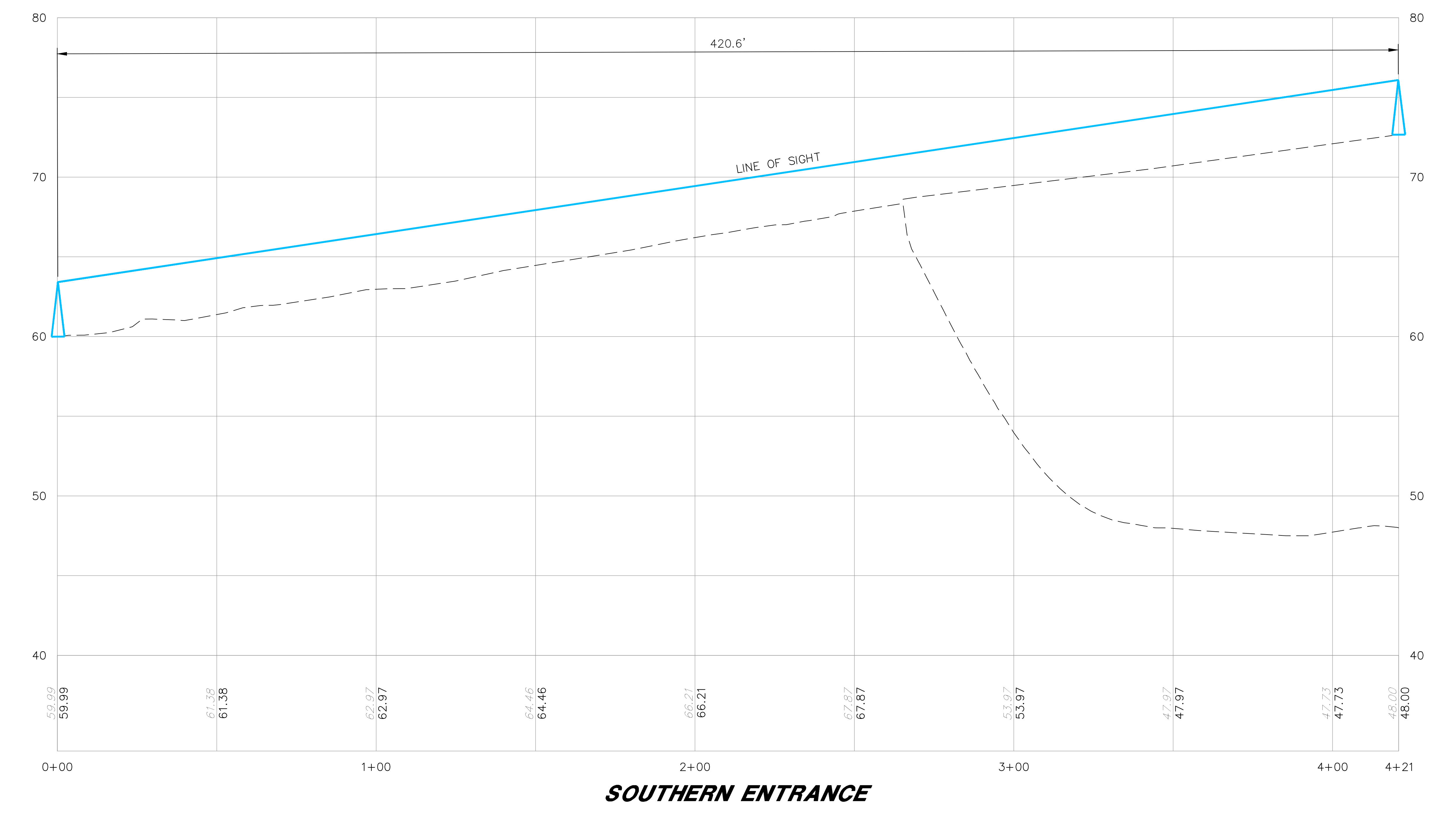

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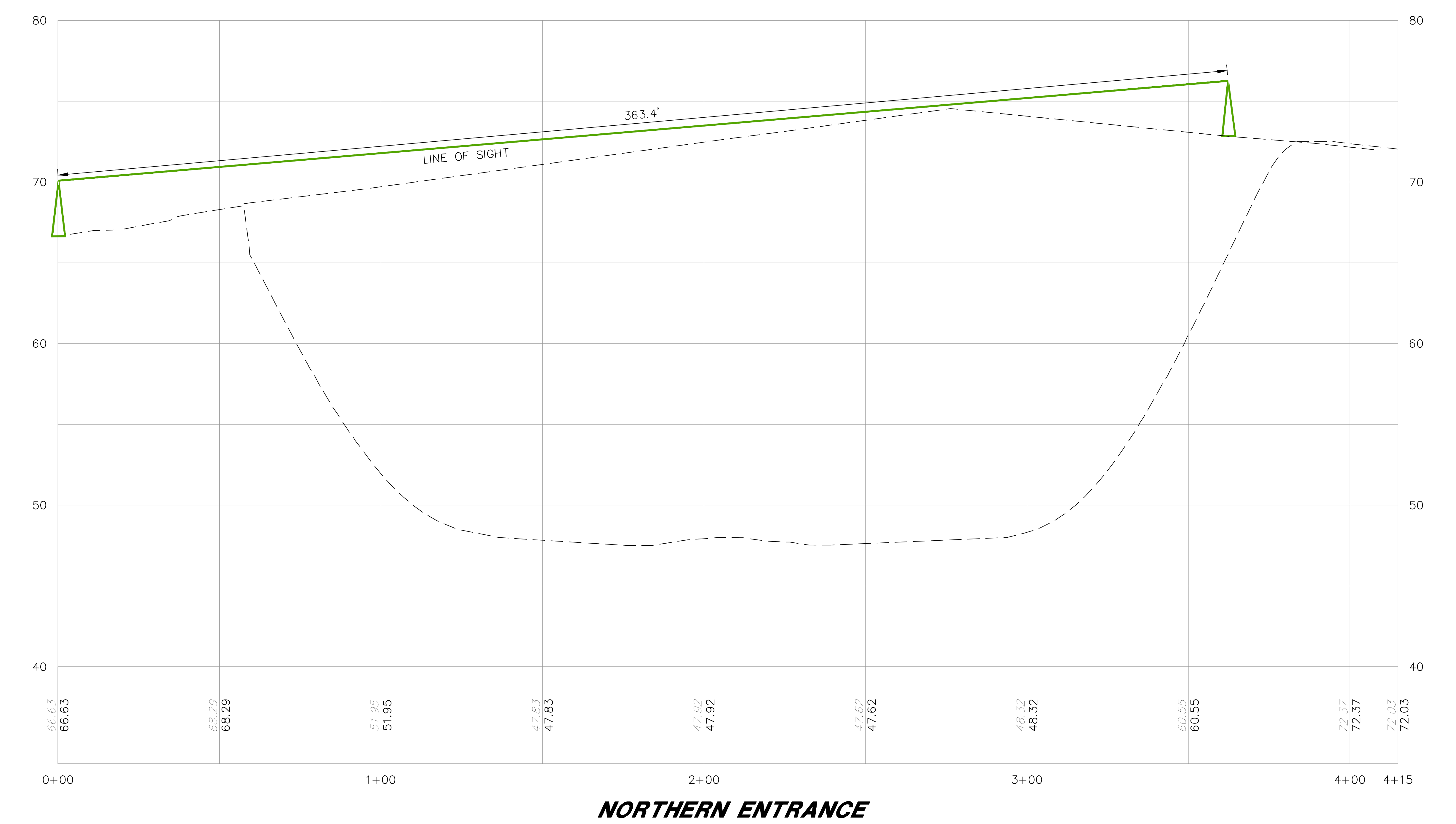

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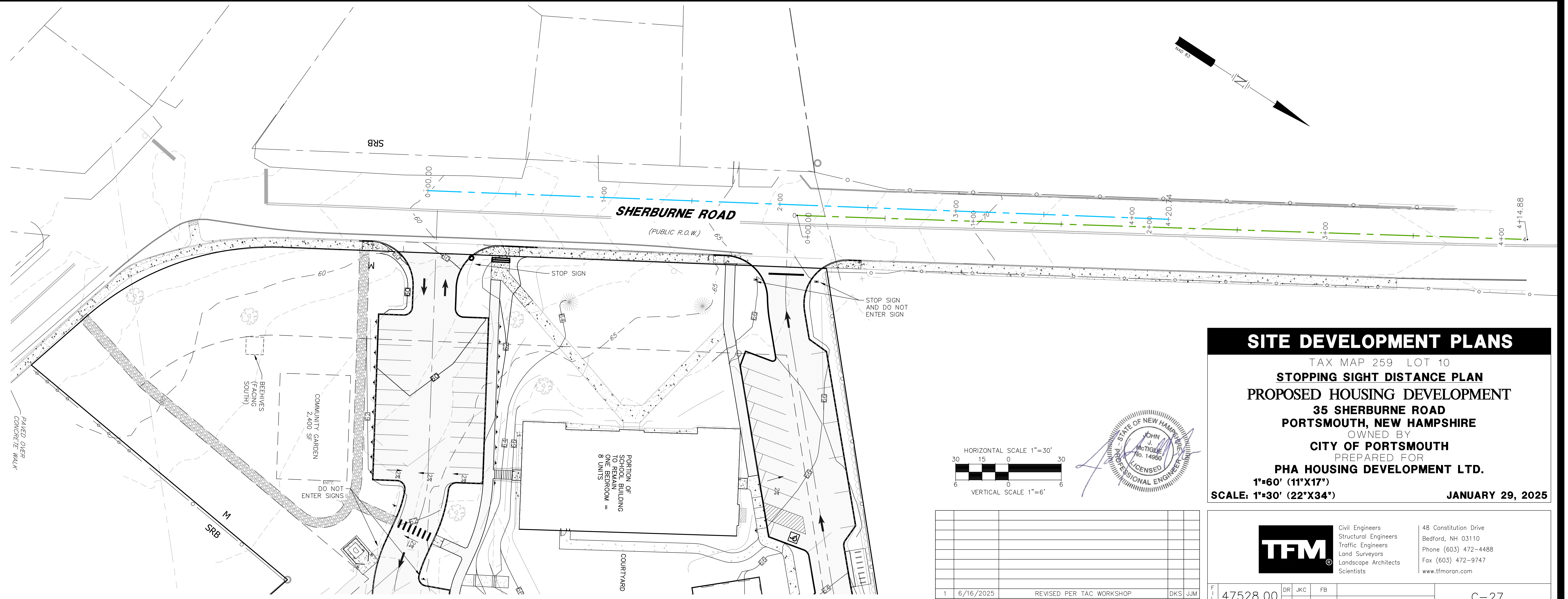

HORIZONTAL SCALE 1"=30'
30 15 0 30
6 0 6
VERTICAL SCALE 1"=6'

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SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

STOPPING SIGHT DISTANCE PLAN

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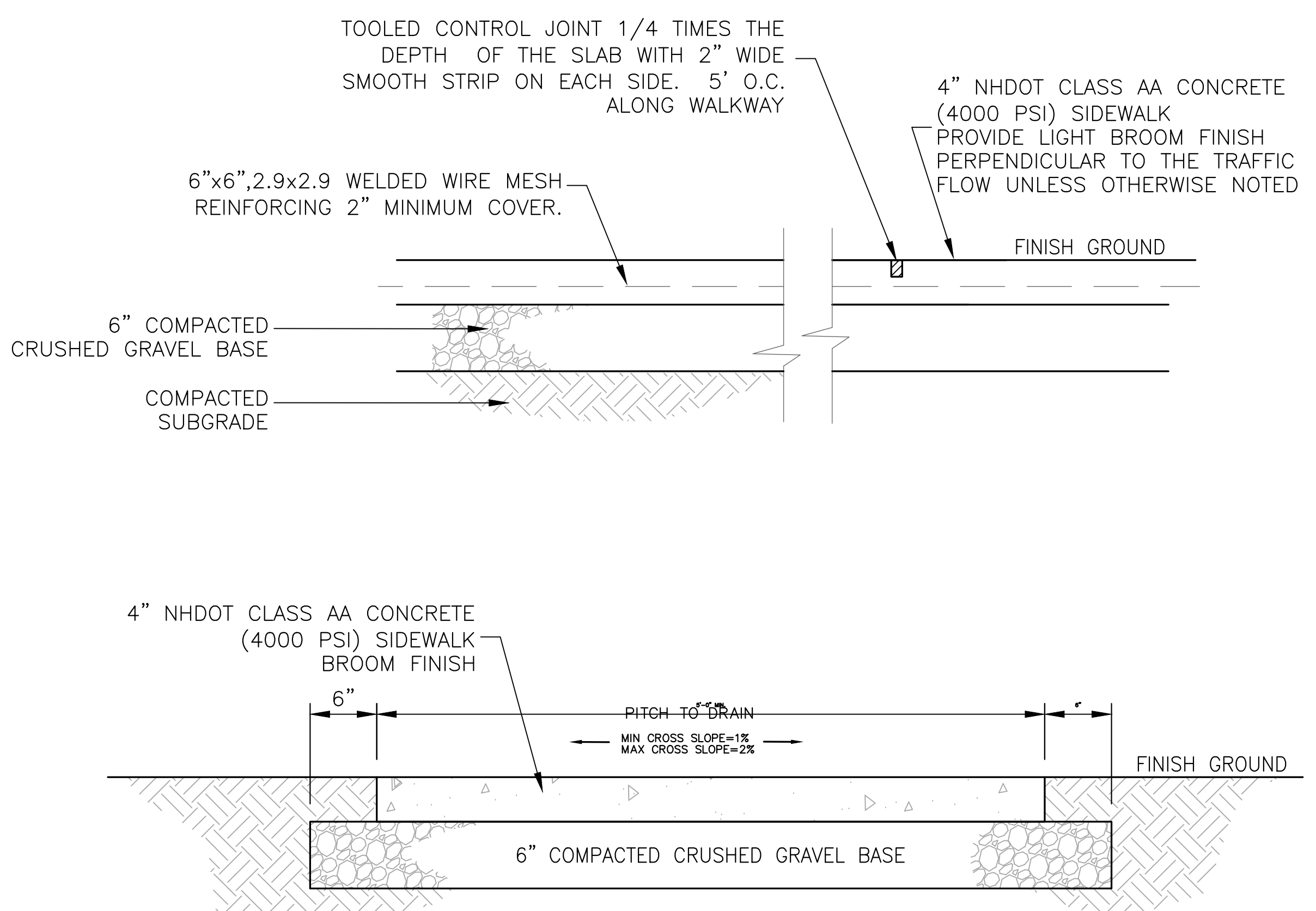
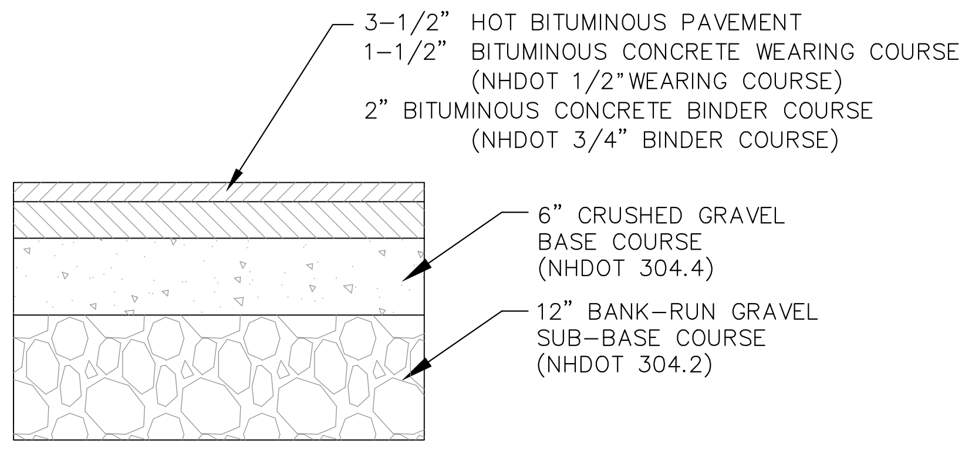


SECTION

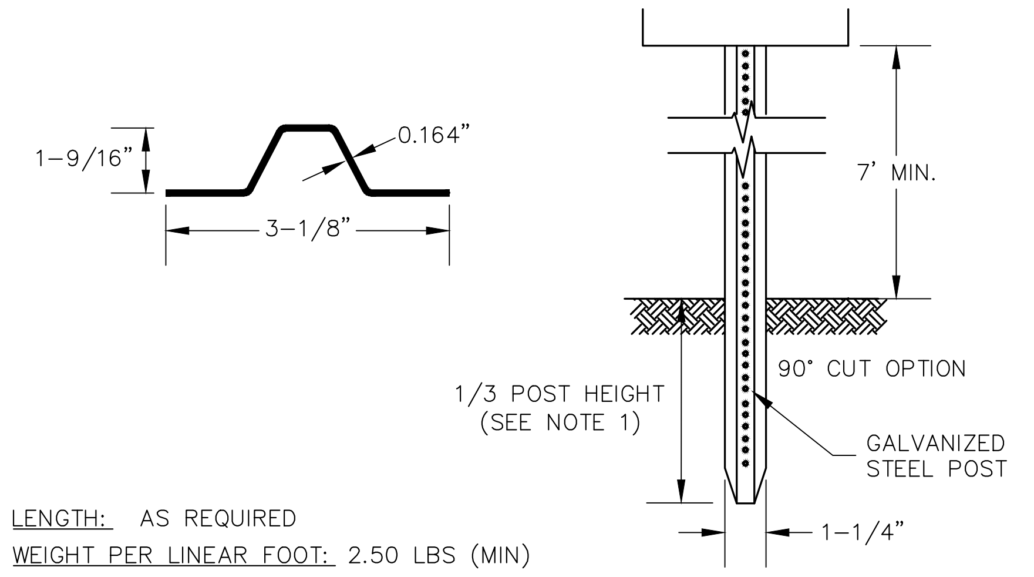
CONCRETE SIDEWALK (WITHOUT CURB)

NOT TO SCALE



TYPICAL SECTION PAVEMENT ON-SITE

NOT TO SCALE



LENGTH: AS REQUIRED

WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN)

HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH

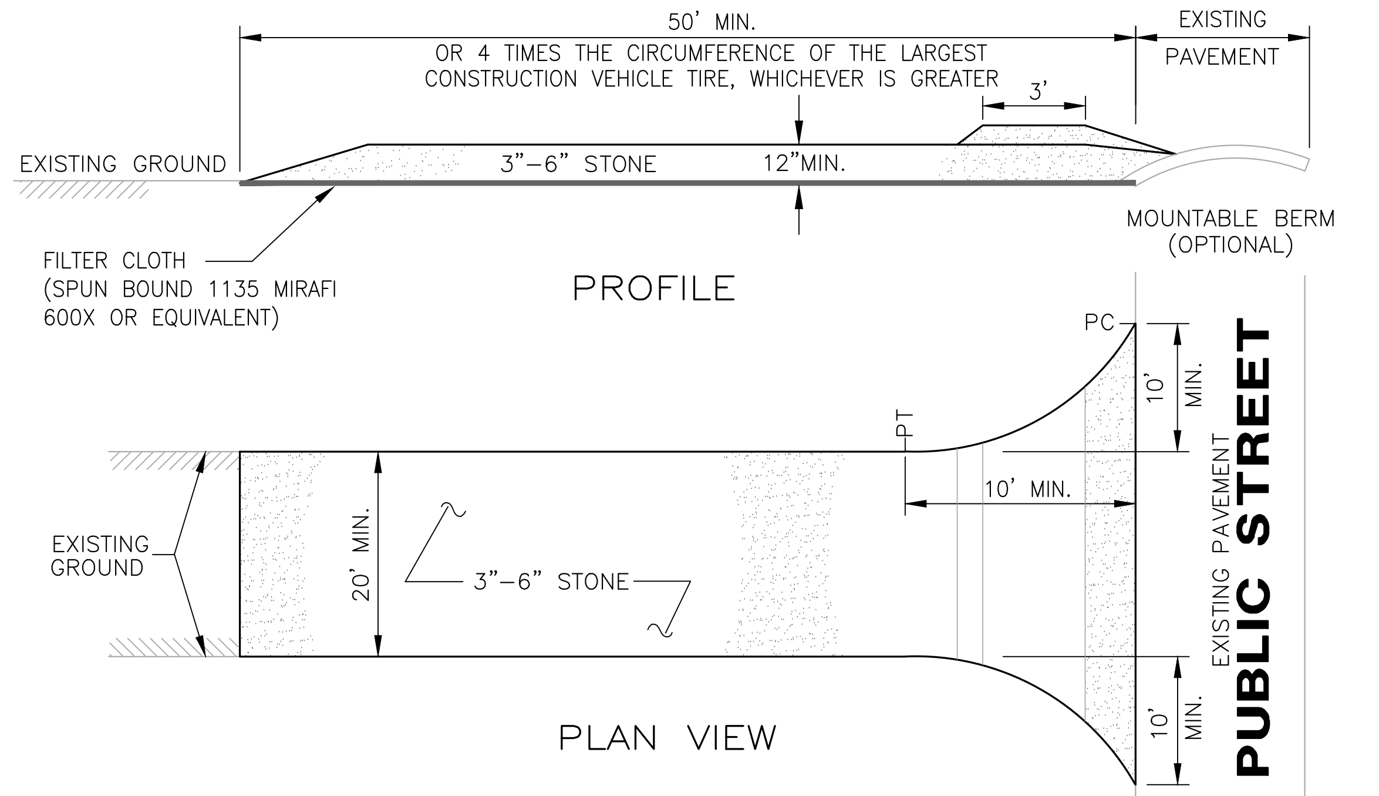
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 - 1080)

FINISH: SHALL BE PAINTED WITH 2 COATS OF AN APPROVED MEDIUM GREEN BAKED-ON OR AIR-DRIED PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

NOTE:
1. WHERE LEDGE APPLICATION EXISTS, DRILL & GROUT TO A MINIMUM OF 2'.
2. ALL SIGNAGE SHALL FOLLOW THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES STANDARDS AND NHDOT STANDARDS.
3. SIGN, HARDWARE, AND INSTALLATION SHALL CONFORM TO THE LATEST NHDOT STANDARD SPECIFICATIONS.

SIGN POST

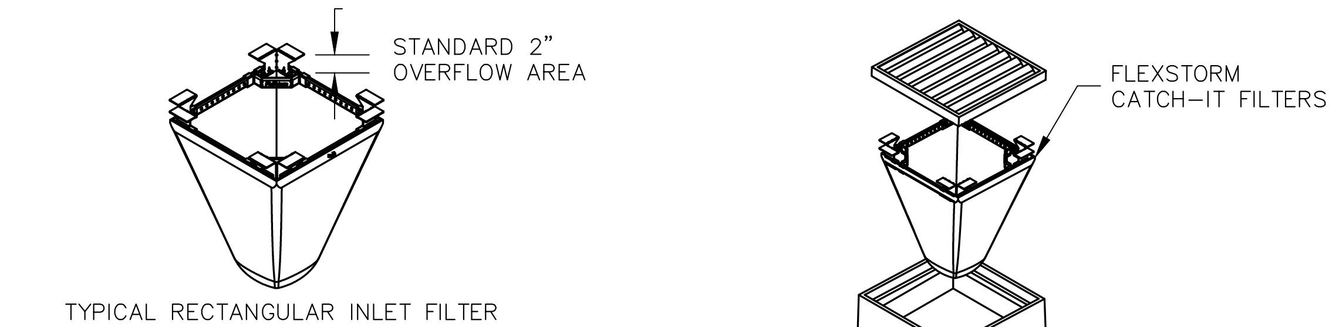
NOT TO SCALE



NOTES
1. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE SURFACE.
2. WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
3. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
4. WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
5. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN STORM EVENT.

USDA - SCS STABILIZED CONSTRUCTION ENTRANCE

SEE PLAN FOR PROPOSED LOCATION NOT TO SCALE



TYPICAL RECTANGULAR INLET FILTER

NOTES:
1. INSTALL PER MANUFACTURER'S SPECIFICATIONS.
2. INSPECTION SHOULD OCCUR FOLLOWING ANY RAIN EVENT > $\frac{1}{2}$".
3. EMPTY THE SEDIMENT BAG PER MANUFACTURER'S SPECIFICATIONS.
4. REMOVED CAKED ON SILT FROM SEDIMENT BAG AND FLUSH WITH MEDIUM SPRAY WITH OPTIMAL FILTRATION.
5. REPLACE BAG IF TORN OR PUNCTURED TO > $\frac{1}{2}$" DIAMETER ON LOWER HALF OF BAG.
6. REFER TO EROSION AND SEDIMENT CONTROL NOTES ON SHEET C-00 REGARDING PROHIBITED MATERIALS.

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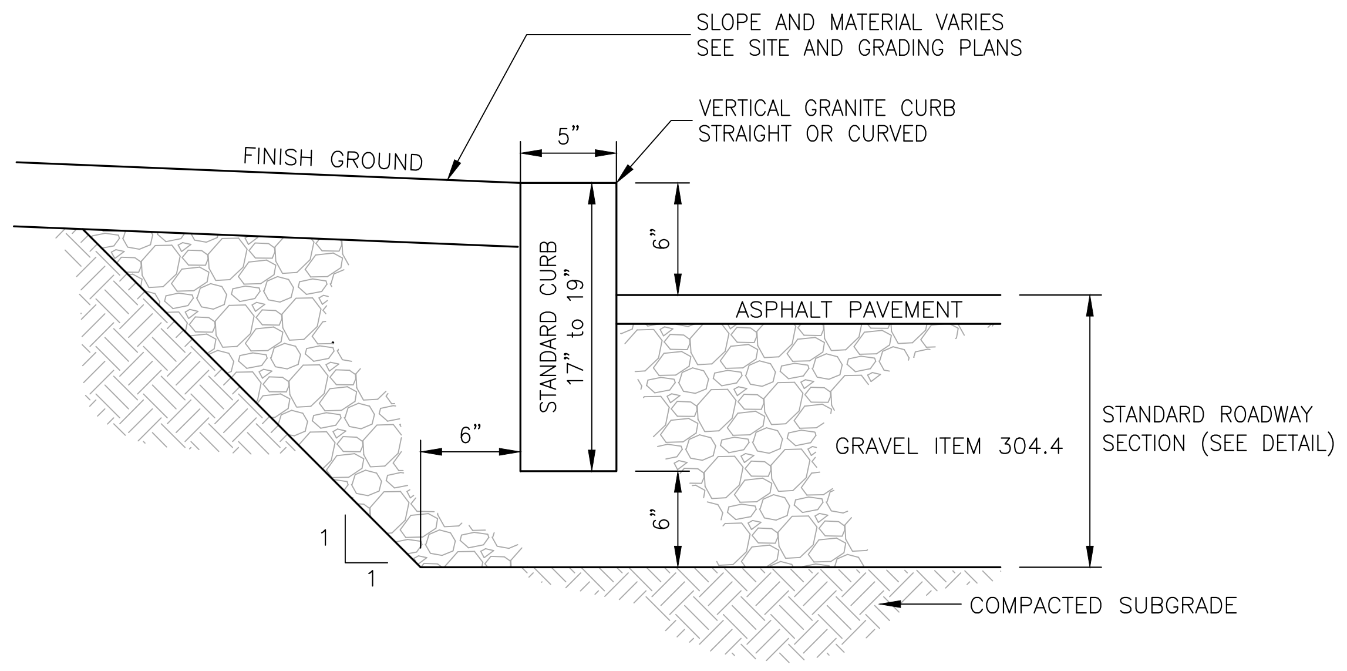
INLET PROTECTION

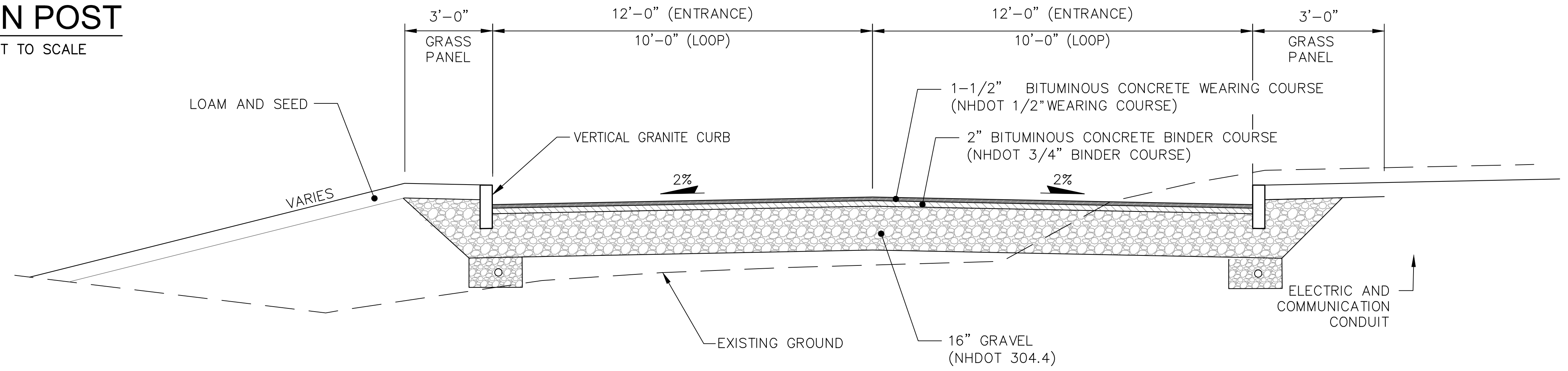
NOT TO SCALE



NOTES
1. MORTAR JOINTS AND OTHER INSTALLATION TO BE AS SPECIFIED IN NHDOT SECTION 609.
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. PROVIDE TRANSITIONS & RAMPS PER A.D.A.

VERTICAL GRANITE CURB

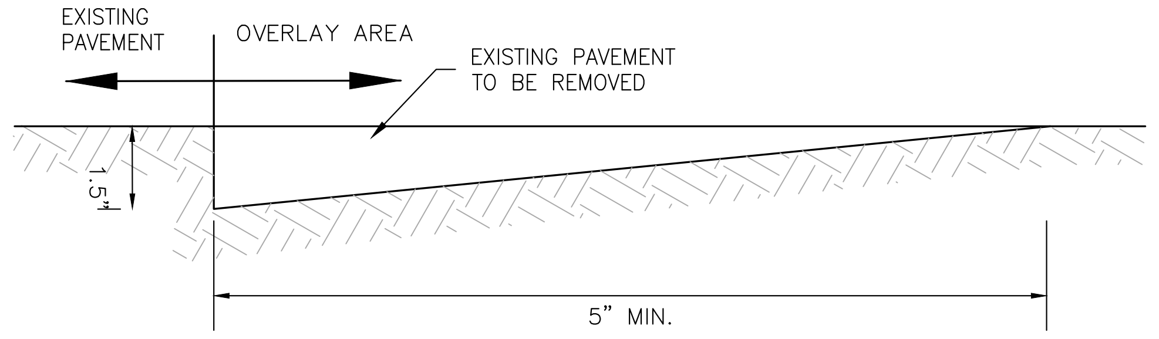
NOT TO SCALE



DRIVE TYPICAL SECTION

NOT TO SCALE

NOTES:
1. SEE GRADING & DRAINAGE PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
2. PROVIDE CLEAN BUTT TO EXISTING PAVEMENT- USE TACK COAT. SPECIFICALLY, A TACK COAT SHALL BE PLACED ATOP THE BINDER COURSE PAVEMENT PRIOR TO PLACING THE WEARING COURSE.
3. REMOVE ALL LOAM AND/OR YIELDING MATERIAL BELOW PAVEMENT.
4. ALL ROADWAY TO CONFORM TO THE STREET DESIGN AND CONSTRUCTION REQUIREMENTS IN THE TOWN OF PORTSMOUTH, NH SUBDIVISION REGULATIONS.
5. BITUMINOUS CONCRETE SHALL BE COMPACTED TO AT LEAST 92.5% OF THEORETICAL MAXIMUM DENSITY AS DETERMINED BY ASTM D2041 OR AASHTO T209. PLACEMENT TEMPERATURES OF BITUMINOUS CONCRETE MIXES, IN GENERAL, RANGE BETWEEN 270 AND 310 DEGREES FAHRENHEIT.
6. PAVEMENT BASE COURSE AGGREGATE SHALL CONFORM TO NHDOT SPECIFICATION SECTION 304, ITEM 304.4 AND COMPACTED TO A MINIMUM OF 95% OF MODIFIED PROCTOR MAXIMUM DRY DENSITY.
7. PAVEMENT SUBBASE COURSE AGGREGATE AND AGGREGATE FOR SUBGRADE REPAIR AREAS SHALL BE SUITABLE FOR USE AS STRUCTURAL FILL AND BE PROOF ROLLED AND COMPACTED TO 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY.
8. THE EXPOSED SOIL SUBGRADE SHOULD BE PROOF ROLLED PRIOR TO THE PLACEMENT OF SUBBASE GRAVEL, AND SOFT AREAS SHOULD BE REPAIRED AND REPLACED.

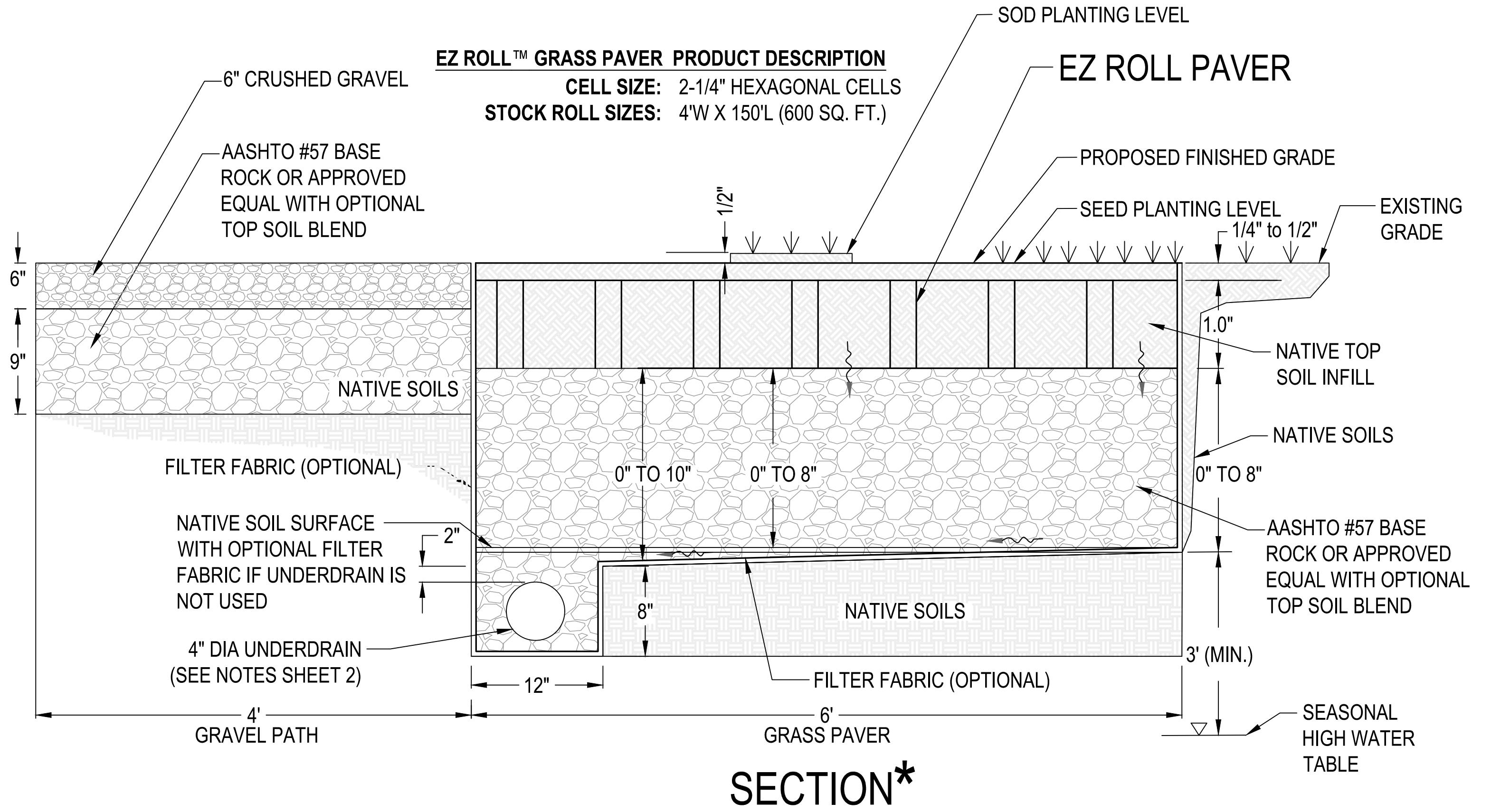


NOTES
1. USE KEY JOINT AT ALL LOCATIONS WHERE OVERLAY MEETS EXISTING PAVEMENT OR CONCRETE.
2. NEW PAVEMENT SHALL BE FLUSH WITH EXISITING PAVEMENT AND SHALL MEET OVERLAY GRADE WHERE IT ABUTS EXISTING PAVEMENT TO BE OVERLAYED.

KEY JOINT

NOT TO SCALE

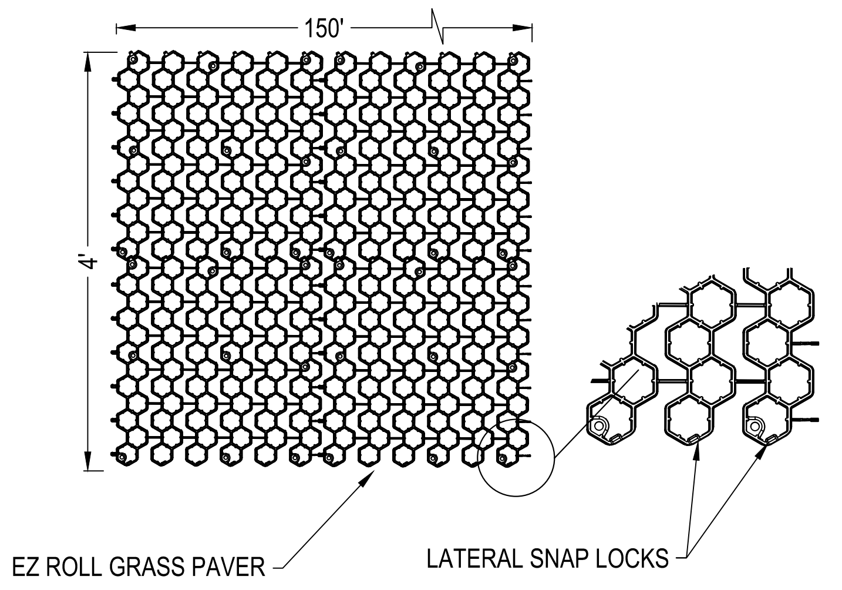
EZ ROLL™ GRASS PAVER PRODUCT DESCRIPTION
CELL SIZE: 2-1/4" HEXAGONAL CELLS
STOCK ROLL SIZES: 4'W X 150'L (600 SQ. FT.)



SECTION*
*SEE NOTES SHEET 2

GRASS PAVER PATH

NOT TO SCALE



PLAN VIEW

JOHN J. McTIGUE
No. 14950

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

DETAILS 1

PROPOSED HOUSING DEVELOPMENT

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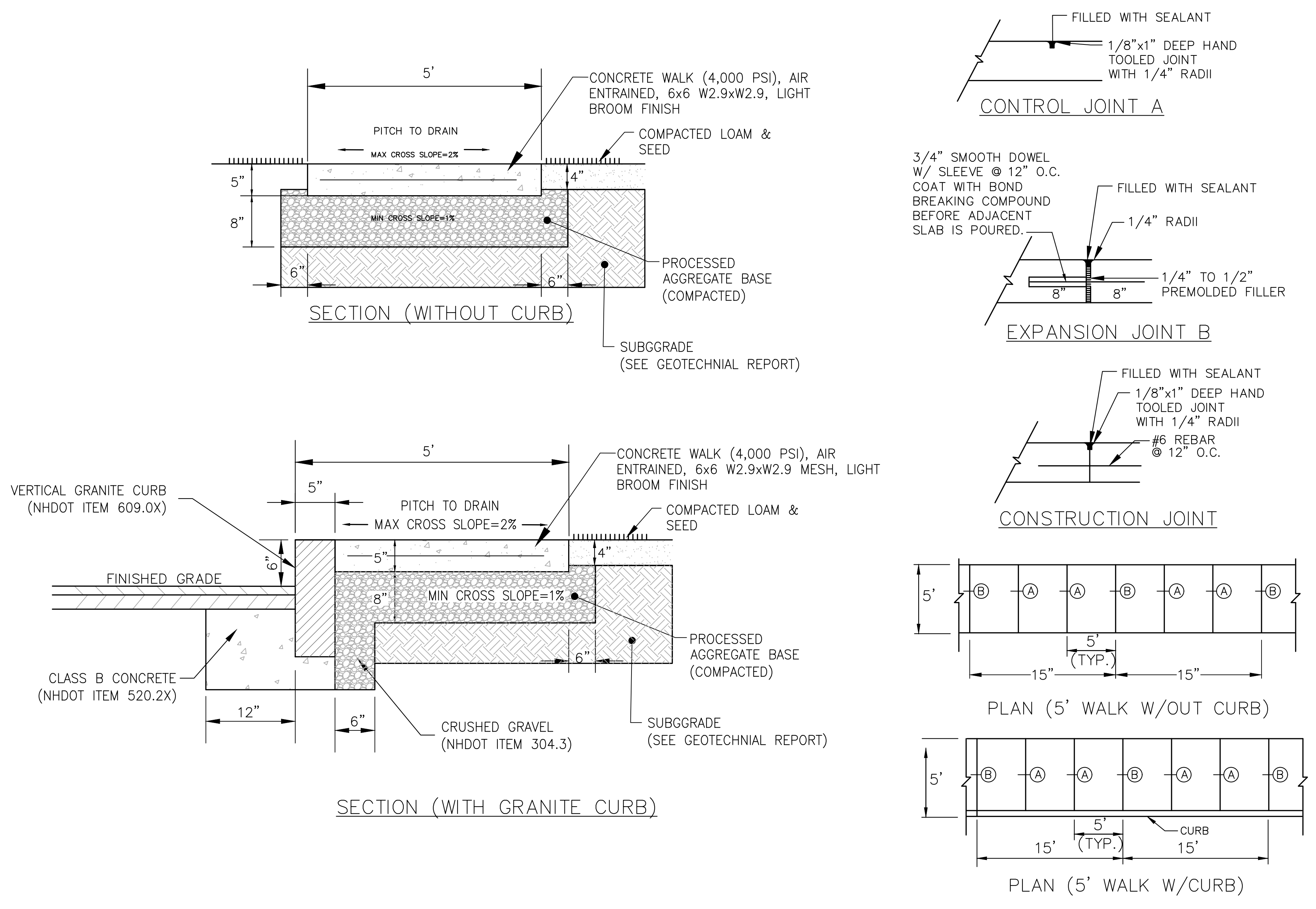
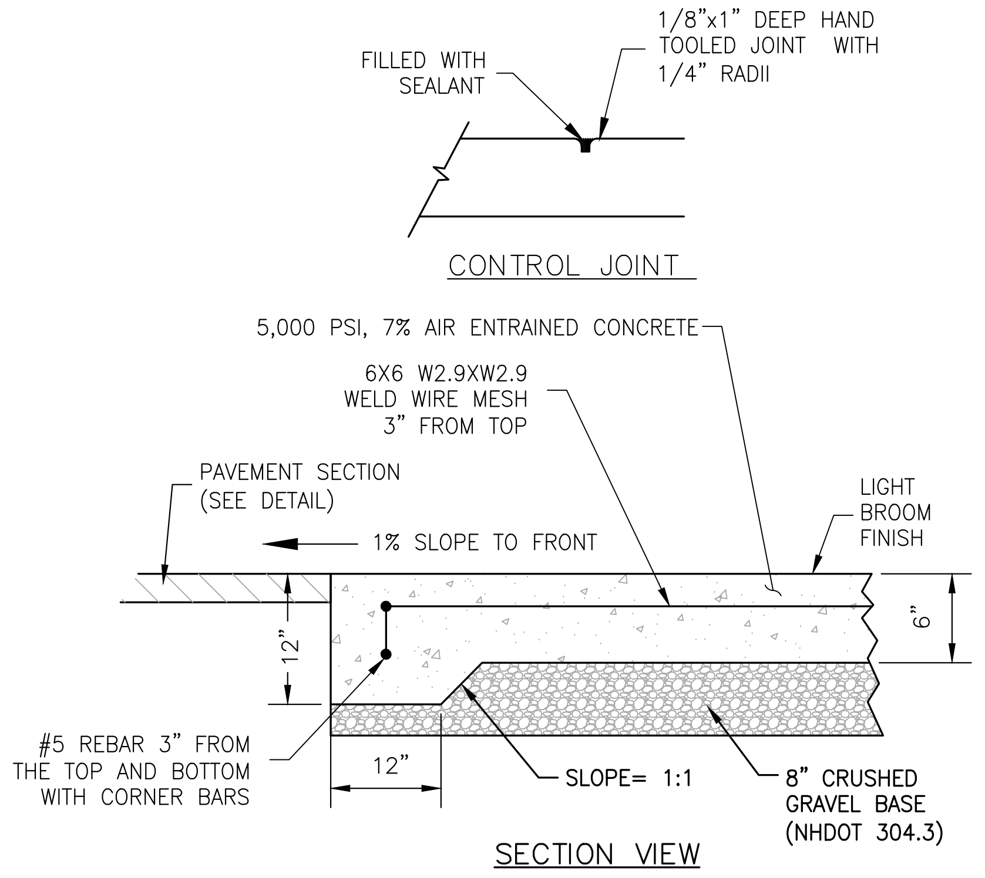


CONCRETE SIDEWALK

NOT TO SCALE

NOTE:

1. COORDINATE SIDEWALK DETAILS WITH STRUCTURAL

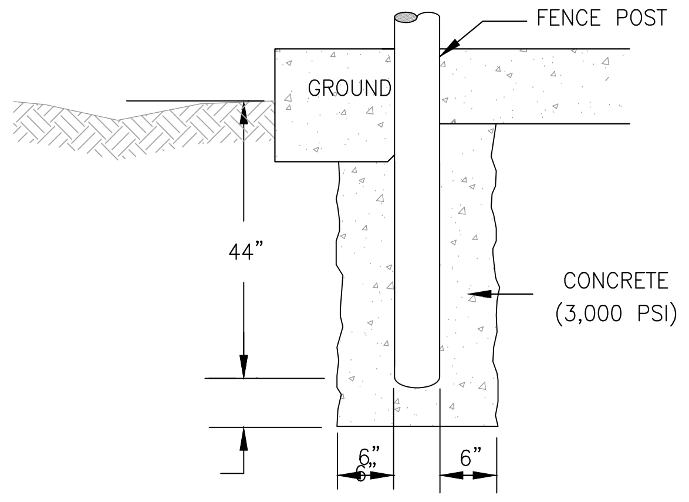


CONCRETE PAD

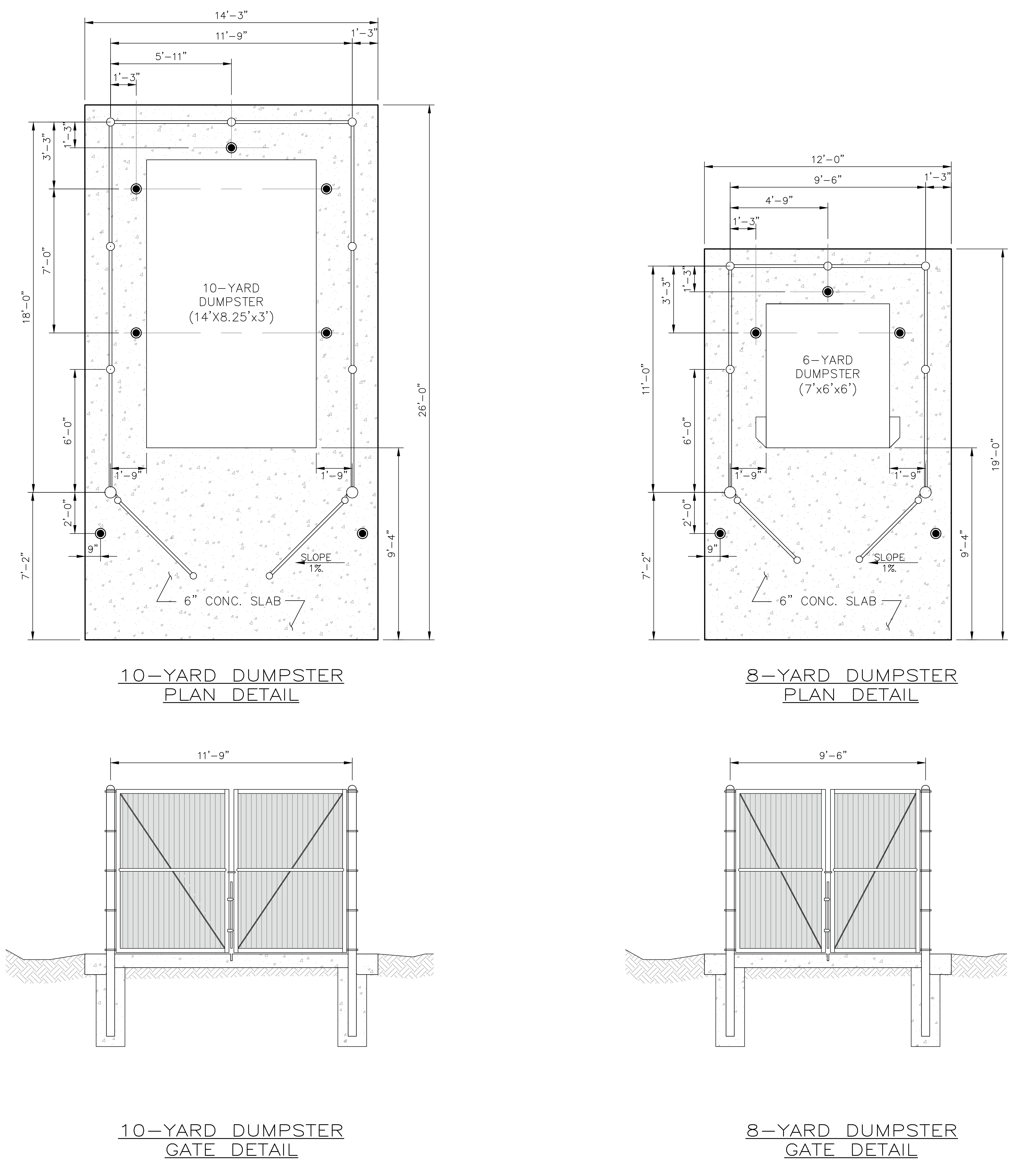
NOT TO SCALE

NOTES

1. PROVIDE CLEAN BUTT TO EXISTING PAVEMENT – USE TACK COAT.
2. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.



FENCE POST FOOTING DETAIL



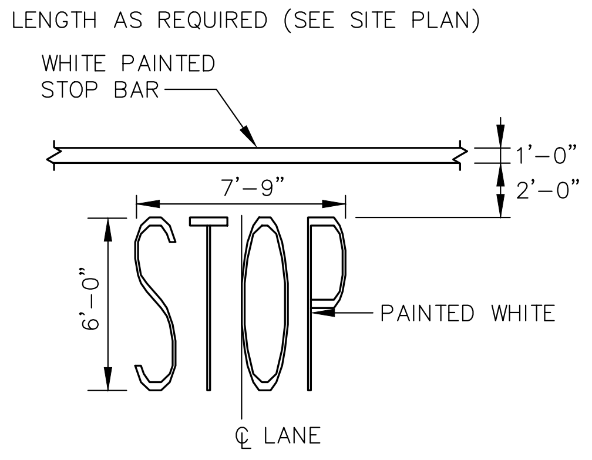
DUMPSTER ENCLOSURE

NOT TO SCALE

NOTE:

1. INSTALL PER MANUFACTURER'S SPECIFICATIONS.
2. CHAIN LINK FENCE TO BE COMMERCIAL "BEST" GRADE. 2" MESH MADE OF 8 GAUGE OR 6 GAUGE WIRE. 1-5/8" O.D. TOP AND BOTTOM RAILS, SCHEDULE 40. SEE DETAIL FOR POST SIZES.
3. POSTS, GATES, WIRE MESH AND HARDWARE TO BE VINYL COATED TO MATCH THE GATE METAL SIDING COATING.
4. SEE CONCRETE PAD DETAIL FOR SPECIFICATION ON THE PAD.

JOHN J. McTIGUE No. 14950

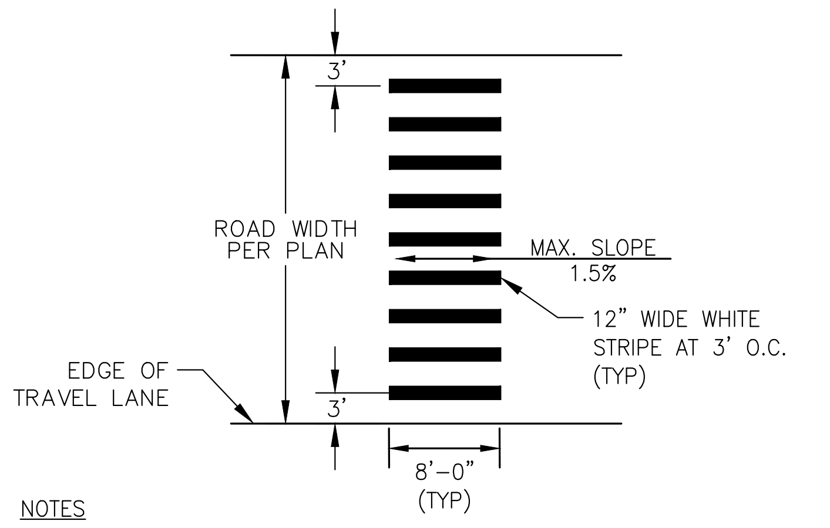


STOP BAR & LEGEND

NOT TO SCALE

NOTES

1. TRAFFIC PAINT SHALL BE APPLIED AS SPECIFIED BY THE MANUFACTURER AND SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F". APPLY TWO COATS.
2. SYMBOLS AND PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT, LATEST EDITION.

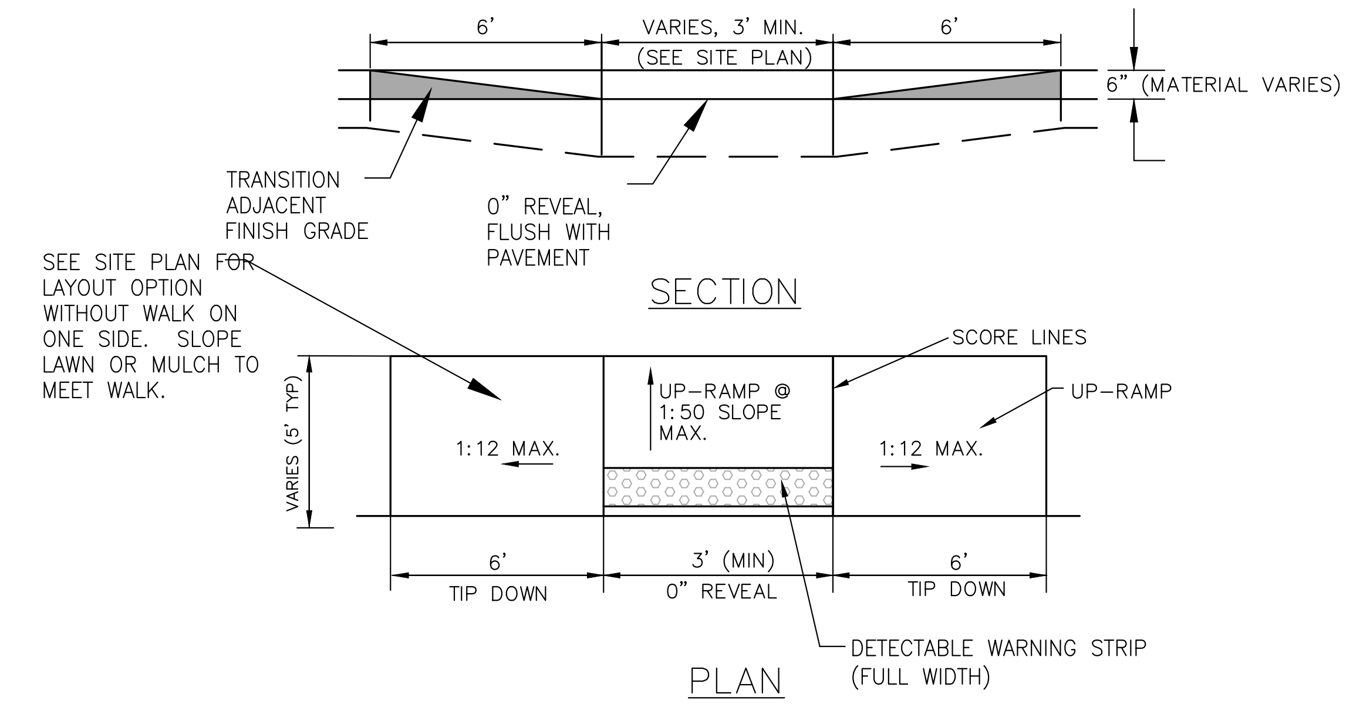


NOTES

1. TRAFFIC PAINT SHALL BE APPLIED AS SPECIFIED BY THE MANUFACTURER AND SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F". APPLY TWO COATS.
2. 12" LINES SHALL BE APPLIED IN ONE APPLICATION. NO COMBINATION OF LINES (E.G., 2 – 6" LINES) WILL BE ACCEPTED.
3. CROSS WALK SIDESLOPE SHALL NOT EXCEED 1.5% IN ANY DIRECTION.

PAINTED CROSSWALK

NOT TO SCALE

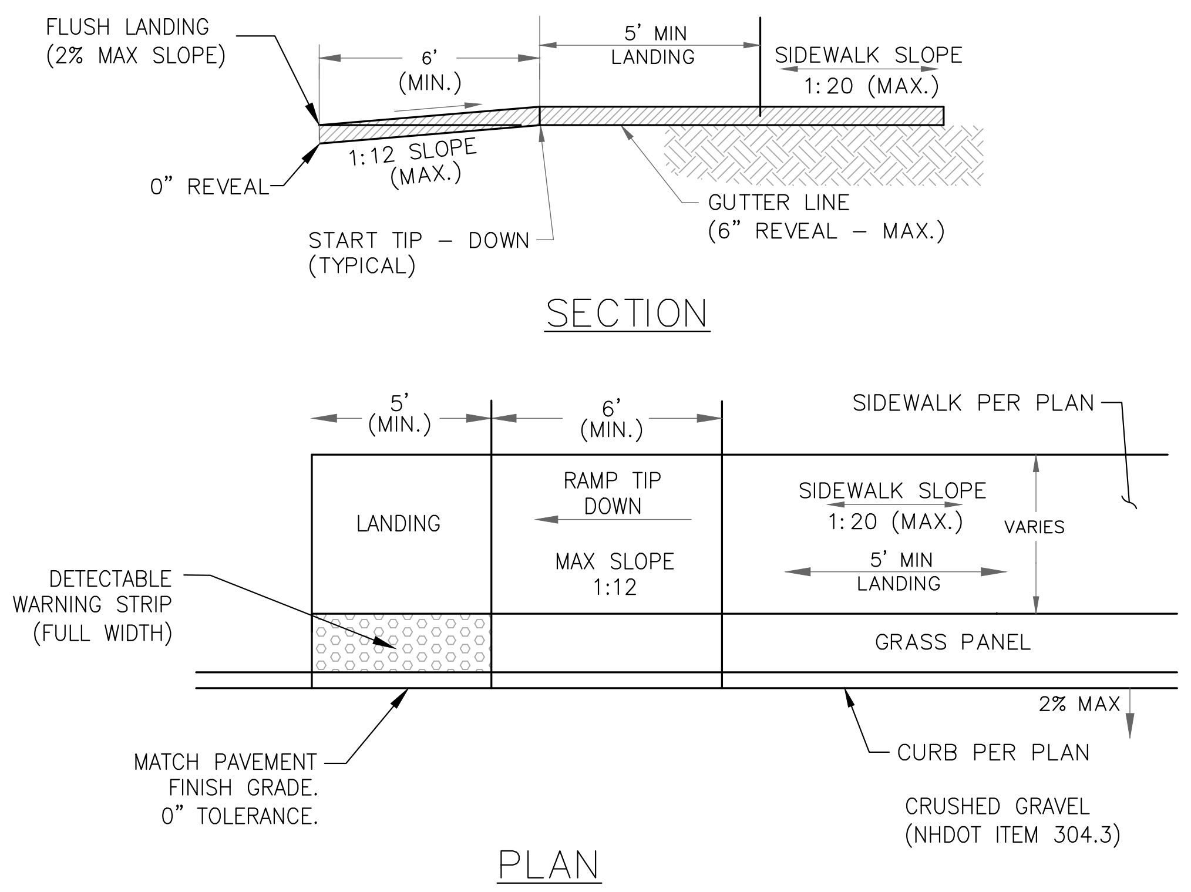


NOTE

1. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICAN WITH DISABILITIES ACT, LATEST EDITION.

SIDEWALK TIP DOWN RAMP (TYPE D)

NOT TO SCALE



SIDEWALK TIP DOWN RAMP (TYPE E)

NOT TO SCALE

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

DETAILS 2

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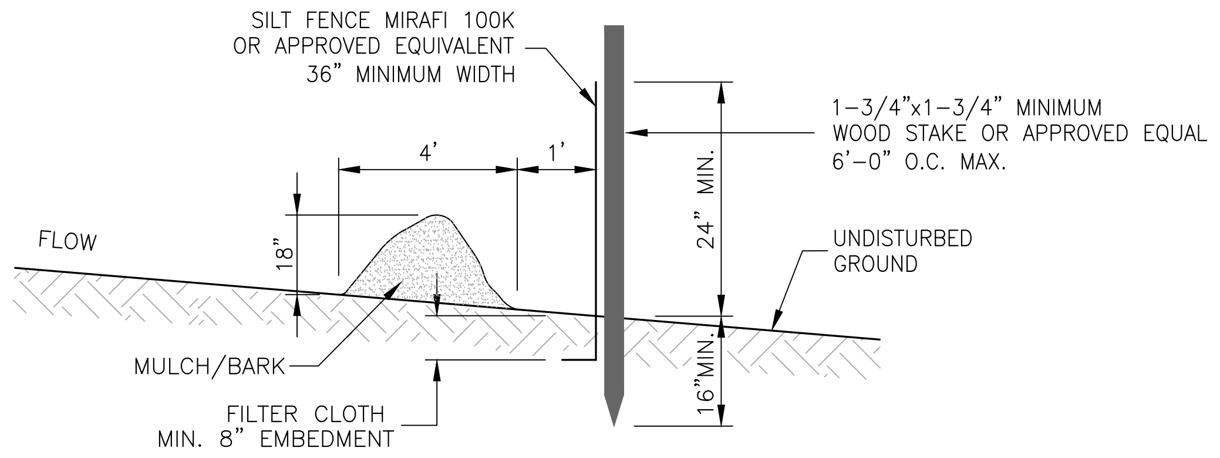


NOTE
WOOD WASTE COMPOST/BARK FILTER BERMS MAY BE USED IN COMBINATION WITH SILT FENCE TO IMPROVE SEDIMENT REMOVAL AND PREVENT CLOGGING OF THE WOOD WASTE COMPOST/BARK BERM BY LARGER SEDIMENT PARTICLES. (SILT FENCE PLACED TO FILTER RUNOFF BEFORE WOOD WASTE COMPOST/BARK). STUMP GRINDINGS MAY BE SUBSTITUTED FOR MULCH.

WOOD WASTE COMPOST/BARK FILTER BERMS
THE FILTER BERM SHALL CONSIST OF A WOOD WASTE COMPOST/BARK MULCH MIX OR RECYCLED COMPOSTED BARK FLUME GRIT AND FRAGMENTED WOOD GENERATED FROM WATER-FLUME LOG HANDLING SYSTEMS. COMPARABLE COMPOSTED MIXES CAN BE USED UPON APPROVAL OF THE ENVIRONMENTAL OFFICE LANDSCAPE UNIT.

THE MIX SHALL CONFORM TO THE FOLLOWING STANDARDS:
(A) MOISTURE CONTENT – 30-60%.
(B) pH-5.0 – 8.0.
(C) SCREEN SIZE – 100% LESS THAN 75 mm, MAXIMUM 70% LESS THAN 25 mm.
(D) NO LESS THAN 40% ORGANIC MATERIAL (DRY WEIGHT) BY LOSS OF IGNITION.
(E) NO STONES LARGER THAN 50 mm IN DIAMETER.
(F) SEE WOOD WASTE COMPOST BERM STANDARD DETAIL 800(43) FOR WIDTH AND HEIGHT SPECIFICATIONS.
THE COMPOSTED BERM SHALL BE PLACED, UNCOMPACTED, ALONG A RELATIVELY LEVEL CONTOUR.

MAINTENANCE/PERFORMANCE OF SEDIMENT BARRIERS

ALL SEDIMENT BARRIERS REQUIRE FREQUENT INSPECTION AND MAINTENANCE TO BE EFFECTIVE. THEY MUST BE INSPECTED BEFORE, DURING AND AFTER EACH RAINFALL, AND AT LEAST DAILY DURING EXTENDED PERIODS OF RAIN. SHOULD THE BARRIER BECOME INEFFECTIVE AS EVIDENCED BY DECOMPOSITION OF THE FILTER FABRIC ON SILT FENCE, BREAKAGE OF THE BALES OR BINDINGS ON HAY BALES, OR OBSERVANCE OF FLOW ESCAPING UNDERNEATH ANY TYPE OF BARRIER, IMMEDIATE REPAIRS MUST BE MADE. RESHAPE BERMS AS NEEDED. SEDIMENT MUST BE REMOVED WHEN DEPOSITS REACH 1/2 THE HEIGHT OF THE BARRIER. SEDIMENTS REMOVED MUST BE PLACED IN AN APPROVED SITE AND STABILIZED.

MULCH BERM WITH SILT FENCE

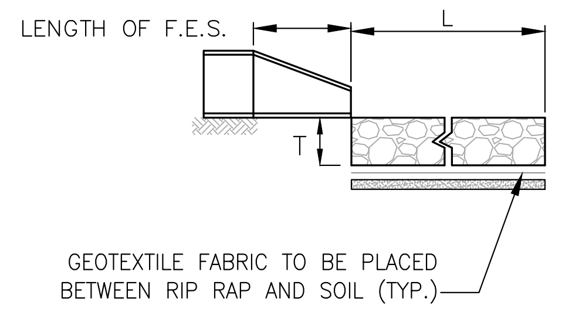
NOT TO SCALE

MAINTENANCE:

THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIP RAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO THE OUTLET PROTECTION APRON.

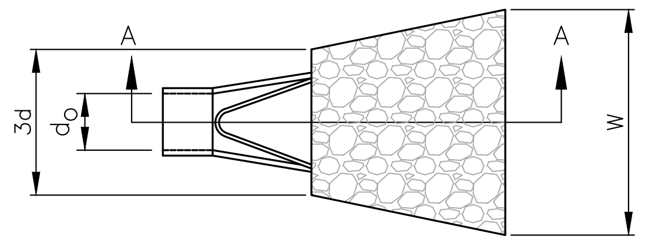
CONSTRUCTION SPECIFICATIONS:

1. THE SUBGRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE ROCK OR GRAVEL USED FOR FILTER OR RIP RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIP RAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12".
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
5. ADD ANIMAL SCREEN TO FLARED END SECTION OUTLET.



SECTION A-A

% OF WEIGHT SMALLER THAN THE GIVEN SIZE	FOR d50=6" SIZE OF STONE (INCHES)
100	9.00 TO 12.00
85	7.80 TO 10.80
50	6.00 TO 9.00
15	1.80 TO 30



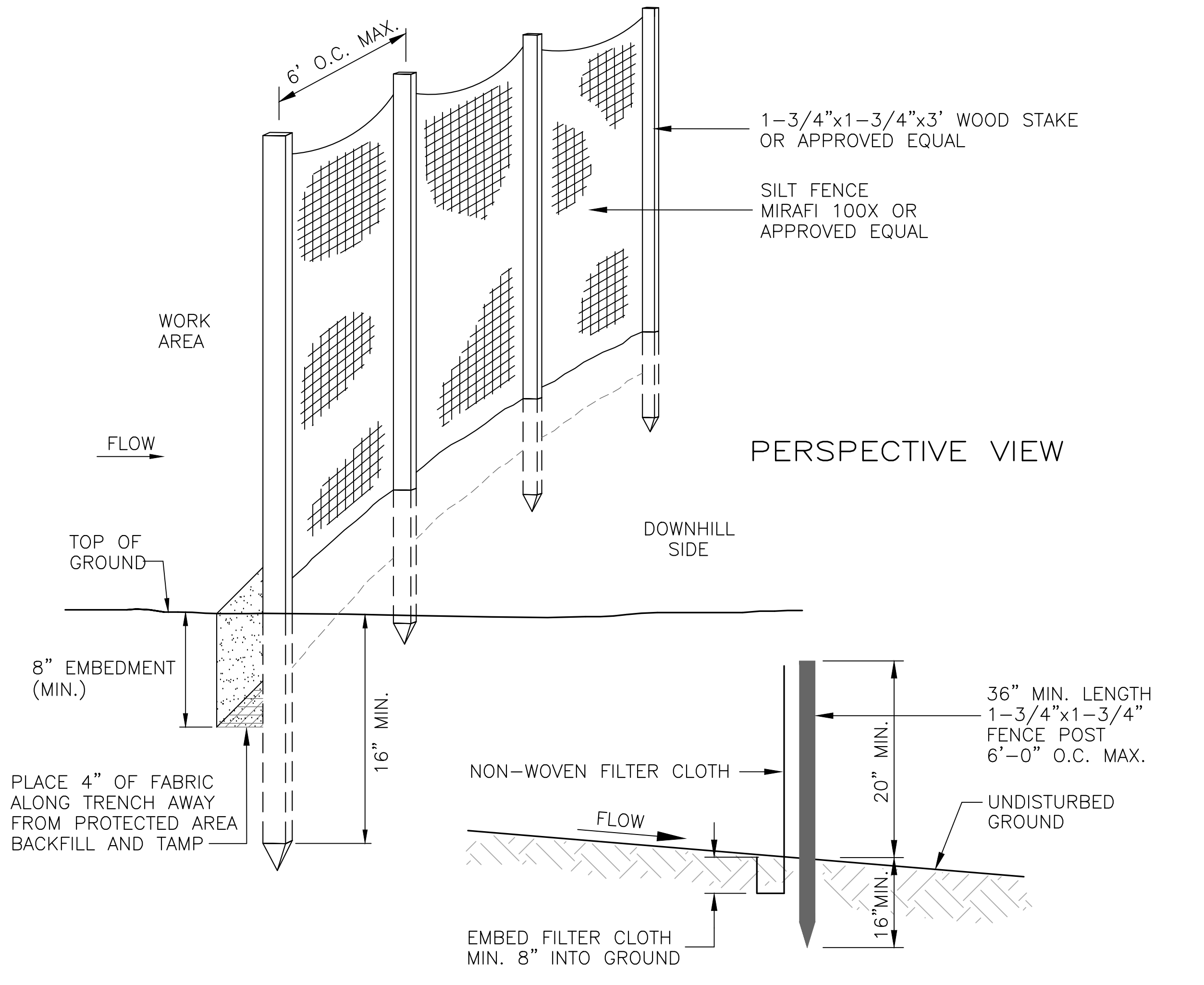
RIPRAP DIMENSIONS

LOCATION	FES01	FES02	FES03*	FES04*	FES05	FES06	FES07	FES08*	FES09
d50 STONE SIZE (IN)	6	6	6	6	6	6	6	6	6
L- LENGTH OF APRON (FT)	5	24	21	20	14	17	16	35	8
W-WIDTH OF APRON (FT)	5	13	15	11	12	13	12	22	8
T-DEPTH OF APRON (IN)	9	9	9	9	9	9	9	9	9

NOTE: * RIPRAP COMPLETE FOREBAY FROM BOTTOM TO TOP OF FOREBAY SPILLWAY.

RIP RAP AND FLARED END SECTION WITH OUTLET PROTECTION

NOT TO SCALE



SECTION

CONSTRUCTION SPECIFICATIONS

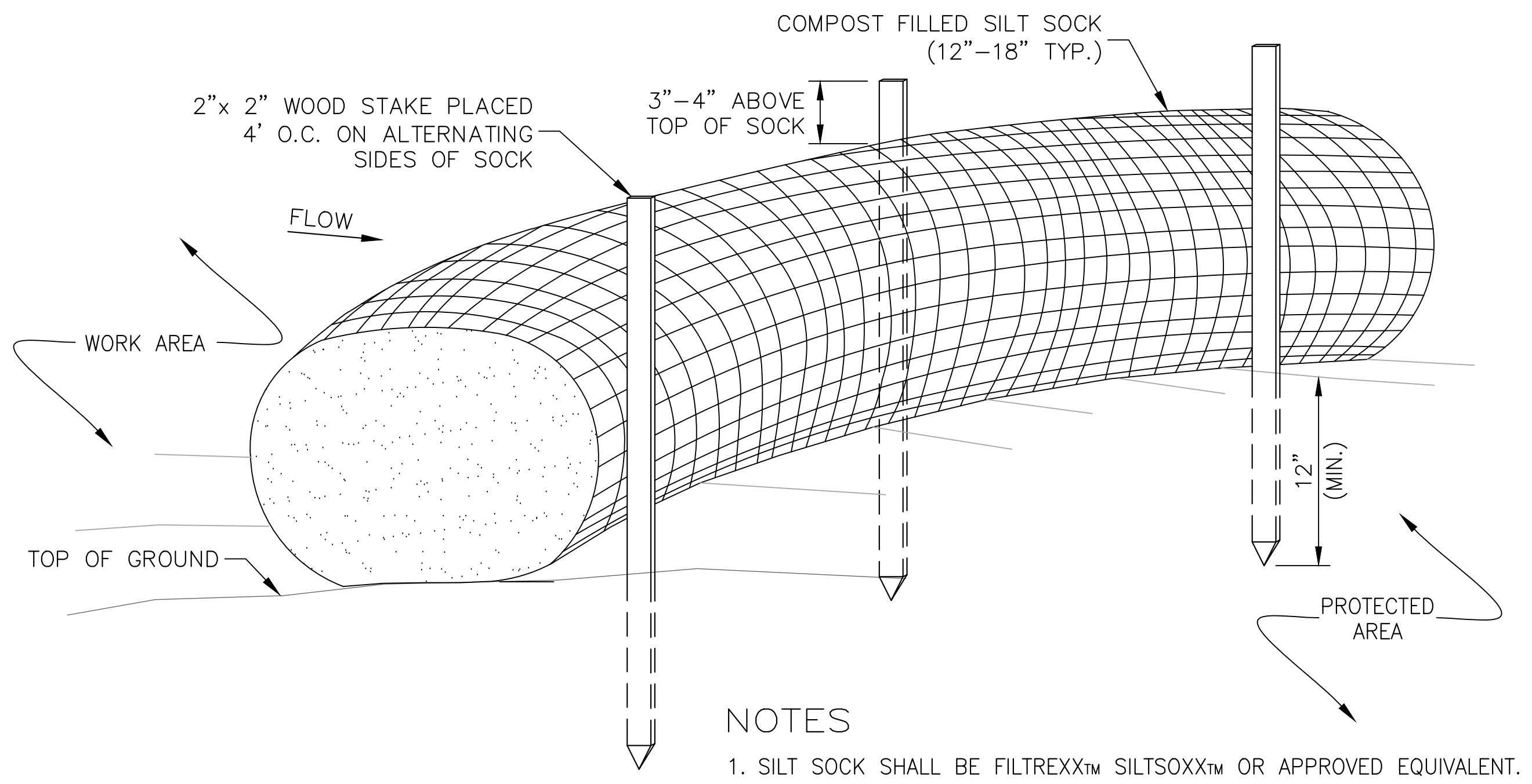
1. THE GEOTEXTILE FABRIC SHALL MEET THE DESIGN CRITERIA FOR ALL SILT FENCES.
2. THE FABRIC SHALL BE EMBEDDED A MINIMUM OF 8 INCHES INTO THE GROUND AND SOIL COMPACTED OVER THE EMBEDDED FABRIC.
3. THE GEOTEXTILE FABRIC SHALL BE FASTENED SECURLY TO THE FENCE POSTS WITH STAPLES.
4. WHEN TWO SECTIONS OF GEOTEXTILE FABRIC ADJION EACH OTHER, THEY SHOULD BE OVERLAPPED BY SIX INCHES, FOLDED AND STAPLED.
5. FENCE POSTS SHALL BE A MINIMUM OF 36 INCHES LONG AND DRIVEN A MINIMUM OF 16 INCHES INTO THE GROUND. WOOD POSTS SHALL BE OF SOUND QUALITY HARDWOOD AND SHALL HAVE A CROSS SECTIONAL AREA OF 3.0 SQUARE INCHES.
6. MAINTENANCE SHALL BE PERFORMED AS NEEDED TO PREVENT BULGES IN THE SILT FENCE DUE TO DEPOSITION OF SEDIMENT.

MAINTENANCE NOTES

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EVERY RAIN STORM AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.
2. IF THE FABRIC ON THE SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH A MAXIMUM OF ONE HALF THE DEPTH OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

SILT FENCE DETAIL

NOT TO SCALE



NOTES

1. SILT SOCK SHALL BE FILTREXX™ SILTSOXX™ OR APPROVED EQUIVALENT.
2. SEE SPECIFICATIONS FOR SOCK SIZE AND COMPOST FILL REQUIREMENTS.
3. SILT SOCK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS, AND REPAIR OR REPLACEMENT SHALL BE PERFORMED AS NEEDED.
4. COMPOST MATERIAL SHALL BE DISPERSED ON SITE, AS DETERMINED BY THE ENGINEER.

SILT SOCK

NOT TO SCALE

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10
DETAILS 3
PROPOSED HOUSING DEVELOPMENT
35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH
PREPARED FOR
PHA HOUSING DEVELOPMENT LTD.
1"=60' (11"X17")
SCALE: 1"=30' (22"X34")
JANUARY 29, 2025

STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14950
LICENSED
PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	DR	CK
1	6/16/2025	REVISED PER TAC WORKSHOP	DKS	JJM

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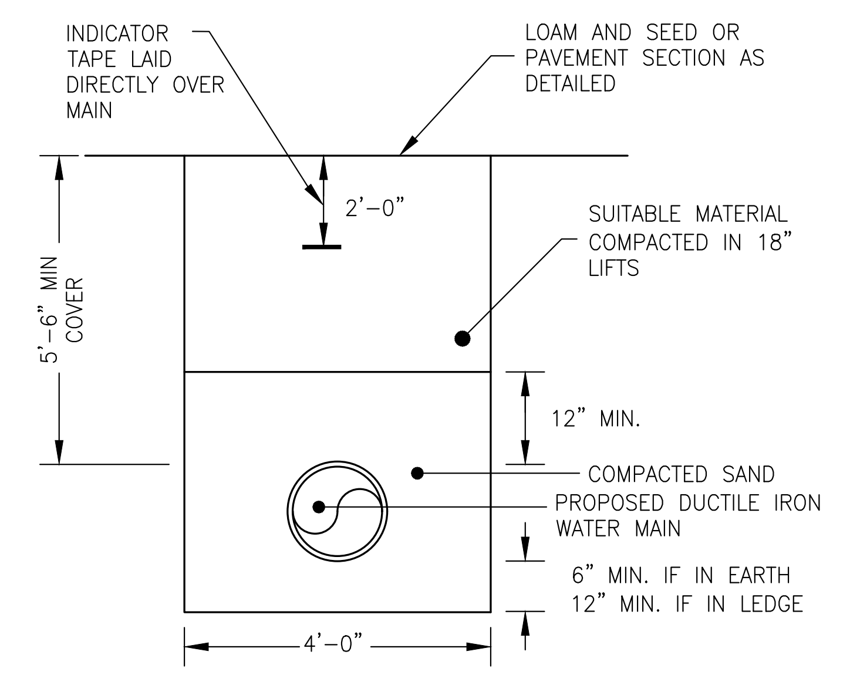
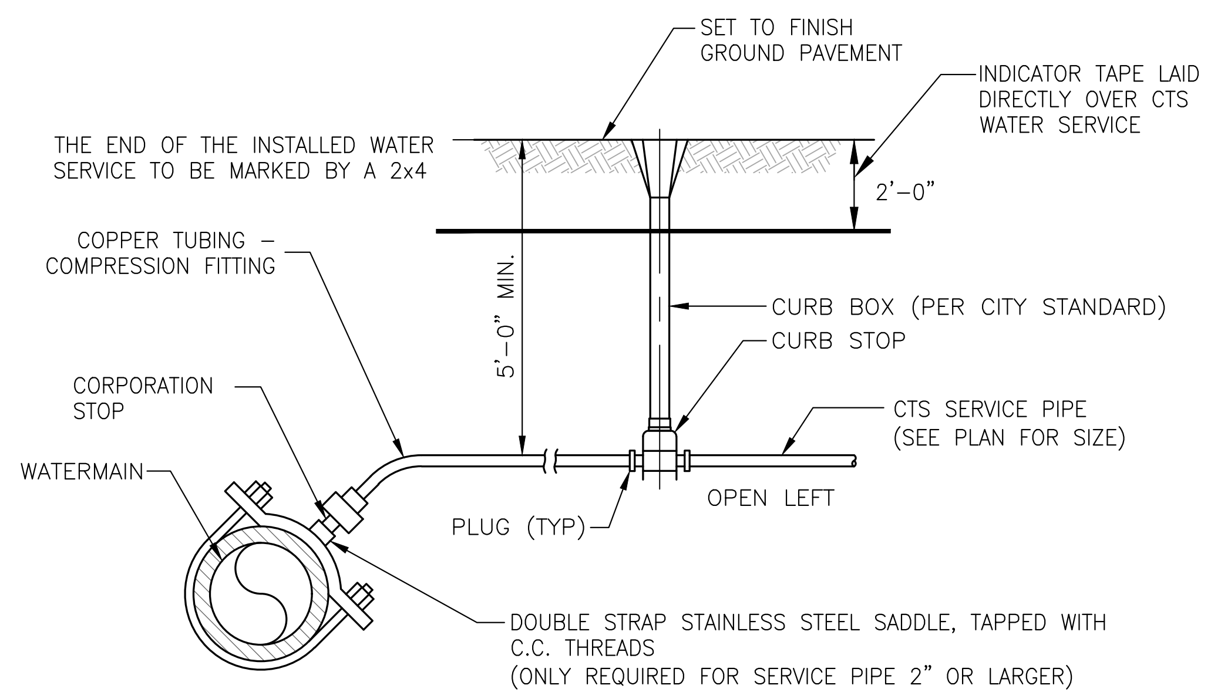


WATER MAIN TRENCH

NOT TO SCALE

NOTE:

1. WATER MAIN SHALL BE CLASS 52 DUCTILE IRON PIPE WRAPPED IN POLYETHYLENE WITH CONTINUITY WEDGES AS PER CITY STANDARDS.

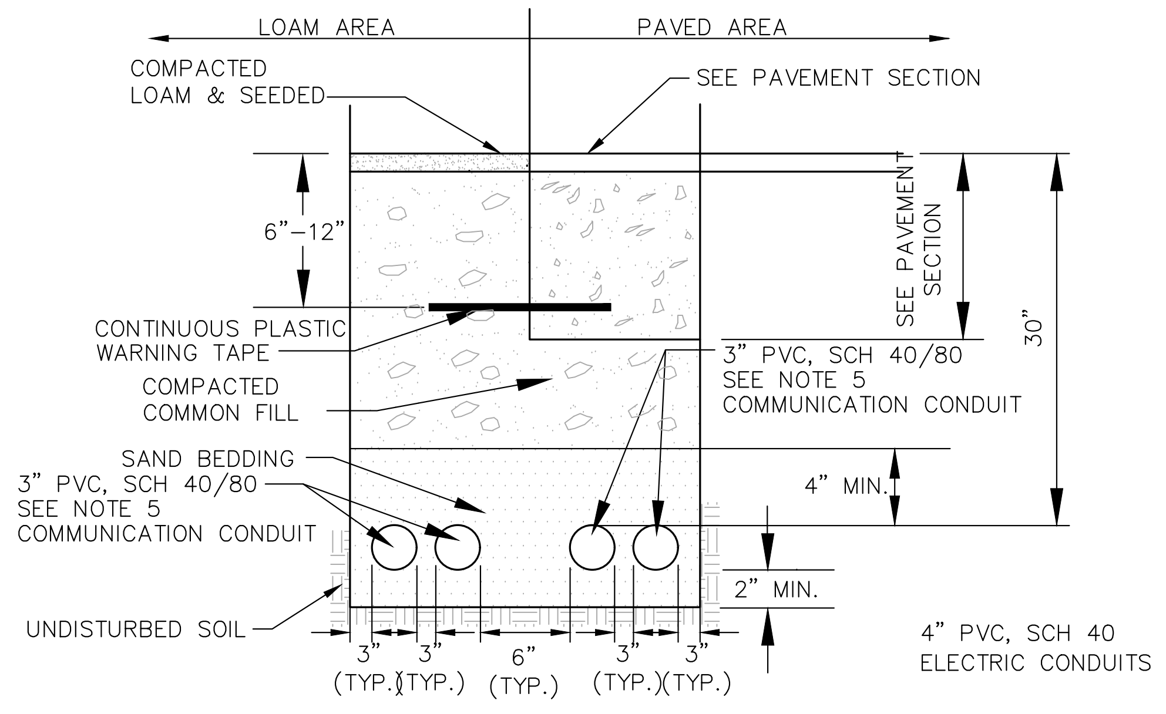


WATER SERVICE CONNECTION

NOT TO SCALE

NOTES

1. CURB STOPS TO OPEN TO THE RICHT.

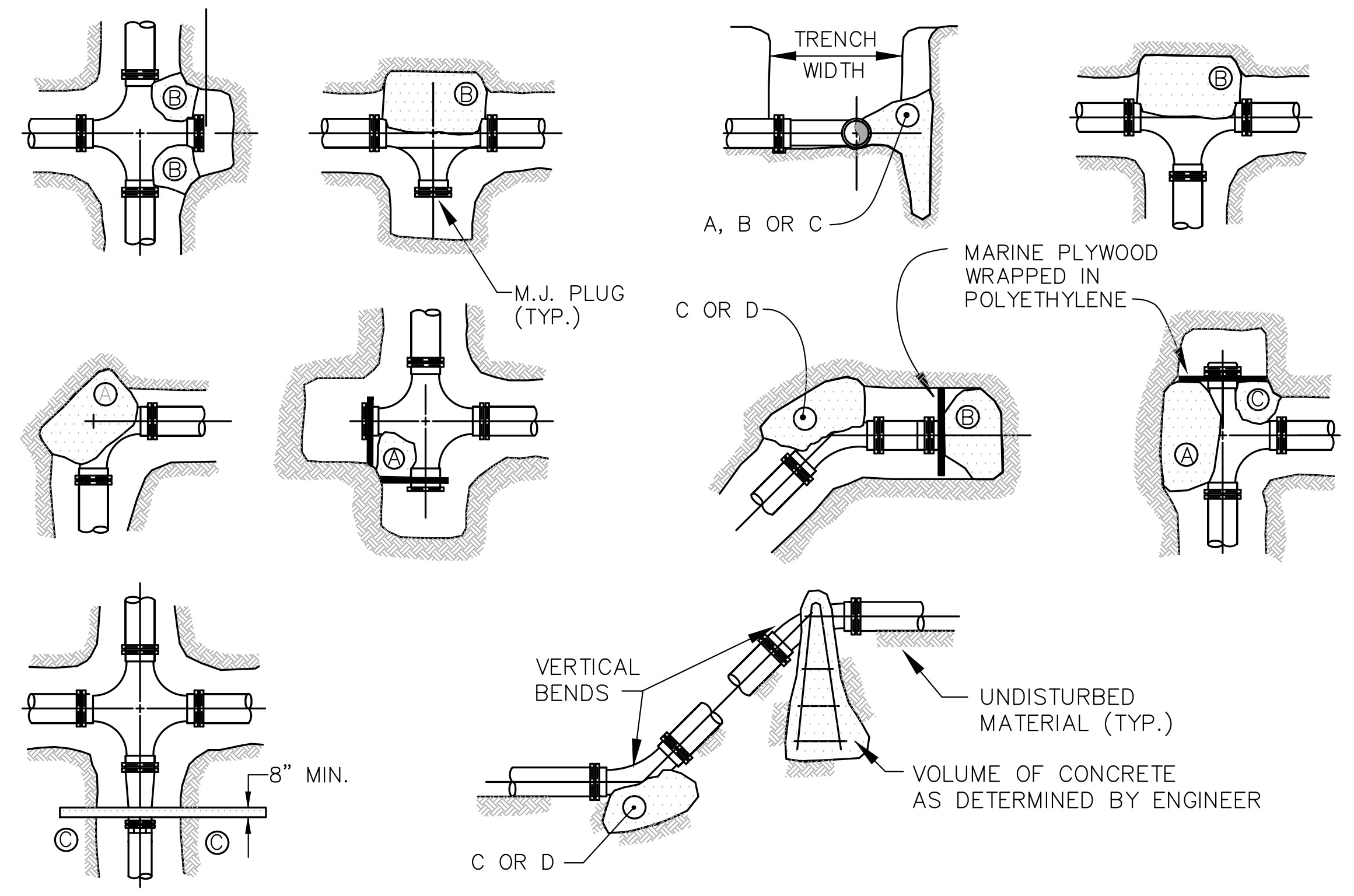


NOTES

1. ELECTRIC SERVICE INSTALLATION AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL CODES.
2. COMMUNICATION SERVICE INSTALLATION SHALL MEET ALL CONSTRUCTION REQUIREMENTS.
3. ACTUAL NUMBER OF CONDUITS TO BE DETERMINED BY RESPECTIVE COMPANIES.
4. VERIFY INSTALLATION REQUIREMENTS WITH RESPECTIVE COMPANIES.
5. SCHEDULE 80 CONDUIT TO BE USED UNDER TRAFFIC SITUATIONS (PRIMARY AND SECONDARY LINES).
6. ALL 90 DEGREE SWEEPS MUST BE STEEL AND THE FIRST 10' STICK OUT OF THE 90 MUST BE STEEL ON ALL PRIMARY CONDUIT RUNS

ELECTRIC/COMMUNICATIONS CONDUIT

NOT TO SCALE



NOTES

1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL, WHERE TRENCH WALL HAS BEEN DISTURBED. EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO PIPE JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS.
4. WHERE MECHANICAL JOINT PIPE IS USED, MECHANICAL JOINT PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
5. INSTALLATION AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN ESTABLISHED RULES AND PROCEDURES.

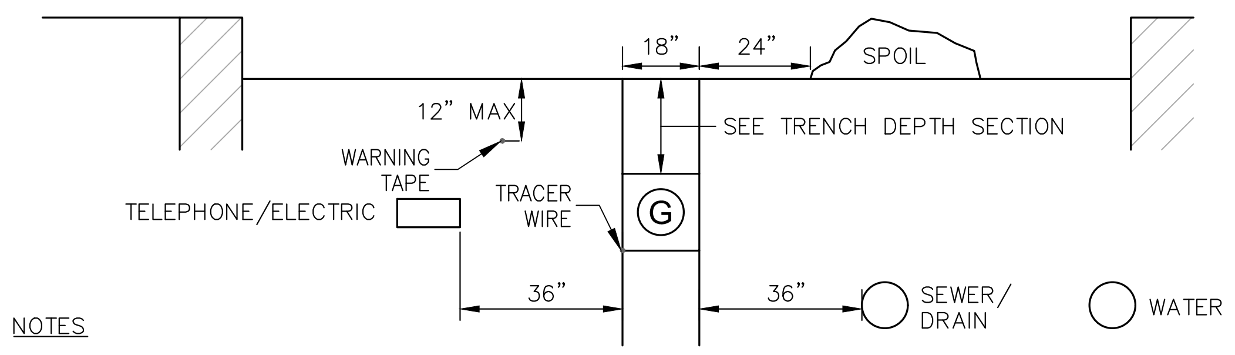
TEST PRESSURE = 200psi

SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL

REACTION TYPE	PIPE SIZE				
	4"	6"	8"	10"	12"
A 90°	0.89	2.19	3.82	11.14	17.24
B 180°	0.65	1.55	2.78	8.38	12.00
C 45°	0.48	1.19	2.12	6.02	9.32
D 22-1/2°	0.25	0.60	1.06	3.08	4.74
E 11-1/4°	0.13	0.30	0.54	1.54	2.38

THRUST BLOCKS

NOT TO SCALE

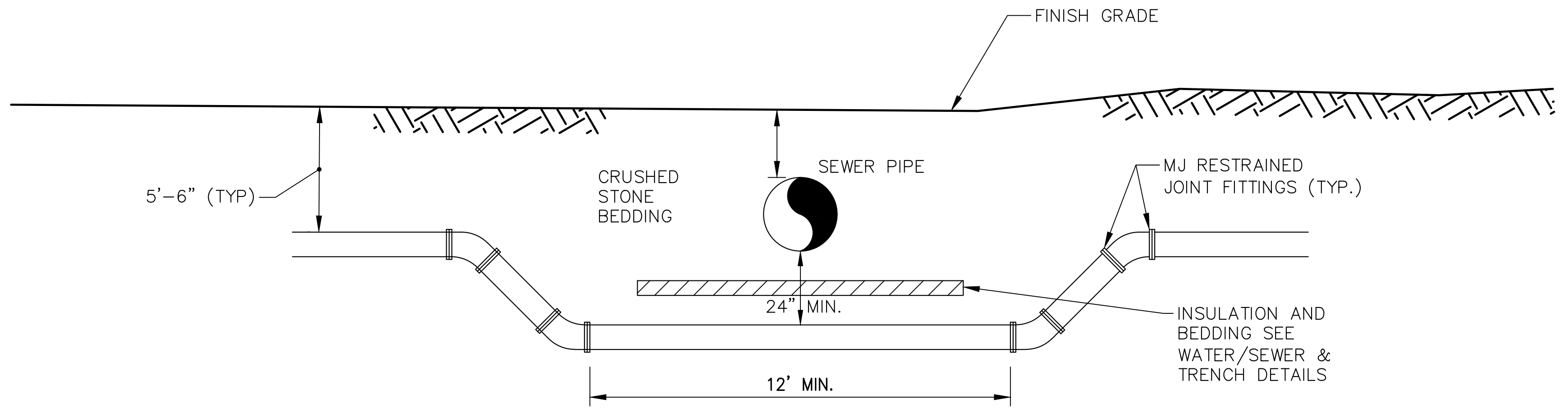


NOTES

1. MAINS—THE TRENCH SHALL BE DEEP ENOUGH TO PROVIDE 36" OF COVER FROM FINISHED GRADE TO TOP OF MAIN. FOR ALL SERVICES AND GAS MAINS, ON PRIVATE PROPERTY, 24" OF COVER IS REQUIRED.
2. THE TRENCH SHALL BE AT LEAST 18" WIDE. THE SPOIL SHOULD BE AT LEAST 24" FROM EDGE OF TRENCH.
3. THE TRENCH SHALL BE LAID OUT SO AS TO PROVIDE A MINIMUM OFFSET OF 36" FROM OTHER UTILITIES. WHERE PRACTICAL, GAS MAINS SHOULD BE ON THE OPPOSITE SIDE OF THE STREET FROM THE WATER MAIN.
4. THE NATURAL BOTTOM OF THE TRENCH SHALL BE PADDED WITH 4" OF SAND ON BOTTOM AND 6" OF SAND ON TOP. ALSO, SUFFICIENT SAND MUST BE PROVIDED FOR A MINIMUM OF 6" OF COVER ABOVE THE MAIN. SAND SHALL BE PROVIDED BY EXCAVATOR AND MUST BE ON SITE PRIOR TO INSTALLATION OF PIPE.
5. NO TRENCHING SHALL BE STARTED UNTIL AN ON SITE MEETING HAS BEEN HELD BETWEEN EXCAVATING CONTRACTOR AND UNITIL PERSONNEL. PRIOR TO THE MEETING, THE CONTRACTOR MUST NOTIFY DIG SAFE OF THE PROPOSED WORK. THE ROUTE OF TRENCH AND TENTATIVE START DATE SHALL BE CONFIRMED AT THE MEETING.
6. IF WORK TAKES PLACE OUTSIDE OF APRIL THROUGH NOVEMBER OFF SITE TIE-INS ON CITY STREETS SHALL BE DONE SUBJECT TO UNITIL CREW AVAILABILITY AND ISSUANCE OF REQUIRED PERMITS
7. ONCE UNITIL HAS INSTALLED THE MAIN AND SERVICES, CONTRACTOR WILL COVER THE PIPE WITH 6" OF SAND AND INSTALL THE TRACING WIRE AND WARNING TAPE PRIOR TO BACKFILLING. THE EXCAVATING CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER COMPACTING OF THE TRENCH AND MAINTAINING ALL SURFACE (VALVE) BOXES PRIOR TO AND DURING ON-SITE PAVING.

UNITIL GAS MAIN

NOT TO SCALE

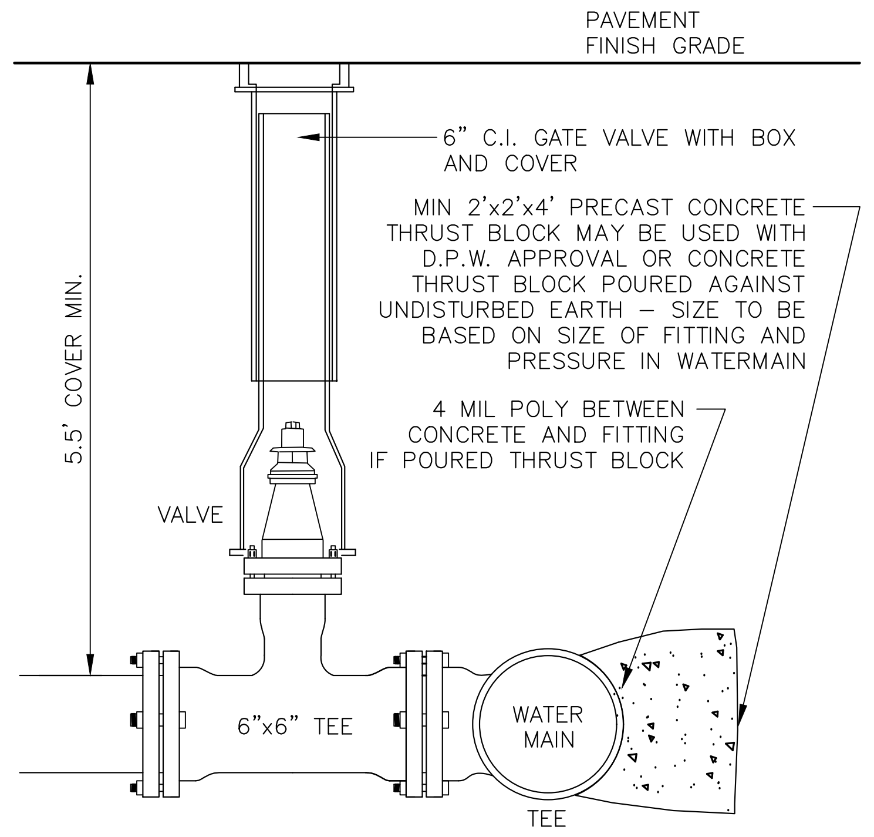


NOTE:

1. INSTALL (4) FOUR 45° MJ BENDS WITH RESTRAINED JOINT FITTINGS.
2. ALL WATER MAINS (DUCTILE IRON) AND SERVICES SHALL HAVE POLYETHYLENE WRAP.

WATER/SEWER CROSSING DETAIL

NOT TO SCALE

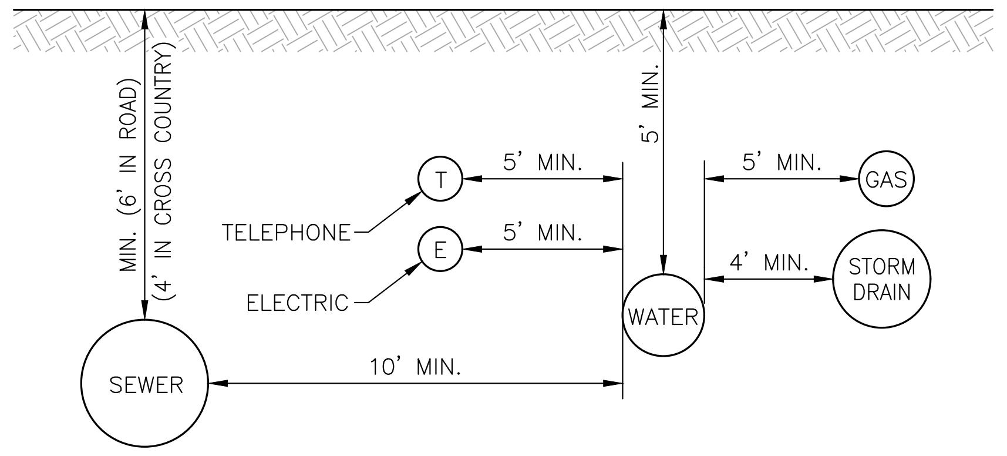


NOTES:

1. VALVE TO OPEN RIGHT.

BURIED GATE VALVE

NOT TO SCALE

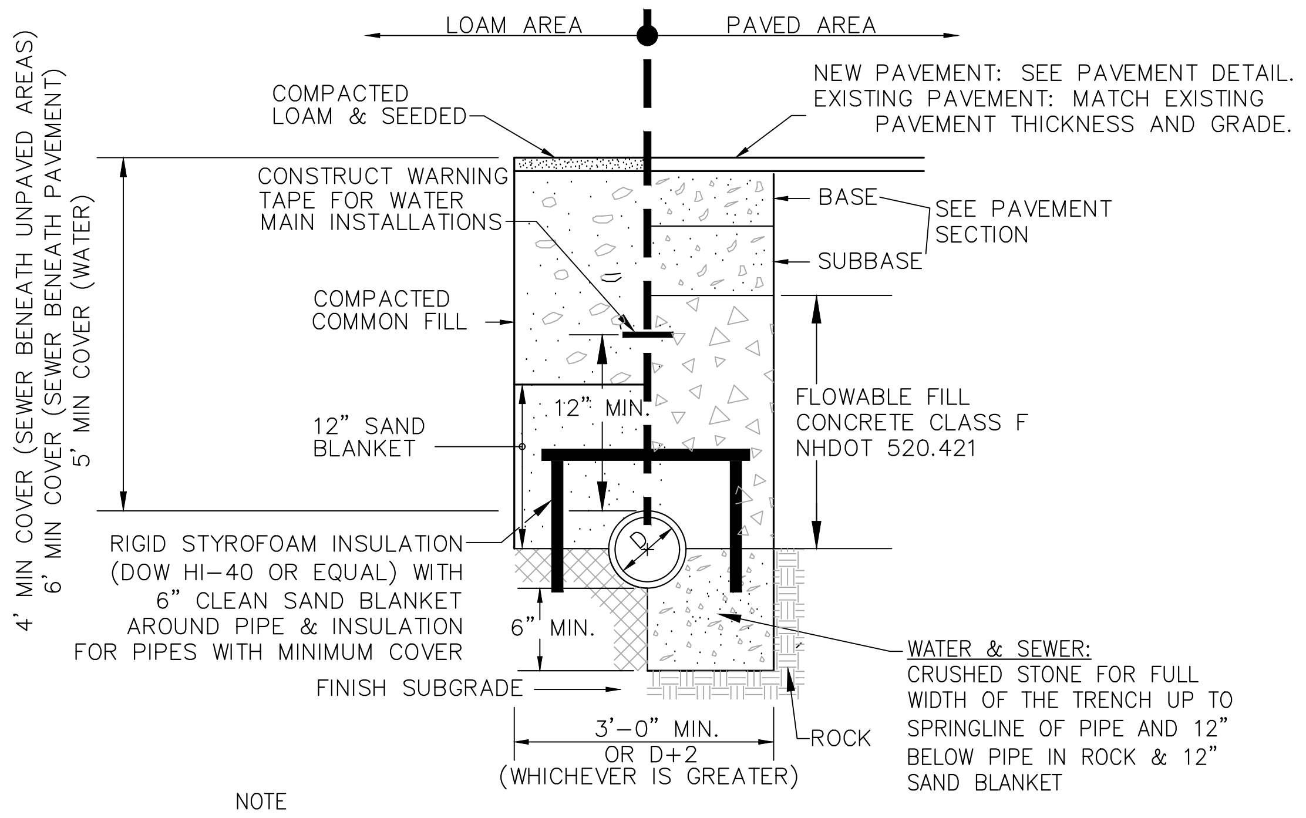


NOTES:

1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO EXETER DPW TECHNICAL SPECIFICATIONS.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. GAS MAIN SHALL HAVE A TYPICAL DEPTH OF 3' FROM THE TOP OF PIPE TO FINISH GRADE
4. DETAIL REPRESENTS LATERAL SEPARATION ONLY UNLESS OTHERWISE NOTED. CONTRACTOR SHALL COORDINATE WITH APPROPRIATE UTILITY COMPANY FOR DEPTHS FOR GAS, TELEPHONE, AND ELECTRIC.

TYPICAL UTILITY LATERAL SEPARATION

NOT TO SCALE



NOTE

1. CONSTRUCT SECTION FOR ALL WATERLINES AND SANITARY SEWERS.

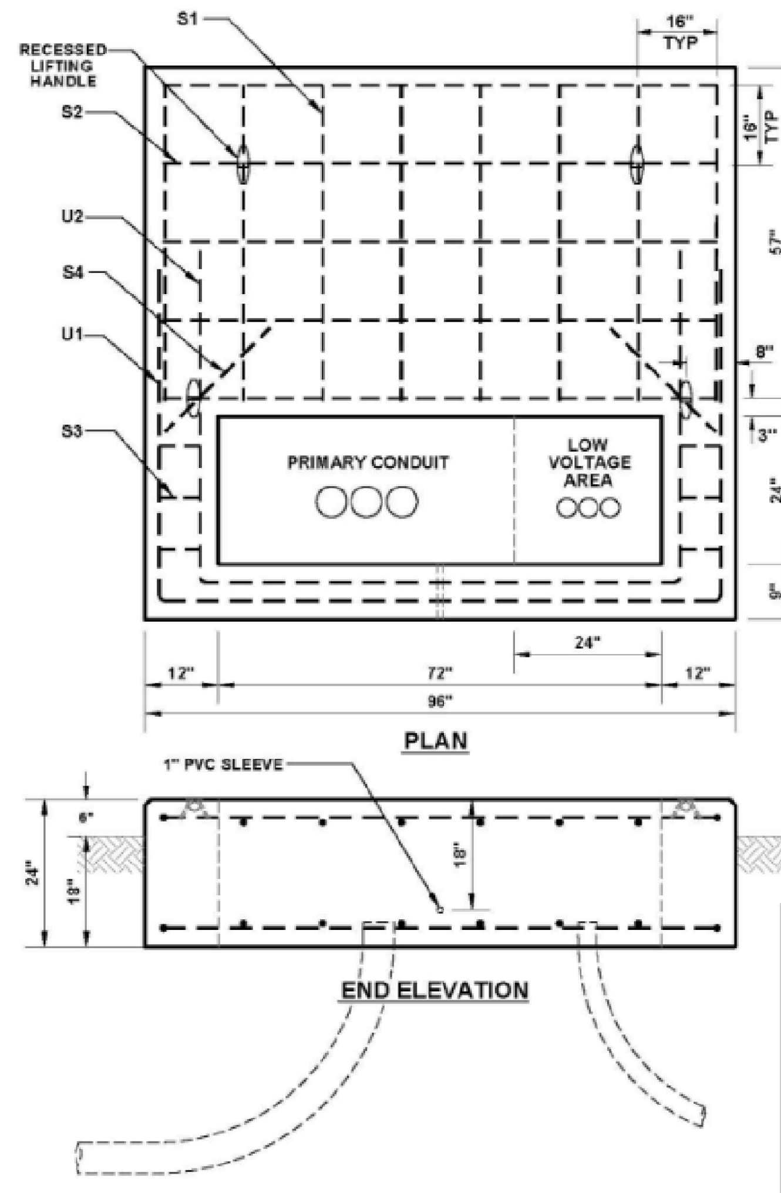
UTILITY TRENCH

NOT TO SCALE

STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14950
LICENSED
PROFESSIONAL ENGINEER

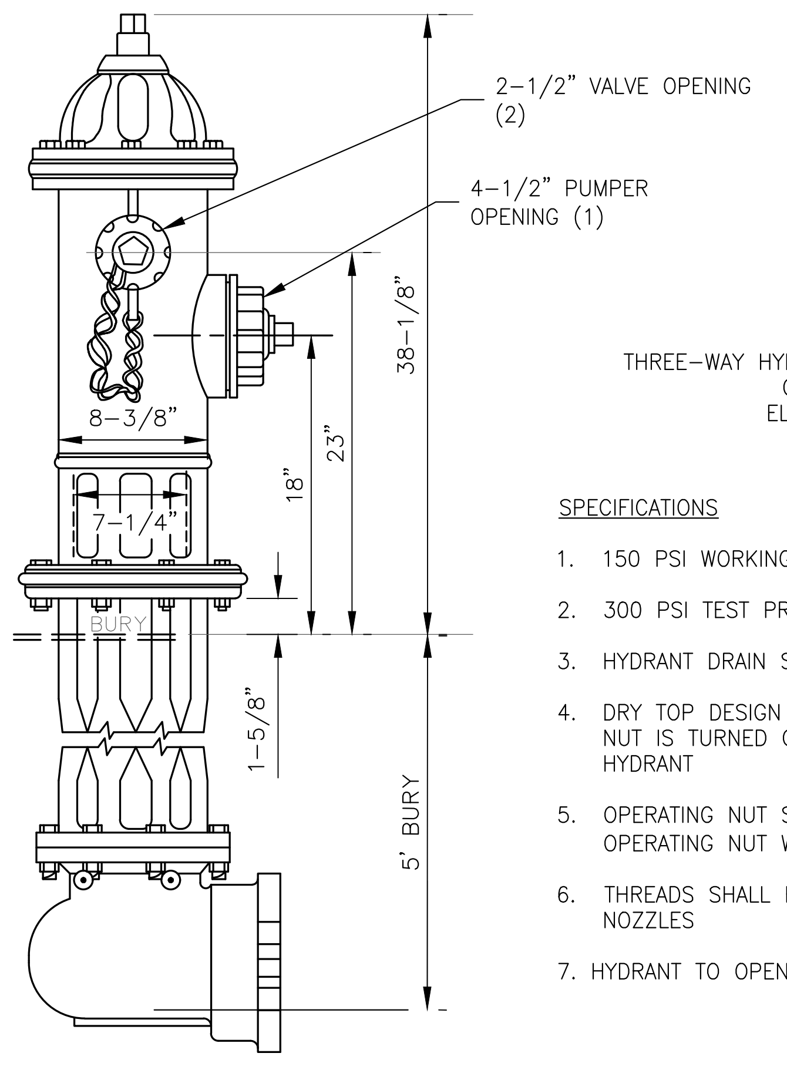
1	6/16/2025	REVISED PER TAC WORKSHOP	DKS	JJM
REV	*DATE*	*DESCRIPTION*	*DR*	*CK*

3 Phase Padmounted Transformer Slab 15KV 750-2500 KVA Dead Front 34KV 75-2500 KVA Dead Front



REINFORCING SCHEDULE (#6 BAR)			
Type	Qty	Length	Diagram
S1	16	51"	Straight
S2	10	90"	Straight
S3	12	7"	Straight
S4	4	24"	Straight
U1	2	198"	54 90 54
U2	2	186"	54 78 54

Total Foundation Weight, 14,200 lbs.



THREE-WAY HYDRANT KENNEDY K-81A
GUARDIAN
ELMIRA, N.Y.

SPECIFICATIONS

1. 150 PSI WORKING PRESSURE
2. 300 PSI TEST PRESSURE
3. HYDRANT DRAIN SHALL BE PLUGGED
4. DRY TOP DESIGN VALVE SHALL OPEN WHEN OPERATING NUT IS TURNED CLOCKWISE AND BE SO INDICATED ON HYDRANT
5. OPERATING NUT SHALL BE STANDARD AWWA PENTAGON OPERATING NUT WITH 1 1/2" POINT TO FLAT DIMENSION
6. THREADS SHALL BE NATIONAL STANDARD HOSE THREAD NOZZLES
7. HYDRANT TO OPEN RIGHT.

PORTSMOUTH FIRE HYDRANT

NOT TO SCALE

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

DETAILS 4

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
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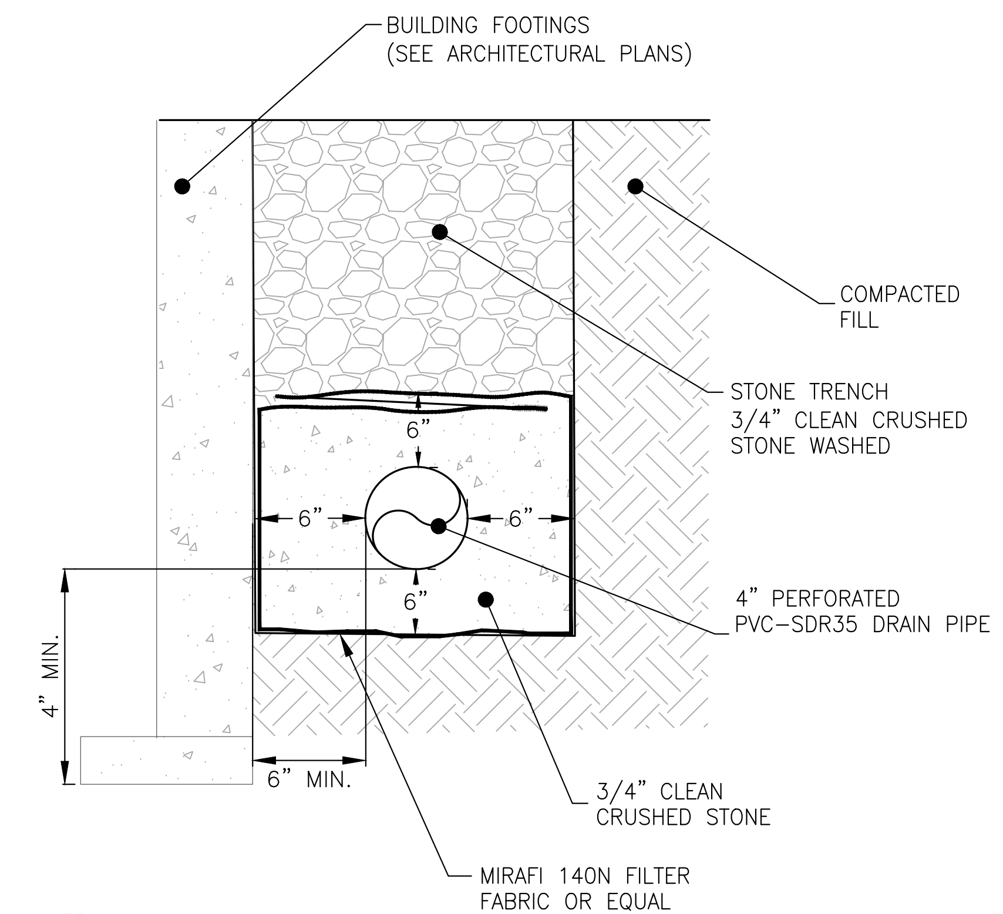
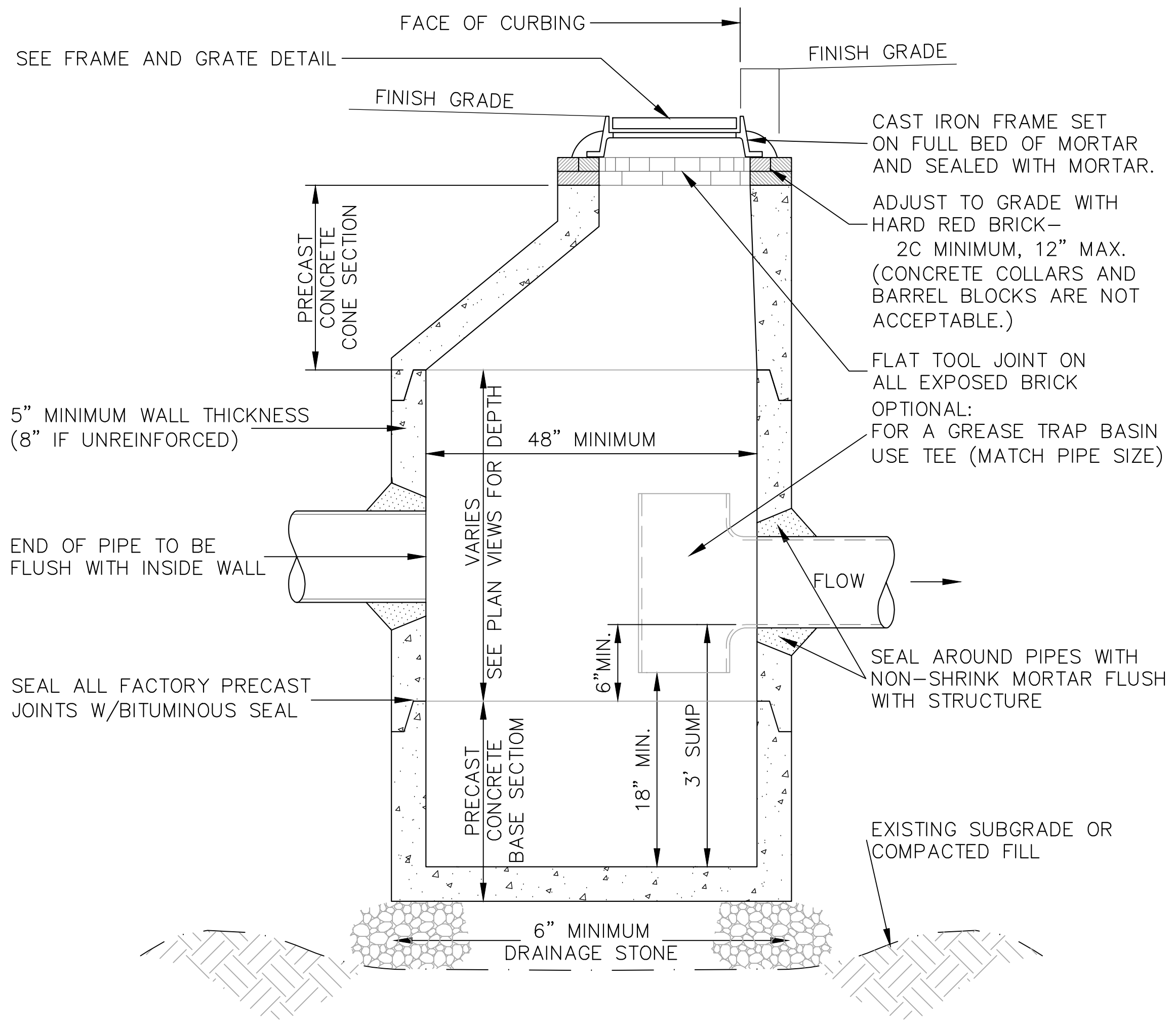


NOTES

1. FOR MINIMUM DIMENSIONAL REQUIREMENT REFER TO THE GEOTECHNICAL REPORT PREPARED BY JOHN TURNER COUNSULTING, INC. ON JULY 3, 2013.

FOUNDATION DRAIN LINES

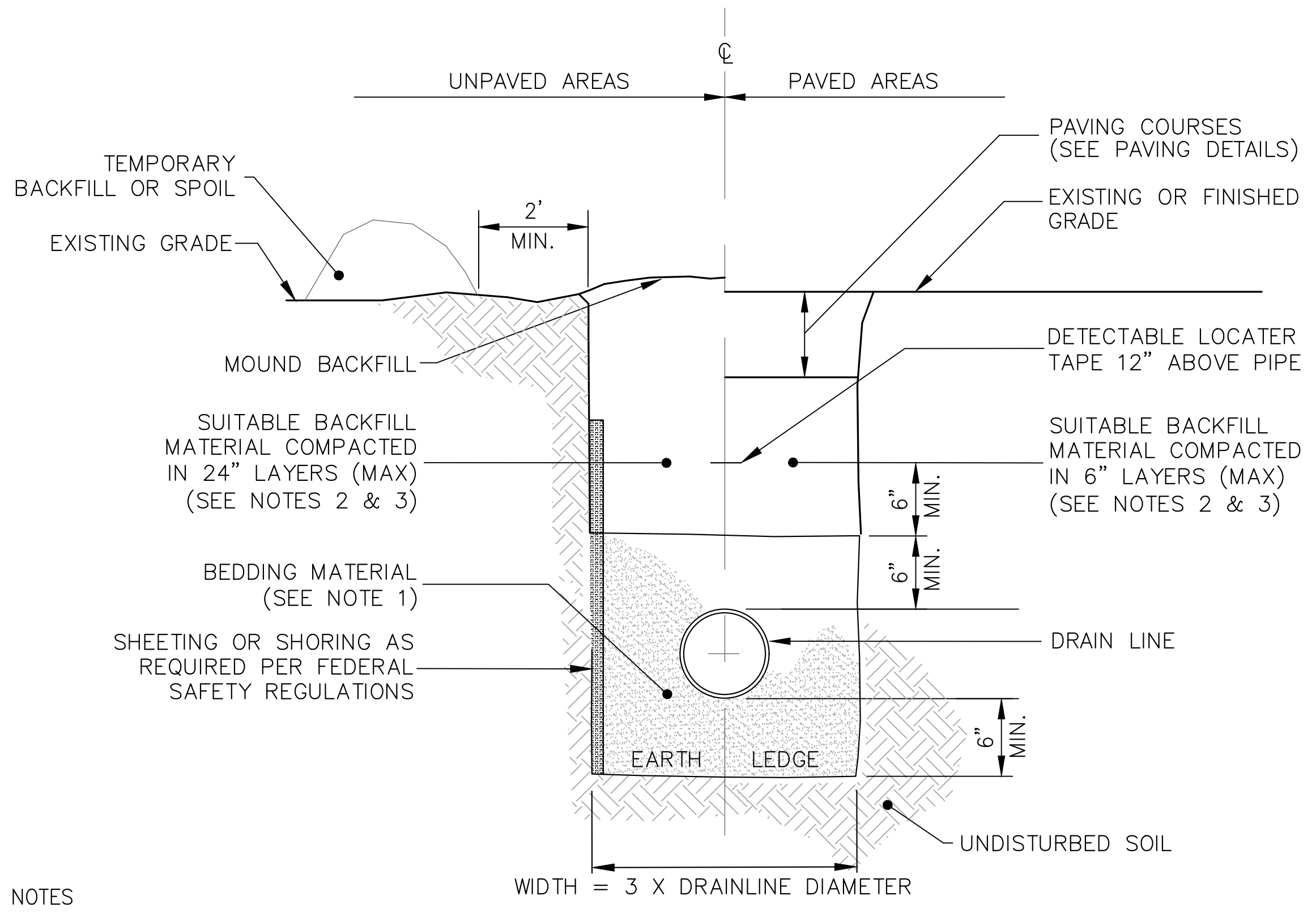
NOT TO SCALE



NOTE: ALL PRECAST SECTIONS SHALL CONFORM TO ASTM C-478

CATCH BASIN

ECCENTRIC CONE (FOR USE IN CURBED AREAS) NOT TO SCALE

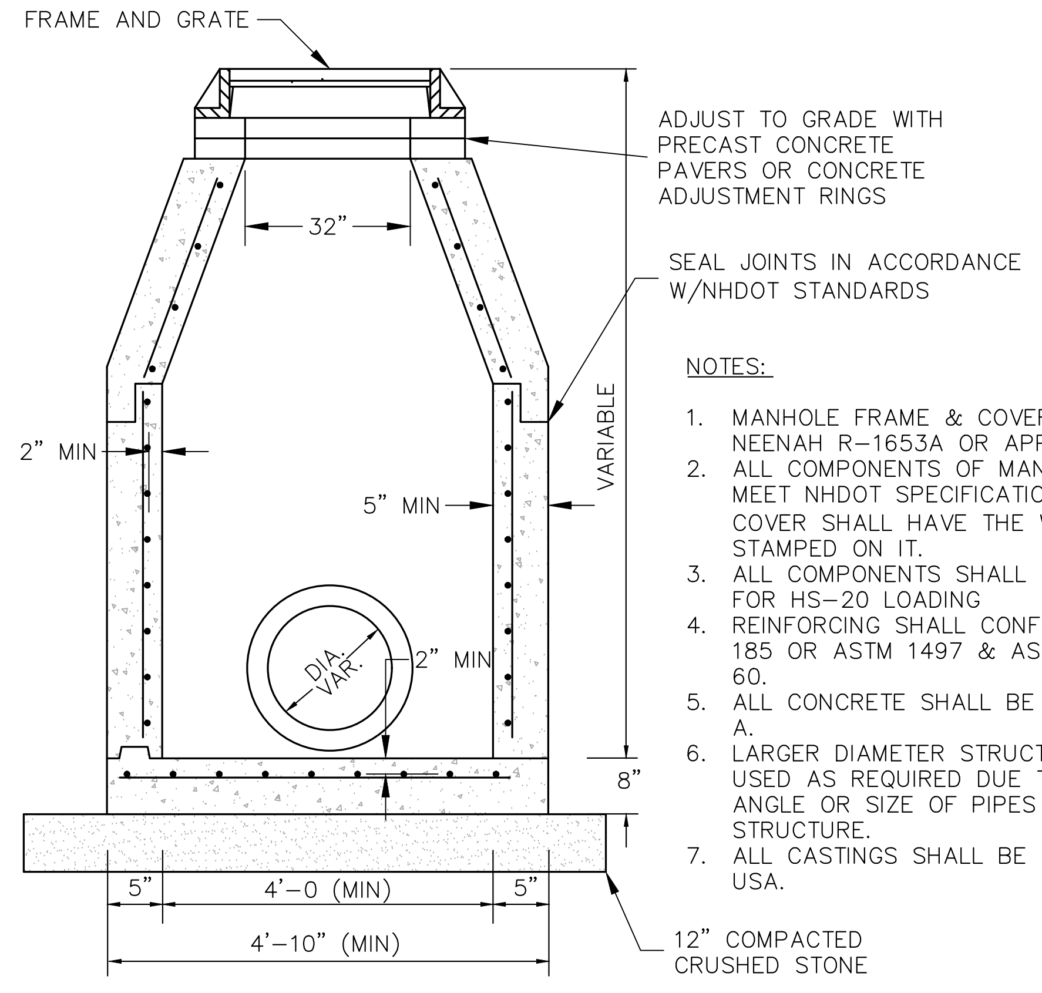


NOTES

1. BEDDING – BEDDING FOR PIPES SHALL CONSIST OF PREPARING THE BOTTOM OF THE TRENCH TO SUPPORT THE ENTIRE LENGTH OF THE PIPE AT A UNIFORM SLOPE AND ALIGNMENT. CRUSHED STONE SHALL BE USED TO BED THE PIPE TO THE ELEVATION SHOWN ON THE DRAWINGS. NORMAL PIPE BEDDING IS CRUSHED STONE TO THE HAUNCH OF THE PIPE AND SAND BEDDING 6" ABOVE THE CROWN. IF THE TOP OF THE PIPE IS LESS THAN 30" FROM FINISH GRADE, BED PIPE COMPLETELY IN STONE UP TO 6" ABOVE PIPE CROWN. UNDERDRAIN TO HAVE 4" MINIMUM OF STONE OVER PIPE OR AS NECESSARY TO BE IN CONTACT WITH GRAVEL LAYER OF SELECTS ABOVE.
2. COMPACTION – ALL BACKFILL SHALL BE COMPACTED AT OR NEAR OPTIMUM MOISTURE CONTENT BY PNEUMATIC TAMPERS, VIBRATORY COMPACTORS OR OTHER APPROVED MEANS. BACKFILL BENEATH PAVED SURFACES SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T99, METHOD C.
3. SUITABLE MATERIAL – IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS; PIECES OF PAVEMENT; ORGANIC MATTER; TOP SOIL; ALL WET OR SOFT MUCK, PEAT, OR CLAY; ALL EXCAVATED LEDGE MATERIAL; ROCKS OVER 6" IN LARGEST DIMENSION; FROZEN EARTH AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.
4. BASE COURSE AND PAVEMENT – SHALL MEET THE REQUIREMENT OF THE NHDOT LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DIVISION 300 AND 400 RESPECTIVELY.

TRENCH FOR DRAIN LINE

NOT TO SCALE

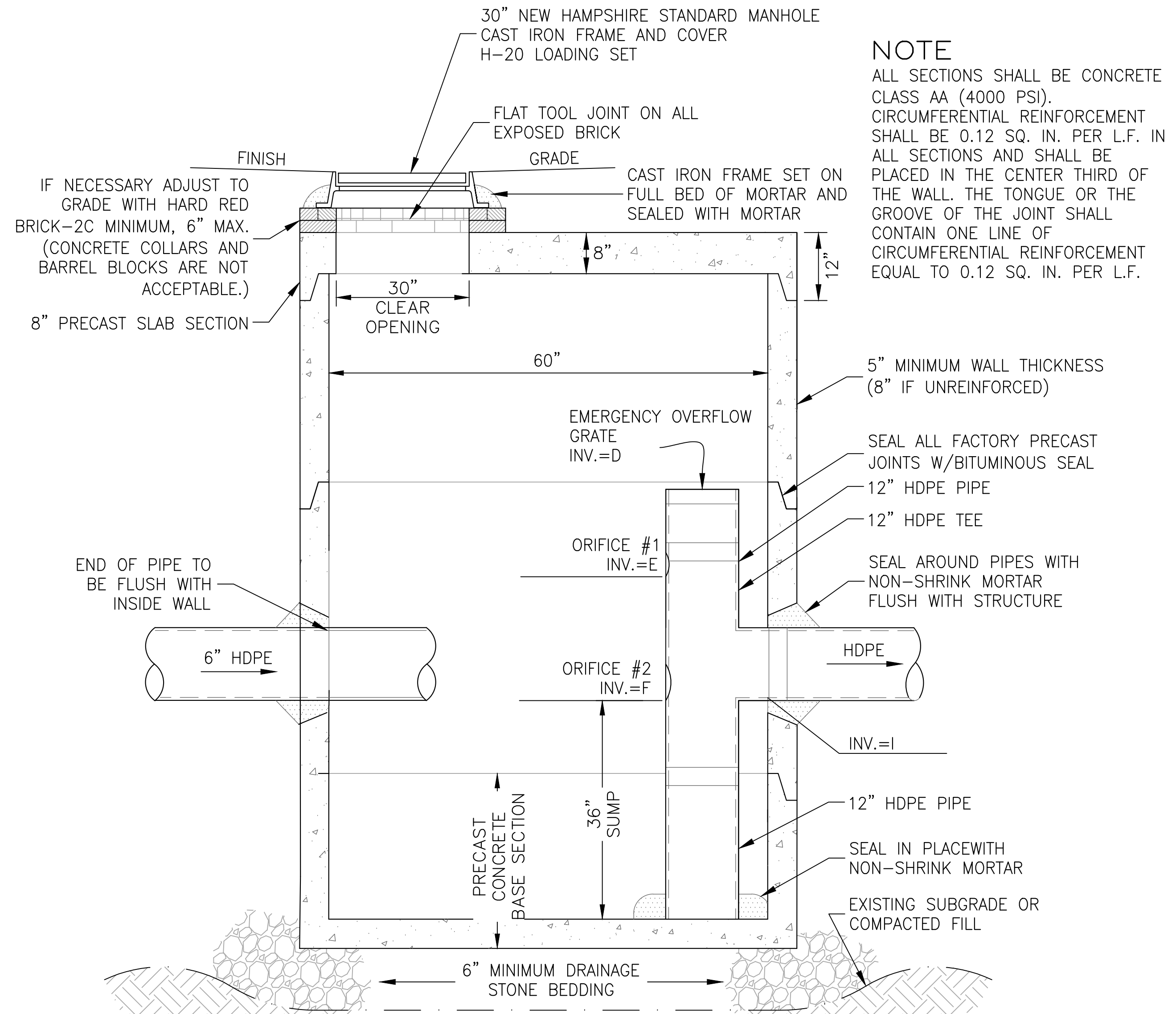


NOTES:

1. MANHOLE FRAME & COVER: SHALL BE NEENAH R-1653A OR APPROVED EQUAL.
2. ALL COMPONENTS OF MANHOLES SHALL MEET NHDOT SPECIFICATIONS AND THE COVER SHALL HAVE THE WORD "DRAIN" STAMPED ON IT.
3. ALL COMPONENTS SHALL BE DESIGNED FOR HS-20 LOADING
4. REINFORCING SHALL CONFORM TO ASTM 185 OR ASTM 1497 & ASTM A615, GRADE 60.
5. ALL CONCRETE SHALL BE NHDOT CLASS A.
6. LARGER DIAMETER STRUCTURES SHALL BE USED AS REQUIRED DUE TO NUMBER, ANGLE OR SIZE OF PIPES AT THE STRUCTURE.
7. ALL CASTINGS SHALL BE MADE IN THE USA.

DRAIN MANHOLE

NOT TO SCALE



NOTE
ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 PSI). CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ. IN. PER L.F. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER L.F.

NOTE: ALL PRECAST SECTIONS SHALL CONFORM TO ASTM C-478

OUTLET CONTROL STRUCTURE

FOR BIORETENTION SYSTEMS NOT TO SCALE

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

DETAILS 5

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE

OWNED BY
CITY OF PORTSMOUTH

PREPARED FOR
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1"=60' (11"X17")
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SEWER SERVICE NOTES

1. MINIMUM SIZE PIPE FOR SEWER SERVICE SHALL BE FOUR INCHES.

2. PIPE AND JOINT MATERIALS:
   A. PLASTIC SEWER PIPE
      1. PIPE AND FITTINGS SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS:

ASTM STANDARDS	GENERIC PIPE MATERIAL	SIZES APPROVED
D3034	*PVC (SOLID WALL)	8" THROUGH 15" (SDR 35)
F679	PVC (SOLID WALL)	18" THROUGH 27" (T–1 & T–2)
F789	PVC (SOLID WALL)	4" THROUGH 18" (T–1 TO T–3)
F794	PVC (RIBBED WALL)	8" THROUGH 36"
D2680	*ABS (COMPOSITES WALL)	8" THROUGH 15"

*PVC: POLY VINYL CHLORIDE
*ABS: ACRYLONITRILE–BUTADIENE–STYRENE

      2. JOINTS SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL CONFORMING TO ASTM D–3212 AND SHALL BE PUSH–ON, BELL AND SPIGOT TYPE.

ABS TRUSS PIPE AND FITTINGS SHALL CONFORM TO ASTM D–2680, POLYMER COMPOUNDING SHALL BE TO ASTM D–1788 (CLASS 322).

JOINTS FOR ABS TRUSS PIPE SHALL BE CHEMICAL WELDED COUPLINGS TYPE SC IN ACCORDANCE WITH ASTM D–2680, FORMING A CHEMICAL WELDED JOINT.

   B. DUCTILE–IRON PIPE, FITTINGS AND JOINTS.
      1. DUCTILE IRON PIPE AND FITTINGS SHALL CONFORM TO THE FOLLOWING STANDARDS OF THE UNITED STATES OF AMERICA STANDARDS INSTITUTE:
         A21.50 THICKNESS DESIGN OF DUCTILE IRON PIPE AND WITH ASTM A–536 DUCTILE IRON CASTINGS.
         A21.51 DUCTILE IRON PIPE, CENTRIFUGALLY CAST IN METAL MOLDS OR SAND–LINED MOLDS FOR WATER OR OTHER LIQUIDS.
      2. JOINTS SHALL BE OF THE MECHANICAL OR PUSH–ON TYPE. JOINTS AND GASKETS SHALL CONFORM TO:
         A21.11 RUBBER GASKETS JOINTS FOR CAST IRON PRESSURE PIPE & FITTINGS

3. DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE.

4. JOINTS SHALL BE DEPENDENT UPON A NEOPRENE OR ELASTOMERIC GASKET FOR WATER–TIGHTNESS. ALL JOINTS SHALL BE PROPERLY MATCHED WITH THE PIPE MATERIALS USED. WHERE DIFFERING MATERIALS ARE TO BE CONNECTED, AS AT THE STREET SEWER WYE OR AT THE FOUNDATION WALL, APPROPRIATE MANUFACTURED ADAPTERS SHALL BE USED.

5. TEES AND WYES: WHERE A TEE OR WYE IS NOT AVAILABLE IN THE EXISTING STREET SEWER, AN APPROPRIATE CONNECTION SHALL BE MADE, FOLLOWING MANUFACTURERS' INSTRUCTIONS USING A BOLTED, CLAMPED OR EPOXY–CEMENTED SADDLE TAPPED INTO A SMOOTHLY DRILLED OR SAWN OPENING IN THE SEWER. THE PRACTICE OF BREAKING AN OPENING WITH A SLEDGE HAMMER, STUFFING CLOTH OR OTHER SUCH MATERIAL AROUND THE JOINT, OR APPLYING MORTAR TO HOLD THE CONNECTION, AND ANY OTHER SIMILAR CRUDE PRACTICES OR INEPT OR HASTY IMPROVISATIONS WILL NOT BE PERMITTED. THE CONNECTION SHALL BE CONCRETE ENCASED AS SHOWN IN THE DETAIL UP TO AND INCLUDING 15" DIAMETER.

6. SEWER SERVICE INSTALLATION: THE PIPE SHALL BE HANDLED, PLACED AND JOINTED IN ACCORDANCE WITH INSTALLATION GUIDES OF THE APPROPRIATE MANUFACTURER. IT SHALL BE CAREFULLY BEDDED ON A 6 INCH LAYER OF CRUSHED STONE AND/OR GRAVEL AS SPECIFIED IN NOTE 10. BEDDING AND RE–FILL FOR DEPTH OF 12 INCHES ABOVE THE TOP OF THE PIPE SHALL BE CAREFULLY AND THOROUGHLY TAMPED BY HAND OR WITH APPROPRIATE MECHANICAL DEVICES.

   THE PIPE SHALL BE LAID AT A CONTINUOUS AND CONSTANT GRADE FROM THE STREET SEWER CONNECTION TO THE FOUNDATION AT A GRADE OF NOT LESS THAN 1/4" INCH PER FOOT. PIPE JOINTS MUST BE MADE UNDER DRY CONDITIONS. IF WATER IS PRESENT, ALL NECESSARY STEPS SHALL BE TAKEN TO DEWATER THE TRENCH.

7. TESTING: THE COMPLETED SEWER SERVICE SHALL BE SUBJECTED TO A THIRD PARTY LEAKAGE TEST IN ANY OF THE FOLLOWING MANNERS: (PRIOR TO BACKFILLING)

   A. AN OBSERVATION TEE SHALL BE INSTALLED AS SHOWN AND WHEN READY FOR TESTING, AN INFLATABLE BLADDER OR PLUG SHALL BE INSERTED JUST UPSTREAM FROM THE OPENING IN THE TEE. AFTER INFLATION, WATER SHALL BE INTRODUCED INTO THE SYSTEM ABOVE THE PLUG TO A HEIGHT OF 5 FEET ABOVE THE LEVEL OF THE PLUG.

   B. THE PIPE SHALL BE LEFT EXPOSED AND LIBERALLY HOSED WITH WATER, TO SIMULATE, AS NEARLY AS POSSIBLE, WET TRENCH CONDITIONS OR, IF TRENCH IS WET, THE GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. INSPECTIONS FOR LEAKS SHALL BE MADE THROUGH THE CLEANOUT WITH A FLASHLIGHT.

   C. DRY FLUORESCENE DYE SHALL BE SPRINKLED INTO THE TRENCH OVER THE PIPE. IF THE TRENCH IS DRY, THE PIPE SHALL BE LIBERALLY HOSED WITH WATER, OR IF THE TRENCH IS WET, GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. OBSERVATION FOR LEAKS SHALL BE MADE IN THE FIRST DOWN–STREAM MANHOLE.

   LEAKAGE OBSERVED IN ANY ONE OF THE ABOVE ALTERNATE TESTS SHALL BE CAUSE FOR NON–ACCEPTANCE AND THE PIPE SHALL BE DUG–UP IF NECESSARY AND RE–LAID SO AS TO ASSURE WATER TIGHTNESS.

8. ILLEGAL CONNECTIONS: NOTHING BUT SANITARY WASTE FLOW FROM TOILETS, SINKS, LAUNDRY ETC. SHALL BE PERMITTED. ROOF LEADERS, FOOTING DRAINS, SUMP PUMPS OR OTHER SIMILAR CONNECTIONS CARRYING RAIN WATER, DRAINAGE OR GROUND WATER SHALL NOT BE PERMITTED.

9. WATER SERVICE SHALL NOT BE LAID IN SAME TRENCH AS SEWER SERVICE.

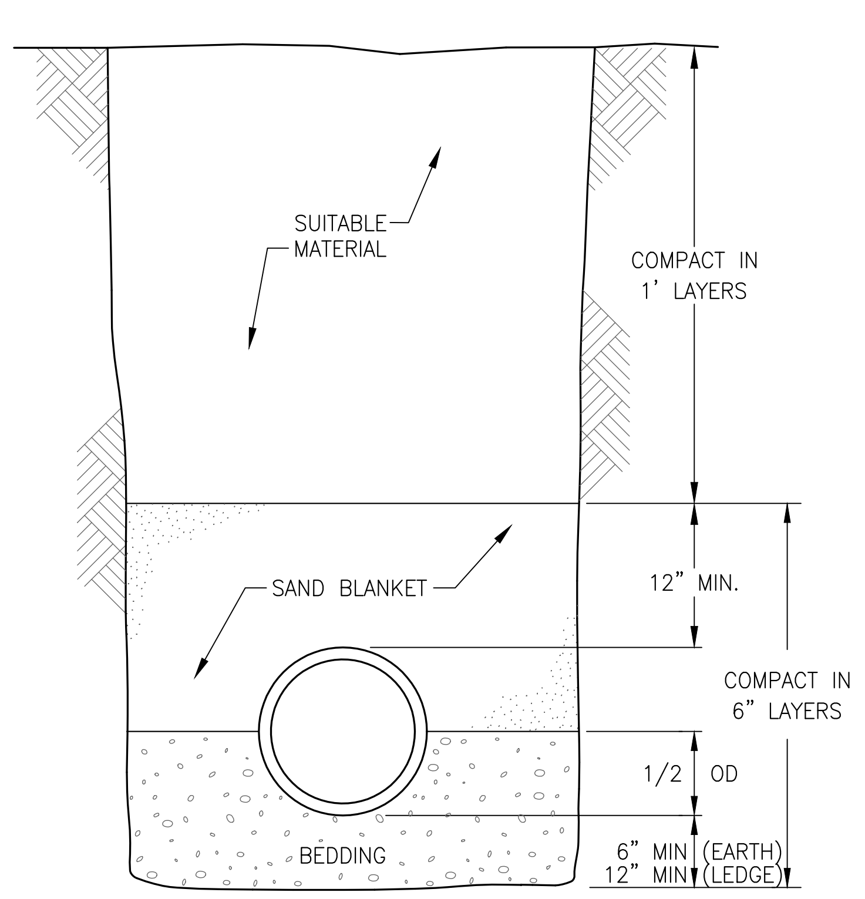
10. BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATERIAL AND MEETING ASTM C33–67.

100% PASSING	1 INCH SCREEN
90%–100% PASSING	3/4 INCH SCREEN
20%–55% PASSING	3/8 INCH SCREEN
0%–10% PASSING	#4 SIEVE
0%–5% PASSING	#8 SIEVE

   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE, SCREENED GRAVEL OR CRUSHED STONE 1/2 INCH TO 1 1/2 INCH SHALL BE USED.

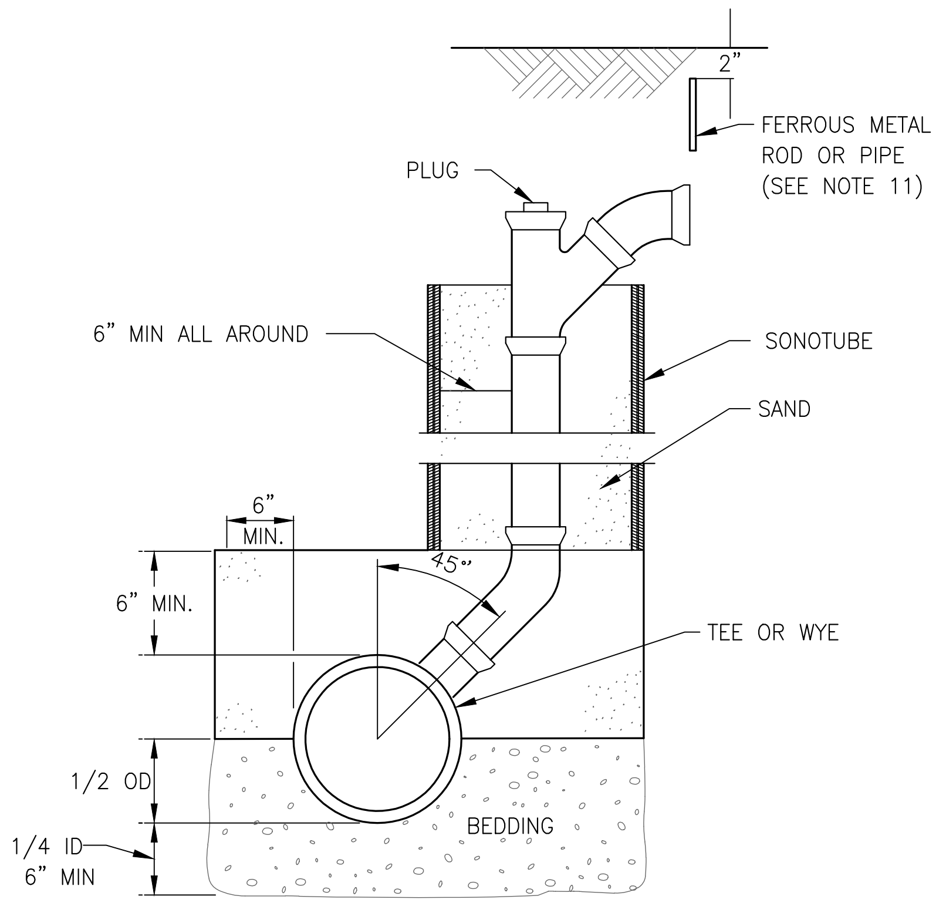
11. LOCATION: THE LOCATION OF THE TEE OR WYE SHALL BE RECORDED AND FILED IN THE MUNICIPAL RECORDS. IN ADDITION, A FERROUS METAL ROD OR PIPE SHALL BE PLACED OVER THE TEE OR WYE AS DESCRIBED IN THE TYPICAL "CHIMNEY" DETAIL, TO AID IN LOCATING THE BURIED PIPE WITH A DIP NEEDLE OR PIPEFINDER.

12. CHIMNEYS: IF VERTICAL DROP INTO SEWER IS GREATER THAN 4 FEET, A CHIMNEY SHALL BE CONSTRUCTED FOR THE SEWER CONNECTION. CHIMNEY INSTALLATION AS RECOMMENDED BY THE PIPE MANUFACTURER MAY BE USED IF APPROVED BY THE ENGINEER.



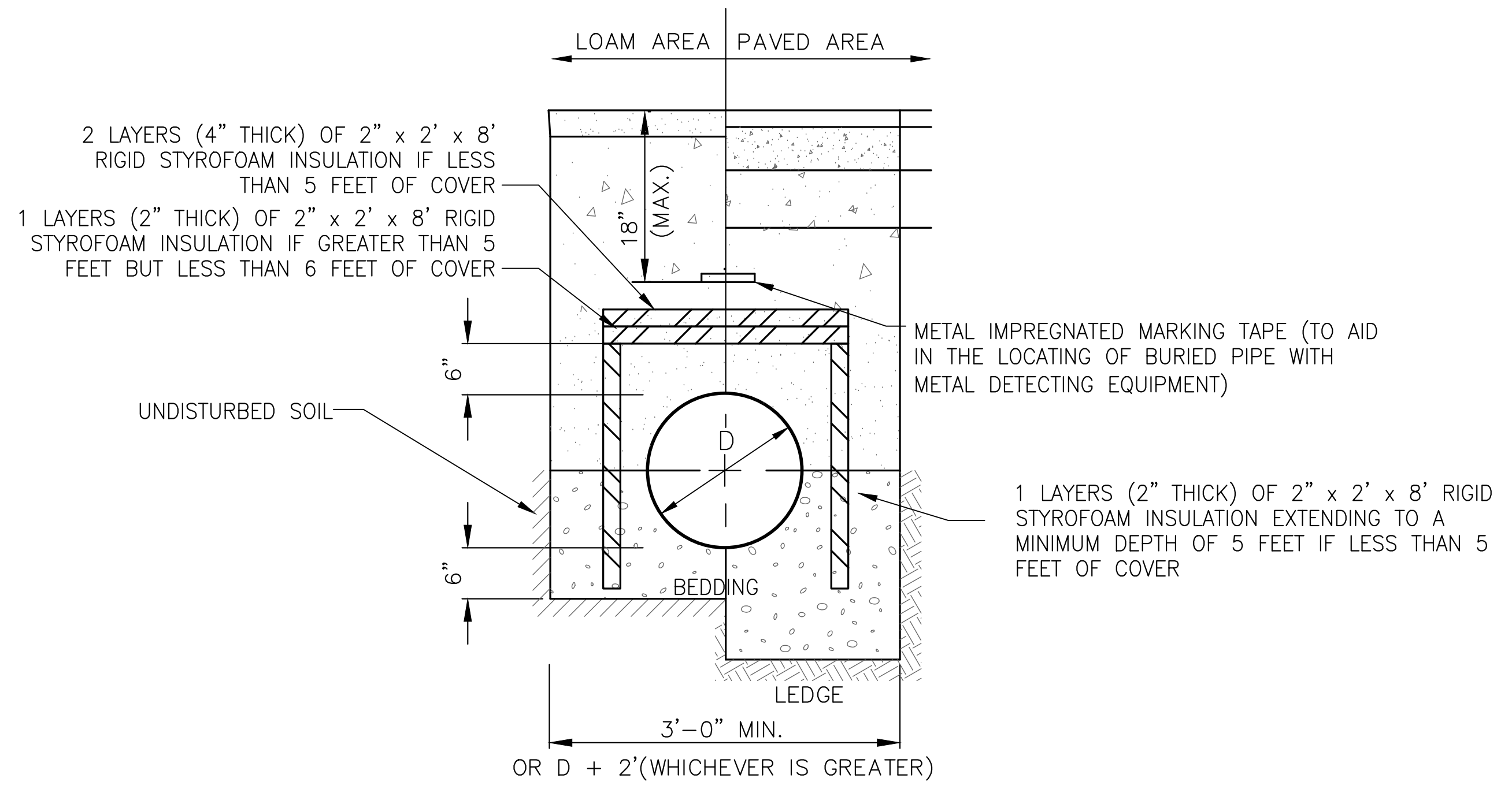
BEDDING TO BE THOROUGHLY COMPACTED (SEE NOTE 10)

TRENCH CROSS-SECTION
NOT TO SCALE



BACKFILLING TO BE BROUGHT UP EVENLY ON ALL SIDES.

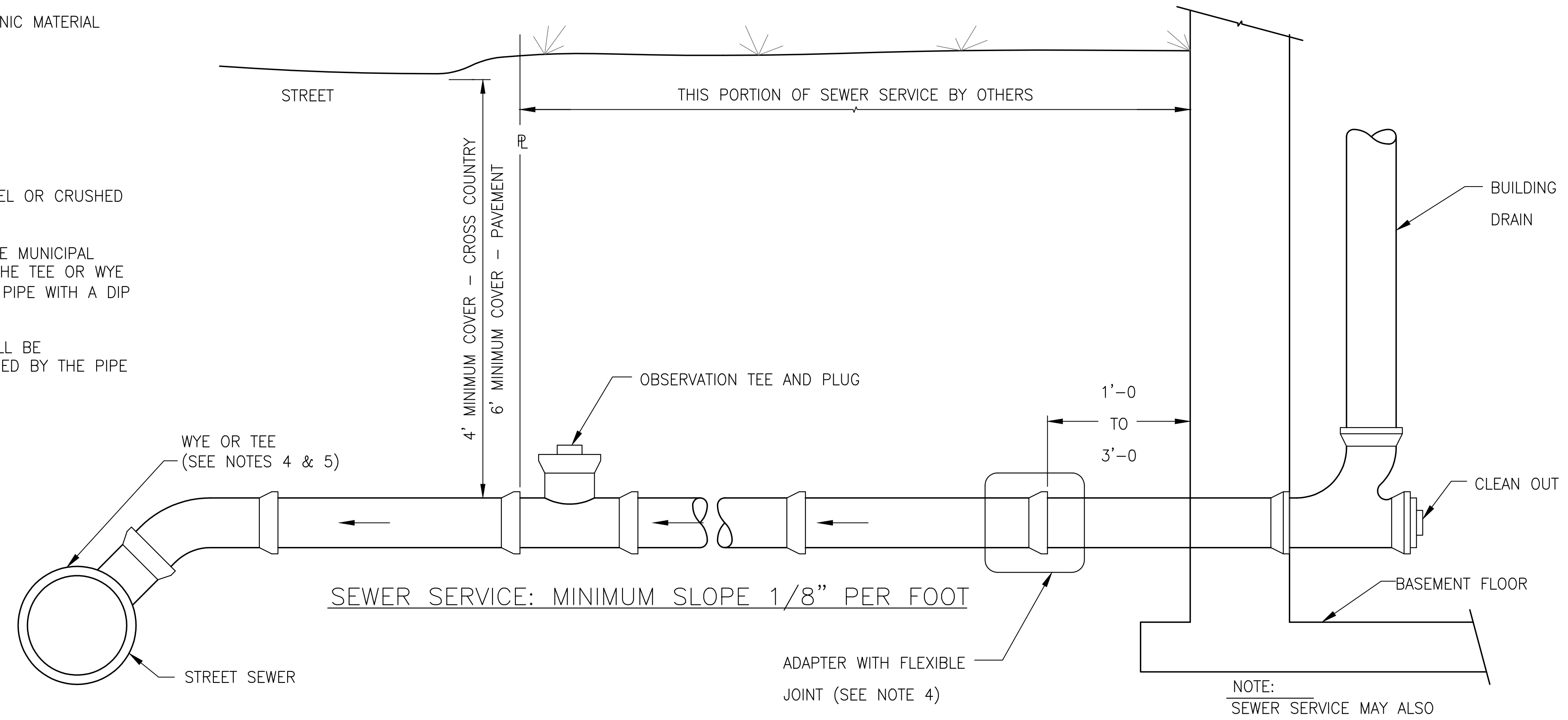
CHIMNEY (SEE NOTE 12)
NOT TO SCALE



NOTES

1. GAPS BETWEEN SECTIONS OF INSULATION TO BE COVERED WITH 2" x 2' x 2' PIECE OF INSULATION CENTERED OVER GAP.

SEWER TRENCH WITH INSULATION
NOT TO SCALE



NOTE:
SEWER SERVICE MAY ALSO BE LOCATED BELOW BASEMENT FLOOR WHEN REQUIRED

SEWER SERVICE DETAILS
NOT TO SCALE

GRAVITY SEWER NOTES

1. MINIMUM SIZE PIPE FOR GRAVITY SEWER SHALL BE 8–INCHES.

2. PIPE AND JOINT MATERIALS FOR PLASTIC SEWER PIPE SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS:

ASTM STANDARDS	GENERIC PIPE MATERIAL	SIZES APPROVED
D3034–04a	* PVC (SOLID WALL)	8" THROUGH 15" (SDR 35)
F679–03	PVC (SOLID WALL)	18" THROUGH 27" (T–1 & T–2)
F794–03	PVC (RIBBED WALL)	8" THROUGH 36"
F1760–01(2005)e1	PVC, RECYCLED	ALL DIAMETERS

*PVC: POLY VINYL CHLORIDE

3. PLASTIC SEWER PIPE SHALL HAVE A PIPE STIFFNESS RATING OF AT LEAST 46 POUNDS PER SQUARE INCH AT 5 PERCENT PIPE DIAMETER DEFLECTION, AS MEASURED IN ACCORDANCE WITH ASTM D2412–02 DURING MANUFACTURE.

4. JOINTS SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL CONFORMING TO ASTM D–3212–96(a)(2003)e1 AND SHALL BE PUSH–ON, BELL AND SPIGOT TYPE.

5. DUCTILE–IRON PIPE, FITTINGS AND JOINTS SHALL CONFORM TO THE FOLLOWING STANDARDS OF THE AMERICAN WATER WORKS ASSOCIATION (AWWA).

   AWWA C151/A21.51–02 THICKNESS DESIGN OF DUCTILE IRON PIPE AND WITH ASTM A–536–84 (2004) DUCTILE IRON CASTINGS.

   AWWA C151/A21.51–02 DUCTILE IRON PIPE, CENTRIFUGALLY CAST IN METAL MOLDS OR SAND–LINED MOLDS FOR WATER OR OTHER LIQUIDS.

   JOINTS SHALL BE OF THE MECHANICAL OR PUSH–ON TYPE. JOINTS AND GASKETS SHALL CONFORM TO AWWA C151/A21.11 RUBBER GASKETS JOINTS FOR CAST IRON PRESSURE PIPE & FITTINGS.

6. CONCRETE PIPE SHALL CONFORM TO AWWA C302–04.

7. PRESTRESSED CONCRETE CYLINDER PIPE AND FITTINGS SHALL CONFORM TO AWWA C301–99.

   JOINTS SEALS FOR CONCRETE CYLINDER PIPE SHALL BE OIL RESISTANT ELASTOMERIC MATERIAL CONFORMING TO ASWWA C301–99 SPECIFICATIONS.

8. DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE.

9. GRAVITY SEWER PIPE TESTING SHALL BE AS FOLLOWS:

   ALL NEW GRAVITY SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY THE USE OF LOW–PRESSURE AIR TESTS.

   LOW PRESSURE AIR TESTING SHALL BE IN CONFORMANCE WITH:

   ASTM F1417–92(2005) "STANDARD TEST METHOD FOR INSTALLATION ACCEPTANCE OF PLASTIC GRAVITY SEWER LINES USING LOW PRESSURE AIR".

   UNI–BELL PVC PIPE ASSOCIATION UNI–B–6, "LOW PRESSURE AIR TESTING OF INSTALLED SEWER PIPE".

10. ALL NEW GRAVITY SEWERS SHALL BE CLEANED AND VISUALLY INSPECTED AND SHALL BE TRUE TO LINE AND GRADE FOLLOWING INSTALLATION AND PRIOR TO USE AND VISUALLY INSPECT USING LAMP TEST.

11. ALL PLASTIC SEWER PIPE SHALL BE DEFLECTION TESTED NOT LESS THAN 30 DAYS AND NO MORE THAN 90 DAYS FOLLOWING INSTALLATION.

12. THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 5 PERCENT OF THE AVERAGE INSIDE DIAMETER.

13. TRENCH CONSTUCTION SHALL CONFORM TO THE FOLLOWING:

   SEWERS SHALL BE BURIED TO A MINIMUM DEPTH OF 6' BELOW GRADE IN ALL ROADWAY LOCATIONS AND TO A MINIMUM DEPTH OF 4 FEET BELOW GRADE IN ALL CROSS COUNTRY LOCATIONS.

   WHERE SEWER LINES CROSS WATER PIPES, A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN THE TWO OUTSIDE PIPE WALLS SHALL BE OBSERVED. AT SEWER/WATER INTERSECTIONS, A MINIMUM OF 6 FEET SHALL BE PROVIDED FROM THE WATER LINE TO THE SEWER PIPE JOINT. 12" SEPARATION BETWEEN THE TWO OUTSIDE PIPE WALLS SHALL BE REQUIRED BETWEEN SEWER LINES AND ALL OTHER PIPES.

   TRENCH DIMENSIONS FOR SEWER PIPE LESS THAN 15 INCHES IN DIAMETER, THE ALLOWABLE TRENCH WIDTH AT A PLANE 12 INCHES ABOVE THE PIPE SHALL BE NO MORE THAN 36 INCHES AND FOR PIPE 15 INCHES AND LARGER, THE ALLOWABLE WIDTH SHALL BE EQUAL TO THE PIPES OUTSIDE DIAMETER PLUS 24 INCHES.

   PIPE TRENCH BEDDING MATERIAL AND FILL MATERIIAL FOR EXCAVATION BELOW GRADE SHALL BE SCREENED GRAVEL OR CRUSHED STONE TO ASTM C33–03 STONE SIZE NO. 67. THE PIPE SAND BLANKET MATERIAL SHALL BE GRADED SAND FREE FROM ANY ORGANIC MATERIALS, GRADED SUCH THAT 100 PERCENT PASSED THE 1/2–INCH SIEVE AND A MAXIMUM OF 15 PERCENT PASSES A #200 SIEVE. IN LIEU OF A SAND BLANKET, A STONE ENVELOPE 6 INCHES THICK COMPLETELY AROUND THE PIPE USING 3/4–INCH STONE MAY BE USED.

   PIPE BEDDING MATERIAL SHALL EXTEND FROM A HORIZONTAL PLANE THROUGH THE PIPE AXIS TO 6–INCHES BELOW THE BOTTOM OF THE OUTSIDE SURFACE OF THE PIPE.

   PIPE SAND BLANKET MATERIAL SHALL COVER THE PIPE A MINIMUM OF 12 INCHES ABOVE THE CROWN OF THE OUTSIDE SURFACE.

   COMPACTION SHALL BE IN 12–INCH LAYERS FOR BEDDING AND BLANKET MATERIALS.

   BACKFILL MATERIAL SHALL BE IN 3–FOOT LAYERS TO THE GROUND SURFACE EXCEPT FOR ROAD CONSTRUCTION WHERE THE FINAL 3–FEET SHALL BE COMPACTED IN 12–INCH LAYERS TO THE ROAD BASE SURFACE.

   TRENCH BACKFILL MATERIAL IN ROADWAY LOCATIONS SHALL BE NATURAL MATERIALS EXCAVATED FROM THE TRENCH DURING CONSTRUCTION, EXCLUDING DEBRIS, PAVEMENT PIECES, ORGANIC MATTER, TOP SOIL, WET OR SOFT MUCK, PEAT, CLAY, EXCAVATED LEDGE, ROCKS OVER 6 INCHES IN THE LARGEST DIMENSION, OR ANY OTHER UNSUITABLE MATERIAL NOT APPROVED BY THE ENGINEER.

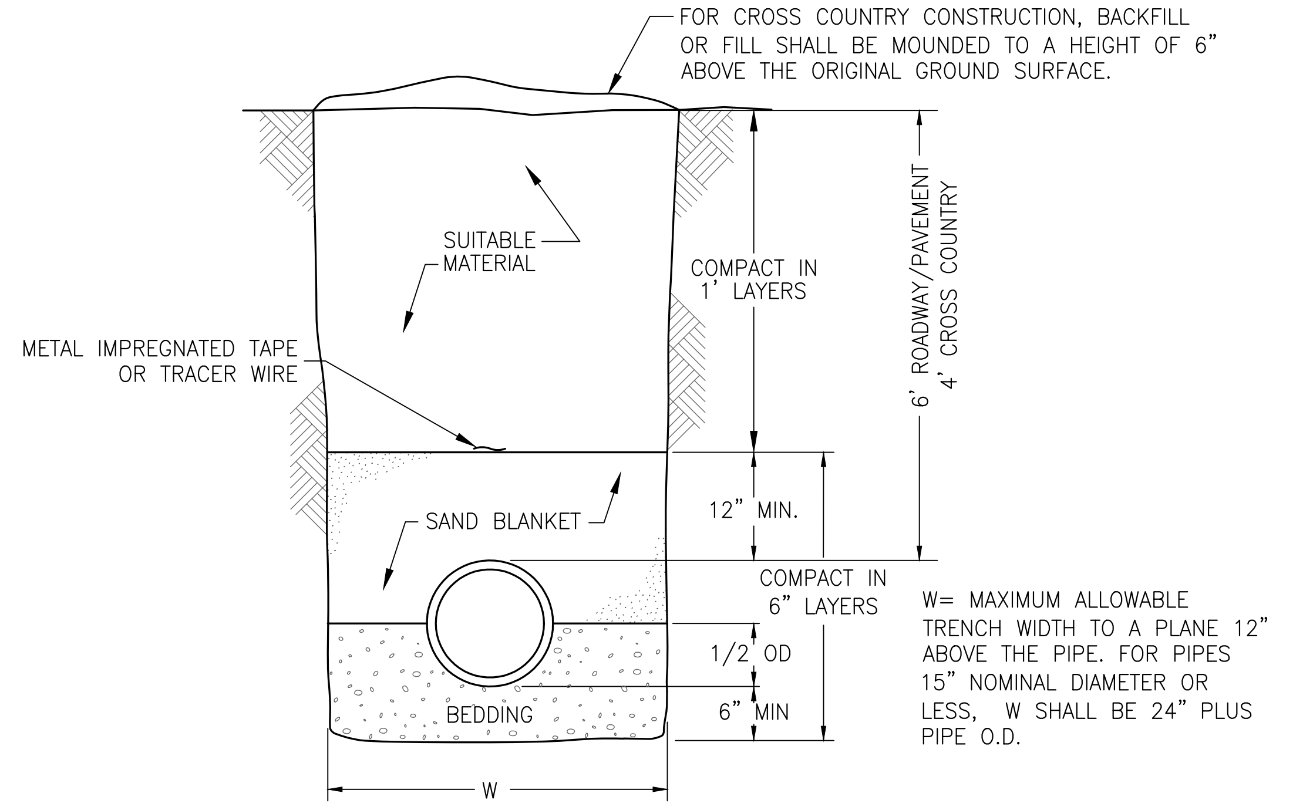
   TRENCH BACKFILL AT CROSS–COUNTRY LOCATIONS SHALL BE AS DESCRIBED ABOVE EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK OR PEAT, IF HE IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER FOR MAINTENANCE AND POSSIBLE RECONSTRUCTION, WHEN NECESSARY WILL BE PRESERVED. BACKFILL SHALL BE MOUNDED 6–INCHES ABOVE ORIGINAL GROUND.

   BASE COURSE MATERIALS FOR TRENCH REPAIRS SHALL MEET THE REQUIREMENTS OF DIVISION 300 OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION.

   WHERE SHEETING IS PLACED ALONG SIDE OF THE PIPE AND EXTENDS BELOW MID–DIAMETER, THE SHEETING SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION NOT LESS THAN ONE FOOT ABOVE THE TOP OF THE PIPE AND AT LEAST 3 FEET BELOW FINISH GRADE.

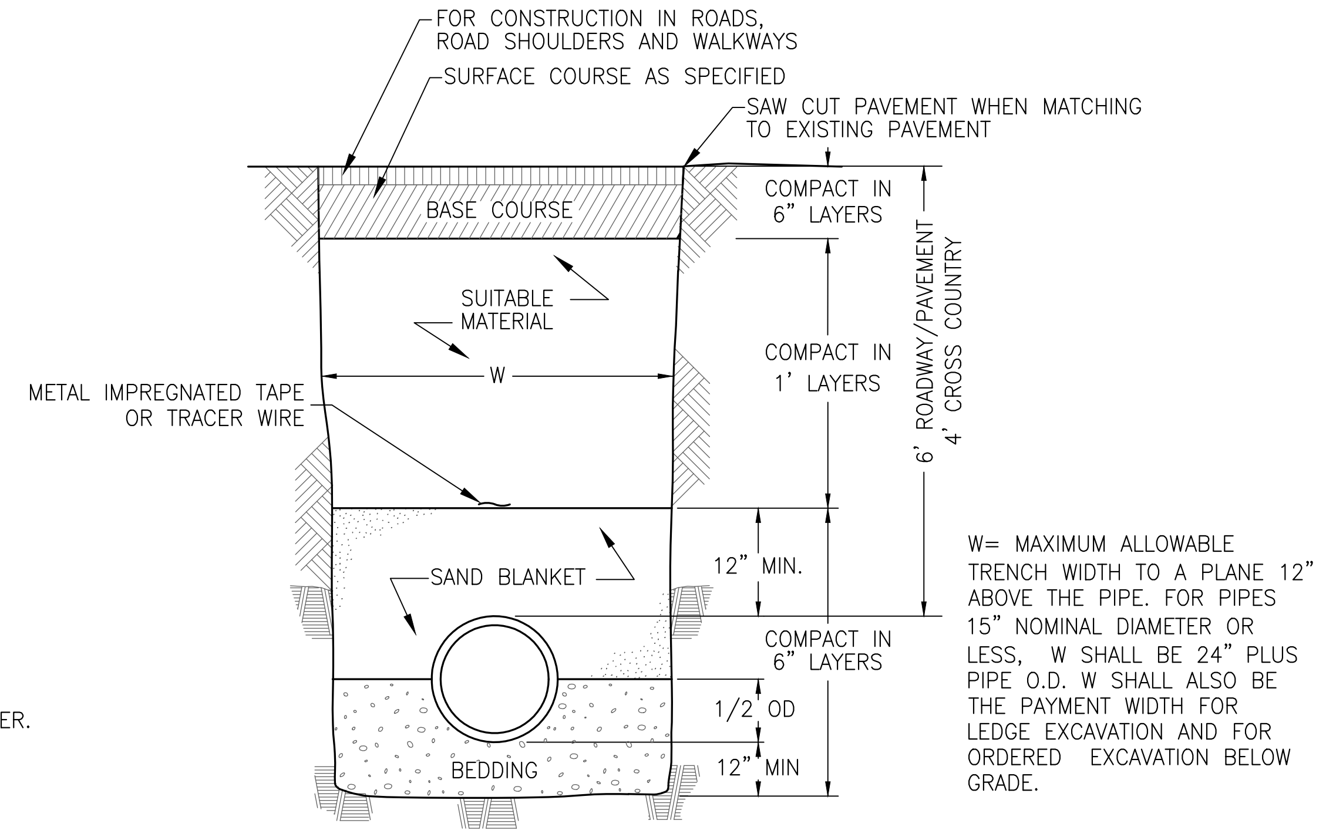
   TRENCHES FOR SEWER PIPES WITH SLOPES OVER 0.08 FEET PER FOOT AND TRENCHES FOR SEWER PIPES BELOW THE SEASONAL HIGH GROUND WATER LEVEL SHALL HAVE IMPERVIOUS TRENCH DAMS CONSTRUCTED EVERY 300 FEET TO PREVENT POTENTIAL DISTURBANCE TO PIPE BEDDING AND BLANKET MATERIALS.

JOHN J. McTIGUE
No. 14950



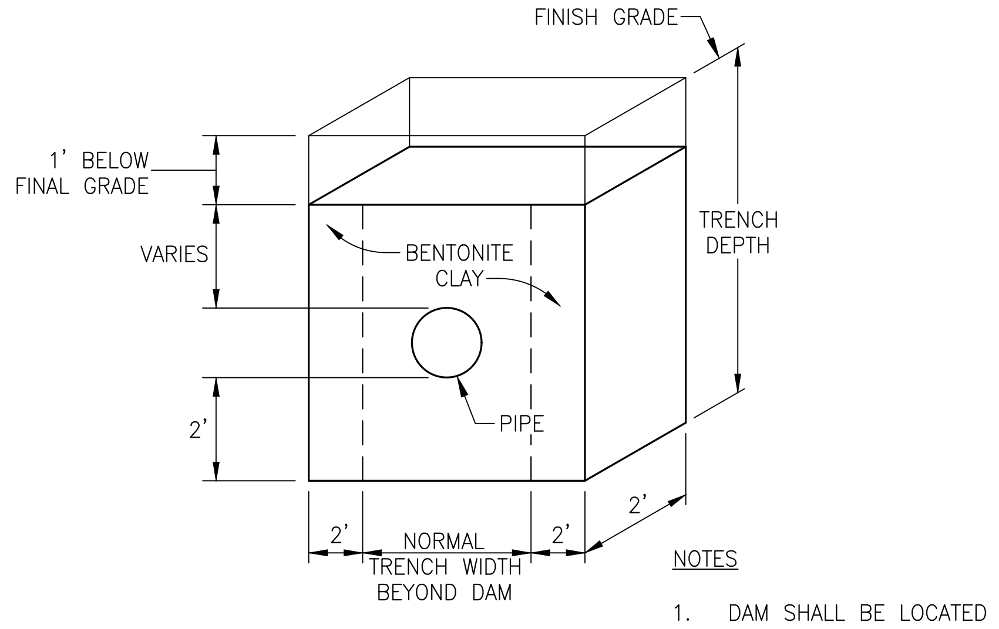
W= MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12" ABOVE THE PIPE. FOR PIPES 15" NOMINAL DIAMETER OR LESS, W SHALL BE 24" PLUS PIPE O.D.

EARTH CONSTRUCTION
NOT TO SCALE



W= MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12" ABOVE THE PIPE. FOR PIPES 15" NOMINAL DIAMETER OR LESS, W SHALL BE 24" PLUS PIPE O.D. W SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.

LEDGE CONSTRUCTION
NOT TO SCALE



INSTALL AT CENTER OF EACH GRAVITY PIPE RUN

NOTES

1. DAM SHALL BE LOCATED EVERY 300' OF SEWER PIPE RUN.
2. NO FITTING SHALL BE LOCATED WITHIN 4' OF DAM.

SEWER TRENCH DAM
NOT TO SCALE

REV	DATE	DESCRIPTION	DR	CK
1	6/16/2025	REVISED PER TAC WORKSHOP	DKS	JJM

SITE DEVELOPMENT PLANS
TAX MAP 259 LOT 10
DETAILS 6
PROPOSED HOUSING DEVELOPMENT
35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH
PREPARED FOR
PHA HOUSING DEVELOPMENT LTD.
1"=60' (11"X17")
SCALE: 1"=30' (22"X34")
JANUARY 29, 2025

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Jun 16, 2025 - 4:38pm
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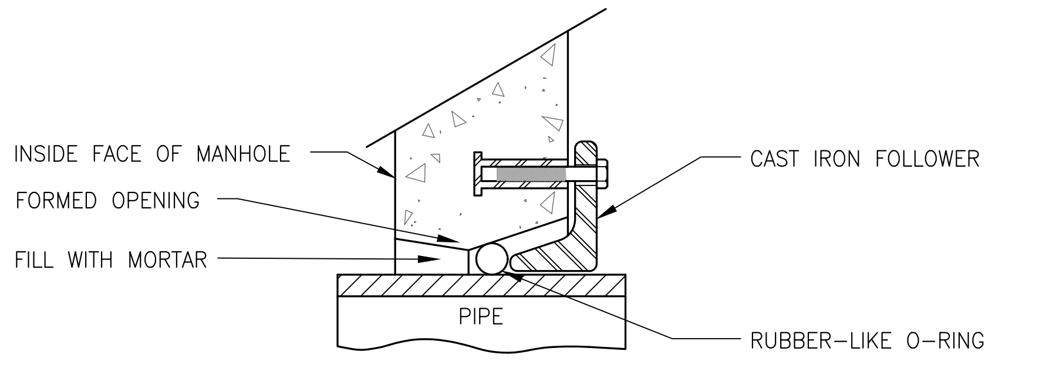
GENERAL NOTES

1. IT IS THE INTENTION THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAKPROOF QUALITIES CONSIDERED NECESSARY FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES SHALL BE AN ASSEMBLY OF PRECAST SECTIONS, WITH STEEL REINFORCEMENT, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH REINFORCEMENT. IN ANY APPROVED MANHOLE, THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS (H–20 LOADING) WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MANHOLE, CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE. A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.
2. BARRELS, CONE SECTIONS AND CONCRETE GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AND SHALL CONFORM ENV–WQ 704.12 & 704.13.
3. PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478–06.
4. BASE SECTIONS SHALL BE OF MONOLITHIC CONSTRUCTION TO A POINT AT LEAST 6 INCHES ABOVE THE CROWN OF THE INCOMING PIPE.
5. MANHOLE CONE SECTIONS SHALL BE ECCENTRIC IN SHAPE.
6. ALL PRECAST SECTIONS AND BASES SHALL HAVE THE DATE OF MANUFACTURE AND THE NAME OR TRADEMARK OF THE MANUFACTURER IMPRESSED OR INDELIBLY MARKED ON THE INSIDE WALL.
7. ALL PRECAST SECTIONS AND BASES SHALL BE COATED ON THE EXTERIOR WITH A BITUMINOUS DAMP–PROOFING COATING.
8. SHALLOW MANHOLE: IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H–20 LOADS.
9. HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF AN OVERLAPPING TYPE, SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC–LIKE SEALANT. APPROVED ELASTOMERIC SEALANTS ARE:
   - SIKAFLEX–12–SL
   - SONNEBORN BUILING PRODUCTS–SONOLASTIC SL–1
10. THE MINIMUM INTERNAL DIAMETER OF MANHOLES SHALL BE 48 INCHES. FOR SEWERS LARGER THAN 24–INCH DIAMETER. MANHOLE DIAMETERS SHALL BE INCREASED SO AS TO PROVIDE AT LEAST 12–INCHES OF SHELF ON EACH SIDE OF THE SEWER.
11. LEAKAGE TEST SHALL BE PERFORMED IN ACCORDANCE TO ENV–WQ 704.17.
    (a) ALL MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST IN ACCORDANCE WITH THE ASTM C1244 STARNDARD IN EFFECT WHEN THE TESTING IS PERFORMED.
    (b) THE MANHOLE VACUUM TEST SHALL CONFORM TO THE FOLLOWING:
        1. THE INITIAL VACUUM GUAGE TEST PRESSURE SHALL BE 10 INCHES Hg.
        2. THE MINIMUM ACCEPTABLE TEST HOLD TIME FOR 1–INCH Hg PRESSURE DROP TO 9 INCHES SHALL BE:
            A. NOT LESS THAN 2 MINUTES FOR MANHOLES LESS THAN 10 FEET DEEP.
            B. NOT LESS THAN 2.5 MINUTES FOR MANHOLES 10 TO 15 FEET DEEP.
            C. NOT LESS THAN 3 MINUTES FOR MANHOLES MORE THAN 15 FEET DEEP.
    (c) THE MANHOLE SHALL BE REPAIRED AND RETESTED IF THE TEST HOLD TIMES FAIL TO ACHIEVE THE ACCEPTANCE LIMITS SPECIFIED IN (b) ABOVE.
    (d) INVERTS AND SHELVES SHALL NOT BE INSTALLED UNTIL AFTER SUCCESSFUL TESTING IS COMPLETE.
    (e) FOLLOWING COMPLETION OF THE LEAKAGE TEST, THE FRAME AND COVER SHALL BE PLACED ON TOP OF THE MANHOLE OR SOME OTHER MEANS USED TO PREVENT ACCIDENTAL ENTRY BY UNAUTHORIZED PERSONS, CHILDREN OR ANIMALS, UNTIL THE CONTRACTOR IS READY TO MAKE FINAL ADJUSTMENT TO GRADE.
12. BRICK MASONRY FOR SHELF, INVERT AND GRADE ADJUSTMENT SHALL COMPLY WITH ASTM C32–05, CLAY OR SHALE, FOR GRADE SS HARD BRICK.
13. MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION. PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE:
    (a) 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
    (b) 4.5 PARTS SAND, 1 PART CEMENT AND 0.5 PART HYDRATED LIME

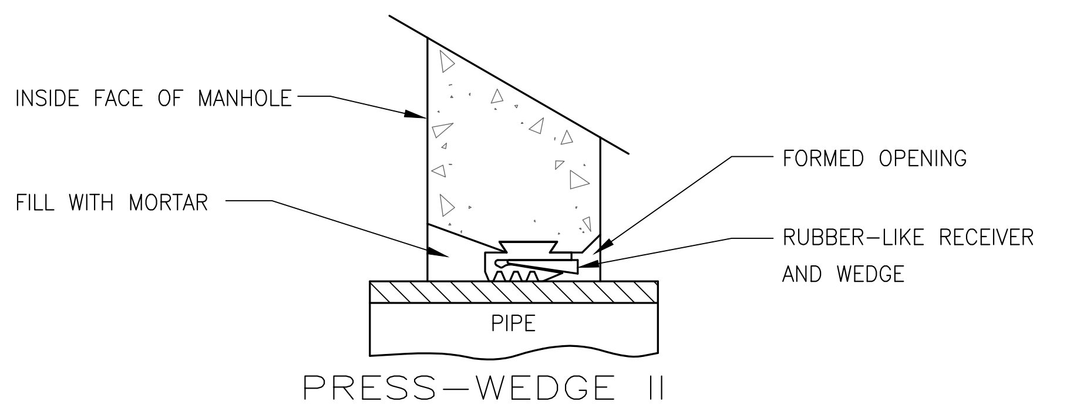
    CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150–05. HYDRATED LIME SHALL BE TYPE S CONFORMING TO ASTM C207–06 "STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES". SAND SHALL CONSIST OF INERT NATURAL SAND CONFORMING TO ASTM C33–03 "STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES".
14. INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED OR PRECAST CONCRETE SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF THE PIPE AND FLOW. AT CHANGES IN DIRECTIONS, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY.
15. FRAMES AND COVERS: FRAMES AND COVERS: SEWER MANHOLE FRAMES AND COVERS SHALL BE CITY OF PORTSMOUTH STANDARD, AND SHALL BE PURCHASED AND PICKED UP AT PORTSMOUTH DEPARTMENT OF PUBLIC WORKS WATER DEPARTMENT. THEY SHALL BE OF HEAVY DUTY DESIGN, CLASS 30, CONFORMING TO ASTM A48/48M AND PROVIDE A 30–INCH CLEAR OPENING. THE CASTING SHALL BE OF EVEN GRAINED CAST IRON, SMOOTH, AND FREE FROM SCALE, LUMPS, BLISTERS, SAND HOLES AND DEFECTS. CONTACT SURFACES OF COVERS AND FRAMES SHALL BE MACHINED AT THE FOUNDRY TO PREVENT ROCKING OF COVERS IN ANY ORIENTATION.
16. BEDDING: PRECAST BASES SHALL BE PLACED ON A 6–INCH LAYER OF COMPACTED BEDDING MATERIAL THAT CONFORMS TO ASTM C33–03 NO. 67 STONE AND FREE FROM CLAY, LOAM AND ORGANNIC MATTER. THE EXCAVATION SHALL BE PROPERLY DEWATERED WHILE PLACING BEDDING MATERIAL AND SETTING OF THE BASE OR POURING CONCRETE. WATER–STOPS SHALL BE USED AT THE HORIZONTAL JOINT OF THE CAST–IN–PLACE MANHOLES.

100% PASSING	1" SCREEN
90–100% PASSING	3/4" SCREEN
20–55% PASSING	3/8" SCREEN
0–10% PASSING	#4 SIEVE
0–5% PASSING	#8 SIEVE

17. FLEXIBLE JOINT: A FLEXIBLE JOINT SHALL BE PROVIDED WIbHIN THE FOLLOWING DISTANCES FROM ANY MANHOLE CONNECTION: (a) WITHIN 48 INCHES FOR REINFORCED CONCRETE PIPE (RCP). (b) WITHIN 60 INCHES FOR PVC PIPE LARGER THAN 15" DIAMETER.
18. NO FLEXIBLE JOINT SHALL BE REQUIRED FOR DUCTILE IRON PIPE OR PVC PIPE UP THROUGH 15–INCH DIAMETER.
19. INTERNAL STEPS ARE PROHIBITED PER CITY OF PORTSMOUTH DPW STANDARDS.
20. REFERENCE NHDES ENV–WQ 700 IN PLACE OF ASTM STANDARDS.
21. PIPE TO MANHOLE JOINTS SHALL BE ONLY AS FOLLOWS:
    A. ELASTOMERIC, RUBBER SLEEVE WITH WATERTIGHT JOINTS AT THE MANHOLE OPENING AND PIPE SURFACES.
    B. CAST INTO WALL OR SECUREED WITH STAINLESS STEEL CLAMPS.
    C. ELASTOMERIC SEALING RING CAST IN THE MANHOLE OPENING WITH THE SEAL FORMED ON THE SURFACE OF THE PIPE BY COMPRESSION OF THE RING.
    D. NON–SHRINK GROUTED JOINTS WHERE WATERTIGHT BONDING TO THE MANHOLE AND PIPE CAN BE OBTAINED.
22. THE INVERT OF THE INCOMING PIPE SHALL BE NO MORE THAN 6 INCHES ABOVE THE OUTGOING PIPE UNLESS A DROP ENTRY IS USED.



RES–SEAL
(OR ACCEPTABLE SUBSTITUTE)



PRESS–WEDGE II
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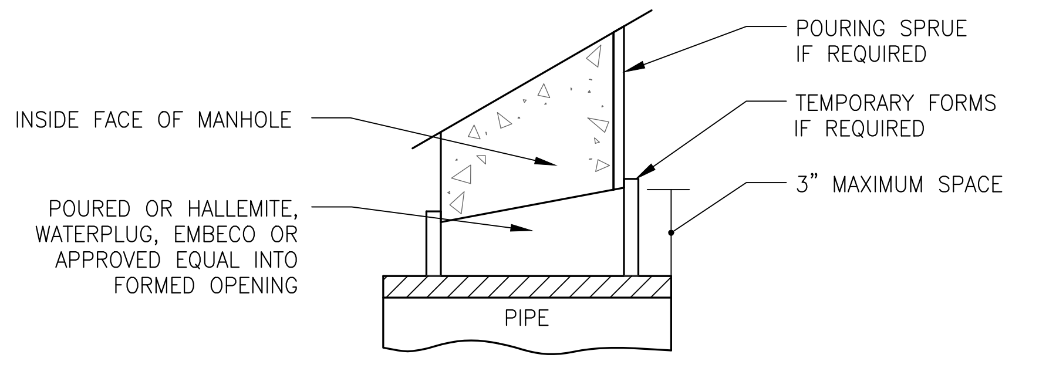
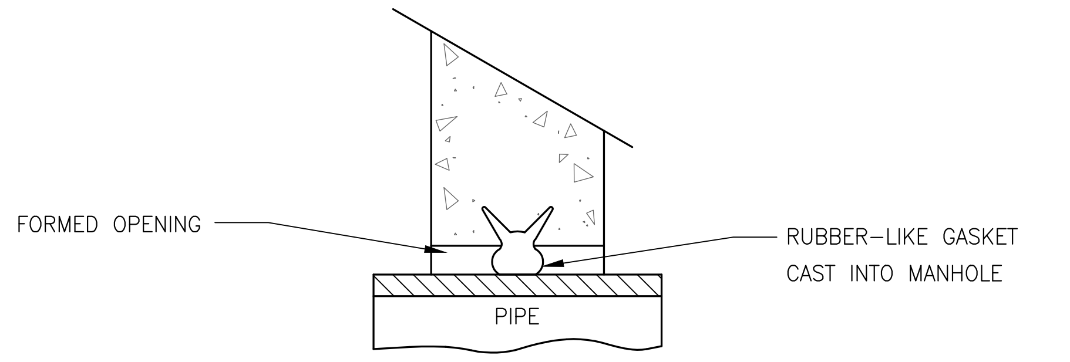


MORTARED JOINT
(OR ACCEPTABLE SUBSTITUTE)



A–LOK
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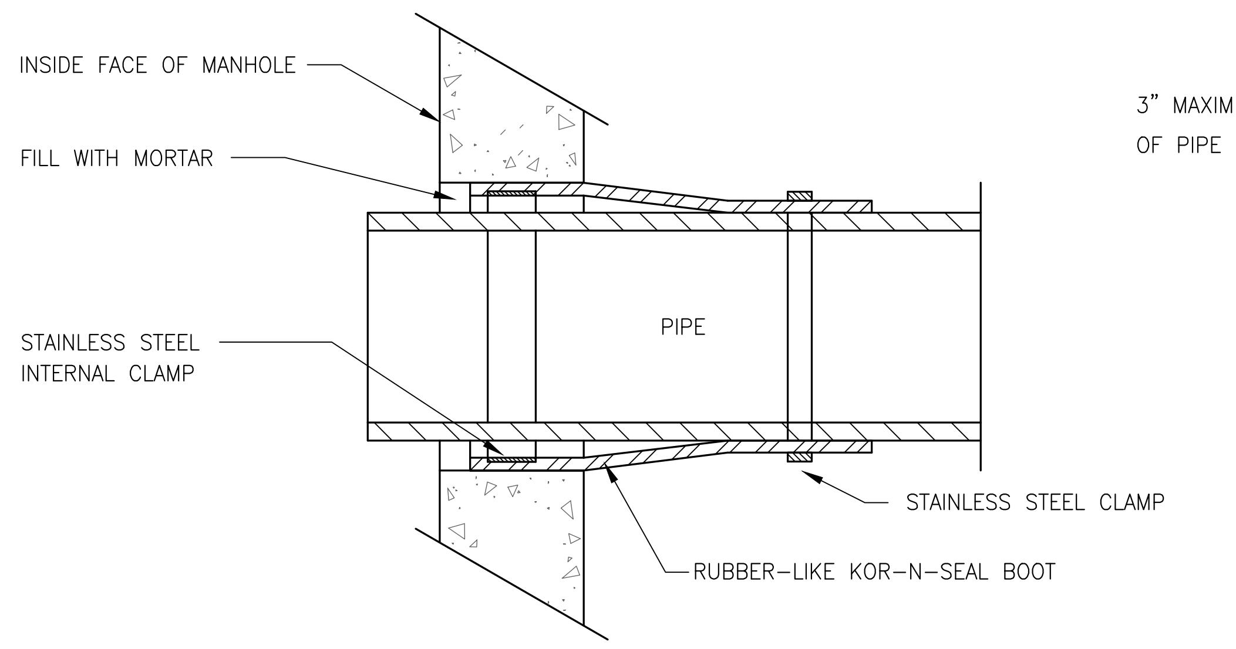

KOR–N–SEAL JOINT SLEEVE
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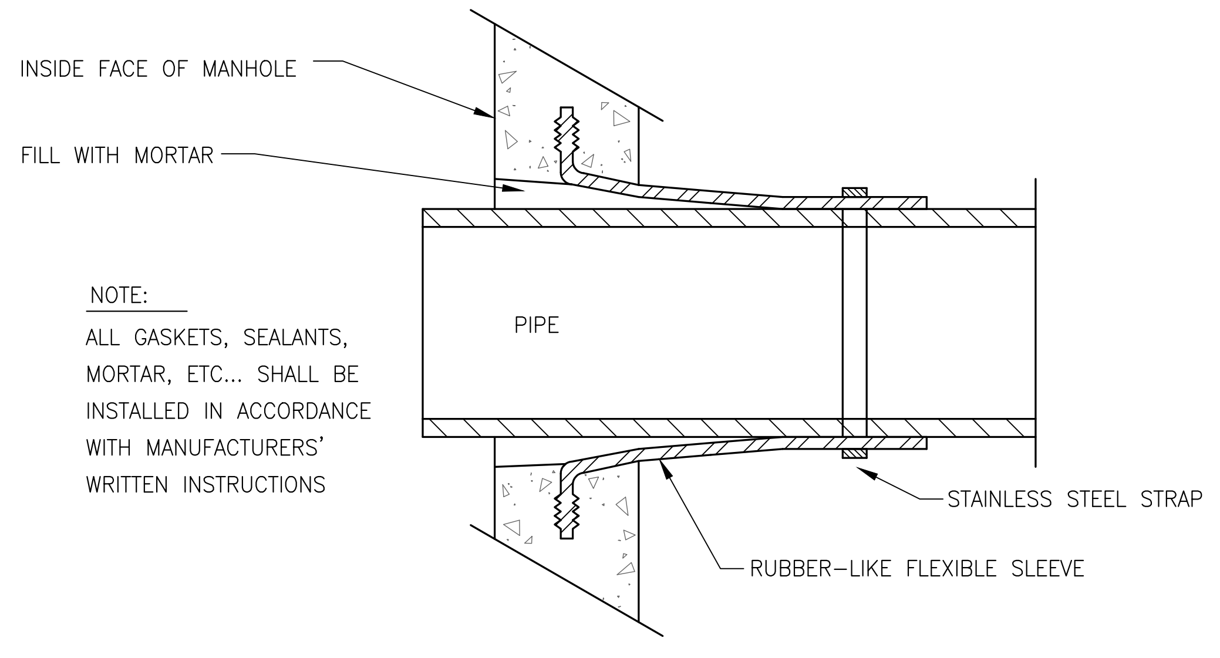
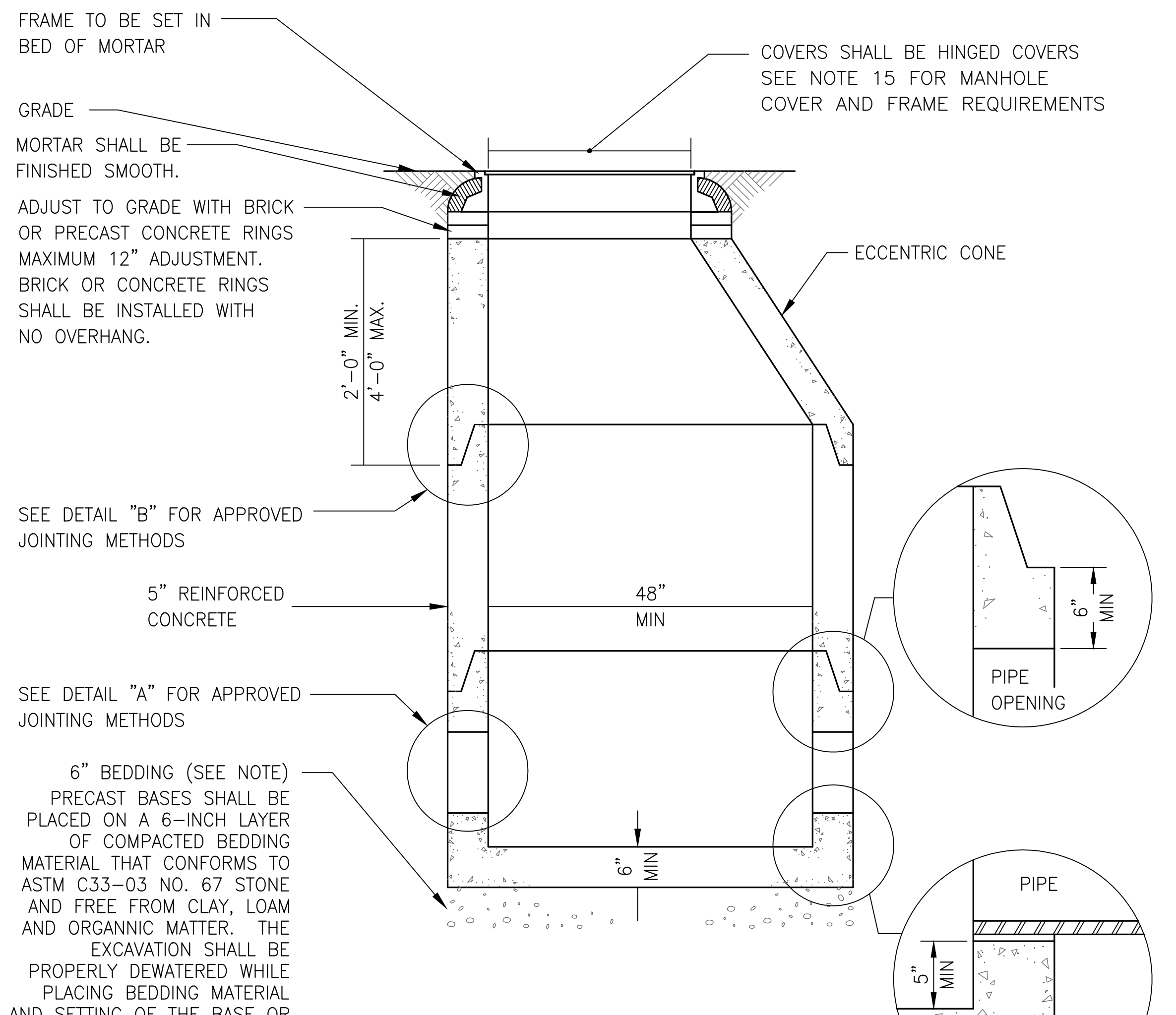


NOTE:
ALL GASKETS, SEALANTS, MORTAR, ETC... SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS

LOCK–JOINT FLEXIBLE MANHOLE SLEEVE
(OR ACCEPTABLE SUBSTITUTE)

DETAIL "A" – PIPE TO MANHOLE JOINTS

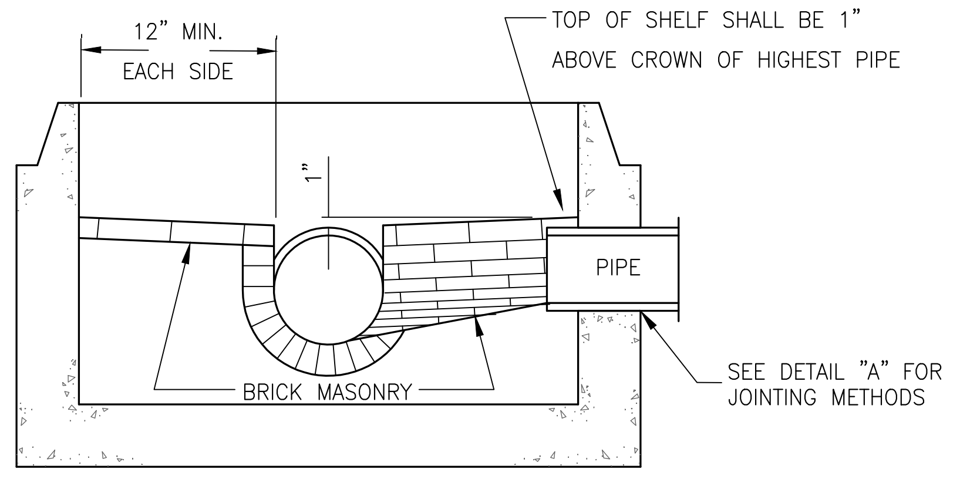


6" BEDDING (SEE NOTE)
PRECAST BASES SHALL BE PLACED ON A 6–INCH LAYER OF COMPACTED BEDDING MATERIAL THAT CONFORMS TO ASTM C33–03 NO. 67 STONE AND FREE FROM CLAY, LOAM AND ORGANNIC MATTER. THE EXCAVATION SHALL BE PROPERLY DEWATERED WHILE PLACING BEDDING MATERIAL AND SETTING OF THE BASE OR POURING CONCRETE.

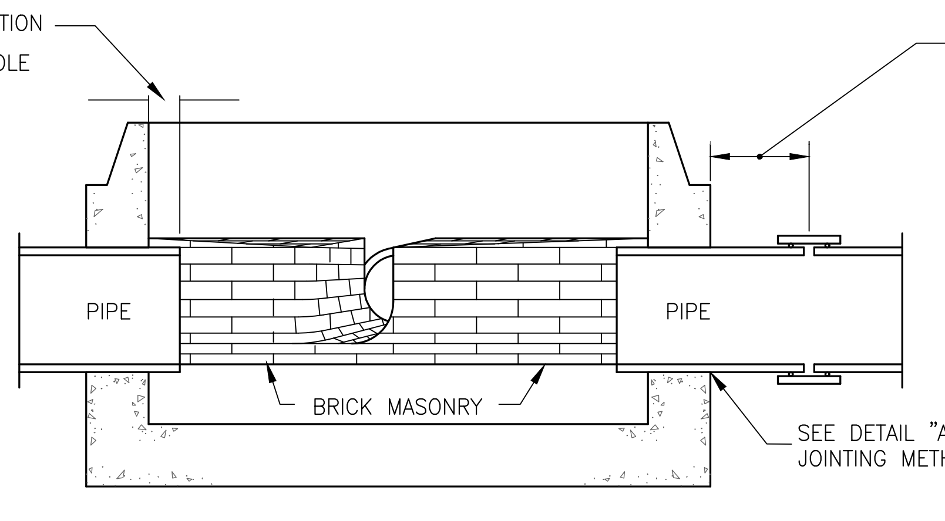
TYPICAL SECTION

NOTES:

1. INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST.
2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT BRICKS SHALL BE LAID ON EDGE.
3. BASE SECTION TO BE FULL WALL THICKNESS AND MONOLITHIC TO A POINT 6" ABOVE THE PIPE CROWN.
4. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY.
5. NO STEPS ARE ALLOWED PER EXETER DPW STANDARDS.
6. BITUMINOUS COATING.



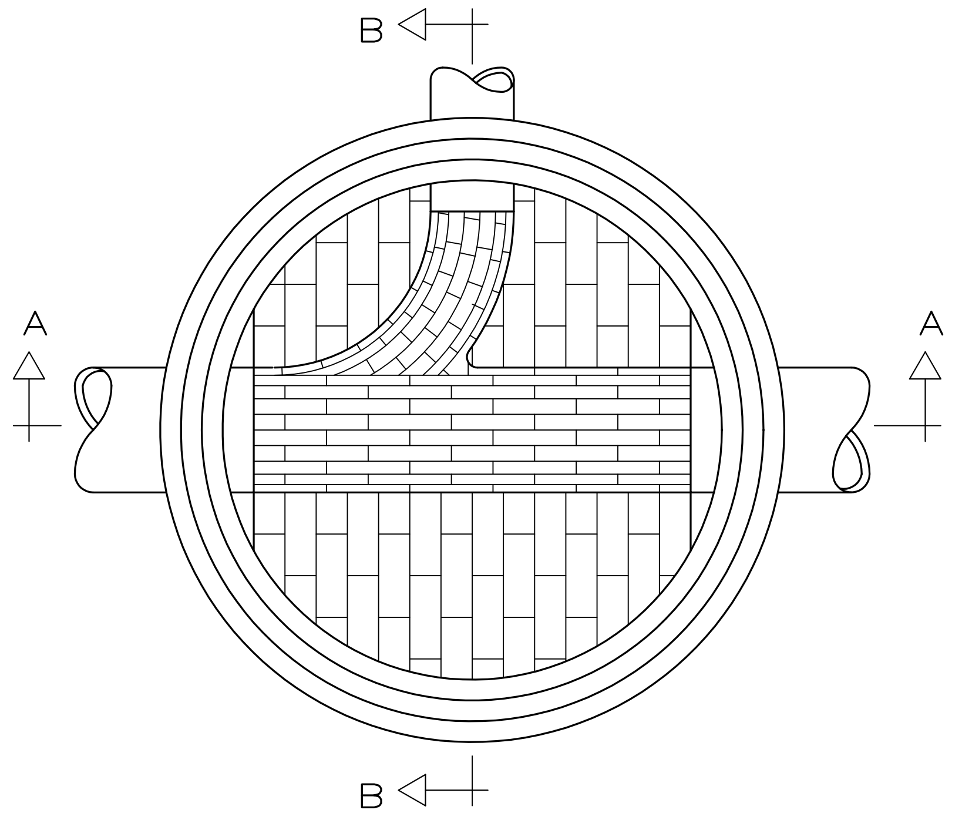
SECTION "B–B"



FLEXIBLE JOINT: A FLEXIBLE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES FROM ANY MANHOLE CONNECTION: (a) WITHIN 48 INCHES FOR REINFORCED CONCRETE PIPE (RCP). (b) WITHIN 60 INCHES FOR PVC PIPE LARGER THAN 15" DIAMETER.

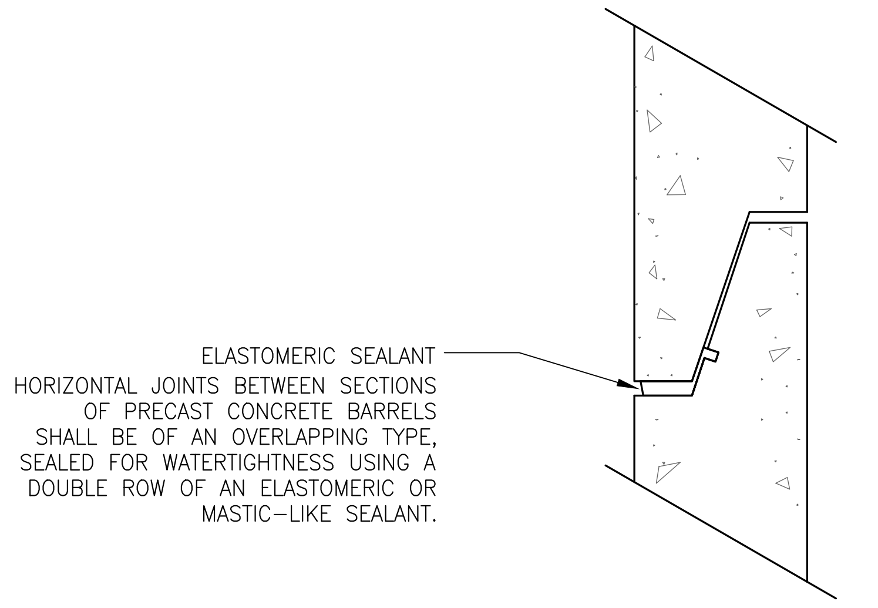
NO FLEXIBLE JOINT SHALL BE REQUIRED FOR DUCTILE IRON PIPE OR PVC PIPE UP THROUGH 15–INCH DIAMETER.

SECTION "A–A"



TYPICAL MANHOLE – PLAN VIEW

STANDARD MANHOLE

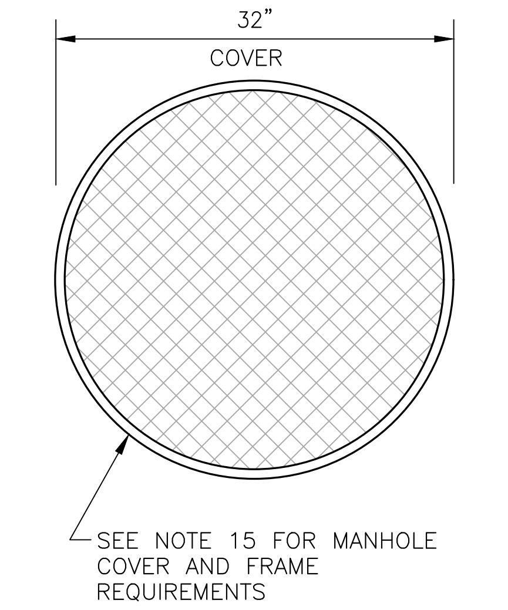


ELASTOMERIC SEALANT

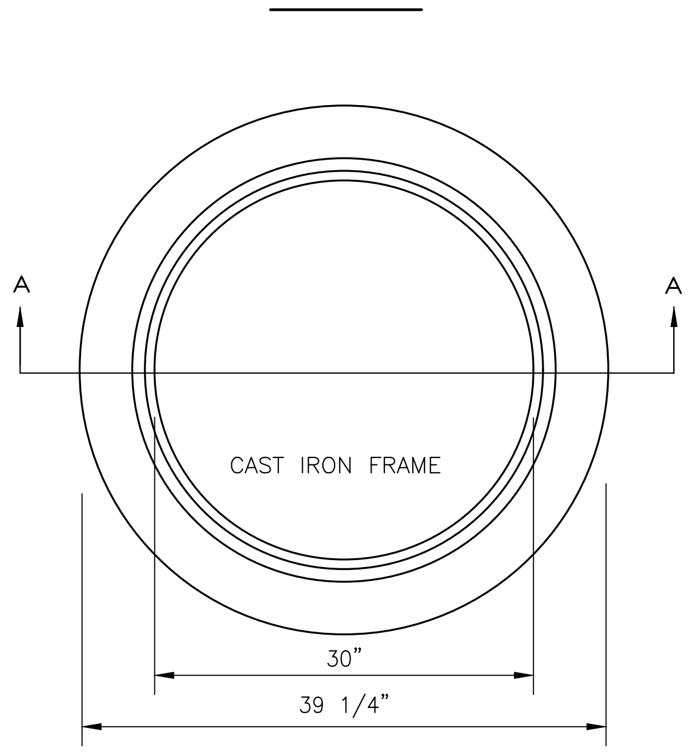
NOTES:
ALL GASKETS AND SEALANTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.

STATE OF NEW HAMPSHIRE APPROVED PRODUCTS
A) SIKAFLEX–12–SL
B) SONNEBORN BUILDING PRODUCTS SONOLASTIC SL–1

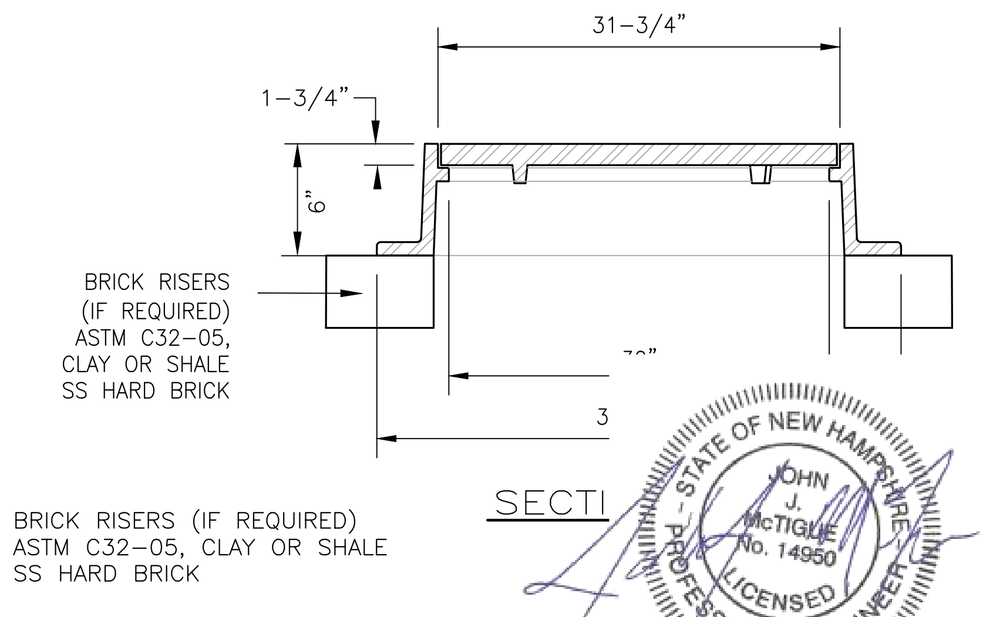
DETAIL "B" – HORIZONTAL JOINTS



COVER



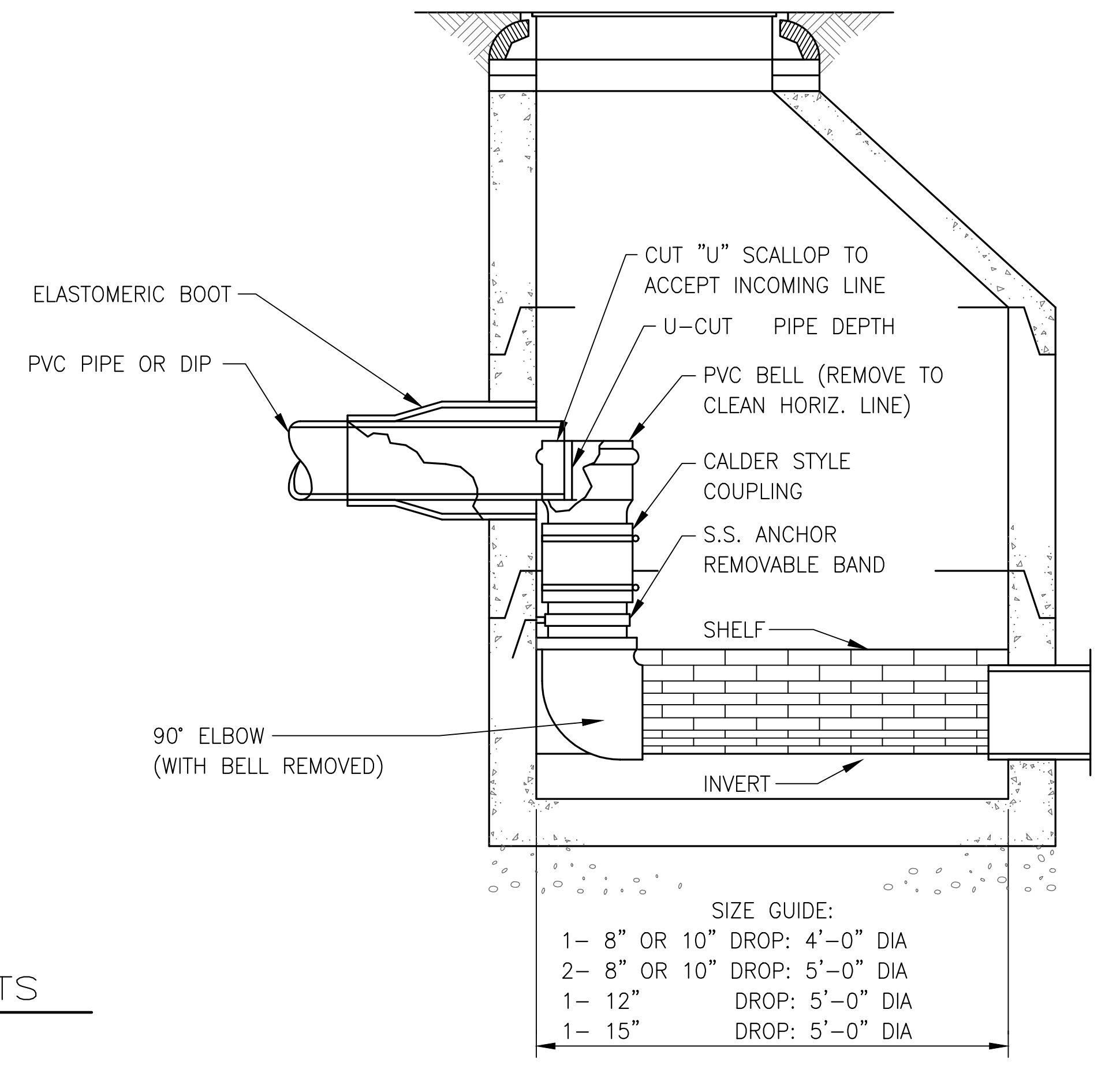
PLAN VIEW



SECTI

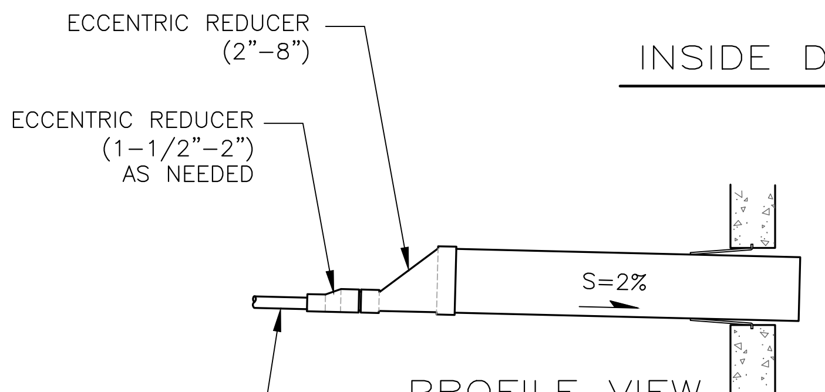
BRICK RISERS (IF REQUIRED)
ASTM C32–05, CLAY OR SHALE
SS HARD BRICK

MANHOLE FR

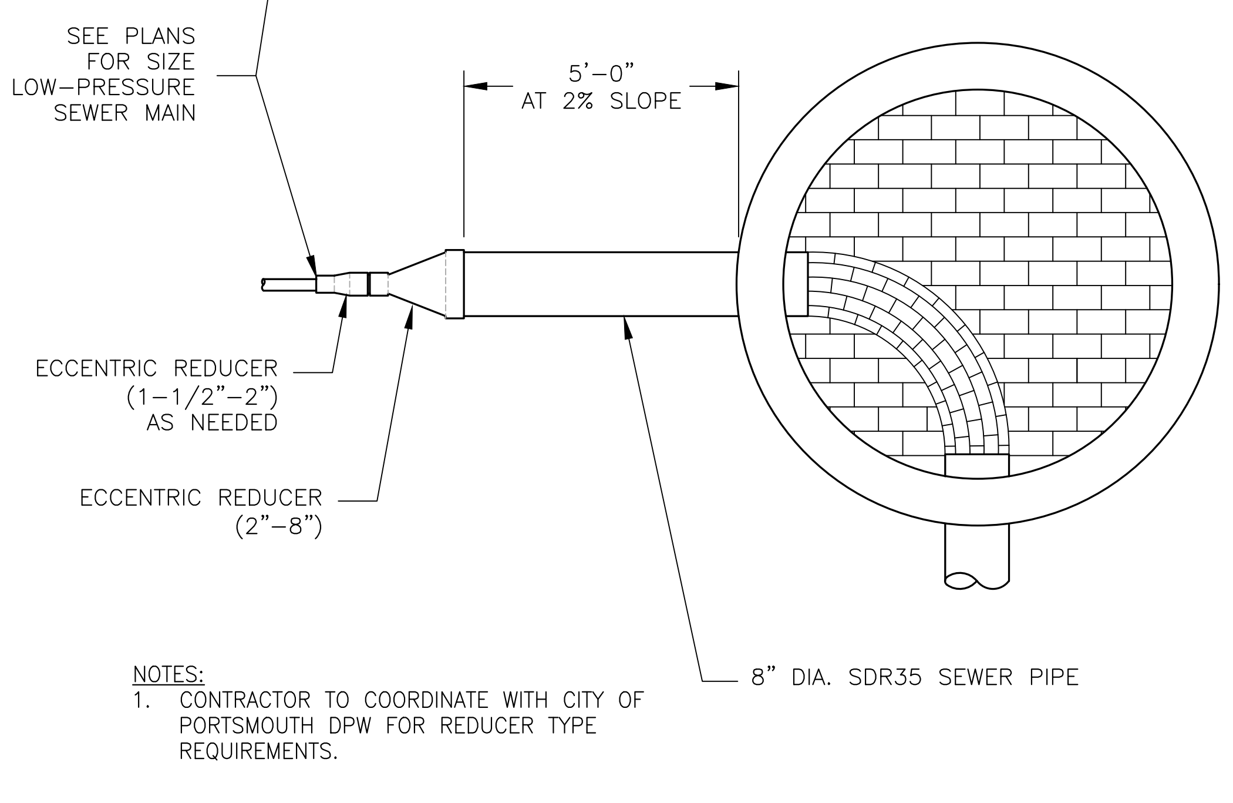


SIZE GUIDE:
1– 8" OR 10" DROP: 4'–0" DIA
2– 8" OR 10" DROP: 5'–0" DIA
1– 12" DROP: 5'–0" DIA
1– 15" DROP: 5'–0" DIA

INSIDE DROP MANHOLE



PROFILE VIEW



NOTES:
1. CONTRACTOR TO COORDINATE WITH CITY OF PORTSMOUTH DPW FOR REDUCER TYPE REQUIREMENTS.

PLAN VIEW

PRESSURE TO GRAVITY SEWER DETAIL

SCALE: N.T.S

STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14950
LICENSED PROFESSIONAL ENGINEER

1	6/16/2025	REVISED PER TAC WORKSHOP	DKS	JJM
REV	*DATE*	*DESCRIPTION*	*DR*	*CK*

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

DETAILS 7

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH
PREPARED FOR
PHA HOUSING DEVELOPMENT LTD.
1"=60' (11"X17")
SCALE: 1"=30' (22"X34")
JANUARY 29, 2025

TFM®
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472–4488
Fax (603) 472–9747
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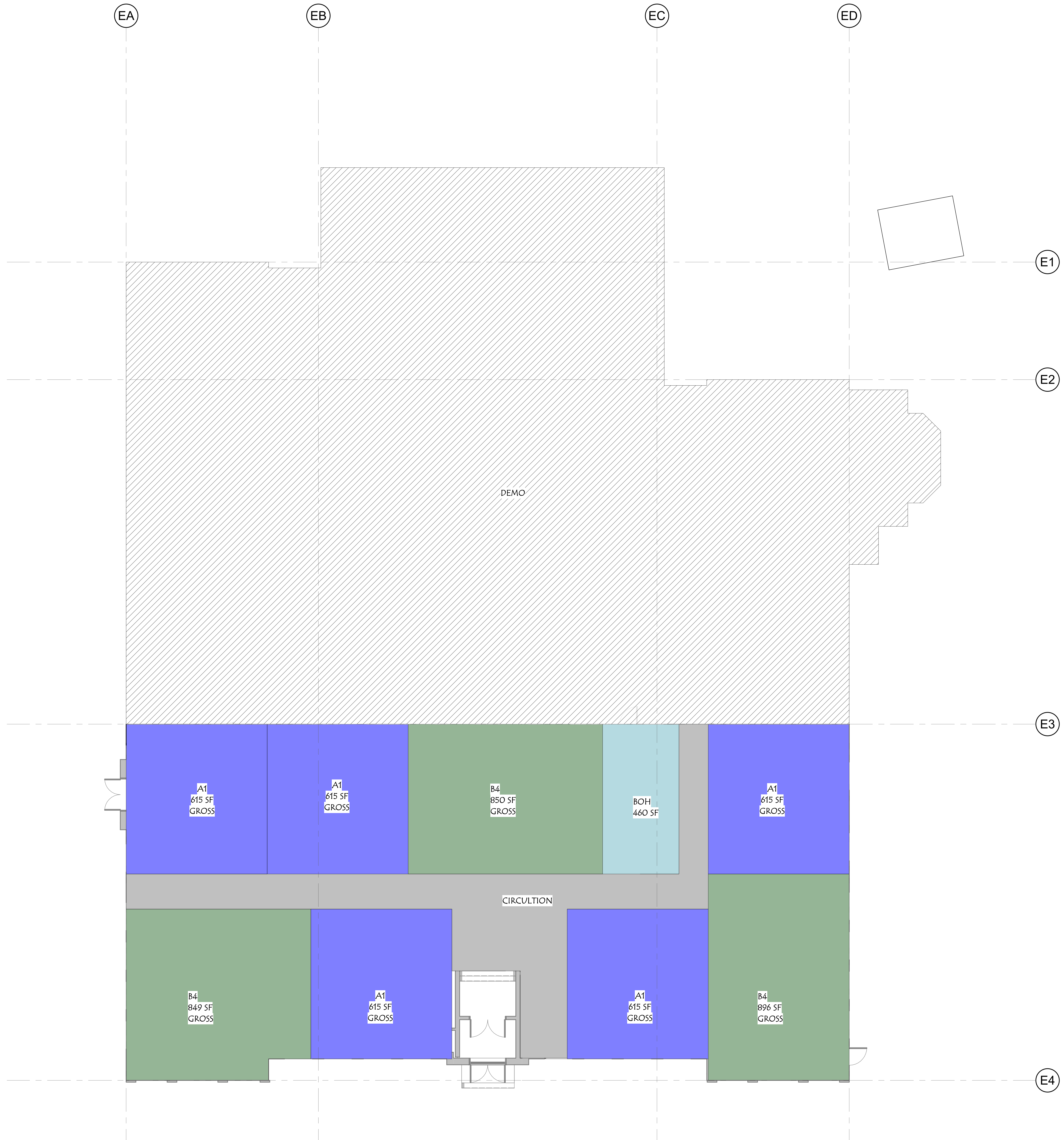
FILE	47528.00	DR	JKC	FB	
		CK	JJM	CADFILE	47528–00_DETAILS

C–34



① OPTION 1 - 8 UNITS PARTIAL DEMO

SCALE: 1/8" = 1'-0"

MARKET SQUARE ARCHITECTS
104 Congress St., STE 203
Portsmouth, NH 03801
PH: 603.501.0202

PHA SHERBURNE SCHOOL - EXISTING

35 Sherburne Road, Portsmouth, NH

NOT FOR CONSTRUCTION

REVISIONS

#	Description	Date

Scale: 1/8" = 1'-0"
Drawn By: MK
Checked By: Checker
Project No.: 2023002
EXISTING CONDITION
Date: 05/06/2025

Title:
PROPOSED

A0.1

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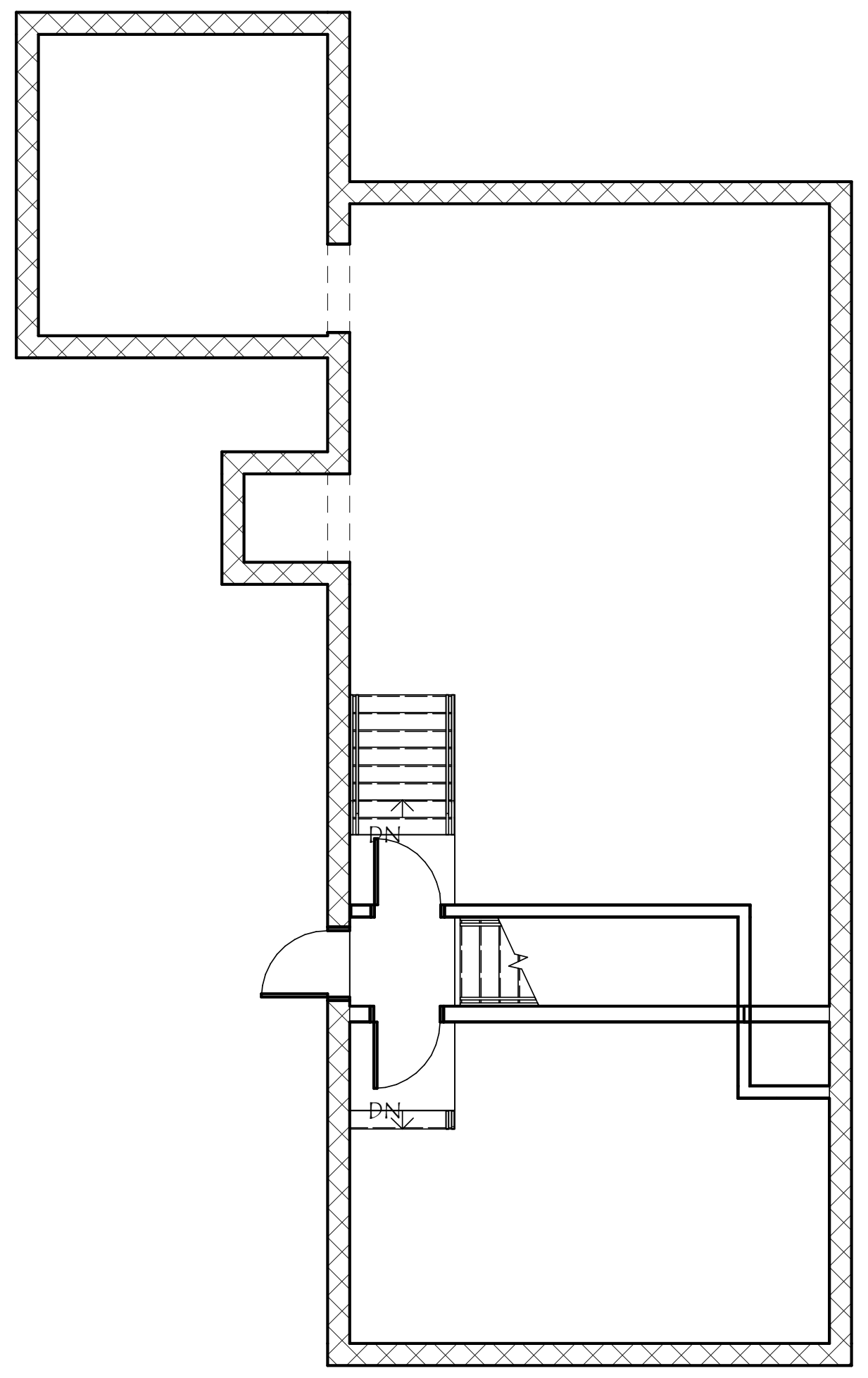
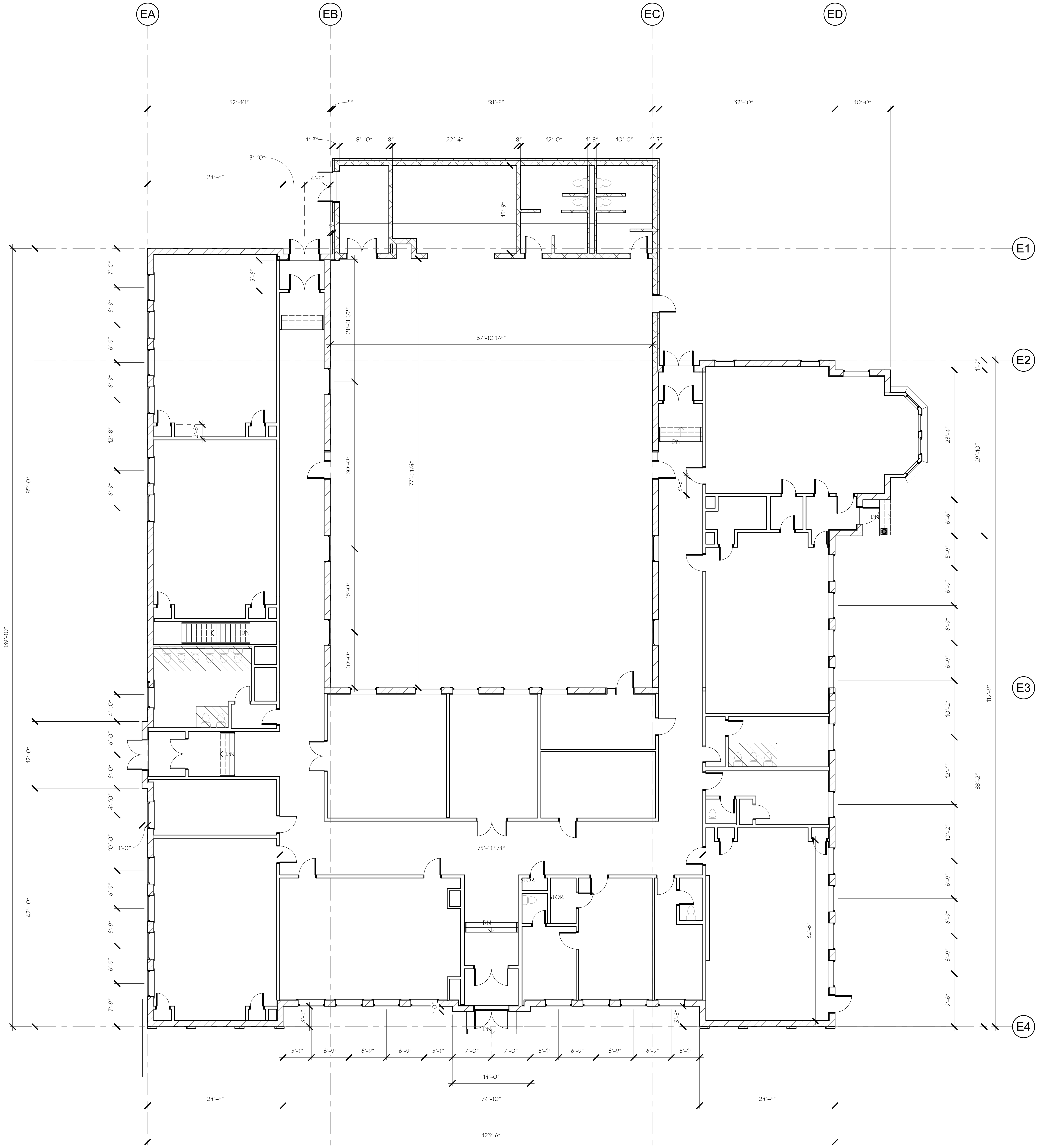


2 SCHOOL BASEMENT
SCALE: 1/8" = 1'-0"



1 SCHOOL LEVEL 1
SCALE: 1/8" = 1'-0"

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PH: 603.501.0202

PHA SHERBURNE SCHOOL – EXISTING
35 Sherburne Road, Portsmouth, NH

NOT FOR CONSTRUCTION

REVISIONS

#	Description	Date

Scale: 1/8" = 1'-0"
Drawn By: Author
Checked By: Checker
Project No.: 2023002
EXISTING CONDITION
Date: 05/06/2025

Title:
EXISTING CONDITIONS

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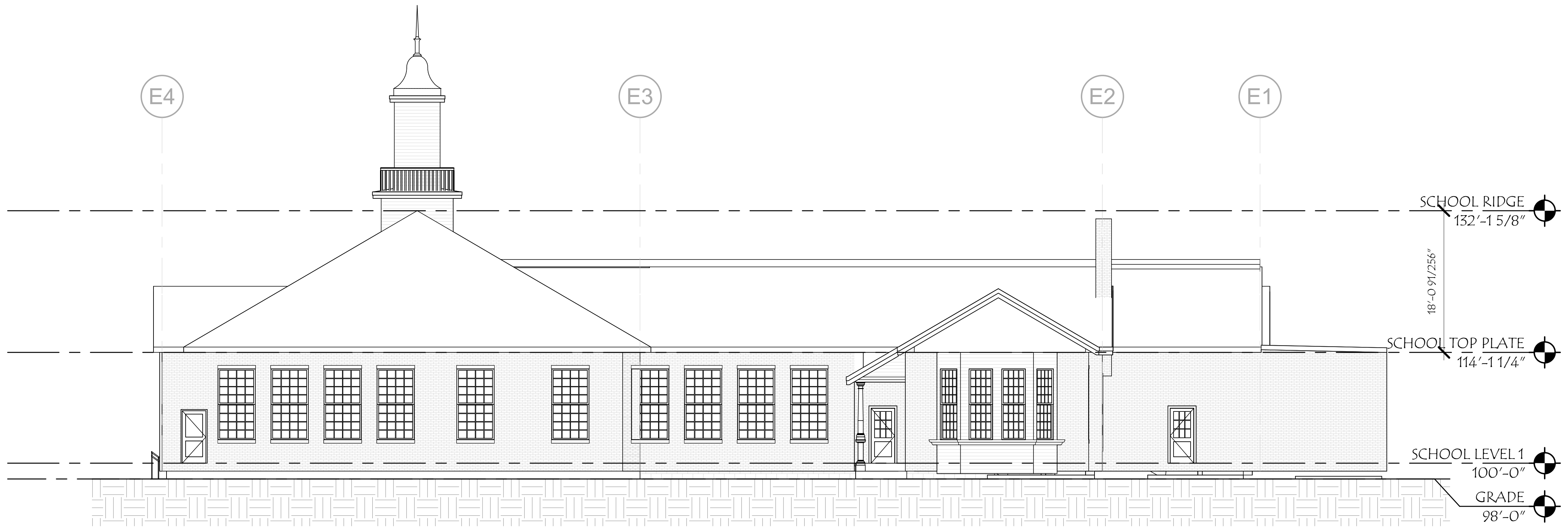
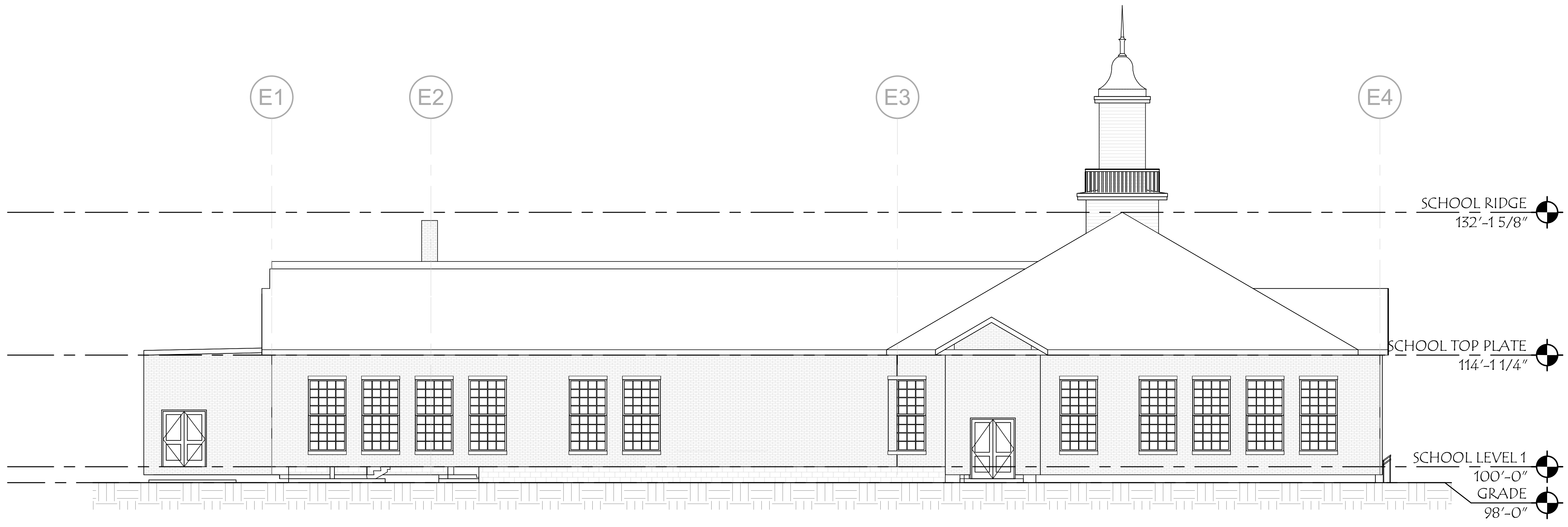


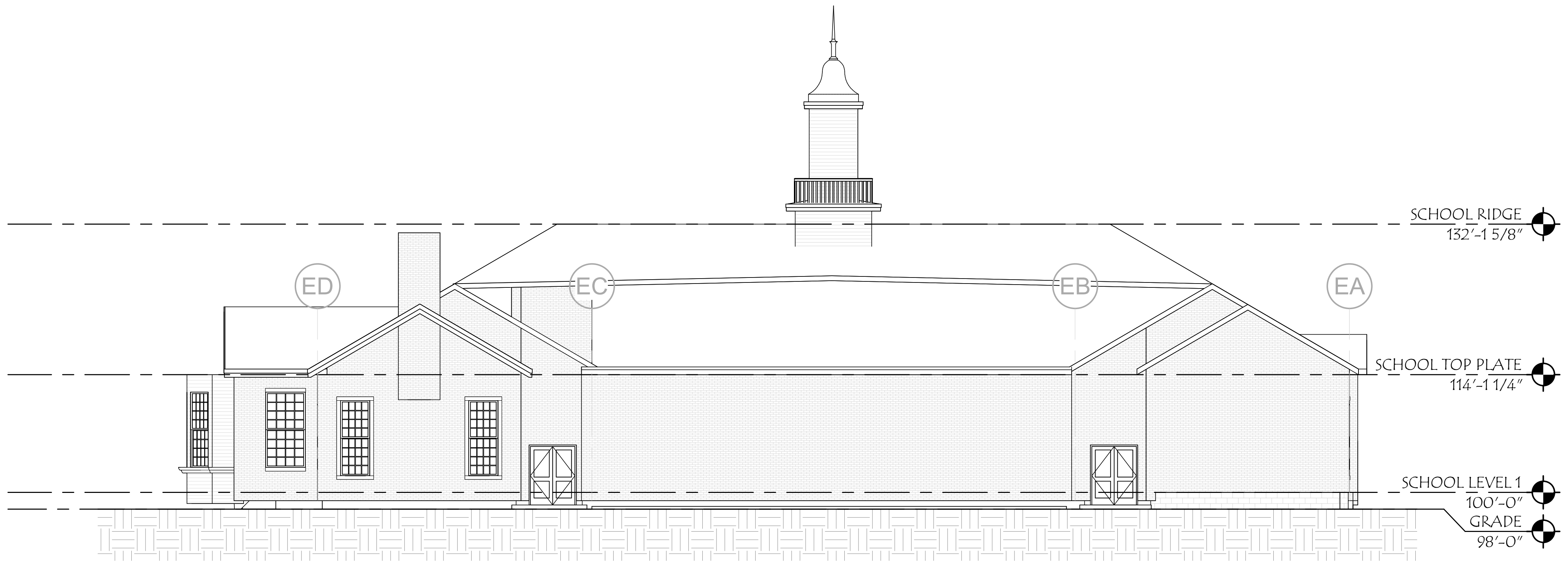
4 EXISTING ELEVATION - SOUTH

SCALE: 3/32" = 1'-0"



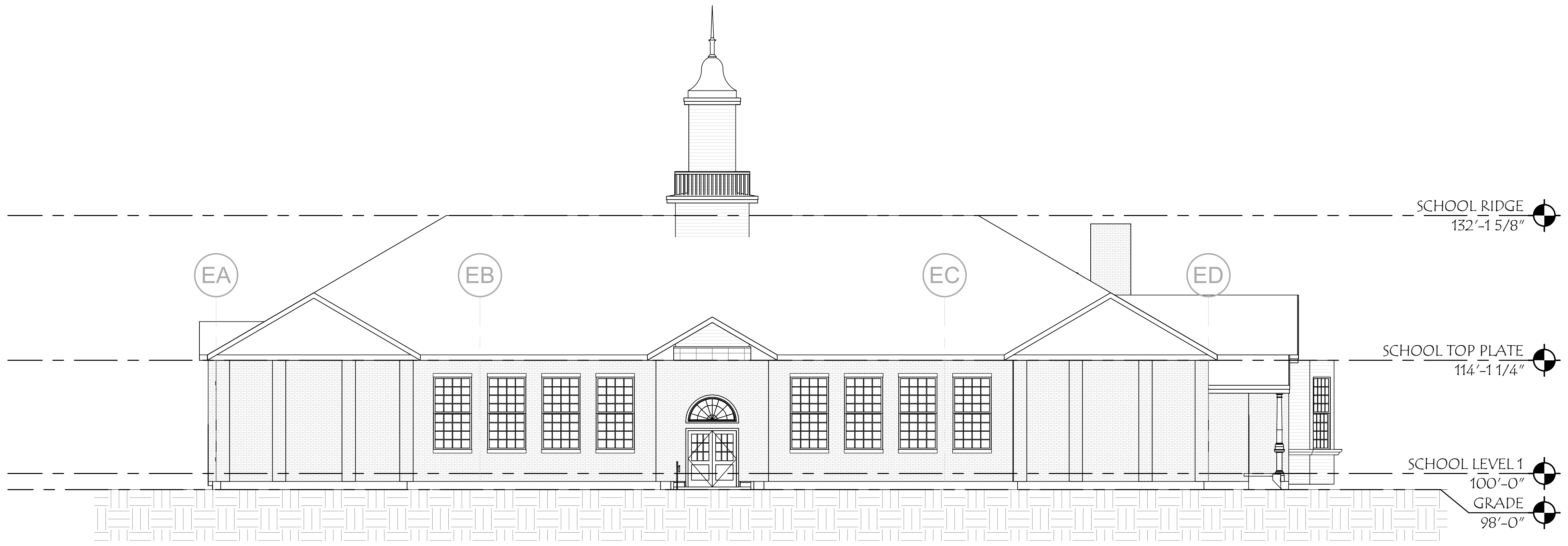
2 EXISTING ELEVATION - NORTH

SCALE: 3/32" = 1'-0"



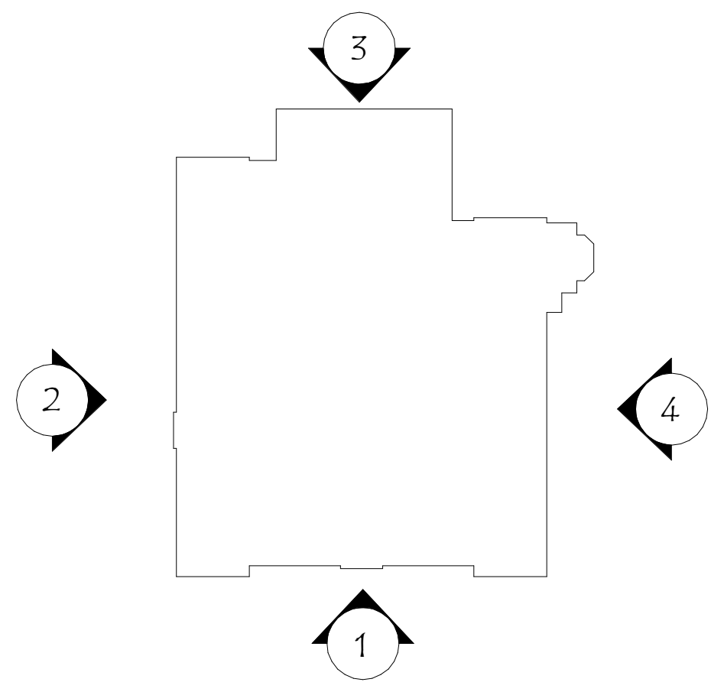
3 EXISTING ELEVATION - EAST

SCALE: 3/32" = 1'-0"



1 EXISTING ELEVATION - ENTRY

SCALE: 3/32" = 1'-0"



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PHA SHERBURNE SCHOOL – EXISTING

35 Sherburne Road, Portsmouth, NH

NOT FOR CONSTRUCTION

REVISIONS

#	Description	Date

Scale: As indicated
Drawn By: MK
Checked By: Checker
Project No.: 2023002
EXISTING CONDITION
Date: 05/06/2025

Title:
EXISTING CONDITIONS – ELEVATIONS

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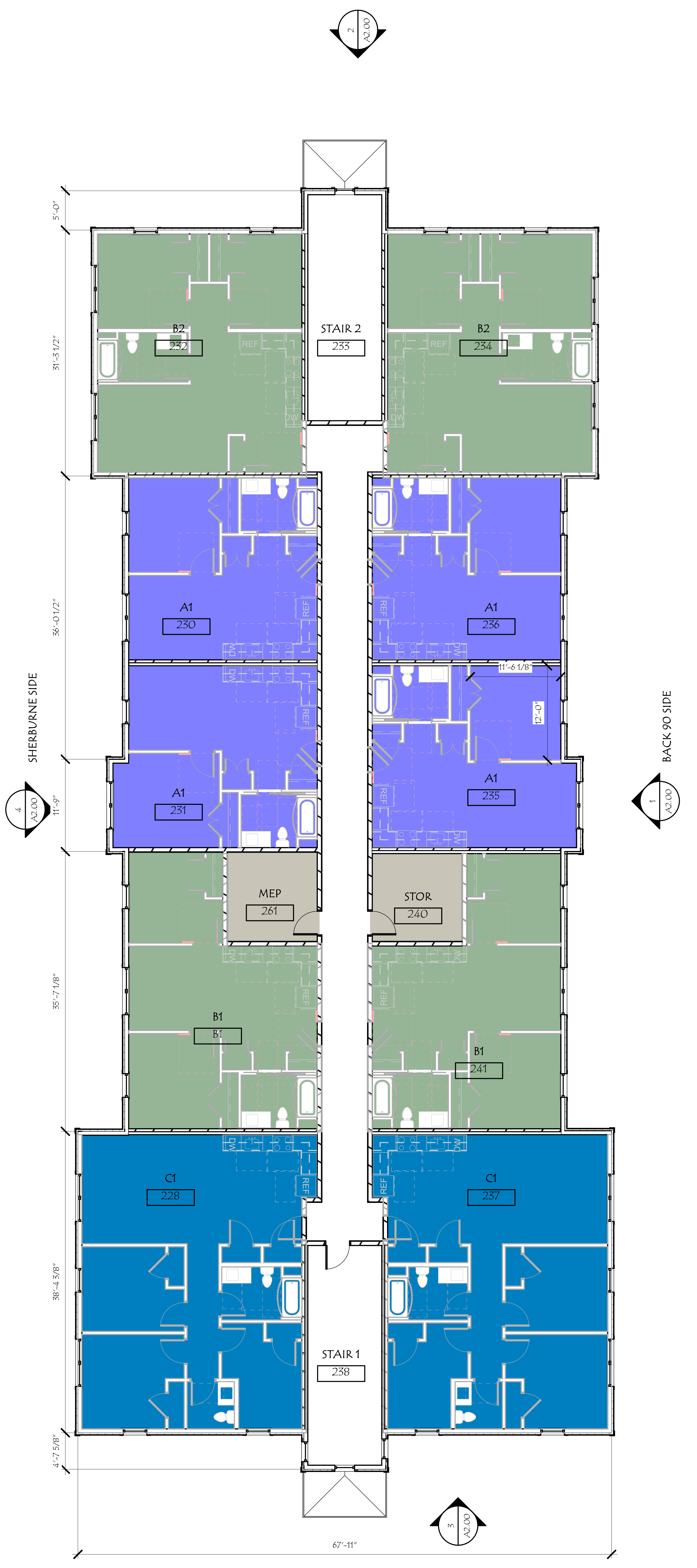


2 LEVEL 2 - FLOOR PLAN (LEVEL 3 SIM)

SCALE: 1/8" = 1'-0"

1 LEVEL 1

SCALE: 1/8" = 1'-0"

COLOR KEY

- ● ONE - BEDROOM = 554-580 SF
- ● TWO - BEDROOM = 771-806 SF
- ● THREE - BEDROOM = 928-1071 SF
- ● BACK OF HOUSE (BOH)

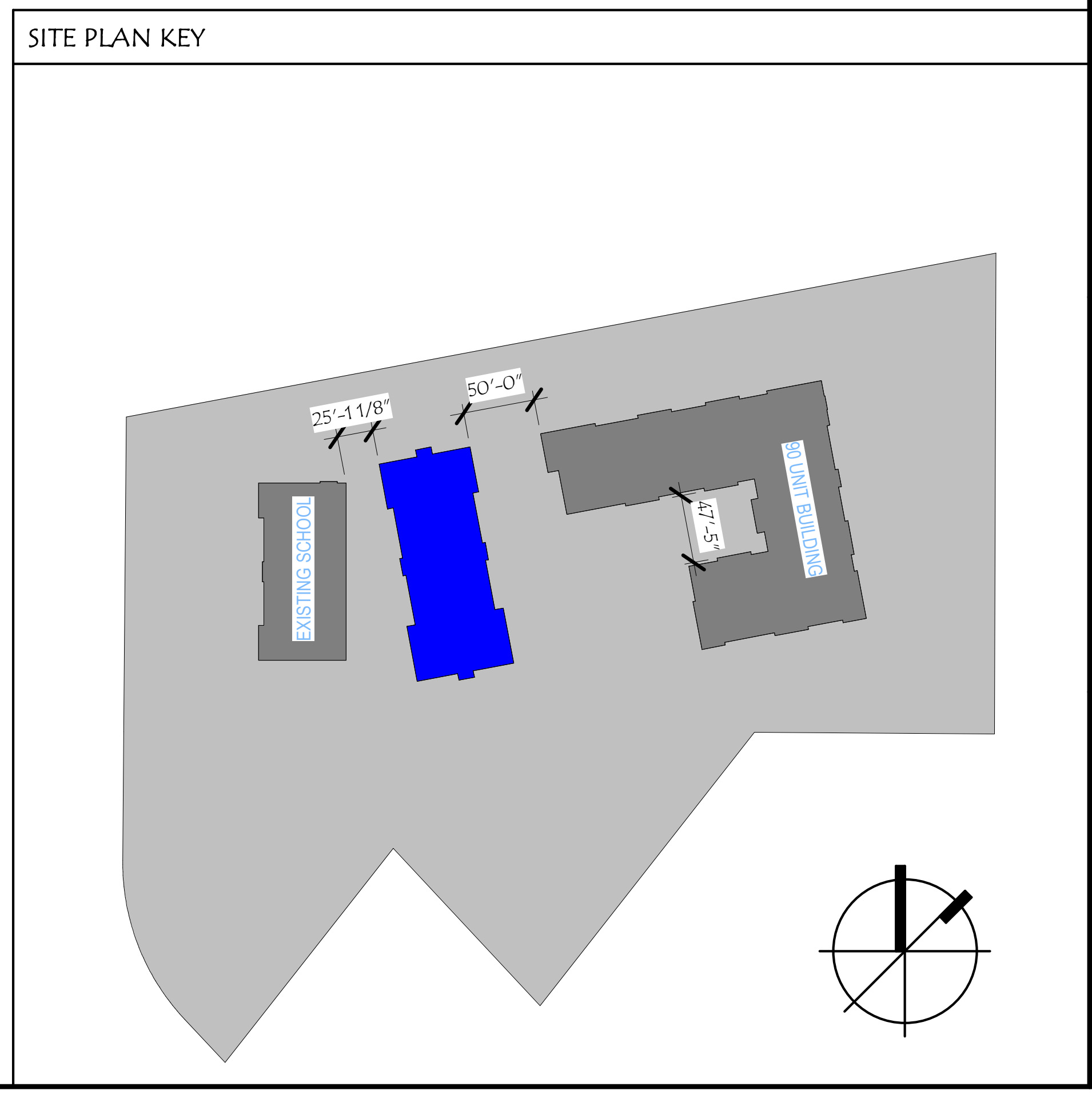
FIRST FLOOR
A (1Bedroom) = 5
B (2Bedrooms) = 2
C (3Bedrooms) = 2

SECOND FLOOR
A (1Bedroom) = 4
B (2Bedrooms) = 4
C (3Bedrooms) = 2

THIRD FLOOR
A (1Bedroom) = 4
B (2Bedrooms) = 4
C (3Bedrooms) = 2

TOTAL 29 UNITS:
A (1Bedroom) = 13 (45%)
B (2Bedrooms) = 10 (34%)
C (3Bedrooms) = 6 (21%)

SITE PLAN KEY



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PH: 603.501.0202

SHERBURNE - SMALL BUILDING

35 Sherburne Road, Portsmouth, NH

NOT FOR CONSTRUCTION

REVISIONS

#	Description	Date

Scale: As indicated
Drawn By: WA
Checked By: SC
Project No.: 2023002
CONCEPT DESIGN
Date: 03/31/2025

Title:
OVERALL LEVEL 1 FLOOR PLAN

A1.01

4/30/2025 10:33:19 AM

1 EXT ELEVATION - EAST1

SCALE: 1/8" = 1'-0"

2 EXT ELEVATION - NORTH1

SCALE: 1/8" = 1'-0"

4 EXT ELEVATION - WEST1

SCALE: 1/8" = 1'-0"

3 EXT ELEVATION - SOUTH1

SCALE: 1/8" = 1'-0"

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SHERBURNE - SMALL BUILDING

35 Sherburne Road, Portsmouth, NH

NOT FOR CONSTRUCTION

REVISIONS

#	Description	Date

Scale: 1/8" = 1'-0"
Drawn By: WAC
Checked By: Checker
Project No.: 2023002
CONCEPT DESIGN
Date: 03/31/2025

Title:
EXTERIOR
ELEVATIONS

A2.00

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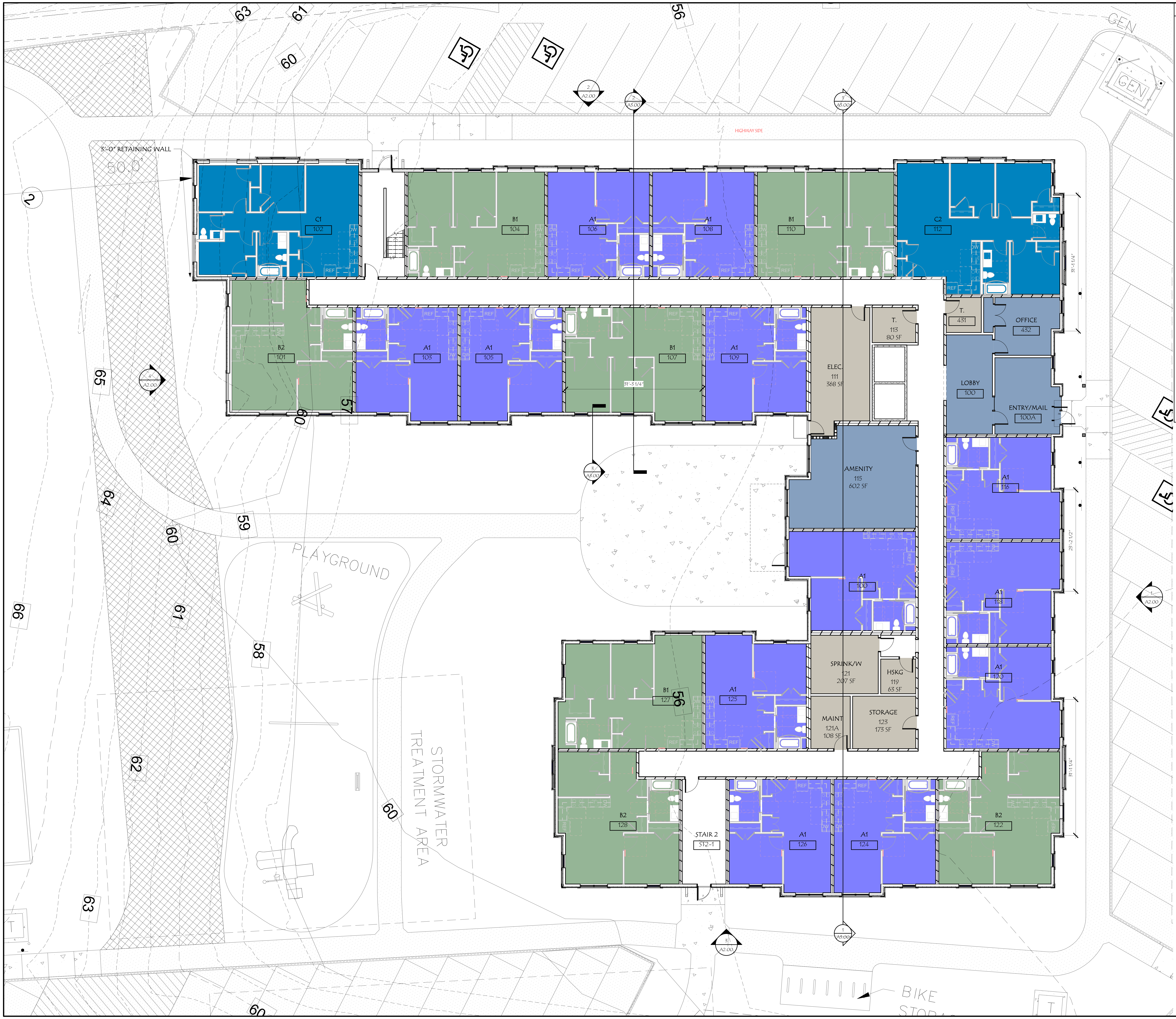

COLOR KEY

🟪 ONE - BEDROOM = 580 SF

🟩 TWO - BEDROOM = 771-806 SF

🟦 THREE - BEDROOM = 928-1071 SF

⬜ BACK OF HOUSE (BOH)

FIRST FLOOR
A (1Bedroom) = 12
B (2Bedrooms) = 7
C (3Bedrooms) = 2

SECOND FLOOR
A (1Bedroom) = 13
B (2Bedrooms) = 8
C (3Bedrooms) = 2

THIRD FLOOR
A (1Bedroom) = 13
B (2Bedrooms) = 8
C (3Bedrooms) = 2

FOURTH FLOOR
A (1Bedroom) = 13
B (2Bedrooms) = 8
C (3Bedrooms) = 2

TOTAL 90 UNITS:
A (1Bedroom) = 51 (57%)
B (2Bedrooms) = 31 (34%)
C (3Bedrooms) = 8 (9%)

MARKET SQUARE
ARCHITECTS
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PHA SHERBURNE 90 UNIT BUILDING

35 Sherburne Road, Portsmouth, NH

NOT FOR CONSTRUCTION

REVISIONS
Description Date

Scale: 1/8" = 1'-0"
Drawn By: SC,WA
Checked By: Checker
Project No.: 2023002
CONCEPT DESIGN
Date: 05/06/2025

Title:
OVERALL - LEVEL 1

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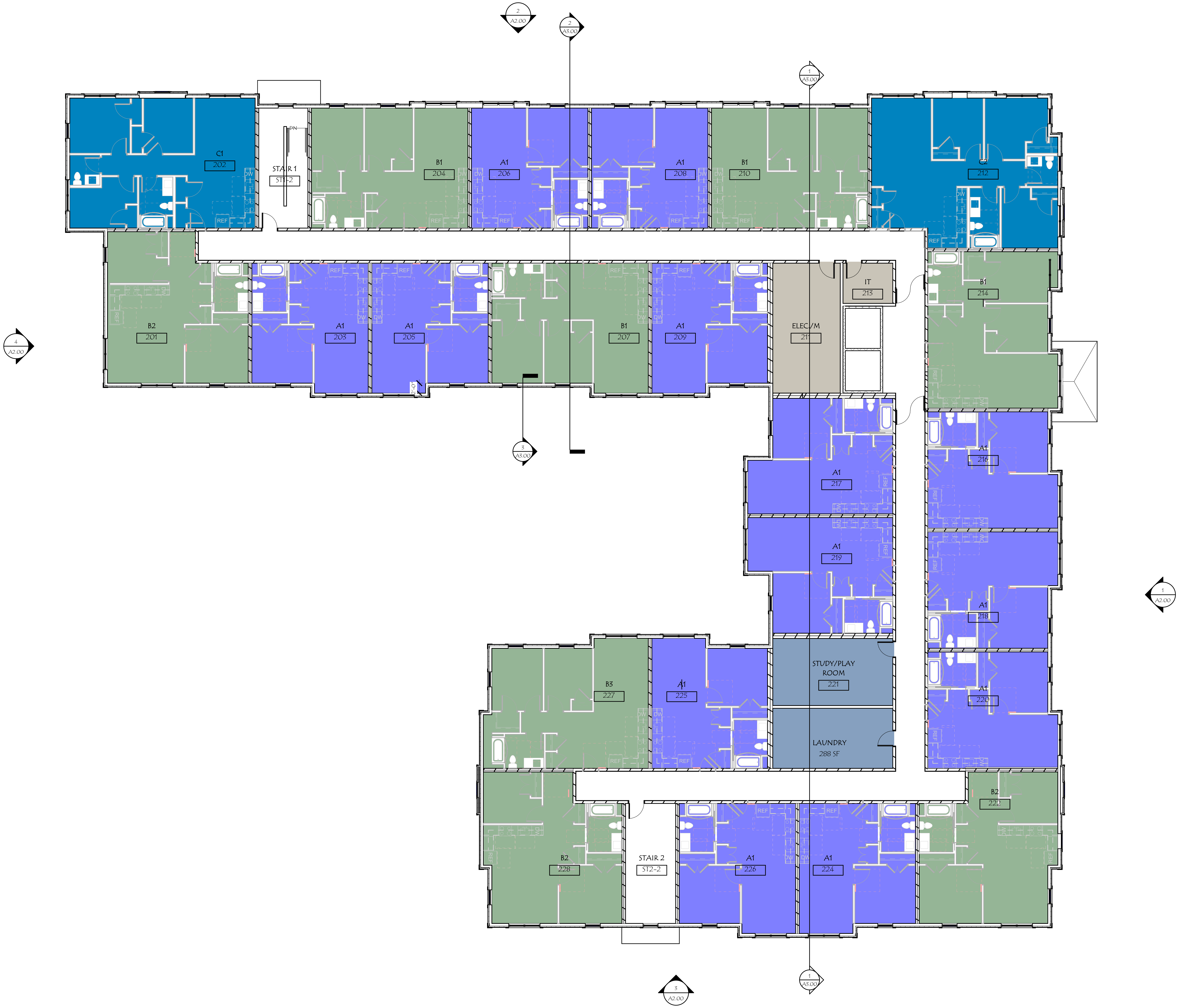

COLOR KEY

ONE - BEDROOM
= 580 SF

TWO - BEDROOM
= 771-806 SF

THREE - BEDROOM
= 928-1071 SF

BACK OF HOUSE
(BOH)

FIRST FLOOR
A (1Bedroom) = 12
B (2Bedrooms) = 7
C (3Bedrooms) = 2

SECOND FLOOR
A (1Bedroom) = 13
B (2Bedrooms) = 8
C (3Bedrooms) = 2

THIRD FLOOR
A (1Bedroom) = 13
B (2Bedrooms) = 8
C (3Bedrooms) = 2

FOURTH FLOOR
A (1Bedroom) = 13
B (2Bedrooms) = 8
C (3Bedrooms) = 2

TOTAL 90 UNITS:
A (1Bedroom) = 51 (57%)
B (2Bedrooms) = 31 (34%)
C (3Bedrooms) = 8 (9%)

90 UNITS
1B = 50 (56%)
2B = 28 (31%)
3B = 12 (13%)

MARKET
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PHA SHERBURNE 90 UNIT BUILDING

35 Sherburne Road, Portsmouth, NH

NOT FOR CONSTRUCTION

REVISIONS

#	Description	Date

Scale: 1/8" = 1'-0"
Drawn By: SC,WA
Checked By: Checker
Project No.: 2023002
CONCEPT DESIGN
Date: 05/06/2025

Title:
OVERALL - LEVEL 2

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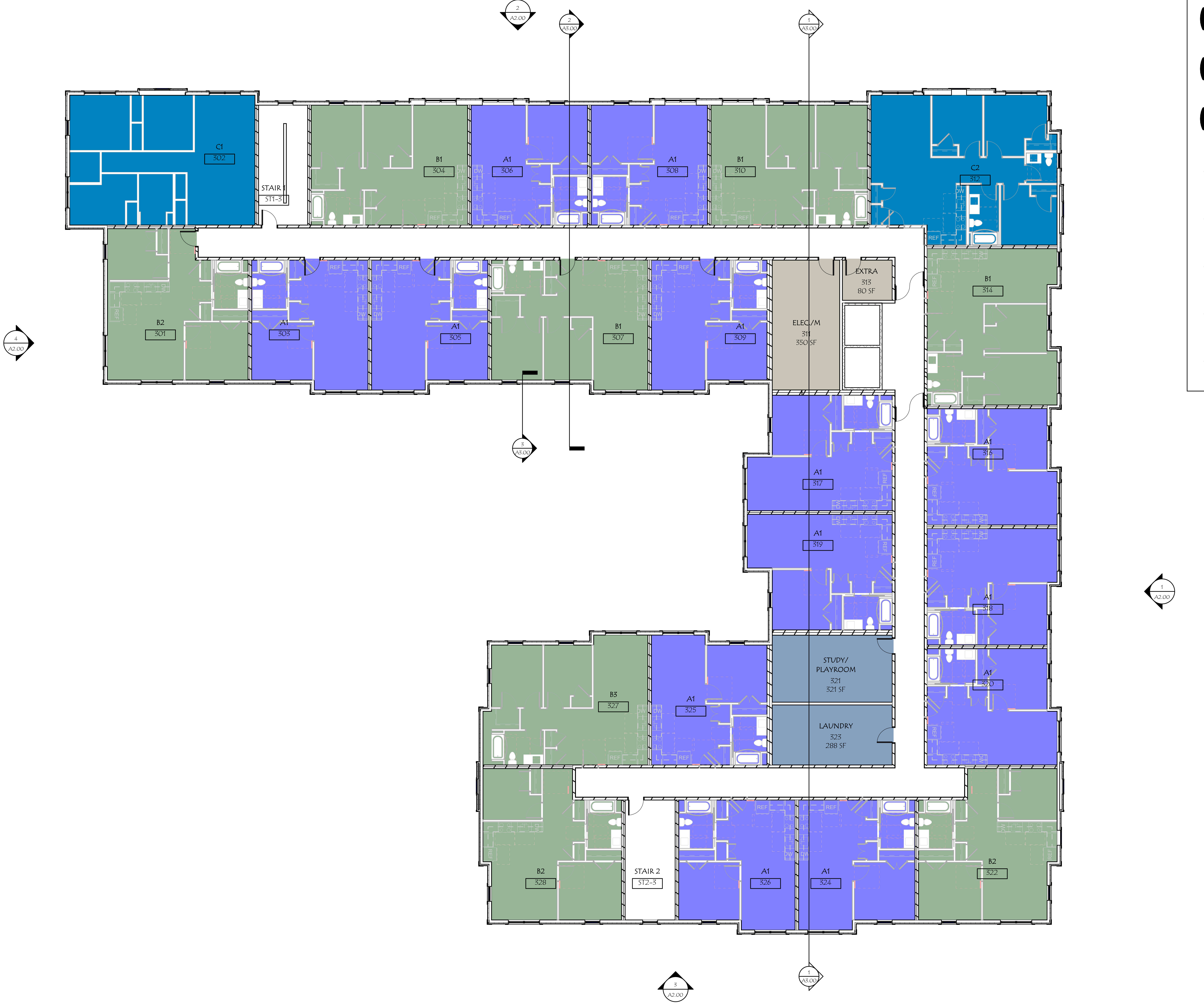

COLOR KEY

● ONE - BEDROOM
= 580 SF

● TWO - BEDROOM
= 771-806 SF

● THREE - BEDROOM
= 928-1071 SF

● BACK OF HOUSE
(BOH)

FIRST FLOOR
A (1Bedroom) = 12
B (2Bedrooms) = 7
C (3Bedrooms) = 2

SECOND FLOOR
A (1Bedroom) = 13
B (2Bedrooms) = 8
C (3Bedrooms) = 2

THIRD FLOOR
A (1Bedroom) = 13
B (2Bedrooms) = 8
C (3Bedrooms) = 2

FOURTH FLOOR
A (1Bedroom) = 13
B (2Bedrooms) = 8
C (3Bedrooms) = 2

TOTAL 90 UNITS:
A (1Bedroom) = 51 (57%)
B (2Bedrooms) = 31 (34%)
C (3Bedrooms) = 8 (9%)

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PHA SHERBURNE 90 UNIT BUILDING

35 Sherburne Road, Portsmouth, NH

NOT FOR CONSTRUCTION

REVISIONS
Description Date

Title:
OVERALL - LEVEL 3

A1.03

Scale: 1/8" = 1'-0"
Drawn By: SC,WA
Checked By: Checker
Project No.: 2023002
CONCEPT DESIGN
Date: 05/06/2025

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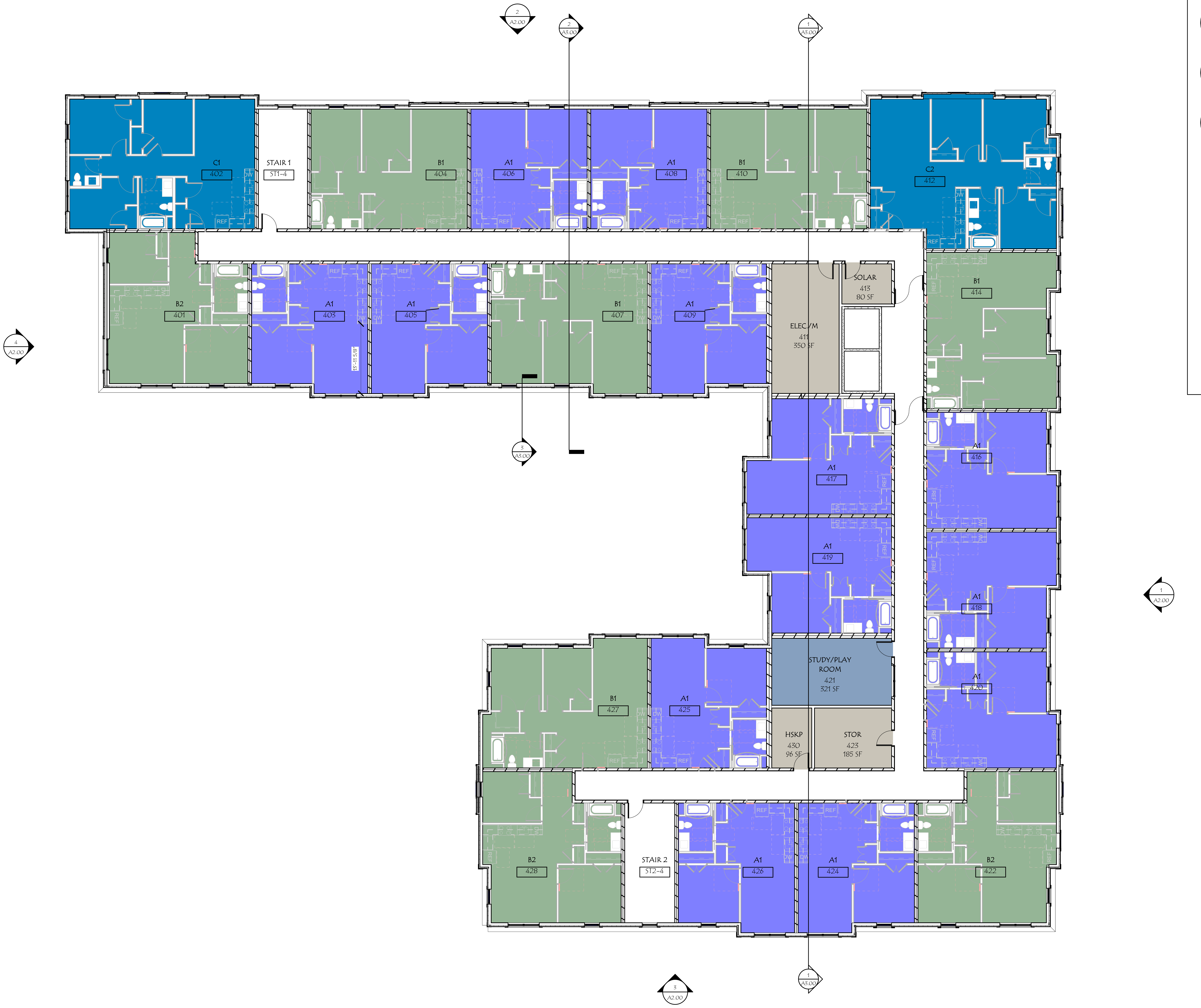

COLOR KEY

🟪 ONE - BEDROOM
= 580 SF

🟩 TWO - BEDROOM
= 771-806 SF

🟦 THREE - BEDROOM
= 928-1071 SF

⬜ BACK OF HOUSE
(BOH)

FIRST FLOOR
A (1Bedroom) = 12
B (2Bedrooms) = 7
C (3Bedrooms) = 2

SECOND FLOOR
A (1Bedroom) = 13
B (2Bedrooms) = 8
C (3Bedrooms) = 2

THIRD FLOOR
A (1Bedroom) = 13
B (2Bedrooms) = 8
C (3Bedrooms) = 2

FOURTH FLOOR
A (1Bedroom) = 13
B (2Bedrooms) = 8
C (3Bedrooms) = 2

TOTAL 90 UNITS:
A (1Bedroom) = 51 (57%)
B (2Bedrooms) = 31 (34%)
C (3Bedrooms) = 8 (9%)

MARKET
SQUARE
ARCHITECTS
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Portsmouth, NH 03801
PH: 603.501.0202

PHA SHERBURNE 90 UNIT BUILDING

35 Sherburne Road, Portsmouth, NH

NOT FOR CONSTRUCTION

REVISIONS

#	Description	Date

Scale: 1/8" = 1'-0"
Drawn By: SC,WA
Checked By: Checker
Project No.: 2023002
CONCEPT DESIGN
Date: 05/06/2025

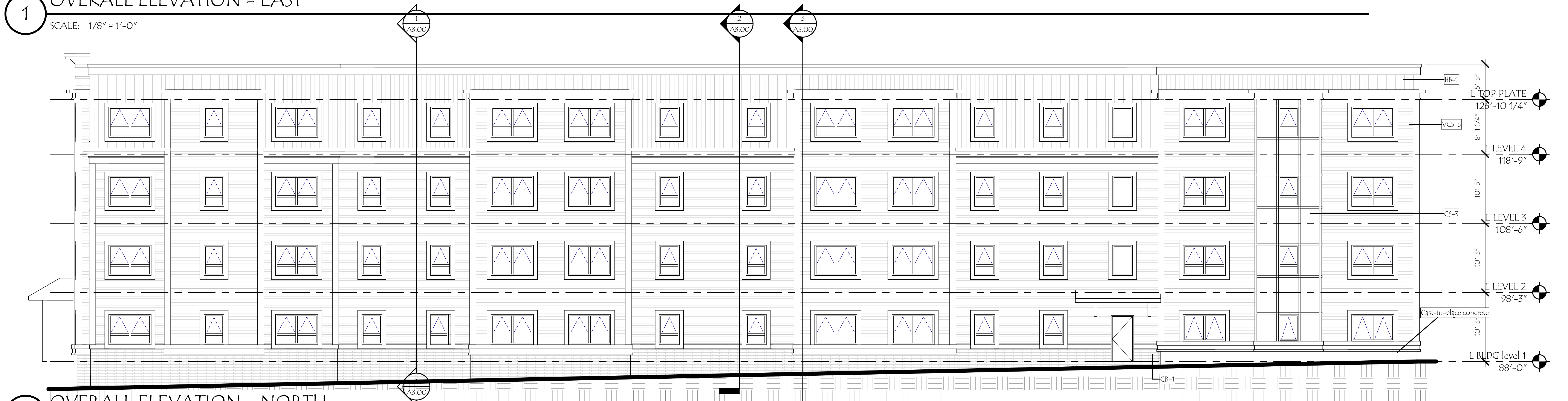
Title:
OVERALL - LEVEL 4

A1.04

4/30/2025 1:54:29 PM

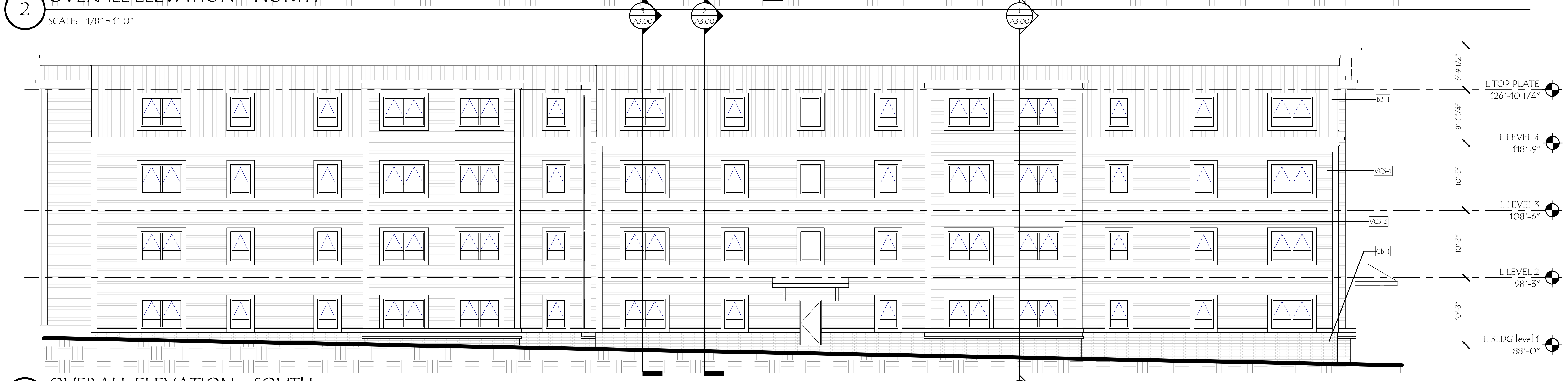
1 OVERALL ELEVATION - EAST

SCALE: 1/8" = 1'-0"



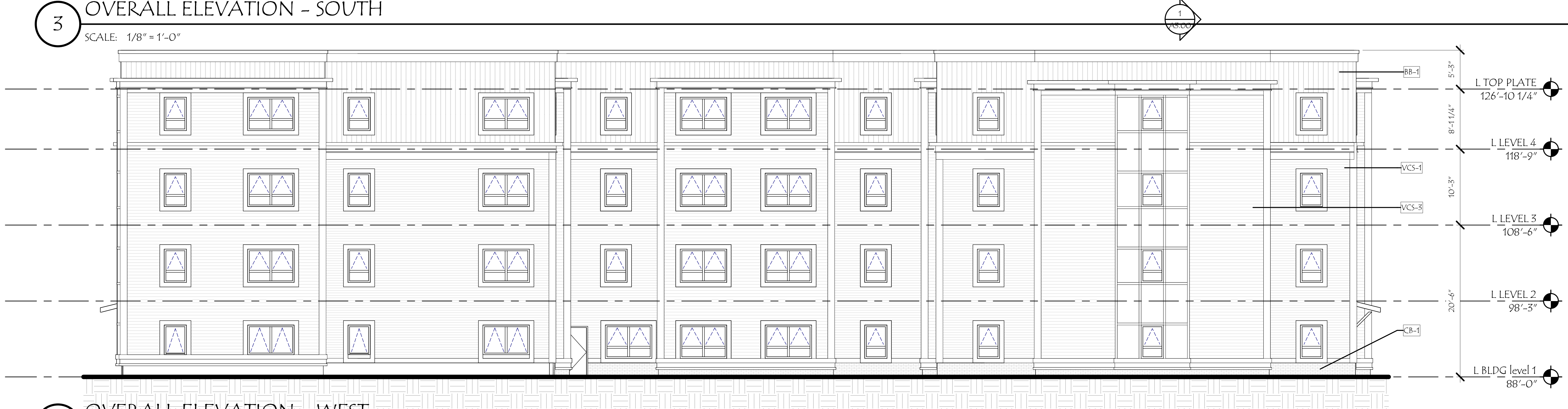
2 OVERALL ELEVATION - NORTH

SCALE: 1/8" = 1'-0"



3 OVERALL ELEVATION - SOUTH

SCALE: 1/8" = 1'-0"



4 OVERALL ELEVATION - WEST

SCALE: 1/8" = 1'-0"

MARKET SQUARE
ARCHITECTS
104 Congress St., STE 203
Portsmouth, NH 03801
PH: 603.501.0202

PHA SHERBURNE 90 UNIT BUILDING

35 Sherburne Road, Portsmouth, NH

NOT FOR CONSTRUCTION

REVISIONS

#	Description	Date

Scale: 1/8" = 1'-0"
Drawn By: WA
Checked By: Checker
Project No.: 2023002
CONCEPT DESIGN
Date: 05/06/2025

Title:
EXTERIOR ELEVATIONS

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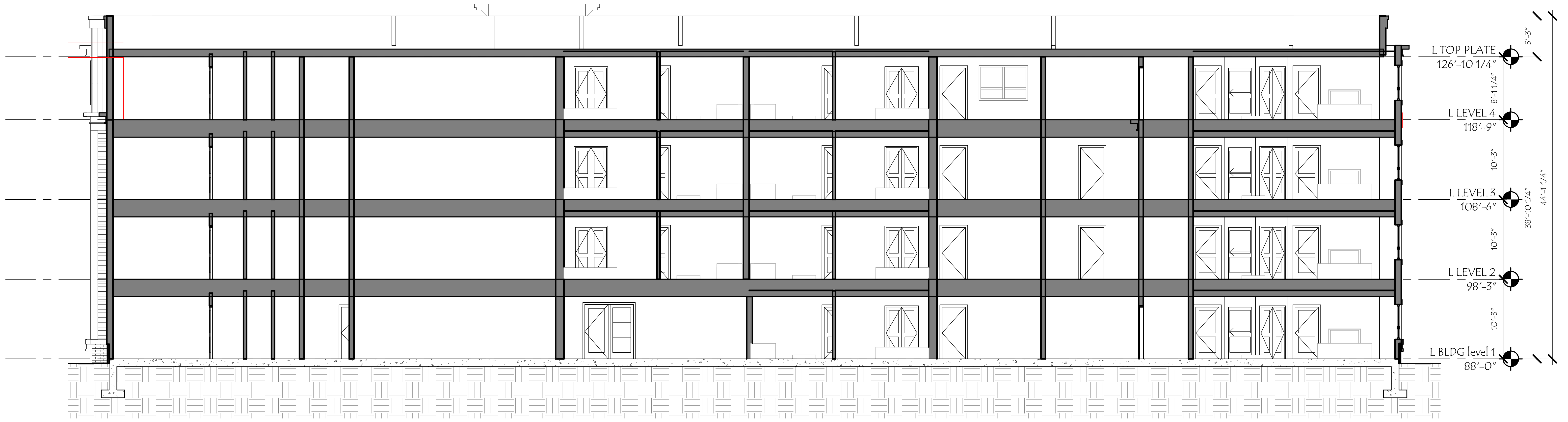
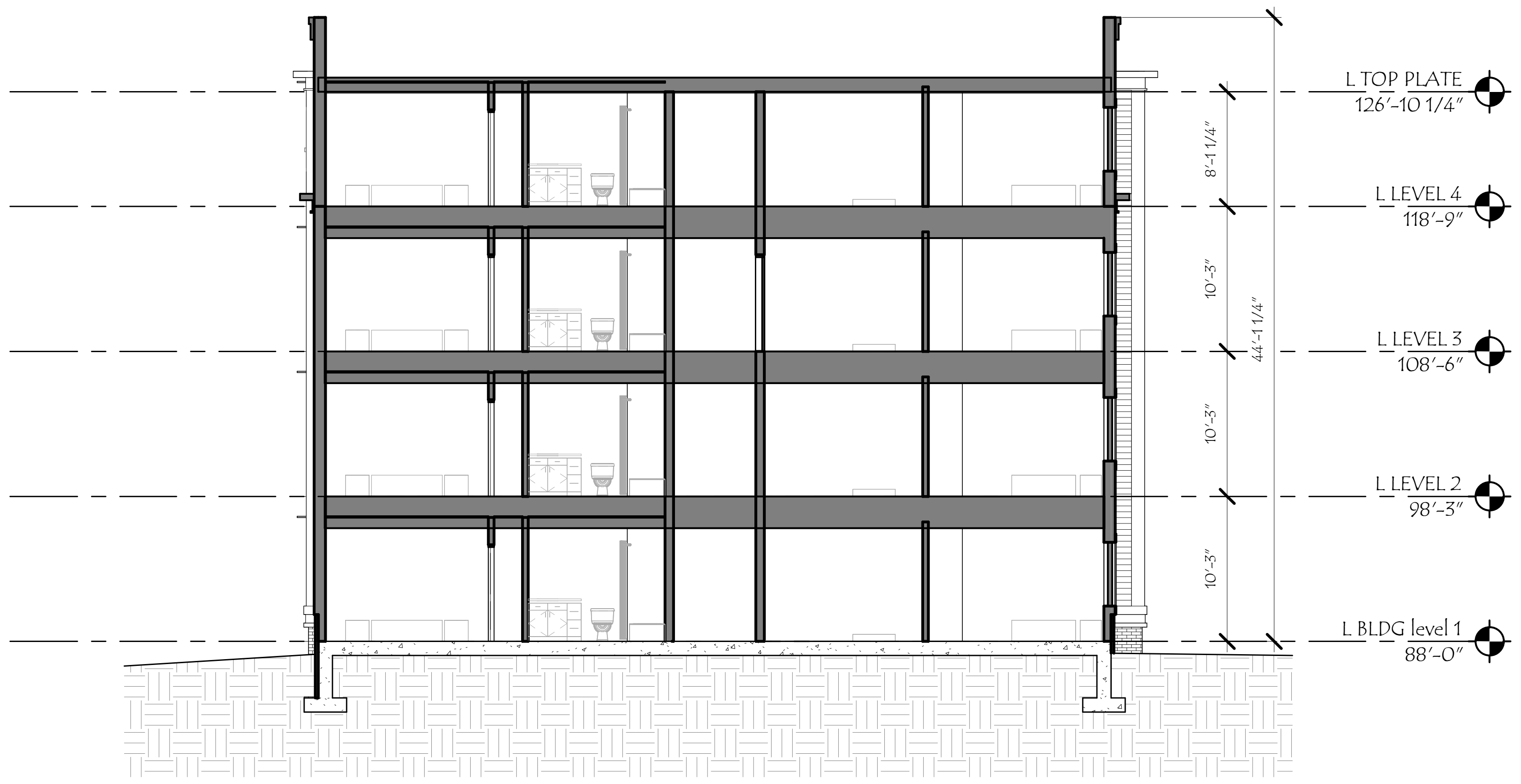
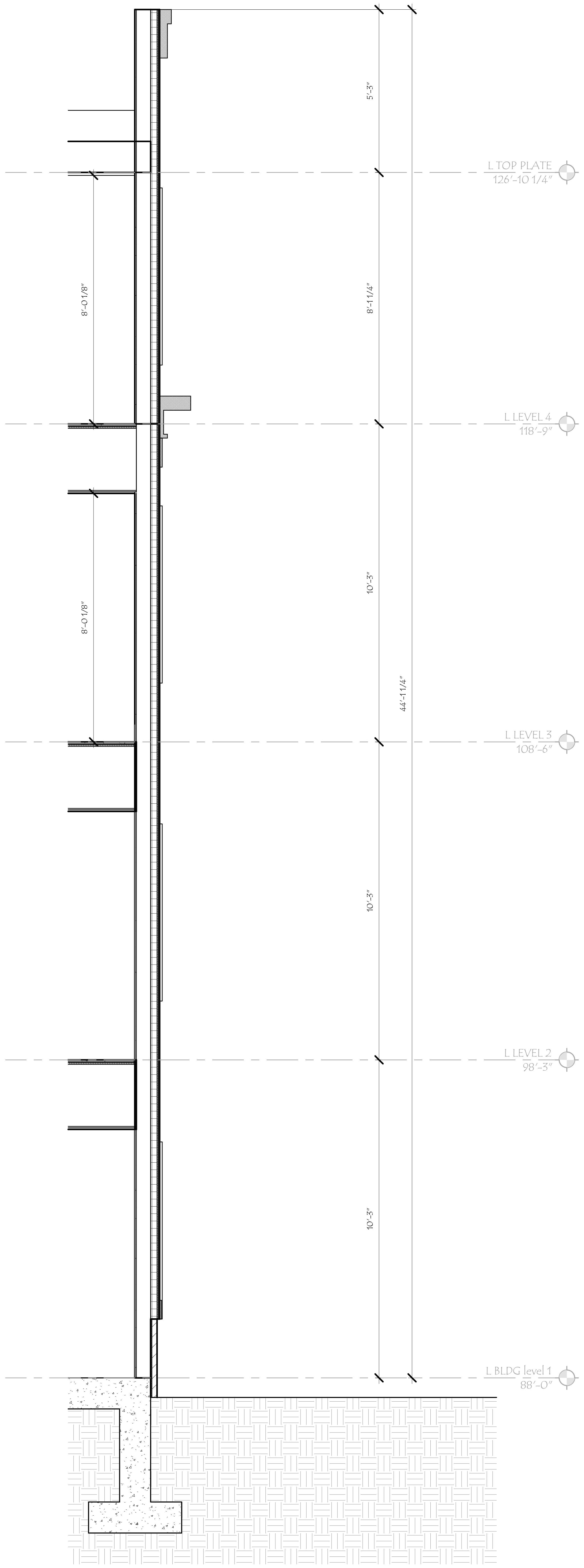
4/30/2025 1:54:30 PM







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Portsmouth, NH 03801
PH: 603.501.0202

PHA SHERBURNE 90 UNIT BUILDING

35 Sherburne Road, Portsmouth, NH

NOT FOR CONSTRUCTION

REVISIONS

#	Description	Date

Scale: As indicated
Drawn By: SC
Checked By: Checker
Project No.: 2023002
CONCEPT DESIGN
Date: 05/06/2025

Title:
BUILDING SECTIONS

A3.00

4/30/2025 1:54:32 PM

Jun 16, 2025 - 4:39pm
F:\MSC Projects\47528 Sherburne Road, Portsmouth, NH\47528-00 Sherburne Road, Portsmouth, NH\Design\PRODUCTION DRAWINGS\47528-00_Landscaping_Phase 2.dwg

LANDSCAPE LEGEND

SYMBOL	QTY	BOTANICAL NAME COMMON NAME	SIZE	REMARKS	MATURE HEIGHT/ SPREAD	GROWTH HABIT
●	1	ACER RUBRUM 'BOWHALL' BOWHALL RED MAPLE	2" TO 2 1/2" CAL.	B&B	40' TO 60' 10' TO 15'	UPRIGHT
●	2	ACER RUBRUM 'OCTOBER GLORY' OCTOBER GLORY RED MAPLE	2" TO 2 1/2" CAL.	B&B	40' TO 60' 30' TO 40'	OVAL
●	5	AMELANCHIER X GRANDIFLORA 'ROBIN HILL' ROBIN HILL SERVICEBERRY	2" TO 2 1/2" CAL.	B&B	15' TO 20' 10' TO 15'	UPRIGHT*
●	1	BETULA NIGRA 'DURA HEAT' DURA HEAT RIVER BIRCH	8' TO 10' CLUMP	B&B	40' TO 60' 20' TO 30'	PYRAMIDAL
●	1	QUERCUS ALBA WHITE OAK	2" TO 2 1/2" CAL.	B&B	60' + 60' +	BROAD
●	14	ILEX CRENATA 'CHESAPEAKE' CHESAPEAKE JAPANESE HOLLY	3 GAL.	CONT.	6' TO 8' 3' TO 4'	PYRAMIDAL

* ALL PLANTS CONTAINED IN LEGEND HAVE BEEN SELECTED FOR URBAN GROWING CONDITIONS.

SEE DETAILS FOR LANDSCAPE NOTES

CITY OF PORTMOUTH PLANNING BOARD

CHAIRPERSON ____________________ DATE ____________

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10

LANDSCAPE PLAN PHASE 2

PROPOSED HOUSING DEVELOPMENT

35 SHERBURNE ROAD
PORTSMOUTH, NEW HAMPSHIRE
OWNED BY
CITY OF PORTSMOUTH
PREPARED FOR
PHA HOUSING DEVELOPMENT LTD.

1"=60' (11"X17")
SCALE: 1"=30' (22"X34") **JANUARY 29, 2025**

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

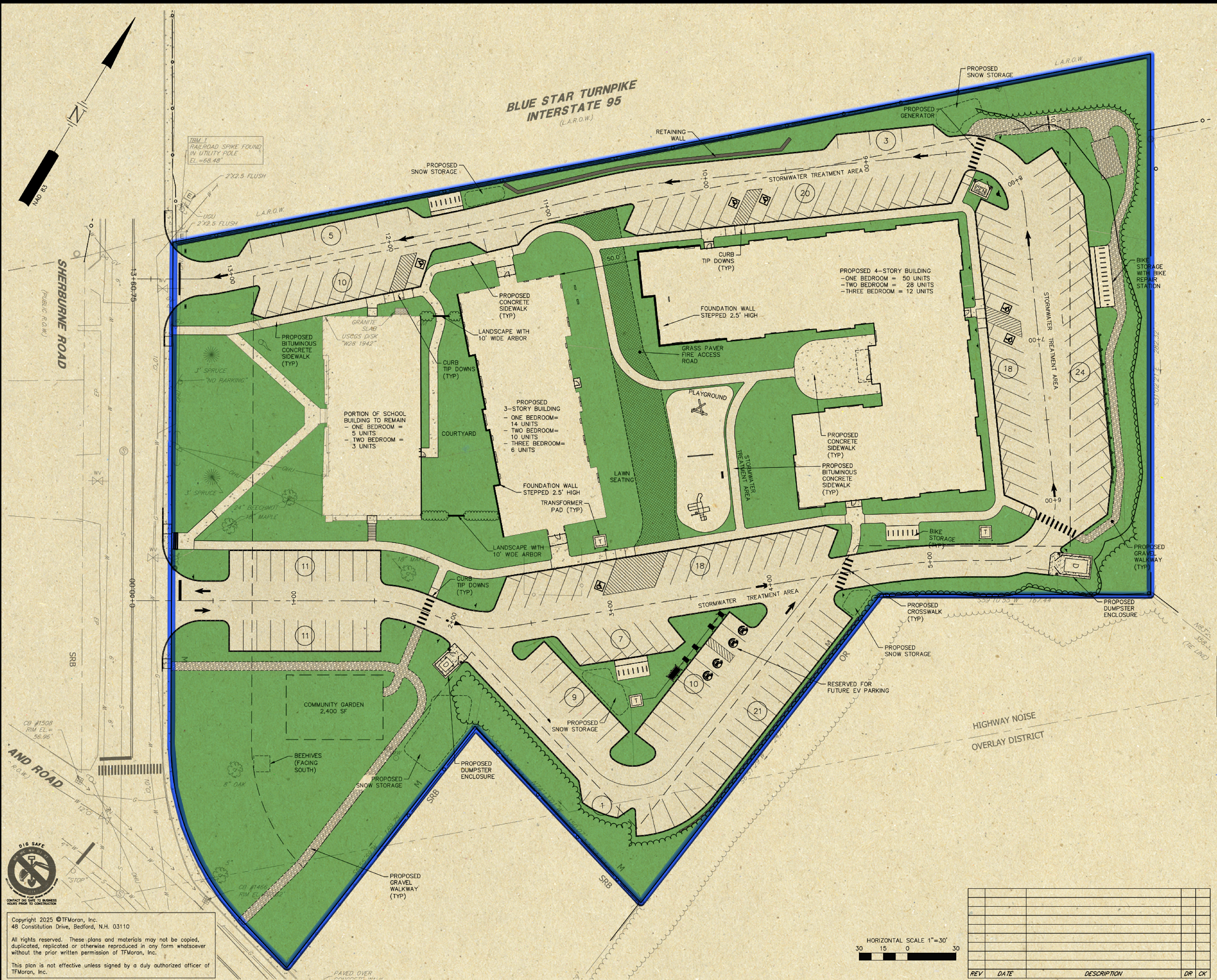
FILE	47528.00	DR	JKC	FB		C-15
		CK	JJM	CAD	47528-00_LANDSCAPING_PHASE 2	

HORIZONTAL SCALE 1"=30'
30 15 0 30

REV	DATE	DESCRIPTION	DR	CK
1	6/16/2025	REVISED PER TAC WORKSHOP	DKS	JJM

This plan is not effective unless signed by a duly authorized officer of TFMoran, Inc.

SITE LAYOUT PLAN



May 05, 2025 - 10:57am
F:\MSC Projects\47528 Sherburne Road, Portsmouth, NH\47528-00 Sherburne Road, Portsmouth, NH\Design\Exhibits\47528-00_Open-Area_Updated1.dwg

SITE DATA

OWNER OF RECORD OF MAP 259 LOT 10: CITY OF PORTSMOUTH SCHOOLS, PO BOX 628, PORTSMOUTH, NH 03802
DEED REFERENCE TO PARCEL IS BK 2389 PG 1272
AREA OF PARCEL = 232,175± SF OR 5.33± ACRES

ZONED: MUNICIPAL
EXISTING USE: SCHOOL
PROPOSED USE: MIXED USE

THE PURPOSE OF THIS PLAN IS TO CONSTRUCT WORK FORCE HOUSING. ASSOCIATED IMPROVEMENTS INCLUDE AND ARE NOT LIMITED TO ACCESS, GRADING, STORMWATER MANAGEMENT SYSTEMS, UTILITIES, LIGHTING, AND LANDSCAPING.

DIMENSIONAL REQUIREMENTS (CURRENT ZONING)

	REQUIRED:	PROVIDED:
MINIMUM LOT DIMENSIONS:		
LOT AREA	NA SF (X.XXX± AC)	232,175± SF (5.33± AC)
LOT FRONTAGE	NA FT	471.79 FT
DEPTH	NA FT	606 FT
MAXIMUM STRUCTURE DIMENSIONS:		
STRUCTURE HEIGHT	NA	38.8 FEET
STRUCTURE STORIES	NA	4 STORIES
ROOF APPURTENANCE HEIGHT	NA	44.1 FT
LOT COVERAGE	NA	54%
MINIMUM SETBACKS/BUFFER:		
BUILDING FRONT	NA FT	93.1 FT
BUILDING SIDE	NA FT	48.8 FT
BUILDING REAR	NA FT	89.5 FT
MINIMUM OPEN SPACE	**NA**	**41.0%**

OPEN SPACE AREA CALCULATION:

GRASS AREA = 95,272 SF
LOT AREA = 232,175 SF
OPEN SPACE = (95,272 SF / 232,175 SF) X 100% = 41.0%

PARKING REQUIREMENTS

RESIDENTIAL		
PARKING SPACES (SEE CALCULATION)	165 SPACES	165 RESIDENTIAL SPACES
OFFICE		
OFFICE	1 SPACES	1 SPACES
TOTAL	166	168
ACCESSIBLE SPACES (REQ'D BY ADA)	6 SPACES	6 SPACES
PARKING SPACE SIZE	8.5 FT X 19 FT	8.5 FT X 19 FT
AISLE WIDTH	18–24 FT	18–24 FT

PARKING CALCULATIONS

REQUIRED PARKING RATIO:
RESIDENTIAL: 1.3 SPACES PER UNIT > 750 SF
1 SPACE PER UNIT 600–750 SF
1 VISITOR SPACE PER 5 UNITS OR PORTION THEREOF
OFFICE:
1 SPACES PER UNIT > 350 SF
TOTAL REQUIRED = 53 UNITS * 1.3 SPACES/UNIT = 74.0 SPACES
74 UNITS * 1 SPACE = 65.9 SPACES
127 UNITS * 1 SPACE/5 UNITS = 25.4 SPACES
1 OFFICE * 1 SPACE/OFFICE = 1.0 SPACES

TOTAL = 166.3 SPACES

NOTES

1. SEE NOTES ON SHEET C–01.
2. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS NOTED OTHERWISE.
3. LIGHTING, SIGNAGE, LANDSCAPING, AND SCREENING SHALL MEET THE REQUIREMENTS OF THE PORTSMOUTH, NH ZONING ORDINANCE AND SITE PLAN REVIEW REGULATIONS.
4. SNOW SHALL NOT BE STOCKPILED IN STORMWATER BMP'S, WETLAND BUFFERS, OR WETLANDS. SEE SNOW STORAGE LOCATIONS. IN THE EVENT THAT THE SNOW STORAGE AREAS PROVIDED ON THE SITE ARE COMPLETELY UTILIZED, EXCESS SNOW SHALL BE TRANSPORTED OFF SITE FOR DISPOSAL IN ACCORDANCE WITH NHDES REGULATION. IF SNOW IS STORED WITHIN PARKING AREA, KEEP CATCH BASINS CLEAR.
5. THE 3' PANEL ALONG THE PARKING LOT EDGE & DRIVE SHALL BE USED FOR SNOW STORAGE
6. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
7. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
8. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

CITY OF PORTMOUTH PLANNING BOARD

CHAIRPERSON
DATE

REV	DATE	DESCRIPTION	DR	CK

SITE DEVELOPMENT PLANS

TAX MAP 259 LOT 10
SITE LAYOUT PLAN
PROPOSED HOUSING DEVELOPMENT
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FILE 47528.00
DR JKC
CK JJM
FB
CADFILE 47528-00_OPEN-AREA_UPDATED1
C-03

SITE LAYOUT PLAN

City of Portsmouth, New Hampshire

Site Plan Application Checklist

This site plan application checklist is a tool designed to assist the applicant in the planning process and for preparing the application for Planning Board review. The checklist is required to be completed and uploaded to the Site Plan application in the City's online permitting system. A pre-application conference with a member of the planning department is strongly encouraged as additional project information may be required depending on the size and scope. The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all site plan review requirements. Please refer to the Site Plan review regulations for full details.

Applicant Responsibilities (Section 2.5.2): Applicable fees are due upon application submittal along with required attachments. The application shall be complete as submitted and provide adequate information for evaluation of the proposed site development. Waiver requests must be submitted in writing with appropriate justification.

Name of Applicant: PHA Housing Development LTD Date Submitted: 6/16/2025

Application # (in City's online permitting): ____________________

Site Address: 35 Sherburne Rd Map: 259 Lot: 10

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☒	Complete application form submitted via the City's web-based permitting program (2.5.2.1**(2.5.2.3A)**		N/A
☒	All application documents, plans, supporting documentation and other materials uploaded to the application form in viewpoint in digital Portable Document Format (PDF). One hard copy of all plans and materials shall be submitted to the Planning Department by the published deadline. **(2.5.2.8)**		N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**		
☒	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1C)**		N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**		N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**		N/A
☒	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**		N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**		N/A
☒	List of reference plans. **(2.5.3.1H)**		N/A
☒	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**		N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director.. **(2.5.4.1A)**	Required on all plan sheets	N/A
☒	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☒	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**		N/A
☒	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
☐ NA	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**		N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**		N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**		N/A
☒	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☒	Source and date of data displayed on the plan. **(2.5.4.2D)**		N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.		
☒	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.		
☒	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).		
☒	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).		
☒	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).		
☒	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.		

☒	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.		
☒	**8. Solid Waste Facilities: (2.5.4.3H)**		
	• The size, type and location of solid waste facilities.		
☒	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.		
☒	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.		
☒	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**		
☒	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.		
☒	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.		
☒	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.		
☒	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**		
☒	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).		
☐ NA	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.		

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Traffic Impact Study or Trip Generation Report, as required. **(3.2.1-2)**		
☒	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**		
☒	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**		
☒	Stormwater Management and Erosion Control Plan. **(7.4)**		
☐	Inspection and Maintenance Plan **(7.6.5)**		

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	All local approvals, permits, easements and licenses required, including but not limited to: • Waivers; • Driveway permits; • Special exceptions; • Variances granted; • Easements; • Licenses. **(2.5.3.2A)**		
☒	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: • Calculations relating to stormwater runoff; • Information on composition and quantity of water demand and wastewater generated; • Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; • Estimates of traffic generation and counts pre- and post-construction; • Estimates of noise generation; • A Stormwater Management and Erosion Control Plan; • Endangered species and archaeological / historical studies; • Wetland and water body (coastal and inland) delineations; • Environmental impact studies. **(2.5.3.2B)**		
☐	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. **(2.5.3.2D)**		

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**		
☒	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**		N/A
☐ NA	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**		
☒	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**		N/A

Applicant's Signature: ______________________ **Date:** 6/16/2026