



August 16, 2023

Ronnie E. Lee, P.E.
New York State Department of Environmental Conservation
Department of Environmental Remediation
625 Broadway
Albany, New York 12233-7016

RE: Remedial Action Work Plan – Addendum #1
737 4th Avenue, Brooklyn, New York
BCP #C224332

Dear Mr. Lee:

P.W. Grosser Consulting Engineer & Hydrogeologist, P.C. (PWGC) has prepared this Addendum to the New York State Department of Environmental Conservation (NYSDEC) approved Remedial Action Workplan dated February 2023 for the above referenced site. The purpose of this Addendum is related to a submission by a third party for a Long Island Well Permit to dewater portions of the site where excavation is planned to extend deeper than the groundwater table in three distinct areas. The NYSDEC had comments relating to the dewatering system due to the radius of influence of the proposed dewatering extending off the property line, specifically towards the source area of the spill beneath the neighboring property at 207 25th Street. These comments indicated additional activities would be required due to the potential for pulling the off-site contamination onto the site, such as treatment for the dewatering liquids, installation of monitoring wells to track the water quality, and the potential for chemical injections if contamination is tracked onto the site.

The dewatering engineer and PWGC have discussed different options to revise the proposed dewatering plan and determined the best approach is to keep the existing, proposed dewatering plan in place and include installation of sentinel monitoring wells with a contingency to conduct chemical injections if groundwater treatment is required. Further details of this approach are detailed below.

Dewatering System and Sentinel Wells

The proposed option will include keeping the existing dewatering system, as designed, and will add sentinel groundwater monitoring wells in various locations across the site to track the change in groundwater quality, if any, during dewatering. Contingency injection wells will be installed so that groundwater treatment can be performed, if required. Under this option, the previously proposed secant barrier wall along the shared property line with 207 25th Street, as discussed in the Interim Remedial Measure (IRM) Work Plan dated June 2022, will still be installed.

Secant Barrier

As outlined in the IRM Work Plan, a secant barrier wall is proposed to be installed along the shared property line with 207 25th Street. The secant piles are proposed to be installed to a minimum depth of two feet below the groundwater table elevation (+12) estimated at approximately elevation +14. The proposed design is included in **Attachment 1**.



Dewatering Model

Cichetti Engineering PLLC prepared a dewatering model (**Attachment 2**) to estimate groundwater drawdown for the proposed dewatering operation for the project. To achieve the required drawdown, a steady-state flow of 26 gallons per minute (gpm) is estimated. The table below shows the estimated drawdown outside of the site versus distance from the property line during the steady-state dewatering phase.

Distance from E Property Line (in feet)	Groundwater Drawdown El (in E-w Direction)
5	El +12.5
35	El +13
100	El +13.5

Based upon the current dewatering model, drawdown is anticipated to elevation +12.5 at the southeast property line. The secant barrier wall depth will be at elevation +12. Based upon this design, any light non-aqueous phase liquid (LNAPL) is anticipated to be contained at the barrier wall and not migrate onto the property.

Sentinel Wells

To evaluate/confirm drawdown of the water table interface and evaluate groundwater quality during dewatering operations, sentinel wells will be installed throughout the site. The sentinel wells will consist of 2-inch diameter PVC with 15 feet of screen and will be installed to a bottom elevation of +2 feet, so the screened interval will be between elevations +2 feet and +17 feet. The existing groundwater table is at approximately elevation +14 feet and the deepest area of dewatering is proposed to maintain the groundwater elevation at +5.5 feet. The sentinel wells will be finished with flush mounted monitoring well covers.

The sentinel wells will be gauged hourly during the first eight hours of operation, then daily for the first week, followed by weekly thereafter to monitor drawdown across the site and to evaluate the potential migration of LNAPL.

The sentinel wells will be sampled before groundwater dewatering begins and following completion of dewatering activities, up to two weeks after dewatering has been completed or until groundwater elevations have reached pre-dewatering equilibrium, whichever timeframe is longer. Samples will be analyzed for the presence of volatile organic compounds (VOCs) by United State Environmental Protection Agency (USEPA) method 8260, CP-51 list, and semi-volatile organic compounds (SVOCs) by USEPA method 8270, CP-51 list.

Proposed locations of the sentinel wells are included on **Figure 1**.

Injection Wells

Injection wells are proposed to be installed as a precautionary measure to allow for future groundwater remediation in the event of contaminant migration resulting from dewatering operations. The injection wells will consist of 2-inch diameter PVC with 5-feet of screen and the screened interval will be placed between elevations +11 feet and +16 feet to capture the interval that the groundwater table is expected to return to once dewatering is complete. The injection wells will be finished with flush mounted monitoring well covers.

Following completion of dewatering operations, chemical injections will be conducted, if needed, until groundwater concentrations reach acceptable concentrations. The chemical injectants, their quantity, and frequency of injections will be determined based upon



groundwater results from the sentinel monitoring wells and will be discussed with NYSDEC prior to injection.

If LNAPL is detected, LNAPL removal efforts such as vacuum enhanced fluid recovery (VEFR), bailing, or absorbent socks will be utilized.

Proposed locations of the injection wells are included on **Figure 1**.



I, Paul K. Boyce, PE, PG, certify that I am currently a New York State registered professional engineer (PE) and that this Remedial Action Work Plan Addendum was prepared in accordance with applicable statutes and regulations and in substantial conformance with the NYSDEC's Division of Environmental Remediation's (DER's) Technical Guidance for Site Investigation and Remediation (DER-10).

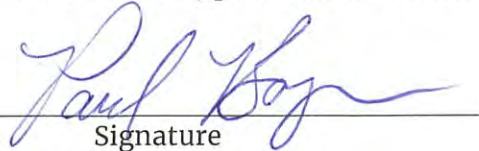
I certify that the information and statements in this certification are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

074604

New York State PE #

08.16.2023

Date



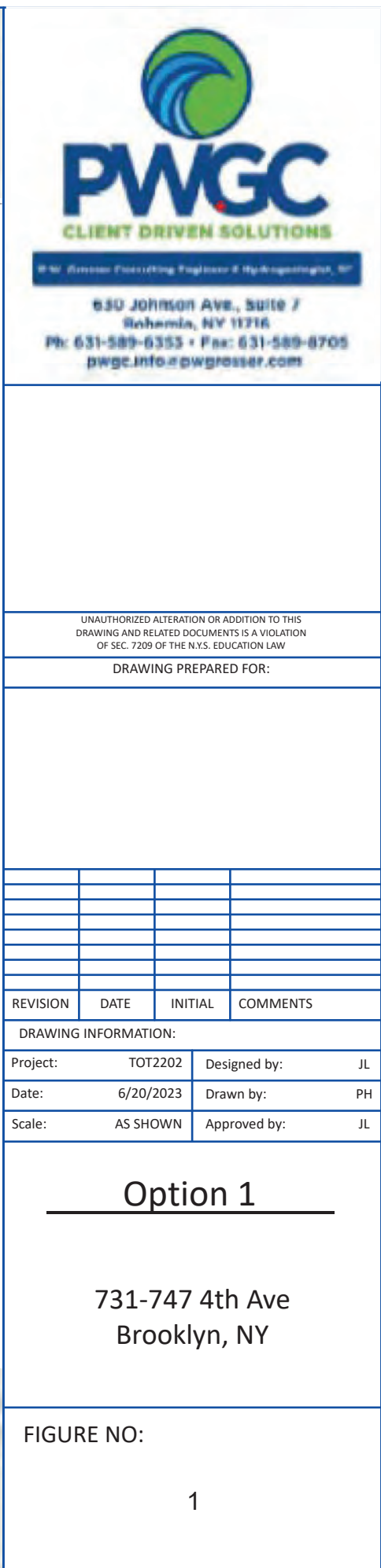
Signature

It is a violation of Article 145 of the New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.



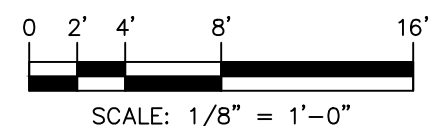
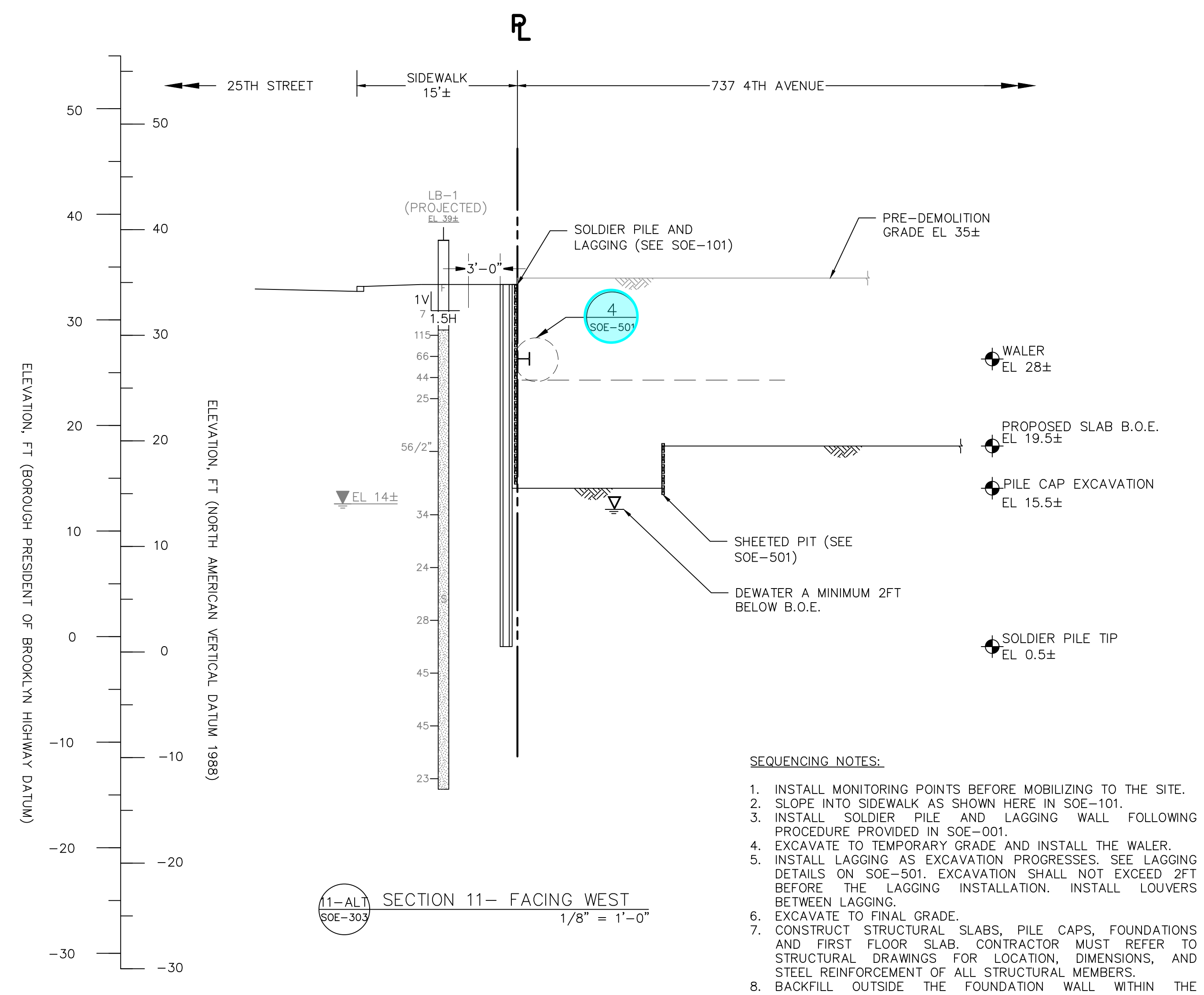
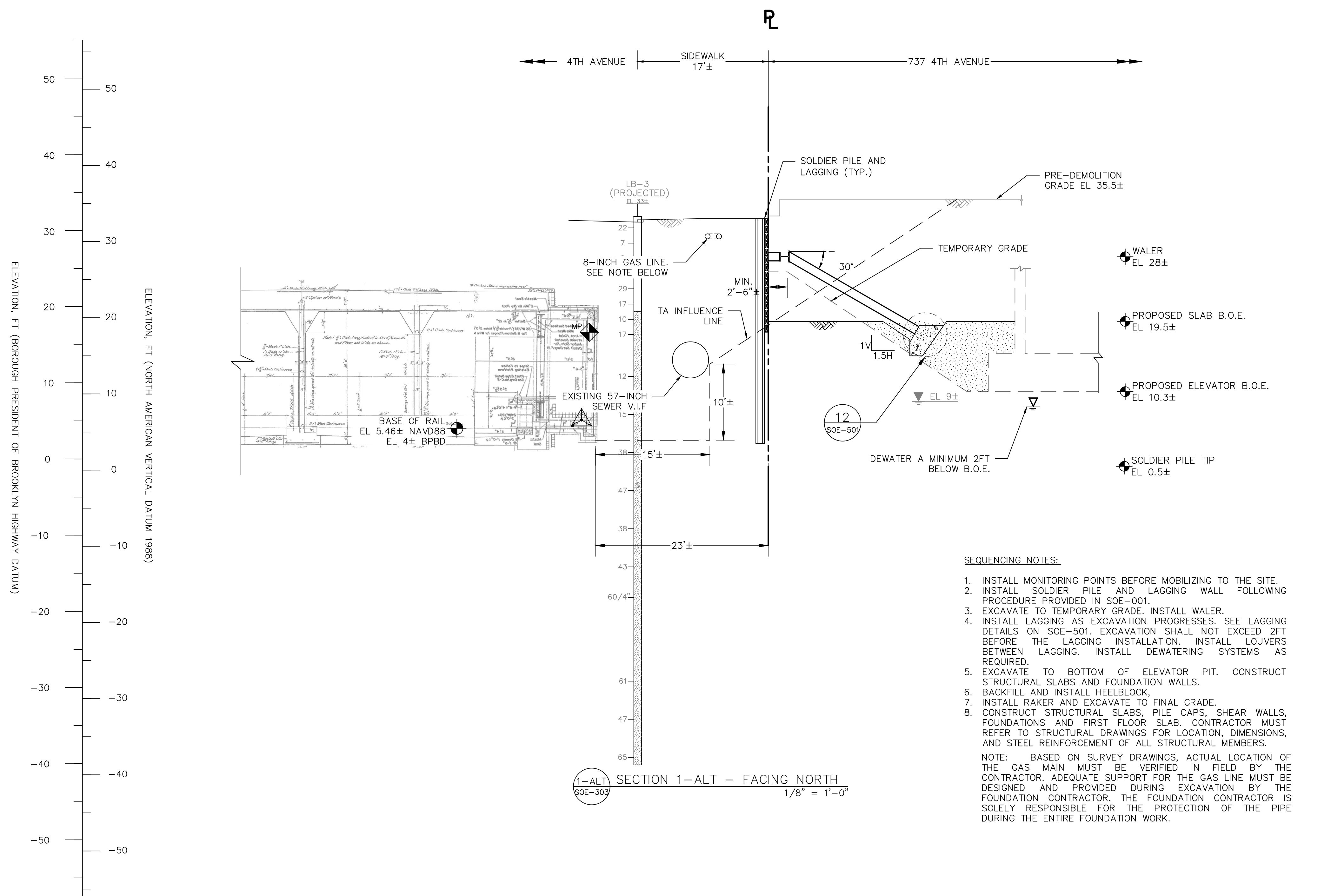
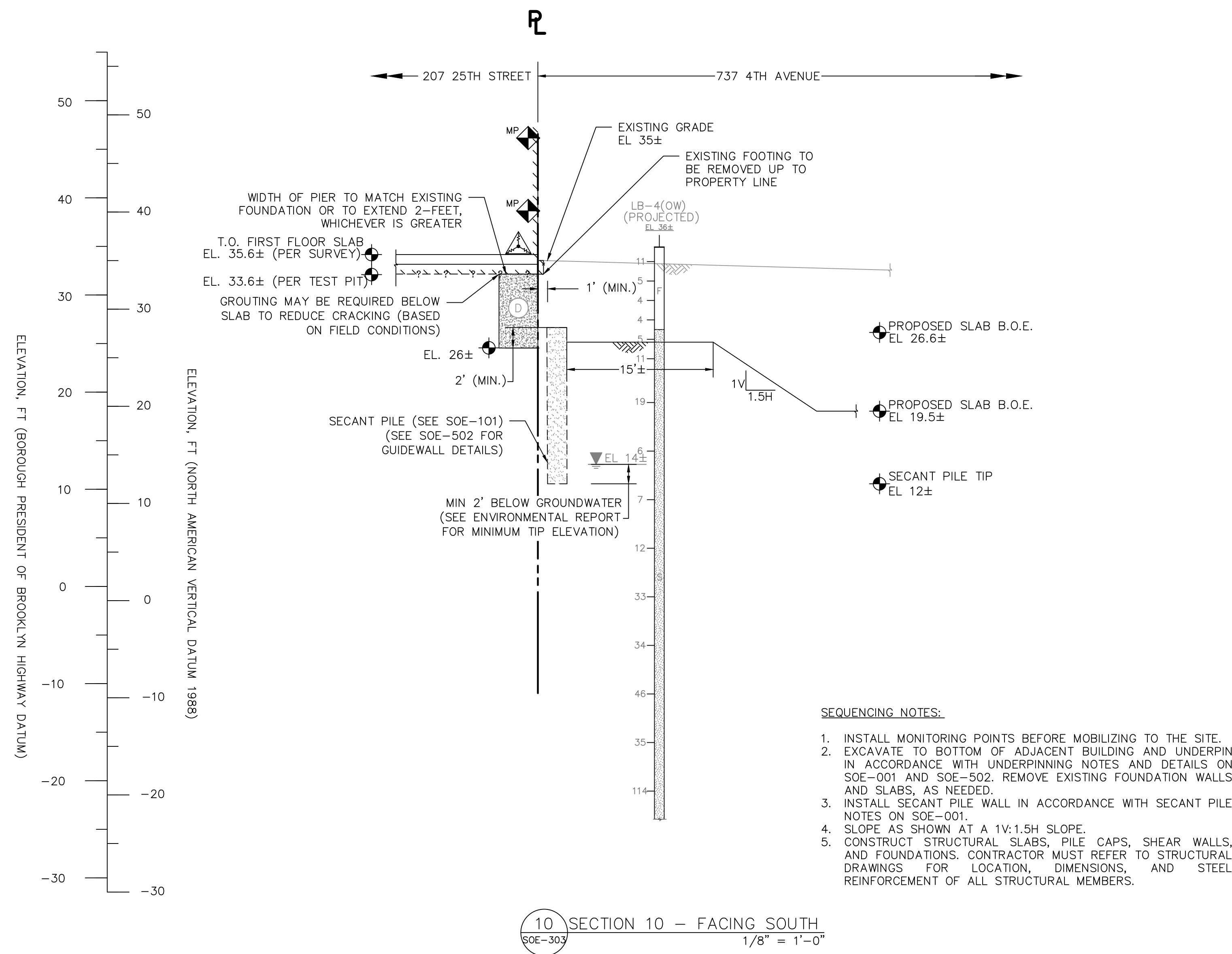
Figure





ATTACHMENT 1

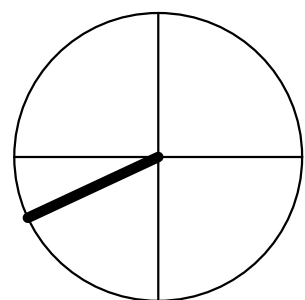




SUPPORT OF EXCAVATION FILED UNDER **DOBNOW# B00580365-S2**. FOR SUPPORT OF EXCAVATION FILING, UNDERPINNING SCOPE SHOWN FOR REFERENCE ONLY. FOR UNDERPINNING FILING SEE DOB FILING NUMBER **DOBNOW# B00580365-S6**.

UNDERPINNING FILED UNDER **DOBNOW# B00580365-S6**. FOR UNDERPINNING FILING, SUPPORT OF EXCAVATION SCOPE SHOWN FOR REFERENCE ONLY. FOR SUPPORT OF EXCAVATION FILING SEE **DOBNOW# B00580365-S2**.

FOUNDATIONS (STRUCTURAL) FILED UNDER **DOBNOW# B00580365-S8**.



SEAL & SIGNATURE

SUPPORT OF EXCAVATION
SECTIONS 02 13 2023

PROJECT No

21.002

SOE-303.00

SCALE: 1/8"=1'-0"

DOB NOW# B00580365-S6 (UNDERPINNING)
DOB NOW# B00580365-S2 (SUPPORT OF EXCAVATION)

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SUPPORT OF EXCAVATION SECTIONS

737 FOURTH AVENUE

BROOKLYN, NEW YORK 11232

No.	DESCRIPTION	DATE
	FOUNDATION SUBMISSION #1	10/06/21
1	FOUNDATION SUBMISSION #2	12/08/21
2	FOUNDATION SUBMISSION #3	01/11/22
3	FOUNDATION BID SET	08/12/22
4	DOB RESUBMISSION	08/17/22
5	ISSUED FOR 50% CD	11/4/2022
6	ISSUED FOR 60% CD	12/2/2022
7	NYCT AND DOB REFILEING	02/13/2023

SEAL & SIGNATURE

SUPPORT OF EXCAVATION
SECTIONS 02 13 2023

PROJECT No

21.002

SOE-303.00

SCALE: 1/8"=1'-0"

DOB NOW# B00580365-S6 (UNDERPINNING)
DOB NOW# B00580365-S2 (SUPPORT OF EXCAVATION)

ATTACHMENT 2



CICHETTI ENGINEERING PLLC

PO BOX 195
GERMANTOWN, NY 12526

August 7, 2023

Charlie Coll
CM & Associates Construction Management, LLC

Re: 737 4th Avenue
Brooklyn, NY
Dewatering Drawdown Model

Charlie,

We are pleased to submit the dewatering model to estimate the groundwater drawdown for the proposed dewatering operation at your 737 4th Avenue project. We based our analysis using the geotechnical Engineering Report by Langan Engineering dated April 11, 2022. As per your request, we've modeled based on the SOE by Langan Engineering, which shows secant piles along the MTA elevator pit excavation and soil sloping or trench box (open excavation) for the ejector and elevator pits. The dewatering plan prepared by Cichetti Engineering was utilized to construct the model and predict offsite drawdown.

GEOTECHNICAL PARAMETERS

The following data was used to construct the dewatering model.

- Geotechnical boring information from borings LB-1 to LB-10. The general subsurface stratigraphy on the site consists of a fill layer to about 6 to 14 feet bgs (below ground surface at about el 32 to 36) underlain by interlayered glacial till until boring completion depths of about 100 feet bgs.
- Fill: heterogeneous soils mixed with construction debris to about el 19 to 29.
- Interlayered glacial till consisting of sand, silt, and clay and is classified as SP, SM, ML, and CL.
- The measured static groundwater table is approximately El 14.
- Per the Geotechnical Report, the average street grade is El 34.
- Dewatering is required for the MTA elevator pit to about el 5 and for the ejector and elevator pits to about el 11 and el 10, respectively.
- For analysis we've assumed a homogeneous SM layer below groundwater.
- Based on the soil classification, we assumed a permeability value of 1.35×10^{-4} ft/s for the SM layer.
- Open excavation is assumed for the building elevator pit and ejector pits. A secant-pile wall with tip elevation at about el -8 is proposed for the MTA elevator pit excavation.
- For the dewatering system, 14 wellpoints are used within the MTA elevator pit, 6 wellpoints for the ejector pit, and 10 wellpoints for the building elevator pit. The spacing and layout of the wellpoints are taken from the dewatering plan.

CICHETTI ENGINEERING PLLC

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GERMANTOWN, NY 12526

RESULTS

We performed the dewatering analysis using GMS Aquaveo software. Based on our analysis we have estimated a steady-state flow of 26 gpm assuming that dewatering for all three pits will be performed simultaneously.

The following table shows the estimated drawdown outside of the site vs distance from the property line during the steady-state dewatering phase:

Distance from East Property Line (in feet)	Groundwater Drawdown Elevation (in E-W direction)
5	el 12.5
35	el 13
100	el 13.5

Please refer to Appendix A showing the groundwater model contours overlaid on the SOE site plan.

LIMITATIONS

- The aquifer hydrogeological properties have not been derived (via pump test) for this site and the input drawdown values are based on a theoretical range of permeability values.
- The on-site drawdown results could vary from the predictions of the dewatering model and if variation is observed, there should be a contingency plan to mitigate drawdown effects.
- Any new data must be brought to our attention for the recalibration of the model.
- Drawdown within the site shall be monitored to prevent “over-dewatering.”
- The groundwater drawdown model is subject to information we currently have, proper installation of the dewatering system, assumptions, and theoretical values.

Should you have any questions, I can be reached at (845) 598-5018 or matt@cichettiengineering.com.

Sincerely,



Matthew Cichetti, PE
Chief Engineer

CICHETTI ENGINEERING PLLC

PO BOX 195
GERMANTOWN, NY 12526

APPENDIX A

