APPENDIX F

SLUG TESTING LOGS/DATA

MEMO

To:

Robert Porsche

Copies:

File

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From:

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Date:

November 7, 2017

Arcadis Project No.:

B0018800.0000.00501

Subject:

Gowanus Canal 1st Street Turning Basin Slug Tests Memorandum

INTRODUCTION

Arcadis and Preferred Environmental performed slug tests at the Gowanus Canal 1st Street Turning Basin on September 7 and 8, 2017. The purpose was to assess saturated soil hydraulic conductivity in shallow and deep materials, in support of possible dewatering operations. Two zones were tested using previously installed and developed monitoring wells: (a) shallow wells screened across the water table; and (b) deep wells screened into confined sand and silt below a clay layer which forms the base of the shallow zone.

Wells and Slug Tests

This section details well construction, stratigraphic intersections with the screens, and slug tests.

Wells

Shallow zone monitoring wells MW-3S, MW-4S, and MW-5S, and deep monitoring wells MW-3D, MW-4D and MW-5D were installed at locations indicated in Figure 1. According to Mr. Bryan Comey of Preferred Environmental, monitoring wells MW-4S/D and MW-5S/D were completed as nested pairs within 8-inch diameter boreholes, with screens separated by cement-bentonite grout, Monitoring wells MW-3S and MW-3D were also originally completed as a nested pair. However, during initial well development efforts, it was noted that screen for monitoring well MW-3S had filled with sand. Efforts to clear the well of sand were unsuccessful and a new monitoring well MW-3S was drilled and set just east of the initial location.

Each of the monitoring wells were constructed of 2-inch diameter, Schedule 40 polyvinyl chloride casing and screens. Screens were machine-milled with 10-slot openings. Draft well construction logs, provided in Attachment A, do not detail the nested pairs constructions. Well construction details are summarized in Table 1.

Monitoring well MW-3S is screened across the water table, within fill comprising crushed brick and concrete. Underlying clay with 'glass and organics' were intersected by SB-3 about 1 ft below the screen base. MW 3D is screened across clay to 31 feet below ground surface (bgs), with only the bottom 2 feet is screened across poorly graded sand.

Monitoring well MW-4S is screened across the water table, within fill comprising sand, silt, crushed brick and concrete. At this location, low plasticity clay was intersected by SB-4 at 25 feet bgs. Deep monitoring well MW-4D was not slug tested due to presence of Non-Aqueous Phase Liquid (NAPL).

Monitoring well MW-5S is screened across the water table, within fill comprising sand with silt and gravel. The basal 2 feet is screened across low plasticity silty clay. Deep monitoring well MW-5D is screened from the base of the overlying clay (25 ft bgs), within fill comprising black silty sand with some brick.

Basal clay or other fine-grained materials have not been intersected below the deep wells MW-3D and 5D. For the purposes of slug tests analyses in these wells, Arcadis assumes the top of such material at 40 feet bgs. Consequently, assumed aquifer thicknesses for MW-3D and MW-5D are 9 and 15 feet respectively, as noted in Table 1.

Slug Tests

Physical slugs of 3 and 4-feet lengths and 1.5-inch diameters were used to initiate the tests to potentially determine the presence of skin effects; field records are presented in Attachment B. Attachment B records the number and direction (falling or rising head) of the tests, the number of tests initiated with each slug, and slug submergence during tests in the shallow wells. Since monitoring wells MW-3S, 4S and 5S are screened across the water table, only rising head tests were performed; in monitoring wells MW-3D and 5D both falling and rising head tests were performed. Water levels were manually recorded from the top of the riser pipes prior to the start of the tests.

A Van Essen 'Micro-Diver' pressure transducer was used to record the tests, with a 'BaroDiver' transducer to record barometric pressure. The transducer records were linear time at a half second (0.5 second) frequency. The 'Micro-Diver' was chosen due to its small size, thereby enabling as much physical slug submergence as possible in the shallow wells. Tests were programmed, recorded in real time, and compensated for barometric response using Schlumberger's 'Diver Office' software. Tests recovered to static prior to initiation of additional tests. Native data files and exported compensated responses are included in Attachment C

The native 'Diver Office' files, once compensated for barometric effects, were exported to workbooks for pre-processing (Attachment D). A summary of subsequent analyses in Aqtesolv are also included in Attachment D.

Elapsed time and displacement data were analyzed using Aqtesolv; the files of which are included in Attachment E. Aqtesolv analyses/output plots are included as Figures 2 through 23.

Slug Tests Analyses

Results of the slug tests using Aqtesolv are presented in Table 1. Output from Aqtesolv are presented in Figures 2 to 23.

As shown in Table 1, the length of screens in MW-5S and MW-3D contributing to flow are less than: (a) saturated screen length below the water table of the unconfined zone well MW-5S; and (b) installed length in confined zone well MW-3D. This is because these two wells were installed partly across clay. The contribution of flow into and out of these wells is due only to the that part of the well screened in sand.

The following comments are provided regarding the usability of the tests.

These tests were conducted using physical slugs. Insertion (falling head tests) and removal (rising head tests) were not instantaneous as the slugs were of 3 and 4 feet in length.

The 'Micro-Diver' transducer frequency of 0.5 second is not 'fast' enough for rapid responses in high conductivity materials. This limited the ability to determine: (a) a double straight-line effect due to potential differences between filter pack and formation materials in over-damped responses; and (b) peak response times in critically and undamped responses.

Bore hole diameters of 8-inches limit the effectiveness of the tests, since the screen and riser pipe diameters are 2-inches in diameter. The effect of nested wells, and the possible interference from the adjacent 2-inch riser pipe on the tested well could not be determined, but was not expected since the well screen zones were separated with a bentonite seal.

In the confined deep wells MW-3D and MW-5D, there may have been inertial responses in the filter pack; a combination of a 0.5 second transducer frequency, non-instantaneous slug movement, and splashing "noise" (always the case with physical slugs) potentially limit the validity of the analyses.

In the shallow wells in unconfined material, critically damped and undamped responses were recorded. In accordance with Butler (1998), the non-instantaneous slug movement made it necessary to translation the observed response data versus time to pick the largest displacements for analysis (Attachment D). While somewhat successful, it was difficult to accurately identify peak displacements due to the limited record frequency.

Differences between tests using the same slug and initiation direction, and differences between rising and falling head tests (MW-3D and 5D) indicate well skin effects likely due to incomplete development.

REFERENCES

Butler, J.J. (1998). "The design, performance, and analysis of slug tests". Lewis Publishers.

TABLES

FIGURES

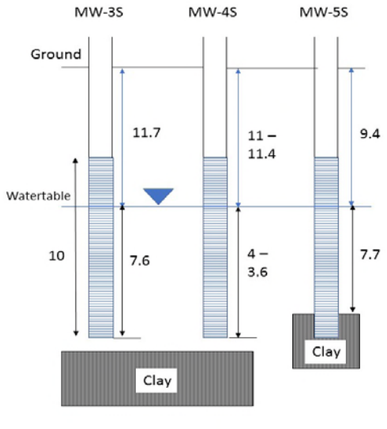
ATTACHMENT

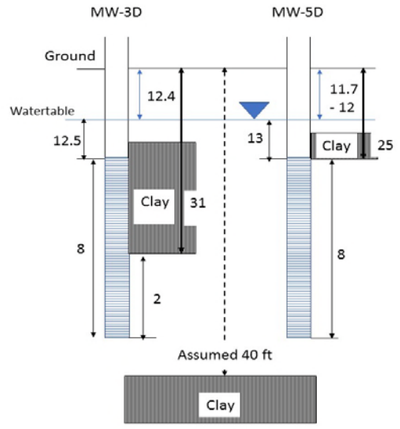
Table 1
Gowanus Canal 1st St Turning Basin
Summary of Well Constructions and Estimated Hydraulic Conductivity, using Physical Slugs

Well	Screen Interval (bgs)				Screen Length (ft)		Aquifer					Slug Test Response Type	Estimated Hydraulic Conductivity		
	Top. As built	Top. Defined by SWL (unconfined)	Top. Defined by Base of Overlying Confining Layer	Base. As built	Length. As built	Saturated Length	SWL (bgs)	Type	Top (bgs). [Unconfined Aquifer = SWL].	Base (bgs). Not intersected in Confined Aquifer.	Thickness (ft)		K (ft/min)	K (cm/sec)	Comments
MW-3S	Tests with 3 ft long slug, saturated length = 3 ft											Tests with 3 ft long slug, saturated length = 3 ft			Rapid inertial responses. Model matches limited by 0.5 sec transducer frequency. Well suitability mass balance check (Butler, 2014) not applicable.
	9.3	11.82	NA	19.3	10	7.5	11.82	Unconfined	11.8	23.5	11.7	Undamped	0.09	4.3E-02	
													0.08	4.2E-02	
	Tests with 4 ft long slug, saturated length = 4 ft											Tests with 4 ft long slug, saturated length = 4 ft			
	9.3	11.67	NA	19.3	10	7.7	11.67	Unconfined	11.7	23.5	11.8	Undamped	0.07	3.7E-02	
													0.06	3.0E-02	
MW-4S	Tests with 3 ft long slug, saturated length = 2.8 ft											Tests with 3 ft long slug, saturated length = 2.8 ft			Well suitability mass balance check (Butler, 2014) suggest poor well suitability as formation responses similar to filter pack.
	5	11.01	NA	15	10	4.0	11.01	Unconfined	11.0	25	14.0	Damped	0.40	2.0E-01	
	Tests with 4 ft long slug, saturated length = 3.6 ft											Tests with 4 ft long slug, saturated length = 3.6 ft			
	5	11.43	NA	15	10	3.6	11.43	Unconfined	11.4	25	13.6	Critically Damped	0.38	1.9E-01	
													0.29	1.5E-01	
MW-5S	Tests with 3 ft long slug, saturated length = 3 ft											Tests with 3 ft long slug, saturated length = 3 ft			Critically damped inertial responses. Model matches limited by 0.5 sec transducer frequency. Well suitability mass balance check (Butler, 2014) not applicable.
	9	9.35	NA	19	10	7.7	9.35	Unconfined	9.4	17	7.7	Undamped	0.55	2.8E-01	
	Tests with 4 ft long slug, saturated length = 4 ft											Tests with 4 ft long slug, saturated length = 4 ft			
	9	9.35	NA	19	10	7.7	9.35	Unconfined	9.4	17	7.7	Undamped	0.69	3.5E-01	
													0.57	2.9E-01	
MW-3D	Tests with 3 ft long slug, saturated length = 3 ft											Tests with 3 ft long slug, saturated length = 3 ft			Potential inertial responses within first 4 +/- seconds may be due to filter pack; transducer frequency of 0.5 sec limits determination. Results not expected from fine to medium poorly graded sand.
	24.9	NA	31	32.9	8	1.9	12.22	Confined	31.0	Assumed 40 ft bgs	9.0	Over damped	0.0039	2.0E-03	
													0.0037	1.9E-03	
													0.0032	1.6E-03	
													0.0028	1.4E-03	
	Tests with 4 ft long slug, saturated length = 4 ft											Tests with 4 ft long slug, saturated length = 4 ft			
	24.9	NA	31	32.9	8	1.9	12.38	Confined	31.0	Assumed 40 ft bgs	9.0	Over damped	0.0086	4.4E-03	
													0.0028	1.4E-03	
MW-5D	Tests with 3 ft long slug, saturated length = 3 ft											Tests with 3 ft long slug, saturated length = 3 ft			Some filter pack inertial responses. Model matches limited by 0.5 sec transducer frequency.
	25	NA	25	33	8	8.0	11.73	Confined	25.0	Assumed 40 ft bgs	15.0	Over damped	0.0005	2.5E-04	
													0.0006	3.0E-04	
													0.0005	2.3E-04	
													0.0004	2.0E-04	
	Tests with 4 ft long slug, saturated length = 4 ft											Tests with 4 ft long slug, saturated length = 4 ft			
	25	NA	25	33	8	8.0	12.03	Confined	25.0	Assumed 40 ft bgs	15.0	Over damped	0.0008	4.3E-04	Likely filter pack inertial responses. Tests not reliable.
													0.0002	1.2E-04	

Note:
All wells constructed with 2-inch diameter schedule 40 PVC in 8-inch diameter boreholes.
bgs
SWL
Slugs; 3 and 4 ft long 1.5-inch diameter solid PVC.
Falling and Rising Head tests conducted in MW-3D and MW-5D.
Conversion 0.508
Since the aquifer base @ MW-3D & MW-5D was not intersected, thicknesses at MW-3D & 5D are unknown. Assume the wells are partially penetrating and that the aquifer base is the same depth at both by adding 5 ft below screen bases giving a constant depth of 40 feet bgs. Since the depths of the base of the upper confining layer is 31 ft @ MW-3D and 25 ft @ MW-5D, the assumed aquifer thickness are 9 ft @ MW-3D & 15 ft @ MW-5D.

Note:
Borehole diameters of 8-inches, and nested well constructions limit effectivness of slug tests in all cases. Results may not properly reflect the formation materials being tested.





LEGEND:

- PROJECT SITE BOUNDARY
- LOT LINE
- PROPOSED CONSTRUCTED WETLAND AREA
- PREVIOUSLY INSTALLED MONITORING WELL
- OFF-SET MONITORING WELL
- SOIL BORINGS TO 18 FT BGS IN PROPOSED WETLAND SHELF
- SOIL BORINGS TO 33 FT BGS
- SOIL BORINGS TO 33 FT BGS; MONITORING WELL/SLUG TESTING
- 453 BLOCK NUMBER
- 54 LOT NUMBER

NOTES:

1. BASE MAP PROVIDED BY AKRF ENGINEERING, P.C., PROJECTED TO NAD83 NY S.P. LONG ISLAND ZONE, US FEET.
2. IMAGERY PROVIDED BY USGS EARTHEXPLORER.
3. GCMW-27 PREVIOUSLY INSTALLED BY EPA.
4. BGS - BELOW GROUND SURFACE

0 20' 40'
APPROXIMATE SCALE IN FEET

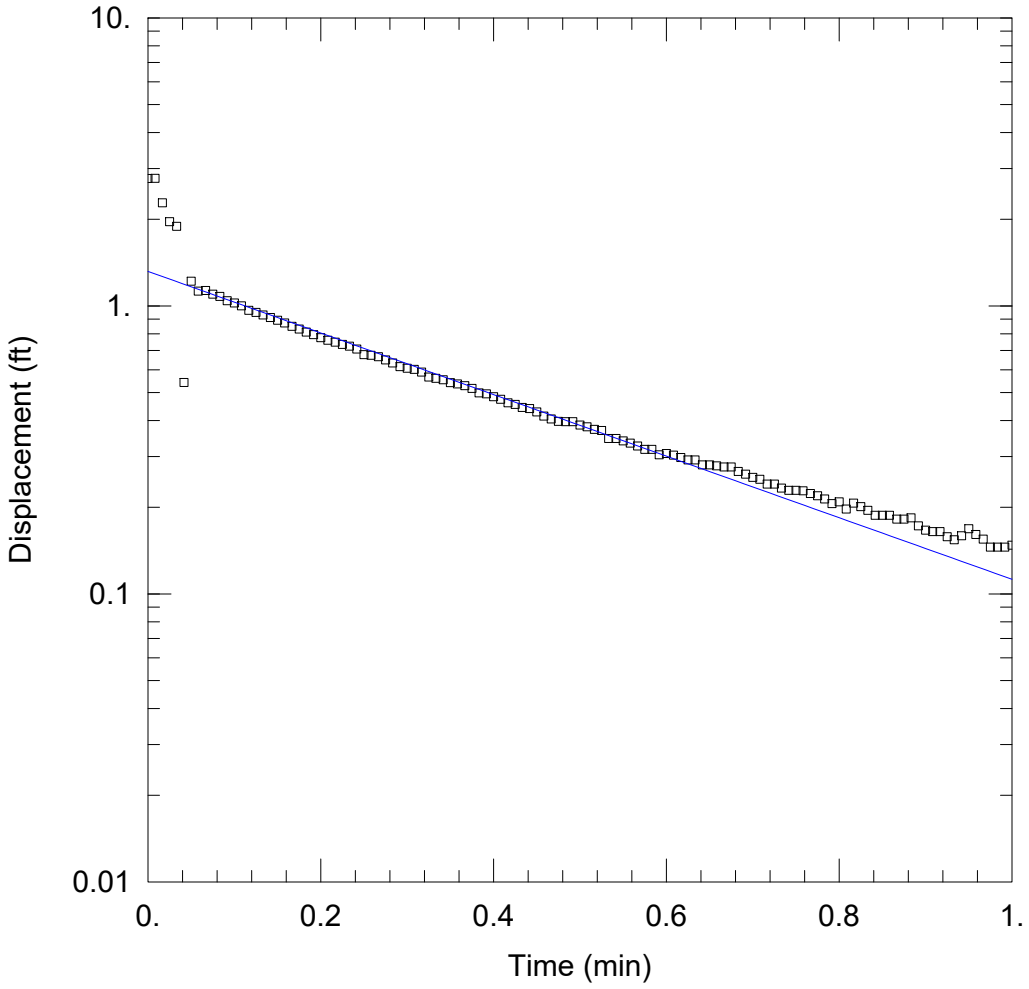
FIRST STREET TURNING BASIN - GOWANUS CANAL
BROOKLYN, NEW YORK

SAMPLE LOCATION MAP

AKRF KSE
The AKRF-KSE JV

FIGURE
2

CITY: SAN RAFAEL, CA DIV/GROUP: ENVCAD DB: A. SANCHEZ
C:\Users\alsanchez\Desktop\B00188800\00000\00501\DWG\18800B02.dwg LAYOUT: 2 SAVED: 11/10/2017 5:16 PM ACADVER: 20.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: --- PLOTTED: 11/10/2017 5:22 PM BY: SANCHEZ, ADRIAN
XREFS: IMAGES: PROJECTNAME: ---
18800X01 18800X01_200 FT.jpg
18800X0D AKRF-KES-JV_Logo2.png



MW-3D 3-FT SLUG FALLING HEAD -1

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW3D-3ftslug-fallinghead-test-1.aqt
Date: 10/19/17 Time: 08:56:24

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-3D
Test Date: 9/7/2017

AQUIFER DATA

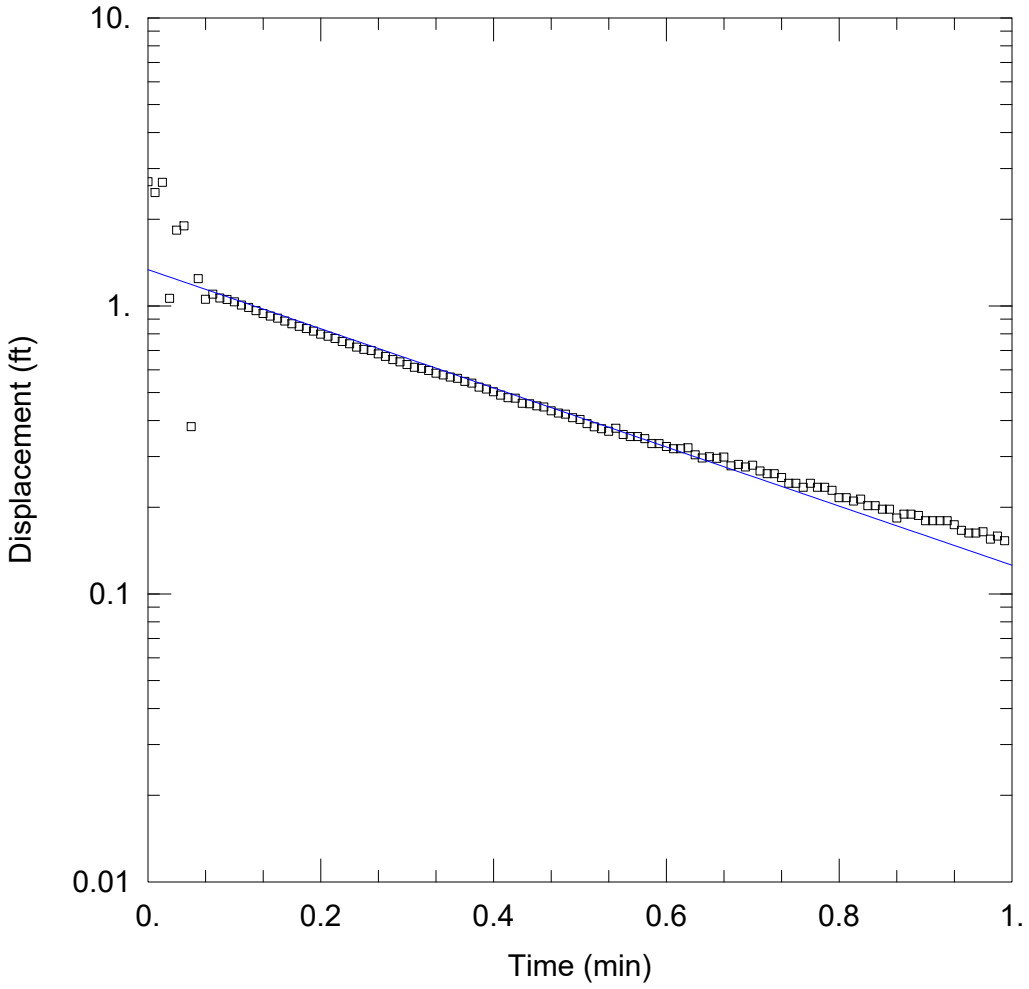
Saturated Thickness: 9. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-3D)

Initial Displacement: 2.77 ft
Total Well Penetration Depth: 2. ft
Casing Radius: 0.08 ft
Static Water Column Height: 20.2 ft
Screen Length: 2. ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Confined
K = 0.003835 ft/min
Solution Method: Bouwer-Rice
y0 = 1.318 ft



MW-3D 3-FT SLUG FALLING HEAD -2

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW3D-3ftslug-fallinghead-test-2.aqt
Date: 10/19/17 Time: 09:00:22

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-3D
Test Date: 9/7/2017

AQUIFER DATA

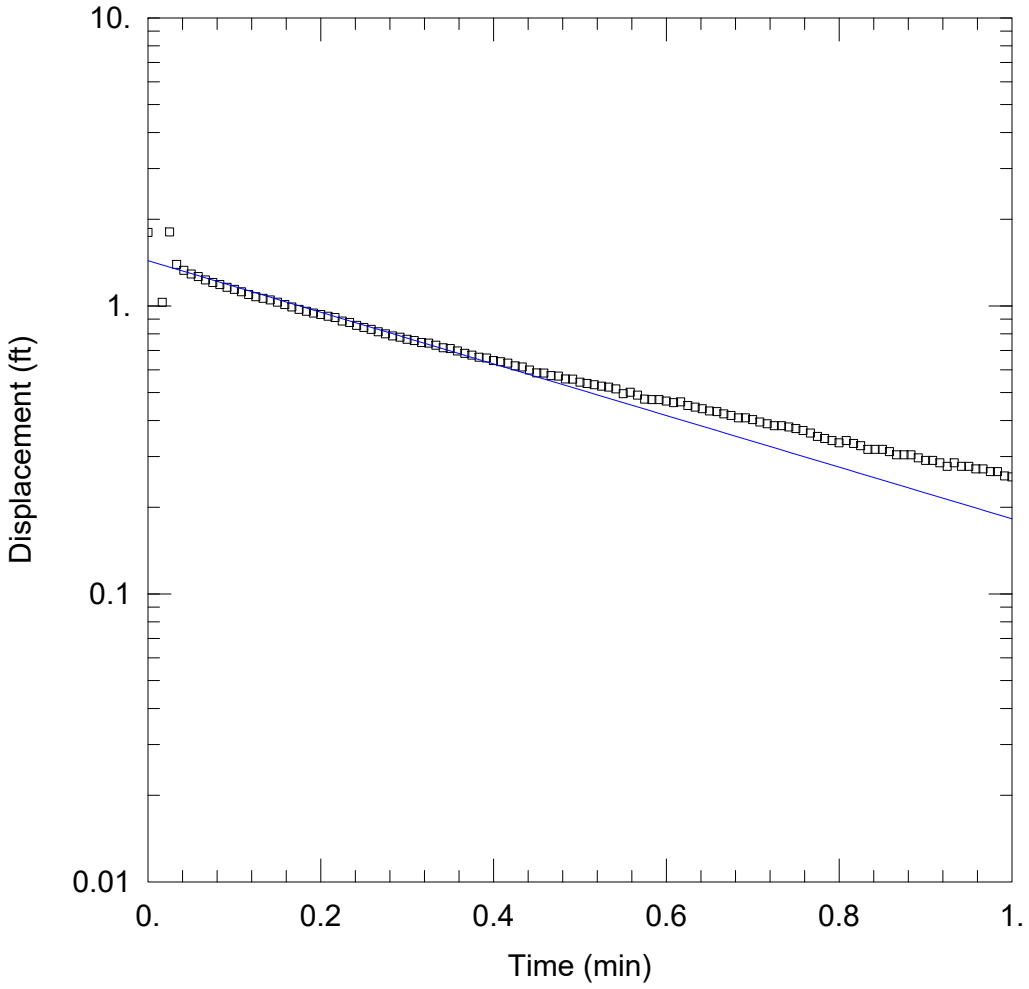
Saturated Thickness: 9. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-3D)

Initial Displacement: 2.7 ft
Total Well Penetration Depth: 2. ft
Casing Radius: 0.08 ft
Static Water Column Height: 20.2 ft
Screen Length: 2. ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Confined
K = 0.003681 ft/min
Solution Method: Bouwer-Rice
y0 = 1.336 ft



MW-3D 3-FT SLUG RISING HEAD -1

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW3D-3ftslug-rising-head-test-1.aqt
Date: 10/19/17 Time: 08:57:52

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-3D
Test Date: 9/7/2017

AQUIFER DATA

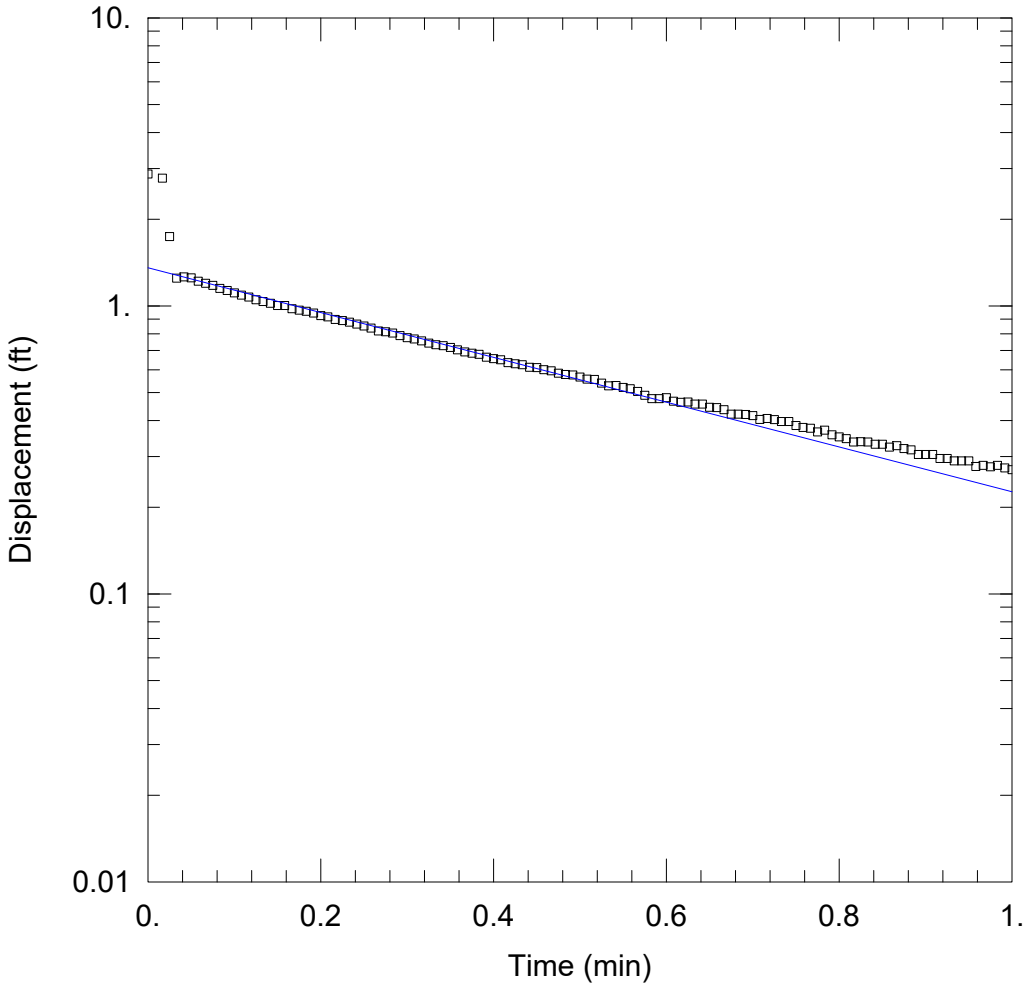
Saturated Thickness: 9. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-3D)

Initial Displacement: 1.8 ft
Total Well Penetration Depth: 2. ft
Casing Radius: 0.08 ft
Static Water Column Height: 20.2 ft
Screen Length: 2. ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Confined
K = 0.003215 ft/min
Solution Method: Bouwer-Rice
y0 = 1.436 ft



MW-3D 3-FT SLUG RISING HEAD -2

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW3D-3ftslug-rising-head-test-2.aqt
Date: 10/19/17 Time: 09:01:46

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-3D
Test Date: 9/7/2017

AQUIFER DATA

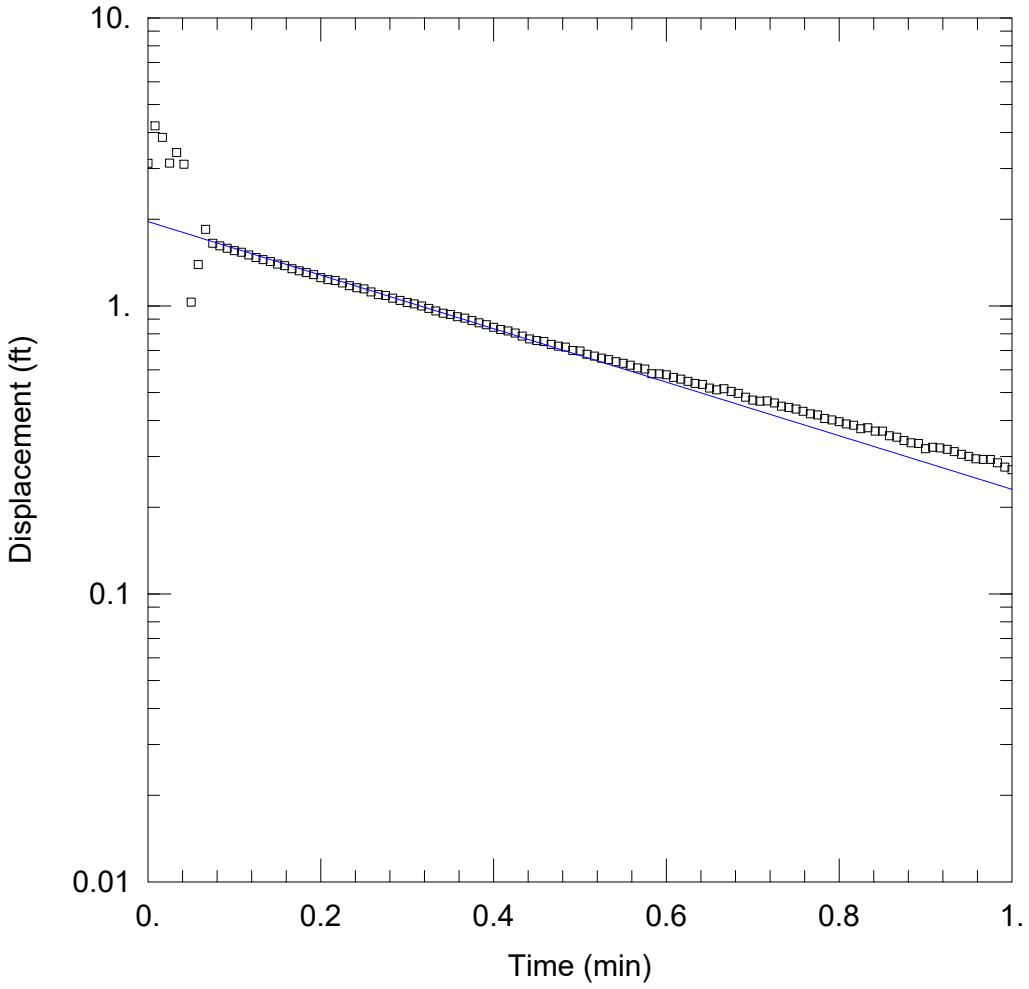
Saturated Thickness: 9. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-3D)

Initial Displacement: 2.87 ft
Total Well Penetration Depth: 2. ft
Casing Radius: 0.08 ft
Static Water Column Height: 20.2 ft
Screen Length: 2. ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Confined
K = 0.00279 ft/min
Solution Method: Bouwer-Rice
y0 = 1.357 ft



MW-3D 4-FT SLUG FALLINGHEAD -1

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW3D-4-ftslug-fallinghead-test-1.aqt
Date: 10/19/17 Time: 09:08:49

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-3D
Test Date: 9/7/2017

AQUIFER DATA

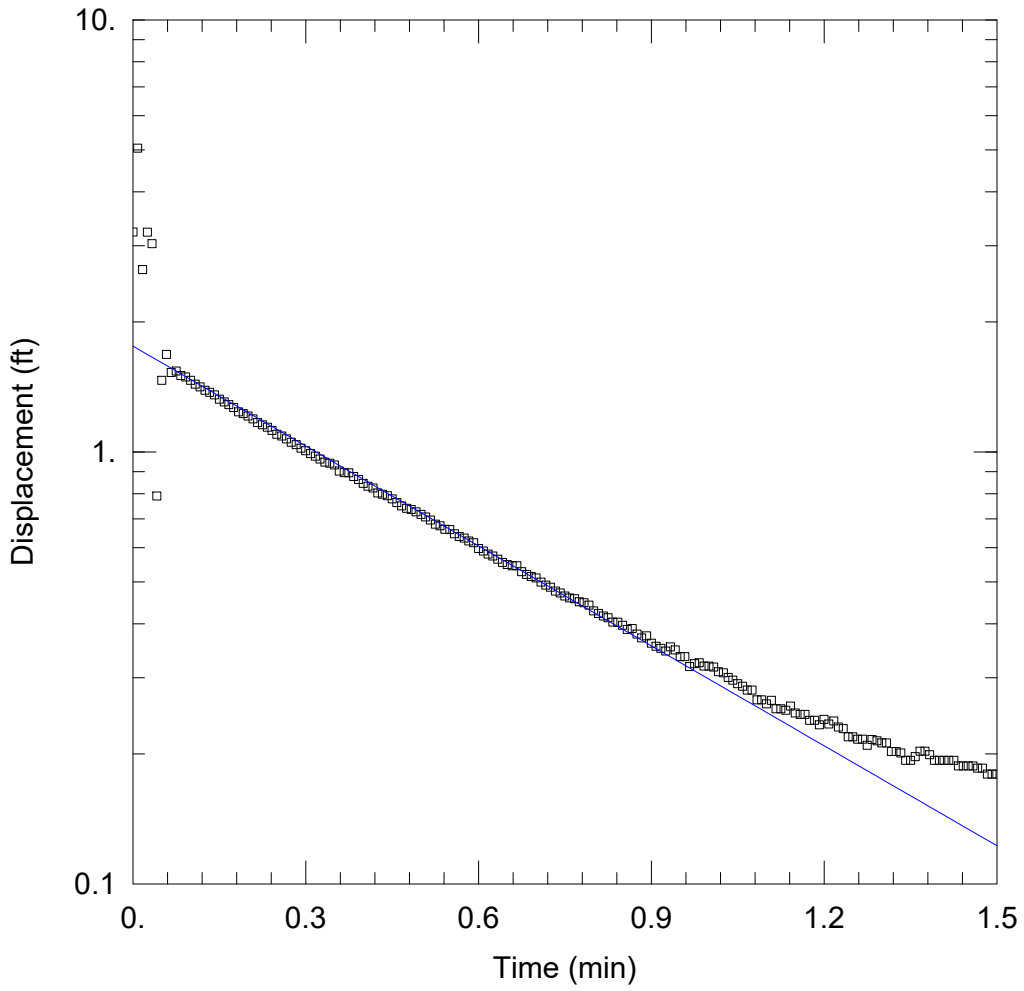
Saturated Thickness: 9. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-3D)

Initial Displacement: 3.13 ft
Total Well Penetration Depth: 2. ft
Casing Radius: 0.08 ft
Static Water Column Height: 20.2 ft
Screen Length: 2. ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Confined
K = 0.008567 ft/min
Solution Method: Hvorslev
y0 = 1.963 ft



MW-3D 4-FT SLUG FALLINGHEAD -2

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW3D-4-ftslug-fallinghead-test-2.aqt
Date: 10/19/17 Time: 09:14:07

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-3D
Test Date: 9/7/2017

AQUIFER DATA

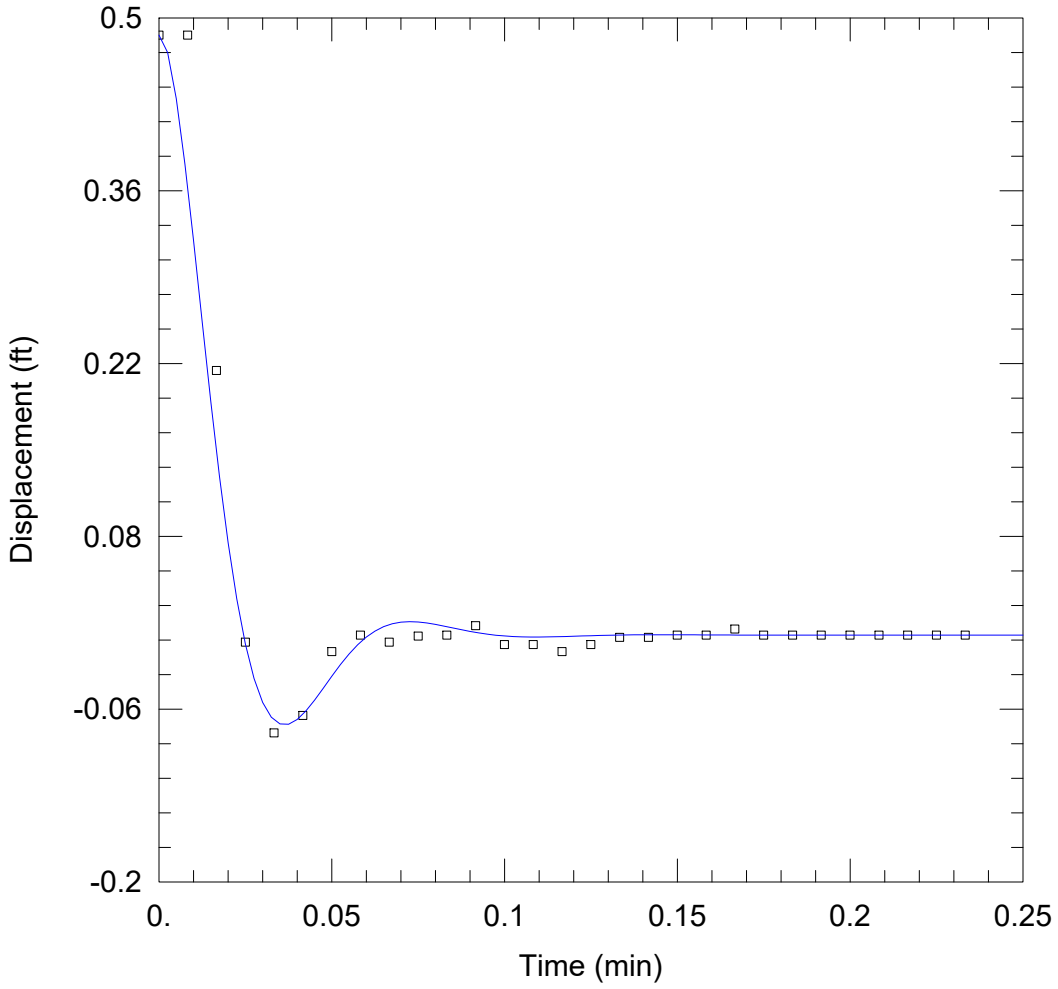
Saturated Thickness: 9. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-3D)

Initial Displacement: 3.23 ft
Total Well Penetration Depth: 2. ft
Casing Radius: 0.08 ft
Static Water Column Height: 20.2 ft
Screen Length: 2. ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Confined
K = 0.002765 ft/min
Solution Method: Bouwer-Rice
y0 = 1.757 ft



MW-3S 3-FT SLUG RISING HEAD TEST-1 TRANSLATION

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW3S-3ftslug-rising-head--test-1A.aqt
Date: 10/18/17 Time: 13:32:00

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-3S
Test Date: 9/7/2017

AQUIFER DATA

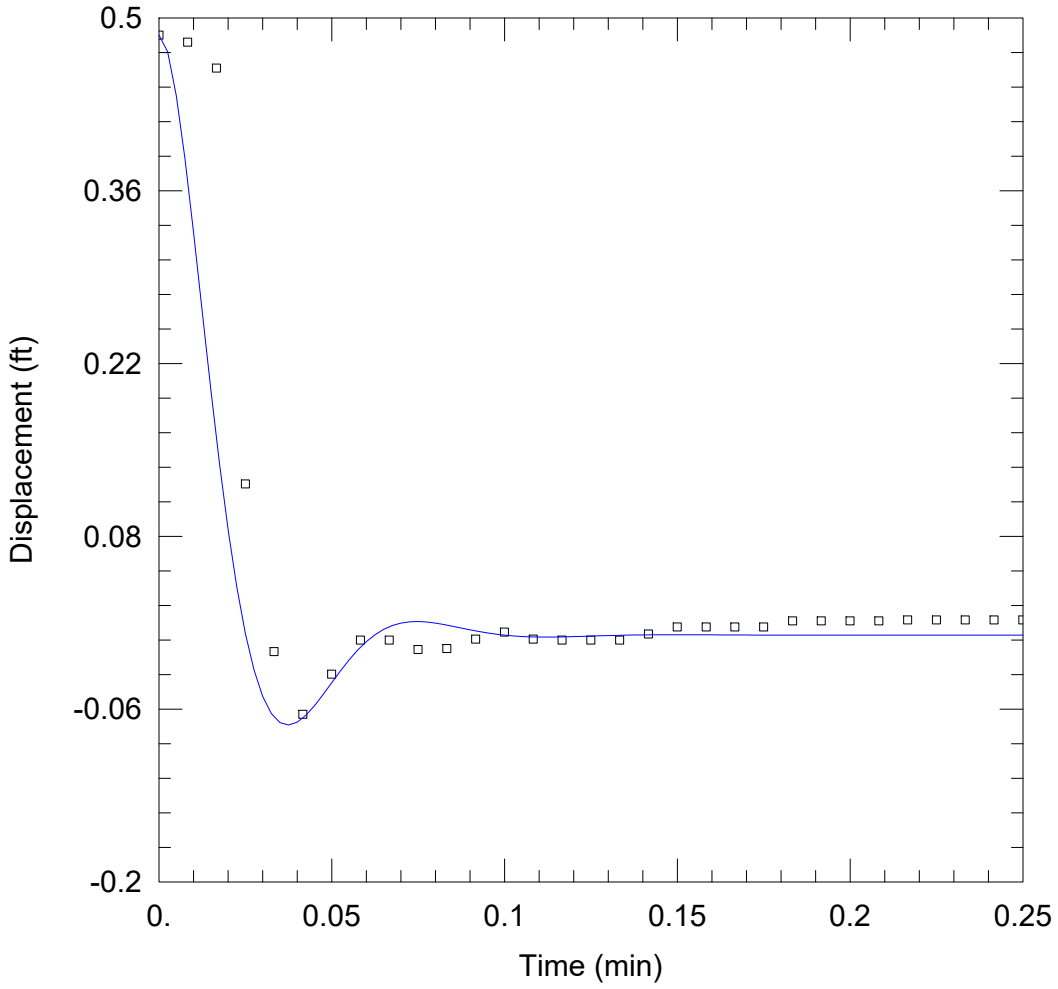
Saturated Thickness: 11.7 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-3S)

Initial Displacement: 0.4861 ft
Total Well Penetration Depth: 7.51 ft
Casing Radius: 0.08 ft
Static Water Column Height: 7.51 ft
Screen Length: 7.51 ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined
K = 0.08502 ft/min
Solution Method: Springer-Gelhar
Le = 11.33 ft



MW-3S 3-FT SLUG RISING HEAD TEST-2 TRANSLATION

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW3S-3ftslug-rising-head--test-2A.aqt
Date: 10/18/17 Time: 17:26:02

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-3S
Test Date: 9/7/2017

AQUIFER DATA

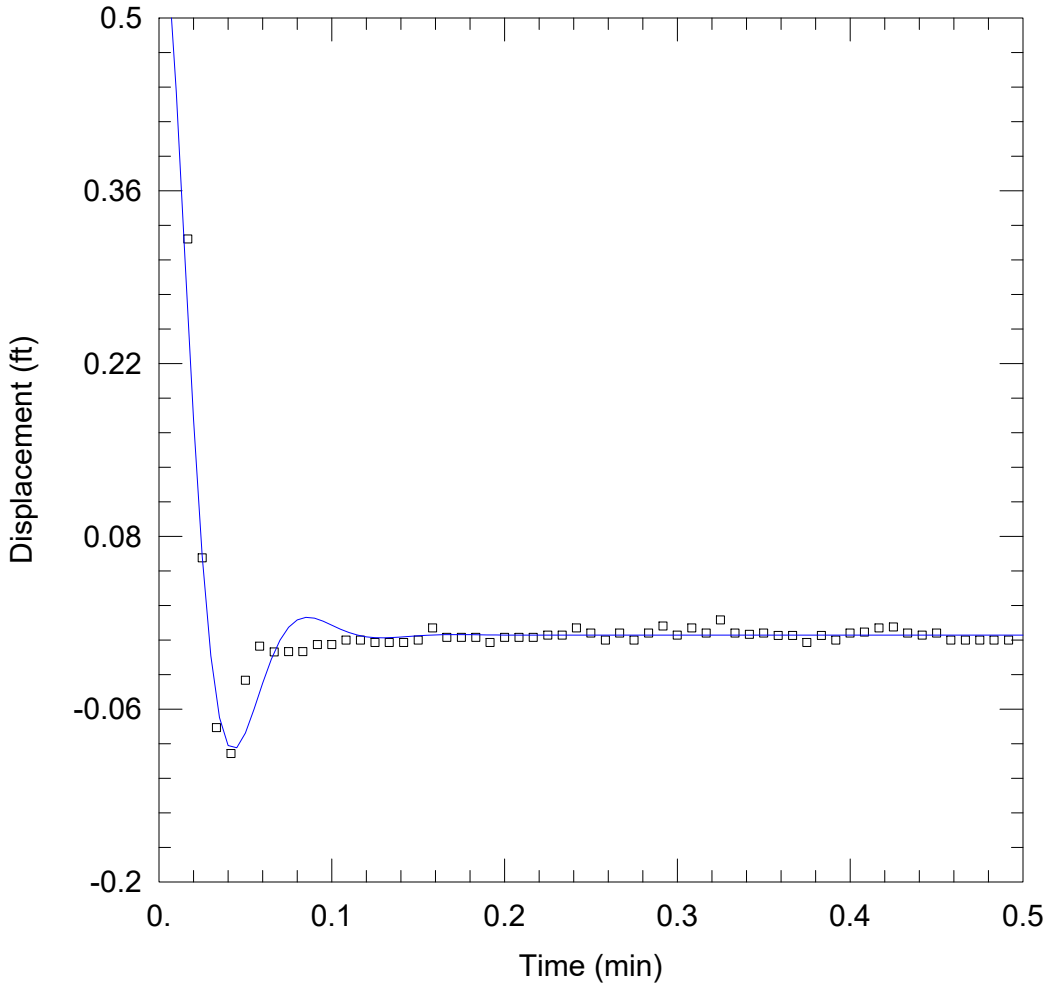
Saturated Thickness: 11.7 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-3S)

Initial Displacement: 0.4861 ft
Total Well Penetration Depth: 7.51 ft
Casing Radius: 0.08 ft
Static Water Column Height: 7.51 ft
Screen Length: 7.51 ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined
K = 0.08289 ft/min
Solution Method: Springer-Gelhar
Le = 11.96 ft



MW-3S 4-FT SLUG RISING HEAD TEST-1 TRANSLATION

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW3S-4ftslug-rising-head--test-1A.aqt
Date: 10/18/17 Time: 13:53:19

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-3S
Test Date: 9/7/2017

AQUIFER DATA

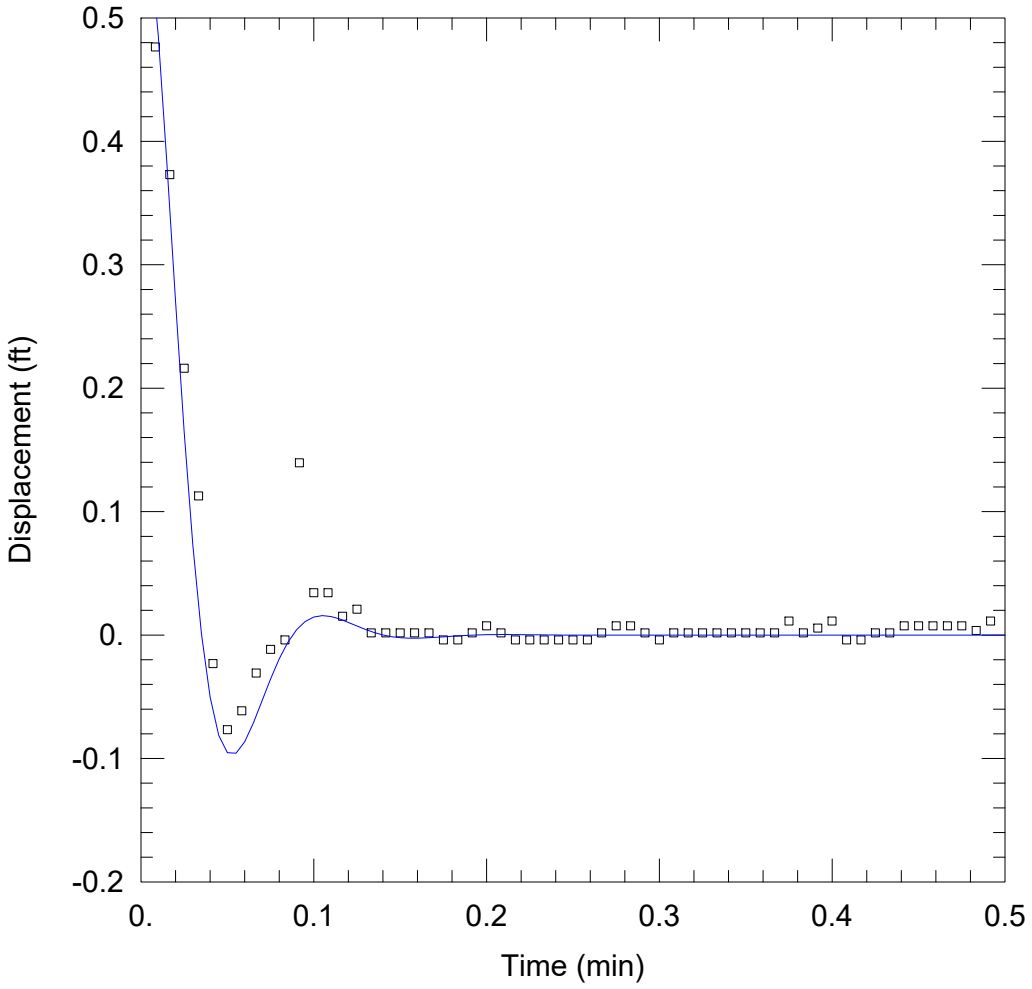
Saturated Thickness: 11.8 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-3S)

Initial Displacement: 0.5955 ft
Total Well Penetration Depth: 7.51 ft
Casing Radius: 0.08 ft
Static Water Column Height: 7.51 ft
Screen Length: 7.51 ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined
K = 0.07256 ft/min
Solution Method: Springer-Gelhar
Le = 16.03 ft



MW-3S 4-FT SLUG RISING HEAD TEST-2 BASELINE TRANSLATION

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW3S-4ftslug-rising-head--test-2B.aqt
Date: 10/18/17 Time: 14:11:22

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-3S
Test Date: 9/7/2017

AQUIFER DATA

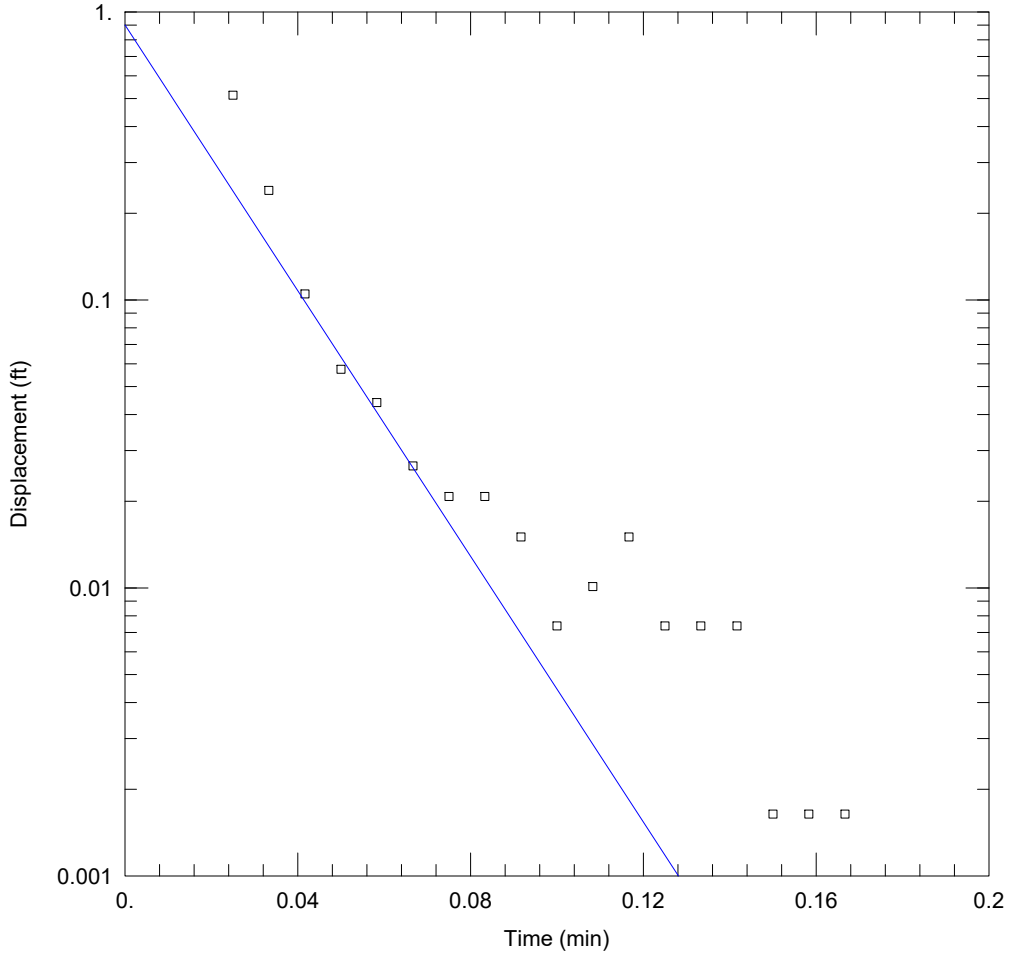
Saturated Thickness: 11.8 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-3S)

Initial Displacement: 0.5955 ft
Total Well Penetration Depth: 7.51 ft
Casing Radius: 0.08 ft
Static Water Column Height: 7.51 ft
Screen Length: 7.51 ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined
K = 0.05996 ft/min
Solution Method: Springer-Gelhar
Le = 24.35 ft



MW-4S 3FT SLUG RISING HEAD TEST #3

Data Set: C:\...\MW4S-3ftslug-rising-head--test-3.aqt
Date: 10/18/17 Time: 12:37:39

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-4S
Test Date: 9/7/2017

AQUIFER DATA

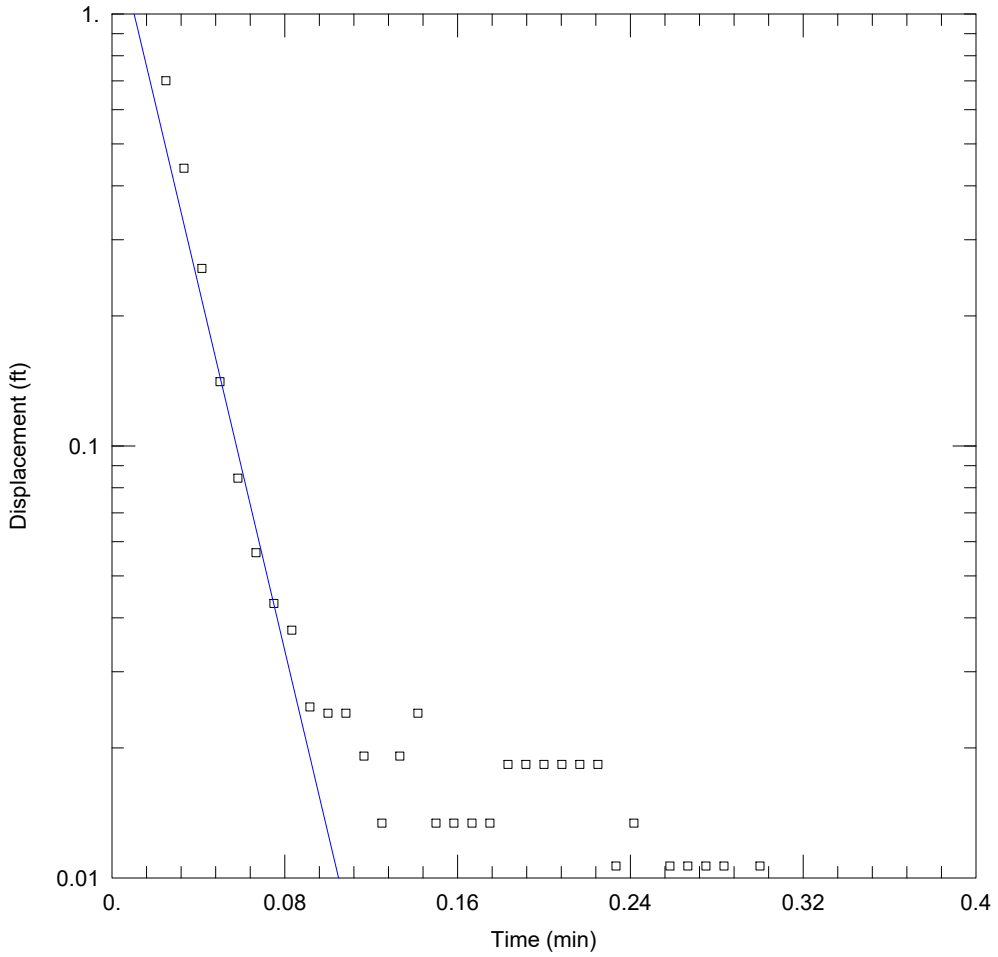
Saturated Thickness: 14. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-4S)

Initial Displacement: 1.11 ft
Total Well Penetration Depth: 3.68 ft
Casing Radius: 0.08 ft
Static Water Column Height: 3.68 ft
Screen Length: 3.68 ft
Well Radius: 0.33 ft
Gravel Pack Porosity: 0.32

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.3968 ft/min
y0 = 0.9005 ft



MW-4S 4FT SLUG RISING HEAD TEST #1-TRANSLATION

Data Set: C:\...\MW4S-4ftslug-rising-head--test-1A.aqt
Date: 10/18/17 Time: 12:48:46

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-4S
Test Date: 9/7/2017

AQUIFER DATA

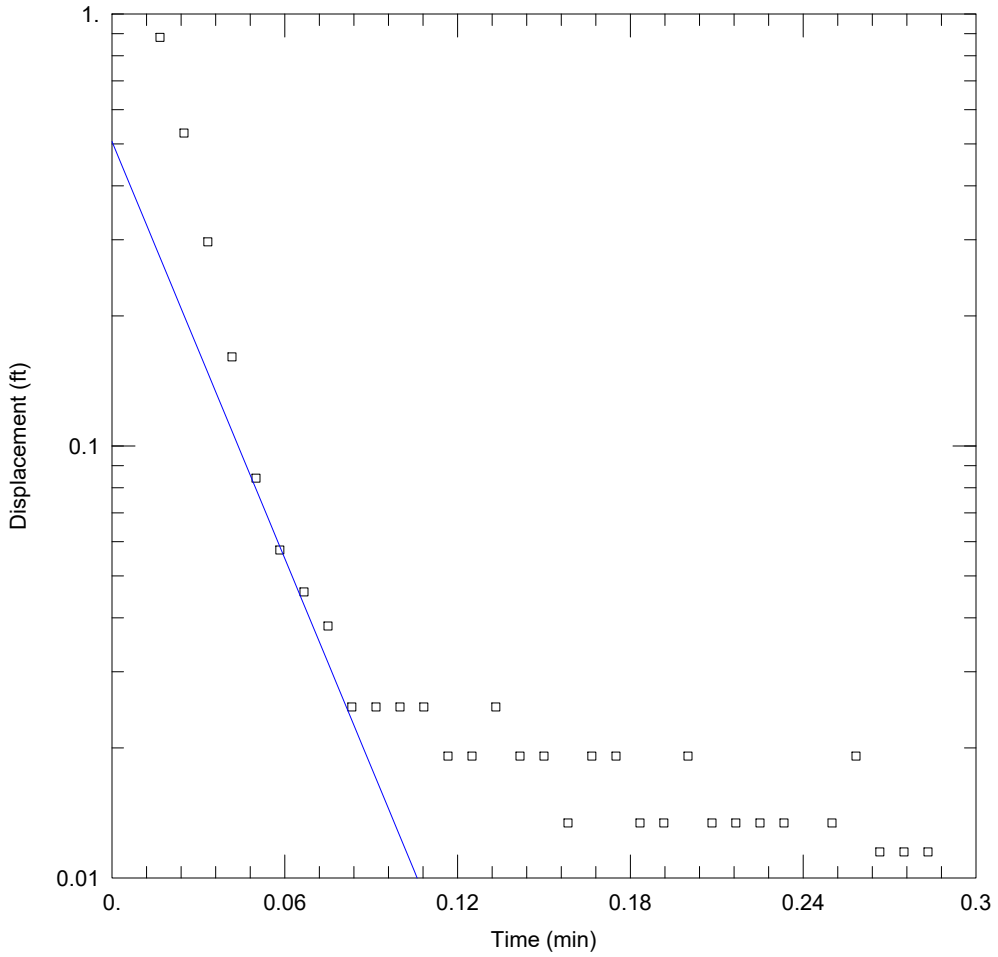
Saturated Thickness: 13.6 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-4S)

Initial Displacement: 1.16 ft
Total Well Penetration Depth: 3.26 ft
Casing Radius: 0.08 ft
Static Water Column Height: 3.68 ft
Screen Length: 3.26 ft
Well Radius: 0.33 ft
Gravel Pack Porosity: 0.32

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.3831 ft/min
y0 = 1.648 ft



MW-4S 4FT SLUG RISING HEAD TEST #3 TRANSLATION

Data Set: C:\...\MW4S-4ftslug-rising-head--test-3A.aqt
Date: 10/18/17 Time: 13:01:27

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-4S
Test Date: 9/7/2017

AQUIFER DATA

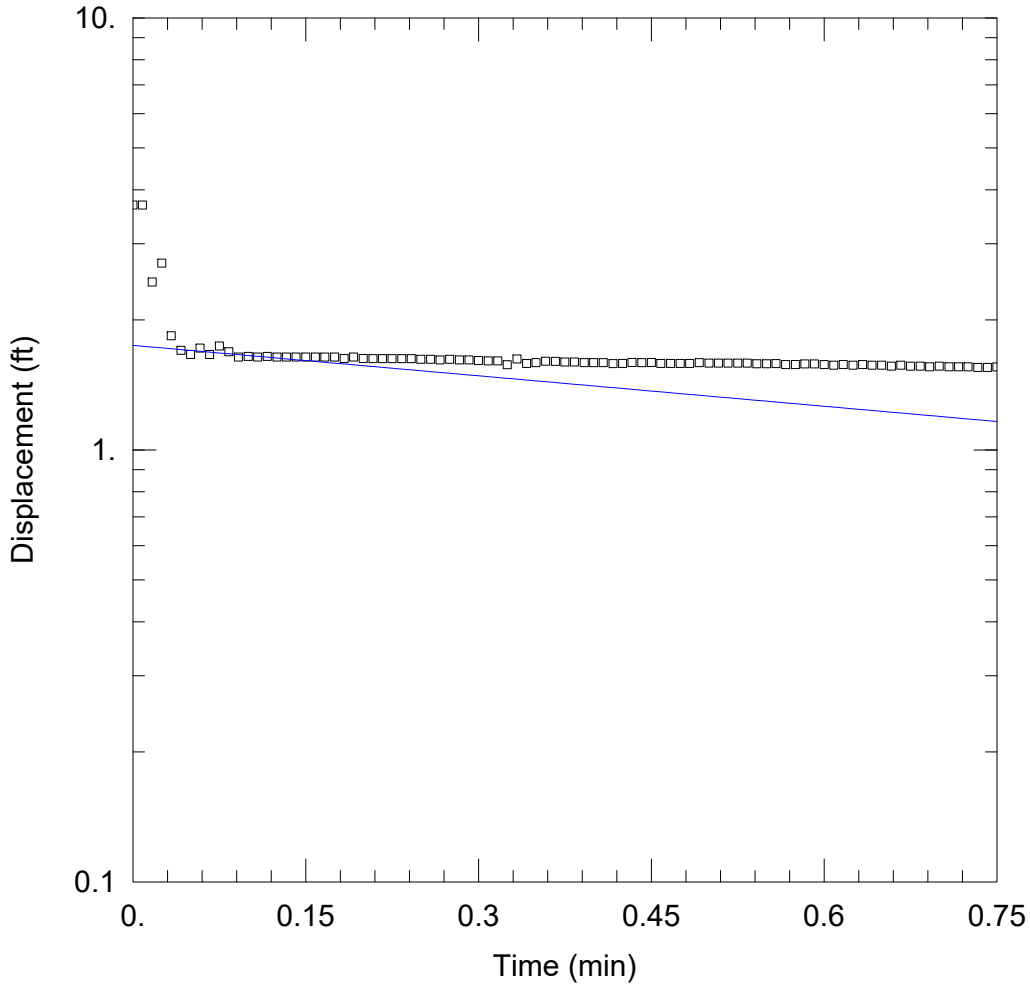
Saturated Thickness: 13.6 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-4S)

Initial Displacement: 1.366 ft
Total Well Penetration Depth: 3.26 ft
Casing Radius: 0.08 ft
Static Water Column Height: 3.26 ft
Screen Length: 3.26 ft
Well Radius: 0.33 ft
Gravel Pack Porosity: 0.32

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.2916 ft/min
y0 = 0.5065 ft



MW-5D 3-FT SLUG FALLINGHEAD -1

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW5D-3-ftslug-fallinghead-test-1.aqt
Date: 10/19/17 Time: 09:27:30

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-5D
Test Date: 9/8/2017

AQUIFER DATA

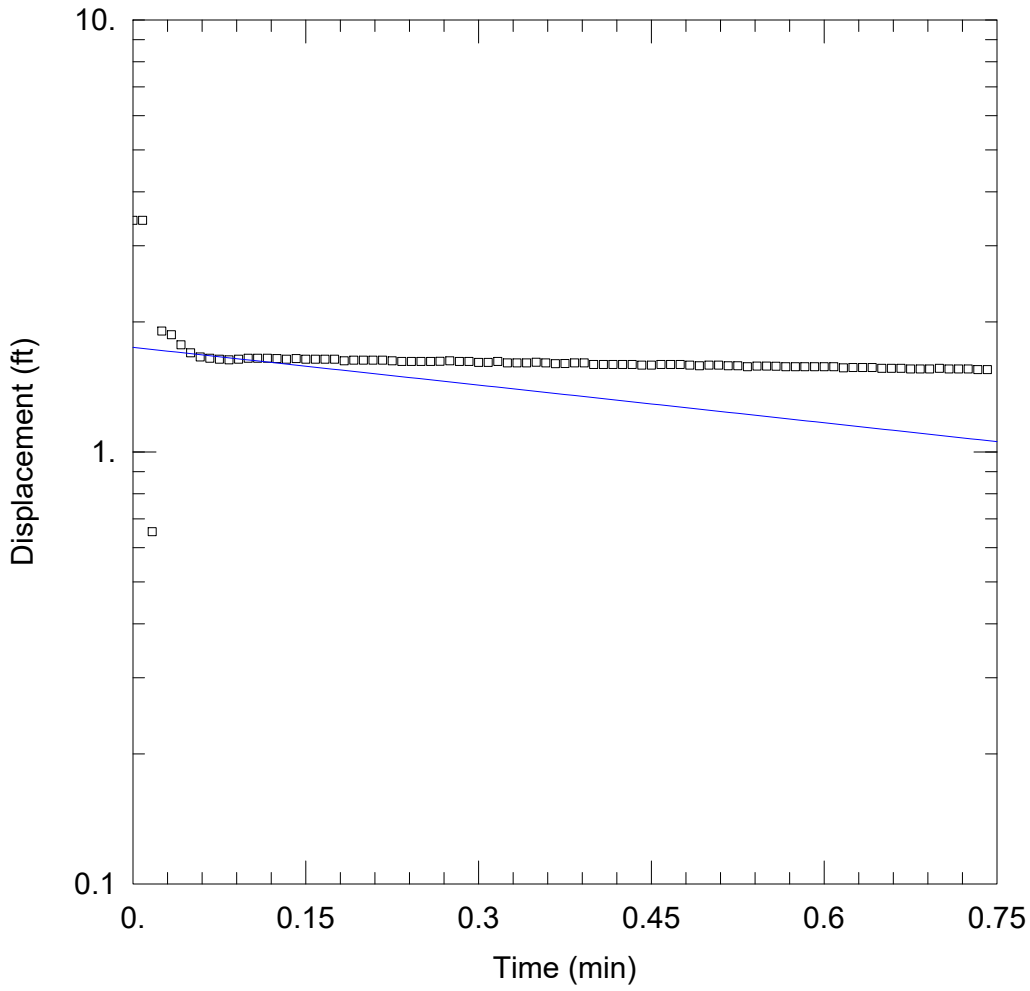
Saturated Thickness: 15. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-5D)

Initial Displacement: 3.69 ft
Total Well Penetration Depth: 8. ft
Casing Radius: 0.08 ft
Static Water Column Height: 24.03 ft
Screen Length: 8. ft
Well Radius: 0.33 ft
Gravel Pack Porosity: 0.32

SOLUTION

Aquifer Model: Confined
K = 0.0004464 ft/min
Solution Method: Bouwer-Rice
y0 = 1.746 ft



MW-5D 3-FT SLUG FALLINGHEAD-2

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW5D-3-ftslug-fallinghead-test-2.aqt
Date: 10/19/17 Time: 10:01:29

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-5D
Test Date: 9/8/2017

AQUIFER DATA

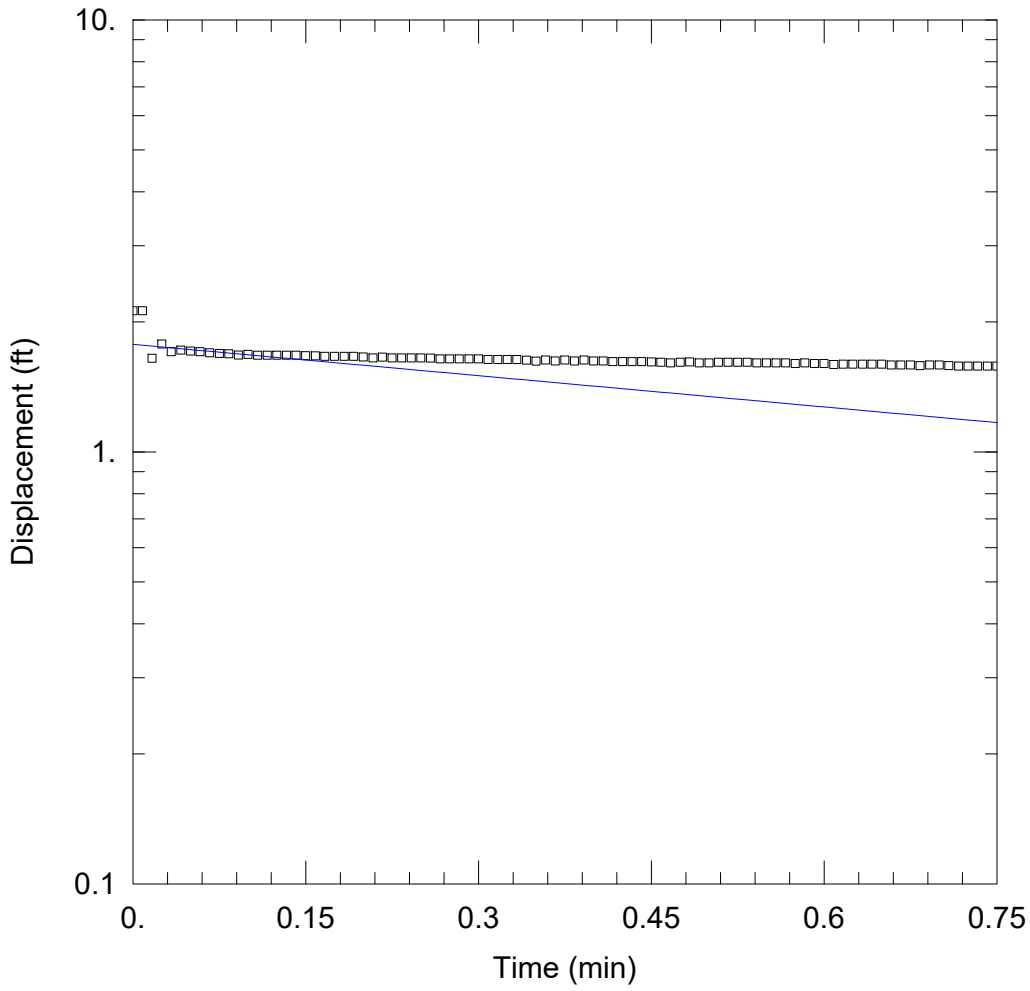
Saturated Thickness: 15. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-5D)

Initial Displacement: 3.436 ft
Total Well Penetration Depth: 8. ft
Casing Radius: 0.08 ft
Static Water Column Height: 24.03 ft
Screen Length: 8. ft
Well Radius: 0.33 ft
Gravel Pack Porosity: 0.32

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.000553 ft/min
y0 = 1.746 ft



MW-5D 3-FT SLUG RISINGHEAD -1

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW5D-3-ftslug-risinghead-test-1.aqt
Date: 10/19/17 Time: 10:06:16

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-5D
Test Date: 9/8/2017

AQUIFER DATA

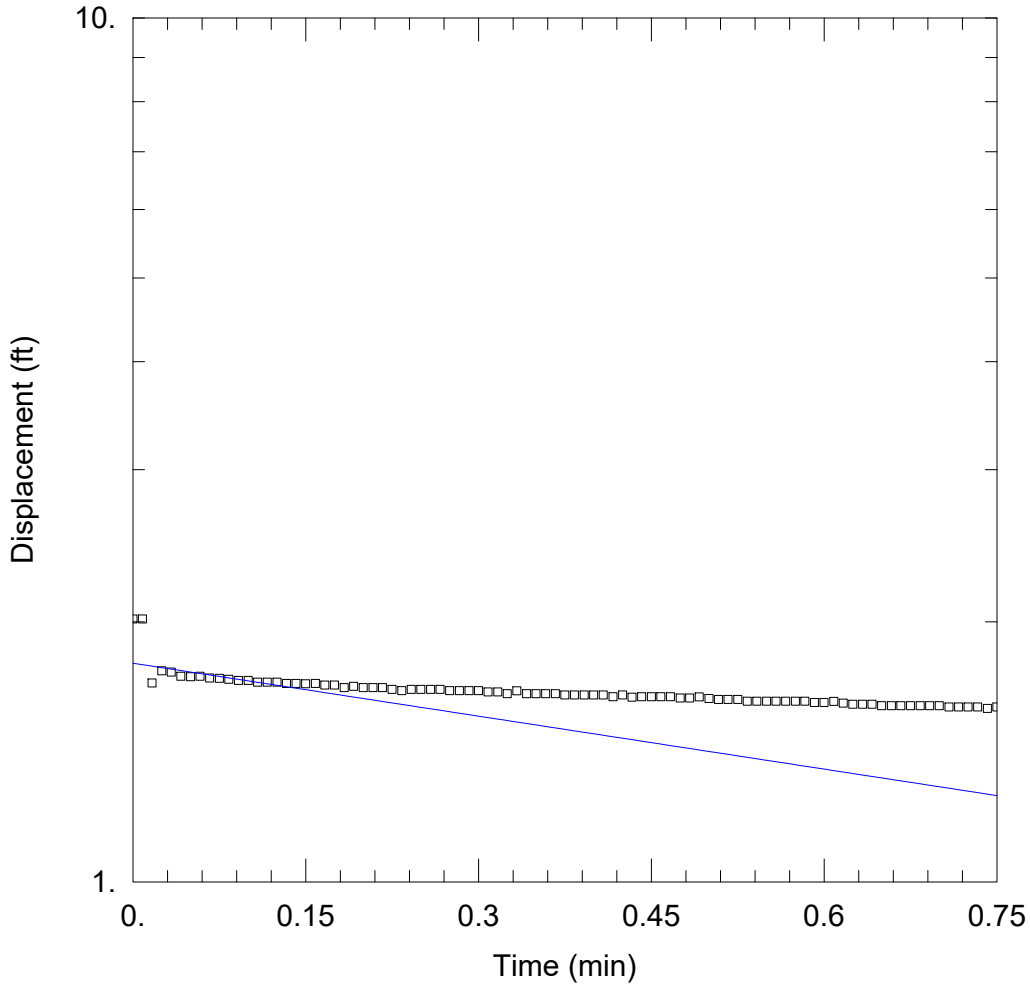
Saturated Thickness: 15. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-5D)

Initial Displacement: 2.122 ft
Total Well Penetration Depth: 8. ft
Casing Radius: 0.08 ft
Static Water Column Height: 24.03 ft
Screen Length: 8. ft
Well Radius: 0.33 ft
Gravel Pack Porosity: 0.32

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.0004588 ft/min
y0 = 1.774 ft



MW-5D 3-FT SLUG RISINGHEAD-2

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW5D-3-ftslug-risinghead-test-2.aqt
Date: 10/19/17 Time: 10:09:35

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-5D
Test Date: 9/8/2017

AQUIFER DATA

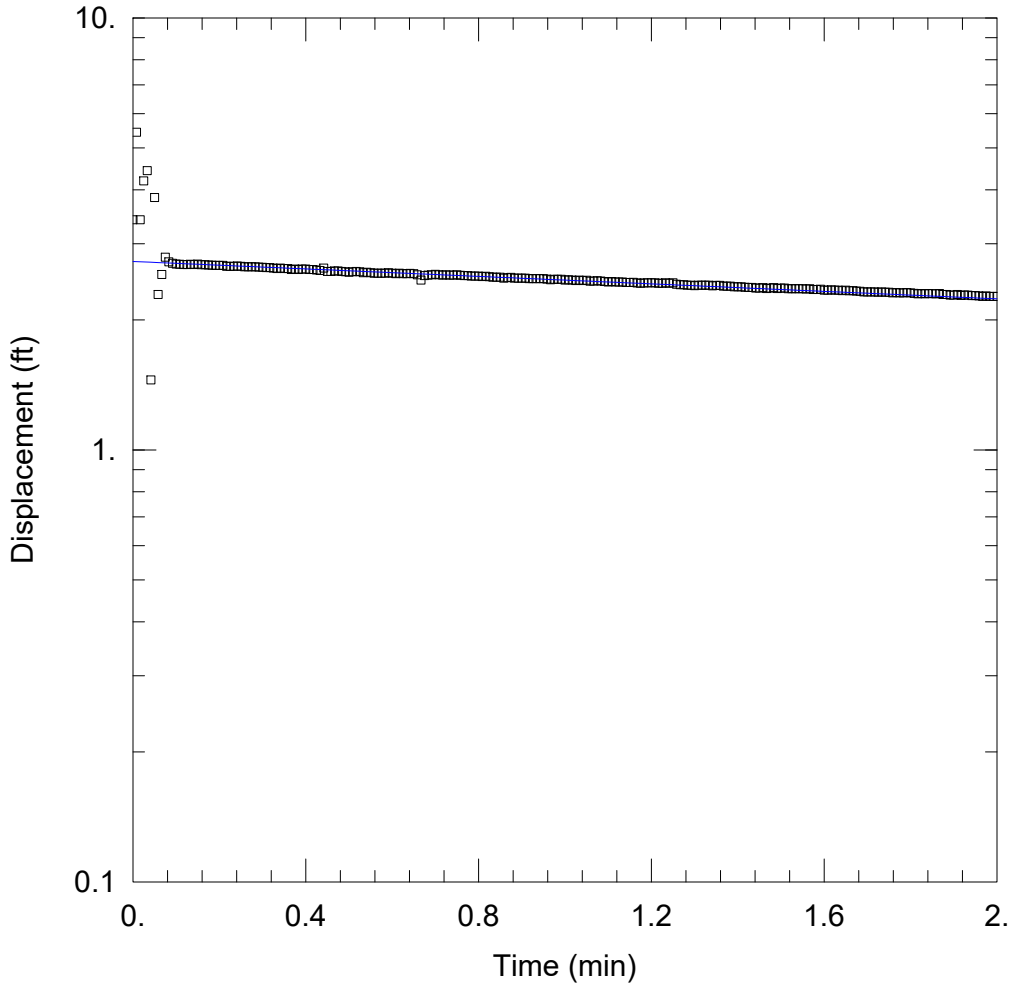
Saturated Thickness: 15. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-5D)

Initial Displacement: 2.015 ft
Total Well Penetration Depth: 8. ft
Casing Radius: 0.08 ft
Static Water Column Height: 24.03 ft
Screen Length: 8. ft
Well Radius: 0.33 ft
Gravel Pack Porosity: 0.32

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.0003882 ft/min
y0 = 1.791 ft



MW-5D 4-FT SLUG FALLINGHEAD -1 TRANSLATION

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW5D-4-ftslug-fallinghead-test-1A.aqt
Date: 10/19/17 Time: 10:12:09

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-5D
Test Date: 9/8/2017

AQUIFER DATA

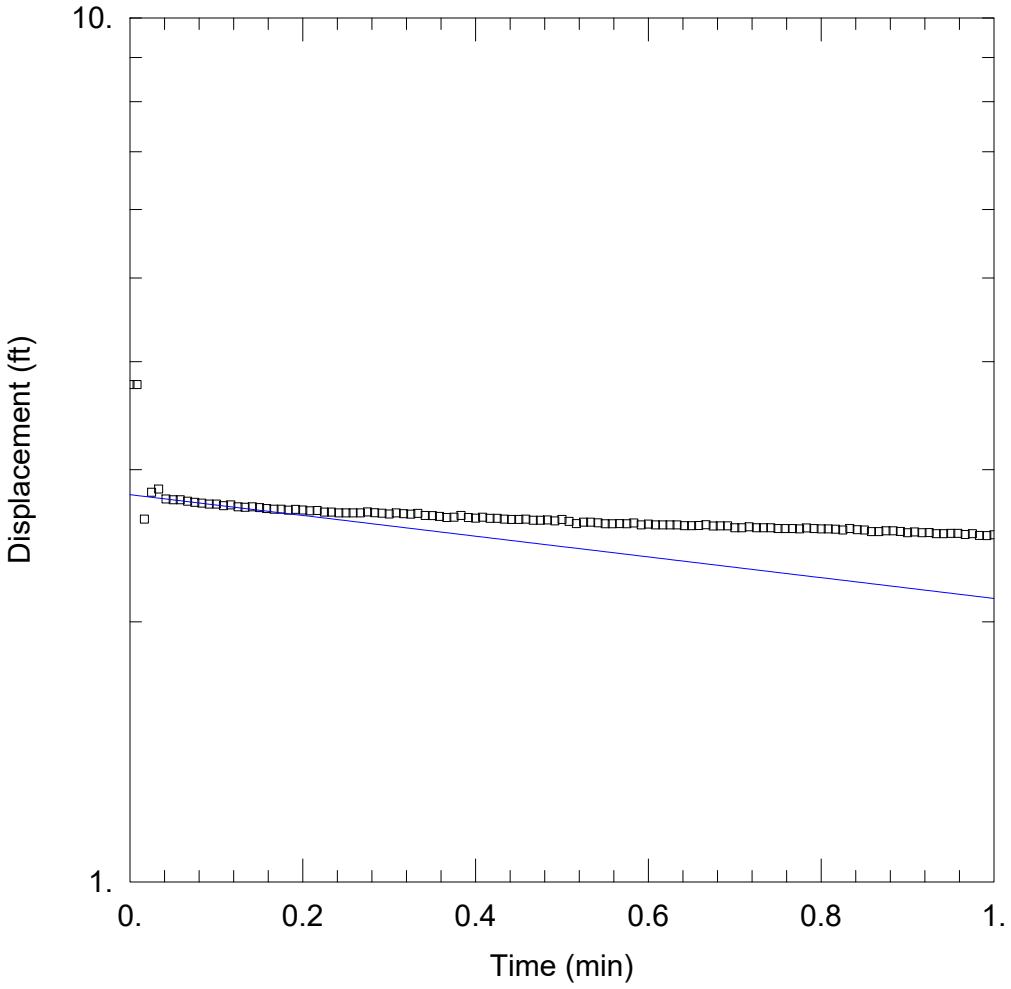
Saturated Thickness: 15. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-5D)

Initial Displacement: 3.41 ft
Total Well Penetration Depth: 8. ft
Casing Radius: 0.08 ft
Static Water Column Height: 23.73 ft
Screen Length: 8. ft
Well Radius: 0.33 ft
Gravel Pack Porosity: 0.32

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 8.432E-5 ft/min
y0 = 2.73 ft



MW-5D 4-FT SLUG RISINGHEAD -1 TRANSLATION

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW5D-4-ftslug-risinghead-test-1A.aqt
Date: 10/19/17 Time: 10:13:35

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-5D
Test Date: 9/8/2017

AQUIFER DATA

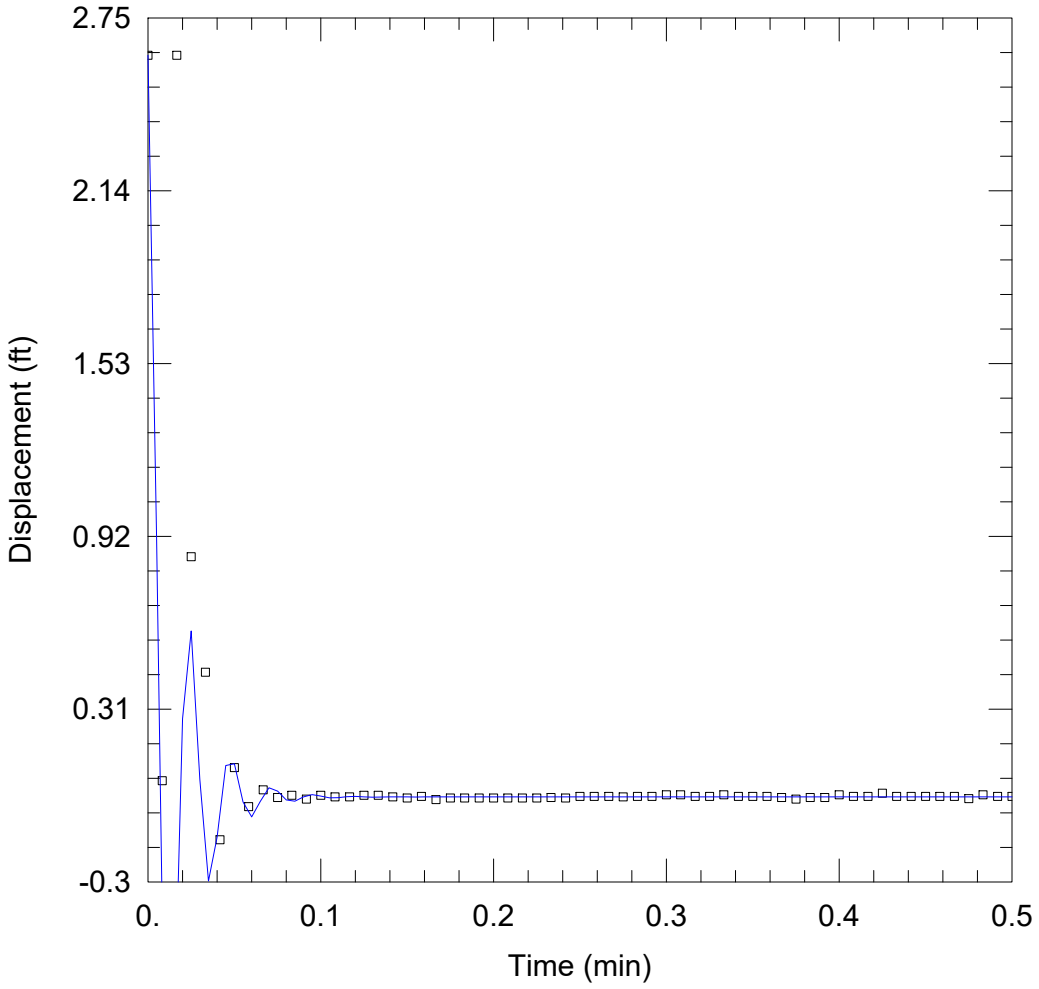
Saturated Thickness: 15. ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-5D)

Initial Displacement: 3.764 ft
Total Well Penetration Depth: 8. ft
Casing Radius: 0.08 ft
Static Water Column Height: 23.73 ft
Screen Length: 8. ft
Well Radius: 0.33 ft
Gravel Pack Porosity: 0.32

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.0002304 ft/min
y0 = 2.807 ft



MW-5S 3-FT SLUG RISING HEAD TEST-1

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW5S-3ftslug-rising-head--test-1.aqt
Date: 10/18/17 Time: 11:43:53

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-5S
Test Date: 9/8/2017

AQUIFER DATA

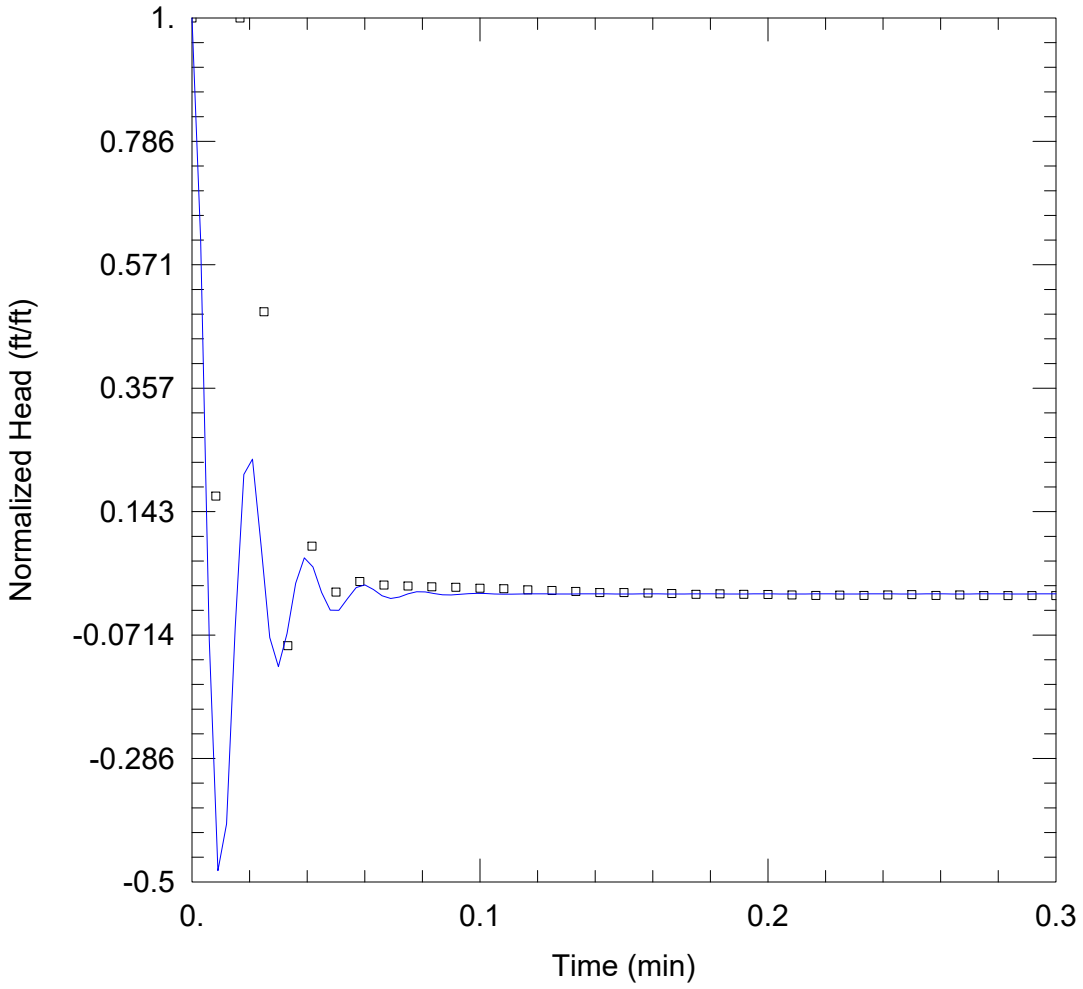
Saturated Thickness: 9.7 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-5S)

Initial Displacement: 2.618 ft
Total Well Penetration Depth: 13.35 ft
Casing Radius: 0.08 ft
Static Water Column Height: 13.35 ft
Screen Length: 13.35 ft
Well Radius: 0.33 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
K = 0.5509 ft/min
Solution Method: Springer-Gelhar
Le = 1.572 ft



MW-5S 4-FT SLUG RISING HEAD TEST-1

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW5S-4ftslug-rising-head--test-1a.aqt
Date: 10/18/17 Time: 11:55:31

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-5S
Test Date: 9/8/2017

AQUIFER DATA

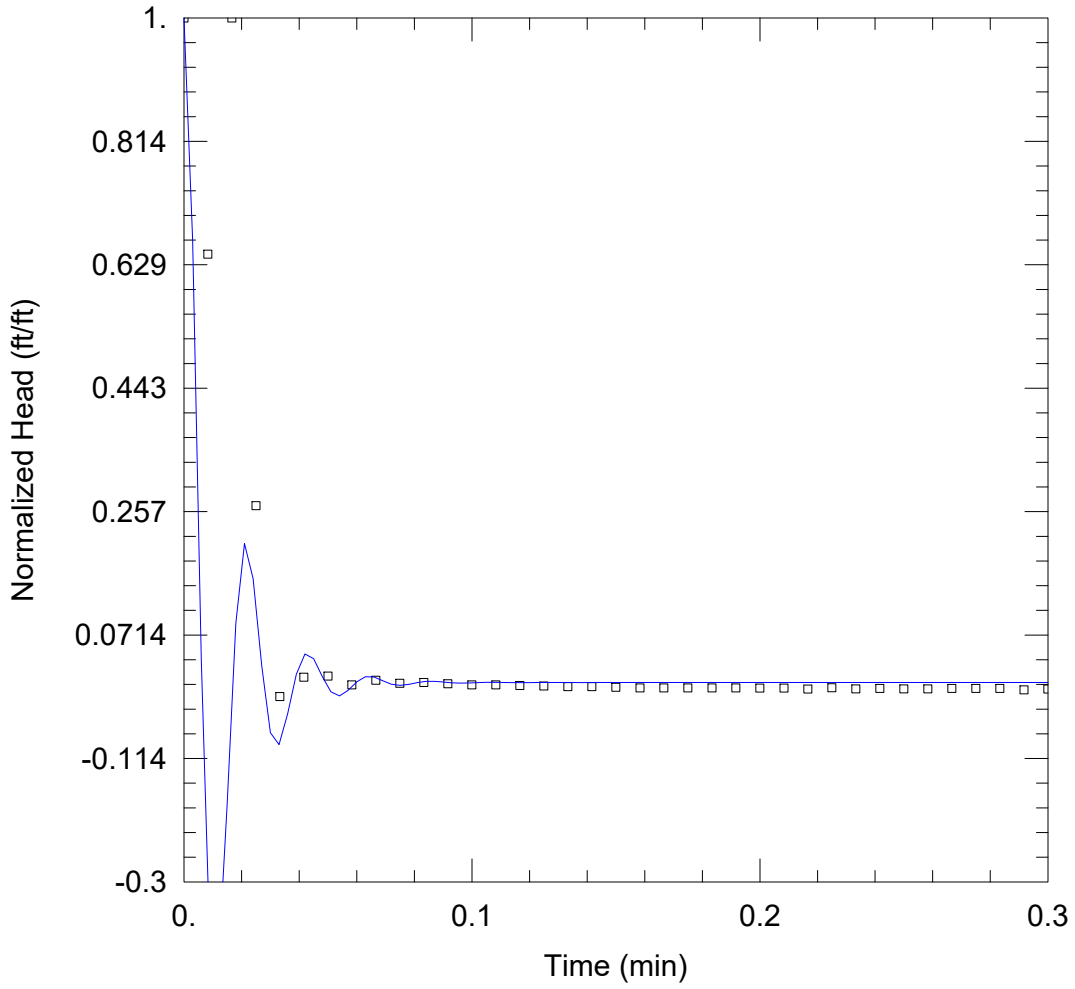
Saturated Thickness: 9.7 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-5S)

Initial Displacement: 7.096 ft
Total Well Penetration Depth: 13.35 ft
Casing Radius: 0.08 ft
Static Water Column Height: 13.35 ft
Screen Length: 13.35 ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined
K = 0.689 ft/min
Solution Method: Springer-Gelhar
Le = 1.096 ft



MW-5S 4-FT SLUG RISING HEAD TEST-2

Data Set: C:\Users\Wood\Documents\My Documents\Gowanus-B0018800\Aqtesolv-slugtests\MW5S-4ftslug-rising-head--test-2.aqt
Date: 10/18/17 Time: 12:02:19

PROJECT INFORMATION

Company: Arcadis
Client: NYCDEP
Project: B0018800
Location: Gowanus 1st St Turning Basin
Test Well: MW-5S
Test Date: 9/8/2017

AQUIFER DATA

Saturated Thickness: 9.7 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-5S)

Initial Displacement: 7.361 ft
Total Well Penetration Depth: 13.35 ft
Casing Radius: 0.08 ft
Static Water Column Height: 13.35 ft
Screen Length: 13.35 ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined
K = 0.57 ft/min
Solution Method: Springer-Gelhar
Le = 1.267 ft

APPENDIX F

SLUG TESTING LOGS/DATA

ATTACHMENT A: BORING AND WELL CONSTRUCTION LOGS

PROJECT: PW77GOWAN

LOCATION: First-Street Turning Basin

DATE: 8/7/17

SOIL BORING LOG

Soil Boring ID: SB-1

SHEET 1 OF 1

BORING LOCATION: 40.6765809°; -073.9877102°

LOGGED BY: Bryan Comey, Preferred Environmental Services

GROUND SURFACE ELEVATION:

MEASURING POINT ELEVATION: N/A

START DATE: 8/7/17

DRILLING CO.: TWS

FINISH DATE: 8/7/17

DRILLERS NAME: Steve E.

SAMPLING METHOD: Continuous

DRILLING METHOD AND RIG TYPE: Roto-Sonic

DEPTH (FT)	SAMPLE DEPTH (FT)	SAMPLE REC. (FT)	SAMPLE PID (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
1	0-5		0.0	N/A	Soft dug to 5 feet below grade surface prior to drilling.
5	5-7	3	0.0		Fill: Gray, poorly graded fine to medium sand with gravel and construction and demolition debris, no staining or odors.
	7-8				Fill: Tan and black poorly graded fine to medium sand and gravel with glass, no staining or odors.
10	8-10				Fill: Black ash, construction and demolition debris, no staining or odors.
	10-12	1.5	0.0		Fill: Dark gray poorly graded fine to medium sand and silt with wood, no staining or odors.
	12-13		4.3		
	13-14	4.5	18.3		Fill: Concrete, wood, and debris with staining and heavy petroleum odors. Wet at 13 feet below grade surface.
15	14-15		79.8		Fill: Black, poorly graded fine to coarse sand and silt with gravel and debris.
	15-16		80.3		
	16-17		11.2		Fill: Brown and gray poorly graded fine to coarse sand and silt with gravel and debris, petroleum odor and staining.
18	17-18		35.8		Fill: Gray brown poorly graded fine to coarse sand and gravel with wood, heavy petroleum odor and non-aqueous phase liquid present.
					End of Boring at 18 feet below grade surface.

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

GW	Well-Graded Gravels, Gravel - Sand Mixtures, Little or No Fines
GP	Poorly-Graded Gravels, Gravel- Sand Mixtures, Little or No Fines
GM	Silty Gravels, Gravel - Sand - Silt Mixtures
GC	Clayey Gravels, Gravel- Sand- Clay Mixtures
SW	Well-Graded Sands, Gravelly Sands, Little or No Fines
SP	Poorly-Graded Sands, Gravelly Sand, Little or no Fines
SM	Silty Sands, Sand - Silt Mixtures
SC	Clayey Sands, Sand - Clay Mixtures
ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
CL	Inorganic Clays of Low Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
OL	Organic Silts and Organic Silty Clays of Low Plasticity
MH	Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Sands
CH	Inorganic class of High Plasticity
OH	Organic Clays of Medium to High Plasticity, Organic Silts
PT	Peat, Humus, Swamp Soils with High Organic Contents
FILL	Fill Material
PT	Peat, Humus, Swamp Soils with High Organic Contents

Notes: Composite samples collected from SB-1: (0'-10'); (10'-18'). Grab samples collected from SB-1: (9.5'-10'); (14'-14.5').

PROJECT: PW77GOWAN

LOCATION: First-Street Turning Basin

DATE: 8/8/17

SOIL BORING LOG

Soil Boring ID: SB-2

SHEET 1 OF 1

BORING LOCATION: 40.6769160° -073.9882869°

LOGGED BY: Bryan Comey, Preferred Environmental Services

GROUND SURFACE ELEVATION: N/A

MEASURING POINT ELEVATION: N/A

START DATE: 8/8/17

DRILLING CO.: TWS

FINISH DATE: 8/8/17

DRILLERS NAME: Steve E.

SAMPLING METHOD: Continuous

DRILLING METHOD AND RIG TYPE: Roto-Sonic

DEPTH (FT)	SAMPLE DEPTH (FT)	SAMPLE REC. (FT)	SAMPLE PID (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
1	0-5		0.0	N/A	Soft dug to 5 feet below grade surface prior to drilling, no odors or staining.
5					
	5-10	2.5	0		Fill: Brown to gray poorly sorted fine to medium sand and silt with construction and demolition debris, no odors or staining.
10					
	10-11	1	1.8		Fill: Brown/Black construction and demolition debris with silt and wood, chemical odor, no staining. Wet at 11 feet below grade surface.
	11-12	4.5	3.6		
	12-13		4.5		
	13-14		59.8		Fill: Black wood with fine sand and silt, chemical odor, no staining.
15	14-15		10.3		
	15-16		8.3		
	16-20		N/A		No Recovery
20					
	20-20.5	5	21.3		OL: Black clay with trace organics, chemical odor, no staining.
	20.5-21		11.6		GW: Black well graded coarse sand with gravel, chemical odor, no staining.
	21-22		186		OL: Black clay with trace organics, chemical odor and staining.
	22-23		205		
	23-24		287		
25	24-25		187		
	25-26.5		119		
	26.5-27	3	143		OL: Black poorly graded fine to coarse sand with gravel and silt, heavy petroleum odor and staining.
	27-28		81.3		GM: Gray poorly graded fine to coarse sand and gravel with silt, heavy petroleum odor and staining, non-aqueous phase liquid present.
	28-29	4.5	80.6		
30	29-30		60.2		
	30-31		25.4		GM: Gray poorly graded fine to coarse sand and gravel with silt, heavy petroleum odor and staining.
	31-32		7.0		
	32-33		3.2		
					End of boring at 33 feet below grade surface.

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

GW	Well-Graded Gravels, Gravel - Sand Mixtures, Little or No Fines
GP	Poorly-Graded Gravels, Gravel- Sand Mixtures, Little or No Fines
GM	Silty Gravels, Gravel - Sand - Silt Mixtures
GC	Clayey Gravels, Gravel- Sand- Clay Mixtures
SW	Well-Graded Sands, Gravelly Sands, Little or No Fines
SP	Poorly-Graded Sands, Gravelly Sand, Little or no Fines
SM	Silty Sands, Sand - Silt Mixtures
SC	Clayey Sands, Sand - Clay Mixtures
ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
CL	Inorganic Clays of Low Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
OL	Organic Silts and Organic Silty Clays of Low Plasticity
MH	Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Sands
CH	Inorganic class of High Plasticity
OH	Organic Clays of Medium to High Plasticity, Organic Silts
PT	Peat, Humus, Swamp Soils with High Organic Contents
FILL	Fill Material

Notes: Composite samples collected from SB-2: (0'-10'); (10'-20'); (20'-33'). Grab samples collected from SB-2: (7.5'-8'); (13.5'-14'); (23'-23.5').

PROJECT: PW77GOWAN

LOCATION: First-Street Turning Basin

DATE: 8/8/17

SOIL BORING LOG

Soil Boring ID: SB-3

SHEET 1 OF 1

BORING LOCATION: 40.6766820° -073.9879056°

LOGGED BY: Bryan Comey, Preferred Environmental Services

GROUND SURFACE ELEVATION: N/A

MEASURING POINT ELEVATION: N/A

START DATE: 8/8/17

DRILLING CO.: TWS

FINISH DATE: 8/8/17

DRILLERS NAME: Steve E.

SAMPLING METHOD: Continuous

DRILLING METHOD AND RIG TYPE: Roto-Sonic

DEPTH (FT)	SAMPLE DEPTH (FT)	SAMPLE REC. (FT)	SAMPLE PID (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
1	0-5		0.0		Soft dug to 5 feet below grade surface prior to drilling, no odors or staining.
5	5-10		N/A		No Recovery.
10	10-13	5	0.0		Fill: Construction and demolition debris (crushed brick), no odors or staining.
	13-15				Fill: Construction and demolition debris (crushed gray concrete), no odors or staining.
15	15-18	2.5	4.3		Fill: Construction and demolition debris (crushed brick), no odors or staining.
	18-20		5.7		Fill: Construction and demolition debris (crushed gray concrete), no odors or staining, wet at 18 feet below grade surface.
20	20-21	3	2.3		Fill: Black clay with organics and glass, chemical odor, no staining.
	21-22		35.7		
	22-23		29.6		
	23-23.5	5	80.7		GW: Black well graded coarse sand with gravel, chemical odor, no staining.
	23.5-24		53.6		OL: Black, low plasticity clay with wood and organics, heavy petroleum odor and staining.
25	24-25		35.8		
	25-26		24.3		
	26-27		25.8		
	27-28		14.6		
	28-29	5	18.8		OH: Black medium plasticity clay, heavy petroleum odor and staining, non-aqueous phase liquid present.
30	29-30		11.7		
	30-31		8.2		
	31-32		2.4		GM: Gray poorly graded fine to medium sand with silt and gravel, heavy petroleum odor and staining.
	32-33		2.2		GM: Gray poorly graded fine to medium sand with silt and gravel, heavy petroleum odor and staining.
					End of boring at 33 feet below grade surface.

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

GW	Well-Graded Gravels, Gravel - Sand Mixtures, Little or No Fines
GP	Poorly-Graded Gravels, Gravel- Sand Mixtures, Little or No Fines
GM	Silty Gravels, Gravel - Sand - Silt Mixtures
GC	Clayey Gravels, Gravel- Sand- Clay Mixtures
SW	Well-Graded Sands, Gravelly Sands, Little or No Fines
SP	Poorly-Graded Sands, Gravelly Sand, Little or no Fines
SM	Silty Sands, Sand - Silt Mixtures
SC	Clayey Sands, Sand - Clay Mixtures
ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
CL	Inorganic Clays of Low Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
OL	Organic Silts and Organic Silty Clays of Low Plasticity
MH	Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Sands
CH	Inorganic class of High Plasticity
OH	Organic Clays of Medium to High Plasticity, Organic Silts
PT	Peat, Humus, Swamp Soils with High Organic Contents
FILL	Fill Material

Notes: Composite samples collected from SB-3: (10'-20'); (20'-33'). Grab samples collected from SB-3: (18'-18.5'); (23'-23.5'). Soil boring SB-3 completed as MW-3D and MW-3S. MW-3S was unable to be utilized as a monitoring well due to collapse of the screen. MW-3S was re-drilled approximately 3 feet east of MW-3D.

PROJECT: PW77GOWAN

LOCATION: First-Street Turning Basin

DATE: 8/18/17

SOIL BORING LOG

Soil Boring ID: SB-3/MW-3S

SHEET 1 OF 1

BORING LOCATION: 40.6766693° -073.9879169°	**LOGGED BY:** Dan Prisco-Buxbaum, Preferred Environmental Services
GROUND SURFACE ELEVATION: N/A	**MEASURING POINT ELEVATION:** N/A
START DATE: 8/18/17	**DRILLING CO.:** TWS
FINISH DATE: 8/18/17	**DRILLERS NAME:** Steve E.
SAMPLING METHOD: Continuous	**DRILLING METHOD AND RIG TYPE:** Roto-Sonic

DEPTH (FT)	SAMPLE DEPTH (FT)	SAMPLE REC. (FT)	SAMPLE PID (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
1	0-5	3	0.7		Fill: Brown poorly sorted fine to medium sand with silt and construction and demolition debris, chemical odors, no staining.
5	5-6	0.5	0.6		Fill: Brown poorly sorted fine to medium sand with silt and construction and demolition debris, chemical odors, no staining.
	6-7	0.5	0.5		
	7-8	0.5	0.6		
	8-9	0.5	0.8		
10	9-10	0.5	0.5		
	10-15	3	0.4		Fill: Brown poorly sorted fine to medium sand with silt and construction and demolition debris, chemical odors, no staining.
15					
	15-20	1	0.5		SM: Gray/brown sandy silt with construction and demolition debris, chemical odors, no staining. Wet at 16 feet below grade surface.
20					End of boring at 20 feet below grade surface.

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

GW	Well-Graded Gravels, Gravel - Sand Mixtures, Little or No Fines
GP	Poorly-Graded Gravels, Gravel- Sand Mixtures, Little or No Fines
GM	Silty Gravels, Gravel - Sand - Silt Mixtures
GC	Clayey Gravels, Gravel- Sand- Clay Mixtures
SW	Well-Graded Sands, Gravelly Sands, Little or No Fines
SP	Poorly-Graded Sands, Gravelly Sand, Little or no Fines
SM	Silty Sands, Sand - Silt Mixtures
SC	Clayey Sands, Sand - Clay Mixtures
ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
CL	Inorganic Clays of Low Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
OL	Organic Silts and Organic Silty Clays of Low Plasticity
MH	Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Sands
CH	Inorganic class of High Plasticity
OH	Organic Clays of Medium to High Plasticity, Organic Silts
PT	Peat, Humus, Swamp Soils with High Organic Contents
FILL	Fill Material

Notes: Composite sample collected from SB-3: (0'-10'). Grab sample collected from SB-3: (8.5'-9'). Soil boring SB-3 completed as MW-3S.

PROJECT: PW77GOWAN

LOCATION: First-Street Turning Basin

DATE: 8/09/17

SOIL BORING LOG

Soil Boring ID: SB-4

SHEET 1 **OF** 1

BORING LOCATION: 40.6770076° -073.9885535°	**LOGGED BY:** Bryan Comey, Preferred Environmental Services
GROUND SURFACE ELEVATION: N/A	**MEASURING POINT ELEVATION:** N/A
START DATE: 8/09/17	**DRILLING CO.:** TWS
FINISH DATE: 8/09/17	**DRILLERS NAME:** Steve E.
SAMPLING METHOD: Continuous	**DRILLING METHOD AND RIG TYPE:** Roto-Sonic

DEPTH (FT)	SAMPLE DEPTH (FT)	SAMPLE REC. (FT)	SAMPLE PID (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
1	0-5			N/A	Soft dug to 5 feet below grade surface prior to drilling, no odors or staining.
5	5-7	3.5	0.0		Fill: Brown poorly graded fine to coarse sand with silt and construction and demolition debris, no odors or staining.
	7-8				Fill: Construction and demolition debris (crushed brick), no odors or staining.
10	8-10				Fill: Brown poorly graded fine-coarse sand with gravel with construction and demolition debris, (crushed concrete), no odors or staining.
	10-11	4.5	1.4		Fill: Brown poorly graded fine to coarse sand and gravel with construction and demolition debris (brick), no odors or staining.
	11-14		0.0		Fill: Brown poorly graded fine to coarse sand with silt, no odors or staining.
15	14-15				Fill: Construction and demolition debris (crushed concrete with wood), no odors or staining.
	15-16	5	1.8		Fill: Brown poorly graded fine to coarse sand with silt and wood, no odors or staining. Wet at 15 feet below grade surface.
	16-17		6.8		
	17-18		13.4		Fill: Gray clay and fine sand and crushed rock, no odors or staining.
	18-19		2.4		
20	19-20		206.3		Fill: Construction and demolition debris (wood) with chemical odor and staining.
	20-21	4.5	36.2		Fill: Construction and demolition debris (bricks).
	21-22		103.7		
	22-23		55.4		GC: Black poorly graded fine to coarse sand silt, chemical odor and staining.
	23-24		78.6		GC: Black poorly graded fine to medium sand with gravel, petroleum odor and staining, non-aqueous phase liquid present.
25	24-25		192.7		
	25-26	3	204.3		OH: Black low plasticity clay with organics, chemical odor and staining.
	26-27		190.6		
	27-28		76.8		
	28-29	5	45.6		GC: Black poorly graded fine to coarse sands with clay, chemical odor and staining, non-aqueous phase liquid present.
30	29-30		47.7		
	30-31		34.3		OH: Gray high plasticity clay, chemical odor and staining, non-aqueous phase liquid present.
	31-32		76.8		SP: Gray poorly graded fine to medium sands, chemical odor and staining, non-aqueous phase liquid present.
	32-33		19.4		
					End of boring at 33 feet below grade surface.

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

GW	Well-Graded Gravels, Gravel - Sand Mixtures, Little or No Fines
GP	Poorly-Graded Gravels, Gravel- Sand Mixtures, Little or No Fines
GM	Silty Gravels, Gravel - Sand - Silt Mixtures
GC	Clayey Gravels, Gravel- Sand- Clay Mixtures
SW	Well-Graded Sands, Gravelly Sands, Little or No Fines
SP	Poorly-Graded Sands, Gravelly Sand, Little or no Fines
SM	Silty Sands, Sand - Silt Mixtures
SC	Clayey Sands, Sand - Clay Mixtures
ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
CL	Inorganic Clays of Low Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
OL	Organic Silts and Organic Silty Clays of Low Plasticity
MH	Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Sands
CH	Inorganic class of High Plasticity
OH	Organic Clays of Medium to High Plasticity, Organic Silts
PT	Peat, Humus, Swamp Soils with High Organic Contents
FILL	Fill Material

Notes: Composite samples collected from SB-4: (0'-10'); (10'-20'); (20'-33'). Grab samples collected from SB-4: (5.5'-6'); (19.5'-20'); (25.5'-26'). Soil boring SB-3 as MW-4S and MW-4D.

	PROJECT: PW77GOWAN **LOCATION:** First-Street Turning Basin **DATE:** 8/10/17	**SOIL BORING LOG** **Soil Boring ID:** SB-5 **SHEET** 1 **OF** 1

BORING LOCATION: 40.6772239° -073.9888338°	**LOGGED BY:** Bryan Comey, Preferred Environmental Services
GROUND SURFACE ELEVATION:	**MEASURING POINT ELEVATION:**
START DATE: 8/10/17	**DRILLING CO.:** TWS
FINISH DATE: 8/10/17	**DRILLERS NAME:** Steve E.
SAMPLING METHOD: Continuous	**DRILLING METHOD AND RIG TYPE:** Roto-Sonic

DEPTH (FT)	SAMPLE DEPTH (FT)	SAMPLE REC. (FT)	SAMPLE PID (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
1	0-5		0.0	N/A	Soft dug to 5 feet below grade surface prior to drilling, no odors or staining.
5	5-10	2	0.0		Fill: Brown poorly graded fine to medium sand with silt, construction and demolition debris and trash, no odors or staining.
10	10-11	4	0.0		Fill: Brown poorly graded fine to medium sand with silt, construction and demolition debris and trash, no odors or staining. Wet at 11 feet below grade surface.
	11-13				
	13-15				Fill: Brown/gray poorly sorted fine to medium sand with silt, gravel and construction and demolition debris (brick), no odors or staining.
15	15-16	5	4.5		Fill: Black silt with fine sand, and organics (plant matter), sheen noted on groundwater, organic odor.
	16-17		9.6		
	17-18		29.6		Fill: Black silty low plasticity clay, chemical odor and staining.
	18-19		113.6		
20	19-20		38.5		
	20-21	5	84.6		
	21-22		46.5		
	22-23		73.6		Fill: Black silty clay with poorly graded fine to medium sand, chemical odor and staining.
	23-24		86.5		
25	24-25		58.3		
	25-26	3	13.8		Fill: Black silt with poorly graded fine to coarse sand, sheen noted on groundwater and chemical odor.
	26-27		9.6		Fill: Black poorly graded fine to coarse sand with silt, gravel and C&D (brick).
	27-28		6.7		
	28-29	N/A	N/A		No recovery from 28-33 feet below grade surface.
30	30-31				
	31-32				
	32-33				
					End of boring at 33 feet below grade surface.

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

GW	Well-Graded Gravels, Gravel - Sand Mixtures, Little or No Fines
GP	Poorly-Graded Gravels, Gravel- Sand Mixtures, Little or No Fines
GM	Silty Gravels, Gravel - Sand - Silt Mixtures
GC	Clayey Gravels, Gravel- Sand- Clay Mixtures
SW	Well-Graded Sands, Gravelly Sands, Little or No Fines
SP	Poorly-Graded Sands, Gravelly Sand, Little or no Fines
SM	Silty Sands, Sand - Silt Mixtures
SC	Clayey Sands, Sand - Clay Mixtures
ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
CL	Inorganic Clays of Low Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
OL	Organic Silts and Organic Silty Clays of Low Plasticity
MH	Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Sands
CH	Inorganic class of High Plasticity
OH	Organic Clays of Medium to High Plasticity, Organic Silts
PT	Peat, Humus, Swamp Soils with High Organic Contents
FILL	Fill Material

Notes: Composite samples collected from SB-5: (0'-10'); (10'-20'); (20'-33'). Grab samples collected from SB-5: (7.5'-8'); (18.5'-19'); (23'-23.5'). Soil boring SB-5 as MW-5S and MW-5D.

PROJECT: PW77GOWAN

LOCATION: First-Street Turning Basin

DATE: 8/11/17

SOIL BORING LOG

Soil Boring ID: SB-6

SHEET 1 **OF** 1

BORING LOCATION: 40.6772117° -073.9888628°	**LOGGED BY:** Bryan Comey, Preferred Environmental Services
GROUND SURFACE ELEVATION: N/A	**MEASURING POINT ELEVATION:** N/A
START DATE: 8/11/17	**DRILLING CO.:** TWS
FINISH DATE: 8/11/17	**DRILLERS NAME:** Steve E.
SAMPLING METHOD: Continuous	**DRILLING METHOD AND RIG TYPE:** Roto-Sonic

DEPTH (FT)	SAMPLE DEPTH (FT)	SAMPLE REC. (FT.)	SAMPLE PID (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
1	0-5		0.0	N/A	Soft dug to 5 feet below grade surface prior to drilling, no odors or staining.
5	5-10		0.0	N/A	No Recovery.
10	10-11	5	0.0		Fill: Brown poorly graded fine to medium sand with gravel, no odor or staining.
	11-12				
	12-13		7.8		Fill: Brown/black poorly graded fine to medium sands with silt, sheen noted on groundwater, no odors. Wet at 13 feet below grade surface.
	13-14		20.8		Fill: Black poorly graded fine to coarse sand with silt, no odors or staining.
15	14-15		31.6		Fill: Black construction and demolition debris (trash/wood), no odors or staining.
	15-16	2	56.8		
	16-17		84.0		Fill: Black silty high plasticity clay, no odors or staining.
18	17-18		104.0		Fill: Black silt with construction and demolition debris (wood/debris), no odors or staining.
					End of boring at 18 feet below grade surface.

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

GW	Well-Graded Gravels, Gravel - Sand Mixtures, Little or No Fines
GP	Poorly-Graded Gravels, Gravel- Sand Mixtures, Little or No Fines
GM	Silty Gravels, Gravel - Sand - Silt Mixtures
GC	Clayey Gravels, Gravel- Sand- Clay Mixtures
SW	Well-Graded Sands, Gravelly Sands, Little or No Fines
SP	Poorly-Graded Sands, Gravelly Sand, Little or no Fines
SM	Silty Sands, Sand - Silt Mixtures
SC	Clayey Sands, Sand - Clay Mixtures
ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
CL	Inorganic Clays of Low Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
OL	Organic Silts and Organic Silty Clays of Low Plasticity
MH	Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Sands
CH	Inorganic class of High Plasticity
OH	Organic Clays of Medium to High Plasticity, Organic Silts
PT	Peat, Humus, Swamp Soils with High Organic Contents
FILL	Fill Material

Notes: Composite samples collected from SB-6: (10'-18'). Grab samples collected from SB-6: (17.5'-18').

PROJECT: PW77GOWAN

LOCATION: First-Street Turning Basin

DATE: 8/18/17

SOIL BORING LOG

Soil Boring ID: SB-7

SHEET 1 OF 1

BORING LOCATION: 40.6771292° -073.9888345°

LOGGED BY: Dan Prisco-Buxbaum, Preferred Environmental Services

GROUND SURFACE ELEVATION: N/A

MEASURING POINT ELEVATION: N/A

START DATE: 8/18/17

DRILLING CO.: TWS

FINISH DATE: 8/18/17

DRILLERS NAME: Steve E.

SAMPLING METHOD: Continuous

DRILLING METHOD AND RIG TYPE: Roto-Sonic

DEPTH (FT)	SAMPLE DEPTH (FT)	SAMPLE REC. (FT)	SAMPLE PID (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
1	0-5	3	0.3		Fill: Brown/black poorly sorted fine to medium sand with silt and construction and demolition debris, no odors or staining.
5	5-6	0.5	9.6		Fill: Brown/black poorly sorted fine to medium sand with silt and construction and demolition debris, chemical odor, no staining.
	6-7	0.5	10.8		
	7-8	0.5	94.8		
	8-9	0.5	81.2		
10	9-10	0.5	76.4		Fill: Brown/black poorly sorted fine to medium sand with silt and construction and demolition debris (wood), chemical odor, no staining.
	10-11		70.3		Fill: Brown/black poorly sorted fine to medium sand with silt and construction and demolition debris, chemical odor, no staining.
	11-12		62.4		
	12-13	3	19.5		Fill: Gray/black poorly sorted sand with silt, cobbles and construction and demolition debris (wood), chemical odor, no staining. Wet at 12 feet below grade surface.
	13-14		32.5		
15	14-15		29.3		
	15-33		N/A		No recovery from 15 to 33 feet below grade surface.
33					End of boring at 33 feet below grade surface.

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

GW	Well-Graded Gravels, Gravel - Sand Mixtures, Little or No Fines
GP	Poorly-Graded Gravels, Gravel- Sand Mixtures, Little or No Fines
GM	Silty Gravels, Gravel - Sand - Silt Mixtures
GC	Clayey Gravels, Gravel- Sand- Clay Mixtures
SW	Well-Graded Sands, Gravelly Sands, Little or No Fines
SP	Poorly-Graded Sands, Gravelly Sand, Little or no Fines
SM	Silty Sands, Sand - Silt Mixtures
SC	Clayey Sands, Sand - Clay Mixtures
ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
CL	Inorganic Clays of Low Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
OL	Organic Silts and Organic Silty Clays of Low Plasticity
MH	Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Sands
CH	Inorganic class of High Plasticity
OH	Organic Clays of Medium to High Plasticity, Organic Silts
PT	Peat, Humus, Swamp Soils with High Organic Contents
FILL	Fill Material

Notes: Composite sample collected from SB-7: (0'-10'); (10'-15'). Grab sample collected from SB-7: (7.5'-8'); (11'-11.5'). SB-7 was re-drilled after hitting refusal atapproximately 12 feet below grade surface.

PROJECT: PW77GOWAN

LOCATION: First-Street Turning Basin

DATE: 8/14/17

SOIL BORING LOG

Soil Boring ID: SB-8

SHEET 1 OF 1

BORING LOCATION: 40.6768319° -073.9880485°	**LOGGED BY:** Bryan Comey, Preferred Environmental Services
GROUND SURFACE ELEVATION: N/A	**MEASURING POINT ELEVATION:** N/A
START DATE: 8/14/17	**DRILLING CO.:** TWS
FINISH DATE: 8/14/17	**DRILLERS NAME:** Steve E.
SAMPLING METHOD: Continuous	**DRILLING METHOD AND RIG TYPE:** Roto-Sonic

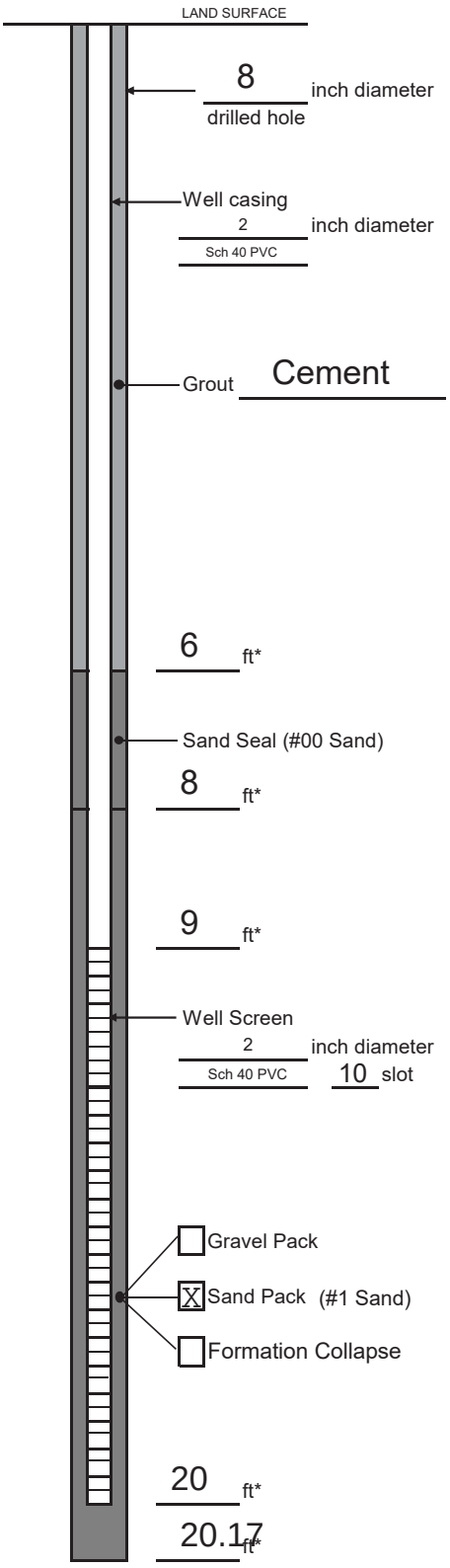
DEPTH (FT)	SAMPLE DEPTH (FT)	SAMPLE REC. (FT.)	SAMPLE PID (PPM)	GRAPHIC LOG	MATERIAL DESCRIPTION
1	0-5		N/A	N/A	Soft dug to 5 feet below grade surface prior to drilling, no odor or staining.
5	5-10	4	0.0		Fill: Brown poorly sorted fine to medium sand and silt with construction and demolition debris (bricks), no odor or staining.
10	10-12	4	5.0		Fill: Red construction and demolition debris (crushed brick) with poorly sorted fine to medium sand, silt and clay, no odor or staining. Wet at 11 feet below garade surface.
	12-13		7.8		
	13-14		12.9		Fill: Black/gray construction and demolition debris (concrete) with poorly sorted fine to medium sand and silt, petroleum odor, no staining.
15	14-15		14.8		
	15-16	3	10.2		
	16-17		0.4		Fill: Red/brown poorly graded fine to medium sand with silt and construction and demolition debris, no odor or staining.
18	17-18		0.0		
					End of boring at 18 feet below grade surface.

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

GW	Well-Graded Gravels, Gravel - Sand Mixtures, Little or No Fines
GP	Poorly-Graded Gravels, Gravel- Sand Mixtures, Little or No Fines
GM	Silty Gravels, Gravel - Sand - Silt Mixtures
GC	Clayey Gravels, Gravel- Sand- Clay Mixtures
SW	Well-Graded Sands, Gravelly Sands, Little or No Fines
SP	Poorly-Graded Sands, Gravelly Sand, Little or no Fines
SM	Silty Sands, Sand - Silt Mixtures
SC	Clayey Sands, Sand - Clay Mixtures
ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
CL	Inorganic Clays of Low Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
OL	Organic Silts and Organic Silty Clays of Low Plasticity
MH	Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Sands
CH	Inorganic class of High Plasticity
OH	Organic Clays of Medium to High Plasticity, Organic Silts
PT	Peat, Humus, Swamp Soils with High Organic Contents
FILL	Fill Material

Notes: Composite samples collected from SB-8: (0'-10'); (10'-18'). Grab samples collected from SB-8: (7.5'-8'); (12.5'-13').

WELL CONSTRUCTION LOG



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project: First Street Turning Basin Well: MW-3S

Town/City: Brooklyn

County: Kings State: NY

Permit No.: NA

Land Surface and Measuring Point Elevation: Datum: NAVD 88

Land Surface: 15.2 feet ☑ Surveyed

Measuring Point: 14.87 feet ☐ Estimated

Installation Date(s): August 18, 2017

Drilling Method: Roto-Sonic

Drilling Contractor: TWS

Drilling Fluid: None

Development Technique(s) and Date(s)

Whale Pump

August 28, 2017

Fluid Loss During Driling: NA gallons

Static Depth to Water: 16.43 feet below M.P.

Water Removed During Development: 40 gallons

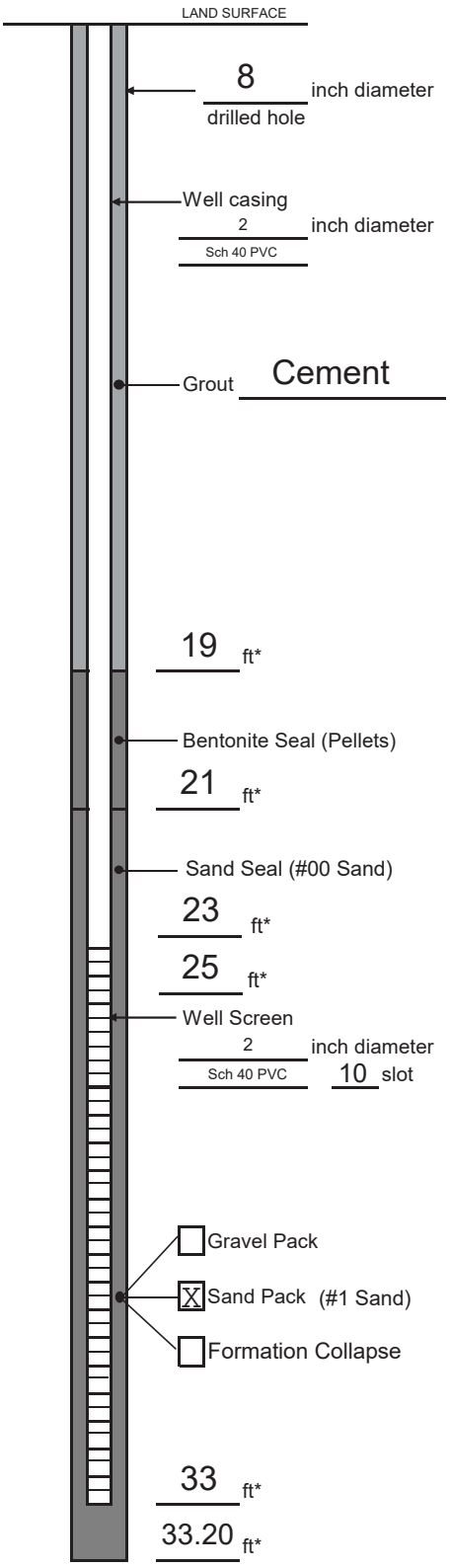
Pumping Duration: 0.75 hours

Well Purpose: Monitoring Well

Remarks: MW-3S was installed as a cluster well, alongside MW-3D in an 8-inch diameter borehole. The original MW-3S was installed on 8/9/17, but the screen was damaged so MW-3S was re-drilled adjacent to MW-3D on 8/18/17.

Prepared by: D. Prisco-Buxbaum, Preferred Environmental Services

WELL CONSTRUCTION LOG



Project: First Street Turning Basin Well: MW-3D

Town/City: Brooklyn

County: Kings State: NY

Permit No.: NA

Land Surface and Measuring Point Elevation: Datum: NAVD 88

Land Surface: 15.31 feet ☑ Surveyed

Measuring Point: 15.01 feet ☐ Estimated

Installation Date(s): August 9, 2017

Drilling Method: Roto-Sonic

Drilling Contractor: TWS

Drilling Fluid: None

Development Technique(s) and Date(s)

Whale Pump

August 11, 2017

Fluid Loss During Driling: NA gallons

Static Depth to Water: 12.71 feet below M.P.

Water Removed During Development: 15 gallons

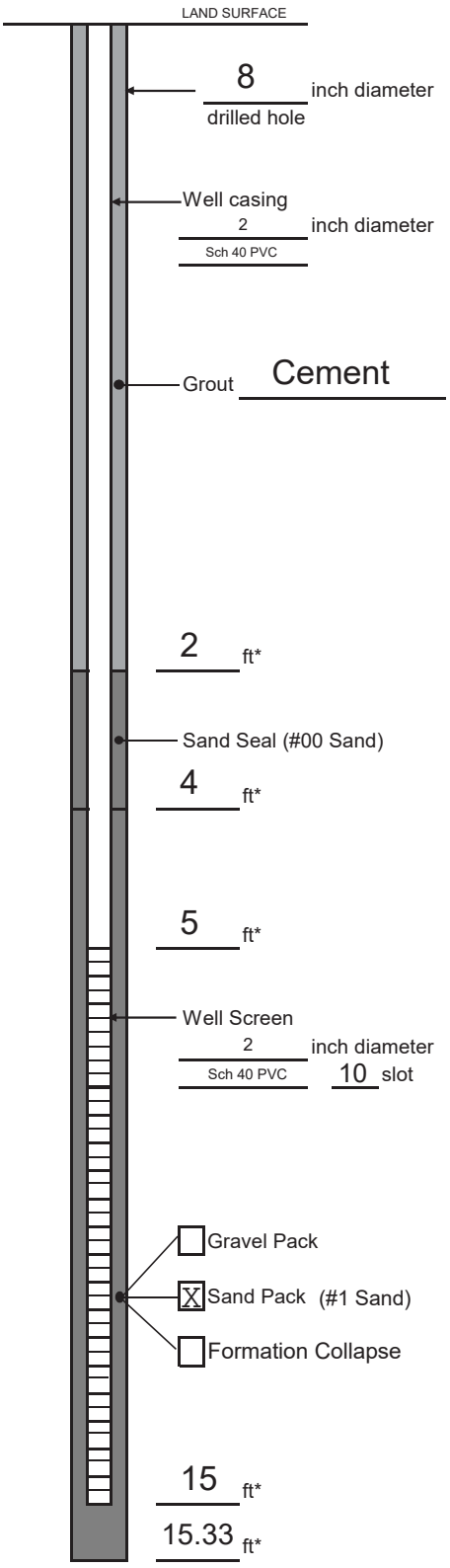
Pumping Duration: 0.83 hours

Well Purpose: Monitoring Well

Remarks: MW-3D was installed as a cluster well, alongside MW-3S in an 8-inch diameter borehole. The original MW-3S was installed on 8/9/17, but the screen was damaged so MW-3S was re-drilled adjacent to MW-3D on 8/18/17.

Prepared by: B. Comey, Preferred Environmental Services

WELL CONSTRUCTION LOG



Project: First Street Turning Basin Well: MW-4S

Town/City: Brooklyn

County: Kings State: NY

Permit No.: NA

Land Surface and Measuring Point Elevation: Datum: NAVD 88

Land Surface: 13.84 feet ☑ Surveyed

Measuring Point: 13.38 feet ☐ Estimated

Installation Date(s): August 10, 2017

Drilling Method: Roto-Sonic

Drilling Contractor: TWS

Drilling Fluid: None

Development Technique(s) and Date(s)

Whale Pump

August 11, 2017

Fluid Loss During Drilling: NA gallons

Static Depth to Water: 11.69 feet below M.P.

Water Removed During Development: 12 gallons

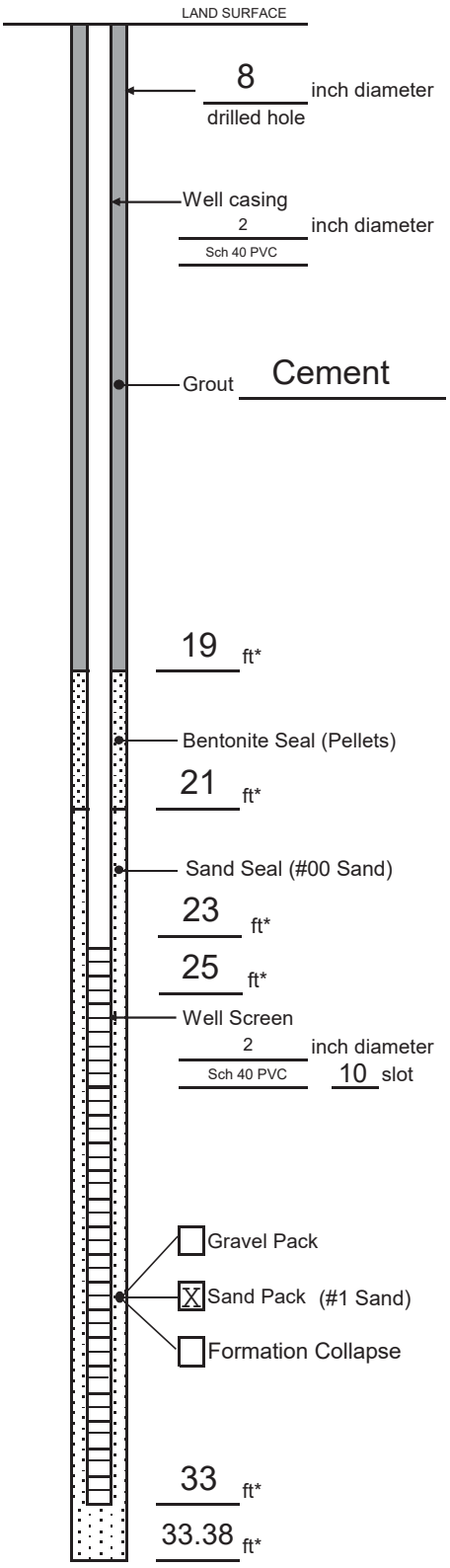
Pumping Duration: 0.83 hours

Well Purpose: Monitoring Well

Remarks: MW-4S was installed as a cluster well alongside MW-4D in an 8-inch diameter borehole.

Prepared by: D. Prisco-Buxbaum, Preferred Environmental Services

WELL CONSTRUCTION LOG



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project: First Street Turning Basin Well: MW-4D

Town/City: Brooklyn

County: Kings State: NY

Permit No.: NA

Land Surface and Measuring Point Elevation: Datum: NAVD 88

Land Surface: 13.84 feet ☑ Surveyed

Measuring Point: 13.38 feet ☐ Estimated

Installation Date(s): August 10, 2017

Drilling Method: Roto-Sonic

Drilling Contractor: TWS

Drilling Fluid: None

Development Technique(s) and Date(s)

Whale Pump

August 11, 2017

Fluid Loss During Driling: NA gallons

Static Depth to Water: 11.54 feet below M.P.

Water Removed During Development: 20 gallons

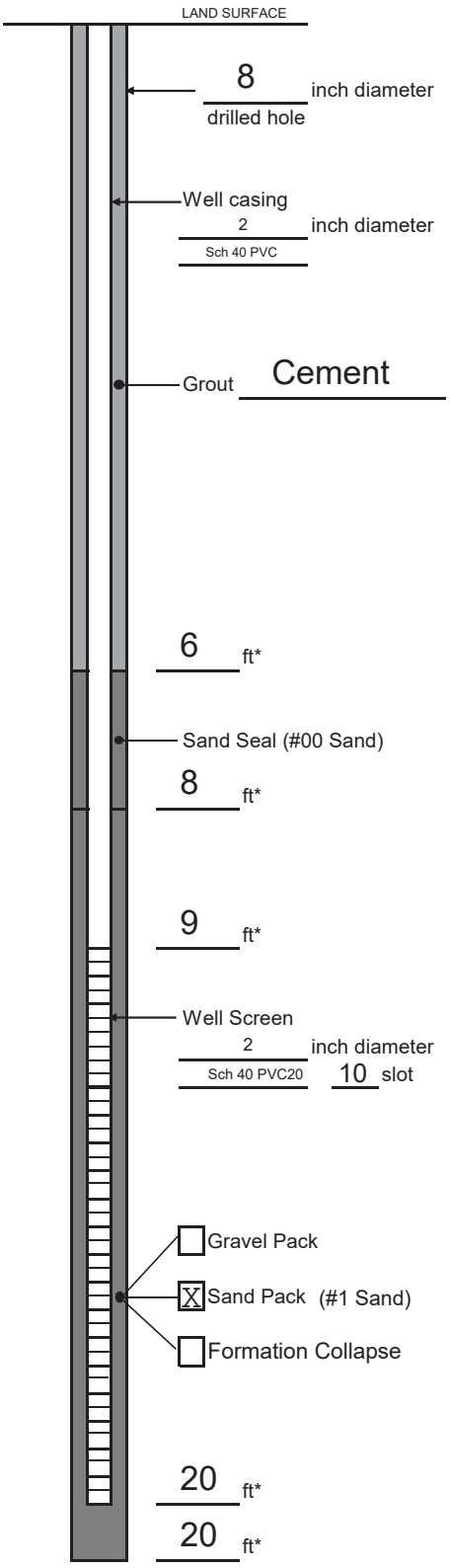
Pumping Duration: 0.75 hours

Well Purpose: Monitoring Well

Remarks: MW-4D was installed as a cluster well alongside MW-4S in an 8-inch diameter borehole.

Prepared by: B. Comey, Preferred Environmental Services

WELL CONSTRUCTION LOG



Project: First Street Turning Basin Well: MW-5S

Town/City: Brooklyn

County: Kings State: NY

Permit No.: NA

Land Surface and Measuring Point Elevation: Datum: NAVD 88

Land Surface: 10.75 feet ☑ Surveyed

Measuring Point: 14.01 feet ☐ Estimated

Installation Date(s): August 10, 2017

Drilling Method: Roto-Sonic

Drilling Contractor: TWS

Drilling Fluid: None

Development Technique(s) and Date(s)

Whale Pump

August 17, 2017

Fluid Loss During Driling: NA gallons

Static Depth to Water: 11.98 feet below M.P.

Water Removed During Development: 12 gallons

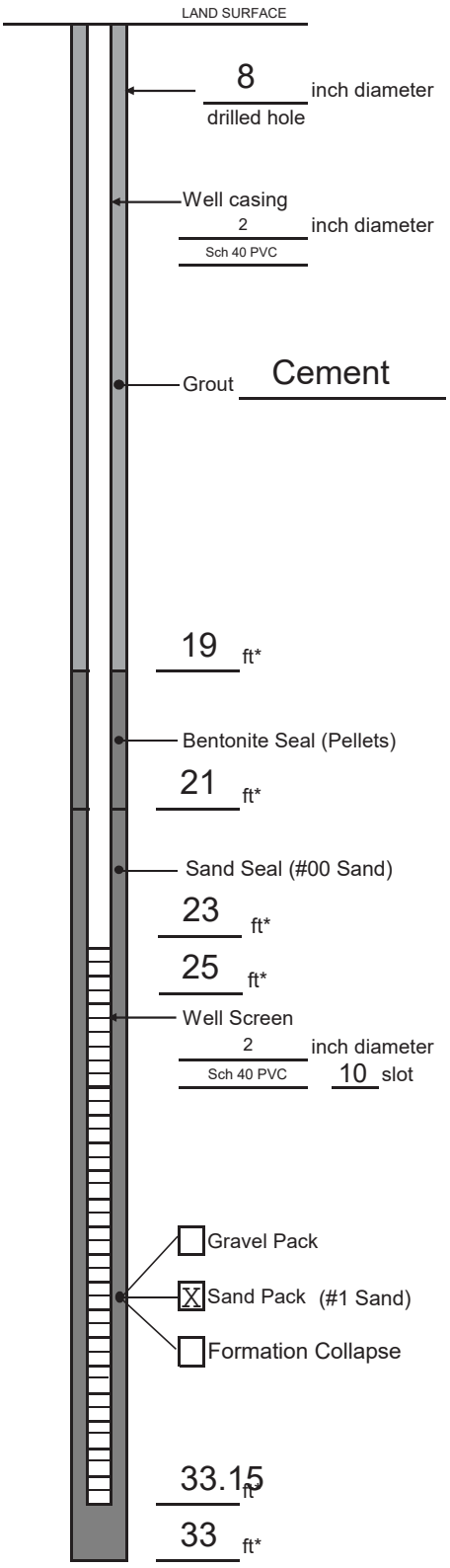
Pumping Duration: 0.75 hours

Well Purpose: Monitoring Well

Remarks: MW-5S was installed as a cluster well alongside MW-5D in an 8-inch diameter borehole.

Prepared by: B. Comey, Preferred Environmental Services

WELL CONSTRUCTION LOG



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project: First Street Turning Basin Well: MW-5D

Town/City: Brooklyn

County: Kings State: NY

Permit No.: NA

Land Surface and Measuring Point Elevation: Datum: NAVD 88

Land Surface: 10.75 feet ☑ Surveyed

Measuring Point: 14.01 feet ☐ Estimated

Installation Date(s): August 10, 2017

Drilling Method: Roto-Sonic

Drilling Contractor: TWS

Drilling Fluid: None

Development Technique(s) and Date(s)

Whale Pump

August 17, 2017

Fluid Loss During Driling: NA gallons

Static Depth to Water: 9.02 feet below M.P.

Water Removed During Development: 16 gallons

Pumping Duration: 0.75 hours

Well Purpose: Monitoring Well

Remarks: MW-5D was installed as a cluster well, alongside MW-5S in an 8-inch diameter borehole.

Prepared by: B. Comey, Preferred Environmental Services

APPENDIX F

SLUG TESTING LOGS/DATA

ATTACHMENT B: FIELD RECORDS OD SLUG TESTS

ARCADIS

Slug Test Log. Well Screened Below Watertable. Physical Slug.

Site Name: Gowanus 1st St Turning Basin | Project No: B0018800: PW77GOWA | Page: 1 of 4

Well No: MW-5D | Prepared By: B. Comey | Date: 9/8/2017 | Time: 14:16

Test/s # 10

Completed By: B. Comey

NOTE: ***Entry cell*** *Data entry cell* ← Calculation (write in only on hard field copy)

Test Type: Rising Yes | Falling Yes

DO NOT USE THIS FORM IF SWL IS BELOW TOP OF SCREEN

Transducer cable diameter: 0.12 inch (NA?)

Transducer used? Diver

Top Riser (TOR) +ve (above ground) = / Top Riser (TOR) -ve (below ground) = 3 ft

Ground Surface

Rc (riser radius) 1 in

Static Water Level (TOR)
SWL = 12.03 ft

Total well depth (bgs)
35.76 ft BGS

Static Water Level (bgs)
SWL = 12.03 ft BGS

Cable length (CL) from TOR to sensor 20 ft

Transducer sensor below SWL (Ts)= 26.73 ft

Depth SWL to top *SATURATED* screen (d)
d = 15.73 ft

Confining Unit (If Present. Otherwise SWL)

Base (bgs) [if present] = 25

Aquifer Thickness h = 15 ft ('unk' if unknown)

NOTE; Aquifer base unkown. Assume base is 5 ft below screen (40 ft bgs).

Effective screen length (Le)
Le = 10 ft

PHYSICAL
Screen length (Ls)
Ls = 8 ft

Screen Interval:
Top 25 bgs
Bottom 33 bgs

Water Column Length (Lw)
Lw = 23.73 ft

Borehole radius (Rb)
Rb = 4 in 0.33 ft

Screen radius (Rs)
Rs = 1 in 0.08 ft

Confining Unit

WELL No.	MW-5D	Test Interval	10

NOTE: Entry cell — Calculation; overwrite ONLY in hard field copy as needed. →

Test Type? Rising Head? Yes Falling Head? Yes

Aquifer Type? Confined? Yes Unconfined? No

Reference Point (TOC) Yes or No: Yes If NO, describe:

Pressure Transducer SN: Slug: Length (L): 4.1 (ft) Diameter (D) 1.5 (inch)

Slug ***Submerged***: Length (L): 4.1 (ft) Diameter (D): 1.5 (inch) 0.13 (feet)

Submerged Slug Volume (V): 0.050 (ft^3) 0.38 (gal) radius = 0.06 (ft)

T_S Baseline: Baseline Pressure Reading:

H_o: Max. Displacement Pressure Reading:

Submerged *Physical Slug Volumes*

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.125	0.003	0.026
1	1.125	0.007	0.052
2	1.125	0.014	0.103
3	1.125	0.021	0.155
4	1.125	0.028	0.207
5	1.125	0.035	0.258
0.5	1.5	0.006	0.046
1	1.5	0.012	0.092
1.5	1.5	0.018	0.138
2	1.5	0.025	0.184
2.5	1.5	0.031	0.230
3	1.5	0.037	0.275
4	1.5	0.049	0.367
5	1.5	0.061	0.459

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.625	0.007	0.054
1	1.625	0.014	0.108
1.5	1.625	0.022	0.162
2	1.625	0.029	0.215
2.5	1.625	0.036	0.269
3	1.625	0.043	0.323
4	1.625	0.058	0.431
1	3	0.049	0.367
2	3	0.098	0.734
3	3	0.147	1.102
4	3	0.196	1.469
4.25	3	0.209	1.561
4.5	3	0.221	1.653
5	3	0.245	1.836

Note: 1/8 inch = 0.125 inch. 5/8 inch = 0.625 inch

H_o Initial change in head at instant the slug test is started

r_t Radius of transducer cable (can be ignored if less than 1/8 inch)

T_S Depth of transducer below static water level

THEORETICAL HEAD CHANGE - INITIAL DISPLACEMENT (H^*_0). USE ACTUAL SUBMERGED VOLUME OF PHYSICAL SLUG

Slug Volume (gallon)	Slug Volume (ml)	Well Casing Diameter (inches)	Theoretical Initial Displacement, H^*_0 (feet)
0.25	946	2	1.56
0.5	1893	2	3.13
1	3785	2	6.25
0.5	1893	4	0.77
1	3785	4	1.54
2	7570	4	3.08
1	3785	6	0.68
2	7570	6	1.36
3	11355	6	2.04

THEORETICAL INITIAL DISPLACEMENT CALCULATOR

Submerged Slug Volume

V = (ft^3) 0.050 (gal) 0.38

Well Screen

(inch) (ft)

R_s = **Screen *RADIUS*** 1 0.08

Theoretical Initial Displacement

(inch) (ft)

H^*_0 = 36.9 3.08

WELL PARAMETERS REQUIRED FOR CALCULATING HYDRAULIC CONDUCTIVITY

L_e	Effective SATURATED screen length, including the sand pack if entire screen is saturated.
L_s	True screen length (SATURATED)
L_w	Length of water column in Well (TD minus SWL)
R_s	Screen radius
R_b	Radius of filter pack or borehole
R_c	Casing radius
r_t	Radius of the transducer data cable (if used)
T_s	Depth the transducer is submerged below Static Water Level (SWL)
CL	Cable/wire length, from TOC to transducer sensor (for barometric correction of Schlumberger 'Diver's).
SWL	Static water level from TOC and ground
TD	Total depth of well/screen from reference point
h	Saturated thickness of aquifer
H_o	Initial head change at instant the slug test is started.
Aquifer Type	Confined or unconfined

Well No.	***MW-5D***	***Estimate of Effective Casing Radius (all analysis methods)***	Page: 3 of 4

Requires that data from formation-response phase plots as a straight line/double straight line in a log of Normalized Head vs Time.

Rc_{ef} = $Rs*sqrt(H_0/H^*_0)$ (from Butler, 1998, 2014)

Rc_{ef} = $[R^2_s+n(R^2_b-R^2_s)]^{0.5}$ (Bouwer, 1989, in Butler, 2014)

Where: Rc_{ef} = Effective casing radius

H_0 Initial head change at instant the slug test is started.

H^*_0 Theoretical/Expected Head Change (page 2)

Normalized Head = change in head divided by the theoretical/expected initial displacement (H^*_0).

Input

Porosity n=	0.32	unitless		R_s = screen radius	
H_0/H_0	0.88	Input from plot of normalized head vs time, as per example from Butler (2014).			

Output

Rs =	1	inch →	0.1	feet	
Rc_{ef} =	0.09	(feet) →	1.1	inch	from Butler (2014)
Rc_{ef} =	0.63	(feet) →	7.5	inch	from Bouwer (1989) referenced in Butler (2014)

If the results from both equations are within 10 - 15% of each other, then Rc_{ef} appears reasonable.

Check the value of 'n' (drainable porosity), for 'reasonableness'.

From:	Rc_{ef} =	$Rs*sqrt(H_0/H^*_0)$	from Butler (1998, 2014)
Substitute Rc_{ef} into:	Rc_{ef} =	$[R^2_s+n(R^2_b-R^2_s)]^{0.5}$	
to obtain 'n':	n=	$R^2c_{ef}-R^2_s/R^2_b-R^2_s$	
n' = 0.01		If about 25% of assumed value of 'n', then this is probably OK.	

Sources: Butler, J.J. (2014). 'Slug tests in wells screened across the water table: some additional considerations'. Groundwater 52, No 2.
Butler, J.J. (1998). "The design, performance, and analysis of slug tests". Lewis Publishers.

Well No.	MW-5D	Test Interval	10	Slug Length (ft)	4.1

Manually Recorded Depths to Water

Rising or Falling Head Test?

Time Start | | *Duration* | 0 | (Initiation - slug in or out) | Duration in minutes

Note	Time	Duration	DTW (TOC)	Note	Time	Duration	DTW (TOC)
Test 7 data for 4.1 ft slug lost. Redone in Test 10.							
Slug in: Falling	14:23:02						
Slug out: Rising	14:51:53						

Notes: Gallons purged for development.

ARCADIS

Slug Test Log. Well Screened Below Watertable. Physical Slug.

Site Name: Gowanus 1st St Turning Basin | Project No: B0018800: PW77GOWA | Page: 1 of 4

Well No: MW-5D | Prepared By: J. Zatos | Date: 9/8/2017 | Time: 11:30

Test/s #: 8 & 9

Completed By: B. Comey

NOTE: *Entry cell* *Data entry cell* ← Calculation (write in only on hard field copy)

Test Type: Rising Yes | Falling Yes

DO NOT USE THIS FORM IF SWL IS BELOW TOP OF SCREEN

Transducer cable diameter: 0.12 inch (NA?)

Transducer used? Diver

Top Riser (TOR) +ve (above ground) = / Top Riser (TOR) -ve (below ground) = 3 ft

Ground Surface

Rc (riser radius) 1 in

Static Water Level (TOR)
SWL = 11.73 ft

Total well depth (bgs)
35.76 ft BGS

Static Water Level (bgs)
SWL = 11.73 ft BGS

Cable length (CL) from TOR to sensor 20 ft

Transducer sensor below SWL (Ts)= 27.03 ft

Depth SWL to top *SATURATED* screen (d)
d = 16.03 ft

Confining Unit (If Present. Otherwise SWL)

Base (bgs) [if present] = 25

Aquifer Thickness h = 15 ft ('unk' if unknown)

NOTE; Aquifer base unkown. Assume base is 5 ft below screen (40 ft bgs).

Effective screen length (Le)
Le = 10 ft

PHYSICAL
Screen length (Ls)
Ls = 8 ft

Screen Interval:
Top 25 bgs
Bottom 33 bgs

Water Column Length (Lw)
Lw = 24.03 ft

Borehole radius (Rb)
Rb = 4 in 0.33 ft

Screen radius (Rs)
Rs = 1 in 0.08 ft

Confining Unit

WELL No.	MW-5D	Test Interval	8 & 9

NOTE: Entry cell — Calculation; overwrite ONLY in hard field copy as needed. →

Test Type? Rising Head? Yes Falling Head? Yes

Aquifer Type? Confined? Yes Unconfined? No

Reference Point (TOC) Yes or No: Yes If NO, describe:

Pressure Transducer SN: Slug: Length (L): 3 (ft) Diameter (D) 1.5 (inch)

Slug ***Submerged***: Length (L): 3 (ft) Diameter (D): 1.5 (inch) 0.13 (feet)

Submerged Slug Volume (V): 0.037 (ft^3) 0.28 (gal) radius = 0.06 (ft)

T_S Baseline: Baseline Pressure Reading:

H_o: Max. Displacement Pressure Reading:

Submerged *Physical Slug Volumes*

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.125	0.003	0.026
1	1.125	0.007	0.052
2	1.125	0.014	0.103
3	1.125	0.021	0.155
4	1.125	0.028	0.207
5	1.125	0.035	0.258
0.5	1.5	0.006	0.046
1	1.5	0.012	0.092
1.5	1.5	0.018	0.138
2	1.5	0.025	0.184
2.5	1.5	0.031	0.230
3	1.5	0.037	0.275
4	1.5	0.049	0.367
5	1.5	0.061	0.459

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.625	0.007	0.054
1	1.625	0.014	0.108
1.5	1.625	0.022	0.162
2	1.625	0.029	0.215
2.5	1.625	0.036	0.269
3	1.625	0.043	0.323
4	1.625	0.058	0.431
1	3	0.049	0.367
2	3	0.098	0.734
3	3	0.147	1.102
4	3	0.196	1.469
4.25	3	0.209	1.561
4.5	3	0.221	1.653
5	3	0.245	1.836

Note: 1/8 inch = 0.125 inch. 5/8 inch = 0.625 inch

H_o Initial change in head at instant the slug test is started

r_t Radius of transducer cable (can be ignored if less than 1/8 inch)

T_S Depth of transducer below static water level

THEORETICAL HEAD CHANGE - INITIAL DISPLACEMENT (H^*_0). USE ACTUAL SUBMERGED VOLUME OF PHYSICAL SLUG

Slug Volume (gallon)	Slug Volume (ml)	Well Casing Diameter (inches)	Theoretical Initial Displacement, H^*_0 (feet)
0.25	946	2	1.56
0.5	1893	2	3.13
1	3785	2	6.25
0.5	1893	4	0.77
1	3785	4	1.54
2	7570	4	3.08
1	3785	6	0.68
2	7570	6	1.36
3	11355	6	2.04

THEORETICAL INITIAL DISPLACEMENT CALCULATOR

Submerged Slug Volume

V = (ft^3) 0.037 (gal) 0.28

Well Screen

(inch) (ft)

R_s = **Screen *RADIUS*** 1 0.08

Theoretical Initial Displacement

(inch) (ft)

H^*_0 = 27.0 2.25

WELL PARAMETERS REQUIRED FOR CALCULATING HYDRAULIC CONDUCTIVITY

L_e	Effective SATURATED screen length, including the sand pack if entire screen is saturated.
L_s	True screen length (SATURATED)
L_w	Length of water column in Well (TD minus SWL)
R_s	Screen radius
R_b	Radius of filter pack or borehole
R_c	Casing radius
r_t	Radius of the transducer data cable (if used)
T_s	Depth the transducer is submerged below Static Water Level (SWL)
CL	Cable/wire length, from TOC to transducer sensor (for barometric correction of Schlumberger 'Diver's).
SWL	Static water level from TOC and ground
TD	Total depth of well/screen from reference point
h	Saturated thickness of aquifer
H_o	Initial head change at instant the slug test is started.
Aquifer Type	Confined or unconfined

Well No.	***MW-5D***	***Estimate of Effective Casing Radius (all analysis methods)***	Page: 3 of 4

Requires that data from formation-response phase plots as a straight line/double straight line in a log of Normalized Head vs Time.

Rc_{ef} = $Rs*sqrt(H_0/H^*_0)$ Where: Rc_{ef} = Effective casing radius

(from Butler, 1998, 2014) H_0 Initial head change at instant the slug test is started.

Rc_{ef} = $[R^2_s+n(R^2_b-R^2_s)]^{0.5}$ H^*_0 Theoretical/Expected Head Change (page 2)

(Bouwer, 1989, in Butler, 2014) Normalized Head = change in head divided by the theoretical/expected initial displacement (H^*_0).

Input	Porosity n=	0.32	unitless		R_s = screen radius	
	H_0/H_0	0.76	Input from plot of normalized head vs time, as per example from Butler (2014).			
	Rs =	1	inch →	0.1	feet	
Output	Rc_{ef} =	0.10	(feet) →	1.2	inch	from Butler (2014)
	Rc_{ef} =	0.63	(feet) →	7.5	inch	from Bouwer (1989) referenced in Butler (2014)

If the results from both equations are within 10 - 15% of each other, then Rc_{ef} appears reasonable.

Check the value of 'n' (drainable porosity), for 'reasonableness'.

From:	Rc_{ef} =	$Rs*sqrt(H_0/H^*_0)$	from Butler (1998, 2014)
Substitute Rc_{ef} into:	Rc_{ef} =	$[R^2_s+n(R^2_b-R^2_s)]^{0.5}$	
to obtain 'n':	n=	$R^2c_{ef}-R^2_s/R^2_b-R^2_s$	
n' = 0.02		If about 25% of assumed value of 'n', then this is probably OK.	

Sources: Butler, J.J. (2014). 'Slug tests in wells screened across the water table: some additional considerations'. Groundwater 52, No 2.
Butler, J.J. (1998). "The design, performance, and analysis of slug tests". Lewis Publishers.

Well No.	MW-5D	Test Interval	8 & 9	Slug Length (ft)	3

Manually Recorded Depths to Water

Rising or Falling Head Test?

Time Start | | *Duration* | 0 | (Initiation - slug in or out) | Duration in minutes

Note	Time	Duration	DTW (TOC)	Note	Time	Duration	DTW (TOC)
Test 7 data for 4.1 ft slug lost.							
Slug in: Falling	11:41:00						
Slug out: Rising	12:10:00						
Slug in: Falling	12:51:45						
Slug out: Rising	13:42:00						

Notes: Gallons purged for development.

ARCADIS

Slug Test Log. Well Screened Across Watertable. Physical Slug.

Site Name: Gowanus 1st St Turning Basin Project No: B0018800: PW77GOWA Page: 1 of 5

Well No: MW-5S Prepared By: B. Comey Date: 9/8/2017 Time: 8:45

Test # 8

Completed By: B. Comey

NOTE: ***Entry cell*** *Data entry cell* ← Calculation (write in only on hard field copy)

Test Type: Rising X

Falling **NOT APPROPRIATE** Comment:

Transducer cable diameter: 0.12 inch (NA?)

Transducer used?

Top Riser (TOR) +ve (above ground) =
Top Riser (TOR) -ve (below ground) = 3 ft

Ground Surface

Rc (riser radius) 1 in

Static Water Level (TOR)
SWL = 12.35 ft

Cable length (CL)
from TOR to sensor 20 ft

Static Water Level (SWL) (bgs)
[Depth to top of SATURATED Screen (d)]
d = 9.35 ft BGS

Total well depth (bgs)
19 ft BGS

Screen Interval:
Top 9 bgs
Bottom 19 bgs

Transducer sensor below SWL (Ts)= 9.65 ft

Aquifer Thickness (h)
h = 7.65 ft
('unk' if unknown)

Effective screen length (Le)
Le = 7.65 ft
(= Ls, as SWL below screen top)

SATURATED Screen length (Ls)
Ls = 7.65 ft
NOTE: <= physical screen length

Water Column Length (Lw)
Lw = 7.65 ft

Borehole radius (Rb)
Rb = 4 in 0.33 ft

Screen radius (Rs)
Rs = 1 in 0.08 ft

Confining Unit

WELL No.	MW-5S	Test #	8	Really great information!

NOTE: Entry cell — Calculation; overwrite ONLY in hard field copy as needed. →

Test Type? Rising Head? Yes Falling Head: NOT APPROPRIATE for watertable wells.

Aquifer Type? Confined? NA Unconfined? Yes

Reference Point (TOC) Yes or No: Yes If NO, describe:

Pressure Transducer SN: Slug: Length (L): 4.1 (ft) Diameter (D) 1.5 (inch)

Slug ***Submerged***: Length (L): 4.1 (ft) Diameter (D): 1.5 (inch) 0.13 (feet)

Submerged Slug Volume (V): 0.050 (ft^3) 0.38 (gal) radius = 0.06 (ft)

T_S Baseline: Baseline Pressure Reading:

H_o: Max. Displacement Pressure Reading:

Submerged *Physical Slug Volumes*

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.125	0.003	0.026
1	1.125	0.007	0.052
2	1.125	0.014	0.103
3	1.125	0.021	0.155
4	1.125	0.028	0.207
5	1.125	0.035	0.258
0.5	1.5	0.006	0.046
1	1.5	0.012	0.092
1.5	1.5	0.018	0.138
2	1.5	0.025	0.184
2.5	1.5	0.031	0.230
3	1.5	0.037	0.275
4	1.5	0.049	0.367
5	1.5	0.061	0.459

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.625	0.007	0.054
1	1.625	0.014	0.108
1.5	1.625	0.022	0.162
2	1.625	0.029	0.215
2.5	1.625	0.036	0.269
3	1.625	0.043	0.323
4	1.625	0.058	0.431
1	3	0.049	0.367
2	3	0.098	0.734
3	3	0.147	1.102
4	3	0.196	1.469
4.25	3	0.209	1.561
4.5	3	0.221	1.653
5	3	0.245	1.836

Note: 1/8 inch = 0.125 inch. 5/8 inch = 0.625 inch

H_o Initial change in head at instant the slug test is started

r_t Radius of transducer cable (can be ignored if less than 1/8 inch)

T_S Depth of transducer below static water level

THEORETICAL HEAD CHANGE - INITIAL DISPLACEMENT (H^*_0). USE ACTUAL SUBMERGED VOLUME OF PHYSICAL SLUG

Slug Volume (gallon)	Slug Volume (ml)	Well Casing Diameter (inches)	Theoretical Initial Displacement, H^*_0 (feet)
0.25	946	2	1.56
0.5	1893	2	3.13
1	3785	2	6.25
0.5	1893	4	0.77
1	3785	4	1.54
2	7570	4	3.08
1	3785	6	0.68
2	7570	6	1.36
3	11355	6	2.04

THEORETICAL INITIAL DISPLACEMENT CALCULATOR

Submerged Slug Volume

V = (ft^3) 0.050 (gal) 0.38

Well Screen

R_s = **Screen *RADIUS*** (inch) 1 (ft) 0.08

Theoretical Initial Displacement

H^*_0 = (inch) 36.9 (ft) 3.08

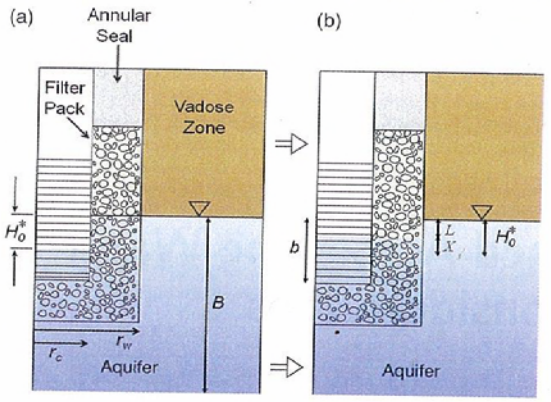
WELL PARAMETERS REQUIRED FOR CALCULATING HYDRAULIC CONDUCTIVITY

L_e	Effective SATURATED screen length, including the sand pack if entire screen is saturated.
L_s	True screen length (SATURATED)
L_w	Length of water column in Well (TD minus SWL)
R_s	Screen radius
R_b	Radius of filter pack or borehole
R_c	Casing radius
r_t	Radius of the transducer data cable (if used)
T_s	Depth the transducer is submerged below Static Water Level (SWL)
CL	Cable/wire length, from TOC to transducer sensor (for barometric correction of Schlumberger 'Diver's).
SWL	Static water level from TOC and ground
TD	Total depth of well/screen from reference point
h	Saturated thickness of aquifer
H_o	Initial head change at instant the slug test is started.
Aquifer Type	Confined or unconfined

Mass Balance Approach. Assumes the filter-pack drains completely before any aquifer response. Assumes the filter-pack is significantly more permeable than the soil. Therefore, the volume of water drained from filter-pack = volume of water entering the well casing. From Butler (2014).

The following estimates a theoretical normalized head, to determine if an acceptable signal-to-noise ratio is present in the test.

Butler (2014). Groundwater 52, No. 2



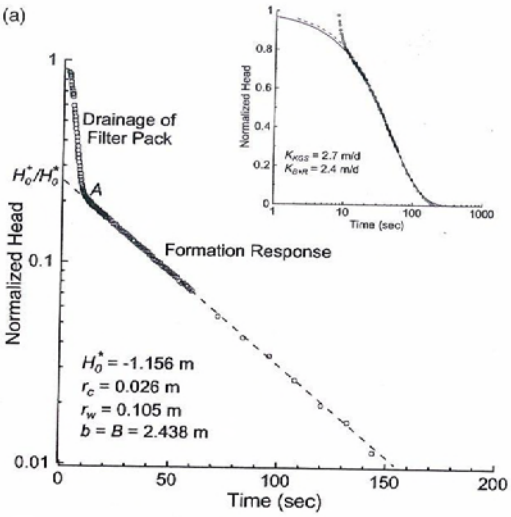


Figure 1. Schematic diagram of a slug test in a well screened across the water table. (a) Situation immediately after initiation of a rising-head slug test with an expected initial displacement of H_0^*; (b) Situation immediately after completion of filter-pack drainage (filter-pack drainage is assumed to be completed prior to any aquifer response; r_c is the radius of the well casing and screen, r_w is the radius of the borehole, b is the effective [submerged] screen length at static conditions, B is the aquifer thickness, L and X are defined in text).

NOTE: ***Entry cell*** ***Calculation; overwrite ONLY in hard field copy as needed.*** →

1). Mass balance: $\pi r^2_s * X = \pi r^2 * (R^2_b - R^2_s) * n \mathcal{l}$

Input	R_s =	1.0	inch	R_s = screen radius
	R_b =	4.0	inch	R_b = borehole radius
	n =	0.25	unitless	n = filter-pack drainable porosity (try different values)
	X =		feet	X = water level change due to filter-pack drainage
	$\mathcal{l}$ =		feet	$\mathcal{l}$ = length of drained filter-pack
Output	$\pi r^2_s * X$ =			$\pi r^2 * (R^2_b - R^2_s) * n \mathcal{l}$ =

If both sides are within a factor of 2, then filter-pack drainage phase is assumed identified (straight line log plot).

2). Substitute: H^*_0 - $\mathcal{l}$ for X and solve for $\mathcal{l}$

$\mathcal{l} = H^*_0/(An-n+1)$ where: H^*_0 = expected/theoretical initial displacement

$A = R^2_b/R^2_s$

3). Divide (2) by H^*_0 to give: To obtain the expected Normalized Head at end of filter-pack drainage.

$\mathcal{l}/H_0 = 1/(An - n + 1)$ Normalized Head serves as a means to determine how much filter-pack drainage may occur.

Input	R_s =	1.0	inch	0.08	feet	R^2_s (ft) = 0.007	No overwrite
	R_b =	4.0	inch	0.33	feet	R^2_b (ft) = 0.111	No overwrite
	n =	(range 0.2 to 0.35)		0.25	unitless		
	A =	16.0					
Output	$\mathcal{l}/H^*_0$ =	0.21	←	Filter-pack drainage should be complete at this Normalized Head.			

If Normalized Head > 0.1, the signal to noise ratio should be acceptable.

If formation - response phase < 25% of the submerged screen at static, changes in submerged screen length should not be of practical importance.

Well No.	***MW-5S***	***Estimate of Effective Casing Radius (all analysis methods)***	Page: 4 of 5

Requires that data from formation-response phase plots as a straight line/double straight line in a log of Normalized Head vs Time.

Rc_{ef} = $Rs*sqrt(H_0/H^*_0)$ Where: Rc_{ef} = Effective casing radius

(from Butler, 1998, 2014) H_0 Initial head change at instant the slug test is started.

Rc_{ef} = $[R^2_s+n(R^2_b-R^2_s)]^{0.5}$ H^*_0 Theoretical/Expected Head Change (page 2)

(Bouwer, 1989, in Butler, 2014) Normalized Head = change in head divided by the theoretical/expected initial displacement (H^*_0).

Input	Porosity n=	0.25	unitless		R_s = screen radius	
	H_0/H_0	1.33	Input from plot of normalized head vs time, as per example from Butler (2014) Figure 1 above.			
	Rs =	1	inch →	0.1	feet	
Output	Rc_{ef} =	0.07	(feet) →	0.9	inch	from Butler (2014)
	Rc_{ef} =	0.18	(feet) →	2.2	inch	from Bouwer (1989) referenced in Butler (2014)

If the results from both equations are within 10 - 15% of each other, then Rc_{ef} appears reasonable.

Check the value of 'n' (drainable porosity), for 'reasonableness'.

From:	Rc_{ef} =	$Rs*sqrt(H_0/H^*_0)$	from Butler (1998, 2014)
Substitute Rc_{ef} into:	Rc_{ef} =	$[R^2_s+n(R^2_b-R^2_s)]^{0.5}$	
to obtain 'n':	n=	$R^2c_{ef}-R^2_s/R^2_b-R^2_s$	

n' = -0.02 If about 25% of assumed value of 'n', then this is probably OK.

Sources: Butler, J.J. (2014). 'Slug tests in wells screened across the water table: some additional considerations'. Groundwater 52, No 2.
Butler, J.J. (1998). "The design, performance, and analysis of slug tests". Lewis Publishers.

Well No.	MW-5S	Test #	8	Slug Length (ft)	4.1

Manually Recorded Depths to Water Page: 5 of 5

Rising Head Test

Time Start		*Duration*	0		Duration in minutes		
Note	Time	Duration	DTW (TOC)	Note	Time	Duration	DTW (TOC)
Slug in	8:39						
slug out; Rising	8:42						
slug in	8:48						
slug out; Rising	8:51						

Notes:

ARCADIS

Slug Test Log. Well Screened Across Watertable. Physical Slug.

Site Name: Gowanus 1st St Turning Basin Project No: B0018800 Page: 1 of 5

Well No: MW-5S Prepared By: J. Zatos Date: 9/8/2017 Time: 8:53

Test # 9 & 10

Completed By: J. Zatos

NOTE: *Entry cell* *Data entry cell* ← Calculation (write in only on hard field copy)

Test Type: Rising X

Falling NOT APPROPRIATE Comment:

Transducer cable diameter: 0.12 inch (NA?)

Transducer used?

Top Riser (TOR) +ve (above ground) =
Top Riser (TOR) -ve (below ground) = 3 ft

Ground Surface

Rc (riser radius) 1 in

Static Water Level (TOR)
SWL = 12.35 ft

Cable length (CL)
from TOR to sensor 20 ft

Static Water Level (SWL) (bgs)
[Depth to top of SATURATED Screen (d)]
d = 9.35 ft BGS

Total well depth (bgs)
19 ft BGS

Screen Interval:
Top 9 bgs
Bottom 19 bgs

Transducer sensor below SWL (Ts)= 9.65 ft

Aquifer Thickness (h)
h = 7.65 ft
('unk' if unknown)

Effective screen length (Le)
Le = 7.65 ft
(= Ls, as SWL below screen top)

SATURATED Screen length (Ls)
Ls = 7.65 ft
NOTE: <= physical screen length

Water Column Length (Lw)
Lw = 7.65 ft

Borehole radius (Rb)
Rb = 4 in 0.33 ft

Screen radius (Rs)
Rs = 1 in 0.08 ft

Confining Unit

WELL No.	MW-5S	Test #	9 & 10	Really great information!

NOTE: Entry cell — Calculation; overwrite ONLY in hard field copy as needed. →

Test Type? Rising Head? Yes Falling Head: NOT APPROPRIATE for watertable wells.

Aquifer Type? Confined? NA Unconfined? Yes

Reference Point (TOC) Yes or No: Yes If NO, describe:

Pressure Transducer SN: Slug: Length (L): 3 (ft) Diameter (D) 1.5 (inch)

Slug ***Submerged***: Length (L): 3 (ft) Diameter (D): 1.5 (inch) 0.13 (feet)

Submerged Slug Volume (V): 0.037 (ft^3) 0.28 (gal) radius = 0.06 (ft)

T_S Baseline: Baseline Pressure Reading:

H_o: Max. Displacement Pressure Reading:

Submerged *Physical Slug Volumes*

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.125	0.003	0.026
1	1.125	0.007	0.052
2	1.125	0.014	0.103
3	1.125	0.021	0.155
4	1.125	0.028	0.207
5	1.125	0.035	0.258
0.5	1.5	0.006	0.046
1	1.5	0.012	0.092
1.5	1.5	0.018	0.138
2	1.5	0.025	0.184
2.5	1.5	0.031	0.230
3	1.5	0.037	0.275
4	1.5	0.049	0.367
5	1.5	0.061	0.459

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.625	0.007	0.054
1	1.625	0.014	0.108
1.5	1.625	0.022	0.162
2	1.625	0.029	0.215
2.5	1.625	0.036	0.269
3	1.625	0.043	0.323
4	1.625	0.058	0.431
1	3	0.049	0.367
2	3	0.098	0.734
3	3	0.147	1.102
4	3	0.196	1.469
4.25	3	0.209	1.561
4.5	3	0.221	1.653
5	3	0.245	1.836

Note: 1/8 inch = 0.125 inch. 5/8 inch = 0.625 inch

H_o Initial change in head at instant the slug test is started

r_t Radius of transducer cable (can be ignored if less than 1/8 inch)

T_S Depth of transducer below static water level

THEORETICAL HEAD CHANGE - INITIAL DISPLACEMENT (H^*_0). USE ACTUAL SUBMERGED VOLUME OF PHYSICAL SLUG

Slug Volume (gallon)	Slug Volume (ml)	Well Casing Diameter (inches)	Theoretical Initial Displacement, H^*_0 (feet)
0.25	946	2	1.56
0.5	1893	2	3.13
1	3785	2	6.25
0.5	1893	4	0.77
1	3785	4	1.54
2	7570	4	3.08
1	3785	6	0.68
2	7570	6	1.36
3	11355	6	2.04

THEORETICAL INITIAL DISPLACEMENT CALCULATOR

Submerged Slug Volume

V = (ft^3) 0.037 (gal) 0.28

Well Screen

R_s = **Screen *RADIUS*** (inch) 1 (ft) 0.08

Theoretical Initial Displacement

H^*_0 = (inch) 27.0 (ft) 2.25

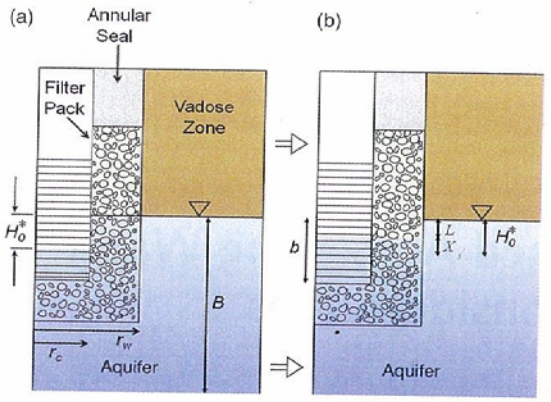
WELL PARAMETERS REQUIRED FOR CALCULATING HYDRAULIC CONDUCTIVITY

L_e	Effective SATURATED screen length, including the sand pack if entire screen is saturated.
L_s	True screen length (SATURATED)
L_w	Length of water column in Well (TD minus SWL)
R_s	Screen radius
R_b	Radius of filter pack or borehole
R_c	Casing radius
r_t	Radius of the transducer data cable (if used)
T_s	Depth the transducer is submerged below Static Water Level (SWL)
CL	Cable/wire length, from TOC to transducer sensor (for barometric correction of Schlumberger 'Diver's).
SWL	Static water level from TOC and ground
TD	Total depth of well/screen from reference point
h	Saturated thickness of aquifer
H_o	Initial head change at instant the slug test is started.
Aquifer Type	Confined or unconfined

Mass Balance Approach. Assumes the filter-pack drains completely before any aquifer response. Assumes the filter-pack is significantly more permeable than the soil. Therefore, the volume of water drained from filter-pack = volume of water entering the well casing. From Butler (2014).

The following estimates a theoretical normalized head, to determine if an acceptable signal-to-noise ratio is present in the test.

Butler (2014). Groundwater 52, No. 2



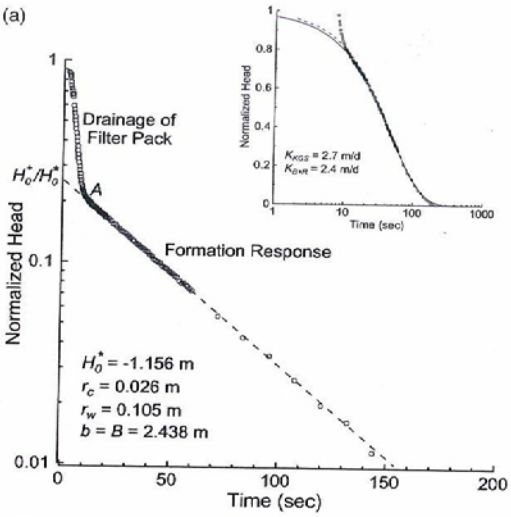


Figure 1. Schematic diagram of a slug test in a well screened across the water table. (a) Situation immediately after initiation of a rising-head slug test with an expected initial displacement of H_0^*; (b) Situation immediately after completion of filter-pack drainage (filter-pack drainage is assumed to be completed prior to any aquifer response; r_c is the radius of the well casing and screen, r_w is the radius of the borehole, b is the effective [submerged] screen length at static conditions, B is the aquifer thickness, L and X are defined in text).

NOTE: ***Entry cell*** ***Calculation; overwrite ONLY in hard field copy as needed.*** →

1). Mass balance: $\pi r^2_s * X = \pi r^2 * (R^2_b - R^2_s) * n \mathcal{l}$

Input	R_s =	1.0	inch	R_s = screen radius
	R_b =	4.0	inch	R_b = borehole radius
	n =	0.25	unitless	n = filter-pack drainable porosity (try different values)
	X =		feet	X = water level change due to filter-pack drainage
	$\mathcal{l}$ =		feet	$\mathcal{l}$ = length of drained filter-pack
Output	$\pi r^2_s * X$ =			$\pi r^2 * (R^2_b - R^2_s) * n \mathcal{l}$ =

If both sides are within a factor of 2, then filter-pack drainage phase is assumed identified (straight line log plot).

2). Substitute: H^*_0 - $\mathcal{l}$ for X and solve for $\mathcal{l}$

$\mathcal{l} = H^*_0/(An-n+1)$ where: H^*_0 = expected/theoretical initial displacement

$A = R^2_b/R^2_s$

3). Divide (2) by H^*_0 to give: To obtain the expected Normalized Head at end of filter-pack drainage.

$\mathcal{l}/H_0 = 1/(An - n + 1)$ Normalized Head serves as a means to determine how much filter-pack drainage may occur.

Input	R_s =	1.0	inch	0.08	feet	R^2_s (ft) = 0.007	No overwrite
	R_b =	4.0	inch	0.33	feet	R^2_b (ft) = 0.111	No overwrite
	n =	(range 0.2 to 0.35)		0.25	unitless		
	A =	16.0					
Output	$\mathcal{l}/H^*_0$ =	0.21	←	Filter-pack drainage should be complete at this Normalized Head.			

If Normalized Head > 0.1, the signal to noise ratio should be acceptable.

If formation - response phase < 25% of the submerged screen at static, changes in submerged screen length should not be of practical importance.

Well No.	*MW-5S*	*Estimate of Effective Casing Radius (all analysis methods)*	Page: 4 of 5

Requires that data from formation-response phase plots as a straight line/double straight line in a log of Normalized Head vs Time.

Rc_{ef} = $Rs*sqrt(H_0/H^*_0)$ Where: Rc_{ef} = Effective casing radius

(from Butler, 1998, 2014) H_0 Initial head change at instant the slug test is started.

Rc_{ef} = $[R^2_s+n(R^2_b-R^2_s)]^{0.5}$ H^*_0 Theoretical/Expected Head Change (page 2)

(Bouwer, 1989, in Butler, 2014) Normalized Head = change in head divided by the theoretical/expected initial displacement (H^*_0).

Input

Porosity n=	0.25	unitless		R_s = screen radius	
H_0/H_0		Input from plot of normalized head vs time, as per example from Butler (2014) Figure 1 above.			
Rs =	1	inch →	0.1	feet	
Output Rc_{ef} =		(feet) →		inch	from Butler (2014)
Rc_{ef} =	0.18	(feet) →	2.2	inch	from Bouwer (1989) referenced in Butler (2014)

If the results from both equations are within 10 - 15% of each other, then Rc_{ef} appears reasonable.

Check the value of 'n' (drainable porosity), for 'reasonableness'.

From:	Rc_{ef} =	$Rs*sqrt(H_0/H^*_0)$	from Butler (1998, 2014)
Substitute Rc_{ef} into:	Rc_{ef} =	$[R^2_s+n(R^2_b-R^2_s)]^{0.5}$	
to obtain 'n':	n=	$R^2c_{ef}-R^2_s/R^2_b-R^2_s$	
n' =		If about 25% of assumed value of 'n', then this is probably OK.	

Sources: Butler, J.J. (2014). 'Slug tests in wells screened across the water table: some additional considerations'. Groundwater 52, No 2.

Butler, J.J. (1998). "The design, performance, and analysis of slug tests". Lewis Publishers.

Well No.	MW-5S	Test #	9 & 10	Slug Length (ft)	3

Manually Recorded Depths to Water

Rising Head Test

Time Start		*Duration*	0		Duration in minutes		
Note	Time	Duration	DTW (TOC)	Note	Time	Duration	DTW (TOC)
Slug in	8:53						
slug out; Rising	8:58						
slug in	9:00						
slug out; Rising	9:03	Bad, transducer cable moved.					
slug in	9:05						
slug out; Rising	9:06						

Notes:

ARCADIS

Slug Test Log. Well Screened Across Watertable. Physical Slug.

Site Name: Gowanus 1st St Turning Basin | Project No: B0018800: PW77GOWA | Page: 1 of 5

Well No: MW-4S | Prepared By: B. Comey | Date: 9/7/2017 | Time: 8:45

Test # 1 to 3

Completed By: B. Comey

NOTE: ***Entry cell*** *Data entry cell* ← Calculation (write in only on hard field copy)

Test Type: Rising X

Falling **NOT APPROPRIATE** Comment:

Transducer cable diameter: 0.12 inch (NA?)

Transducer used?

Top Riser (TOR) +ve (above ground) =
Top Riser (TOR) -ve (below ground) = -0.3 ft

Ground Surface

Rc (riser radius) 1 in

Static Water Level (TOR)
SWL = 11.13 ft

Cable length (CL)
from TOR to sensor 14.7 ft

Static Water Level (SWL) (bgs)
[Depth to top of SATURATED Screen (d)]
d = 11.43 ft BGS

Total well depth (bgs)
14.69 ft BGS

Screen Interval:
Top 5 bgs
Bottom 15 bgs

Transducer sensor below SWL (Ts)= 3.26 ft

Aquifer Thickness (h)
h = 13.57 ft
('unk' if unknown)

Effective screen length (Le)
Le = 3.26 ft
(= Ls, as SWL below screen top)

SATURATED Screen length (Ls)
Ls = 3.26 ft
NOTE: <= physical screen length

Water Column Length (Lw)
Lw = 3.26 ft

Borehole radius (Rb)
Rb = 4 in 0.33 ft

Screen radius (Rs)
Rs = 1 in 0.08 ft

Confining Unit

WELL No.	MW-4S	Test #	1 to 3	Really great information!

NOTE: Entry cell — Calculation; overwrite ONLY in hard field copy as needed. →

Test Type? Rising Head? Yes Falling Head: NOT APPROPRIATE for watertable wells.

Aquifer Type? Confined? NA Unconfined? Yes

Reference Point (TOC) Yes or No: Yes If NO, describe:

Pressure Transducer SN: Slug: Length (L): 4 (ft) Diameter (D) 1.5 (inch)

Slug ***Submerged***: Length (L): 3.55 (ft) Diameter (D): 1.5 (inch) 0.13 (feet)

Submerged Slug Volume (V): 0.044 (ft^3) 0.33 (gal) radius = 0.06 (ft)

T_S Baseline: Baseline Pressure Reading:

H_o: Max. Displacement Pressure Reading:

Submerged *Physical Slug Volumes*

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.125	0.003	0.026
1	1.125	0.007	0.052
2	1.125	0.014	0.103
3	1.125	0.021	0.155
4	1.125	0.028	0.207
5	1.125	0.035	0.258
0.5	1.5	0.006	0.046
1	1.5	0.012	0.092
1.5	1.5	0.018	0.138
2	1.5	0.025	0.184
2.5	1.5	0.031	0.230
3	1.5	0.037	0.275
4	1.5	0.049	0.367
5	1.5	0.061	0.459

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.625	0.007	0.054
1	1.625	0.014	0.108
1.5	1.625	0.022	0.162
2	1.625	0.029	0.215
2.5	1.625	0.036	0.269
3	1.625	0.043	0.323
4	1.625	0.058	0.431
1	3	0.049	0.367
2	3	0.098	0.734
3	3	0.147	1.102
4	3	0.196	1.469
4.25	3	0.209	1.561
4.5	3	0.221	1.653
5	3	0.245	1.836

Note: 1/8 inch = 0.125 inch. 5/8 inch = 0.625 inch

H_o Initial change in head at instant the slug test is started

r_t Radius of transducer cable (can be ignored if less than 1/8 inch)

T_S Depth of transducer below static water level

THEORETICAL HEAD CHANGE - INITIAL DISPLACEMENT (H^*_0). USE ACTUAL SUBMERGED VOLUME OF PHYSICAL SLUG

Slug Volume (gallon)	Slug Volume (ml)	Well Casing Diameter (inches)	Theoretical Initial Displacement, H^*_0 (feet)
0.25	946	2	1.56
0.5	1893	2	3.13
1	3785	2	6.25
0.5	1893	4	0.77
1	3785	4	1.54
2	7570	4	3.08
1	3785	6	0.68
2	7570	6	1.36
3	11355	6	2.04

THEORETICAL INITIAL DISPLACEMENT CALCULATOR

Submerged Slug Volume

V = (ft^3) 0.044 (gal) 0.33

Well Screen

R_s = **Screen *RADIUS*** (inch) 1 (ft) 0.08

Theoretical Initial Displacement

H^*_0 = (inch) 32.0 (ft) 2.66

WELL PARAMETERS REQUIRED FOR CALCULATING HYDRAULIC CONDUCTIVITY

L_e	Effective SATURATED screen length, including the sand pack if entire screen is saturated.
L_s	True screen length (SATURATED)
L_w	Length of water column in Well (TD minus SWL)
R_s	Screen radius
R_b	Radius of filter pack or borehole
R_c	Casing radius
r_t	Radius of the transducer data cable (if used)
T_s	Depth the transducer is submerged below Static Water Level (SWL)
CL	Cable/wire length, from TOC to transducer sensor (for barometric correction of Schlumberger 'Diver's).
SWL	Static water level from TOC and ground
TD	Total depth of well/screen from reference point
h	Saturated thickness of aquifer
H_o	Initial head change at instant the slug test is started.
Aquifer Type	Confined or unconfined

Mass Balance Approach. Assumes the filter-pack drains completely before any aquifer response. Assumes the filter-pack is significantly more permeable than the soil. Therefore, the volume of water drained from filter-pack = volume of water entering the well casing. From Butler (2014).

The following estimates a theoretical normalized head, to determine if an acceptable signal-to-noise ratio is present in the test.

Butler (2014). Groundwater 52, No. 2

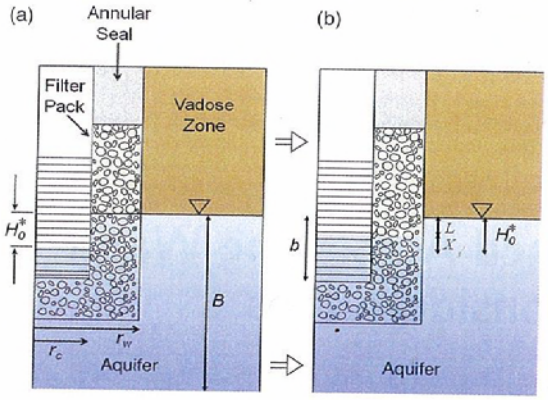
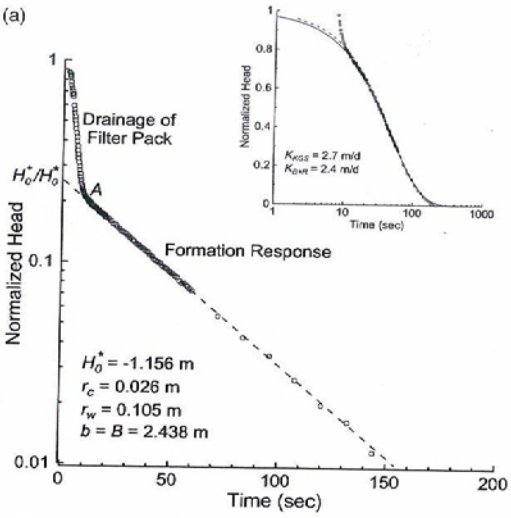


Figure 1. Schematic diagram of a slug test in a well screened across the water table. (a) Situation immediately after initiation of a rising-head slug test with an expected initial displacement of H_0^*; (b) Situation immediately after completion of filter-pack drainage (filter-pack drainage is assumed to be completed prior to any aquifer response; r_c is the radius of the well casing and screen, r_w is the radius of the borehole, b is the effective [submerged] screen length at static conditions, B is the aquifer thickness, L and X are defined in text).



NOTE: ***Entry cell*** ***Calculation; overwrite ONLY in hard field copy as needed.***

1). Mass balance: $\pi\iota * R^2_s * X = \pi\iota * (R^2_b - R^2_s) * n\iota$

Input	R_s =	1.0	inch	R_s = screen radius
	R_b =	4.0	inch	R_b = borehole radius
	n =	0.32	unitless	n = filter-pack drainable porosity (try different values)
	X =	0.3	feet	X = water level change due to filter-pack drainage
	ι =	0.1	feet	ι = length of drained filter-pack
Output	$\pi\iota * R^2_s * X$ =	0.00654		$\pi\iota * (R^2_b - R^2_s) * n\iota$ = 0.0105

If both sides are within a factor of 2, then filter-pack drainage phase is assumed identified (straight line log plot).

2). Substitute: H^*_0 - ι for X and solve for ι

$\iota = H^*_0/(An-n+1)$ where: H^*_0 = expected/theoretical initial displacement

$A = R^2_b/R^2_s$

3). Divide (2) by H^*_0 to give: To obtain the expected Normalized Head at end of filter-pack drainage.

$\iota/H_0 = 1/(An - n + 1)$ Normalized Head serves as a means to determine how much filter-pack drainage may occur.

Input	R_s =	1.0	inch	0.08	feet	R^2_s (ft) = 0.007	No overwrite
	R_b =	4.0	inch	0.33	feet	R^2_b (ft) = 0.111	No overwrite
	n =	(range 0.2 to 0.35)		0.25	unitless		
	A =	16.0					
Output	ι/H^*_0 =	0.21	← Filter-pack drainage should be complete at this Normalized Head.				

If Normalized Head > 0.1, the signal to noise ratio should be acceptable.

If formation - response phase < 25% of the submerged screen at static, changes in submerged screen length should not be of practical importance.

Well No.	***MW-4S***	***Estimate of Effective Casing Radius (all analysis methods)***	Page: 4 of 5

Requires that data from formation-response phase plots as a straight line/double straight line in a log of Normalized Head vs Time.

Rc_{ef} = $Rs*sqrt(H_0/H^*_0)$ Where: Rc_{ef} = Effective casing radius

(from Butler, 1998, 2014) H_0 Initial head change at instant the slug test is started.

Rc_{ef} = $[R^2_s+n(R^2_b-R^2_s)]^{0.5}$ H^*_0 Theoretical/Expected Head Change (page 2)

(Bouwer, 1989, in Butler, 2014) Normalized Head = change in head divided by the theoretical/expected initial displacement (H^*_0).

Input

Porosity n=	0.25	unitless		R_s = screen radius	
H_0/H_0	1.01	Input from plot of normalized head vs time, as per example from Butler (2014) Figure 1 above.			
Rs =	1	inch →	0.1	feet	
Output Rc_{ef} =	0.08	(feet) →	1.0	inch	from Butler (2014)
Rc_{ef} =	0.18	(feet) →	2.2	inch	from Bouwer (1989) referenced in Butler (2014)

If the results from both equations are within 10 - 15% of each other, then Rc_{ef} appears reasonable.

Check the value of 'n' (drainable porosity), for 'reasonableness'.

From:	Rc_{ef} =	$Rs*sqrt(H_0/H^*_0)$	from Butler (1998, 2014)
Substitute Rc_{ef} into:	Rc_{ef} =	$[R^2_s+n(R^2_b-R^2_s)]^{0.5}$	
to obtain 'n':	n=	$R^2c_{ef}-R^2_s/R^2_b-R^2_s$	

n' = -0.001 If about 25% of assumed value of 'n', then this is probably OK.

Sources: Butler, J.J. (2014). 'Slug tests in wells screened across the water table: some additional considerations'. Groundwater 52, No 2.
Butler, J.J. (1998). "The design, performance, and analysis of slug tests". Lewis Publishers.

Well No.	MW-4S	Test #	1 to 3	Slug Length (ft)	3.55

Manually Recorded Depths to Water

Rising Head Test

Time Start		*Duration*	0		Duration in minutes		
Note	Time	Duration	DTW (TOC)	Note	Time	Duration	DTW (TOC)
Slug in	8:57						
slug out; Rising	9:10						
slug in	9:14						
slug out; Rising	9:18	Slow- no good					
slug in	9:21						
slug out; Rising	9:23						
slug in	9:27						
slug out; Rising	9:30						

Notes:

ARCADIS

Slug Test Log. Well Screened Across Watertable. Physical Slug.

Site Name: Gowanus 1st St Turning Basin | Project No: B0018800: PW77GOWA | Page: 1 of 5

Well No: MW-4S | Prepared By: B. Comey | Date: 9/7/2017 | Time: 9:30

Test # 4 to 6

Completed By: B. Comey

NOTE: ***Entry cell*** *Data entry cell* ← Calculation (write in only on hard field copy)

Test Type: Rising X

Falling **NOT APPROPRIATE** Comment:

Transducer cable diameter: 0.12 inch (NA?)

Transducer used?

Top Riser (TOR) +ve (above ground) =
Top Riser (TOR) -ve (below ground) = -0.3 ft

Ground Surface

Rc (riser radius) 1 in

Static Water Level (TOR)
SWL = 10.71 ft

Cable length (CL)
from TOR to sensor 14.7 ft

Static Water Level (SWL) (bgs)
[Depth to top of SATURATED Screen (d)]
d = 11.01 ft BGS

Total well depth (bgs)
14.69 ft BGS

Screen Interval:
Top 5 bgs
Bottom 15 bgs

Transducer sensor below SWL (Ts)= 3.68 ft

Aquifer Thickness (h)
h = 13.99 ft
('unk' if unknown)

Effective screen length (Le)
Le = 3.68 ft
(= Ls, as SWL below screen top)

SATURATED Screen length (Ls)
Ls = 3.68 ft
NOTE: <= physical screen length

Water Column Length (Lw)
Lw = 3.68 ft

Borehole radius (Rb)
Rb = 4 in 0.33 ft

Screen radius (Rs)
Rs = 1 in 0.08 ft

Confining Unit

WELL No.	MW-4S	Test #	4 to 6	Really great information!

NOTE: Entry cell — Calculation; overwrite ONLY in hard field copy as needed. →

Test Type? Rising Head? Yes Falling Head: NOT APPROPRIATE for watertable wells.

Aquifer Type? Confined? NA Unconfined? Yes

Reference Point (TOC) Yes or No: Yes If NO, describe:

Pressure Transducer SN: Slug: Length (L): 3 (ft) Diameter (D) 1.5 (inch)

Slug ***Submerged***: Length (L): 2.8 (ft) Diameter (D): 1.5 (inch) 0.13 (feet)

Submerged Slug Volume (V): 0.034 (ft^3) 0.26 (gal) radius = 0.06 (ft)

T_S Baseline: Baseline Pressure Reading:

H_o: Max. Displacement Pressure Reading:

Submerged *Physical Slug Volumes*

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.125	0.003	0.026
1	1.125	0.007	0.052
2	1.125	0.014	0.103
3	1.125	0.021	0.155
4	1.125	0.028	0.207
5	1.125	0.035	0.258
0.5	1.5	0.006	0.046
1	1.5	0.012	0.092
1.5	1.5	0.018	0.138
2	1.5	0.025	0.184
2.5	1.5	0.031	0.230
3	1.5	0.037	0.275
4	1.5	0.049	0.367
5	1.5	0.061	0.459

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.625	0.007	0.054
1	1.625	0.014	0.108
1.5	1.625	0.022	0.162
2	1.625	0.029	0.215
2.5	1.625	0.036	0.269
3	1.625	0.043	0.323
4	1.625	0.058	0.431
1	3	0.049	0.367
2	3	0.098	0.734
3	3	0.147	1.102
4	3	0.196	1.469
4.25	3	0.209	1.561
4.5	3	0.221	1.653
5	3	0.245	1.836

Note: 1/8 inch = 0.125 inch. 5/8 inch = 0.625 inch

H_o Initial change in head at instant the slug test is started

r_t Radius of transducer cable (can be ignored if less than 1/8 inch)

T_S Depth of transducer below static water level

THEORETICAL HEAD CHANGE - INITIAL DISPLACEMENT (H^*_0). USE ACTUAL SUBMERGED VOLUME OF PHYSICAL SLUG

Slug Volume (gallon)	Slug Volume (ml)	Well Casing Diameter (inches)	Theoretical Initial Displacement, H^*_0 (feet)
0.25	946	2	1.56
0.5	1893	2	3.13
1	3785	2	6.25
0.5	1893	4	0.77
1	3785	4	1.54
2	7570	4	3.08
1	3785	6	0.68
2	7570	6	1.36
3	11355	6	2.04

THEORETICAL INITIAL DISPLACEMENT CALCULATOR

Submerged Slug Volume

V = (ft^3) 0.034 (gal) 0.26

Well Screen

R_s = **Screen *RADIUS*** (inch) 1 (ft) 0.08

Theoretical Initial Displacement

H^*_0 = (inch) 25.2 (ft) 2.10

WELL PARAMETERS REQUIRED FOR CALCULATING HYDRAULIC CONDUCTIVITY

L_e	Effective SATURATED screen length, including the sand pack if entire screen is saturated.
L_s	True screen length (SATURATED)
L_w	Length of water column in Well (TD minus SWL)
R_s	Screen radius
R_b	Radius of filter pack or borehole
R_c	Casing radius
r_t	Radius of the transducer data cable (if used)
T_s	Depth the transducer is submerged below Static Water Level (SWL)
CL	Cable/wire length, from TOC to transducer sensor (for barometric correction of Schlumberger 'Diver's).
SWL	Static water level from TOC and ground
TD	Total depth of well/screen from reference point
h	Saturated thickness of aquifer
H_o	Initial head change at instant the slug test is started.
Aquifer Type	Confined or unconfined

Mass Balance Approach. Assumes the filter-pack drains completely before any aquifer response. Assumes the filter-pack is significantly more permeable than the soil. Therefore, the volume of water drained from filter-pack = volume of water entering the well casing. From Butler (2014).

The following estimates a theoretical normalized head, to determine if an acceptable signal-to-noise ratio is present in the test.

Butler (2014). Groundwater 52, No. 2

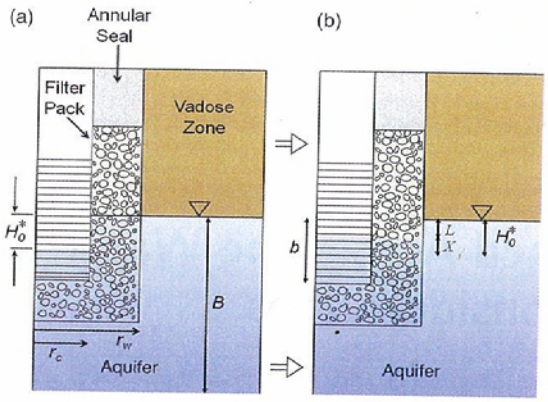
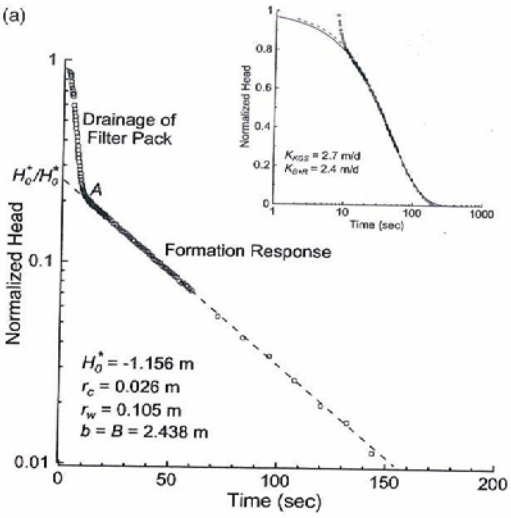


Figure 1. Schematic diagram of a slug test in a well screened across the water table. (a) Situation immediately after initiation of a rising-head slug test with an expected initial displacement of H_0^*; (b) Situation immediately after completion of filter-pack drainage (filter-pack drainage is assumed to be completed prior to any aquifer response; r_c is the radius of the well casing and screen, r_w is the radius of the borehole, b is the effective [submerged] screen length at static conditions, B is the aquifer thickness, L and X are defined in text).



NOTE: ***Entry cell*** ***Calculation; overwrite ONLY in hard field copy as needed.***

1). Mass balance: $\pi\iota * R^2_s * X = \pi\iota * (R^2_b - R^2_s) * n\iota$

Input	R_s =	1.0	inch	R_s = screen radius
	R_b =	4.0	inch	R_b = borehole radius
	n =	0.32	unitless	n = filter-pack drainable porosity (try different values)
	X =	0.3	feet	X = water level change due to filter-pack drainage
	ι =	0.1	feet	ι = length of drained filter-pack
Output	$\pi\iota * R^2_s * X$ =	0.00654		$\pi\iota * (R^2_b - R^2_s) * n\iota$ = 0.0105

If both sides are within a factor of 2, then filter-pack drainage phase is assumed identified (straight line log plot).

2). Substitute: $H^*_0 - \iota$ for X and solve for ι

$\iota = H^*_0/(An-n+1)$ where: H^*_0 = expected/theoretical initial displacement

$A = R^2_b/R^2_s$

3). Divide (2) by H^*_0 to give: $\iota/H_0 = 1/(An - n + 1)$

To obtain the expected Normalized Head at end of filter-pack drainage.

Normalized Head serves as a means to determine how much filter-pack drainage may occur.

Input	R_s =	1.0	inch	0.08	feet	R^2_s (ft) = 0.007	No overwrite
	R_b =	4.0	inch	0.33	feet	R^2_b (ft) = 0.111	No overwrite
	n =	(range 0.2 to 0.35)		0.32	unitless		
	A =	16.0					
Output	ι/H^*_0 =	0.17	← Filter-pack drainage should be complete at this Normalized Head.				

If Normalized Head > 0.1, the signal to noise ratio should be acceptable.

If formation - response phase < 25% of the submerged screen at static, changes in submerged screen length should not be of practical importance.

Well No.	***MW-4S***	***Estimate of Effective Casing Radius (all analysis methods)***	Page: 4 of 5

Requires that data from formation-response phase plots as a straight line/double straight line in a log of Normalized Head vs Time.

Rc_{ef} = $Rs*sqrt(H_0/H^*_0)$ Where: Rc_{ef} = Effective casing radius

(from Butler, 1998, 2014) H_0 Initial head change at instant the slug test is started.

Rc_{ef} = $[R^2_s+n(R^2_b-R^2_s)]^{0.5}$ H^*_0 Theoretical/Expected Head Change (page 2)

(Bouwer, 1989, in Butler, 2014) Normalized Head = change in head divided by the theoretical/expected initial displacement (H^*_0).

Input	Porosity n=	0.25	unitless		R_s = screen radius	
	H_0/H_0	1.19	Input from plot of normalized head vs time, as per example from Butler (2014) Figure 1 above.			
	Rs =	1	inch →	0.1	feet	
Output	Rc_{ef} =	0.08	(feet) →	0.9	inch	from Butler (2014)
	Rc_{ef} =	0.20	(feet) →	2.4	inch	from Bouwer (1989) referenced in Butler (2014)

If the results from both equations are within 10 - 15% of each other, then Rc_{ef} appears reasonable.

Check the value of 'n' (drainable porosity), for 'reasonableness'.

From:	Rc_{ef} =	$Rs*sqrt(H_0/H^*_0)$	from Butler (1998, 2014)
Substitute Rc_{ef} into:	Rc_{ef} =	$[R^2_s+n(R^2_b-R^2_s)]^{0.5}$	
to obtain 'n':	n=	$R^2c_{ef}-R^2_s/R^2_b-R^2_s$	

n' = -0.01 If about 25% of assumed value of 'n', then this is probably OK.

Sources: Butler, J.J. (2014). 'Slug tests in wells screened across the water table: some additional considerations'. Groundwater 52, No 2.
Butler, J.J. (1998). "The design, performance, and analysis of slug tests". Lewis Publishers.

Well No.	MW-4S	Test #	4 to 6	Slug Length (ft)	2.8

Manually Recorded Depths to Water Page: 5 of 5

Rising Head Test

Time Start		*Duration*	0		Duration in minutes		
Note	Time	Duration	DTW (TOC)	Note	Time	Duration	DTW (TOC)
Slug in	9:33						
slug out; Rising	9:39						
slug in	9:44						
slug out; Rising	9:48						
slug in	9:52						
slug out; Rising	9:54						

Notes:

ARCADIS

Slug Test Log. Well Screened Below Watertable. Physical Slug.

Site Name: Gowanus 1st St Turning Basin | Project No: B0018800: PW77GOWA | Page: 1 of 4

Well No: MW-3D | Prepared By: B. Comey | Date: 9/7/2017 | Time: 11:52

Test/s #: 5 to 8

Completed By: B. Comey

NOTE: *Entry cell* *Data entry cell* ← Calculation (write in only on hard field copy)

Test Type: Rising Yes | Falling Yes

DO NOT USE THIS FORM IF SWL IS BELOW TOP OF SCREEN

Top Riser (TOR) +ve (above ground) =
Top Riser (TOR) -ve (below ground) = 0.33 ft

Transducer cable diameter: 0.12 inch (NA?)

Transducer used? Diver

Ground Surface

Rc (riser radius) 1 in

Static Water Level (TOR)
SWL = 12.38 ft

Total well depth (bgs)
32.4 ft BGS

Static Water Level (bgs)
SWL = 12.38 ft BGS

Cable length (CL)
from TOR to sensor 20 ft

Transducer sensor
below SWL (Ts)= 20.35 ft

Depth SWL to top *SATURATED* screen (d)
d = 12.02 ft

Confining Unit (If Present. Otherwise SWL)

Base (bgs) [if present] = 31

Aquifer Thickness
h = 9 ft
('unk' if unknown)

NOTE; Aquifer base unkown. Assume base is 5 ft below screen (40 ft bgs).

Effective screen length (Le)
Le = 10 ft

PHYSICAL
Screen length (Ls)
Ls = 8 ft

Screen Interval:
Top 24.9 bgs
Bottom 32.9 bgs

Water Column Length (Lw)
Lw = 20.02 ft

Borehole radius (Rb)
Rb = 4 in 0.33 ft

Screen radius (Rs)
Rs = 1 in 0.08 ft

Confining Unit

WELL No.	MW-3D	Test Interval	5 to 8

NOTE: Entry cell — Calculation; overwrite ONLY in hard field copy as needed. →

Test Type? Rising Head? Yes Falling Head? Yes

Aquifer Type? Confined? Yes Unconfined? No

Reference Point (TOC) Yes or No: Yes If NO, describe:

Pressure Transducer SN: Slug: Length (L): 4.1 (ft) Diameter (D) 1.5 (inch)

Slug ***Submerged***: Length (L): 4.1 (ft) Diameter (D): 1.5 (inch) 0.13 (feet)

Submerged Slug Volume (V): 0.050 (ft^3) 0.38 (gal) radius = 0.06 (ft)

T_S Baseline: Baseline Pressure Reading:

H_o: Max. Displacement Pressure Reading:

Submerged *Physical Slug Volumes*

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.125	0.003	0.026
1	1.125	0.007	0.052
2	1.125	0.014	0.103
3	1.125	0.021	0.155
4	1.125	0.028	0.207
5	1.125	0.035	0.258
0.5	1.5	0.006	0.046
1	1.5	0.012	0.092
1.5	1.5	0.018	0.138
2	1.5	0.025	0.184
2.5	1.5	0.031	0.230
3	1.5	0.037	0.275
4	1.5	0.049	0.367
5	1.5	0.061	0.459

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.625	0.007	0.054
1	1.625	0.014	0.108
1.5	1.625	0.022	0.162
2	1.625	0.029	0.215
2.5	1.625	0.036	0.269
3	1.625	0.043	0.323
4	1.625	0.058	0.431
1	3	0.049	0.367
2	3	0.098	0.734
3	3	0.147	1.102
4	3	0.196	1.469
4.25	3	0.209	1.561
4.5	3	0.221	1.653
5	3	0.245	1.836

Note: 1/8 inch = 0.125 inch. 5/8 inch = 0.625 inch

H_o Initial change in head at instant the slug test is started

r_t Radius of transducer cable (can be ignored if less than 1/8 inch)

T_S Depth of transducer below static water level

THEORETICAL HEAD CHANGE - INITIAL DISPLACEMENT (H^*_0). USE ACTUAL SUBMERGED VOLUME OF PHYSICAL SLUG

Slug Volume (gallon)	Slug Volume (ml)	Well Casing Diameter (inches)	Theoretical Initial Displacement, H^*_0 (feet)
0.25	946	2	1.56
0.5	1893	2	3.13
1	3785	2	6.25
0.5	1893	4	0.77
1	3785	4	1.54
2	7570	4	3.08
1	3785	6	0.68
2	7570	6	1.36
3	11355	6	2.04

THEORETICAL INITIAL DISPLACEMENT CALCULATOR

Submerged Slug Volume

V = (ft^3) 0.050 (gal) 0.38

Well Screen

(inch) (ft)

R_s = **Screen *RADIUS*** 1 0.08

Theoretical Initial Displacement

(inch) (ft)

H^*_0 = 36.9 3.08

WELL PARAMETERS REQUIRED FOR CALCULATING HYDRAULIC CONDUCTIVITY

L_e	Effective SATURATED screen length, including the sand pack if entire screen is saturated.
L_s	True screen length (SATURATED)
L_w	Length of water column in Well (TD minus SWL)
R_s	Screen radius
R_b	Radius of filter pack or borehole
R_c	Casing radius
r_t	Radius of the transducer data cable (if used)
T_s	Depth the transducer is submerged below Static Water Level (SWL)
CL	Cable/wire length, from TOC to transducer sensor (for barometric correction of Schlumberger 'Diver's).
SWL	Static water level from TOC and ground
TD	Total depth of well/screen from reference point
h	Saturated thickness of aquifer
H_o	Initial head change at instant the slug test is started.
Aquifer Type	Confined or unconfined

Well No.	***MW-3D***	***Estimate of Effective Casing Radius (all analysis methods)***	Page: 3 of 4

Requires that data from formation-response phase plots as a straight line/double straight line in a log of Normalized Head vs Time.

Rc_{ef} = $Rs*sqrt(H_0/H^*_0)$ (from Butler, 1998, 2014)

Rc_{ef} = $[R^2_s+n(R^2_b-R^2_s)]^{0.5}$ (Bouwer, 1989, in Butler, 2014)

Where: Rc_{ef} = Effective casing radius

H_0 Initial head change at instant the slug test is started.

H^*_0 Theoretical/Expected Head Change (page 2)

Normalized Head = change in head divided by the theoretical/expected initial displacement (H^*_0).

Input

Porosity n=	0.25	unitless		R_s = screen radius	
H_0/H_0	0.75	Input from plot of normalized head vs time, as per example from Butler (2014).			

Output

Rs =	1	inch →	0.1	feet	
Rc_{ef} =	0.10	(feet) →	1.2	inch	from Butler (2014)
Rc_{ef} =	0.55	(feet) →	6.7	inch	from Bouwer (1989) referenced in Butler (2014)

If the results from both equations are within 10 - 15% of each other, then Rc_{ef} appears reasonable.

Check the value of 'n' (drainable porosity), for 'reasonableness'.

From:	Rc_{ef} =	$Rs*sqrt(H_0/H^*_0)$	from Butler (1998, 2014)
Substitute Rc_{ef} into:	Rc_{ef} =	$[R^2_s+n(R^2_b-R^2_s)]^{0.5}$	
to obtain 'n':	n=	$R^2c_{ef}-R^2_s/R^2_b-R^2_s$	
n' = 0.02		If about 25% of assumed value of 'n', then this is probably OK.	

Sources: Butler, J.J. (2014). 'Slug tests in wells screened across the water table: some additional considerations'. Groundwater 52, No 2.
Butler, J.J. (1998). "The design, performance, and analysis of slug tests". Lewis Publishers.

Well No.	MW-3D	Test Interval	5 to 8	Slug Length (ft)	4.1

Manually Recorded Depths to Water

Rising or Falling Head Test?

Time Start | | *Duration* | 0 | (Initiation - slug in or out) | Duration in minutes

Note	Time	Duration	DTW (TOC)	Note	Time	Duration	DTW (TOC)
slug in: Falling	11:52:00						
slug out: Rising	11:57:00						
slug in: Falling	12:09:00						
slug out: Rising	12:13:00						
Tests at 12:01 and 12:04 not good							

Notes: Gallons purged for development.

ARCADIS

Slug Test Log. Well Screened Below Watertable. Physical Slug.

Site Name: Gowanus 1st St Turning Basin | Project No: B0018800: PW77GOWA | Page: 1 of 4

Well No: MW-3D | Prepared By: B. Comey | Date: 9/7/2017 | Time: 11:24

Test/s #: 1 to 4

Completed By: B. Comey

NOTE: ***Entry cell*** *Data entry cell* ← Calculation (write in only on hard field copy)

Test Type: Rising Yes | Falling Yes

DO NOT USE THIS FORM IF SWL IS BELOW TOP OF SCREEN

Transducer cable diameter: 0.12 inch (NA?)

Transducer used? Diver

Top Riser (TOR) +ve (above ground) =
Top Riser (TOR) -ve (below ground) = 0.33 ft

Ground Surface

Rc (riser radius) 1 in

Static Water Level (TOR)
SWL = 12.22 ft

Total well depth (bgs)
32.4 ft BGS

Static Water Level (bgs)
SWL = 12.22 ft BGS

Cable length (CL)
from TOR to sensor 20 ft

Transducer sensor below SWL (Ts)= 20.51 ft

Depth SWL to top *SATURATED* screen (d)
d = 12.18 ft

Confining Unit (If Present. Otherwise SWL)

Base (bgs) [if present] = 31

Aquifer Thickness h = 9 ft ('unk' if unknown)

NOTE; Aquifer base unkown. Assume base is 5 ft below screen (40 ft bgs).

Effective screen length (Le)
Le = 10 ft

PHYSICAL
Screen length (Ls)
Ls = 8 ft

Screen Interval:
Top 24.9 bgs
Bottom 32.9 bgs

Water Column Length (Lw)
Lw = 20.18 ft

Borehole radius (Rb)
Rb = 4 in 0.33 ft

Screen radius (Rs)
Rs = 1 in 0.08 ft

Confining Unit

WELL No.	MW-3D	Test Interval	1 to 4

NOTE: Entry cell — Calculation; overwrite ONLY in hard field copy as needed. →

Test Type? Rising Head? Yes Falling Head? Yes

Aquifer Type? Confined? Yes Unconfined? No

Reference Point (TOC) Yes or No: Yes If NO, describe:

Pressure Transducer SN: Slug: Length (L): 3 (ft) Diameter (D) 1.5 (inch)

Slug ***Submerged*** : Length (L): 3 (ft) Diameter (D): 1.5 (inch) 0.13 (feet)

Submerged Slug Volume (V): 0.037 (ft^3) 0.28 (gal) radius = 0.06 (ft)

T_S Baseline: Baseline Pressure Reading:

H_o: Max. Displacement Pressure Reading:

Submerged *Physical Slug Volumes*

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.125	0.003	0.026
1	1.125	0.007	0.052
2	1.125	0.014	0.103
3	1.125	0.021	0.155
4	1.125	0.028	0.207
5	1.125	0.035	0.258
0.5	1.5	0.006	0.046
1	1.5	0.012	0.092
1.5	1.5	0.018	0.138
2	1.5	0.025	0.184
2.5	1.5	0.031	0.230
3	1.5	0.037	0.275
4	1.5	0.049	0.367
5	1.5	0.061	0.459

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.625	0.007	0.054
1	1.625	0.014	0.108
1.5	1.625	0.022	0.162
2	1.625	0.029	0.215
2.5	1.625	0.036	0.269
3	1.625	0.043	0.323
4	1.625	0.058	0.431
1	3	0.049	0.367
2	3	0.098	0.734
3	3	0.147	1.102
4	3	0.196	1.469
4.25	3	0.209	1.561
4.5	3	0.221	1.653
5	3	0.245	1.836

Note: 1/8 inch = 0.125 inch. 5/8 inch = 0.625 inch

H_o Initial change in head at instant the slug test is started

r_t Radius of transducer cable (can be ignored if less than 1/8 inch)

T_S Depth of transducer below static water level

THEORETICAL HEAD CHANGE - INITIAL DISPLACEMENT (H^*_0). USE ACTUAL SUBMERGED VOLUME OF PHYSICAL SLUG

Slug Volume (gallon)	Slug Volume (ml)	Well Casing Diameter (inches)	Theoretical Initial Displacement, H^*_0 (feet)
0.25	946	2	1.56
0.5	1893	2	3.13
1	3785	2	6.25
0.5	1893	4	0.77
1	3785	4	1.54
2	7570	4	3.08
1	3785	6	0.68
2	7570	6	1.36
3	11355	6	2.04

THEORETICAL INITIAL DISPLACEMENT CALCULATOR

Submerged Slug Volume

V = (ft^3): 0.037 (gal): 0.28

Well Screen

R_s = **Screen *RADIUS*** (inch): 1 (ft): 0.08

Theoretical Initial Displacement

H^*_0 = (inch): 27.0 (ft): 2.25

WELL PARAMETERS REQUIRED FOR CALCULATING HYDRAULIC CONDUCTIVITY

L_e	Effective SATURATED screen length, including the sand pack if entire screen is saturated.
L_s	True screen length (SATURATED)
L_w	Length of water column in Well (TD minus SWL)
R_s	Screen radius
R_b	Radius of filter pack or borehole
R_c	Casing radius
r_t	Radius of the transducer data cable (if used)
T_s	Depth the transducer is submerged below Static Water Level (SWL)
CL	Cable/wire length, from TOC to transducer sensor (for barometric correction of Schlumberger 'Diver's).
SWL	Static water level from TOC and ground
TD	Total depth of well/screen from reference point
h	Saturated thickness of aquifer
H_o	Initial head change at instant the slug test is started.
Aquifer Type	Confined or unconfined

Well No.	***MW-3D***	***Estimate of Effective Casing Radius (all analysis methods)***	Page: 3 of 4

Requires that data from formation-response phase plots as a straight line/double straight line in a log of Normalized Head vs Time.

Rc_{ef} = $Rs*sqrt(H_0/H^*_0)$ (from Butler, 1998, 2014)

Rc_{ef} = $[R^2_s+n(R^2_b-R^2_s)]^{0.5}$ (Bouwer, 1989, in Butler, 2014)

Where: Rc_{ef} = Effective casing radius

H_0 Initial head change at instant the slug test is started.

H^*_0 Theoretical/Expected Head Change (page 2)

Normalized Head = change in head divided by the theoretical/expected initial displacement (H^*_0).

Input

Porosity n=	0.25	unitless		R_s = screen radius	
H_0/H_0	1.23	Input from plot of normalized head vs time, as per example from Butler (2014).			

Output

Rs =	1	inch →	0.1	feet	
Rc_{ef} =	0.08	(feet) →	0.9	inch	from Butler (2014)
Rc_{ef} =	0.55	(feet) →	6.7	inch	from Bouwer (1989) referenced in Butler (2014)

If the results from both equations are within 10 - 15% of each other, then Rc_{ef} appears reasonable.

Check the value of 'n' (drainable porosity), for 'reasonableness'.

From:	Rc_{ef} =	$Rs*sqrt(H_0/H^*_0)$	from Butler (1998, 2014)
Substitute Rc_{ef} into:	Rc_{ef} =	$[R^2_s+n(R^2_b-R^2_s)]^{0.5}$	
to obtain 'n':	n=	$R^2c_{ef}-R^2_s/R^2_b-R^2_s$	
n' = -0.01		If about 25% of assumed value of 'n', then this is probably OK.	

Sources: Butler, J.J. (2014). 'Slug tests in wells screened across the water table: some additional considerations'. Groundwater 52, No 2.
Butler, J.J. (1998). "The design, performance, and analysis of slug tests". Lewis Publishers.

Well No.	MW-3D	Test Interval	1 to 4	Slug Length (ft)	3

Manually Recorded Depths to Water

Rising or Falling Head Test?

Time Start		*Duration*	0	(Initiation - slug in or out)	Duration in minutes		
Note	Time	Duration	DTW (TOC)	Note	Time	Duration	DTW (TOC)
slug in: Falling	11:29:00						
slug out: Rising	11:33:00						
slug in: Falling	11:39:00						
slug out: Rising	11:43:00						

Notes: Gallons purged for development.

ARCADIS

Slug Test Log. Well Screened Across Watertable. Physical Slug.

Site Name: Gowanus 1st St Turning Basin Project No: B0018800: PW77GOWA Page: 1 of 5

Well No: MW-3S Prepared By: B. Comey Date: 9/7/2017 Time: 10:30

Test # 1 to 2

Completed By: B. Comey

NOTE: ***Entry cell*** *Data entry cell* ← Calculation (write in only on hard field copy)

Test Type: Rising X

Falling **NOT APPROPRIATE** Comment:

Transducer cable diameter: 0.12 inch (NA?)

Transducer used?

Top Riser (TOR) +ve (above ground) =
Top Riser (TOR) -ve (below ground) = 0.45 ft

Ground Surface

Rc (riser radius) 1 in

Static Water Level (TOR)
SWL = 12.12 ft

Cable length (CL)
from TOR to sensor 19 ft

Static Water Level (SWL) (bgs)
[Depth to top of SATURATED Screen (d)]
d = 11.67 ft BGS

Total well depth (bgs)
19.33 ft BGS

Screen Interval:

Top	9.33	bgs
Bottom	19.33	bgs

Transducer sensor below SWL (Ts)= 7.66 ft

Aquifer Thickness (h)
h = 11.83 ft
('unk' if unknown)

Effective screen length (Le)
Le = 7.66 ft
(= Ls, as SWL below screen top)

SATURATED Screen length (Ls)
Ls = 7.66 ft
NOTE: <= physical screen length

Water Column Length (Lw)
Lw = 7.66 ft

Borehole radius (Rb)
Rb = 4 in 0.33 ft

Screen radius (Rs)
Rs = 1 in 0.08 ft

Confining Unit

WELL No.	MW-3S	Test #	1 to 2	Really great information!

NOTE: Entry cell — Calculation; overwrite ONLY in hard field copy as needed. →

Test Type? Rising Head? Yes Falling Head: NOT APPROPRIATE for watertable wells.

Aquifer Type? Confined? NA Unconfined? Yes

Reference Point (TOC) Yes or No: Yes If NO, describe:

Pressure Transducer SN: Slug: Length (L): 4 (ft) Diameter (D) 1.5 (inch)

Slug ***Submerged***: Length (L): 4 (ft) Diameter (D): 1.5 (inch) 0.13 (feet)

Submerged Slug Volume (V): 0.049 (ft^3) 0.37 (gal) radius = 0.06 (ft)

T_S Baseline: Baseline Pressure Reading:

H_o: Max. Displacement Pressure Reading:

Submerged *Physical Slug Volumes*

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.125	0.003	0.026
1	1.125	0.007	0.052
2	1.125	0.014	0.103
3	1.125	0.021	0.155
4	1.125	0.028	0.207
5	1.125	0.035	0.258
0.5	1.5	0.006	0.046
1	1.5	0.012	0.092
1.5	1.5	0.018	0.138
2	1.5	0.025	0.184
2.5	1.5	0.031	0.230
3	1.5	0.037	0.275
4	1.5	0.049	0.367
5	1.5	0.061	0.459

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.625	0.007	0.054
1	1.625	0.014	0.108
1.5	1.625	0.022	0.162
2	1.625	0.029	0.215
2.5	1.625	0.036	0.269
3	1.625	0.043	0.323
4	1.625	0.058	0.431
1	3	0.049	0.367
2	3	0.098	0.734
3	3	0.147	1.102
4	3	0.196	1.469
4.25	3	0.209	1.561
4.5	3	0.221	1.653
5	3	0.245	1.836

Note: 1/8 inch = 0.125 inch. 5/8 inch = 0.625 inch

H_o Initial change in head at instant the slug test is started

r_t Radius of transducer cable (can be ignored if less than 1/8 inch)

T_S Depth of transducer below static water level

THEORETICAL HEAD CHANGE - INITIAL DISPLACEMENT (H^*_0). USE ACTUAL SUBMERGED VOLUME OF PHYSICAL SLUG

Slug Volume (gallon)	Slug Volume (ml)	Well Casing Diameter (inches)	Theoretical Initial Displacement, H^*_0 (feet)
0.25	946	2	1.56
0.5	1893	2	3.13
1	3785	2	6.25
0.5	1893	4	0.77
1	3785	4	1.54
2	7570	4	3.08
1	3785	6	0.68
2	7570	6	1.36
3	11355	6	2.04

THEORETICAL INITIAL DISPLACEMENT CALCULATOR

Submerged Slug Volume

V = (ft^3) 0.049 (gal) 0.37

Well Screen

(inch) (ft)

R_s = **Screen *RADIUS*** 1 0.08

Theoretical Initial Displacement

(inch) (ft)

H^*_0 = 36.0 3.00

WELL PARAMETERS REQUIRED FOR CALCULATING HYDRAULIC CONDUCTIVITY

L_e	Effective SATURATED screen length, including the sand pack if entire screen is saturated.
L_s	True screen length (SATURATED)
L_w	Length of water column in Well (TD minus SWL)
R_s	Screen radius
R_b	Radius of filter pack or borehole
R_c	Casing radius
r_t	Radius of the transducer data cable (if used)
T_s	Depth the transducer is submerged below Static Water Level (SWL)
CL	Cable/wire length, from TOC to transducer sensor (for barometric correction of Schlumberger 'Diver's).
SWL	Static water level from TOC and ground
TD	Total depth of well/screen from reference point
h	Saturated thickness of aquifer
H_o	Initial head change at instant the slug test is started.
Aquifer Type	Confined or unconfined

Mass Balance Approach. Assumes the filter-pack drains completely before any aquifer response. Assumes the filter-pack is significantly more permeable than the soil. Therefore, the volume of water drained from filter-pack = volume of water entering the well casing. From Butler (2014).

The following estimates a theoretical normalized head, to determine if an acceptable signal-to-noise ratio is present in the test.

Butler (2014). Groundwater 52, No. 2

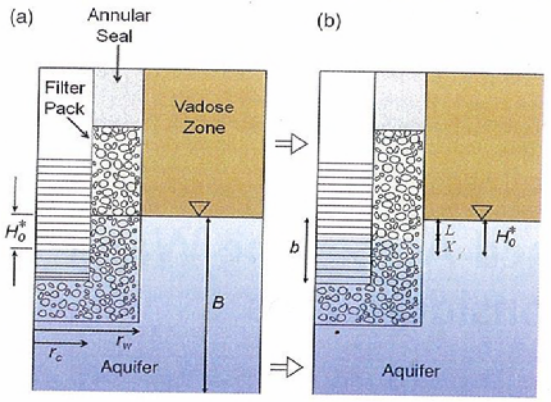
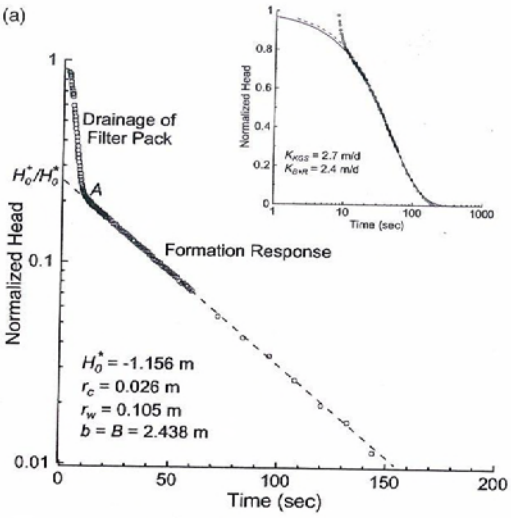


Figure 1. Schematic diagram of a slug test in a well screened across the water table. (a) Situation immediately after initiation of a rising-head slug test with an expected initial displacement of H_0^*; (b) Situation immediately after completion of filter-pack drainage (filter-pack drainage is assumed to be completed prior to any aquifer response; r_c is the radius of the well casing and screen, r_w is the radius of the borehole, b is the effective [submerged] screen length at static conditions, B is the aquifer thickness, L and X are defined in text).



NOTE: ***Entry cell*** ***Calculation; overwrite ONLY in hard field copy as needed.*** →

1). Mass balance: $\pi\iota * R^2_s * X = \pi\iota * (R^2_b - R^2_s) * n\iota$

Input	R_s =	1.0	inch	R_s = screen radius
	R_b =	4.0	inch	R_b = borehole radius
	n =	0.25	unitless	n = filter-pack drainable porosity (try different values)
	X =		feet	X = water level change due to filter-pack drainage
	ι =		feet	ι = length of drained filter-pack
Output	$\pi\iota * R^2_s * X$ =			$\pi\iota * (R^2_b - R^2_s) * n\iota$ =

If both sides are within a factor of 2, then filter-pack drainage phase is assumed identified (straight line log plot).

2). Substitute: H^*_0 - ι for X and solve for ι

$\iota = H^*_0/(An-n+1)$ where: H^*_0 = expected/theoretical initial displacement

$A = R^2_b/R^2_s$

3). Divide (2) by H^*_0 to give: To obtain the expected Normalized Head at end of filter-pack drainage.

$\iota/H_0 = 1/(An - n + 1)$ Normalized Head serves as a means to determine how much filter-pack drainage may occur.

Input	R_s =	1.0	inch	0.08	feet	R^2_s (ft) = 0.007	No overwrite
	R_b =	4.0	inch	0.33	feet	R^2_b (ft) = 0.111	No overwrite
	n =	(range 0.2 to 0.35)		0.25	unitless		
	A =	16.0					
Output	ι/H^*_0 =	0.21	←	Filter-pack drainage should be complete at this Normalized Head.			

If Normalized Head > 0.1, the signal to noise ratio should be acceptable.

If formation - response phase < 25% of the submerged screen at static, changes in submerged screen length should not be of practical importance.

Well No.	*MW-3S*	*Estimate of Effective Casing Radius (all analysis methods)*	Page: 4 of 5

Requires that data from formation-response phase plots as a straight line/double straight line in a log of Normalized Head vs Time.

Rc_{ef} = $Rs*sqrt(H_0/H^*_0)$ Where: Rc_{ef} = Effective casing radius

(from Butler, 1998, 2014) H_0 Initial head change at instant the slug test is started.

Rc_{ef} = $[R^2_s+n(R^2_b-R^2_s)]^{0.5}$ H^*_0 Theoretical/Expected Head Change (page 2)

(Bouwer, 1989, in Butler, 2014) Normalized Head = change in head divided by the theoretical/expected initial displacement (H^*_0).

Input

Porosity n=	0.25	unitless		R_s = screen radius	
H_0/H_0		Input from plot of normalized head vs time, as per example from Butler (2014) Figure 1 above.			
Rs =	1	inch →	0.1	feet	
Output Rc_{ef} =		(feet) →		inch	from Butler (2014)
Rc_{ef} =	0.18	(feet) →	2.2	inch	from Bouwer (1989) referenced in Butler (2014)

If the results from both equations are within 10 - 15% of each other, then Rc_{ef} appears reasonable.

Check the value of 'n' (drainable porosity), for 'reasonableness'.

From:	Rc_{ef} =	$Rs*sqrt(H_0/H^*_0)$	from Butler (1998, 2014)
Substitute Rc_{ef} into:	Rc_{ef} =	$[R^2_s+n(R^2_b-R^2_s)]^{0.5}$	
to obtain 'n':	n=	$R^2c_{ef}-R^2_s/R^2_b-R^2_s$	

n' = If about 25% of assumed value of 'n', then this is probably OK.

Sources: Butler, J.J. (2014). 'Slug tests in wells screened across the water table: some additional considerations'. Groundwater 52, No 2.

Butler, J.J. (1998). "The design, performance, and analysis of slug tests". Lewis Publishers.

Well No.	MW-3S	Test #	1 to 2	Slug Length (ft)	4

Manually Recorded Depths to Water

Rising Head Test

Time Start		*Duration*	0		Duration in minutes		
Note	Time	Duration	DTW (TOC)	Note	Time	Duration	DTW (TOC)
Slug in	10:38						
slug out; Rising	10:42						
slug in	10:49						
slug out; Rising	10:53						

Notes:

ARCADIS

Slug Test Log. Well Screened Across Watertable. Physical Slug.

Site Name: Gowanus 1st St Turning Basin Project No: B0018800: PW77GOWA Page: 1 of 5

Well No: MW-3S Prepared By: B. Comey Date: 9/7/2017 Time: 10:50

Test # 4 & 5

Completed By: B. Comey

NOTE: ***Entry cell*** *Data entry cell* ← Calculation (write in only on hard field copy)

Test Type: Rising X

Falling **NOT APPROPRIATE** Comment:

Transducer cable diameter: 0.12 inch (NA?)

Transducer used?

Top Riser (TOR) +ve (above ground) =
Top Riser (TOR) -ve (below ground) = 0.45 ft

Ground Surface

Rc (riser radius) 1 in

Static Water Level (TOR)
SWL = 12.27 ft

Cable length (CL)
from TOR to sensor 19 ft

Static Water Level (SWL) (bgs)
[Depth to top of SATURATED Screen (d)]
d = 11.82 ft BGS

Total well depth (bgs)
19.33 ft BGS

Screen Interval:
Top 9.33 bgs
Bottom 19.33 bgs

Transducer sensor below SWL (Ts)= 7.51 ft

Aquifer Thickness (h)
h = 11.68 ft
('unk' if unknown)

Effective screen length (Le)
Le = 7.51 ft
(= Ls, as SWL below screen top)

SATURATED Screen length (Ls)
Ls = 7.51 ft
NOTE: <= physical screen length

Water Column Length (Lw)
Lw = 7.51 ft

Borehole radius (Rb)
Rb = 4 in 0.33 ft

Screen radius (Rs)
Rs = 1 in 0.08 ft

Confining Unit

WELL No.	MW-3S	Test #	4 & 5	Really great information!

NOTE: Entry cell — Calculation; overwrite ONLY in hard field copy as needed. →

Test Type? Rising Head? Yes Falling Head: NOT APPROPRIATE for watertable wells.

Aquifer Type? Confined? NA Unconfined? Yes

Reference Point (TOC) Yes or No: Yes If NO, describe:

Pressure Transducer SN: Slug: Length (L): 3 (ft) Diameter (D) 1.5 (inch)

Slug ***Submerged***: Length (L): 3 (ft) Diameter (D): 1.5 (inch) 0.13 (feet)

Submerged Slug Volume (V): 0.037 (ft^3) 0.28 (gal) radius = 0.06 (ft)

T_S Baseline: Baseline Pressure Reading:

H_o: Max. Displacement Pressure Reading:

Submerged *Physical Slug Volumes*

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.125	0.003	0.026
1	1.125	0.007	0.052
2	1.125	0.014	0.103
3	1.125	0.021	0.155
4	1.125	0.028	0.207
5	1.125	0.035	0.258
0.5	1.5	0.006	0.046
1	1.5	0.012	0.092
1.5	1.5	0.018	0.138
2	1.5	0.025	0.184
2.5	1.5	0.031	0.230
3	1.5	0.037	0.275
4	1.5	0.049	0.367
5	1.5	0.061	0.459

L (ft)	D (in)	V (ft^3)	V (gal)
0.5	1.625	0.007	0.054
1	1.625	0.014	0.108
1.5	1.625	0.022	0.162
2	1.625	0.029	0.215
2.5	1.625	0.036	0.269
3	1.625	0.043	0.323
4	1.625	0.058	0.431
1	3	0.049	0.367
2	3	0.098	0.734
3	3	0.147	1.102
4	3	0.196	1.469
4.25	3	0.209	1.561
4.5	3	0.221	1.653
5	3	0.245	1.836

Note: 1/8 inch = 0.125 inch. 5/8 inch = 0.625 inch

H_o Initial change in head at instant the slug test is started

r_t Radius of transducer cable (can be ignored if less than 1/8 inch)

T_S Depth of transducer below static water level

THEORETICAL HEAD CHANGE - INITIAL DISPLACEMENT (H^*_0). USE ACTUAL SUBMERGED VOLUME OF PHYSICAL SLUG

Slug Volume (gallon)	Slug Volume (ml)	Well Casing Diameter (inches)	Theoretical Initial Displacement, H^*_0 (feet)
0.25	946	2	1.56
0.5	1893	2	3.13
1	3785	2	6.25
0.5	1893	4	0.77
1	3785	4	1.54
2	7570	4	3.08
1	3785	6	0.68
2	7570	6	1.36
3	11355	6	2.04

THEORETICAL INITIAL DISPLACEMENT CALCULATOR

Submerged Slug Volume

V = (ft^3) 0.037 (gal) 0.28

Well Screen

R_s = **Screen *RADIUS*** (inch) 1 (ft) 0.08

Theoretical Initial Displacement

H^*_0 = (inch) 27.0 (ft) 2.25

WELL PARAMETERS REQUIRED FOR CALCULATING HYDRAULIC CONDUCTIVITY

L_e	Effective SATURATED screen length, including the sand pack if entire screen is saturated.
L_s	True screen length (SATURATED)
L_w	Length of water column in Well (TD minus SWL)
R_s	Screen radius
R_b	Radius of filter pack or borehole
R_c	Casing radius
r_t	Radius of the transducer data cable (if used)
T_s	Depth the transducer is submerged below Static Water Level (SWL)
CL	Cable/wire length, from TOC to transducer sensor (for barometric correction of Schlumberger 'Diver's).
SWL	Static water level from TOC and ground
TD	Total depth of well/screen from reference point
h	Saturated thickness of aquifer
H_o	Initial head change at instant the slug test is started.
Aquifer Type	Confined or unconfined

Mass Balance Approach. Assumes the filter-pack drains completely before any aquifer response. Assumes the filter-pack is significantly more permeable than the soil. Therefore, the volume of water drained from filter-pack = volume of water entering the well casing. From Butler (2014).

The following estimates a theoretical normalized head, to determine if an acceptable signal-to-noise ratio is present in the test.

Butler (2014). Groundwater 52, No. 2

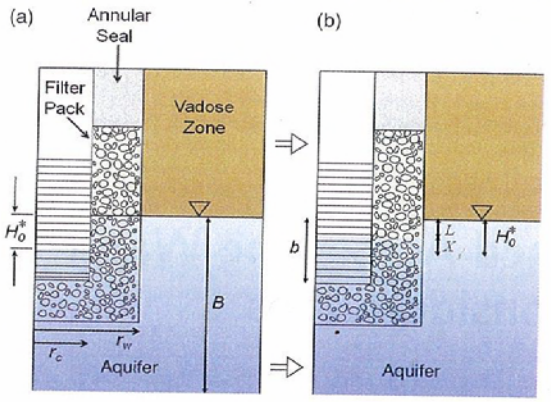
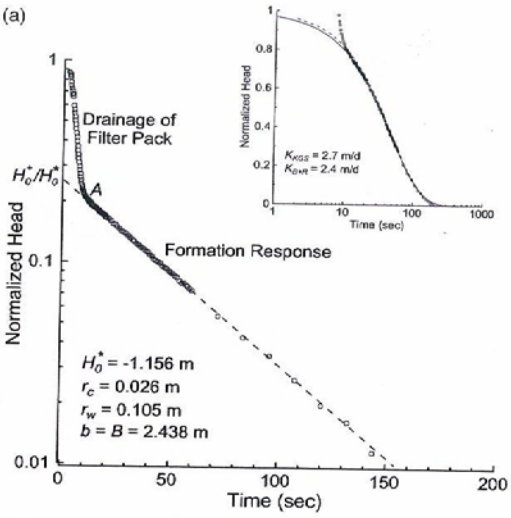


Figure 1. Schematic diagram of a slug test in a well screened across the water table. (a) Situation immediately after initiation of a rising-head slug test with an expected initial displacement of H_0^*; (b) Situation immediately after completion of filter-pack drainage (filter-pack drainage is assumed to be completed prior to any aquifer response; r_c is the radius of the well casing and screen, r_w is the radius of the borehole, b is the effective [submerged] screen length at static conditions, B is the aquifer thickness, L and X are defined in text).



NOTE: ***Entry cell*** ***Calculation; overwrite ONLY in hard field copy as needed.*** →

1). Mass balance: $\pi\iota * R^2_s * X = \pi\iota * (R^2_b - R^2_s) * n\iota$

Input	R_s =	1.0	inch	R_s = screen radius
	R_b =	4.0	inch	R_b = borehole radius
	n =	0.25	unitless	n = filter-pack drainable porosity (try different values)
	X =		feet	X = water level change due to filter-pack drainage
	ι =		feet	ι = length of drained filter-pack
Output	$\pi\iota * R^2_s * X$ =			$\pi\iota * (R^2_b - R^2_s) * n\iota$ =

If both sides are within a factor of 2, then filter-pack drainage phase is assumed identified (straight line log plot).

2). Substitute: H^*_0 - ι for X and solve for ι

$\iota = H^*_0/(An-n+1)$ where: H^*_0 = expected/theoretical initial displacement

$A = R^2_b/R^2_s$

3). Divide (2) by H^*_0 to give: To obtain the expected Normalized Head at end of filter-pack drainage.

$\iota/H_0 = 1/(An - n + 1)$ Normalized Head serves as a means to determine how much filter-pack drainage may occur.

Input	R_s =	1.0	inch	0.08	feet	R^2_s (ft) = 0.007	No overwrite
	R_b =	4.0	inch	0.33	feet	R^2_b (ft) = 0.111	No overwrite
	n =	(range 0.2 to 0.35)		0.25	unitless		
	A =	16.0					
Output	ι/H^*_0 =	0.21	←	Filter-pack drainage should be complete at this Normalized Head.			

If Normalized Head > 0.1, the signal to noise ratio should be acceptable.

If formation - response phase < 25% of the submerged screen at static, changes in submerged screen length should not be of practical importance.

Well No.	*MW-3S*	*Estimate of Effective Casing Radius (all analysis methods)*	Page: 4 of 5

Requires that data from formation-response phase plots as a straight line/double straight line in a log of Normalized Head vs Time.

Rc_{ef} = $Rs*sqrt(H_0/H^*_0)$ Where: Rc_{ef} = Effective casing radius

(from Butler, 1998, 2014) H_0 Initial head change at instant the slug test is started.

Rc_{ef} = $[R^2_s+n(R^2_b-R^2_s)]^{0.5}$ H^*_0 Theoretical/Expected Head Change (page 2)

(Bouwer, 1989, in Butler, 2014) Normalized Head = change in head divided by the theoretical/expected initial displacement (H^*_0).

Input

Porosity n=	0.25	unitless		R_s = screen radius	
H_0/H_0		Input from plot of normalized head vs time, as per example from Butler (2014) Figure 1 above.			
Rs =	1	inch →	0.1	feet	
Output Rc_{ef} =		(feet) →		inch	from Butler (2014)
Rc_{ef} =	0.18	(feet) →	2.2	inch	from Bouwer (1989) referenced in Butler (2014)

If the results from both equations are within 10 - 15% of each other, then Rc_{ef} appears reasonable.

Check the value of 'n' (drainable porosity), for 'reasonableness'.

From:	Rc_{ef} =	$Rs*sqrt(H_0/H^*_0)$	from Butler (1998, 2014)
Substitute Rc_{ef} into:	Rc_{ef} =	$[R^2_s+n(R^2_b-R^2_s)]^{0.5}$	
to obtain 'n':	n=	$R^2c_{ef}-R^2_s/R^2_b-R^2_s$	

n' = If about 25% of assumed value of 'n', then this is probably OK.

Sources: Butler, J.J. (2014). 'Slug tests in wells screened across the water table: some additional considerations'. Groundwater 52, No 2.

Butler, J.J. (1998). "The design, performance, and analysis of slug tests". Lewis Publishers.

Well No.	MW-3S	Test #	4 & 5	Slug Length (ft)	3

Manually Recorded Depths to Water Page: 5 of 5

Rising Head Test

Time Start		*Duration*	0		Duration in minutes		
Note	Time	Duration	DTW (TOC)	Note	Time	Duration	DTW (TOC)
Slug in	11:00						
slug out; Rising	11:04						
slug in	11:07						
slug out; Rising	11:11						

Notes:

APPENDIX G

LOW-FLOW GROUNDWATER SAMPLING LOGS

Low-Flow Groundwater Sampling Log

Project	Gowanus Canal- First Street Turning Basin				
Project Number	PW77GOWAN	Site Location	First Street Turning Basin	Well ID	MW-3S
Date	September 12, 2017	Sampled By	B. Comey, Preferred Environmental Services		
Sampling Time	11:15	Recorded By	B. Comey, Preferred Environmental Services		
Weather	Sunny, 75 Degrees	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s)	YSI 650 MDS	Serial #	01F0657

Casing Material	PVC	Purge Method	Bladder Pump		
Casing Diameter	2"	Screen Interval (ft bmp)	Top 9	Bottom	19
Sounded Depth (ft bmp)	19.33	Pump Intake Depth (ft bmp)	17		18
Depth to Water (ft bmp)	14.64	Purge Time	Start 10:40	Finish	11:15

Field Parameter Measurements During Purging

Time	Minutes Elasped	Flow Rate (mL/min)	Estimated Volume Purged (L)	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
10:40	0	450	0	19.29	7.25	22.22	-19.5	0.87	35.2	14.89
10:45	5	450	2.25	18.76	7.17	22.44	-27.0	0.44	27.6	14.68
10:50	10	450	4.50	18.67	7.16	22.42	-94.5	0.49	6.09	14.63
10:55	15	450	6.75	18.63	7.16	22.44	-115.1	0.41	4.02	14.60
11:00	20	450	9.00	18.58	7.15	22.53	-124.5	0.41	2.95	14.58
11:05	25	450	11.25	18.57	7.14	22.56	-134.4	0.49	2.13	14.55
11:10	30	450	13.50	18.58	7.13	22.57	-141.9	0.46	1.97	14.52
11:15	35	450	15.75	18.64	7.12	22.62	-148.7	0.46	1.87	14.50

Collected Sample Condition Color Clear Odor Organic Appearance Heavy Sheen

Parameter	Container	No.	Preservative

PID Reading 0.0 ppm

Comments Heavy sheen on purge water and organic odors noted

1) Circle one unit type

bmp- below measuring point

ppm- parts per million

Low-Flow Groundwater Sampling Log

Project	Gowanus Canal- First Street Turning Basin				
Project Number	PW77GOWAN	Site Location	First Street Turning Basin	Well ID	MW-3D
Date	September 12, 2017	Sampled By	B. Comey, Preferred Environmental Services		
Sampling Time	9:17	Recorded By	B. Comey, Preferred Environmental Serivces		
Weather	Sunny, 75 Degrees	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s)	YSI 650 MDS	Serial #	01F0657

Casing Material	PVC	Purge Method	Bladder Pump		
Casing Diameter	2"	Screen Interval (ft bmp)	Top 25	Bottom	33
Sounded Depth (ft bmp)	33.08	Pump Intake Depth (ft bmp)	28		29
Depth to Water (ft bmp)	13.52	Purge Time	Start 8:36	Finish	9:10

Field Parameter Measurements During Purging

Time	Minutes Elasped	Flow Rate (mL/min)	Estimated Volume Purged (L)	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) 1)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
8:36	0	450	0	17.67	6.77	16.70	-24.3	1.15	8.3	13.52
8:41	5	450	2.25	16.53	6.76	1.523	-27.8	1.05	1.50	13.56
8:46	10	450	4.50	16.28	6.78	1.538	-37.3	0.78	1.32	13.56
8:51	15	450	6.75	16.26	6.83	1.538	-36.8	0.70	0.93	13.56
8:56	20	450	9.00	16.27	6.84	1.536	-36.1	0.61	1.55	13.50
9:01	25	450	11.25	16.22	6.85	1.535	-35.2	0.65	0.77	13.50
9:06	30	450	13.50	16.20	6.86	1.533	-36.7	0.62	0.57	13.50
9:11	35	450	15.75	16.18	6.86	1.536	-38.1	0.60	0.58	13.50

Collected Sample Condition Color Clear Odor No Appearance No Sheen

Parameter	Container	No.	Preservative

PID Reading 0.0 ppm

Comments Clear purge water with no odors or sheen. However, a small amount of non-aqueous phase liquid was noted on the tubing when it was removed from the well.

1) Circle one unit type

bmp- below measuring point

ppm- parts per million

Low-Flow Groundwater Sampling Log

Project	Gowanus Canal- First Street Turning Basin				
Project Number	PW77GOWAN	Site Location	First Street Turning Basin	Well ID	MW-4S
Date	September 13, 2017	Sampled By	B. Comey, Preferred Environmental Services		
Sampling Time	11:43	Recorded By	B. Comey, Preferred Environmental Services		
Weather	Sunny, 80 Degrees	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s)	YSI 650 MDS	Serial #	01F0657

Casing Material	PVC	Purge Method	Bladder Pump		
Casing Diameter	2"	Screen Interval (ft bmp)	Top 5	Bottom	15
Sounded Depth (ft bmp)	14.69	Pump Intake Depth (ft bmp)	13.20		14.69
Depth to Water (ft bmp)	13.44	Purge Time	Start 11:13	Finish	11:43

Field Parameter Measurements During Purging

Time	Minutes Elasped	Flow Rate (mL/min)	Estimated Volume Purged (L)	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
11:13	5	175	0.875	23.43	7.34	28.32	66.7	9.24	32.3	13.44
11:18	10	175	1.750	22.81	7.12	28.39	12.1	7.94	24.6	13.31
11:23	15	175	2.625	22.52	6.95	28.50	-1.0	6.35	16.7	13.20
11:28	20	175	3.500	21.99	6.91	28.81	-0.2	5.51	8.23	13.21
11:33	25	175	4.375	21.94	6.90	28.96	7.1	5.84	7.34	13.15
11:38	30	175	5.250	21.80	6.88	29.08	16.4	5.55	6.36	13.10
11:43	35	175	6.125	21.66	6.86	29.28	12.4	5.27	5.67	13.04

Collected Sample Condition — Color Clear — Odor Slight Organic — Appearance No Sheen

Parameter	Container	No.	Preservative

PID Reading 0.5 ppm

Comments: Smoke observed coming out of well while purging. Notified necessary parties. Continued purging and sampling. No sheen on purge water, organic odors.

1) Circle one unit type

bmp- below measuring point

ppm- parts per million

Low-Flow Groundwater Sampling Log

Project	Gowanus Canal- First Street Turning Basin				
Project Number	PW77GOWAN	Site Location	First Street Turning Basin	Well ID	MW-4D
Date	September 13, 2017	Sampled By	B. Comey, Preferred Environmental Services		
Sampling Time	14:23	Recorded By	B. Comey, Preferred Environmental Services		
Weather	Sunny, 75 Degrees	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s)	YSI 650 MDS	Serial #	01F0657

Casing Material	PVC	Purge Method	Bladder Pump		
Casing Diameter	2"	Screen Interval (ft bmp)	Top 25	Bottom	33
Sounded Depth (ft bmp)	32.38	Pump Intake Depth (ft bmp)	27		28
Depth to Water (ft bmp)	11.44	Purge Time	Start 13:48	Finish	14:23

Field Parameter Measurements During Purging

Time	Minutes Elasped	Flow Rate (mL/min)	Estimated Volume Purged (L)	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) 1)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
13:48	0	200	0	20.18	7.88	2.771	58.1	4.09	54.4	11.31
13:53	5	200	1.0	19.05	7.98	2.190	-29.5	1.46	67.3	11.24
13:58	10	200	2.0	20.51	8.06	2.075	-112.3	0.64	48.2	11.33
14:03	15	200	3.0	20.50	8.09	2.066	-121.3	0.63	27.1	11.29
14:08	20	200	4.0	20.34	8.05	2.110	-114.7	0.56	34.3	11.31
14:13	25	200	5.0	20.18	7.96	3.998	-105.1	0.56	36.9	11.30
14:18	30	200	6.0	20.03	7.92	4.076	-113.8	0.55	40.1	11.30
14:23	35	200	7.0	20.19	7.87	4.173	-119.3	0.52	37.6	11.30

Collected Sample Condition Color Slightly Clear Odor Organic Appearance Sheen

Parameter	Container	No.	Preservative

PID Reading 57.3 ppm

Comments Purge water was noted to be slightly turbid and exhibited a product sheen on both purge water and the groundwater sample. Organic odors noted.

1) Circle one unit type

bmp- below measuring point

ppm- parts per million

Low-Flow Groundwater Sampling Log

Project	Gowanus Canal- First Street Turning Basin				
Project Number	PW77GOWAN	Site Location	First Street Turning Basin	Well ID	MW-5S
Date	September 12, 2017	Sampled By	B. Comey, Preferred Environmental Services		
Sampling Time	14:25	Recorded By	B. Comey, Preferred Environmental Services		
Weather	Sunny, 75 Degrees	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s)	YSI 650 MDS	Serial #	01F0657

Casing Material	PVC	Purge Method	Bladder Pump		
Casing Diameter	2"	Screen Interval (ft bmp)	Top 9	Bottom	19
Sounded Depth (ft bmp)	22.70	Pump Intake Depth (ft bmp)	15		16
Depth to Water (ft bmp)	11.16	Purge Time	Start 13:35	Finish	14:20

Field Parameter Measurements During Purging

Time	Minutes Elasped	Flow Rate (mL/min)	Estimated Volume Purged (L)	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) 1)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
13:35	0	450	0	21.84	7.10	32.85	-23.0	2.52	-27.1	11.16
13:40	5	450	2.25	21.57	6.86	32.39	-10.7	3.09	23.4	11.07
13:45	10	450	4.50	21.50	6.80	32.43	-6.8	3.37	43.1	11.04
13:50	15	450	6.75	21.56	6.77	32.42	180.8	3.67	12.9	11.05
13:55	20	450	9.00	21.60	6.76	32.44	187.0	3.97	12.9	11.04
14:00	25	450	11.25	21.49	6.75	32.44	191.0	4.00	8.51	11.03
14:05	30	450	13.50	21.43	6.76	32.46	197.7	4.20	7.51	11.04
14:10	35	450	15.75	21.45	6.77	32.46	200.1	4.24	7.31	11.05
14:15	40	450	18.00	21.48	6.77	32.47	201.6	4.27	6.97	11.07
14:20	45	450	20.25	21.47	6.77	32.48	203.6	4.28	7.08	11.08

Collected Sample Condition Color Clear Odor No Appearance No Sheen

Parameter	Container	No.	Preservative

PID Reading 0.0 ppm

Comments Purge water did not exhibit any sheens or odors.

1) Circle one unit type

bmp- below measuring point

ppm- parts per million

Low-Flow Groundwater Sampling Log

Project	Gowanus Canal- First Street Turning Basin				
Project Number	PW77GOWAN	Site Location	First Street Turning Basin	Well ID	MW-5D
Date	September 13, 2017	Sampled By	B. Comey, Preferred Environmental Services		
Sampling Time	9:25	Recorded By	B. Comey, Preferred Environmental Services		
Weather	Sunny, 75 Degrees	Coded Replicate No.			

Instrument Identification

Water Quality Meter(s)	YSI 650 MDS	Serial #	01F0657

Casing Material	PVC	Purge Method	Bladder Pump		
Casing Diameter	2"	Screen Interval (ft bmp)	Top 25	Bottom	33
Sounded Depth (ft bmp)	35.87	Pump Intake Depth (ft bmp)	29		30
Depth to Water (ft bmp)	12.05	Purge Time	Start 8:30	Finish	9:25

Field Parameter Measurements During Purging

Time	Minutes Elasped	Flow Rate (mL/min)	Estimated Volume Purged (L)	Temp (°C)	pH (s.u.)	Conductivity (umhos or mS/cm) [1]	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Depth to Water (ft bmp)
8:30	0	500	0	17.14	7.58	4.557	73.3	0.23	19.0	12.67
8:35	5	400	2.0	16.76	7.54	4.556	-32.9	4.23	47.0	13.12
8:40	10	200	3.0	17.67	7.46	5.534	-119.9	10.31	32.7	14.01
8:45	15	175	3.875	17.76	7.44	5.583	-119.4	8.66	17.7	15.75
8:50	20	175	3.875	17.58	7.46	5.697	-120.3	9.83	6.0	15.52
8:55	25	175	4.750	17.50	7.48	5.647	-132.6	8.41	3.0	15.31
9:00	30	175	5.625	16.94	7.50	5.588	-148.1	7.80	4.0	14.55
9:05	35	175	5.625	16.79	7.50	5.532	-151.8	5.93	4.4	14.88
9:10	40	175	6.500	16.71	7.51	5.486	-153.9	4.13	3.5	14.92
9:15	45	175	7.375	16.66	7.51	5.376	-157.2	3.82	3.2	15.63
9:20	50	175	8.250	16.68	7.56	5.312	-160.6	3.54	2.8	15.04
9:25	55	175	9.125	16.69	7.55	5.297	-161.2	3.51	2.8	14.75

Collected Sample Condition Color Slightly Dark Gray Odor Organic Appearance No Sheen

Parameter	Container	No.	Preservative

PID Reading 0.0 ppm

Comments Purge water did not exhibit any sheen, but exhibited organic odors. Encountered draw-down at the start of purging, adjusted flow rate to stabilize water level.

1) Circle one unit type

bmp- below measuring point

ppm- parts per million

APPENDIX H

INVESTIGATION DERIVED WASTE DISPOSAL MANIFESTS

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	N / A	1	(267) 406-0063	40941

GENERATOR

5. Generator's Name and Mailing Address
City of New York
30-30 Thomson Avenue
Long Island City NY 11101
Generator's Phone: 212 696-0670

Generator's Site Address (if different than mailing address)
City of New York
Former 1st Street Turning Basin-Gowanus Canal
Brooklyn NY 11215

6. Transporter 1 Company Name: Innovative Recycling Technologies, Inc.
U.S. EPA ID Number: NYR000134940

7. Transporter 2 Company Name: Republic Environmental Systems (Trans Group)LLC
U.S. EPA ID Number: PAD982861381

8. Designated Facility Name and Site Address
Republic Environmental Systems (PA), LLC
2869 Sandstone Drive
Hatfield PA 19440
Facility's Phone: 215 822-8905
U.S. EPA ID Number: PAD085690592

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Non Hazardous City Purge Water Non-DOT Regulated Material	04	DM	800	P	
2.	Non Hazardous Engine Oil & Soil Non-DOT Regulated Material	03	DM	750	P	
3.	Non Hazardous Fuel Oil Non-DOT Regulated Material	03	DM	600	P	
4.	Non Hazardous Soil & Drilling Mud Non-DOT Regulated Material	08	DM	2400	P	

13. Special Handling Instructions and Additional Information
9.1)
9.2)
Dock
9.3)
9.4)

14. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name | Signature | Month 10 | Day 27 | Year 17

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name | Signature | Month 10 | Day 27 | Year 17

Transporter 2 Printed/Typed Name | Signature | Month | Day | Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) | U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) | Month | Day | Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name | Signature | Month | Day | Year

GENERATOR'S/SHIPPER'S INITIAL COPY

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
N / A	1	(267) 406-0083	40961

GENERATOR

5. Generator's Name and Mailing Address
City of New York
30-30 Thomson Avenue
Long Island City NY 11101
Generator's Phone: 212 696-0670

Generator's Site Address (if different than mailing address)
City of New York
Former 1st Street Turning Basin-Gowanus Canel
Brooklyn NY 11215

6. Transporter 1 Company Name: Innovative Recycling Technologies, Inc.
U.S. EPA ID Number: NYR000134940

7. Transporter 2 Company Name: Republic Environmental Systems (Trans Group)LLC
U.S. EPA ID Number: PAD982661381

8. Designated Facility Name and Site Address
Republic Environmental Systems (PA), LLC
2869 Sandstone Drive
Hatfield PA 19440
Facility's Phone: 215 822-8895
U.S. EPA ID Number: PAD085690592

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Non-Hazardous Soil & Drilling Mud Non-DOT Regulated Material	001	DF	50	P	
2.						
3.						
4.						

13. Special Handling Instructions and Additional Information
9.1)887023
Doc#

14. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: [illegible] Signature: [signature] Month: 11 Day: 10 Year: 17

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Tony Dull Signature: [signature] Month: 11 Day: 10 Year: 17

Transporter 2 Printed/Typed Name: Signature: Month: Day: Year:

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) Month: Day: Year:

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name: Signature: Month: Day: Year:

GENERATOR'S/SHIPPER'S INITIAL COPY

APPENDIX I

PARTICULATE MONITORING DATA

Instrument Name	DustTrak II
Model Number	8530
Serial Number	8530141502
Firmware Version	3.4
Calibration Date	8/11/2016
Test Name	MANUAL_001
Test Start Time	9:33:51 AM
Test Start Date	8/8/2017
Test Length [D:H:M]	0:07:21
Test Interval [M:S]	1:00
Mass Average [mg/m3]	0.013
Mass Minimum [mg/m3]	0.007
Mass Maximum [mg/m3]	0.039
Mass TWA [mg/m3]	0.012
Photometric User Cal	0.9
Flow User Cal	0
Errors	
Number of Samples	441

Elapsed Time [s]	Mass [mg/m3]	Alarms	Errors
60	0.024		
120	0.019		
180	0.03		
240	0.032		
300	0.025		
360	0.023		
420	0.024		
480	0.026		
540	0.019		
600	0.026		
660	0.017		
720	0.019		
780	0.014		
840	0.011		
900	0.016		
960	0.011		
1020	0.015		
1080	0.015		
1140	0.016		
1200	0.013		
1260	0.008		
1320	0.008		
1380	0.007		
1440	0.008		
1500	0.007		
1560	0.008		
1620	0.009		

1680	0.01
1740	0.009
1800	0.013
1860	0.012
1920	0.015
1980	0.015
2040	0.025
2100	0.016
2160	0.012
2220	0.014
2280	0.011
2340	0.017
2400	0.021
2460	0.022
2520	0.028
2580	0.02
2640	0.016
2700	0.011
2760	0.009
2820	0.017
2880	0.019
2940	0.012
3000	0.009
3060	0.009
3120	0.012
3180	0.01
3240	0.008
3300	0.009
3360	0.011
3420	0.013
3480	0.011
3540	0.015
3600	0.01
3660	0.012
3720	0.01
3780	0.01
3840	0.014
3900	0.011
3960	0.009
4020	0.01
4080	0.008
4140	0.01
4200	0.009
4260	0.008
4320	0.009
4380	0.009
4440	0.008

4500	0.008
4560	0.011
4620	0.019
4680	0.012
4740	0.021
4800	0.011
4860	0.011
4920	0.012
4980	0.013
5040	0.01
5100	0.01
5160	0.008
5220	0.008
5280	0.009
5340	0.01
5400	0.008
5460	0.008
5520	0.009
5580	0.012
5640	0.013
5700	0.009
5760	0.01
5820	0.01
5880	0.01
5940	0.009
6000	0.009
6060	0.008
6120	0.008
6180	0.009
6240	0.008
6300	0.015
6360	0.008
6420	0.009
6480	0.008
6540	0.01
6600	0.011
6660	0.011
6720	0.01
6780	0.009
6840	0.012
6900	0.01
6960	0.01
7020	0.01
7080	0.009
7140	0.01
7200	0.009
7260	0.021

7320	0.01
7380	0.01
7440	0.01
7500	0.011
7560	0.012
7620	0.012
7680	0.011
7740	0.01
7800	0.011
7860	0.01
7920	0.01
7980	0.011
8040	0.013
8100	0.011
8160	0.021
8220	0.017
8280	0.014
8340	0.012
8400	0.013
8460	0.016
8520	0.017
8580	0.013
8640	0.012
8700	0.012
8760	0.011
8820	0.011
8880	0.011
8940	0.01
9000	0.012
9060	0.01
9120	0.011
9180	0.011
9240	0.01
9300	0.01
9360	0.01
9420	0.011
9480	0.01
9540	0.011
9600	0.011
9660	0.01
9720	0.01
9780	0.012
9840	0.011
9900	0.012
9960	0.011
10020	0.011
10080	0.011

10140	0.011
10200	0.011
10260	0.011
10320	0.012
10380	0.017
10440	0.013
10500	0.011
10560	0.012
10620	0.012
10680	0.012
10740	0.012
10800	0.012
10860	0.012
10920	0.011
10980	0.011
11040	0.011
11100	0.011
11160	0.011
11220	0.015
11280	0.012
11340	0.011
11400	0.012
11460	0.011
11520	0.012
11580	0.012
11640	0.012
11700	0.011
11760	0.012
11820	0.014
11880	0.012
11940	0.013
12000	0.01
12060	0.01
12120	0.011
12180	0.011
12240	0.011
12300	0.012
12360	0.012
12420	0.012
12480	0.011
12540	0.011
12600	0.011
12660	0.011
12720	0.012
12780	0.011
12840	0.011
12900	0.011

12960	0.013
13020	0.012
13080	0.011
13140	0.011
13200	0.011
13260	0.01
13320	0.011
13380	0.013
13440	0.013
13500	0.016
13560	0.018
13620	0.013
13680	0.016
13740	0.017
13800	0.019
13860	0.016
13920	0.016
13980	0.013
14040	0.016
14100	0.015
14160	0.013
14220	0.012
14280	0.013
14340	0.015
14400	0.023
14460	0.012
14520	0.013
14580	0.013
14640	0.013
14700	0.012
14760	0.012
14820	0.012
14880	0.013
14940	0.013
15000	0.012
15060	0.013
15120	0.017
15180	0.014
15240	0.014
15300	0.016
15360	0.015
15420	0.013
15480	0.014
15540	0.016
15600	0.027
15660	0.013
15720	0.013

15780	0.018
15840	0.022
15900	0.023
15960	0.014
16020	0.014
16080	0.014
16140	0.015
16200	0.015
16260	0.013
16320	0.013
16380	0.011
16440	0.012
16500	0.016
16560	0.012
16620	0.013
16680	0.015
16740	0.012
16800	0.011
16860	0.011
16920	0.013
16980	0.015
17040	0.016
17100	0.014
17160	0.013
17220	0.012
17280	0.012
17340	0.013
17400	0.012
17460	0.012
17520	0.012
17580	0.013
17640	0.014
17700	0.014
17760	0.013
17820	0.013
17880	0.018
17940	0.016
18000	0.013
18060	0.012
18120	0.012
18180	0.012
18240	0.011
18300	0.012
18360	0.012
18420	0.012
18480	0.011
18540	0.012

18600	0.013
18660	0.012
18720	0.012
18780	0.011
18840	0.012
18900	0.012
18960	0.014
19020	0.012
19080	0.012
19140	0.012
19200	0.013
19260	0.014
19320	0.015
19380	0.015
19440	0.014
19500	0.017
19560	0.02
19620	0.019
19680	0.013
19740	0.014
19800	0.015
19860	0.013
19920	0.013
19980	0.013
20040	0.012
20100	0.017
20160	0.014
20220	0.011
20280	0.012
20340	0.012
20400	0.013
20460	0.013
20520	0.014
20580	0.015
20640	0.014
20700	0.013
20760	0.013
20820	0.014
20880	0.013
20940	0.014
21000	0.013
21060	0.013
21120	0.014
21180	0.014
21240	0.013
21300	0.016
21360	0.014

21420	0.015
21480	0.015
21540	0.014
21600	0.014
21660	0.014
21720	0.013
21780	0.018
21840	0.014
21900	0.014
21960	0.014
22020	0.014
22080	0.014
22140	0.014
22200	0.014
22260	0.018
22320	0.014
22380	0.014
22440	0.014
22500	0.018
22560	0.02
22620	0.014
22680	0.014
22740	0.016
22800	0.019
22860	0.014
22920	0.014
22980	0.015
23040	0.014
23100	0.015
23160	0.019
23220	0.014
23280	0.014
23340	0.015
23400	0.015
23460	0.014
23520	0.015
23580	0.014
23640	0.015
23700	0.014
23760	0.014
23820	0.014
23880	0.015
23940	0.014
24000	0.014
24060	0.015
24120	0.013
24180	0.013

24240	0.014
24300	0.014
24360	0.013
24420	0.013
24480	0.013
24540	0.013
24600	0.013
24660	0.013
24720	0.014
24780	0.013
24840	0.013
24900	0.013
24960	0.013
25020	0.013
25080	0.013
25140	0.013
25200	0.015
25260	0.013
25320	0.012
25380	0.012
25440	0.013
25500	0.013
25560	0.013
25620	0.039
25680	0.025
25740	0.014
25800	0.018
25860	0.014
25920	0.021
25980	0.022
26040	0.018
26100	0.016
26160	0.016
26220	0.015
26280	0.013
26340	0.015
26400	0.018
26460	0.018

Instrument Name	DustTrak II
Model Number	8530
Serial Number	8530141502
Firmware Version	3.4
Calibration Date	8/11/2016
Test Name	MANUAL_002
Test Start Time	8:23:31 AM
Test Start Date	8/9/2017
Test Length [D:H:M]	0:05:03
Test Interval [M:S]	1:00
Mass Average [mg/m3]	0.034
Mass Minimum [mg/m3]	0.022
Mass Maximum [mg/m3]	0.236
Mass TWA [mg/m3]	0.021
Photometric User Cal	0.9
Flow User Cal	0
Errors	
Number of Samples	303

Elapsed Time [s]	Mass [mg/m3]	Alarms	Errors
60	0.034		
120	0.033		
180	0.031		
240	0.033		
300	0.032		
360	0.03		
420	0.028		
480	0.032		
540	0.025		
600	0.026		
660	0.028		
720	0.028		
780	0.026		
840	0.026		
900	0.028		
960	0.029		
1020	0.028		
1080	0.028		
1140	0.03		
1200	0.034		
1260	0.029		
1320	0.029		
1380	0.029		
1440	0.033		
1500	0.033		
1560	0.035		
1620	0.04		

1680	0.038
1740	0.031
1800	0.03
1860	0.03
1920	0.033
1980	0.031
2040	0.032
2100	0.029
2160	0.029
2220	0.028
2280	0.029
2340	0.028
2400	0.028
2460	0.037
2520	0.034
2580	0.027
2640	0.031
2700	0.031
2760	0.032
2820	0.03
2880	0.037
2940	0.031
3000	0.032
3060	0.031
3120	0.028
3180	0.029
3240	0.027
3300	0.029
3360	0.03
3420	0.039
3480	0.037
3540	0.031
3600	0.029
3660	0.027
3720	0.026
3780	0.027
3840	0.026
3900	0.029
3960	0.027
4020	0.025
4080	0.025
4140	0.026
4200	0.025
4260	0.028
4320	0.031
4380	0.028
4440	0.027

4500	0.026
4560	0.026
4620	0.033
4680	0.03
4740	0.026
4800	0.026
4860	0.026
4920	0.026
4980	0.024
5040	0.025
5100	0.023
5160	0.025
5220	0.026
5280	0.024
5340	0.026
5400	0.028
5460	0.033
5520	0.034
5580	0.028
5640	0.028
5700	0.025
5760	0.025
5820	0.025
5880	0.026
5940	0.027
6000	0.026
6060	0.024
6120	0.023
6180	0.023
6240	0.023
6300	0.024
6360	0.028
6420	0.029
6480	0.023
6540	0.025
6600	0.028
6660	0.023
6720	0.022
6780	0.023
6840	0.022
6900	0.022
6960	0.028
7020	0.022
7080	0.033
7140	0.027
7200	0.025
7260	0.044

7320	0.041
7380	0.025
7440	0.024
7500	0.026
7560	0.023
7620	0.024
7680	0.025
7740	0.032
7800	0.025
7860	0.025
7920	0.023
7980	0.023
8040	0.024
8100	0.027
8160	0.042
8220	0.032
8280	0.026
8340	0.034
8400	0.028
8460	0.028
8520	0.027
8580	0.026
8640	0.025
8700	0.023
8760	0.028
8820	0.029
8880	0.031
8940	0.034
9000	0.026
9060	0.027
9120	0.026
9180	0.026
9240	0.029
9300	0.031
9360	0.05
9420	0.03
9480	0.027
9540	0.026
9600	0.03
9660	0.031
9720	0.037
9780	0.041
9840	0.037
9900	0.026
9960	0.036
10020	0.035
10080	0.03

10140	0.026
10200	0.026
10260	0.03
10320	0.028
10380	0.043
10440	0.039
10500	0.038
10560	0.03
10620	0.029
10680	0.029
10740	0.03
10800	0.027
10860	0.026
10920	0.027
10980	0.036
11040	0.028
11100	0.041
11160	0.036
11220	0.033
11280	0.033
11340	0.028
11400	0.027
11460	0.027
11520	0.028
11580	0.031
11640	0.04
11700	0.036
11760	0.034
11820	0.041
11880	0.042
11940	0.035
12000	0.038
12060	0.046
12120	0.034
12180	0.037
12240	0.041
12300	0.034
12360	0.032
12420	0.031
12480	0.034
12540	0.04
12600	0.031
12660	0.034
12720	0.037
12780	0.037
12840	0.04
12900	0.032

12960	0.032
13020	0.033
13080	0.04
13140	0.032
13200	0.033
13260	0.035
13320	0.032
13380	0.044
13440	0.032
13500	0.032
13560	0.031
13620	0.037
13680	0.037
13740	0.031
13800	0.032
13860	0.099
13920	0.045
13980	0.065
14040	0.043
14100	0.049
14160	0.236
14220	0.051
14280	0.034
14340	0.033
14400	0.035
14460	0.049
14520	0.042
14580	0.037
14640	0.038
14700	0.034
14760	0.038
14820	0.057
14880	0.046
14940	0.061
15000	0.049
15060	0.07
15120	0.039
15180	0.081
15240	0.052
15300	0.038
15360	0.04
15420	0.042
15480	0.038
15540	0.041
15600	0.036
15660	0.036
15720	0.051

15780	0.039
15840	0.037
15900	0.039
15960	0.037
16020	0.041
16080	0.038
16140	0.038
16200	0.037
16260	0.038
16320	0.039
16380	0.038
16440	0.037
16500	0.037
16560	0.037
16620	0.037
16680	0.038
16740	0.04
16800	0.046
16860	0.044
16920	0.042
16980	0.04
17040	0.04
17100	0.04
17160	0.041
17220	0.039
17280	0.042
17340	0.041
17400	0.045
17460	0.042
17520	0.04
17580	0.041
17640	0.047
17700	0.043
17760	0.04
17820	0.041
17880	0.04
17940	0.04
18000	0.04
18060	0.041
18120	0.044
18180	0.05

Instrument Name	DustTrak II
Model Number	8530
Serial Number	8530141302
Firmware Version	3.5
Calibration Date	8/3/2017
Test Name	MANUAL_002
Test Start Time	2:13:45 PM
Test Start Date	8/9/2017
Test Length [D:H:M]	0:01:56
Test Interval [M:S]	1:00
Mass Average [mg/m3]	0.064
Mass Minimum [mg/m3]	0.031
Mass Maximum [mg/m3]	0.633
Mass TWA [mg/m3]	0.015
Photometric User Cal	1
Flow User Cal	0
Errors	
Number of Samples	116

Elapsed Time [s]	Mass [mg/m3]	Alarms	Errors
60	0.061		
120	0.107		
180	0.061		
240	0.066		
300	0.046		
360	0.041		
420	0.06		
480	0.068		
540	0.048		
600	0.06		
660	0.059		
720	0.04		
780	0.04		
840	0.048		
900	0.057		
960	0.049		
1020	0.046		
1080	0.041		
1140	0.049		
1200	0.056		
1260	0.049		
1320	0.061		
1380	0.055		
1440	0.066		
1500	0.105		
1560	0.129		
1620	0.119		

1680	0.156
1740	0.083
1800	0.181
1860	0.112
1920	0.198
1980	0.633
2040	0.104
2100	0.064
2160	0.058
2220	0.08
2280	0.062
2340	0.101
2400	0.187
2460	0.115
2520	0.046
2580	0.041
2640	0.043
2700	0.078
2760	0.213
2820	0.098
2880	0.203
2940	0.066
3000	0.046
3060	0.037
3120	0.049
3180	0.056
3240	0.061
3300	0.041
3360	0.056
3420	0.044
3480	0.041
3540	0.038
3600	0.037
3660	0.034
3720	0.035
3780	0.051
3840	0.049
3900	0.062
3960	0.049
4020	0.071
4080	0.097
4140	0.038
4200	0.047
4260	0.049
4320	0.041
4380	0.046
4440	0.043

4500	0.047
4560	0.047
4620	0.042
4680	0.043
4740	0.038
4800	0.037
4860	0.036
4920	0.038
4980	0.04
5040	0.045
5100	0.037
5160	0.046
5220	0.036
5280	0.034
5340	0.042
5400	0.05
5460	0.036
5520	0.034
5580	0.033
5640	0.034
5700	0.038
5760	0.037
5820	0.047
5880	0.034
5940	0.035
6000	0.038
6060	0.038
6120	0.045
6180	0.034
6240	0.034
6300	0.038
6360	0.04
6420	0.034
6480	0.033
6540	0.033
6600	0.035
6660	0.032
6720	0.034
6780	0.037
6840	0.032
6900	0.031
6960	0.035

Instrument Name	DustTrak II
Model Number	8530
Serial Number	8530141302
Firmware Version	3.5
Calibration Date	8/3/2017
Test Name	MANUAL_003
Test Start Time	7:56:10 AM
Test Start Date	8/10/2017
Test Length [D:H:M]	0:09:51
Test Interval [M:S]	1:00
Mass Average [mg/m3]	0.048
Mass Minimum [mg/m3]	0.014
Mass Maximum [mg/m3]	0.306
Mass TWA [mg/m3]	0.055
Photometric User Cal	1
Flow User Cal	0
Errors	
Number of Samples	591

Elapsed Time [s]	Mass [mg/m3]	Alarms	Errors
60	0.099		
120	0.124		
180	0.128		
240	0.115		
300	0.104		
360	0.09		
420	0.096		
480	0.097		
540	0.085		
600	0.086		
660	0.089		
720	0.088		
780	0.099		
840	0.087		
900	0.096		
960	0.092		
1020	0.088		
1080	0.093		
1140	0.091		
1200	0.087		
1260	0.085		
1320	0.089		
1380	0.092		
1440	0.09		
1500	0.094		
1560	0.096		
1620	0.095		

1680	0.09
1740	0.089
1800	0.091
1860	0.096
1920	0.101
1980	0.09
2040	0.094
2100	0.088
2160	0.096
2220	0.102
2280	0.108
2340	0.113
2400	0.106
2460	0.105
2520	0.095
2580	0.103
2640	0.098
2700	0.093
2760	0.091
2820	0.089
2880	0.086
2940	0.097
3000	0.106
3060	0.092
3120	0.087
3180	0.131
3240	0.306
3300	0.098
3360	0.114
3420	0.097
3480	0.114
3540	0.114
3600	0.114
3660	0.125
3720	0.126
3780	0.097
3840	0.085
3900	0.094
3960	0.128
4020	0.102
4080	0.091
4140	0.092
4200	0.096
4260	0.099
4320	0.094
4380	0.106
4440	0.103

4500	0.109
4560	0.095
4620	0.093
4680	0.086
4740	0.084
4800	0.09
4860	0.081
4920	0.084
4980	0.095
5040	0.09
5100	0.09
5160	0.097
5220	0.087
5280	0.085
5340	0.081
5400	0.078
5460	0.079
5520	0.082
5580	0.101
5640	0.09
5700	0.078
5760	0.076
5820	0.075
5880	0.076
5940	0.079
6000	0.081
6060	0.082
6120	0.075
6180	0.074
6240	0.073
6300	0.071
6360	0.073
6420	0.078
6480	0.077
6540	0.072
6600	0.073
6660	0.071
6720	0.075
6780	0.071
6840	0.067
6900	0.064
6960	0.066
7020	0.085
7080	0.071
7140	0.069
7200	0.062
7260	0.062

7320	0.062
7380	0.06
7440	0.059
7500	0.058
7560	0.058
7620	0.059
7680	0.059
7740	0.059
7800	0.072
7860	0.065
7920	0.062
7980	0.083
8040	0.082
8100	0.081
8160	0.086
8220	0.081
8280	0.086
8340	0.1
8400	0.101
8460	0.08
8520	0.092
8580	0.08
8640	0.062
8700	0.074
8760	0.074
8820	0.066
8880	0.068
8940	0.071
9000	0.072
9060	0.073
9120	0.081
9180	0.064
9240	0.067
9300	0.062
9360	0.063
9420	0.086
9480	0.08
9540	0.085
9600	0.076
9660	0.073
9720	0.078
9780	0.074
9840	0.08
9900	0.069
9960	0.07
10020	0.071
10080	0.091

10140	0.089
10200	0.098
10260	0.062
10320	0.058
10380	0.083
10440	0.092
10500	0.086
10560	0.083
10620	0.064
10680	0.063
10740	0.064
10800	0.082
10860	0.104
10920	0.081
10980	0.069
11040	0.063
11100	0.056
11160	0.057
11220	0.062
11280	0.056
11340	0.053
11400	0.06
11460	0.061
11520	0.059
11580	0.05
11640	0.056
11700	0.053
11760	0.054
11820	0.056
11880	0.057
11940	0.066
12000	0.07
12060	0.076
12120	0.079
12180	0.071
12240	0.067
12300	0.062
12360	0.065
12420	0.064
12480	0.059
12540	0.075
12600	0.076
12660	0.083
12720	0.06
12780	0.055
12840	0.056
12900	0.052

12960	0.05
13020	0.042
13080	0.041
13140	0.047
13200	0.053
13260	0.086
13320	0.087
13380	0.053
13440	0.046
13500	0.054
13560	0.047
13620	0.051
13680	0.056
13740	0.051
13800	0.055
13860	0.055
13920	0.065
13980	0.055
14040	0.05
14100	0.048
14160	0.044
14220	0.044
14280	0.046
14340	0.045
14400	0.041
14460	0.039
14520	0.04
14580	0.04
14640	0.04
14700	0.035
14760	0.035
14820	0.035
14880	0.035
14940	0.035
15000	0.051
15060	0.036
15120	0.033
15180	0.032
15240	0.032
15300	0.033
15360	0.032
15420	0.033
15480	0.031
15540	0.036
15600	0.035
15660	0.032
15720	0.031

15780	0.03
15840	0.034
15900	0.033
15960	0.057
16020	0.033
16080	0.032
16140	0.036
16200	0.034
16260	0.033
16320	0.03
16380	0.032
16440	0.033
16500	0.033
16560	0.032
16620	0.034
16680	0.03
16740	0.03
16800	0.031
16860	0.031
16920	0.031
16980	0.032
17040	0.032
17100	0.034
17160	0.038
17220	0.033
17280	0.031
17340	0.037
17400	0.03
17460	0.032
17520	0.031
17580	0.03
17640	0.03
17700	0.032
17760	0.034
17820	0.057
17880	0.031
17940	0.03
18000	0.03
18060	0.03
18120	0.03
18180	0.031
18240	0.031
18300	0.031
18360	0.031
18420	0.033
18480	0.031
18540	0.031

18600	0.032
18660	0.04
18720	0.037
18780	0.035
18840	0.03
18900	0.039
18960	0.034
19020	0.032
19080	0.032
19140	0.029
19200	0.03
19260	0.044
19320	0.034
19380	0.032
19440	0.029
19500	0.029
19560	0.027
19620	0.026
19680	0.026
19740	0.026
19800	0.026
19860	0.027
19920	0.029
19980	0.03
20040	0.029
20100	0.028
20160	0.026
20220	0.027
20280	0.026
20340	0.026
20400	0.028
20460	0.03
20520	0.028
20580	0.029
20640	0.044
20700	0.029
20760	0.037
20820	0.034
20880	0.03
20940	0.033
21000	0.04
21060	0.039
21120	0.035
21180	0.029
21240	0.029
21300	0.033
21360	0.029

21420	0.027
21480	0.029
21540	0.027
21600	0.035
21660	0.027
21720	0.027
21780	0.028
21840	0.028
21900	0.03
21960	0.044
22020	0.029
22080	0.03
22140	0.031
22200	0.03
22260	0.029
22320	0.028
22380	0.03
22440	0.032
22500	0.03
22560	0.028
22620	0.036
22680	0.028
22740	0.028
22800	0.032
22860	0.028
22920	0.029
22980	0.033
23040	0.03
23100	0.033
23160	0.027
23220	0.026
23280	0.026
23340	0.025
23400	0.026
23460	0.033
23520	0.028
23580	0.029
23640	0.026
23700	0.027
23760	0.03
23820	0.036
23880	0.031
23940	0.026
24000	0.024
24060	0.026
24120	0.026
24180	0.023

24240	0.024
24300	0.025
24360	0.027
24420	0.025
24480	0.027
24540	0.026
24600	0.025
24660	0.03
24720	0.027
24780	0.031
24840	0.023
24900	0.023
24960	0.024
25020	0.05
25080	0.032
25140	0.029
25200	0.033
25260	0.032
25320	0.023
25380	0.043
25440	0.035
25500	0.023
25560	0.024
25620	0.026
25680	0.021
25740	0.022
25800	0.021
25860	0.021
25920	0.021
25980	0.032
26040	0.022
26100	0.025
26160	0.024
26220	0.023
26280	0.027
26340	0.022
26400	0.023
26460	0.021
26520	0.021
26580	0.022
26640	0.022
26700	0.022
26760	0.021
26820	0.022
26880	0.021
26940	0.021
27000	0.021

27060	0.021
27120	0.021
27180	0.02
27240	0.023
27300	0.022
27360	0.02
27420	0.02
27480	0.022
27540	0.035
27600	0.038
27660	0.023
27720	0.025
27780	0.026
27840	0.024
27900	0.022
27960	0.022
28020	0.021
28080	0.024
28140	0.02
28200	0.024
28260	0.02
28320	0.02
28380	0.02
28440	0.019
28500	0.021
28560	0.02
28620	0.023
28680	0.021
28740	0.02
28800	0.019
28860	0.02
28920	0.02
28980	0.019
29040	0.022
29100	0.021
29160	0.018
29220	0.018
29280	0.019
29340	0.017
29400	0.017
29460	0.018
29520	0.018
29580	0.018
29640	0.018
29700	0.018
29760	0.018
29820	0.027

29880	0.029
29940	0.022
30000	0.019
30060	0.019
30120	0.019
30180	0.018
30240	0.018
30300	0.018
30360	0.02
30420	0.021
30480	0.018
30540	0.017
30600	0.023
30660	0.019
30720	0.02
30780	0.038
30840	0.022
30900	0.018
30960	0.045
31020	0.037
31080	0.035
31140	0.019
31200	0.017
31260	0.019
31320	0.017
31380	0.017
31440	0.017
31500	0.017
31560	0.028
31620	0.017
31680	0.017
31740	0.019
31800	0.016
31860	0.015
31920	0.016
31980	0.029
32040	0.024
32100	0.022
32160	0.015
32220	0.015
32280	0.015
32340	0.014
32400	0.015
32460	0.014
32520	0.014
32580	0.015
32640	0.024

32700	0.014
32760	0.015
32820	0.015
32880	0.015
32940	0.015
33000	0.016
33060	0.016
33120	0.016
33180	0.016
33240	0.016
33300	0.016
33360	0.015
33420	0.015
33480	0.015
33540	0.015
33600	0.016
33660	0.021
33720	0.016
33780	0.016
33840	0.031
33900	0.032
33960	0.019
34020	0.017
34080	0.017
34140	0.018
34200	0.017
34260	0.017
34320	0.016
34380	0.027
34440	0.022
34500	0.017
34560	0.018
34620	0.017
34680	0.019
34740	0.019
34800	0.031
34860	0.025
34920	0.018
34980	0.016
35040	0.017
35100	0.018
35160	0.019
35220	0.029
35280	0.026
35340	0.021
35400	0.019
35460	0.03

Instrument Name	DustTrak II
Model Number	8530
Serial Number	8530141302
Firmware Version	3.5
Calibration Date	8/3/2017
Test Name	MANUAL_004
Test Start Time	8:35:56 AM
Test Start Date	8/11/2017
Test Length [D:H:M]	0:05:58
Test Interval [M:S]	1:00
Mass Average [mg/m3]	0.023
Mass Minimum [mg/m3]	-0.044
Mass Maximum [mg/m3]	1.18
Mass TWA [mg/m3]	0.017
Photometric User Cal	1
Flow User Cal	0
Errors	
Number of Samples	358

Elapsed Time [s]	Mass [mg/m3]	Alarms	Errors
60	0.011		
120	0.033		
180	0.123		
240	0.443		
300	0.148		
360	0.073		
420	0.023		
480	0.124		
540	0.095		
600	0.075		
660	0.071		
720	0.087		
780	0.082		
840	0.104		
900	0.25		
960	0.291		
1020	0.3		
1080	0.03		
1140	0.02		
1200	0.062		
1260	0.117		
1320	0.155		
1380	0.038		
1440	0.013		
1500	0.073		
1560	0.009		
1620	0.013		

1680	0.022
1740	0.057
1800	-0.005
1860	0.011
1920	0.422
1980	0.155
2040	0.148
2100	0.053
2160	0.056
2220	-0.008
2280	-0.014
2340	-0.031
2400	-0.039
2460	-0.039
2520	-0.035
2580	-0.037
2640	-0.036
2700	-0.04
2760	-0.037
2820	-0.034
2880	-0.038
2940	-0.041
3000	-0.041
3060	-0.041
3120	-0.042
3180	-0.042
3240	-0.042
3300	-0.033
3360	-0.04
3420	-0.026
3480	-0.006
3540	-0.042
3600	-0.041
3660	-0.041
3720	-0.038
3780	-0.042
3840	-0.041
3900	-0.032
3960	-0.035
4020	-0.042
4080	-0.043
4140	-0.026
4200	-0.034
4260	0.031
4320	0.129
4380	0.056
4440	0.003

4500	0.003
4560	0.097
4620	0.164
4680	0.004
4740	0.517
4800	0.12
4860	-0.01
4920	0.175
4980	0.071
5040	-0.031
5100	-0.03
5160	-0.011
5220	-0.042
5280	-0.036
5340	-0.041
5400	-0.028
5460	0.026
5520	0.217
5580	0.065
5640	0.021
5700	0.064
5760	0.017
5820	0.103
5880	-0.021
5940	-0.032
6000	-0.025
6060	-0.024
6120	-0.008
6180	-0.014
6240	0.032
6300	0.032
6360	0.069
6420	0.041
6480	0.349
6540	0.018
6600	-0.026
6660	-0.02
6720	-0.008
6780	-0.006
6840	0.004
6900	0.013
6960	0.023
7020	0.064
7080	0.844
7140	0.031
7200	0.023
7260	0.013

7320	-0.018
7380	-0.028
7440	-0.04
7500	-0.014
7560	0.199
7620	0.085
7680	-0.022
7740	-0.028
7800	0.164
7860	-0.012
7920	-0.027
7980	0.008
8040	0.1
8100	0.27
8160	0.076
8220	0.003
8280	0.019
8340	0.047
8400	0.133
8460	0.021
8520	-0.001
8580	-0.02
8640	-0.003
8700	0.01
8760	-0.01
8820	-0.013
8880	0.043
8940	-0.033
9000	0.13
9060	0.104
9120	0.112
9180	0.28
9240	0.08
9300	-0.009
9360	-0.02
9420	-0.019
9480	0.007
9540	0.124
9600	0.054
9660	0.112
9720	0.083
9780	0.004
9840	0.045
9900	-0.002
9960	-0.028
10020	-0.007
10080	0.005

10140	0.003
10200	0.086
10260	0.023
10320	0.006
10380	0.014
10440	-0.001
10500	0.008
10560	-0.01
10620	-0.015
10680	0.063
10740	0.219
10800	0.026
10860	0.061
10920	0.085
10980	-0.011
11040	-0.027
11100	0.003
11160	0.057
11220	0.134
11280	0.245
11340	0.283
11400	0.047
11460	0.788
11520	0.073
11580	0.063
11640	1.18
11700	0.455
11760	0.081
11820	0.098
11880	-0.035
11940	-0.028
12000	-0.033
12060	-0.035
12120	-0.03
12180	-0.039
12240	-0.04
12300	-0.041
12360	-0.038
12420	-0.021
12480	-0.038
12540	-0.038
12600	-0.034
12660	-0.036
12720	0.044
12780	-0.033
12840	-0.037
12900	-0.007

12960	-0.033
13020	-0.037
13080	-0.006
13140	-0.025
13200	-0.035
13260	-0.032
13320	-0.039
13380	-0.039
13440	-0.033
13500	-0.037
13560	-0.034
13620	-0.019
13680	-0.017
13740	-0.027
13800	-0.038
13860	-0.036
13920	-0.033
13980	-0.037
14040	-0.039
14100	-0.031
14160	-0.039
14220	-0.039
14280	-0.039
14340	-0.036
14400	-0.033
14460	-0.042
14520	-0.042
14580	-0.042
14640	0.064
14700	-0.027
14760	-0.016
14820	0.001
14880	0.003
14940	-0.023
15000	-0.037
15060	0.096
15120	0.016
15180	0.026
15240	-0.012
15300	-0.017
15360	-0.038
15420	-0.041
15480	-0.041
15540	-0.04
15600	-0.041
15660	-0.039
15720	-0.039

15780	-0.035
15840	-0.025
15900	-0.03
15960	-0.038
16020	-0.037
16080	-0.03
16140	-0.03
16200	-0.032
16260	-0.041
16320	-0.04
16380	-0.021
16440	0.001
16500	-0.023
16560	-0.03
16620	-0.041
16680	-0.038
16740	-0.04
16800	-0.034
16860	-0.033
16920	-0.037
16980	-0.04
17040	-0.041
17100	-0.042
17160	-0.042
17220	-0.037
17280	-0.04
17340	-0.033
17400	-0.04
17460	0.025
17520	-0.009
17580	-0.036
17640	-0.033
17700	-0.039
17760	-0.043
17820	-0.039
17880	-0.022
17940	-0.035
18000	-0.037
18060	-0.041
18120	-0.04
18180	-0.037
18240	-0.04
18300	-0.034
18360	-0.042
18420	-0.037
18480	-0.041
18540	-0.043

18600	-0.043
18660	-0.041
18720	-0.042
18780	-0.043
18840	-0.043
18900	-0.043
18960	-0.043
19020	-0.044
19080	-0.043
19140	-0.043
19200	-0.042
19260	-0.014
19320	-0.038
19380	-0.04
19440	-0.038
19500	-0.02
19560	-0.039
19620	-0.037
19680	-0.037
19740	-0.033
19800	-0.031
19860	-0.035
19920	-0.04
19980	-0.038
20040	-0.037
20100	-0.035
20160	-0.038
20220	-0.02
20280	-0.033
20340	0.014
20400	-0.038
20460	-0.029
20520	0.01
20580	0.015
20640	0.008
20700	-0.013
20760	-0.035
20820	-0.029
20880	0.034
20940	-0.006
21000	-0.018
21060	-0.036
21120	-0.038
21180	-0.029
21240	-0.023
21300	1.18
21360	0.068

21420	0.038
21480	-0.031

Instrument Name	DustTrak II
Model Number	8530
Serial Number	8530141302
Firmware Version	3.5
Calibration Date	8/3/2017
Test Name	MANUAL_005
Test Start Time	8:03:14 AM
Test Start Date	8/14/2017
Test Length [D:H:M]	0:06:56
Test Interval [M:S]	1:00
Mass Average [mg/m3]	0.03
Mass Minimum [mg/m3]	0.007
Mass Maximum [mg/m3]	0.24
Mass TWA [mg/m3]	0.026
Photometric User Cal	1
Flow User Cal	0
Errors	
Number of Samples	416

Elapsed Time [s]	Mass [mg/m3]	Alarms	Errors
60	0.083		
120	0.022		
180	0.042		
240	0.043		
300	0.028		
360	0.027		
420	0.033		
480	0.04		
540	0.035		
600	0.039		
660	0.051		
720	0.043		
780	0.065		
840	0.038		
900	0.019		
960	0.019		
1020	0.023		
1080	0.019		
1140	0.02		
1200	0.022		
1260	0.026		
1320	0.035		
1380	0.042		
1440	0.023		
1500	0.021		
1560	0.019		
1620	0.02		

1680	0.019
1740	0.026
1800	0.019
1860	0.017
1920	0.018
1980	0.019
2040	0.02
2100	0.018
2160	0.043
2220	0.018
2280	0.017
2340	0.016
2400	0.026
2460	0.046
2520	0.053
2580	0.044
2640	0.058
2700	0.035
2760	0.018
2820	0.017
2880	0.014
2940	0.019
3000	0.017
3060	0.015
3120	0.019
3180	0.027
3240	0.032
3300	0.072
3360	0.03
3420	0.025
3480	0.025
3540	0.024
3600	0.021
3660	0.022
3720	0.055
3780	0.02
3840	0.022
3900	0.024
3960	0.03
4020	0.044
4080	0.023
4140	0.027
4200	0.028
4260	0.032
4320	0.019
4380	0.019
4440	0.042

4500	0.041
4560	0.018
4620	0.017
4680	0.02
4740	0.023
4800	0.024
4860	0.021
4920	0.019
4980	0.017
5040	0.019
5100	0.016
5160	0.012
5220	0.018
5280	0.015
5340	0.016
5400	0.011
5460	0.015
5520	0.015
5580	0.017
5640	0.022
5700	0.011
5760	0.017
5820	0.034
5880	0.045
5940	0.011
6000	0.012
6060	0.026
6120	0.013
6180	0.013
6240	0.015
6300	0.034
6360	0.017
6420	0.021
6480	0.014
6540	0.012
6600	0.011
6660	0.009
6720	0.016
6780	0.011
6840	0.011
6900	0.009
6960	0.01
7020	0.018
7080	0.015
7140	0.014
7200	0.011
7260	0.024

7320	0.051
7380	0.017
7440	0.013
7500	0.014
7560	0.025
7620	0.03
7680	0.014
7740	0.078
7800	0.013
7860	0.011
7920	0.012
7980	0.01
8040	0.024
8100	0.017
8160	0.014
8220	0.009
8280	0.009
8340	0.009
8400	0.01
8460	0.009
8520	0.013
8580	0.011
8640	0.015
8700	0.012
8760	0.038
8820	0.009
8880	0.009
8940	0.01
9000	0.043
9060	0.016
9120	0.017
9180	0.017
9240	0.052
9300	0.012
9360	0.011
9420	0.01
9480	0.047
9540	0.032
9600	0.01
9660	0.034
9720	0.075
9780	0.015
9840	0.009
9900	0.039
9960	0.047
10020	0.018
10080	0.057

10140	0.02
10200	0.007
10260	0.015
10320	0.012
10380	0.069
10440	0.027
10500	0.014
10560	0.01
10620	0.013
10680	0.014
10740	0.022
10800	0.023
10860	0.033
10920	0.016
10980	0.077
11040	0.036
11100	0.015
11160	0.02
11220	0.028
11280	0.032
11340	0.027
11400	0.029
11460	0.048
11520	0.02
11580	0.048
11640	0.019
11700	0.015
11760	0.044
11820	0.024
11880	0.016
11940	0.019
12000	0.013
12060	0.015
12120	0.016
12180	0.031
12240	0.016
12300	0.015
12360	0.029
12420	0.048
12480	0.038
12540	0.032
12600	0.034
12660	0.051
12720	0.065
12780	0.031
12840	0.031
12900	0.047

12960	0.021
13020	0.033
13080	0.027
13140	0.021
13200	0.042
13260	0.042
13320	0.051
13380	0.026
13440	0.023
13500	0.03
13560	0.032
13620	0.023
13680	0.032
13740	0.023
13800	0.038
13860	0.064
13920	0.059
13980	0.03
14040	0.026
14100	0.022
14160	0.025
14220	0.019
14280	0.017
14340	0.018
14400	0.022
14460	0.037
14520	0.035
14580	0.02
14640	0.016
14700	0.016
14760	0.02
14820	0.018
14880	0.017
14940	0.015
15000	0.015
15060	0.015
15120	0.016
15180	0.017
15240	0.018
15300	0.029
15360	0.024
15420	0.031
15480	0.03
15540	0.016
15600	0.143
15660	0.043
15720	0.021

15780	0.019
15840	0.04
15900	0.021
15960	0.022
16020	0.036
16080	0.02
16140	0.024
16200	0.032
16260	0.018
16320	0.018
16380	0.031
16440	0.022
16500	0.022
16560	0.017
16620	0.029
16680	0.025
16740	0.042
16800	0.028
16860	0.021
16920	0.023
16980	0.036
17040	0.055
17100	0.037
17160	0.028
17220	0.033
17280	0.033
17340	0.021
17400	0.023
17460	0.02
17520	0.024
17580	0.024
17640	0.024
17700	0.019
17760	0.021
17820	0.022
17880	0.017
17940	0.022
18000	0.036
18060	0.035
18120	0.039
18180	0.044
18240	0.026
18300	0.019
18360	0.021
18420	0.028
18480	0.018
18540	0.042

18600	0.02
18660	0.022
18720	0.023
18780	0.026
18840	0.016
18900	0.028
18960	0.058
19020	0.046
19080	0.045
19140	0.083
19200	0.021
19260	0.03
19320	0.021
19380	0.02
19440	0.019
19500	0.026
19560	0.033
19620	0.024
19680	0.032
19740	0.027
19800	0.04
19860	0.053
19920	0.028
19980	0.021
20040	0.035
20100	0.027
20160	0.028
20220	0.033
20280	0.024
20340	0.02
20400	0.037
20460	0.052
20520	0.072
20580	0.026
20640	0.068
20700	0.038
20760	0.075
20820	0.038
20880	0.034
20940	0.023
21000	0.029
21060	0.085
21120	0.066
21180	0.025
21240	0.052
21300	0.054
21360	0.043

21420	0.047
21480	0.04
21540	0.056
21600	0.022
21660	0.03
21720	0.053
21780	0.04
21840	0.24
21900	0.022
21960	0.031
22020	0.061
22080	0.024
22140	0.033
22200	0.044
22260	0.072
22320	0.066
22380	0.039
22440	0.065
22500	0.082
22560	0.097
22620	0.057
22680	0.029
22740	0.036
22800	0.024
22860	0.029
22920	0.036
22980	0.018
23040	0.017
23100	0.017
23160	0.021
23220	0.022
23280	0.022
23340	0.02
23400	0.037
23460	0.028
23520	0.033
23580	0.028
23640	0.016
23700	0.031
23760	0.022
23820	0.051
23880	0.051
23940	0.035
24000	0.031
24060	0.165
24120	0.049
24180	0.042

24240	0.074
24300	0.033
24360	0.055
24420	0.026
24480	0.058
24540	0.022
24600	0.024
24660	0.03
24720	0.08
24780	0.034
24840	0.051
24900	0.057
24960	0.053

Instrument Name	DustTrak II
Model Number	8530
Serial Number	8530141302
Firmware Version	3.5
Calibration Date	8/3/2017
Test Name	MANUAL_006
Test Start Time	9:13:07 AM
Test Start Date	8/15/2017
Test Length [D:H:M]	0:03:33
Test Interval [M:S]	1:00
Mass Average [mg/m3]	0.047
Mass Minimum [mg/m3]	0.036
Mass Maximum [mg/m3]	0.166
Mass TWA [mg/m3]	0.021
Photometric User Cal	1
Flow User Cal	0
Errors	
Number of Samples	213

Elapsed Time [s]	Mass [mg/m3]	Alarms	Errors
60	0.047		
120	0.047		
180	0.047		
240	0.047		
300	0.048		
360	0.048		
420	0.049		
480	0.049		
540	0.049		
600	0.049		
660	0.049		
720	0.05		
780	0.05		
840	0.05		
900	0.051		
960	0.049		
1020	0.1		
1080	0.166		
1140	0.146		
1200	0.074		
1260	0.051		
1320	0.052		
1380	0.069		
1440	0.074		
1500	0.054		
1560	0.048		
1620	0.047		

1680	0.05
1740	0.048
1800	0.049
1860	0.048
1920	0.048
1980	0.048
2040	0.047
2100	0.083
2160	0.053
2220	0.051
2280	0.05
2340	0.05
2400	0.051
2460	0.051
2520	0.053
2580	0.049
2640	0.048
2700	0.049
2760	0.05
2820	0.053
2880	0.054
2940	0.055
3000	0.047
3060	0.047
3120	0.047
3180	0.049
3240	0.047
3300	0.042
3360	0.05
3420	0.052
3480	0.059
3540	0.055
3600	0.049
3660	0.046
3720	0.044
3780	0.042
3840	0.047
3900	0.046
3960	0.044
4020	0.046
4080	0.05
4140	0.052
4200	0.048
4260	0.047
4320	0.042
4380	0.049
4440	0.045

4500	0.049
4560	0.047
4620	0.056
4680	0.056
4740	0.043
4800	0.039
4860	0.041
4920	0.057
4980	0.06
5040	0.07
5100	0.048
5160	0.041
5220	0.078
5280	0.09
5340	0.045
5400	0.044
5460	0.042
5520	0.041
5580	0.045
5640	0.045
5700	0.044
5760	0.044
5820	0.04
5880	0.039
5940	0.042
6000	0.045
6060	0.04
6120	0.039
6180	0.038
6240	0.04
6300	0.038
6360	0.041
6420	0.04
6480	0.039
6540	0.039
6600	0.039
6660	0.04
6720	0.04
6780	0.039
6840	0.04
6900	0.04
6960	0.041
7020	0.039
7080	0.041
7140	0.046
7200	0.044
7260	0.04

7320	0.042
7380	0.056
7440	0.045
7500	0.043
7560	0.042
7620	0.04
7680	0.039
7740	0.037
7800	0.036
7860	0.036
7920	0.037
7980	0.038
8040	0.038
8100	0.038
8160	0.039
8220	0.037
8280	0.042
8340	0.04
8400	0.039
8460	0.041
8520	0.043
8580	0.04
8640	0.044
8700	0.045
8760	0.039
8820	0.045
8880	0.05
8940	0.046
9000	0.046
9060	0.042
9120	0.04
9180	0.038
9240	0.04
9300	0.039
9360	0.039
9420	0.039
9480	0.038
9540	0.052
9600	0.052
9660	0.046
9720	0.041
9780	0.041
9840	0.046
9900	0.043
9960	0.044
10020	0.044
10080	0.045

10140	0.039
10200	0.038
10260	0.04
10320	0.043
10380	0.047
10440	0.044
10500	0.038
10560	0.037
10620	0.038
10680	0.038
10740	0.039
10800	0.037
10860	0.038
10920	0.037
10980	0.037
11040	0.036
11100	0.036
11160	0.037
11220	0.036
11280	0.038
11340	0.038
11400	0.04
11460	0.038
11520	0.039
11580	0.039
11640	0.039
11700	0.039
11760	0.041
11820	0.042
11880	0.043
11940	0.044
12000	0.045
12060	0.046
12120	0.049
12180	0.052
12240	0.049
12300	0.05
12360	0.054
12420	0.057
12480	0.054
12540	0.058
12600	0.055
12660	0.054
12720	0.058
12780	0.057

Instrument Name	DustTrak II
Model Number	8530
Serial Number	8530141302
Firmware Version	3.5
Calibration Date	8/3/2017
Test Name	MANUAL_007
Test Start Time	9:26:09 AM
Test Start Date	8/16/2017
Test Length [D:H:M]	0:05:57
Test Interval [M:S]	1:00
Mass Average [mg/m3]	0.05
Mass Minimum [mg/m3]	0.013
Mass Maximum [mg/m3]	0.517
Mass TWA [mg/m3]	0.037
Photometric User Cal	1
Flow User Cal	0
Errors	
Number of Samples	357

Elapsed Time [s]	Mass [mg/m3]	Alarms	Errors
60	0.05		
120	0.052		
180	0.051		
240	0.044		
300	0.047		
360	0.048		
420	0.046		
480	0.046		
540	0.042		
600	0.043		
660	0.043		
720	0.045		
780	0.045		
840	0.049		
900	0.046		
960	0.046		
1020	0.042		
1080	0.041		
1140	0.042		
1200	0.042		
1260	0.045		
1320	0.044		
1380	0.045		
1440	0.04		
1500	0.043		
1560	0.041		
1620	0.044		

1680	0.047
1740	0.059
1800	0.077
1860	0.045
1920	0.048
1980	0.04
2040	0.042
2100	0.046
2160	0.042
2220	0.041
2280	0.041
2340	0.041
2400	0.042
2460	0.041
2520	0.04
2580	0.042
2640	0.04
2700	0.037
2760	0.043
2820	0.046
2880	0.045
2940	0.04
3000	0.042
3060	0.037
3120	0.035
3180	0.046
3240	0.037
3300	0.045
3360	0.04
3420	0.039
3480	0.041
3540	0.039
3600	0.043
3660	0.058
3720	0.05
3780	0.051
3840	0.162
3900	0.12
3960	0.082
4020	0.053
4080	0.051
4140	0.102
4200	0.04
4260	0.039
4320	0.045
4380	0.04
4440	0.038

4500	0.036
4560	0.037
4620	0.137
4680	0.257
4740	0.324
4800	0.158
4860	0.115
4920	0.142
4980	0.041
5040	0.046
5100	0.052
5160	0.037
5220	0.032
5280	0.029
5340	0.039
5400	0.056
5460	0.029
5520	0.032
5580	0.083
5640	0.182
5700	0.051
5760	0.037
5820	0.032
5880	0.042
5940	0.038
6000	0.036
6060	0.032
6120	0.033
6180	0.028
6240	0.028
6300	0.092
6360	0.115
6420	0.275
6480	0.054
6540	0.037
6600	0.03
6660	0.041
6720	0.026
6780	0.025
6840	0.027
6900	0.029
6960	0.034
7020	0.12
7080	0.033
7140	0.035
7200	0.037
7260	0.028

7320	0.037
7380	0.03
7440	0.025
7500	0.03
7560	0.031
7620	0.025
7680	0.024
7740	0.023
7800	0.026
7860	0.024
7920	0.026
7980	0.023
8040	0.022
8100	0.021
8160	0.022
8220	0.022
8280	0.029
8340	0.031
8400	0.084
8460	0.021
8520	0.019
8580	0.044
8640	0.025
8700	0.047
8760	0.026
8820	0.023
8880	0.02
8940	0.021
9000	0.05
9060	0.05
9120	0.032
9180	0.022
9240	0.02
9300	0.019
9360	0.037
9420	0.022
9480	0.031
9540	0.023
9600	0.042
9660	0.069
9720	0.067
9780	0.024
9840	0.02
9900	0.035
9960	0.019
10020	0.019
10080	0.018

10140	0.019
10200	0.02
10260	0.019
10320	0.019
10380	0.019
10440	0.02
10500	0.019
10560	0.019
10620	0.022
10680	0.023
10740	0.02
10800	0.019
10860	0.019
10920	0.018
10980	0.018
11040	0.017
11100	0.018
11160	0.015
11220	0.092
11280	0.018
11340	0.019
11400	0.018
11460	0.018
11520	0.017
11580	0.016
11640	0.023
11700	0.021
11760	0.053
11820	0.019
11880	0.017
11940	0.015
12000	0.015
12060	0.017
12120	0.017
12180	0.034
12240	0.016
12300	0.07
12360	0.017
12420	0.14
12480	0.309
12540	0.23
12600	0.015
12660	0.158
12720	0.359
12780	0.506
12840	0.272
12900	0.517

12960	0.41
13020	0.286
13080	0.142
13140	0.151
13200	0.166
13260	0.105
13320	0.05
13380	0.019
13440	0.016
13500	0.013
13560	0.013
13620	0.013
13680	0.019
13740	0.025
13800	0.014
13860	0.033
13920	0.099
13980	0.052
14040	0.031
14100	0.032
14160	0.019
14220	0.025
14280	0.018
14340	0.034
14400	0.014
14460	0.027
14520	0.031
14580	0.039
14640	0.035
14700	0.032
14760	0.085
14820	0.157
14880	0.259
14940	0.319
15000	0.425
15060	0.413
15120	0.248
15180	0.058
15240	0.037
15300	0.018
15360	0.038
15420	0.023
15480	0.015
15540	0.014
15600	0.017
15660	0.015
15720	0.017

15780	0.013
15840	0.024
15900	0.018
15960	0.016
16020	0.014
16080	0.013
16140	0.014
16200	0.014
16260	0.015
16320	0.015
16380	0.017
16440	0.015
16500	0.014
16560	0.014
16620	0.034
16680	0.013
16740	0.015
16800	0.015
16860	0.016
16920	0.024
16980	0.041
17040	0.015
17100	0.041
17160	0.021
17220	0.051
17280	0.066
17340	0.018
17400	0.021
17460	0.019
17520	0.024
17580	0.024
17640	0.023
17700	0.016
17760	0.017
17820	0.021
17880	0.021
17940	0.022
18000	0.017
18060	0.024
18120	0.02
18180	0.02
18240	0.021
18300	0.031
18360	0.021
18420	0.017
18480	0.023
18540	0.017

18600	0.023
18660	0.019
18720	0.021
18780	0.018
18840	0.019
18900	0.018
18960	0.019
19020	0.019
19080	0.018
19140	0.023
19200	0.017
19260	0.017
19320	0.018
19380	0.042
19440	0.093
19500	0.041
19560	0.027
19620	0.027
19680	0.022
19740	0.017
19800	0.018
19860	0.016
19920	0.018
19980	0.022
20040	0.017
20100	0.019
20160	0.019
20220	0.037
20280	0.021
20340	0.024
20400	0.021
20460	0.019
20520	0.018
20580	0.022
20640	0.018
20700	0.018
20760	0.018
20820	0.044
20880	0.019
20940	0.018
21000	0.016
21060	0.094
21120	0.027
21180	0.018
21240	0.018
21300	0.018
21360	0.018

21420 0.018

Instrument Name	DustTrak II
Model Number	8530
Serial Number	8530141302
Firmware Version	3.5
Calibration Date	8/3/2017
Test Name	MANUAL_008
Test Start Time	7:26:38 AM
Test Start Date	8/17/2017
Test Length [D:H:M]	0:08:06
Test Interval [M:S]	1:00
Mass Average [mg/m3]	0.059
Mass Minimum [mg/m3]	0.006
Mass Maximum [mg/m3]	0.716
Mass TWA [mg/m3]	0.059
Photometric User Cal	1
Flow User Cal	0
Errors	
Number of Samples	486

Elapsed Time [s]	Mass [mg/m3]	Alarms	Errors
60	0.032		
120	0.028		
180	0.042		
240	0.04		
300	0.035		
360	0.061		
420	0.032		
480	0.029		
540	0.026		
600	0.11		
660	0.159		
720	0.047		
780	0.03		
840	0.032		
900	0.073		
960	0.067		
1020	0.03		
1080	0.025		
1140	0.029		
1200	0.028		
1260	0.027		
1320	0.027		
1380	0.031		
1440	0.034		
1500	0.034		
1560	0.037		
1620	0.032		

1680	0.034
1740	0.051
1800	0.031
1860	0.028
1920	0.033
1980	0.028
2040	0.043
2100	0.061
2160	0.053
2220	0.102
2280	0.095
2340	0.059
2400	0.092
2460	0.239
2520	0.045
2580	0.034
2640	0.042
2700	0.028
2760	0.049
2820	0.037
2880	0.061
2940	0.029
3000	0.034
3060	0.024
3120	0.024
3180	0.023
3240	0.021
3300	0.041
3360	0.064
3420	0.044
3480	0.06
3540	0.027
3600	0.028
3660	0.071
3720	0.047
3780	0.036
3840	0.056
3900	0.039
3960	0.049
4020	0.034
4080	0.067
4140	0.141
4200	0.165
4260	0.051
4320	0.033
4380	0.024
4440	0.054

4500	0.074
4560	0.064
4620	0.117
4680	0.109
4740	0.039
4800	0.131
4860	0.047
4920	0.026
4980	0.066
5040	0.083
5100	0.079
5160	0.172
5220	0.082
5280	0.044
5340	0.041
5400	0.05
5460	0.041
5520	0.03
5580	0.028
5640	0.208
5700	0.155
5760	0.089
5820	0.085
5880	0.066
5940	0.295
6000	0.087
6060	0.04
6120	0.046
6180	0.116
6240	0.044
6300	0.036
6360	0.03
6420	0.044
6480	0.049
6540	0.065
6600	0.03
6660	0.044
6720	0.593
6780	0.058
6840	0.028
6900	0.028
6960	0.023
7020	0.029
7080	0.025
7140	0.023
7200	0.022
7260	0.023

7320	0.026
7380	0.027
7440	0.032
7500	0.025
7560	0.025
7620	0.027
7680	0.035
7740	0.022
7800	0.036
7860	0.021
7920	0.028
7980	0.029
8040	0.225
8100	0.053
8160	0.052
8220	0.059
8280	0.053
8340	0.042
8400	0.028
8460	0.024
8520	0.027
8580	0.031
8640	0.028
8700	0.03
8760	0.082
8820	0.046
8880	0.028
8940	0.021
9000	0.068
9060	0.062
9120	0.032
9180	0.035
9240	0.058
9300	0.036
9360	0.031
9420	0.029
9480	0.036
9540	0.04
9600	0.045
9660	0.034
9720	0.022
9780	0.022
9840	0.024
9900	0.023
9960	0.026
10020	0.024
10080	0.023

10140	0.029
10200	0.025
10260	0.052
10320	0.048
10380	0.03
10440	0.057
10500	0.041
10560	0.512
10620	0.292
10680	0.125
10740	0.071
10800	0.028
10860	0.054
10920	0.037
10980	0.046
11040	0.026
11100	0.044
11160	0.027
11220	0.057
11280	0.058
11340	0.106
11400	0.117
11460	0.035
11520	0.058
11580	0.199
11640	0.053
11700	0.088
11760	0.029
11820	0.142
11880	0.088
11940	0.094
12000	0.031
12060	0.098
12120	0.047
12180	0.035
12240	0.048
12300	0.07
12360	0.045
12420	0.057
12480	0.076
12540	0.031
12600	0.09
12660	0.206
12720	0.205
12780	0.125
12840	0.065
12900	0.484

12960	0.034
13020	0.041
13080	0.129
13140	0.109
13200	0.08
13260	0.054
13320	0.109
13380	0.349
13440	0.18
13500	0.086
13560	0.026
13620	0.038
13680	0.038
13740	0.031
13800	0.024
13860	0.065
13920	0.043
13980	0.027
14040	0.025
14100	0.022
14160	0.023
14220	0.028
14280	0.041
14340	0.037
14400	0.03
14460	0.024
14520	0.026
14580	0.027
14640	0.122
14700	0.141
14760	0.141
14820	0.134
14880	0.032
14940	0.169
15000	0.252
15060	0.119
15120	0.044
15180	0.167
15240	0.041
15300	0.088
15360	0.081
15420	0.045
15480	0.038
15540	0.025
15600	0.031
15660	0.077
15720	0.119

15780	0.273
15840	0.1
15900	0.021
15960	0.034
16020	0.064
16080	0.189
16140	0.241
16200	0.081
16260	0.092
16320	0.124
16380	0.086
16440	0.059
16500	0.176
16560	0.102
16620	0.039
16680	0.06
16740	0.06
16800	0.157
16860	0.026
16920	0.109
16980	0.099
17040	0.036
17100	0.026
17160	0.019
17220	0.016
17280	0.06
17340	0.126
17400	0.024
17460	0.033
17520	0.025
17580	0.033
17640	0.024
17700	0.018
17760	0.02
17820	0.039
17880	0.018
17940	0.038
18000	0.029
18060	0.036
18120	0.019
18180	0.024
18240	0.019
18300	0.021
18360	0.014
18420	0.137
18480	0.035
18540	0.014

18600	0.016
18660	0.018
18720	0.021
18780	0.024
18840	0.022
18900	0.011
18960	0.01
19020	0.011
19080	0.012
19140	0.011
19200	0.011
19260	0.009
19320	0.012
19380	0.022
19440	0.01
19500	0.011
19560	0.008
19620	0.024
19680	0.012
19740	0.009
19800	0.009
19860	0.009
19920	0.016
19980	0.01
20040	0.012
20100	0.011
20160	0.01
20220	0.035
20280	0.012
20340	0.091
20400	0.042
20460	0.044
20520	0.032
20580	0.027
20640	0.026
20700	0.02
20760	0.032
20820	0.07
20880	0.04
20940	0.101
21000	0.014
21060	0.012
21120	0.011
21180	0.025
21240	0.034
21300	0.009
21360	0.008

21420	0.01
21480	0.02
21540	0.007
21600	0.006
21660	0.011
21720	0.022
21780	0.009
21840	0.056
21900	0.049
21960	0.008
22020	0.008
22080	0.013
22140	0.012
22200	0.009
22260	0.012
22320	0.028
22380	0.017
22440	0.016
22500	0.013
22560	0.012
22620	0.009
22680	0.009
22740	0.009
22800	0.02
22860	0.013
22920	0.033
22980	0.065
23040	0.021
23100	0.008
23160	0.008
23220	0.008
23280	0.008
23340	0.009
23400	0.716
23460	0.316
23520	0.117
23580	0.04
23640	0.015
23700	0.031
23760	0.088
23820	0.263
23880	0.101
23940	0.087
24000	0.046
24060	0.076
24120	0.031
24180	0.02

24240	0.041
24300	0.03
24360	0.082
24420	0.068
24480	0.043
24540	0.162
24600	0.124
24660	0.058
24720	0.035
24780	0.037
24840	0.05
24900	0.07
24960	0.108
25020	0.033
25080	0.018
25140	0.02
25200	0.051
25260	0.074
25320	0.035
25380	0.03
25440	0.029
25500	0.045
25560	0.03
25620	0.045
25680	0.018
25740	0.043
25800	0.063
25860	0.134
25920	0.083
25980	0.04
26040	0.018
26100	0.134
26160	0.283
26220	0.106
26280	0.027
26340	0.033
26400	0.031
26460	0.035
26520	0.256
26580	0.117
26640	0.055
26700	0.024
26760	0.098
26820	0.066
26880	0.039
26940	0.352
27000	0.216

27060	0.044
27120	0.066
27180	0.191
27240	0.038
27300	0.034
27360	0.014
27420	0.018
27480	0.037
27540	0.018
27600	0.017
27660	0.017
27720	0.029
27780	0.04
27840	0.035
27900	0.02
27960	0.017
28020	0.06
28080	0.017
28140	0.016
28200	0.018
28260	0.026
28320	0.02
28380	0.014
28440	0.027
28500	0.014
28560	0.018
28620	0.024
28680	0.02
28740	0.038
28800	0.02
28860	0.026
28920	0.022
28980	0.035
29040	0.027
29100	0.012
29160	0.02

Instrument Name	DustTrak II
Model Number	8530
Serial Number	8530141302
Firmware Version	3.5
Calibration Date	8/3/2017
Test Name	MANUAL_009
Test Start Time	8:01:26 AM
Test Start Date	8/18/2017
Test Length [D:H:M]	0:00:18
Test Interval [M:S]	1:00
Mass Average [mg/m3]	0.061
Mass Minimum [mg/m3]	0.033
Mass Maximum [mg/m3]	0.147
Mass TWA [mg/m3]	0.002
Photometric User Cal	1
Flow User Cal	0
Errors	
Number of Samples	18

Elapsed Time [s]	Mass [mg/m3]	Alarms	Errors
60	0.062		
120	0.068		
180	0.072		
240	0.066		
300	0.054		
360	0.047		
420	0.043		
480	0.042		
540	0.04		
600	0.038		
660	0.037		
720	0.034		
780	0.033		
840	0.034		
900	0.109		
960	0.068		
1020	0.147		
1080	0.097		

Instrument Name	DustTrak II
Model Number	8530
Serial Number	8530141302
Firmware Version	3.5
Calibration Date	8/3/2017
Test Name	MANUAL_010
Test Start Time	7:49:29 AM
Test Start Date	8/21/2017
Test Length [D:H:M]	0:05:23
Test Interval [M:S]	1:00
Mass Average [mg/m3]	0.075
Mass Minimum [mg/m3]	0.021
Mass Maximum [mg/m3]	1.21
Mass TWA [mg/m3]	0.05
Photometric User Cal	1
Flow User Cal	0
Errors	
Number of Samples	220

Elapsed Time [s]	Mass [mg/m3]	Alarms	Errors
60	0.276		
120	0.149		
180	0.075		
240	0.079		
300	0.066		
360	0.064		
420	0.067		
480	0.089		
540	0.069		
600	0.066		
660	0.055		
720	0.09		
780	0.07		
840	0.063		
900	0.066		
960	0.072		
1020	0.077		
1080	0.082		
1140	1.21		
1200	0.076		
1260	0.07		
1320	0.069		
1380	0.066		
1440	0.06		
1500	0.06		
1560	0.06		
1620	0.061		

1680	0.068
1740	0.059
1800	0.066
1860	0.063
1920	0.066
1980	0.065
2040	0.072
2100	0.073
2160	0.064
2220	0.061
2280	0.058
2340	0.056
2400	0.055
2460	0.064
2520	0.059
2580	0.061
2640	0.052
2700	0.055
2760	0.055
2820	0.059
2880	0.072
2940	0.075
3000	0.091
3060	0.072
3120	0.06
3180	0.089
3240	0.074
3300	0.057
3360	0.072
3420	0.094
3480	0.065
3540	0.102
3600	0.102
3660	0.07
3720	0.064
3780	0.07
3840	0.08
3900	0.08
3960	0.058
4020	0.056
4080	0.062
4140	0.193
4200	0.119
4260	0.113
4320	0.088
4380	0.101
4440	0.083

4500	0.092
4560	0.111
4620	0.099
4680	0.076
4740	0.065
4800	0.067
4860	0.066
4920	0.075
4980	0.065
5040	0.068
5100	0.07
5160	0.069
5220	0.071
5280	0.072
5340	0.065
5400	0.083
5460	0.067
5520	0.069
5580	0.123
5640	0.091
5700	0.089
5760	0.096
5820	0.065
5880	0.06
5940	0.056
6000	0.085
6060	0.057
6120	0.064
6180	0.058
6240	0.061
6300	0.059
6360	0.058
6420	0.056
6480	0.059
6540	0.061
6600	0.052
6660	0.051
6720	0.063
6780	0.058
6840	0.055
6900	0.058
6960	0.06
7020	0.06
7080	0.056
7140	0.058
7200	0.058
7260	0.055

7320	0.057
7380	0.051
7440	0.08
7500	0.087
7560	0.098
7620	0.109
7680	0.092
7740	0.06
7800	0.058
7860	0.06
7920	0.054
7980	0.057
8040	0.059
8100	0.05
8160	0.059
8220	0.057
8280	0.073
8340	0.109
8400	0.118
8460	0.1
8520	0.126
8580	0.124
8640	0.055
8700	0.166
8760	0.121
8820	0.071
8880	0.06
8940	0.057
9000	0.058
9060	0.059
9120	0.06
9180	0.055
9240	0.052
9300	0.048
9360	0.054
9420	0.056
9480	0.052
9540	0.057
9600	0.05
9660	0.054
9720	0.054
9780	0.063
9840	0.064
9900	0.062
9960	0.065
10020	0.061
10080	0.061

10140	0.069
10200	0.066
10260	0.056
10320	0.072
10380	0.051
10440	0.055
10500	0.052
10560	0.051
10620	0.053
10680	0.061
10740	0.206
10800	0.065
10860	0.056
10920	0.048
10980	0.043
11040	0.036
11100	0.052
11160	0.045
11220	0.119
11280	0.045
11340	0.041
11400	0.045
11460	0.045
11520	0.055
11580	0.046
11640	0.043
11700	0.039
11760	0.06
11820	0.041
11880	0.127
11940	0.077
12000	0.125
12060	0.053
12120	0.046
12180	0.052
12240	0.048
12300	0.062
12360	0.051
12420	0.048
12480	0.045
12540	0.114
12600	0.041
12660	0.058
12720	0.041
12780	0.054
12840	0.04
12900	0.038

12960	0.046
13020	0.045
13080	0.049
13140	0.07
19408	0.021

APPENDIX J

SOIL AND GROUNDWATER ANALYTICAL DATA

(included in separate electronic zip folder)

APPENDIX B.3

BULKHEAD INSPECTION REPORT

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August 8, 2017

NYC Department of Design and Construction
30-30 Thomson Avenue
Long Island City, NY 11101

RE: General Visual Condition Inspection of Bulkhead
Former First Street Turning Basin, Gowanus Canal, Brooklyn NY

To Whom It May Concern,

On Tuesday, May 9, 2017, Moffatt & Nichol (M&N) performed a detailed visual inspection of retaining walls along the eastern shore of the Gowanus Canal at the former First Street Turning Basin (the "Site" and the properties located immediately north and south of the Site. The purpose of the inspection was to assess and rate the condition of the shoreline, providing structural observations of the retaining walls characterize the mudline and document any construction obstructions in support of the design development. The inspection was performed by a diver walking and swimming within a 5 to10-foot proximity from the shoreline. Approximately 350 feet (ft) of the Gowanus Canal bulkhead line was inspected.

Background

The former First Street Turning Basin was originally a waterway offset from the Gowanus Canal used to deliver coal via barges to the former Powerhouse (the existing building to the south). Once the Powerhouse was no longer in operation, the former First Street Turning Basin was filled-in and no longer maintained as an active waterway.

Per the June 2016 Final Remedial Design Work Plan (RDWP), the remedial action for the Site is "excavation and restoration of approximately 475 linear ft of the filled-in former First Street Turning Basin" . The restoration, according to the 2016 RDWP, includes:

- Removal of soil and buried sediment to a presumptive depth of approximately 26 ft below grade at approximately -18 ft (NAVD88).
- Installation of a cap on the exposed surface at the excavation bottom.
- Restoration of three sides of the upland perimeter of the area.
- Restoration of the fourth side of the perimeter such that the former First Street Turning Basin is again open to the Gowanus Canal.

Geosyntec (National Grid's consultant) inventoried and inspected the bulkhead along the shoreline of the former First Street Turning Basin and adjacent properties in 2015. Geosyntec rated the observations based on *C1-C3* and *D* and *F* ratings. Bulkheads rated as *C1* through *C3* are believed to be in excellent to fair condition. Bulkheads rated as a *D* or *F* are considered to be in poor to failed condition and in need of reconstruction.

- Former First Street Turning Basin is classified as approximately 50 ft of earth embankment and was rated *F*.
- 420 Carroll Street, north of the former turning basin, is classified as a 240 ft-long timber crib and was rated *D*.
- 323 3rd Avenue (former Powerhouse property), south of the former turning basin, is classified as a 232 ft-long timber crib with a concrete seawall and was rated *F*.

2017 Inspection Procedures

The inspection was performed by an M&N diver, walking and swimming, within a 5 to 10-foot proximity from the shoreline. The diver observed the existing condition of the various structures as well as identified structural defects, potential construction obstructions, and probed the canal mudline for soil characterization. The structures were given a condition assessment rating based on the New York City Economic Development Corporation (NYCEDC) Inspection Guidelines Manual (refer to Table 1).

TABLE 1 – NEW YORK CITY EDC CONDITION ASSESSMENT RATING CRITERIA

Good	No problems or only minor problems noted. Structural elements may show some very minor deterioration, but no overstressing observed.
Satisfactory	Minor to moderate defects and deterioration observed, but no overstressing observed.
Fair	All primary structural elements are sound; but minor to moderate defects and deterioration observed. Localized areas of moderate to advanced deterioration may be present but do not significantly reduce the load bearing capacity of the structure.
Poor	Advanced deterioration or overstressing observed on widespread portions of the structure, but does not significantly reduce the load carrying capacity of the structure.
Serious	Advanced deterioration, overstressing, or breakage may have significantly affected the load bearing capacity of primary structural elements. Local failures are possible and loading restrictions may be necessary.
Critical	Very advanced deterioration, overstressing, or breakage has resulted in localized failure(s) of primary structural elements. More widespread failures are possible or likely to occur and load restrictions should be implemented as necessary.

Condition Assessment

The inspection consisted of three different structures, the former First Street Turning Basin earth embankment, the 420 Carroll Street timber crib retaining wall located to the north, and the 323 3rd Avenue timber crib retaining wall to the south. The extent of the inspection included 175 ft of the 420 Carroll Street timber crib wall from stations (STAs) 15+75 to 17+30, the full 50 ft of the former First Street Turning Basin from STAs 17+30 to 17+80, and 145 ft of the 323 3rd Avenue retaining wall from STA 17+80 to 19+25. Table 2 documents the three structures, their construction type and start and end stations. Figure 1 indicates the start and end of the inspection.

TABLE 2 – PROJECT SITE SECTION AND STATIONING

Section	Location	Description	Start Station	End Station
A	420 Carroll Street	Timber Crib Wall	15+75	17+30
B	Former First Street Turning Basin	Earth Embankment	17+30	17+80
C	323 3rd Avenue	Timber Crib Wall w/Concrete Seawall	17+80	19+25

FIGURE 1 – INSPECTION TRANSECT

Structural Observations

The earth embankment of the Site is not an engineered slope and appears to have been constructed by placing fill material until it reached its natural angle of repose. The surface is littered with stones, concrete debris, trash and unmaintained vegetation. In general, the embankment appears to be stable and is considered to be in *Fair* condition. Below water, the mudline is soft consisting of a mud and gravel mix. Black particles, which may represent contamination, disperse up to the water surface when the mudline is disturbed. Mudline depth was observed to be shallow, essentially at mean lower low water (MLLW) at the bulkhead line and approximately 4 ft below MLLW approximately 5 ft offshore of the bulkhead line. In comparison, the water depth at the timber crib retaining wall to the south is 5 ft below MLLW at the bulkhead line. No large obstructions were observed below water within the first 5 to 8 ft of the bulkhead line. The earth embankment is shown at two different water elevations in Photo 1 and Photo 2.

PHOTO 1 – FORMER FIRST STREET TURNING BASIN EARTH EMBANKMENT
(LOWER WATER ELEVATION @ 1030 5/9/17)

PHOTO 2 – FORMER FIRST STREET TURNING BASIN EARTH EMBANKMENT
(HIGHER WATER ELEVATION @ 1630 5/9/17)

The timber crib walls at 420 Carroll Street and 323 3rd Avenue are in *Poor* condition overall. At the 420 Carroll Street retaining wall to the north, approximate 50% of the top course of timber beams are missing, allowing for erosion of soil above and behind the wall. The missing timbers are resting on the mudline. The remaining timber elements typically exhibit moderate to severe rot. Where the top course of timber beams are missing, there are voids due to rot on top of the timber beams that are now exposed. The upland building, which is located approximately 7 ft away from the bulkhead, was observed to have undermining, approximately 2 to 3 ft in height and 3 ft deep, exposing the foundation (refer to Photo 3 and Photo 4).

The timber crib retaining wall at 323 3rd Avenue (the Powerhouse) supports a concrete seawall, which has large voids due to erosion and spalls (refer to Photo 5). This area of severe deterioration extends from the southern extent of the former First Street Turning Basin to approximately 50 ft south at STA 18+30. Several missing pieces of concrete were observed along the base of the structure on the mudline. The observed timber crib elements at 323 3rd Avenue are in better condition than the timber crib at 420 Carroll Street. The missing timber members at the top of the 323 3rd Avenue retaining structure do not expose the upland fill as seen at 420 Carroll Street, however does expose the base of the concrete seawall. The remaining timber beams still typically exhibit moderate to severe rot similar to those at 420 Carroll Street. Both retaining wall structures were observed to return into the former First Street Turning Basin and appear to maintain the same type of construction. The retaining walls are only exposed for approximately 10 ft then are buried by the upland fill material (refer to Photo 6 and Photo 7).

PHOTO 3 – 420 CARROLL STREET BUILDING: UNDERMINING AND MISSING TIMBER PLANKS

PHOTO 4 – 420 CARROLL STREET BUILDING: UNDERMINING AND MISSING TIMBER PLANKS

PHOTO 5 – 323 3RD AVENUE: ERODED CONCRETE SEAWALL AND MISSING TIMBER PLANKS

PHOTO 6 – 323 3RD AVENUE: ERODED RETAINING WALL AT SOUTHWESTERN CORNER OF FORMER FIRST STREET TURNING BASIN

PHOTO 7 – 420 CARROLL STREET: DETERIORATED/MISSING RETAINING WALL AT NORTHWESTERN CORNER OF FORMER FIRST STREET TURNING BASIN

Construction Obstructions

Alpine Ocean Seismic Survey performed a hydrographic survey of the Gowanus Canal in the vicinity of the Site on April 27, 2017. The survey identified potential obstructions that could cause difficulties during construction. During the inspection, M&N identified the obstructions as either concrete debris, timber planks, timber piles, tires, rocks, etc. Plumb piles were observed in random locations along the 323 3rd Avenue retaining wall. The location of the plumb piles were not consistent enough to determine if they were part of a previous structure. Table 3 and Figure 2 shows the locations of the debris, the soil characterization and the approximate mudline elevation at the base of the retaining walls and 5 ft from the

wall. The elevations were determined based on estimated water depths and National Oceanic and Atmospheric Administration (NOAA) tidal chart predictions for the Gowanus Canal on May 9, 2017.

The Carroll Street Bridge was used as a permanent structure reference. The bridge timber deck surface was measured in the field at 7.5 ft from waterline to the top of deck at a time of 17:21, resulting in an elevation of approximately 10.5 ft (MLLW).

TABLE 3 – FORMER FIRST STREET TURNING BASIN - GOWANUS CANAL OBSERVATIONS

No.	Station	Obstruction	Soil Characterization	Approx. Mudline Elevation (FT)[1]	
				At Wall	5ft from Wall
1	15+75	Concrete Slab Debris, Trees, Rocks, Timber Planks	Soft	2.8	2.3
2	16+00	Concrete Pieces approx. 2ft from wall	Soft Mud & Gravel	1.3	2.3
3	16+25	Brick Debris at wall	Soft Mud	1.3	2.3
4	16+37.5	Tire Debris approx. 10ft from wall	Soft Mud	-	-
5	16+50	Timber Debris approx. 2ft from wall	Soft Mud & Gravel	0.5	2.3
6	16+75	Two Timbers approx. 6ft from wall Timber approx. 2.5ft from wall	Soft Mud & Gravel	0.6	2.3
7	17+00	Three Timbers approx. 7ft from wall Timber Debris	Soft Mud & Gravel	1.8	2.3
8	17+25	No obstructions observed	Soft Mud & Gravel	1.2	1.7
9	17+50	Earth Embankment	Soft Mud, Gravel, Trash	0.2	4.2
10	17+75	Concrete Debris up to approx. 6ft out	Mud	1.0	4.0
11	17+80	Southwest Wall Corner	-	-	-
12	18+00	Rocks/Concrete Debris approx. 1ft from wall	Soft Mud	4.3	6.3
13	18+25	Small Debris	Soft Mud	8.0	8.0
14	18+50	Concrete Debris	Soft Mud	8.5	9.5
15	18+75	Heavy Timber approx. 3ft from wall	Soft Mud w/RipRap	7.8	8.8
16	19+00	Timber Debris approx. 5ft from wall	Soft Mud	6.0	9.0
17	19+25	Timber Debris approx. 5ft from wall Concrete Debris approx. 2ft from wall	Soft Mud	7.0	9.0

[1] Approximate Mudline Elevation based on NOAA Tides (MLLW)

FIGURE 2 – HYDROGRAPHIC SURVEY WITH ANOMALIES IDENTIFIED

Recommendations

It is understood that the conceptual design is to excavate, dredge, and/or remove soil/fill from the 50 ft wide by 475 ft long (inland) former First Street Turning Basin. The design will try to reuse the existing buried bulkheads supporting 420 Carroll Street and 323 3rd Avenue, if possible. Although the condition of the buried portions of the structures are unknown, at a minimum, the exposed portions of the 420 Carroll Street and 323 3rd Avenue timber crib retaining walls at either end of the former First Street Turning Basin's earth embankment will need to be repaired.

At 420 Carroll Street, the top of the timber crib is approximately 5 ft lower than the top of the concrete wall of the 323 3rd Avenue retaining wall. It is assumed that the project's deck elevation will be similar to the top of the concrete wall at 323 Avenue. In order to achieve a consistent deck elevation, the structure at 420 Carroll Street will need to be raised. Based on its poor condition and low elevation, building on top of or restoring the structure will be difficult. It is likely that the 420 Carroll Street timber crib will need to be selectively demolished and replaced in order to meet the project requirements. It should be noted that the foundation of the upland building (at 420 Carroll Street) is being undermined and that any repairs around this area will need to be carefully monitored.

At 323 3rd Avenue, the concrete wall on top of timber crib is severely deteriorated for a 50 ft long section starting from the earth embankment at STA 17+80 to STA 18+30. The concrete seawall 50 ft south is intact from STA 18+30 to STA 18+80 and likely can remain. The remaining length of the retaining wall beyond STA 18+80 is severely deteriorated but will not affect the earth embankment, so therefore, is not requiring repair. It is recommended that the first 50 ft of the 323 3rd Avenue retaining wall from STA 17+80 to STA 18+30 be repaired and preferably replaced. The risk in repairing the structure in-kind is that any potential surcharge loads at grade elevation could result in overstressing of the deteriorated timber crib elements. If the existing retaining wall is to be re-used, then the concrete seawall should be demolished and replaced and the timber crib reinforced to support the future design live loads.

We sincerely appreciate the opportunity to work with you and please do not hesitate to contact us with any questions.

Respectfully Submitted,

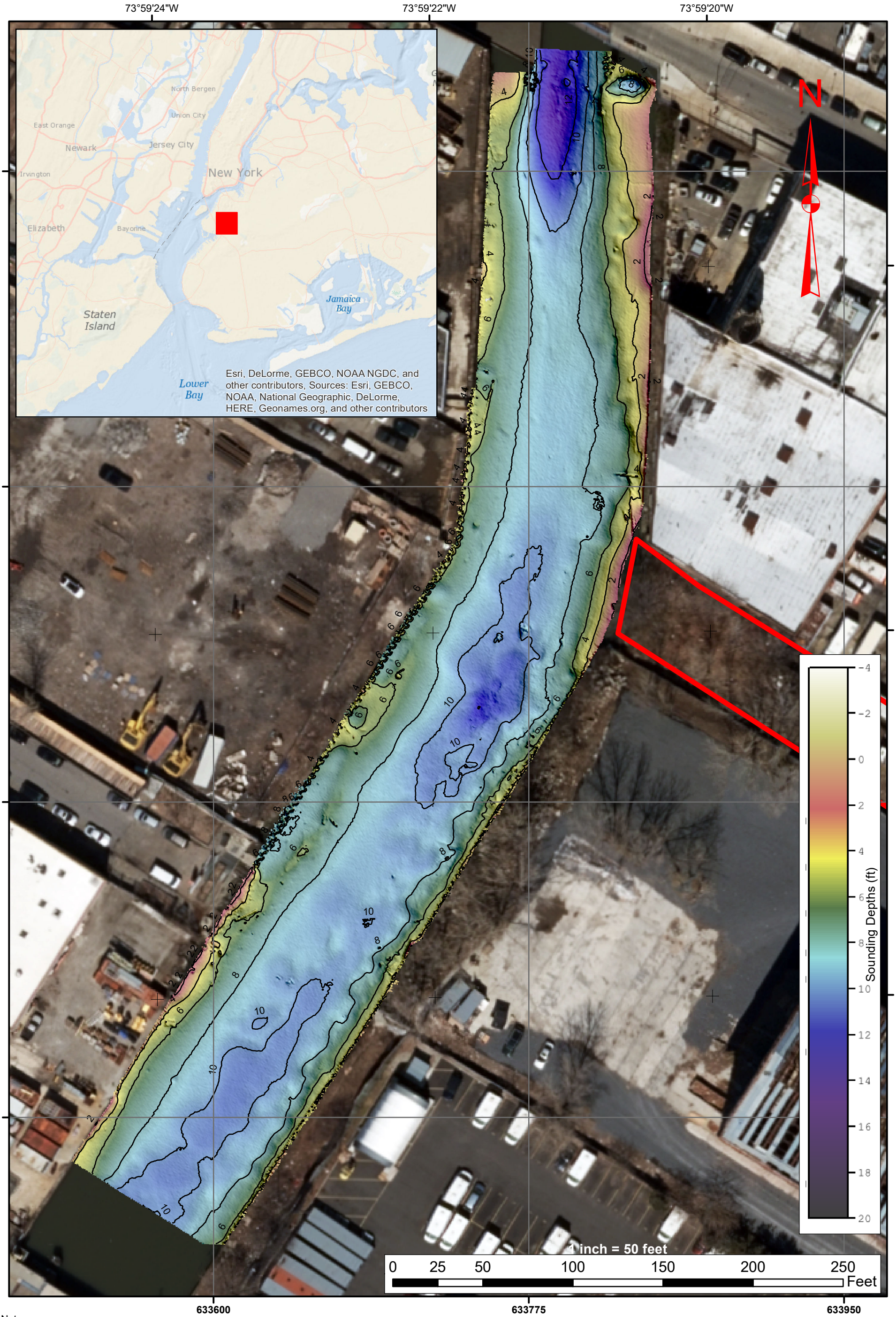
MOFFATT & NICHOL

Joseph S. Choi, PE
Senior Engineer

APPENDIX B.4

TOPOGRAPHIC SURVEY AND SOUNDING SURVEYS

GOWANUS FIRST STREET BATHYMETRY SURVEY



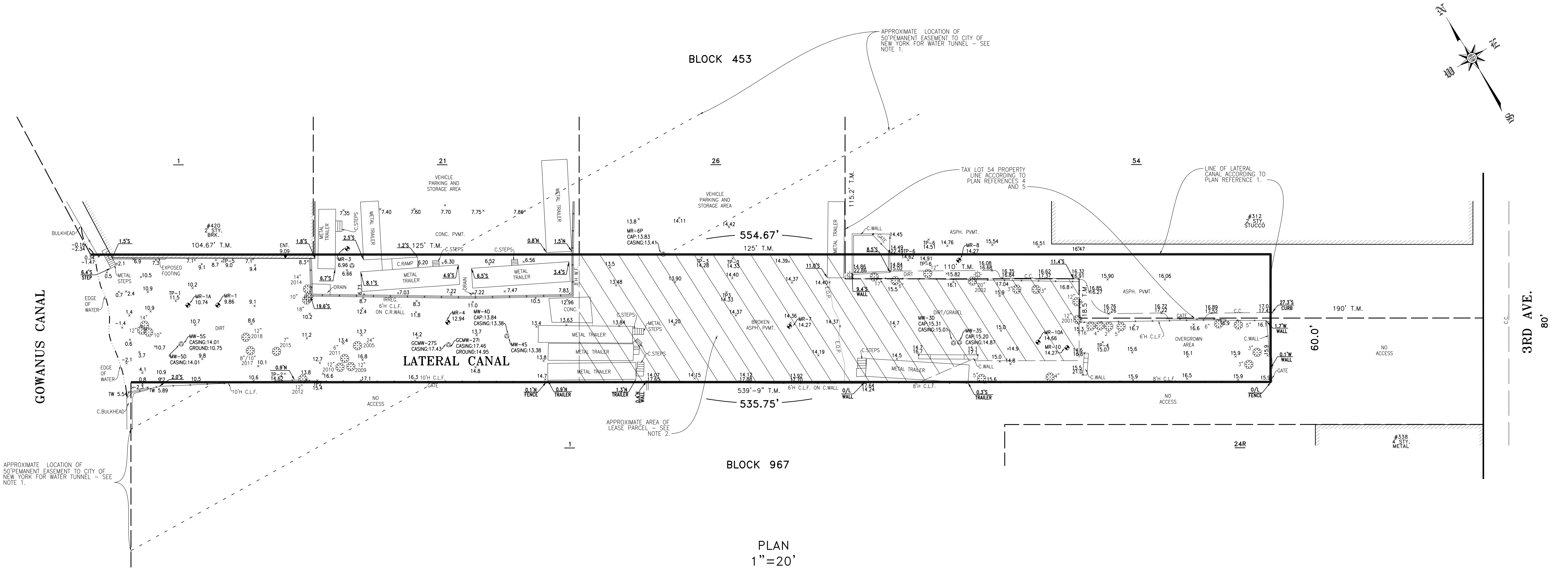
Notes:
1. The bathymetry depicted on this drawing represents the results of a survey performed on April 27, 2017 and can only be considered to indicate the general conditions existing at that time.
2. Survey Data Acquisition Equipment:
   a. Applanix Oceanmaster with Hemisphere S321 GNSS
   b. R2Sonic 2024 MBES System
   c. Sontek Castaway CTD
3. Horizontal Datum: New York East State Plane, NAD 1983, US survey ft
4. Vertical Datum: NAVD 88, ft
5. Background imagery is from AKRF and is for reference only.

Legend

- Bathymetric Contours
- Proposed 1st St turning basin boundary

Alpine
A GARDLINE COMPANY
www.alpineocean.com

AKRF | KSE
The AKRF-KSE JV



PLAN
1"=20'

REFERENCE PLANS

1. PLAN TITLED "GOWANUS CANAL/LATERAL CANAL" DATED 11/21/00 PREPARED FOR BUREAU OF SITE ENGINEERING TOPOGRAPHICAL SECTION (PROVIDED TO BTA BY DDC).
2. ARCHITECTURAL SURVEY OF BLOCK 453, LOTS 1 & 21, DATED 6/13/2016, AMENDED ON 7/7/2016 PERFORMED BY LEONARD J. STRANDBERG AND ASSOCIATES (PROVIDED TO BTA BY AKRF).
3. ARCHITECTURAL SURVEY OF BLOCK 967 LOT 1, DATED FEBRUARY 2, 2013 (SOUTH PROPERTY LINE STAKEOUT FEBRUARY 7, 2017) PERFORMED BY PERFECT POINT LAND SURVEYING RT (PROVIDED TO BTA BY AKRF).
4. FINAL SURVEY OF BLOCK 453 LOT 54, DATED MARCH 11, 2004, REVISED JUNE 18, 2004, PERFORMED BY BARRY M. FAHER (SUPPLIED TO BTA BY BROOKLYN BUILDING DEPARTMENT).
5. ALTA/ACSM LAND TITLE SURVEY BLOCK 353, LOT 54, DATED 3/21/2002, PERFORMED BY JOHN P. FERRANTELLO, PC (SUPPLIED TO BTA BY BROOKLYN BUILDING DEPARTMENT).
6. UNTITLED SURVEY OF BLOCK 967 LOTS 1 AND 50, DATED 8/12/1986, PERFORMED BY ALBERT A. BIANCO (SUPPLIED TO BTA BY BROOKLYN BUILDING DEPARTMENT).
7. SURVEY TITLED "PROPOSED SECURITY WALL, BROOKLYN, NY – BLOCK 967 LOT1" DATED 3/23/1978, PERFORMED BY PIERRE R. FOSS, P.E. (SUPPLIED TO BTA BY BROOKLYN BUILDING DEPARTMENT).

NOTES
1. WATER TUNNEL EASEMENT PLACEMENT PERFORMED BY GRAPHICAL METHODS ONLY – EXACT POSITION HAS NOT BEEN ESTABLISHED.
2. LEASE PARCEL TAKEN FROM REVOCABLE LICENSE AGREEMENT BETWEEN THE CITY OF NEW YORK DEPARTMENT OF CITYWIDE ADMINISTRATIVE SERVICES AND TBD FIVE MANAGEMENT INC, SUPPLIED TO BTA BY DCAS. LIMITS OF LEASE PARCEL ARE NOT WELL DESCRIBED IN THAT DOCUMENT AND MAY BE SUBJECT TO INTERPRETATION.

NOTES

ALL ELEVATIONS SHOWN ON THIS SURVEY REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). TO CONVERT THIS DATUM TO BROOKLYN HIGHWAY DATUM, SUBTRACT 1.460 FEET FROM EACH ELEVATION. ELEVATIONS WERE ESTABLISHED USING A COMBINATION OF REDUNDANT RTK GPS OBSERVATIONS AND DIFFERENTIAL SPIRIT LEVELING.

BEARING SYSTEM IN KEEPING WITH THE NEW YORK STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM 1983 (NAD83)(2011) LONG ISLAND ZONE, EPOCH: 2010, OBTAINED USING REDUNDANT RTK OBSERVATIONS REFERENCING THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION REAL TIME NETWORK.

ALL SUBSURFACE INFORMATION SHOWN IS TAKEN FROM VARIOUS MAPS AND IS NOT GUARANTEED FOR ACCURACY OR COMPLETENESS. CONSULT WITH THE APPROPRIATE UTILITY COMPANY PRIOR TO ANY DESIGN IMPROVEMENTS.

ALL DIMENSIONS SHOWN ARE IN THE U.S. STANDARD OF MEASUREMENT.

ALL ENCROACHMENTS SHOWN TO POLES OR TREES REFER TO THE CENTER OF SAME.

SITE COMPRISES: FIRST STREET TURNING BASIN
AS SHOWN ON THE "TAX MAP" OF THE CITY OF NEW YORK.

FIELD SURVEY COMPLETED: 10/04/2017

"ONLY COPIES FROM THE ORIGINAL OF THIS SURVEY MARKED WITH AN ORIGINAL OF THE LAND SURVEYOR'S BLUE INKED OR EMBOSSED SEAL SHALL BE CONSIDERED TO BE A TRUE VALID COPY"

"UNAUTHORIZED ALTERATIONS OR ADDITION TO A LAND SURVEYING DRAWING BEARING A LICENSED PROFESSIONAL LAND SURVEYOR'S SEAL IS A VIOLATION OF ARTICLE 145, SECTION 7209 PARAGRAPH 2 OF THE NEW YORK STATE EDUCATION LAW"

ALL INFORMATION ON THIS MAP, EXCEPT THAT PERTAINING TO THE PROPERTY LINE, IS FOR REFERENCE ONLY.

THIS IS TO CERTIFY THAT THERE ARE NO VISIBLE STREAMS OR VISIBLE NATURAL WATER COURSES ACROSS THE PROPERTY AS SHOWN ON THIS SURVEY.

LEGEND

EXISTING ELEVATION	16.0 / 16.7 ×
OFFSETS	1.16'N, 1.47'E
BUILDING	
FENCE	×——×——×
CATCHBASIN	
FIRE HYDRANT	LOW PRESSURE / HIGH PRESSURE
VALVE	□W □G □St □?
TREE & TRUNK DIAMETER	24" (TREE) / 10" (EVERGREEN) / (SHRUB)
DEPRESSED CURB	DC
TAX LOT NUMBER	1
TAX LOT LINE & DIMENSION	40.00 T.M.
EASEMENT LINE	- - - - -
STREET LINE & DIMENSION	200.00'
SITE LINE & DIMENSION	100'

SYMBOLS

MANHOLES
- (S) SEWER
- (E) ELECTRIC
- (St) STEAM
- (Su) SUBWAY
- (Mh) MANHOLE (NO ID)
- (S) FROM RECORD MAP
- (W) WATER
- (G) GAS
- (F) N.Y.F.D.
- (T) TELEPHONE
- [E] BECO or CTES
- [C] CABLE TV IRON

- OTS TRAFFIC SIGN
- PARKING METER
- OCC COAL CHUTE
- VENT PIPE
- □F FIRE ALARM BOX
- TRAFFIC CONTROL BOX
- □MM MUNI METER
- □EB ELECTRIC BOX
- OFILL OIL FILL
- MONUMENT
- STANDPIPE
- SPRINKLER
- ROUND DRAIN
- SQUARE DRAIN
- SIGN
- BORING HOLE
- MONITORING WELL
- LINKNYC WIFI

- GUY WIRE
- T TRAFFIC SIGNAL
- PS PEDESTRIAN SIGNAL
- TPS TRAFFIC SIGNAL W/PEDESTRIAN SIGNAL
- WOOD UTILITY POLE
- F WOOD UTILITY POLE W/FIRE ALARM BOX
- PS WOOD UTILITY POLE W/PEDESTRIAN SIGNAL
- T WOOD UTILITY POLE W/TRAFFIC SIGNAL
- TPS WOOD UTILITY POLE W/TRAFFIC SIGNAL & PED. SIGNAL
- WOOD UTILITY POLE W/STREET LIGHT
- F WOOD UTILITY POLE W/STREET LIGHT & FIRE ALARM BOX
- PS WOOD UTILITY POLE W/STREET LIGHT & PEDESTRIAN SIGNAL
- T WOOD UTILITY POLE W/STREET LIGHT & TRAFFIC SIGNAL
- TPS WOOD UTILITY POLE W/STREET LIGHT, TRAF. SIGNAL & PED. SIGNAL
- METAL STREET LIGHT
- PS METAL STREET LIGHT W/PEDESTRIAN SIGNAL
- T METAL STREET LIGHT W/TRAFFIC SIGNAL
- TPS METAL STREET LIGHT W/TRAFFIC SIGNAL & PEDESTRIAN SIGNAL

NYC DDC Department of Design and Construction

PREPARED FOR:
CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION

PREPARED BY:
B. THAYER ASSOCIATES
99 SUNNYSIDE BLVD.
WOODBURY, NY 11797

PW777GOWAN
001 A

FIRST STREET TURNING BASIN
EXCAVATION AND CAPPING
GOWANUS CANAL
BOROUGH OF BROOKLYN

TOPOGRAPHICAL & PROPERTY LINE MAP

DATE 01/18/17 — SCALE 20' 0' 20' 40' — SHEET 1 OF 1

PARTY CHIEF R.E.
COMPUTATION M.B. CHECKED J.Mc.
DRAFTED S.W. CHECKED J.P.
FIELD EDITED

KURT KRAEMER, L.S.
DEPUTY DIRECTOR
OFFICE OF SITE ENGINEERING

OLTON OLIVER, L.S.
DIRECTOR
OFFICE OF SITE ENGINEERING

JEAN M. JEAN-LOUIS
ASSISTANT COMMISSIONER
DIVISION OF PROGRAM MANAGEMENT

NO.	DATE	DESCRIPTIONS	APPR'D
		REVISIONS	

Sheet File: O:\0358.002.00 – Gowanus Canal 1st St Turning Basin\12 Drawings\12E Survey Drawings\SURVEY_DRAWINGS\PL_TOPO.dwg
Date/Time: Jan 18, 2018, 3:38pm

APPENDIX B.5

TREE INVENTORY REPORT

PROJECT ID. PW77GOWAN

PRELIMINARY AND FINAL DESIGN SERVICES FOR EXCAVATION AND CAPPING OF THE FILLED FIRST ST. TURNING BASIN GOWANUS CANAL, BOROUGH OF BROOKLYN

ARBORIST INVENTORY REPORT

SEPTEMBER 2017

PREPARED BY:

B. THAYER ASSOCIATES

TABLE OF CONTENTS

Note: For each item listed above, the following have been provided:

- Tree Photo Log
- NYCDPR Workbook

Arborist Summary

B. Thayer Associates' International Society of Arboriculture (ISA) Certified Arborists conducted a tree inventory for the Preliminary and Final Design Services for the Excavation and Capping of the Filled First Street Turning Basin along the Gowanus Canal in Brooklyn on July 21, 2017. The inventory encompasses the project area measuring 475 feet long and 50 feet wide along the eastern side of the Gowanus Canal directly across from First Street. All trees larger than 3-inch diameter at breast height (DBH) that are expected to be within or adjacent to the project limits were tagged with a Tree Tag ID number and inspected individually at ground level, representing a visual analysis as per ANSI A300 Level 2 standard for tree assessment. The New York City Department of Parks and Recreation (NYCDPR) "Workbook" format was used as a basis for collecting data as part of the tree inventory.

The Workbook data includes the tree's ID number, common name, genus and species, DBH documented with a caliper measuring tool, tree height, crown height, and crown radius documented with a laser distance measurer. Each tree's age class and life expectancy was also documented based on three variables: the typical life expectancy of the species, the DBH, and the structure and health condition. The structure and health condition of tree root systems, tree trunks, scaffold branching, small branches, buds and foliage were assessed on a rated scale of one (1) through four (4); one (1) noting extreme problems, four (4) finding no apparent problems. These ratings were calculated into a total condition rating, with the highest value a thirty-two (32) (see outlined rating system below).

Rating System:	30-32:	Excellent
	25-29:	Good
	17-24:	Fair
	1-16:	Poor
	0:	Dead

The site conditions during the arborist inventory performed on July 21, 2017 was very poor. Immense volumes of debris including vehicles, tractor trailers, tire stockpiles, and miscellaneous garbage seen in the photos below, made it difficult to obtain clear and unobstructed photos of individual trees. Our ISA Certified Arborists performed the initial tree inventory and returned after the site was cleared of debris to reshoot photo documentation.

Each tree was photo documented on September 7, 2017 for inclusion in the Arborist Inventory photo log. The Photo Log documentation consists of each tree's silhouette showing its trunk and crown, the base of each tree trunk, and photos highlighting any problems with the tree, issues, or special observations. These photos were formatted into a template for each tree, specifying the tree's common name, genus and species, the tree location by street name, block and lot number, including the date, time, and weather conditions when the tree was photographed. In addition, the tree's DBH, observations from the tree inventory workbook, and the tree's total condition rating are included in the photo log for reference. The photo log has a space reserved for mitigation case numbers, which will be determined when the technical drawings are prepared by others for the project area. For tree locations, see topographic survey drawings.

Tree Inventory – General Findings

A total of eighteen (18) trees were inventoried inside the project limits of the former First Street Turning Basin. Eastern Cottonwood (*Populus deltoides*) totaling ten (10), was the dominant tree species found on the project area. There were five (5) White Mulberry (*Morus alba*), two (2) Black Locust (*Robinia pseudoacacia*), and one (1) Tree of Heaven (*Ailanthus altissima*).

Overall, the trees assessed within the project limits are common volunteer species that can grow in poor site conditions. The conditions ratings of each tree concluded that five (5) trees are in good condition, eight (8) trees are in fair condition, and five (5) trees are in poor condition.

Tree: ***Populus deltoides***	Street: **N/A**	Station Offset:	Tree No. **2001**
Name: **COTTONWOOD, EASTERN**	Block No.: **N/A**		
Caliper (DBH): **11,9.5**	Lot No.: **N/A**		
Comments: **Debris piled around root collar; growing against chain link fence** Condition: **GOOD**		Date: **9/7/2017** Time: **--:--** Weather: **Sunny** Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Root collar

Populus deltoides COTTONWOOD, EASTERN

Tree: ***Robinia pseudoacacia***	Street: **N/A**	Station Offset:	Tree No. **2002**
Name: **BLACK LOCUST**	Block No.: **N/A**		
Caliper (DBH): **17**	Lot No.: **N/A**		
Comments: **Debris piled around root collar; growing against chain link fence; codominant leaders; included bark** Condition: **GOOD**		Date: **9/7/2017** Time: **--:--** Weather: **Sunny** Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Included bark at trunk union

Root collar

Robinia pseudoacacia BLACK LOCUST

Tree: ***Robinia pseudoacacia***	Street: **N/A**	Station Offset:	Tree No. **2003**
Name: **BLACK LOCUST**	Block No.: **N/A**		
Caliper (DBH): **6,3**	Lot No.: **N/A**		
Comments: **Growing between chain link fence and vehicle; minor trunk lean; root suckers at base** Condition: **GOOD**		Date: **9/7/2017** Time: **--:--** Weather: **Sunny** Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Growing between fence and vehicle

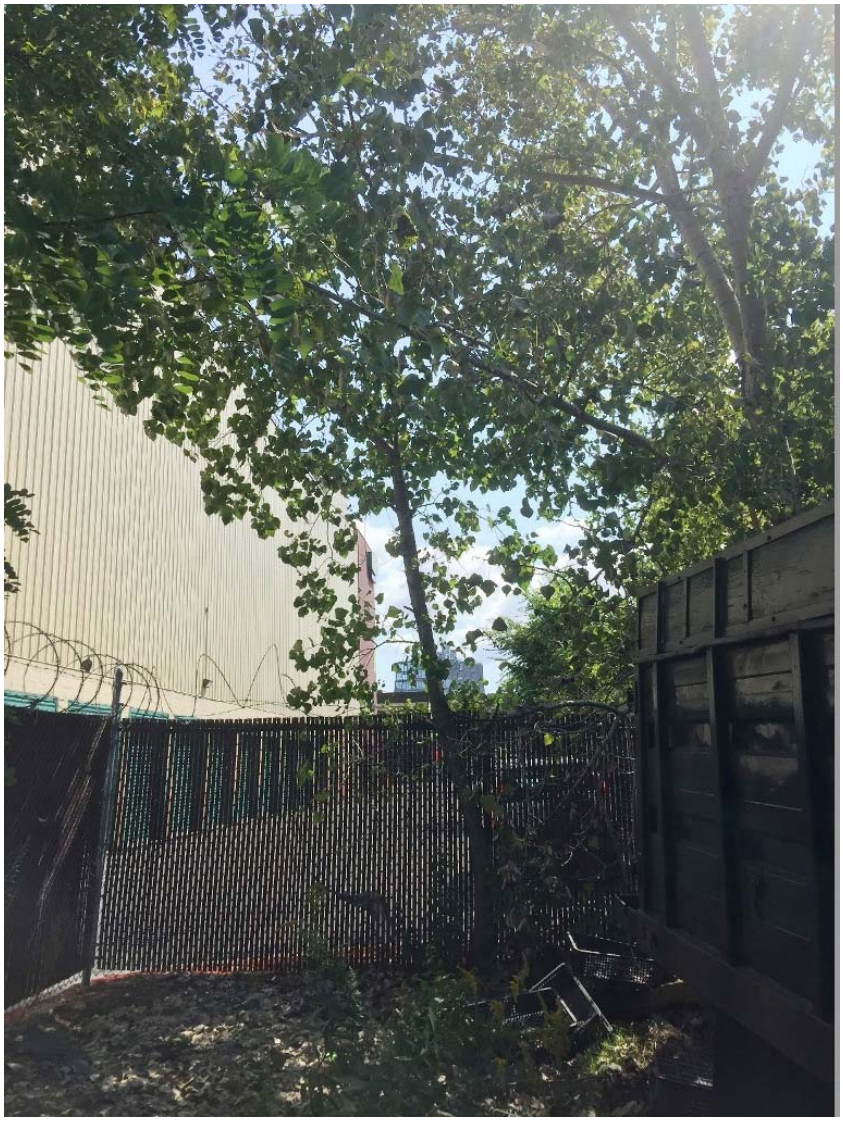
Robinia pseudoacacia BLACK LOCUST

Tree: ***Populus deltoides***	Street: **N/A**	Station Offset:	Tree No. **2004**
Name: **COTTONWOOD, EASTERN**	Block No.: **N/A**		
Caliper (DBH): **5**	Lot No.: **N/A**		
Comments: **Growing against chain link fence; thin crown; minor dead branches** Condition: **GOOD**		Date: **9/7/2017** Time: **--:--** Weather: **Sunny** Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Minor dead branches

Root collar



Populus deltoides COTTONWOOD, EASTERN

Tree: ***Populus deltoides***	Street: **N/A**	Station Offset:	Tree No. **2005**
Name: **COTTONWOOD, EASTERN**	Block No.: **N/A**		
Caliper (DBH): **22**	Lot No.: **N/A**		
Comments: **Growing through the center of a tire; basal damage; codominant leaders; dead lower branches; thin crown** Condition: **FAIR**		Date: **9/7/2017** Time: **--:--** Weather: **Sunny** Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Dead branches

Root collar

Populus deltoides COTTONWOOD, EASTERN

Tree: ***Morus alba***	Street: **N/A**	Station Offset:	Tree No. **2008**
Name: **MULBERRY, WHITE**	Block No.: **N/A**		
Caliper (DBH): **7**	Lot No.: **N/A**		
Comments: **Debris around root collar; growing into chain link fence; dead branches** Condition: **FAIR**		Date: **9/7/2017** Time: **--:--** Weather: **Sunny** Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Dead branches

Root collar

Morus alba MULBERRY, WHITE

Tree: ***Populus deltoides***	Street: **N/A**	Station Offset:	Tree No. **2009**
Name: **COTTONWOOD, EASTERN**	Block No.: **N/A**		
Caliper (DBH): **10**	Lot No.: **N/A**		
Comments: **Basal damage; major dead branches; thin crown** Condition: **FAIR**		Date: **9/7/2017** Time: **--:--** Weather: **Sunny** Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Dead branches

Root collar

Populus deltoides COTTONWOOD, EASTERN

Tree: ***Populus deltoides***	Street: **N/A**	Station Offset:	Tree No. **2010**
Name: **COTTONWOOD, EASTERN**	Block No.: **N/A**		
Caliper (DBH): **10**	Lot No.: **N/A**		
Comments: **Dead branches; thin crown**		Date: **9/7/2017**	
		Time: **--:--**	
		Weather: **Sunny**	
Condition: **GOOD**		Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Root collar

Populus deltoides COTTONWOOD, EASTERN

Tree: ***Populus deltoides***	Street: **N/A**	Station Offset:	Tree No. **2011**
Name: **COTTONWOOD, EASTERN**	Block No.: **N/A**		
Caliper (DBH): **6**	Lot No.: **N/A**		
Comments: **Minor vertical cracking on trunk; major dead branches; thin crown**		Date: **9/7/2017**	
		Time: **--:--**	
		Weather: **Sunny**	
Condition: **FAIR**		Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Major dead branches

Root collar

Populus deltoides COTTONWOOD, EASTERN

Tree: ***Populus deltoides***	Street: **N/A**	Station Offset:	Tree No. **2012**
Name: **COTTONWOOD, EASTERN**	Block No.: **N/A**		
Caliper (DBH): **9**	Lot No.: **N/A**		
Comments: **Buried root collar; growing against chain link fence; dead branches; thin crown**		Date: **9/7/2017**	
		Time: **--:--**	
		Weather: **Sunny**	
Condition: **FAIR**		Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Thin crown

Buried root collar

Populus deltoides COTTONWOOD, EASTERN

Tree: ***Morus alba***	Street: **N/A**	Station Offset:	Tree No. **2013**
Name: **MULBERRY, WHITE**	Block No.: **N/A**		
Caliper (DBH): **10,5**	Lot No.: **N/A**		
Comments: **Debris around root collar; multistem; fusing with chain link fence; dead branches** Condition: **FAIR**		Date: **9/7/2017** Time: **--:--** Weather: **Sunny** Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Fusing with chain link fence

Root collar

Morus alba MULBERRY, WHITE

Tree: ***Morus alba***	Street: **N/A**	Station Offset:	Tree No. **2014**
Name: **MULBERRY, WHITE**	Block No.: **N/A**		
Caliper (DBH): **9**	Lot No.: **N/A**		
Comments: **Debris around root collar; dead branches; poor structure** Condition: **FAIR**		Date: **9/7/2017** Time: **--:--** Weather: **Sunny** Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Dead branches

Root collar

Morus alba MULBERRY, WHITE

Tree: ***Populus deltoides***	Street: **N/A**	Station Offset:	Tree No. **2015**
Name: **COTTONWOOD, EASTERN**	Block No.: **N/A**		
Caliper (DBH): **7**	Lot No.: **N/A**		
Comments: **Major dead branches; poor foliage** Condition: **POOR**		Date: **9/7/2017** Time: **--:--** Weather: **Sunny** Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

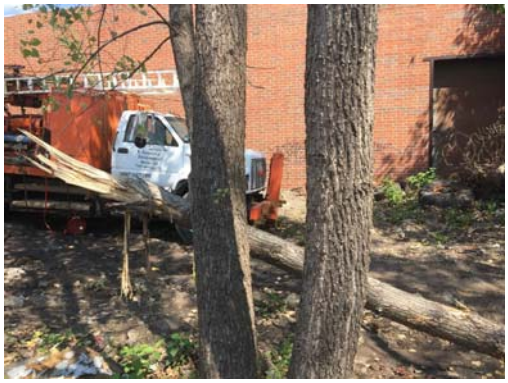
Dead branches

Root collar

Populus deltoides COTTONWOOD, EASTERN

Tree: ***Populus deltoides***	Street: **N/A**	Station Offset:	Tree No. **2017**
Name: **COTTONWOOD, EASTERN**	Block No.: **N/A**		
Caliper (DBH): **7,6**	Lot No.: **N/A**		
Comments: **Multistem; buried root collar; dead branches; thin crown** Condition: **FAIR**		Date: **9/7/2017** Time: **--:--** Weather: **Sunny** Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS



Multistem

Buried root collar

Populus deltoides COTTONWOOD, EASTERN

Tree: ***Populus deltoides***	Street: **N/A**	Station Offset:	Tree No. **2018**
Name: **COTTONWOOD, EASTERN**	Block No.: **N/A**		
Caliper (DBH): **10**	Lot No.: **N/A**		
Comments: **Trunk damage; dead lower branches** Condition: **FAIR**		Date: **9/7/2017** Time: **--:--** Weather: **Sunny** Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Trunk damage

Root collar

Populus deltoides COTTONWOOD, EASTERN

Tree: ***Ailanthus altissima***	Street: **N/A**	Station Offset:	Tree No. **2021**
Name: **TREE OF HEAVEN**	Block No.: **N/A**		
Caliper (DBH): **7**	Lot No.: **N/A**		
Comments: **Exposed roots; minor trunk damage; dead branches** Condition: **POOR**		Date: **9/7/2017** Time: **--:--** Weather: **Sunny** Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Dead branches

Root collar

Ailanthus altissima TREE OF HEAVEN

Tree: ***Morus alba***	Street: **N/A**	Station Offset:	Tree No. **2022**
Name: **MULBERRY, WHITE**	Block No.: **N/A**		
Caliper (DBH): **8,6,5**	Lot No.: **N/A**		
Comments: **Growing at the edge of the property on a steep ledge; major dead branches**		Date: **9/7/2017**	
		Time: **--:--**	
		Weather: **Sunny**	
Condition: **POOR**		Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Dead branches

Root collar on ledge

Morus alba MULBERRY, WHITE

Tree: ***Morus alba***	Street: **N/A**	Station Offset:	Tree No. **2023**
Name: **MULBERRY, WHITE**	Block No.: **N/A**		
Caliper (DBH): **9,6**	Lot No.: **N/A**		
Comments: **Growing at the edge of the property on a steep ledge**		Date: **9/7/2017**	
		Time: **--:--**	
		Weather: **Sunny**	
Condition: **POOR**		Temp: **88°F**	
Mitigation Case #:		Location: **See survey**	

PHOTOS

Dead branches

Root collar on ledge

Morus alba MULBERRY, WHITE

City of New York Parks & Recreation

B. THAYER ASSOCIATES

Prepared By: DM, MP
Date: 7/21/2017

PROJ NAME	Excavation and Capping of the Filled First Street Turning Basin Gowanus Canal						PRUNING										CONDITION											
PROJ #	PW77GOWAN						ANSI A-300										ROOTS			TRUNK			SCAFFOLD BRANCHES					
TREE #	SPECIES	D.B.H. (INCHES)	TOTAL TREE HEIGHT (FT)	CROWN HEIGHT (FT)	CROWN WIDTH (FT DIAM.)	AGE CLASS Y-<20% M-20-80% OM->80% of Life Expectancy	Cleaning	Raising	Reducing	Restoring	Structural	Thinning	Limb Tying	REMOVAL (condition)	REMOVAL (design)	REMOVAL (stump only)	TRANSPLANT	Structure (1-4)	Health (1-4)	Subtotal (2-8)	Structure (1-4)	Health (1-4)	Subtotal (2-8)	Structure (1-4)	Health (1-4)	Subtotal (2-8)	SMALL BRANCHES (1-4)	BUDS & FOLIAGE (1-4)	SUBTOTAL (32)	COMMENTS
2001	COTTONWOOD, EASTERN	11,9.5	40	30	32	M												3	3	6	4	3	7	4	4	8	4	4	29	Debris piled around root collar; growing against chain link fence
2002	BLACK LOCUST	17	35	25	40	M												4	3	7	3	3	6	4	4	8	3	4	28	Debris piled around root collar; growing against chain link fence; codominant leaders; included bark
2003	BLACK LOCUST	6,3	27	20	25	M												4	3	7	4	3	7	4	4	8	3	4	29	Growing between chain link fence and vehicle; minor trunk lean; root suckers at base
2004	COTTONWOOD, EASTERN	5	23	19	12	Y												4	3	7	4	4	8	4	3	7	3	3	28	Growing against chain link fence; thin crown; minor dead branches
2005	COTTONWOOD, EASTERN	22	45	35	47	M												3	2	5	3	3	6	3	3	6	3	3	23	Growing through the center of a tire; basal damage; codominant leaders; dead lower branches; thin crown
2008	MULBERRY, WHITE	7	22	17	18	M												2	3	5	3	3	6	2	3	5	2	3	21	Debris around root collar; growing into chain link fence; dead branches
2009	COTTONWOOD, EASTERN	10	45	35	36	M												4	3	7	3	3	6	3	3	6	2	2	23	Basal damage; major dead branches; thin crown
2010	COTTONWOOD, EASTERN	10	40	30	32	M												4	3	7	4	3	7	3	3	6	2	3	25	Dead branches; thin crown
2011	COTTONWOOD, EASTERN	6	37	25	30	M												3	4	7	3	4	7	2	2	4	3	2	23	Minor vertical cracking on trunk; major dead branches; thin crown
2012	COTTONWOOD, EASTERN	9	38	30	19	M												2	2	4	4	3	7	3	2	5	3	2	21	Buried root collar; growing against chain link fence; dead branches; thin crown
2013	MULBERRY, WHITE	10,5	28	22	26	M												3	3	6	3	3	6	2	2	4	3	3	22	Debris around root collar; multistem; fusing with chain link fence; dead branches
2014	MULBERRY, WHITE	9	30	26	20	M												3	3	6	3	3	6	2	2	4	2	2	20	Debris around root collar; dead branches; poor structure
2015	COTTONWOOD, EASTERN	7	36	16	12	M												3	3	6	2	2	4	1	1	2	1	1	14	Major dead branches; poor foliage
2017	COTTONWOOD, EASTERN	7,6	38	10	15	M												4	3	7	3	3	6	2	2	4	3	2	22	Multistem; buried root collar; dead branches; thin crown
2018	COTTONWOOD, EASTERN	10	37	22	9	M												4	3	7	3	3	6	3	3	6	3	2	24	Trunk damage; dead lower branches
2021	TREE OF HEAVEN	7	36	26	18	M												2	2	4	2	2	4	2	2	4	2	1	15	Exposed roots; minor trunk damage; dead branches
2022	MULBERRY, WHITE	8,6,5	18	16	28	M												1	2	3	2	2	4	2	2	4	2	2	15	Growing at the edge of the property on a steep ledge; major dead branches
2023	MULBERRY, WHITE	9,6	20	18	38	M												1	2	3	2	2	4	2	2	4	2	2	15	Growing at the edge of the property on a steep ledge

CONDITION RATINGS: 4 - No Apparent Problems 3 - Minor Problems 2 - Major Problems 1 - Extreme Problems

APPENDIX B.6

ADJACENT BUILDING RESEARCH AND INSPECTION REPORTS

BUILDING RESEARCH SUMMARY
ADJACENT BUILDINGS AND STRUCTURES RESEARCH AND INSPECTION

PROJECT ID: PW77GOWAN
EXCAVATION & CAPPING OF FILLED
FIRST STREET TURNING BASIN, GOWANUS CANAL
BROOKLYN, NEW YORK

AKRF – KSE Joint Venture
440 Park Ave South, 7th Floor
New York , NY 10016

Mueser Rutledge Consulting Engineers
14 Penn Plaza, 225 West 34th Street
New York, New York 10122

September 14, 2017

MRCE
built on firm foundations

PARTNERS
Peter W. Deming
Roderic A. Ellman, Jr.
Francis J. Arland
David R. Good
Walter E. Kaeck

ASSOCIATE PARTNERS
Tony D. Canale
Jan Cermak
Sitotaw Y. Fantaye

SENIOR ASSOCIATES
Domenic D'Argenzio
Robert K. Radske
Ketan H. Trivedi
Hiren J. Shah
Alice Arana
Joel L. Volterra
Frederick C. Rhyner
Steven R. Lowe
Andrew R. Tognon
Gregg V. Piazza
James M. Tantalla
T. C. Michael Law

ASSOCIATES
Douglas W. Christie
Andrew Pontecorvo
Renzo D. Verastegui
Alex Krutovskiy
Srinivas Yenamandra
Farid Vastani
Jesse L. Richins
Jong W. Choi
Raj S. Chinthamani
Andrew R. Klaetsch
Peter L. Madarasz

TECHNICAL SPECIALISTS
David M. Cacoilo
Alfred H. Brand
James L. Kaufman
Hugh S. Lacy
Joel Moskowitz
George J. Tamaro
Elmer A. Richards

FINANCE DIRECTOR
Joseph N. Courtade

MARKETING DIRECTOR
Martha J. Huguet

September 14, 2017

AKRF – KSE Joint Venture
440 Park Ave South, 7th Floor
New York, NY 10016

Re: Building Research Summary
Task: Adjacent Buildings and Structures Research and Inspection

Project ID: PW77GOWAN
Excavation & Capping of Filled First Street
Turning Basin, Gowanus Canal
Brooklyn, New York
MRCE File #12541

To Whom It May Concern:

Mueser Rutledge Consulting Engineers (MRCE) has completed a search of New York City (NYC) records and archives for information on the properties adjacent to the proposed construction at the First Street Turning Basin located along the Gowanus Canal in Brooklyn, New York (Site). The Site is bounded by the Gowanus Canal on the west, adjacent properties along Carroll Street to the north, adjacent properties along Third Avenue to the east, and adjacent properties along the paper street Second Street to the south. MRCE researched the NYC Department of Buildings (DOB) on-line database and their hardcopy archives, the Topographic Bureau of the Brooklyn Borough President's Office, and the New York Public Library.

The building research was performed in accordance with the United States Environmental Protection Agency (EPA)-approved 30% Field Activity Plan for Adjacent Buildings and Structures Research and Inspection dated June 2017.

EXHIBITS

Number	*Name*
SK-1	Site Location Plan
Table 1	List of Documents by Block and Lot
Section A	Block 453, Lot 1 - 420 Carroll Street
Section B	Block 453, Lot 21 - 430 Carroll Street
Section C	Block 453, Lot 54 - 312 & 318 Third Avenue
Section D	Block 967, Lot 1 - 175 Second Street
Section E	Block 967, Lot 24 - 338 Third Avenue
Section F	Documentation from Brooklyn Borough President's Office: Commissioners' Sheets & Final Sections

BUILDING SUMMARIES

Block 453, Lot 1, 420 Carroll Street: This is a masonry building being used as a warehouse. There are two sections, a three-story section along the frontage of Carroll Street, and a one-story section at the rear of the building which extends to within approximately 30 feet of the north bulkhead line of the former First Street Turning Basin. The western property line is coincident with the Gowanus Canal.

Block 453, Lot 21, 430 Carroll Street: This approximately 7,600-square foot masonry building is one story and lies beyond the 100-foot construction influence radius. There is a parking lot along the north bulkhead line of the former First Street Turning Basin. This building was not targeted for a pre-construction condition survey due to being beyond the 100-foot construction influence radius established for the project.

Block 453, Lot 54, 312 & 318 Third Avenue: Extra Space Storage is the current occupant of this four-story, concrete-framed, pile-supported warehouse building. The south façade of 312 Third Avenue is approximately 30 feet north of the north bulkhead line of the former First Street Turning Basin.

Block 967, Lot 1, 175 Second Street: This is the lot containing the remains of the former Brooklyn Rapid Transit Powerhouse. Currently, most of the roof does not remain and the masonry, one-story building is generally in disrepair. This building was not targeted for a pre-construction condition survey as it is beyond the established 100-foot construction influence radius.

Block 967, Lot 24, 338 Third Avenue: This building is a storage facility operated by Cube Smart. It is a four-story, masonry and concrete structure with several prefabricated structures to the rear.

All documentation found regarding structural details, foundations, grades, and certificates of occupancy for the Blocks and Lots listed above is included in the respective Exhibits. We were informed by the Topographic Bureau of the Brooklyn Borough President's Office that some documentation normally retained by their office had been accidentally destroyed. Additionally, MRCE was unable to determine whether or not grade waivers were issued.

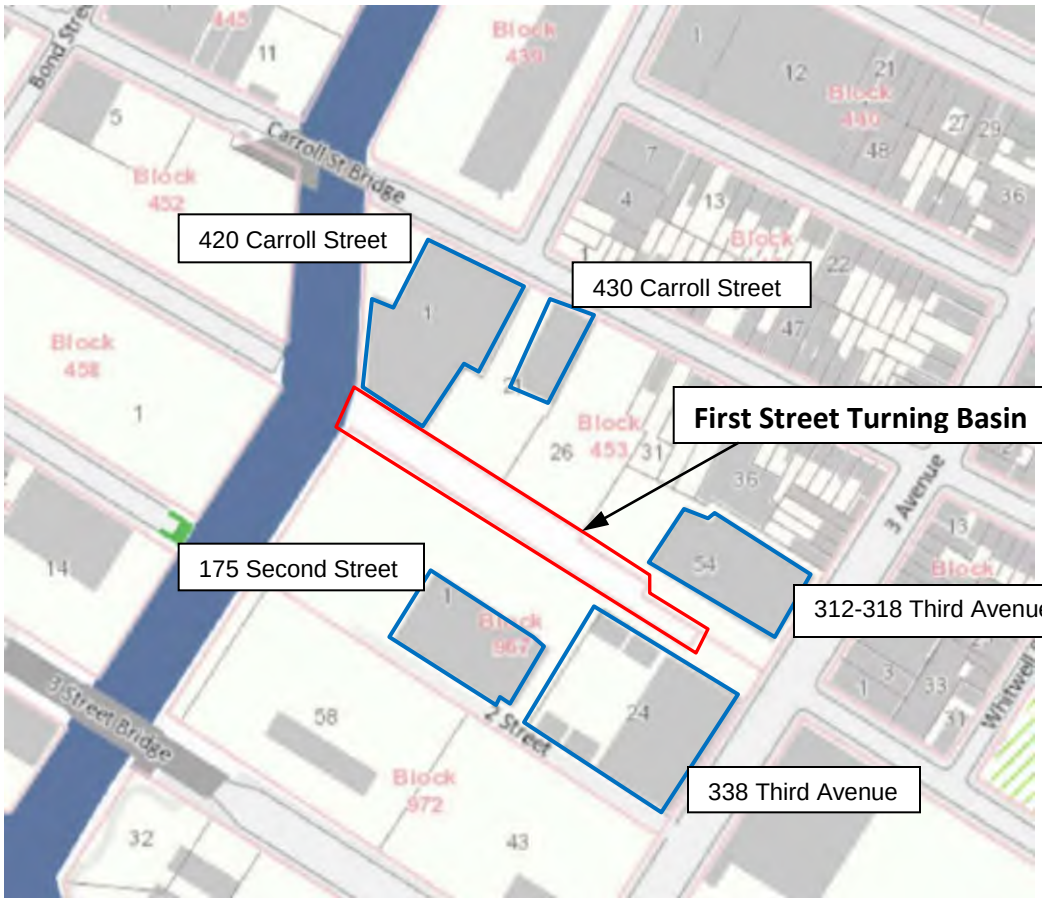
Very truly yours,
MUESER RUTLEDGE CONSULTING ENGINEERS

Sarah O. H. Johnson, PE

Domenic D'Argenzio, PE

SOHJ:DD F:\125\12541 - First St Turning Basin\BuildingsResearch\Report\Text.docx

EXHIBITS



Base plan from www.oasisnyc.net, April 27, 2017.

CAPITAL PROJECT PW77GOWAN
EXCAVATION & CAPPING OF FILLED FIRST STREET TURNING BASIN
BROOKLYN NEW YORK

NYC DEPT OF DESIGN & CONSTRUCTION
LONG ISLAND CITY NEW YORK

MUESER RUTLEDGE CONSULTING ENGINEERS
225 WEST 34TH STREET, NEW YORK, NY 10122

SCALE	MADE BY: SOHJ DATE: 04-27-17	FILE NO.
NA	CH'KD BY: DD DATE: 04-27-17	12541

SITE LOCATION PLAN PLATE NO. **SK-1**

Table 1
List of Documents By Block and Lot

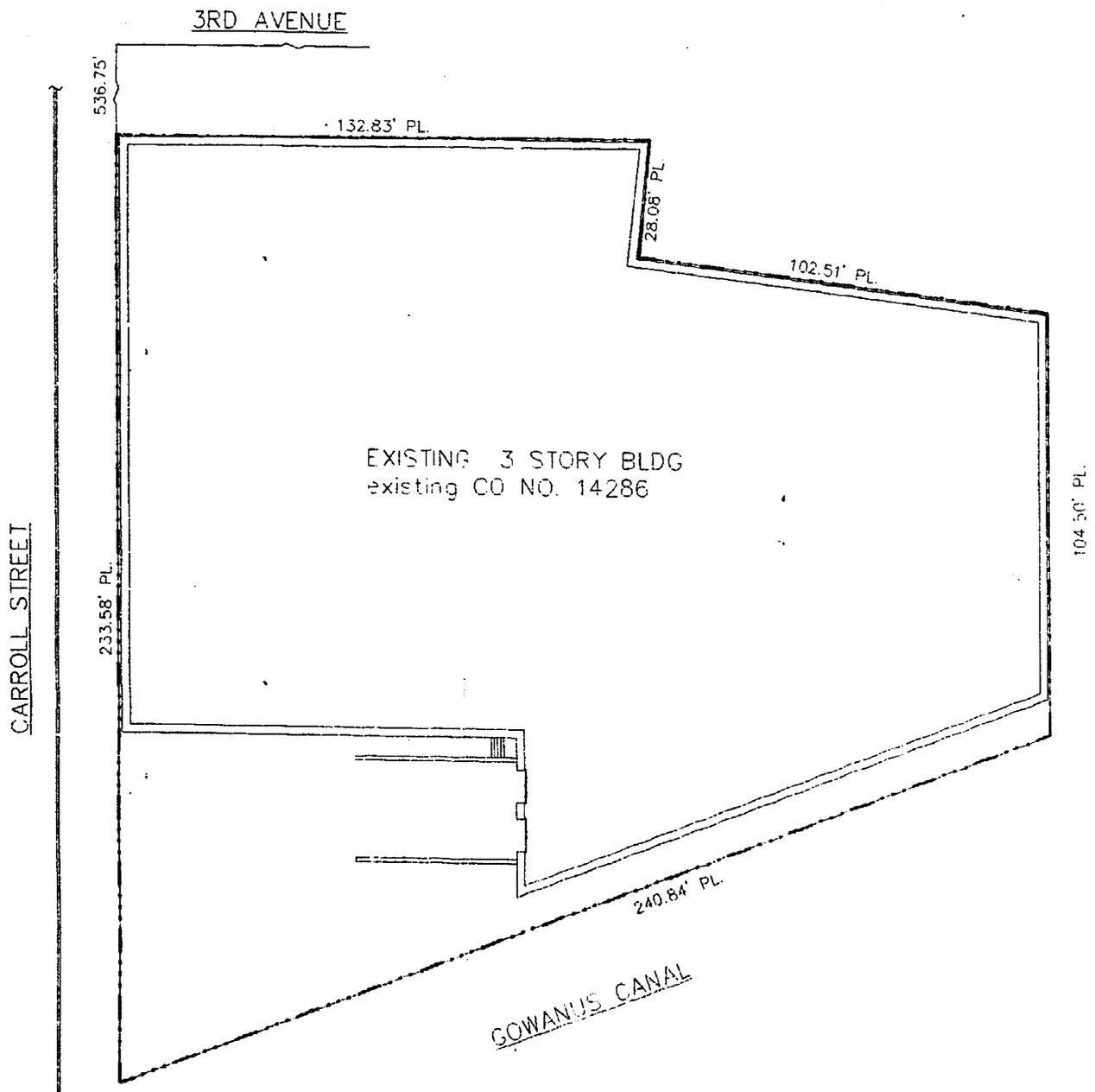
Address	Block	Lot	Number/Title	Date	Source	Drawing Description
420 Carroll Street	B453	L1	A-4: Third Floor Plan	11/3/2000	Sheldon L. Reich, P.C.	Third Floor Plan
420 Carroll Street	B453	L1	A-1: Site Plan	11/3/2000	Sheldon L. Reich, P.C.	Site and Location Plan
420 Carroll Street	B453	L1	A-2: First Floor Plan	11/3/2000	Sheldon L. Reich, P.C.	First Floor Plan
420 Carroll Street	B453	L1	A-3: Second Floor Plan	11/3/2000	Sheldon L. Reich, P.C.	Second Floor Plan
420-426 Carroll Street	B453	L1	Certificate of Occupancy	11/28/1923	Office of the Pres. Of the Borough of Bklyn.	
408/428 Carroll Street	B453	L1	Certificate of Occupancy	7/26/1937	Office of the Pres. Of the Borough of Bklyn.	
420 Carroll Street	B453	L1	Certificate of Occupancy	2/28/1992	City of New York Department of Buildings	
430 Carroll Street	B453	L21	A-1	N/A	Louis R Collalillo	Zoning Computation and Site Plan
430 Carroll Street	B453	L21	Certificate of Occupancy	8/15/1946	Department of Housing and Buildings	
430/440 Carroll Street	B453	L21	Certificate of Occupancy	--/--/1948	Department of Housing and Buildings	
430/440 Carroll Street	B453	L21	Certificate of Occupancy	6/5/1951	Department of Housing and Buildings	
430 Carroll Street	B453	L21	Certificate of Occupancy	3/28/1993	City of New York Department of Buildings	
318 3rd Avenue	B453	L54	A-1.1: Cellar Plan	1/12/2002	NF Designs, Architects and planners	Cellar Plan
318 3rd Avenue	B453	L54	A-1.2: 1st Floor Plan	1/12/2002	NF Designs, Architects and planners	First Floor Plan
318 3rd Avenue	B453	L54	A-1.3: 2nd Floor Plan	1/12/2002	NF Designs, Architects and planners	Second Floor Plan
318 3rd Avenue	B453	L54	A-1.4: 3rd Floor Plan	1/12/2002	NF Designs, Architects and planners	Third Floor Plan
318 3rd Avenue	B453	L54	A-1.5: 4th Floor Plan	1/12/2002	NF Designs, Architects and planners	Fourth Floor Plan
318 3rd Avenue	B453	L54	A-1.6: Roof Plan	1/12/2002	NF Designs, Architects and planners	Roof Plan
318 3rd Avenue	B453	L54	A-4.1: Elevations	1/12/2002	NF Designs, Architects and planners	North and South Exterior Wall Elevations
318 3rd Avenue	B453	L54	A-4.2: Elevations	1/12/2002	NF Designs, Architects and planners	East and West Exterior Wall Elevations
318 3rd Avenue	B453	L54	A-5.1: Building Section	1/12/2002	NF Designs, Architects and planners	Building and Wall Sections
318 3rd Avenue	B453	L54	A-5.2: Building Section	1/12/2002	NF Designs, Architects and planners	Building Section
318 3rd Avenue	B453	L54	A-5.3: Building Section	1/12/2002	NF Designs, Architects and planners	Building Section
318 3rd Avenue	B453	L54	A-5.4: Stair Details	1/12/2002	NF Designs, Architects and planners	Stair Details
318 3rd Avenue	B453	L54	A-5.5: Elevator Details	1/12/2002	NF Designs, Architects and planners	Elevator Details
318 3rd Avenue	B453	L54	S-1	4/1/2003	James Wiesenfeld & Associates /NF Designs	Foundation Plan and Part 1st Floor Framing Plan
318 3rd Avenue	B453	L54	S-2: Foundation Details & Sections	4/1/2003	James Wiesenfeld & Associates /NF Designs	Foundations Details and Sections: Pilecap and Grade Beams
318 3rd Avenue	B453	L54	ST-1, Z-1, CS-3	N/A	NF Designs, Architects and planners	Site Plan, Zoning Plan, Project Information
318 3rd Avenue	B453	L54	Builders Pavement Plan	N/A	NF Designs	Builders pavement plan
312 3rd Avenue	B453	L54	Cellar	N/A	A&F Fire Protection Co.	Cellar Fire Plan and Sprinkler Details
312 3rd Avenue	B453	L54	First Floor	N/A	A&F Fire Protection Co.	First Floor Plan, Riser Diagram, Plot Plan, and Sprinkler Details
312 3rd Avenue	B453	L54	2nd to 4th Floors	N/A	A&F Fire Protection Co.	2nd to 4th Floor Plans and Tie-in Detail
312 3rd Avenue	B453	L54	FA-1: Cellar Floor Plan	N/A	Sal V. Tartaglione, Architect, P.C.	Cellar Floor Plan: Installation of Interior Individually Coded Fire Alarm System
312 3rd Avenue	B453	L54	FA-2: First Floor Plan	N/A	Sal V. Tartaglione, Architect, P.C.	First Floor Plan: Installation of Interior Individually Coded Fire Alarm System
312 3rd Avenue	B453	L54	FA-3: Second Floor Plan	N/A	Sal V. Tartaglione, Architect, P.C.	Second Floor Plan: Installation of Interior Individually Coded Fire Alarm System
312 3rd Avenue	B453	L54	FA-4: Third Floor Plan	N/A	Sal V. Tartaglione, Architect, P.C.	Third Floor Plan: Installation of Interior Individually Coded Fire Alarm System
312 3rd Avenue	B453	L54	FA-5: Fourth Floor Plan	N/A	Sal V. Tartaglione, Architect, P.C.	Fourth Floor Plan: Installation of Interior Individually Coded Fire Alarm System
312 3rd Avenue	B453	L54	T-1: Notes, Plot Plan, Riser Diagram Legend	N/A	Sal V. Tartaglione, Architect, P.C.	Fire Alarm Legend, Notes, Plan: Installation of Interior Individually Coded Fire Alarm System
312 3rd Avenue	B453	L54	Map of Alta ACSM Land Title Survey	3/21/2002	John P. Ferrantello, P.C.	Survey
318 3rd Avenue	B453	L54	Final Survey	3/11/2004	Barry M. Fahrer	Survey
312 3rd Avenue	B453	L54	B-1 of 3: Subsurface Investigation - Test Borings	3/1/2002	C.E. Boss Co., Inc	Boring Location Plan and Boring Log Data
312 3rd Avenue	B453	L54	B-2 of 3: Subsurface Investigation - Test Borings	3/1/2002	C.E. Boss Co., Inc	Boring Log Data
312 3rd Avenue	B453	L54	B-3 of 3: Subsurface Investigation - Test Borings	3/1/2002	C.E. Boss Co., Inc	Boring Log Data
318 3rd Avenue	B453	L54	Certificate of Occupancy	9/16/2005	City of New York Department of Buildings	
312/318 Third Avenue	B453	L54	Certificate of Occupancy	11/--/1951	Department of Housing and Buildings	
310 Third Avenue	B453	L54	Certificate of Occupancy (for B453, L52)	1/28/1959	Department of Buildings	
318 Third Avenue	B453	L54	Certificate of Occupancy (Temporary)	1/7/2005	City of New York Department of Buildings	
310 Third Avenue	B453	L54	Certificate of Occupancy (for B453, L36)	11/21/1962	Department of Buildings	
310 Third Avenue	B453	L54	Certificate of Occupancy (for B453, L52)	6/8/1965	Department of Buildings	
N/A	B967	L1	N/A	8/12/1986	Albert A. Bianco	Survey
175 2nd Street	B967	L1	SW1	3/23/1987	Pierre R. Foss, P.E.	Plan and Wall Section: Note of "Exisiting 4.40' Wide Conc. Bulkhead"
338 3rd Avenue	B967	L24	A-1: Plot Plan	8/9/2000	Clough, Harbour & Associates LLP	Site Plan
338 3rd Avenue	B967	L24	A-1: Roof Plan and Notes	5/21/2027	French & Parrello	Roof Plan and Notes
338 Third Avenue	B967	L24	Certificate of Occupancy	6/24/2014	City of New York Department of Buildings	

Table 1
List of Documents By Block and Lot

Address	Block	Lot	Number/Title	Date	Source	Drawing Description
338 Third Avenue	B967	L24	Certificate of Occupancy (Temporary)	9/19/2013	City of New York Department of Buildings	
338 Third Avenue	B967	L24	Certificate of Occupancy (Temporary)	2/13/2014	City of New York Department of Buildings	
338 Third Avenue	B967	L24	Certificate of Occupancy (Temporary)	5/20/2014	City of New York Department of Buildings	

SECTION A
BLOCK 453, LOT 1
420 CARROLL STREET

B453 L1



SITE & LOCATION PLAN

SCALE: 1/16" = 1'-0"

DATA

BLOCK:	453
LOT:	1
HOUSE NO.	420

ZONING

ZONE:	M2-1
map:	16c

CODE

CONSTRUCTION CLASS: 3 & Ic (no change)
(STORAGE, MANUFACTURING AND ACESS OFFICES)
C.O.# 238286

note: building is fully sprinklered.

ITEMS OF CONTROLLED INSPECTION

1) FIRE-STOPS 27-345
2) FINAL INSP. DIR. 14

ACCEPTABLE FOR PERMIT UNDER DIRECTIVE NO. 14/1999
MAR 27 2001
ANDY PACHECO

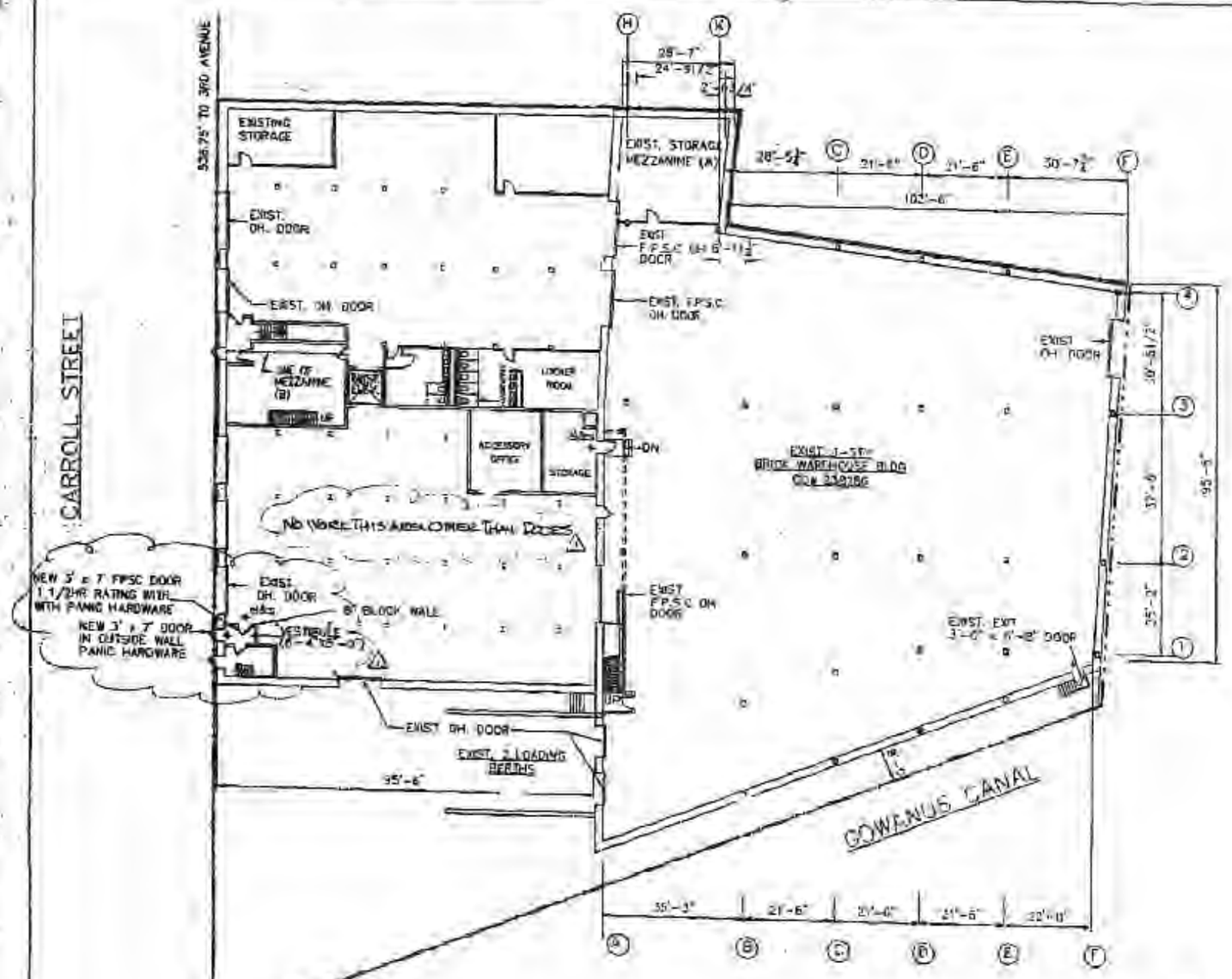
30113286

ALL DIMENSIONS ARE TO BE FIELD VERIFIED AND ANY DISCREPANCIES SHALL BE REPORTED TO THE ARCHITECT / ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORK	THIS PLAN IS APPROVED ONLY FOR ITEMS SHOWN ON THE APPLICATION DATED . ALL OTHER NOTATIONS ARE NOT TO BE CONSIDERED APPROVED UNLESS SPECIFICALLY NOTED HEREON, OR TO BE CONSIDERED AS EITHER BEING APPROVED OR AS ADDITIONAL NEW APPLICATION ITEMS	The Drawings, Specifications and other documents prepared by the Architect / Engineer for this project are instruments of service for use solely with respect to this project and, unless otherwise provided, the Architect / Engineer shall be deemed the author of these documents and shall retain all common law, statutory and other reserved rights, including the copyright thereto.	

NO.	DESCRIPTION	DATE	ALEX>FIGLIOLA	11/2/00
			404-428<CARROLL<STREET,<BKLYN,<NY	SRS
			SITE<PLAN	
			SHELDON L. REICH, P.C.	

STATE OF NEW YORK SHELDON L. REICH 044705 PROFESSIONAL ENGINEER

A-1



FIRST FLOOR PLAN

SCALE: 1/16" = 1'-0"

ANDY PACHECO

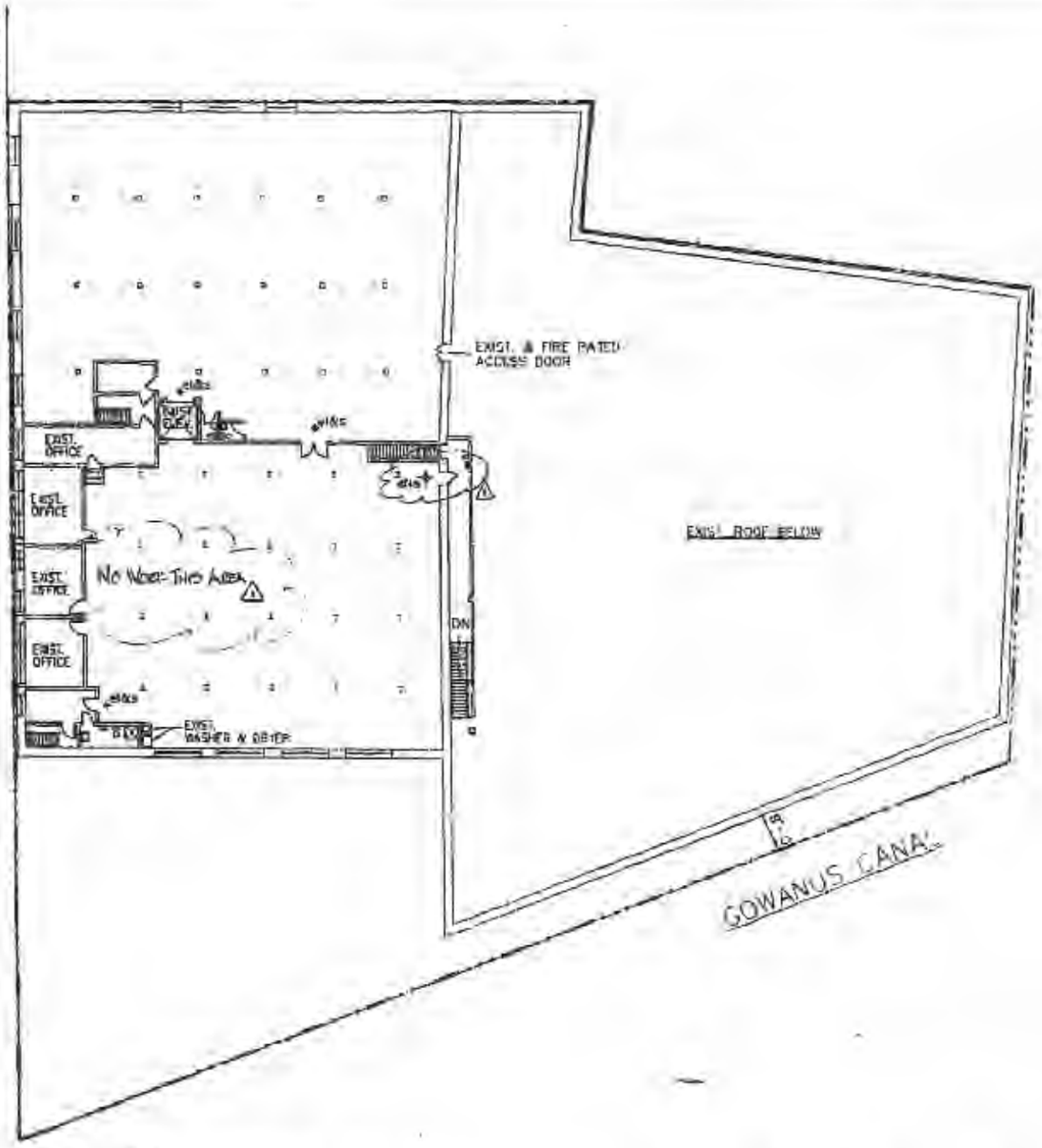
30113865

ALEX FIGLIOLA 404-428 CARROLL STREET, BKLYN, NY	11203-00 AS SHOWN
FIRST FLOOR PLAN	CC 03-03 A-2
SHELDON L. REICH, P.C.	A-2

REVISIONS

CARROLL STREET

536.75' TO 3RD AVENUE



SECOND FLOOR PLAN

SCALE: 1/16" = 1'-0"

FEB 27 2011
ANDY FACHEDDO
301132660

ALEX FIGLIOLA	11=0"+00"	AS SHOWN
804-828 CARROLL STREET, BKLYN, NY	60	06-08 A3
SECOND FLOOR PLAN		A-3
SHELDON L. REICH, P.C.		

B453 L1

CARROLL STREET

536.79' TO 3RD AVENUE

EXIST. ROOF BELOW

EXIST. ROOF BELOW

EXIST. STORAGE

EXIST. CONFERENCE ROOM

EXIST. KITCHEN

EXIST. STORAGE

EXIST. STORAGE

EXIST. OFFICE

NEW OPEN OFFICE AREA

EXIST. OFFICE

EXIST. OFFICE

EXIST. OFFICE

EXIST. OFFICE

EXIST. OFFICE

EXIST. OFFICE

EXIST. BATHROOM

EXIST. PARAPET WALL

75'

GOWANUS CANAL

THIRD FLOOR PLAN

SCALE: 1/16" = 1'-0"

APR 29 2011

ANDY PACHECO

301132 80

ALEX FIGLIOLA	11-03-00	AS SHOWN
404-408 CARROLL STREET BKLYN, NY	C.C.	00-03 A4
THIRD FLOOR PLAN		A-4
SHELDON L. REICH, P.C.		4 OF 5

DUPLICATE

No 22868

OFFICE OF THE PRESIDENT OF THE BOROUGH OF BROOKLYN

BUREAU OF BUILDINGS

CERTIFICATE OF OCCUPANCY

(ISSUED PURSUANT TO ARTICLE 1, SECTION 5, BUILDING CODE)

BROOKLYN, N. Y. Nov 28 1923

This is to certify that the NEW BUILDING

Located at 411-26 Canal St. 53.6'9" W of 3rd Av

Has been COMPLETED substantially according to the approved plans and specifications and the requirements of the BUILDING CODE and PERMISSION is hereby granted for the OCCUPANCY of said building for the following purposes:

Garage, Storage & Shop

Permit No. 951 1920

10/31/23

Superintendent of Buildings

2083-M-BA

PLICATE

CITY OF NEW YORK No. 83348

OFFICE OF THE PRESIDENT OF THE BOROUGH OF BROOKLYN

DEPARTMENT OF BUILDINGS

DATE July 26, 1937

CERTIFICATE OF OCCUPANCY

dard form adopted by the Board of Standards and Appeals July 22, 1932, and issued pursuant to Section Greater New York Charter, and Chapter 5, Building Code, Code of Ordinances, City of New York)

certificate supersedes all previously issued certificates.

e owner or owners of the building or premises:

THIS CERTIFIES that the ALTERED —BUILDING—PREMISES

98/4 N Carroll St. 68.5'-9" W. of 3rd Ave.

Block 453, Lot 1, conforms substantially to the approved nd specifications, and to the requirements of the building code and all other laws and ordi-, and of the rules and regulations of the Board of Standards and Appeals, applicable to a g of its class and kind at the time the permit was issued; and CERTIFIES FURTHER ny provisions of law relating to standpipe and sprinkler equipment have been complied s certified by a report of the Fire Commissioner to the Commissioner of Buildings.

ERTIFICATE IS ISSUED SUBJECT TO THE LIMITATIONS HEREINAFTER SPECIFIED AND O THE FOLLOWING RESOLUTIONS OF THE BOARD OF STANDARDS AND APPEALS:

(Calendar numbers to be inserted here)

PERMISSIBLE USE AND OCCUPANCY

RY	LIVE LOADS LBS. PER SQ. FT.	PERSONS ACCOMMODATED MALE	FEMALE	TOTAL	USE
					Roof
	120#				Factory - Manufacturing
	150#				Printing Ink
					Total - 4 Story
					Manufacturing Printing Ink

C. 77672 Type of Construction Brick

stories 36 feet Date of completion, construction 1/26/37

Unrestricted zone at time of issuance of permit. plumbing Sep

(OVER)

NO CHANGE OF USE OR OCCUPANCY NOT CONSISTENT WITH THIS CERTIFICATE SHALL BE MADE UNLESS FIRST APPROVED BY THE COMMISSIONER OF BUILDINGS.

Unless an approval for the same has been obtained from the Commissioner of Building change or rearrangement in the structural parts of the building, or affecting the light and ve tion of any part thereof, or in the exit facilities, shall be made; no enlargement, whether b tending on any side or by increasing in height shall be made; nor shall the building be moved one location or position to another; nor shall there be any reduction or diminution of the a the lot or plot on which the building is located.

The building or any part thereof shall not be used for any purpose other than th which it is certified.

The superimposed, uniformly distributed loads, or concentrated loads producing th stresses in the construction in any story shall not exceed the live loads specified above; th ber of persons of either sex in any story shall not exceed that specified when sex is indicat shall the aggregate number of persons in any story exceed the specified total; and the use t any story may be put shall be restricted to that fixed by this certificate except as spe stated.

This certificate does not in any way relieve the owner or owners or any other pe persons in possession or control of the building, or any part thereof, from obtaining suc permits, licenses or approvals as may be prescribed by law for the uses or purposes for w building is designed or intended; nor from obtaining the special certificates required for and operation of elevators; nor from the installation of fire alarm systems where required nor from complying with any lawful order for additional fire extinguishing appliances u discretionary powers of the fire commissioner; nor from complying with any lawful ord with the object of maintaining the building in a safe or lawful condition; nor from co with any authorized direction to remove encroachments into a public highway or othe place, whether attached to or part of the building or not.

If this certificate is marked "Temporary", it is applicable only to those parts of ing indicated on its face, and certifies to the legal use and occupancy of only such par building; it is subject to all the provisions and conditions applying to a final or perma ficate; it is not applicable to any building under the jurisdiction of the tenement house sioner unless it is also approved and endorsed by him; and it must be replaced by a full at the date of its expiration.

Examined by

Per

Commissioner of Buildings
Borough of Brooklyn.

Additional copies of this certificate will be issued, upon written request, to persons having a the building or premises.

B Form 54 (Rev. 6/65)

THE CITY OF NEW YORK

DEPARTMENT OF BUILDINGS

CERTIFICATE OF OCCUPANCY

2382286

DATE FEB 2 [illegible] NO.

BOROUGH Brooklyn ZONING DISTRICT [M2-1]

This certificate supersedes C.O. NO

THIS CERTIFIES that the new—altered—existing—building—premises located at 420 Carroll Street Block 453 Lot 1

CONFORMS SUBSTANTIALLY TO THE APPROVED PLANS AND SPECIFICATIONS AND TO THE REQUIREMENTS OF ALL APPLICABLE LAWS, RULES, AND REGULATIONS FOR THE USES AND OCCUPANCIES SPECIFIED HEREIN.

PERMISSIBLE USE AND OCCUPANCY

STORY	LIVE LOAD LBS. PER SQ. FT	MAXIMUM NO. OF PERSONS PERMITTED	ZONING DWELLING OR ROOMING UNITS	BUILDING CODE ASSEMBLE ROOMS	ZONING USE GROUP	BUILDING CODE OCCUPANCY GROUP	DESCRIPTION OF USE
First	Ground	20			17 16	D-2 B-2	Manufacturing and Storage of Electrical Equipment
Second	120	40			17	D-2	Manufacturing of Electrical Equipment
Third	120	20			17	D-2	Manufacturing of Electrical Equipment Two Open Loading Berths Open Accessory Parking for (6) Cars

All Performance Standards for an M2-1 Zoning District will be complied with.

New Code

OPEN SPACE USES (SPECIFY—PARKING SPACES, LOADING BERTHS, OTHER USES, NONE)

NO CHANGES OF USE OR OCCUPANCY SHALL BE MADE UNLESS A NEW AMENDED CERTIFICATE OF OCCUPANCY IS OBTAINED

THIS CERTIFICATE OF OCCUPANCY IS ISSUED SUBJECT TO FURTHER LIMITATIONS, CONDITIONS AND SPECIFICATIONS NOTED ON THE REVERSE SIDE.

B-5

Borough President

Commissioner

☐ ORIGINAL ☒ OFFICE COPY - DEPARTMENT OF BUILDINGS

B Form 54 (Back) (Rev. 8/82)

THAT THE ZONING LOT ON WHICH THE PREMISES IS LOCATED IS BOUNDED AS FOLLOWS:

BEGINNING at a point on the South side of Carroll Street distant 536' 9" feet from the corner formed by the intersection of West Carroll Street and Third Avenue

running thence South 132' 10" feet; thence West 27' 11 7/8" S. 102' 6" feet;

thence West 104' 6" feet; thence Norht 239' 3" E. 223' 7" feet;

thence _____ feet; thence _____ feet;

thence _____ feet; thence _____ feet;

to the point or place of beginning.

Alteration #530/90

~~Not on file~~ DATE OF COMPLETION 1/3/92 CONSTRUCTION CLASSIFICATION 3 & IC

BUILDING OCCUPANCY GROUP CLASSIFICATION HEIGHT Three STORIES 40' FEET

THE FOLLOWING FIRE DETECTION AND EXTINGUISHING SYSTEMS ARE REQUIRED AND WERE INSTALLED IN COMPLIANCE WITH APPLICABLE LAWS.

	YES	NO		YES	NO
STANDPIPE SYSTEM			AUTOMATIC SPRINKLER SYSTEM		
YARD HYDRANT SYSTEM					
STANDPIPE FIRE TELEPHONE AND SIGNALLING SYSTEM					
SMOKE DETECTOR					
FIRE ALARM AND SIGNAL SYSTEM					

STORM DRAINAGE DISCHARGES INTO:

A) STORM SEWER ☐ B) COMBINED SEWER ☐ C) PRIVATE SEWAGE DISPOSAL SYSTEM ☐

SANITARY DRAINAGE DISCHARGES INTO:

A) SANITARY SEWER ☐ B) COMBINED SEWER ☐ C) PRIVATE SEWAGE DISPOSAL SYSTEM ☐

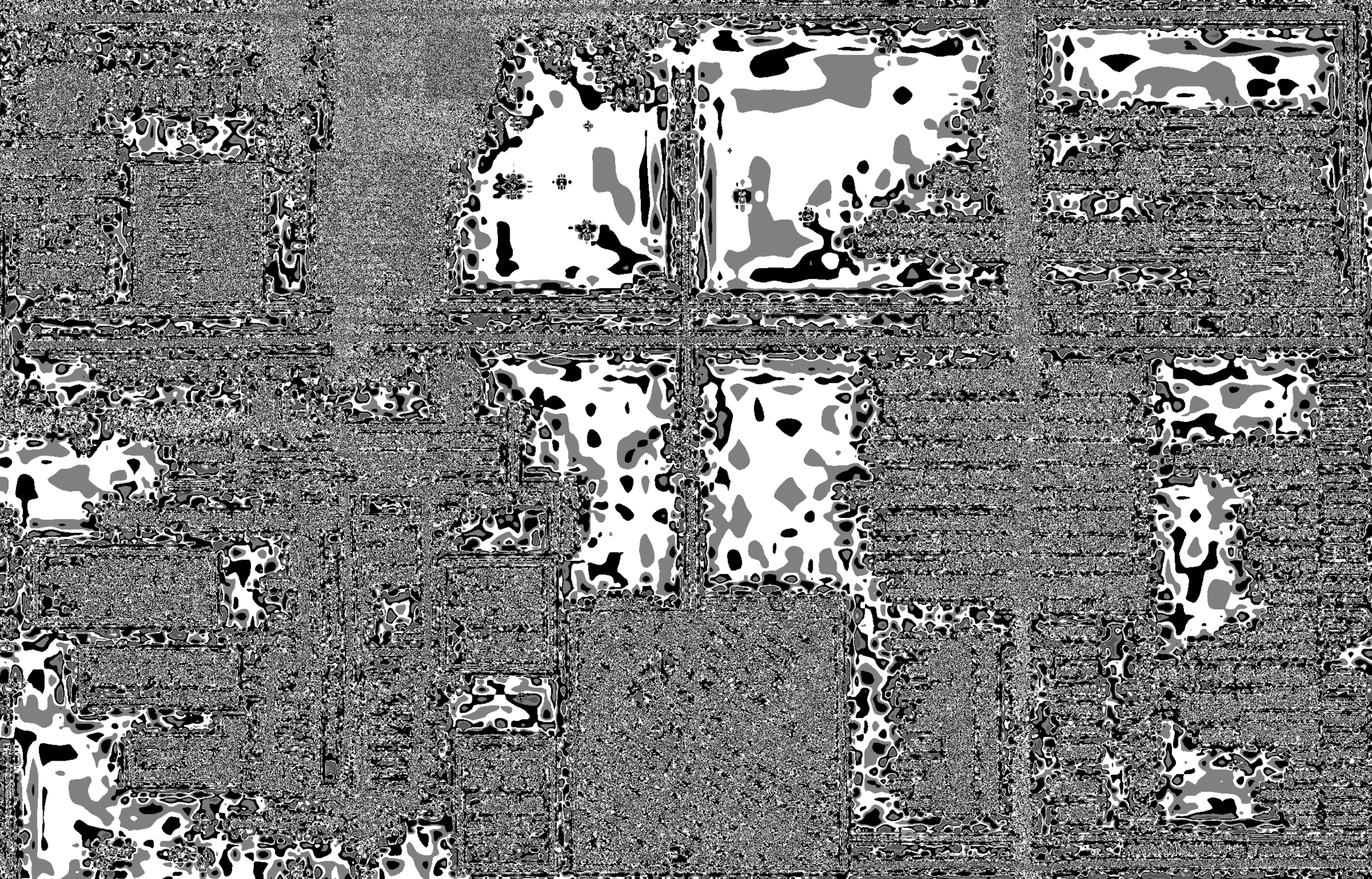
LIMITATIONS OR RESTRICTIONS:

BOARD OF STANDARDS AND APPEALS CAL. NO. _____

CITY PLANNING COMMISSION CAL. NO. _____

OTHERS:

SECTION B
BLOCK 453, LOT 21
430 CARROLL STREET



DEPARTMENT OF HOUSING AND BUILDINGS

BOROUGH OF , CITY OF NEW YORK

No. [redacted]

Date AUG 15 1946

CERTIFICATE OF OCCUPANCY

dard form adopted by the Board of Standards and Appeals and issued pursuant to Section 646 of the York Charter, and Sections C26-181.0 to C26-187.0 inclusive, Administrative Code 2.1.3.1. to 2.1.3.7. ing Code.)

This certificate supersedes C. O. No. 25227

Owner or owners of the building or premises:

THIS CERTIFIES that the [redacted] existing building—premises located at

Carroll St S.S. 273' E of Gowanus Canal

Block 453 Lot 21

, conforms substantially to the approved plans and specifications, and to the requirements building code and all other laws and ordinances, and of the rules and regulations of the Board of Stand- and Appeals, applicable to a building of its class and kind at the time the permit was issued; and

CERTIFIES FURTHER that, any provisions of Section 646F of the New York Charter have been lied with as certified by a report of the Fire Commissioner to the Borough Superintendent.

[redacted] 5057 1925 Construction classification— Brick

ancy classification— Junk Shop . Height 1 stories, 11 feet.

of completion— SD 8/14/46 . Located in Unrestricted Use District.

Area . Height Zone at time of issuance of permit

This certificate is issued subject to the limitations hereinafter specified and to the following resolu- of the Board of Standards and Appeals: (Calendar numbers to be inserted here)

PERMISSIBLE USE AND OCCUPANCY

STORY	LIVE LOADS Lbs. per Sq. Ft.	PERSONS ACCOMMODATED MALE	FEMALE	TOTAL	USE
First	250	4	2	6	Junk shop
		TOTAL— JUNK SHOP			

Borough Superintendent.

TK

NO CHANGES OF USE OR OCCUPANCY NOT CONSISTENT WITH THIS CERTIFICATE SH BE MADE UNLESS FIRST APPROVED BY THE BOROUGH SUPERINTENDENT

Unless an approval for the same has been obtained from the Borough Superintendent, no chan rearrangement in the structural parts of the building, or affecting the light and ventilation of any part the or in the exit facilities, shall be made; no enlargement, whether by extending on any side or by increasi height shall be made; nor shall the building be moved from one location or position to another; nor shall be any reduction or diminution of the area of the lot or plot on which the building is located.

The building or any part thereof shall not be used for any purpose other than that for which it is cer

The superimposed, uniformly distributed loads, or concentrated loads producing the same stresses i construction in any story shall not exceed the live loads specified on reverse side; the number of persons of sex in any story shall not exceed that specified when sex is indicated, nor shall the aggregate number of pe in any story exceed the specified total; and the use to which any story may be put shall be restricted to that by this certificate except as specifically stated.

This certificate does not in any way relieve the owner or owners or any other person or persons in posse or control of the building, or any part thereof, from obtaining such other permits, licenses or approvals as be prescribed by law for the uses or purposes for which the building is designed or intended; nor from obta the special certificates required for the use and operation of elevators; nor from the installation of fire systems where required by law; nor from complying with any lawful order for additional fire extingui appliances under the discretionary powers of the fire commissioner; nor from complying with any lawful issued with the object of maintaining the building in a safe or lawful condition; nor from complying with authorized direction to remove encroachments into a public highway or other public place, whether attach or part of the building or not.

If this certificate is marked "Temporary", it is applicable only to those parts of the building ind on its face, and certifies to the legal use and occupancy of only such parts of the building; it is subject to al provisions and conditions applying to a final or permanent certificate; it is not applicable to any building unde jurisdiction of the Housing Division unless it is also approved and endorsed by them, and it must be rep by a full certificate at the date of expiration.

If this certificate is for an existing building, erected prior to March 14, 1916, it has been duly insp and it has been found to have been occupied or arranged to be occupied prior to March 14, 1916, as note the reverse side, and that on information and belief, since that date there has been no alteration or conve to a use that changed its classification as defined in the Building Code, or that would necessitate compliance some special requirement or with the State Labor Law or any other law or ordinance; that there are no no of violations or orders pending in the Department of Housing and Buildings at this time; that Section of the New York City Charter has been complied with as certified by a report of the Fire Commissioner t Borough Superintendent, and that, so long as the building is not altered, except by permission of the Bor Superintendent, the existing use and occupancy may be continued.

"§ 646 F. No certificate of occupancy shall be issued for any building, structure, enclosure, plac premises wherein containers for combustibles, chemicals, explosives, inflammables and other dangerous substa articles, compounds or mixtures are stored, or wherein automatic or other fire alarm systems or fire extingui equipment are required by law to be or are installed, until the fire commissioner has tested and inspected and certified his approval in writing of the installation of such containers, systems or equipment to the Bor Superintendent of the borough in which the installation has been made. Such approval shall be recorde the certificate of occupancy."

Additional copies of this certificate will be furnished to persons having an interest in the building or premises, upon payment of a fee of fifty cents per copy

DEPARTMENT OF HOUSING AND BUILDINGS

BOROUGH OF BROOKLYN, CITY OF NEW YORK

No. 121165

Date

CERTIFICATE OF OCCUPANCY

(Standard form adopted by the Board of Standards and Appeals and issued pursuant to Section 646 of the New York Charter, and Sections C.26-181.0 to C26-187.0 inclusive Administrative Code 2.1.3.1. to 2.1.3.7. Building Code.)

This certificate supersedes C. O. No.

To the owner or owners of the building or premises:

THIS CERTIFIES that the ~~new~~ altered ~~existing~~ building—premises located at 440 Carroll Street-S/E 235' ~~[illegible]~~ East of Gowanus Canal

Block 453 Lot 21

, conforms substantially to the approved plans and specifications, and to the requirements of the building code and all other laws and ordinances, and of the rules and regulations of the Board of Standards and Appeals, applicable to a building of its class and kind at the time the permit was issued; and CERTIFIES FURTHER that, any provisions of Section 646F of the New York Charter have been complied with as certified by a report of the Fire Commissioner to the Borough Superintendent.

~~[illegible]~~ Alt- 4134/47

Occupancy classification— Storage Garage . Construction classification— Non-Fire Pr

Date of completion— Const- 6/15/48 . Height 1 stories, 15 feet.

Fl- 6/18/48

Area . Located in Unrestricted Use District.

Height Zone at time of issuance of permit

This certificate is issued subject to the limitations hereinafter specified and to the following resolutions of the Board of Standards and Appeals: (Calendar numbers to be inserted here)

PERMISSIBLE USE AND OCCUPANCY

STORY	LIVE LOADS Lbs. per Sq. Ft.	PERSONS ACCOMMODATED MALE	FEMALE	TOTAL	USE
Ground	15	-	15	Storage Garage for more than five(5) trucks	
Total----	Storage Garage				

Fire Department card dated August 13, 1948

(Page 1)

Borough Superintendent.

C. Abeles

NO CHANGES OF USE OR OCCUPANCY NOT CONSISTENT WITH THIS CERTIFICATE SH BE MADE UNLESS FIRST APPROVED BY THE BOROUGH SUPERINTENDENT

Unless an approval for the same has been obtained from the Borough Superintendent, no chan rearrangement in the structural parts of the building, or affecting the light and ventilation of any part th or in the exit facilities, shall be made; no enlargement, whether by extending on any side or by increas height shall be made; nor shall the building be moved from one location or position to another; nor shall be any reduction or diminution of the area of the lot or plot on which the building is located.

The building or any part thereof shall not be used for any purpose other than that for which it is ce

The superimposed, uniformly distributed loads, or concentrated loads producing the same stresses construction in any story shall not exceed the live loads specified on reverse side; the number of persons of sex in any story shall not exceed that specified when sex is indicated, nor shall the aggregate number of p in any story exceed the specified total; and the use to which any story may be put shall be restricted to tha by this certificate except as specifically stated.

This certificate does not in any way relieve the owner or owners or any other person or persons in pos or control of the building, or any part thereof from obtaining such other permits, licenses or approvals be prescribed by law for the uses or purposes for which the building is designed or intended; nor from ob the special certificates required for the use and operation of elevators; nor from the installation of fire systems where required by law; nor from complying with any lawful order for additional fire extingu appliances under the discretionary powers of the fire commissioner; nor from complying with any lawfu issued with the object of maintaining the building in a safe or lawful condition; nor from complying wi authorized direction to remove encroachments into a public highway or other public place, whether atta or part of the building or not.

If this certificate is marked "Temporary", it is applicable only to those parts of the building in on its face, and certifies to the legal use and occupancy of only such parts of the building; it is subject to provisions and conditions applying to a final or permanent certificate; it is not applicable to any building un jurisdiction of the Housing Division unless it is also approved and endorsed by them, and it must be r by a full certificate at the date of expiration.

If this certificate is for an existing building, erected prior to March 14, 1916, it has been duly in and it has been found to have been occupied or arranged to be occupied prior to March 14, 1916, as n the reverse side, and that on information and belief, since that date there has been no alteration or con to a use that changed its classification as defined in the Building Code, or that would necessitate complian some special requirement or with the State Labor Law or any other law or ordinance; that there are no of violations or orders pending in the Department of Housing and Buildings at this time; that Sectio of the New York City Charter has been complied with as certified by a report of the Fire Commissioner Borough Superintendent, and that, so long as the building is not altered, except by permission of the B Superintendent, the existing use and occupancy may be continued.

"§ 646 F. No certificate of occupancy shall be issued for any building, structure, enclosure, p premises wherein containers for combustibles, chemicals, explosives, inflammables and other dangerous sub articles, compounds or mixtures are stored, or wherein automatic or other fire alarm systems or fire extin equipment are required by law to be or are installed, until the fire commissioner has tested and inspected certified his approval in writing of the installation of such containers, systems or equipment to the B Superintendent of the borough in which the installation has been made. Such approval shall be reco the certificate of occupancy."

Additional copies of this certificate will be furnished to persons having an interest in the building or premises, upon payment of a fee of fifty cents per copy

Form 54-40M-7016(50) 114

EVB

DEPARTMENT OF HOUSING AND BUILDINGS

BOROUGH OF BROOKLYN, CITY OF NEW YORK

No. 129602

Date JUN 5 1951

CERTIFICATE OF OCCUPANCY

(Standard form adopted by the Board of Standards and Appeals and issued pursuant to Section 646 of the New York Charter, and Sections C.26-181.0 to C26-187.0 inclusive Administrative Code 2.1.3.1. to 2.1.3.7. Building Code.)

This certificate supersedes C. O. No. 121165

To the owner or owners of the building or premises:

THIS CERTIFIES that the ~~new altered existing~~ building—premises located at 430/440 Carroll Street, S/S 233'7" E. of Gowanus Canal

Block 453 Lot Pt. of 21

, conforms substantially to the approved plans and specifications, and to the requirements of the building code and all other laws and ordinances, and of the rules and regulations of the Board of Standards and Appeals, applicable to a building of its class and kind at the time the permit was issued; and

CERTIFIES FURTHER that, any provisions of Section 646F of the New York Charter have been complied with as certified by a report of the Fire Commissioner to the Borough Superintendent.

~~New~~ Alt. No.—3425/48 Construction classification— Non-Fireproof

Occupancy classification—See occupancy below Height 1 stories, 15 feet.

Date of completion— Const. 5-16-51 Located in Unrestricted Use District.
Plumb. None
A. Area B.D. 6-5-51 Height Zone at time of issuance of permit

This certificate is issued subject to the limitations hereinafter specified and to the following resolutions of the Board of Standards and Appeals: (Calendar numbers to be inserted here)

PERMISSIBLE USE AND OCCUPANCY

STORY	LIVE LOADS Lbs. per Sq. Ft.	PERSONS ACCOMMODATED MALE	FEMALE	TOTAL	USE
First	Ground	5	-	5	Manufacturing metal bridging
First	Ground	14	-	14	Metal processing - cutting and shearing sheet metal for off premises fabricating
Rear Yard	space	-	-	-	Auto wrecking approximately 125' x 100'
		TOTAL: As stated above			

Fire Department permit B.101676 issued 12/27/50 for fuel oil

Fire Department approval dated 6/5/51 for acetylene oxygen blow-pipe.

Borough Superintendent

NO CHANGES OF USE OR OCCUPANCY NOT CONSISTENT WITH THIS CERTIFICATE SHALL BE MADE UNLESS FIRST APPROVED BY THE BOROUGH SUPERINTENDENT

Unless an approval for the same has been obtained from the Borough Superintendent, no change or rearrangement in the structural parts of the building, or affecting the light and ventilation of any part thereof, or in the exit facilities, shall be made; no enlargement, whether by extending on any side or by increasing in height shall be made; nor shall the building be moved from one location or position to another; nor shall there be any reduction or diminution of the area of the lot or plot on which the building is located.

The building or any part thereof shall not be used for any purpose other than that for which it is certified.

The superimposed, uniformly distributed loads, or concentrated loads producing the same stresses in the construction in any story shall not exceed the live loads specified on reverse side; the number of persons of either sex in any story shall not exceed that specified when sex is indicated, nor shall the aggregate number of persons in any story exceed the specified total; and the use to which any story may be put shall be restricted to that fixed by this certificate except as specifically stated.

This certificate does not in any way relieve the owner or owners or any other person or persons in possession or control of the building, or any part thereof from obtaining such other permits, licenses or approvals as may be prescribed by law for the uses or purposes for which the building is designed or intended; nor from obtaining the special certificates required for the use and operation of elevators; nor from the installation of fire alarm systems where required by law; nor from complying with any lawful order for additional fire extinguishing appliances under the discretionary powers of the fire commissioner; nor from complying with any lawful order issued with the object of maintaining the building in a safe or lawful condition; nor from complying with any authorized direction to remove encroachments into a public highway or other public place, whether attached to or part of the building or not.

If this certificate is marked "Temporary", it is applicable only to those parts of the building indicated on its face, and certifies to the legal use and occupancy of only such parts of the building; it is subject to all the provisions and conditions applying to a final or permanent certificate; it is not applicable to any building under the jurisdiction of the Housing Division unless it is also approved and endorsed by them, and it must be replaced by a full certificate at the date of expiration.

If this certificate is for an existing building, erected prior to March 14, 1916, it has been duly inspected and it has been found to have been occupied or arranged to be occupied prior to March 14, 1916, as noted on the reverse side, and that on information and belief, since that date there has been no alteration or conversion to a use that changed its classification as defined in the Building Code, or that would necessitate compliance with some special requirement or with the State Labor Law or any other law or ordinance; that there are no notices of violations or orders pending in the Department of Housing and Buildings at this time; that Section 646F of the New York City Charter has been complied with as certified by a report of the Fire Commissioner to the Borough Superintendent, and that, so long as the building is not altered, except by permission of the Borough Superintendent, the existing use and occupancy may be continued.

"§ 646 F. No certificate of occupancy shall be issued for any building, structure, enclosure, place or premises wherein containers for combustibles, chemicals, explosives, inflammables and other dangerous substances, articles, compounds or mixtures are stored, or wherein automatic or other fire alarm systems or fire extinguishing equipment are required by law to be or are installed, until the fire commissioner has tested and inspected and has certified his approval in writing of the installation of such containers, systems or equipment to the Borough Superintendent of the borough in which the installation has been made. Such approval shall be recorded on the certificate of occupancy."

Additional copies of this certificate will be furnished to persons having an interest in the building or premises, upon payment of a fee of fifty cents per copy.

B Form 54 (Rev. 11/56)

THE CITY OF NEW YORK

DEPARTMENT OF BUILDINGS

CERTIFICATE OF OCCUPANCY 241254

BOROUGH Brooklyn **DATE:** MAR 2 3 1983 **NO.**

This certificate supersedes C.O. NO ZONING DISTRICT (M2-1)

THIS CERTIFIES that the new—altered—existing—building—premises located at
430 Carroll Street Block 453 Lot 21

CONFORMS SUBSTANTIALLY TO THE APPROVED PLANS AND SPECIFICATIONS AND TO THE REQUIREMENTS OF ALL APPLICABLE LAWS, RULES, AND REGULATIONS FOR THE USES AND OCCUPANCIES SPECIFIED HEREIN.

PERMISSIBLE USE AND OCCUPANCY

STORY	LIVE LOAD LBS. PER SQ. FT.	MAXIMUM NO. OF PERSONS PERMITTED	ZONING DWELLING OR ROOMING UNITS	BUILDING CODE HABITABLE ROOMS	ZONING USE GROUP	BUILDING CODE OCCUPANCY GROUP	DESCRIPTION OF USE
First	100	8			16	D-1	Auto and Truck Repair
First	50	5			16	D-1	Accessory Offices.
Rear Yard					16		Accessory Parking for Motor Vehicles.

NOTE:
AUTO AND TRUCK REPAIR SHOP WITH LESS THAN 20 GALS. OF PAINT AND USE OF LESS THAN 2 QUARTS PER DAY PER SHOP

NOTE:
PERFORMANCE STANDARDS OF AN M-1 DISTRICT TO BE COMPLIED WITH AS PER SECTION 42-20 Z.R.

NOTE:
NO MORE THAN TWO TANKS OF OXYGEN AND TWO TANKS OF COMPRESSED ACETYLENE GAS MAY BE STORED IN A LEGAL MOTOR VEHICLES REPAIR SHOP.

Old Code

OPEN SPACE USES _____
(SPECIFY—PARKING SPACES, LOADING BERTHS, OTHER USES, NONE)

NO CHANGES OF USE OR OCCUPANCY SHALL BE MADE UNLESS A NEW AMENDED CERTIFICATE OF OCCUPANCY IS OBTAINED

THIS CERTIFICATE OF OCCUPANCY IS ISSUED SUBJECT TO FURTHER LIMITATIONS, CONDITIONS AND SPECIFICATIONS NOTED ON THE REVERSE SIDE.

BOROUGH SUPERINTENDENT

ORIGINAL ☐ OFFICE COPY - DEPARTMENT OF BUILDINGS ☐ COPY

B Form 54 (Back) (Rev. 8/82)

241254

THAT THE ZONING LOT ON WHICH THE PREMISES IS LOCATED IS BOUNDED AS FOLLOWS:

BEGINNING at a point on the South side of Carroll Street
distant 436' 9" ~~direction~~ corner formed by the intersection of
Third Avenue and Carroll Street

running thence	South 142' 4"	feet; thence	West 3' 4½"	feet;
thence	South 100'	feet; thence	West 125'	feet;
thence	North 100'	feet; thence	East 27' 11¼"	feet;
thence	North 133'	feet; thence	East 100'	feet;

to the point or place of beginning.

Alt. #300186019/92

~~RECORDED~~ DATE OF COMPLETION 1/8/93 CONSTRUCTION CLASSIFICATION II-B

BUILDING OCCUPANCY GROUP CLASSIFICATION HEIGHT One STORIES 15' FEET

THE FOLLOWING FIRE DETECTION AND EXTINGUISHING SYSTEMS ARE REQUIRED AND WERE INSTALLED IN COMPLIANCE WITH APPLICABLE LAWS.

	YES	NO		YES	NO
STANDPIPE SYSTEM			AUTOMATIC SPRINKLER SYSTEM		
YARD HYDRANT SYSTEM					
STANDPIPE FIRE TELEPHONE AND SIGNALLING SYSTEM					
SMOKE DETECTOR					
FIRE ALARM AND SIGNAL SYSTEM					

STORM DRAINAGE DISCHARGES INTO:

A) STORM SEWER ☐ B) COMBINED SEWER ☐ C) PRIVATE SEWAGE DISPOSAL SYSTEM ☐

SANITARY DRAINAGE DISCHARGES INTO:

A) SANITARY SEWER ☐ B) COMBINED SEWER ☐ C) PRIVATE SEWAGE DISPOSAL SYSTEM ☐

LIMITATIONS OR RESTRICTIONS:

BOARD OF STANDARDS AND APPEALS CAL. NO. _____

CITY PLANNING COMMISSION CAL. NO. _____

OTHERS:

E

SECTION C
BLOCK 453, LOT 54
312 – 318 THIRD AVENUE
(Also formerly including
310 Third Avenue)

NYC BUILDINGS

Certificate of Occupancy

CO Number: 301510595F

This certifies that the premises described herein conforms substantially to the approved plans and specifications and to the requirements of all applicable laws, rules and regulations for the uses and occupancies specified. No change of use or occupancy shall be made unless a new Certificate of Occupancy is issued. *This document or a copy shall be available for inspection at the building at all reasonable times.*

A.

Borough:	Brooklyn	**Block Number:**	00453	**Certificate Type:**	Final
Address:	318 THIRD AVENUE	**Lot Number(s):**	54	**Effective Date:**	09/16/2005
Building Identification Number (BIN):	3007684				
Special District:	None	**Building Type:**	New		

This Certificate supercedes CO Number(s): None

For zoning lot metes & bounds, please see BISWeb.

B.

Construction classification:	NON-COMB: 1-C	**Number of stories:**	4
Building Occupancy Group classification:	B-1	**Height in feet:**	53
Multiple Dwelling Law Classification:	None	**Number of dwelling units:**	0

C. **Fire Protection Equipment:**
None associated with this filing.

D. **Type and number of open spaces:**
None associated with this filing.

E. **This Certificate is issued with the following legal limitations:**
None

Borough Comments: None

Borough Commissioner, R.A.
Borough Commissioner
Brooklyn 1

Borough Commissioner

Commissioner

DOCUMENT CONTINUES ON NEXT PAGE

NYC BUILDINGS

Certificate of Occupancy

CO Number: 301510595F

Permissible Use and Occupancy

Floor From	To	Maximum persons permitted	Live load lbs per sq. ft.	Building Code habitable rooms	Building Code occupancy group	Zoning dwelling or rooming units	Zoning use group	Description of use
CEL		00099	OG	00000	B-1	00000	16D	STORAGE
001		00107	100	00000	B-1	00000	16D	STORAGE ACCESSORY OFFICE
002	004	00107	100	00000	B-1	00000	16D	STORAGE ALL APPLICABLE PERFORMANCE STANDARDS TO BE COMPLIED WITH FOR USE GROUP 16D

END OF SECTION

R.A.
Borough Commissioner
Brooklyn 1

Borough Commissioner

Commissioner

END OF DOCUMENT

Form 54-116.5M-201317(49) 114

VB

DEPARTMENT OF HOUSING AND BUILDINGS

BOROUGH OF BROOKLYN, CITY OF NEW YORK

No.

Date

CERTIFICATE OF OCCUPANCY

(Standard form adopted by the Board of Standards and Appeals and issued pursuant to Section 646 of the New York Charter, and Sections C.26-181.0 to C26-187.0 inclusive Administrative Code 2.1.3.1. to 2.1.3.7. Building Code.)

This certificate supersedes C. O. No. 112919

To the owner or owners of the building or premises:

THIS CERTIFIES that the ~~new~~ altered ~~existing~~ building—premises located at 312/318 Third Avenue, W/S 192'8" S. of Carroll Street

Displayed 318-Third Avenue Block 453 Lot Part of 54

, conforms substantially to the approved plans and specifications, and to the requirements of the building code and all other laws and ordinances, and of the rules and regulations of the Board of Standards and Appeals, applicable to a building of its class and kind at the time the permit was issued; and

CERTIFIES FURTHER that, any provisions of Section 646F of the New York Charter have been complied with as certified by a report of the Fire Commissioner to the Borough Superintendent.

N.B. ~~or Alt.~~ No. 658/51 & Alt. 1598/41 Construction classification—Frame

Occupancy classification—See occupancy below Height 1 stories, 25 feet.

Date of completion—Const. 11-9-51 Plumb. 11-7-51 S.D. 11-10-51 Located in Unrestricted Use District.

Area ~~or~~ Height Zone at time of issuance of permit

This certificate is issued subject to the limitations hereinafter specified and to the following resolutions of the Board of Standards and Appeals: (Calendar numbers to be inserted here)

Resolution 392-41-A-Adopted May 13, 1941 Bulletin 20 Volume 26

Resolution 392-41-A Adopted April 24th 1951, Bulletin 18 Volume 36

PERMISSIBLE USE AND OCCUPANCY

STORY	LIVE LOADS Lbs per Sq. Ft.	PERSONS ACCOMMODATED MALE	FEMALE	TOTAL	USE
Cellar	Ground	-	-	-	Boiler Room
First	Ground	-	-	23	~~Storage~~, melting, refining and fabrication of metal, including office and laboratory.
	TOTAL	As stated above.			

NOTE: Subject to the maintenance of a second means of egress through unoccupied portion of property, north of the building in question to Third Avenue.

Fire Department permit CB #21554 issued 5/4/51 (Fuel oil for Shelter)

Fire Department permit CB #40419 issued 7-8-51 (Fuel Oil)

Fire Department permit CB #11584 issued 5/4/51 (Oxygen, Acetylen tanks)

Temporary-Six (6) years-Expires April 24, 1957.

Borough Superintendent.

NO CHANGES OF USE OR OCCUPANCY NOT CONSISTENT WITH THIS CERTIFICATE SHALL BE MADE UNLESS FIRST APPROVED BY THE BOROUGH SUPERINTENDENT

Unless an approval for the same has been obtained from the Borough Superintendent, no change or rearrangement in the structural parts of the building, or affecting the light and ventilation of any part thereof, or in the exit facilities, shall be made; no enlargement, whether by extending on any side or by increasing in height shall be made; nor shall the building be moved from one location or position to another; nor shall there be any reduction or diminution of the area of the lot or plot on which the building is located.

The building or any part thereof shall not be used for any purpose other than that for which it is certified.

The superimposed, uniformly distributed loads, or concentrated loads producing the same stresses in the construction in any story shall not exceed the live loads specified on reverse side; the number of persons of either sex in any story shall not exceed that specified when sex is indicated, nor shall the aggregate number of persons in any story exceed the specified total; and the use to which any story may be put shall be restricted to that fixed by this certificate except as specifically stated.

This certificate does not in any way relieve the owner or owners or any other person or persons in possession or control of the building, or any part thereof from obtaining such other permits, licenses or approvals as may be prescribed by law for the uses or purposes for which the building is designed or intended; nor from obtaining the special certificates required for the use and operation of elevators; nor from the installation of fire alarm systems where required by law; nor from complying with any lawful order for additional fire extinguishing appliances under the discretionary powers of the fire commissioner; nor from complying with any lawful order issued with the object of maintaining the building in a safe or lawful condition; nor from complying with any authorized direction to remove encroachments into a public highway or other public place, whether attached to or part of the building or not.

If this certificate is marked "Temporary", it is applicable only to those parts of the building indicated on its face, and certifies to the legal use and occupancy of only such parts of the building; it is subject to all the provisions and conditions applying to a final or permanent certificate; it is not applicable to any building under the jurisdiction of the Housing Division unless it is also approved and endorsed by them, and it must be replaced by a full certificate at the date of expiration.

If this certificate is for an existing building, erected prior to March 14, 1916, it has been duly inspected and it has been found to have been occupied or arranged to be occupied prior to March 14, 1916, as noted on the reverse side, and that on information and belief, since that date there has been no alteration or conversion to a use that changed its classification as defined in the Building Code, or that would necessitate compliance with some special requirement or with the State Labor Law or any other law or ordinance; that there are no notices of violations or orders pending in the Department of Housing and Buildings at this time; that Section 646F of the New York City Charter has been complied with as certified by a report of the Fire Commissioner to the Borough Superintendent, and that, so long as the building is not altered, except by permission of the Borough Superintendent, the existing use and occupancy may be continued.

"§ 646 F. No certificate of occupancy shall be issued for any building, structure, enclosure, place or premises wherein containers for combustibles, chemicals, explosives, inflammables and other dangerous substances, articles, compounds or mixtures are stored, or wherein automatic or other fire alarm systems or fire extinguishing equipment are required by law to be or are installed, until the fire commissioner has tested and inspected and has certified his approval in writing of the installation of such containers, systems or equipment to the Borough Superintendent of the borough in which the installation has been made. Such approval shall be recorded on the certificate of occupancy."

Additional copies of this certificate will be furnished to persons having an interest in the building or premises, upon payment of a fee of fifty cents per copy.

Form 54-71M-902854(58) 114

DEPARTMENT OF BUILDINGS

BOROUGH OF BROOKLYN, THE CITY OF NEW YORK

No. 151188

Date JAN 28 1959

CERTIFICATE OF OCCUPANCY

(Standard form adopted by the Board of Standards and Appeals and issued pursuant to Section 646 of the New York Charter, and Sections C.26-181.0 to C26-187.0 inclusive Administrative Code 2.1.3.1. to 2.1.3.7. Building Code.)

This certificate supersedes C. O. No.

To the owner or owners of the building or premises:

THIS CERTIFIES that the new—~~alteration~~—building—premises located at

310 3rd Avenue, West Side, 157 ft. South of Carroll Street Block 459 Lot 52 (tentative)

, conforms substantially to the approved plans and specifications, and to the requirements of the building code and all other laws and ordinances, and of the rules and regulations of the Board of Standards and Appeals, applicable to a building of its class and kind at the time the permit was issued; and

CERTIFIES FURTHER that, any provisions of Section 646F of the New York Charter have been complied with as certified by a report of the Fire Commissioner to the Borough Superintendent.

N.B. ~~Application~~ No.— 591/1945 Construction classification— non-fireproof

Occupancy classification— factory , Height 1 stories, 20'4" feet.

Date of completion— constr. 1/20/59 . Located in Unrestricted Use District.

plumb. 1/20/59

Area Feb. 1/22/59 . Height Zone at time of issuance of permit

This certificate is issued subject to the limitations hereinafter specified and to the following resolutions of the Board of Standards and Appeals: (Calendar numbers to be inserted here)

PERMISSIBLE USE AND OCCUPANCY

STORY	LIVE LOADS Lbs. per Sq. Ft.	PERSONS ACCOMMODATED MALE	FEMALE	TOTAL	USE
first	ground	15	-	15	factory used in conjunction with premises 466-468 Carroll Street (same ownership and occupant)
		TOTAL - as stated above			

Borough Superintendent

CERTIFICATE WILL BE NULL AND VOID IF ALTERED IN ANY MANNER OR ADDITIONS ARE MADE THERETO.

NO CHANGES OF USE OR OCCUPANCY NOT CONSISTENT WITH THIS CERTIFICATE SHALL BE MADE UNLESS FIRST APPROVED BY THE BOROUGH SUPERINTENDENT

Unless an approval for the same has been obtained from the Borough Superintendent, no change or rearrangement in the structural parts of the building, or affecting the light and ventilation of any part thereof, or in the exit facilities, shall be made; no enlargement, whether by extending on any side or by increasing in height shall be made; nor shall the building be moved from one location or position to another; nor shall there be any reduction or diminution of the area of the lot or plot on which the building is located.

The building or any part thereof shall not be used for any purpose other than that for which it is certified.

The superimposed, uniformly distributed loads, or concentrated loads producing the same stresses in the construction in any story shall not exceed the live loads specified on reverse side; the number of persons of either sex in any story shall not exceed that specified when sex is indicated, nor shall the aggregate number of persons in any story exceed the specified total; and the use to which any story may be put shall be restricted to that fixed by this certificate except as specifically stated.

This certificate does not in any way relieve the owner or owners or any other person or persons in possession or control of the building, or any part thereof from obtaining such other permits, licenses or approvals as may be prescribed by law for the uses or purposes for which the building is designed or intended; nor from obtaining the special certificates required for the use and operation of elevators; nor from the installation of fire alarm systems where required by law; nor from complying with any lawful order for additional fire extinguishing appliances under the discretionary powers of the fire commissioner; nor from complying with any lawful order issued with the object of maintaining the building in a safe or lawful condition; nor from complying with any authorized direction to remove encroachments into a public highway or other public place, whether attached to or part of the building or not.

If this certificate is marked "Temporary", it is applicable only to those parts of the building indicated on its face, and certifies to the legal use and occupancy of only such parts of the building; it is subject to all the provisions and conditions applying to a final or permanent certificate; it is not applicable to any building under the jurisdiction of the Housing Division unless it is also approved and endorsed by them, and it must be replaced by a full certificate at the date of expiration.

If this certificate is for an existing building, erected prior to March 14, 1916, it has been duly inspected and it has been found to have been occupied or arranged to be occupied prior to March 14, 1916, as noted on the reverse side, and that on information and belief, since that date there has been no alteration or conversion to a use that changed its classification as defined in the Building Code, or that would necessitate compliance with some special requirement or with the State Labor Law or any other law or ordinance; that there are no notices of violations or orders pending in the Department of Buildings at this time; that Section 646F of the New York City Charter has been complied with as certified by a report of the Fire Commissioner to the Borough Superintendent, and that, so long as the building is not altered, except by permission of the Borough Superintendent, the existing use and occupancy may be continued.

"§ 646 F. No certificate of occupancy shall be issued for any building, structure, enclosure, place or premises wherein containers for combustibles, chemicals, explosives, inflammables and other dangerous substances, articles, compounds or mixtures are stored, or wherein automatic or other fire alarm systems or fire extinguishing equipment are required by law to be or are installed, until the fire commissioner has tested and inspected and has certified his approval in writing of the installation of such containers, systems or equipment to the Borough Superintendent of the borough in which the installation has been made. Such approval shall be recorded on the certificate of occupancy."

Additional copies of this certificate will be furnished to persons having an interest in the building or premises, upon payment of a fee of fifty cents per copy.

DEPT OF BUILDINGS

TEMPORARY

CERTIFICATE OF OCCUPANCY - Temporary

BOROUGH Brooklyn **DATE:** 1/7/05 **NO.** 301510595-Temp.

This certificate supersedes C.O. NO ZONING DISTRICT M2-1

THIS CERTIFIES that the new ~~already existing~~ building—premises located at

318 3rd Avenue Block 453 Lot 54

CONFORMS SUBSTANTIALLY TO THE APPROVED PLANS AND SPECIFICATIONS AND TO THE REQUIREMENTS OF ALL APPLICABLE LAWS, RULES, AND REGULATIONS FOR THE USES AND OCCUPANCIES SPECIFIED HEREIN.

PERMISSIBLE USE AND OCCUPANCY

STORY	LIVE LOAD LBS PER SQ. FT.	MAXIMUM NO. OF PERSONS PERMITTED	ZONING DWELLING OR ROOMING UNITS	BUILDING CODE HABITABLE ROOMS	ZONING USE GROUP	BUILDING CODE OCCUPANCY GROUP	DESCRIPTION OF USE
Cellar	O.G.	99			16D	B-1	STORAGE
001	100	107			16D	B-1	STORAGE ACCESSORY OFFICE
002-004	100	107			16D	B-1	STORAGE ALL APPLICABLE PERFORMANCE STANDARDS TO BE COMPLIED WITH FOR USE GROUP 16D
							NOTE : Fire Guards located on each floor as per Boro Commissioner OK DATED 12-15-04
							ELECTRICAL SIGNOFF REMAINING TRI
							TEMP 90 DAY TO EXPIRE 4/7/05

OPEN SPACE USES

(SPECIFY—PARKING SPACES, LOADING BERTHS, OTHER USES, NONE)

NO CHANGES OF USE OR OCCUPANCY SHALL BE MADE UNLESS A NEW AMENDED CERTIFICATE OF OCCUPANCY IS OBTAINED

THIS CERTIFICATE OF OCCUPANCY IS ISSUED SUBJECT TO FURTHER LIMITATIONS, CONDITIONS AND SPECIFICATIONS NOTED ON THE REVERSE SIDE.

A.I.A.

BOROUGH SUPERINTENDENT

COMMISSIONER

☑ ORIGINAL ☐ OFFICE COPY - DEPARTMENT OF BUILDINGS ☐ COPY

3

B Form 54 (REV. 06/03)

B Form 54 (Back) (REV. 06/03)

THAT THE ZONING LOT ON WHICH THE PREMISES IS LOCATED IS BOUNDED AS FOLLOWS:

BEGINNING at a point on the Northwest side of Third Avenue
distant 157 feet from the corner formed by the intersection of
Third Avenue and Carroll Street
running thence SW 154.80 feet; thence NW 190.0 feet;
thence NE 18.63 feet; thence NW 110 feet;
thence E 115.20 feet; thence SE 120.60 feet;
thence E 9.9 feet; thence SE 180 feet;
to the point or place of beginning.

~~N.B. BLOCK No.~~ 301510595 DATE OF COMPLETION
BUILDING OCCUPANCY GROUP CLASSIFICATION B-1
CONSTRUCTION CLASSIFICATION 1-C
HEIGHT 4 STORIES, 53 FEET

THE FOLLOWING FIRE DETECTION AND EXTINGUISHING SYSTEMS ARE REQUIRED AND WERE INSTALLED IN COMPLIANCE WITH APPLICABLE LAWS.

	YES	NO
STANDPIPE SYSTEM		
YARD HYDRANT SYSTEM		X
STANDPIPE FIRE TELEPHONE AND SIGNALLING SYSTEM		X
SMOKE DETECTOR	X	
FIRE ALARM AND SIGNAL SYSTEM	X	

	YES	NO
AUTOMATIC SPRINKLER SYSTEM	X	

STORM DRAINAGE DISCHARGES INTO:
A) STORM SEWER ☐ B) COMBINED SEWER ☒ C) PRIVATE SEWAGE DISPOSAL SYSTEM ☐

SANITARY DRAINAGE DISCHARGES INTO:
A) SANITARY SEWER ☐ B) COMBINED SEWER ☒ C) PRIVATE SEWAGE DISPOSAL SYSTEM ☐

LIMITATIONS OR RESTRICTIONS:
BOARD OF STANDARDS AND APPEALS CAL. NO.
CITY PLANNING COMMISSION CAL. NO.
OTHERS:

E

50/C/H

Form 54-B (Rev. 4/62)-80M-601036(62) 114

DEPARTMENT OF BUILDINGS

CK BOROUGH OF Brooklyn , THE CITY OF NEW YORK

Date NOV 21 1962 No. 1960

CERTIFICATE OF OCCUPANCY

NO CHANGES OF USE OR OCCUPANCY NOT CONSISTENT WITH THIS CERTIFICATE SHALL BE MADE UNLESS FIRST APPROVED BY THE BOROUGH SUPERINTENDENT

This certificate supersedes C. O. No.

THIS CERTIFIES that the ~~new~~ altered ~~existing~~ building—premises located at 310 - 3rd Avenue Block 453 Lot 36

That the zoning lot and premises above referred to are situated, bounded and described as follows:

BEGINNING at a point on the west side of 3rd Avenue distant 157'8" feet south from the corner formed by the intersection of Carroll Street and 3rd Avenue running thence south 37'8"thence west 194'5-5/8"thence north 176' ~~xxxx~~5-3/8 thence east 44'thence south 75 feet; thence east 45'thence south 33 feet: running thence east 12'3"thence south 39'10-5/8"thence east 100 feet; to the point or place of beginning, conforms substantially to the approved plans and specifications, and to the requirements of the Building Code, the Zoning Resolution and all other laws and ordinances, and of the rules of the Board of Standards and Appeals, applicable to a building of its class and kind at the time the permit was issued; and

CERTIFIES FURTHER that, any provisions of Section 646F of the New York Charter have been complied with as certified by a report of the Fire Commissioner to the Borough Superintendent.

~~xxxxx~~ Alt. No.— 329-1959

Occupancy classification— factory Construction classification— non-fireproof

Date of completion— const. 11-16-62 . Height 1 stories, 16 feet.

at time of issuance of permit. plumb. 11-16-62 . Located in unrestricted - A Zoning District.

This certificate is issued subject to the limitations hereinafter specified and to the following resolutions of the Board of Standards and Appeals:
and The City Planning Commission: (Calendar numbers to be inserted here)

PERMISSIBLE USE AND OCCUPANCY

Off-Street Parking Spaces .....

Off-Street Loading Berths .....

STORY	LIVE LOADS Lbs. per Sq. Ft.	PERSONS ACCOMMODATED	USE
First	on ground	15	factory
			TOTAL:- Factory

Borough Superintendent

OFFICE COPY—DEPARTMENT OF BUILDINGS

PERMISSIBLE USE AND OCCUPANCY (continued)

STORY	LIVE LOADS Lbs. per Sq. Ft.	PERSONS ACCOMMODATED	USE

Borough Superintendent

Form 54-C (Rev. 7/64)–15M-701020(64) 114

DEPARTMENT OF BUILDINGS

ck BOROUGH OF Brooklyn, THE CITY OF NEW YORK

Date JUN 8- 1965 No. 191946

CERTIFICATE OF OCCUPANCY

NO CHANGES OF USE OR OCCUPANCY NOT CONSISTENT WITH THIS CERTIFICATE SHALL BE MADE UNLESS FIRST APPROVED BY THE BOROUGH SUPERINTENDENT

This certificate supersedes C. O. No. 164188

THIS CERTIFIES that the ~~new~~ altered ~~erected~~ building—premises located at 310 Third Avenue Block 453 Lot 52

That the zoning lot and premises above referred to are situated, bounded and described as follows:

BEGINNING at a point on the west side of 3rd Avenue distant 157'8" feet south from the corner formed by the intersection of Carroll Street and 3rd Avenue.

running thence south 37'8" feet; thence west 194'5-5/8" feet;
thence north 26'5-3/8" feet; thence east 17 feet;
running thence north 9'9" feet; thence east 80 feet;
to the point or place of beginning, conforms substantially to the approved plans and specifications, and to the requirements of the Building Code, the Zoning Resolution and all other laws and ordinances, and of the rules of the Board of Standards and Appeals, applicable to a building of its class and kind at the time the permit was issued: and

CERTIFIES FURTHER that any provisions of Section 646e of the New York Charter have been complied with as certified by a report of the Fire Commissioner to the Borough Superintendent.

~~New~~ Alt. No.— Alt. 194-1963 Construction classification— class 3 nonfireproof

Occupancy classification—See occupancy below . Height 1 stories, 16 feet.

Date of completion— const. 3-3-65 . Located in M2-1 Zoning District.

at time of issuance of permit. plumb. 2-8-65

This certificate is issued subject to the limitations hereinafter specified and to the following resolutions of the Board of Standards and Appeals:
and The City Planning Commission: (Calendar numbers to be inserted here)

PERMISSIBLE USE AND OCCUPANCY

Off-Street Parking Spaces .....

Off-Street Loading Berths .....

STORY	LIVE LOADS Lbs. per Sq. Ft.	PERSONS ACCOMMODATED	USE
First	on ground	15	motor vehicle repair shop, including body and fender work (Use Group #17B) with oxy-acetylene welding (Use Group #16A)
open yard	on ground	-	oxy-acetylene welding-(Use Group #16A)
Performance Standards Applicable in an M2 District to be fully complied with			
		TOTAL:- AS STATED ABOVE	

Sewage Disposal:
Sanitary Drainage (DOES) (DOES NOT) Discharge Into Either Sanitary or Combined Sewer

Storm Drainage (DOES) (DOES NOT) Discharge Into Either Storm or Combined Sewer

Borough Superintendent

OFFICE COPY—DEPARTMENT OF BUILDINGS

PERMISSIBLE USE AND OCCUPANCY (continued)

STORY	LIVE LOADS Lbs. per Sq. Ft.	PERSONS ACCOMMODATED	USE

Borough Superintendent

PREMIER HOLDING
318 3RD AVE
BROOKLYN, NY

CELLAR PLAN

nf designs
architects & planners

APPROVED/ACCEPTED
WITH SELF CERTIFICATION
OF COMPLIANCE

PARTIAL APPROVED

A-1.1

PREMIER HOLDING
38 3RD AVE.
BROOKLYN, NY

1ST FLOOR PLAN

nf designs
architects & planners

1 FIRST FLOOR PLAN

APPROVED/ACCEPTED
WITH SELF CERTIFICATION
OF OBJECTIONS

A-1.2

SECOND FLOOR PLAN

PREMIER HOLDING

318 3RD AVE
BROOKLYN, NY

nf designs
architecture & planning

3RD FLOOR PLAN

A-1.4

1 THIRD FLOOR PLAN

APPROVED/ACCEPTED
WITH SELF CERTIFICATION
NO OBJECTIONS

FOURTH FLOOR PLAN

B453 L54

1 ROOF PLAN
A-1.6

2 PARAPET FLASHING
A-1.6

3 ROOF PORTAL DETAIL
A-1.6

5 SCUPPER DETAIL
A-1.6

APPROVED/ACCEPTED WITH SELF CERTIFICATION OF OBJECTIONS

APR 24 2018

ANDY PACHECO

PREMIER HOLDING
312 3RD AVE
BROOKLYN NY

nf designs
architects & planners

3015104995
Objections
Self Certified

A-1.6

3457 L4

PREMIER HOLDING
312/318 3RD AVE
BROOKLYN, NY

nf designs
architects & planners

ROOF PLAN

A-16

1 ROOF/STAIR BULKHEAD PLAN

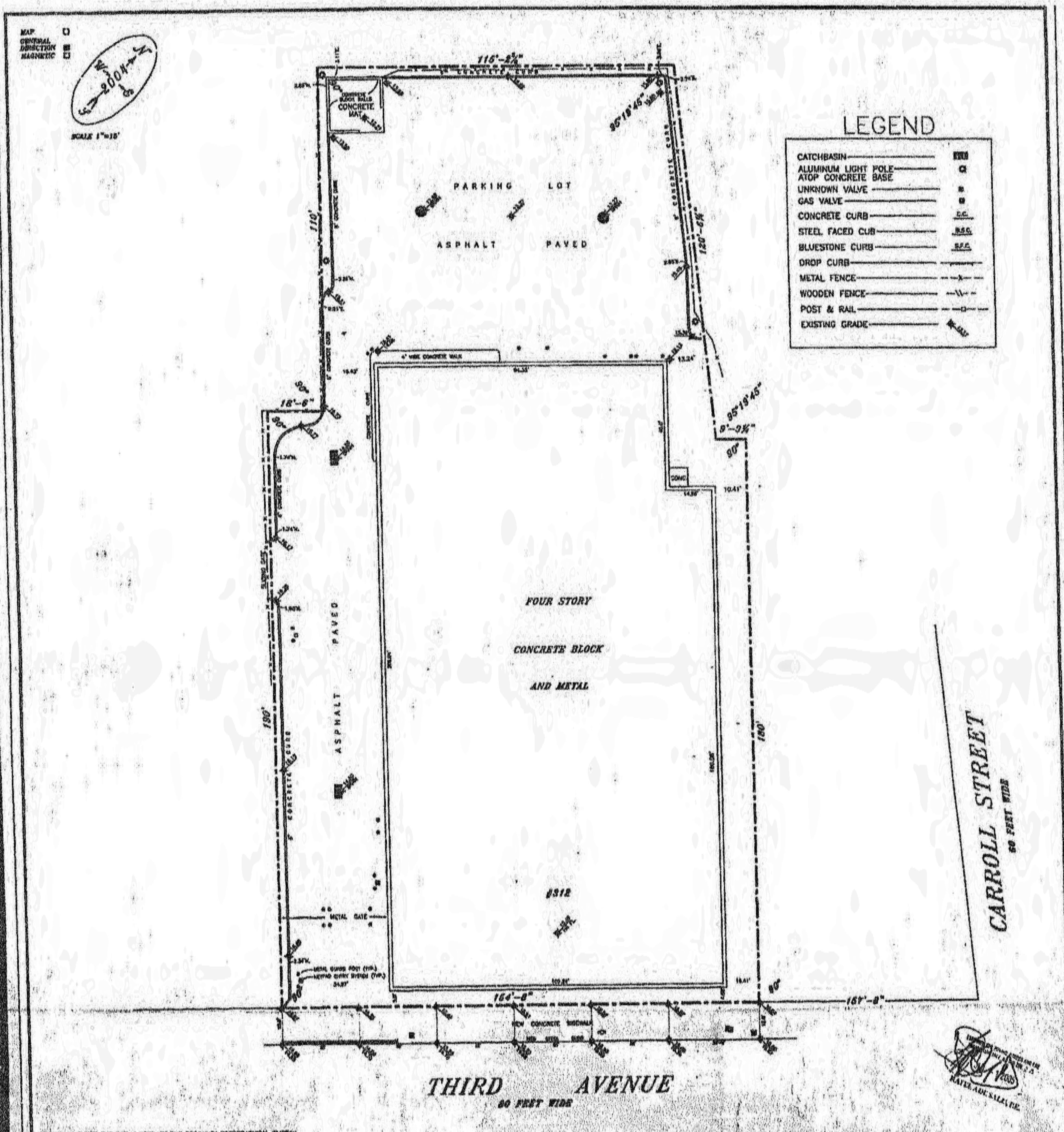
2 PARAPET FLASHING

3 ROOF PORTAL DETAIL

4 PARAPET RAILING

5 SCUPPER DETAIL

B453 L54



ELEVATIONS REFER THE DATUM USED BY THE BROOKLYN TOPOGRAPHICAL BUREAU

NOT TO BE USED IN THE CONVEYANCE OF REAL PROPERTY
UNLESS OTHERWISE NOTED, PHYSICAL MONUMENTS HAVE NOT BEEN SET.
Use of this survey for any other purpose may result in problems for which this surveyor will not be liable.
"Unauthorized alteration to a survey map bearing a licensed land surveyor's seal is a violation of section 7209, sub-division 2, of the New York State Education Law"
"Only copies from the original of this survey marked with an original of the land surveyor's embossed seal shall be considered to be valid true copies."

312-3AVE-FINAL PR

FINAL SURVEY

REVISED JUNE 18, 2004

DATE SURVEYED
MARCH 11, 2004

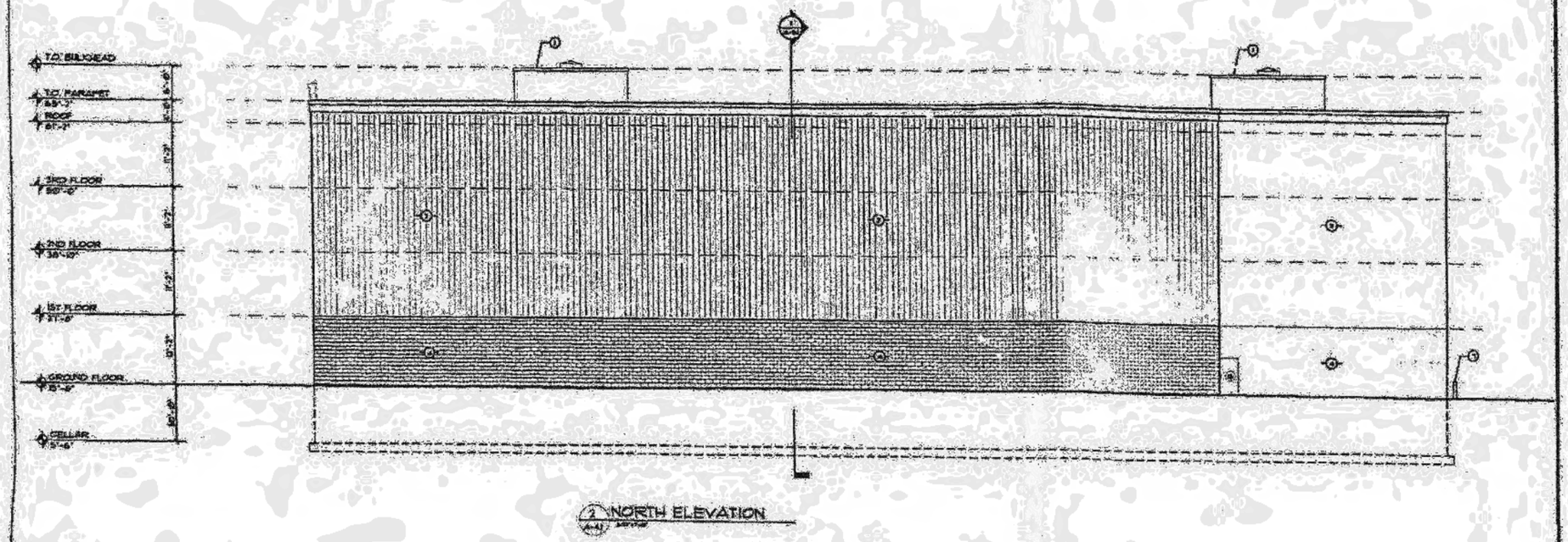
BROOKLYN
COUNTY OF: KINGS

JOB No. 20040281 TAX BLOCK No. 453 LOT No. 54

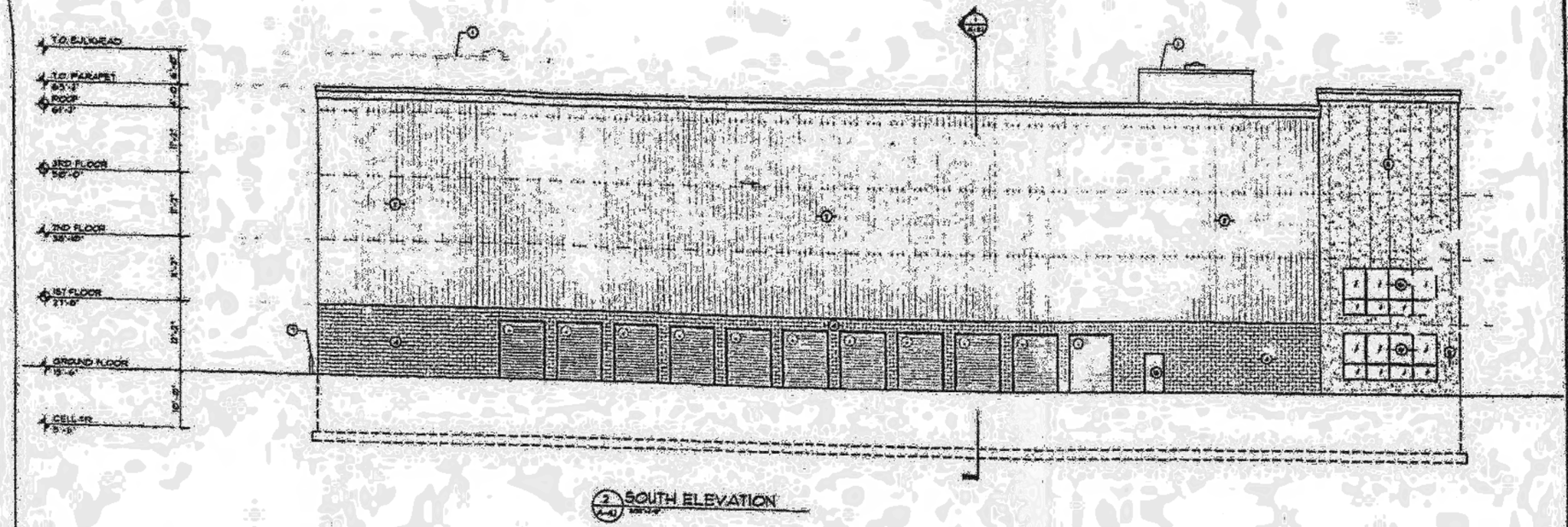
BARRY M. FAHRER
NEW YORK STATE
LICENSED LAND SURVEYOR
No. 49651

STATE OF NEW YORK

3453 L54



2 NORTH ELEVATION



2 SOUTH ELEVATION

LEGEND

1. STAIR BULKHEAD, EIFS FINISH
2. ALUMA SHIELD, INSULATED METAL WALL PANEL 4400-SERIES 2" THICK (COLOR TO BE SELECTED)
3. 10'-0" x 10'-0" PULL DOWN METAL GATE
4. CONCRETE BLOCK
5. CORNICE
6. EXPOSED CONCRETE, PAINTED
7. STEEL BOLLARD 3" DIA. 3'-6" OC. (TYP.) (PAINT COLOR TO BE SELECTED)
8. ALUMINUM COPING (COLOR TO BE SELECTED)
9. WALL MOUNTED LIGHT FIXTURE
10. EXPOSED GUTTER/LEADER SEE PLAN
11. ALUMINUM & GLASS STOREFRONT TO BE DOUBLE GALAZED INSULATED
12. ELEVATOR BULKHEAD
13. EXIT DOOR, PAINTED TO MATCH COLOR OF WALL

COLOR CODE

- (A) XXXXXXXXXX
- (B) XXXXXXXXXX
- (C) XXXXXXXXXX
- (D) XXXXXXXXXX
- (E) XXXXXXXXXX
- (F) XXXXXXXXXX

APPROVED/ACCEPTED WITH SELF CERTIFICATION OF OBJECTIONS

APR 2 4 2003

ANDY PACHECO

ORIGINAL APPROVED

LOCATION
PREMIER HOLDING
318 3RD AVE.
BROOKLYN, NY

NO.	DATE	REVISION
1		
2		
3		

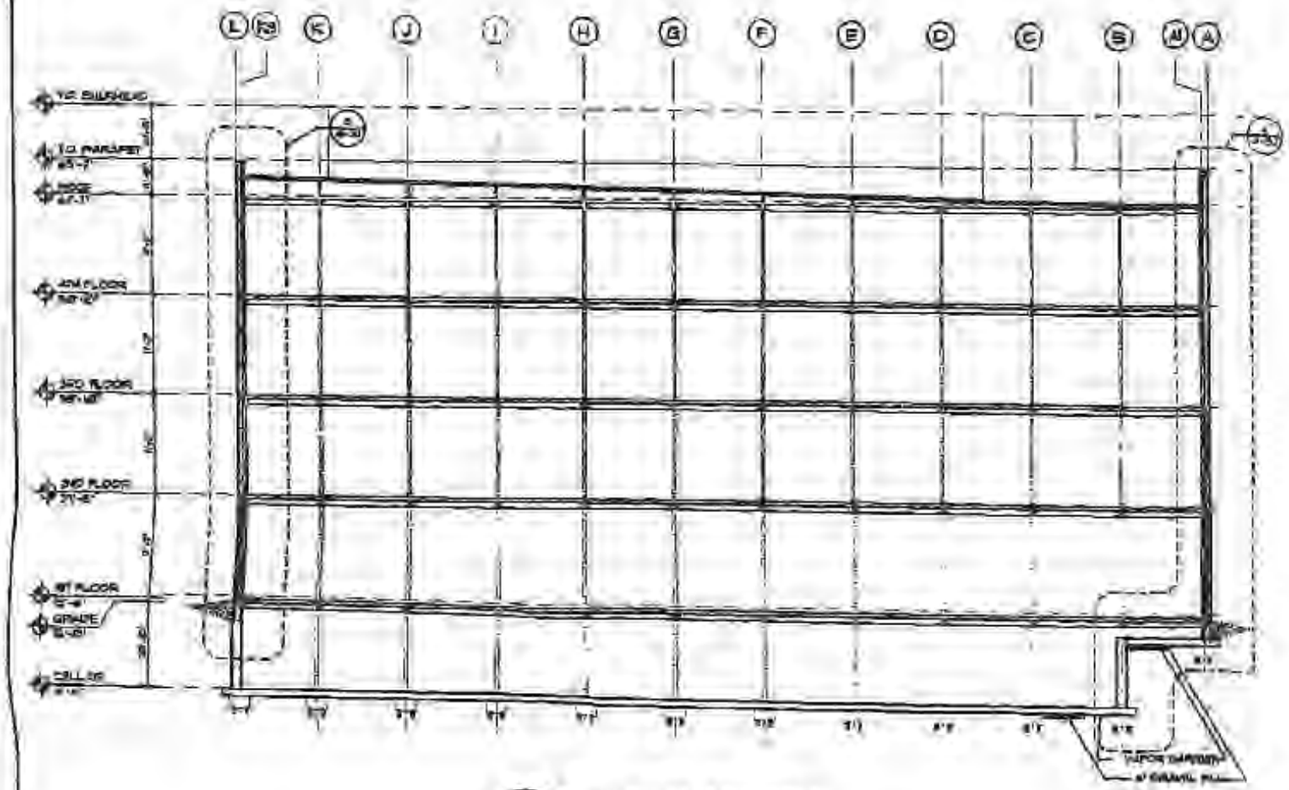
DRAWING TITLE
ELEVATIONS

nf designs
architects & planners

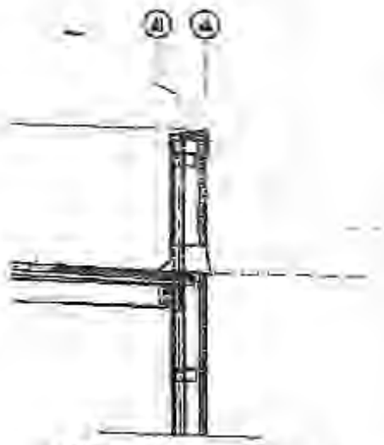
A-4.1

WEST ELEVATION

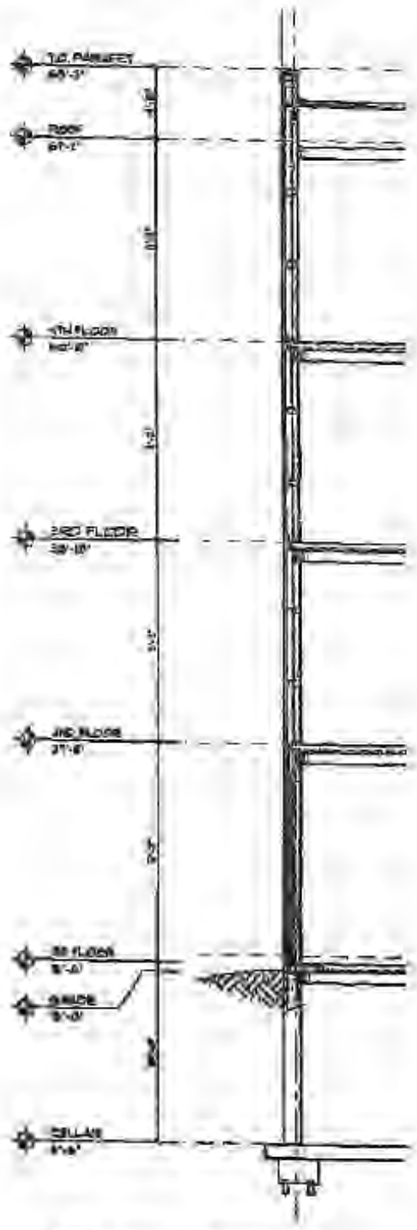
2451 Lc



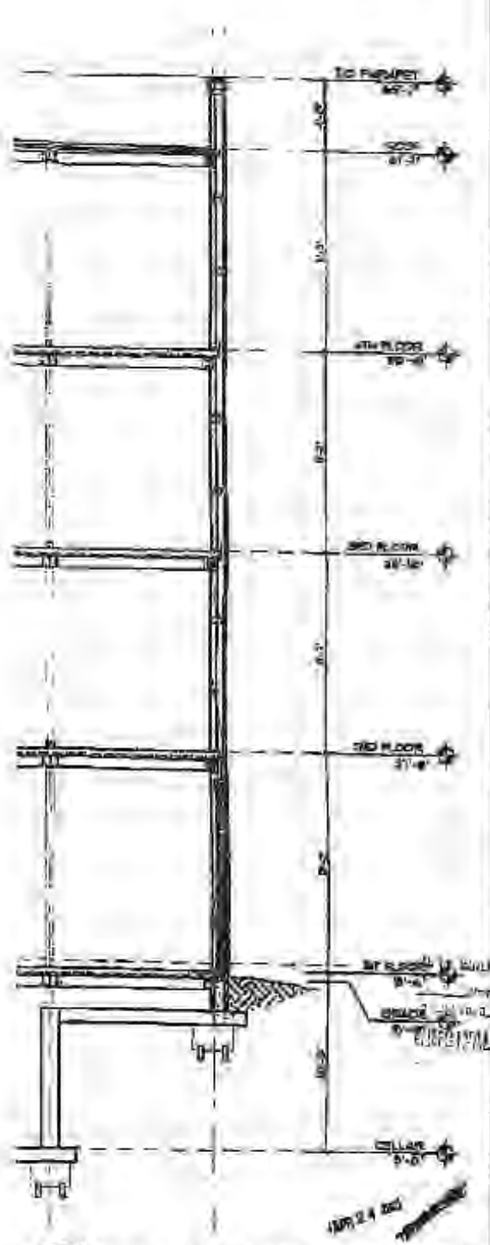
1 / A5.1 BUILDING SECTION



2 / A5.1 WALL SECTION



3 / A5.1 WALL SECTION



4 / A5.1 WALL SECTION

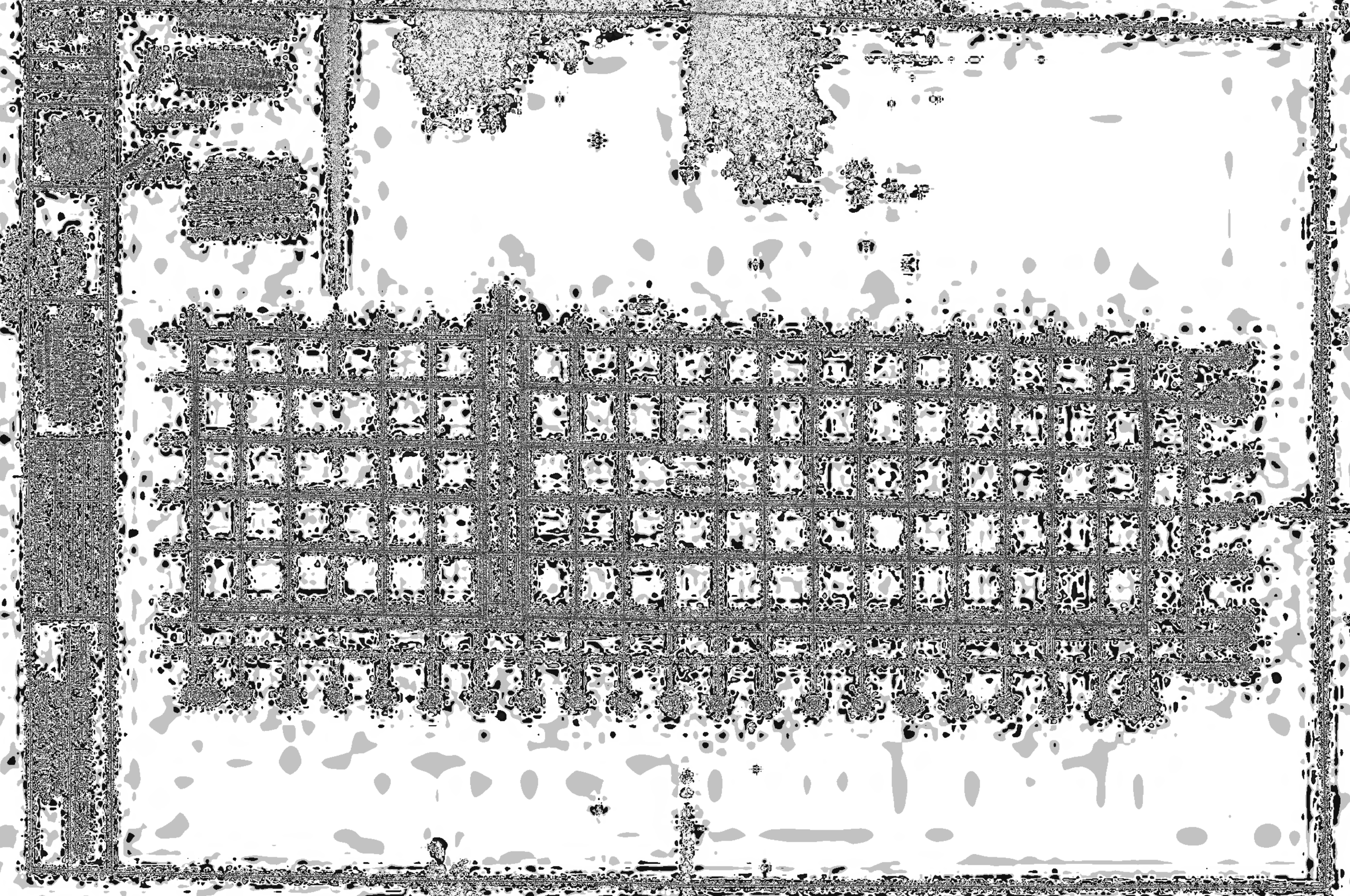
APPROVED/ACCEPTED

PREMIER HOLDING
318 3RD AVE.
BROOKLYN, NY

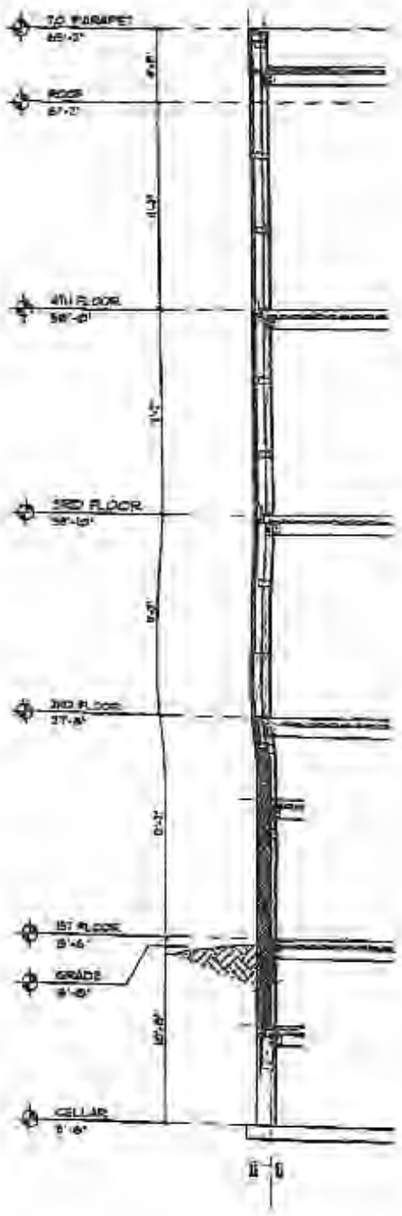
BUILDING SECTION

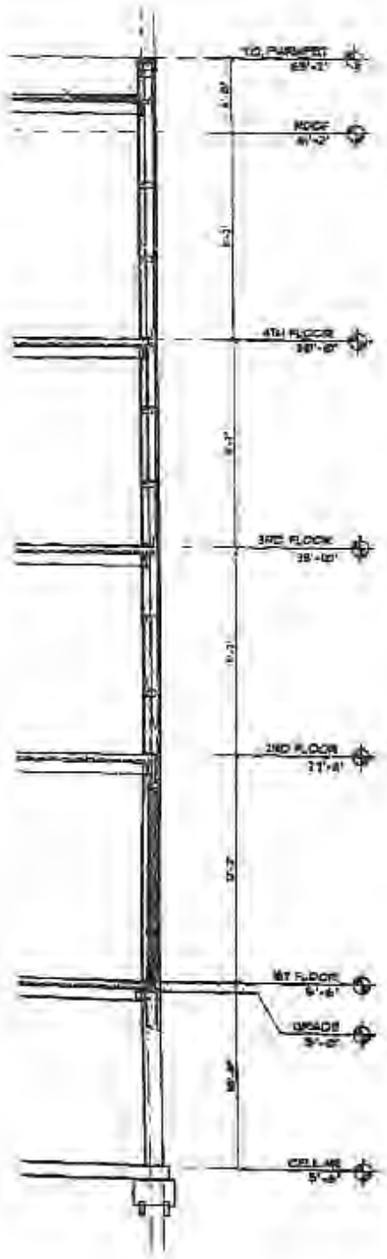
nf designs
architects & planners

A-5.1



B451 L55





ANDY PACHECO

APPROVED/UNDER
WITH SELF
OF

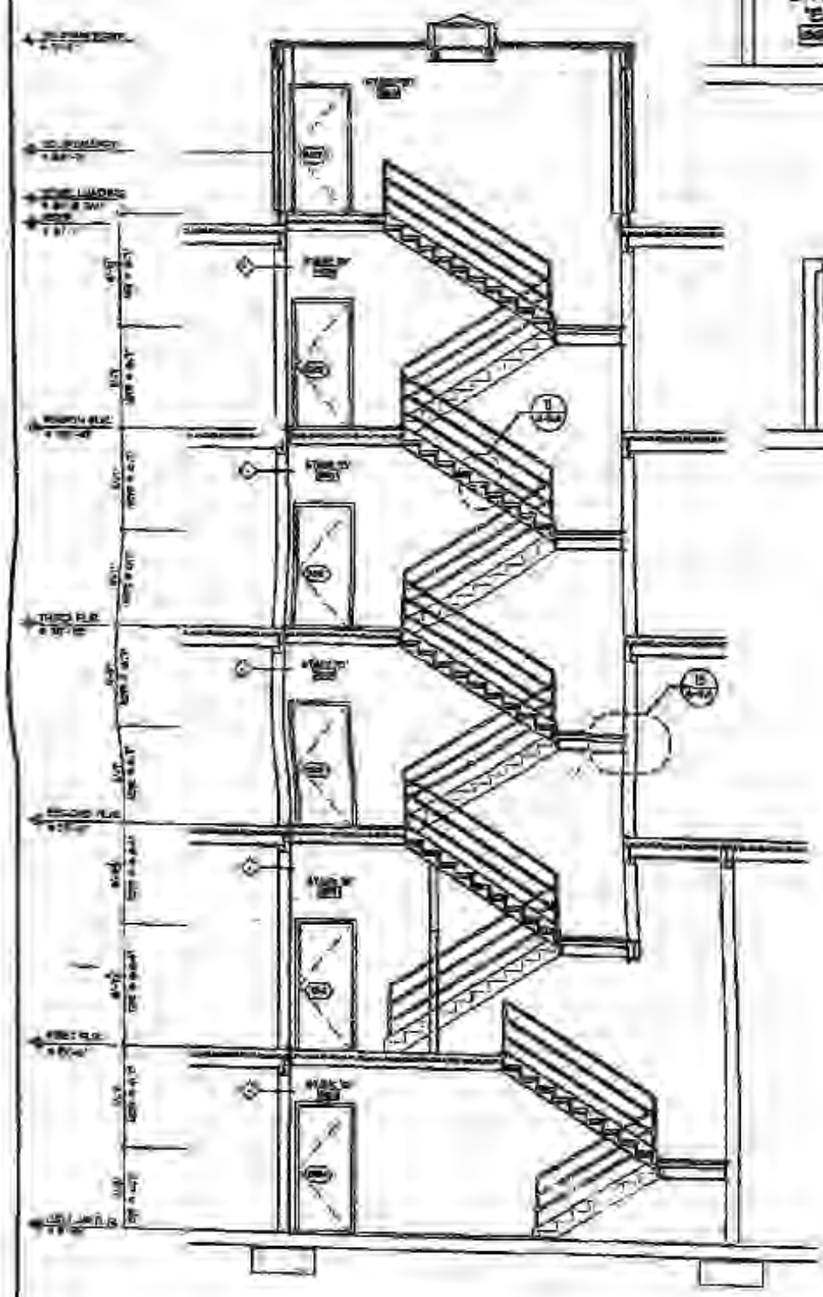
1

PREMIER HOLDING
318 3RD AVE.
BROOKLYN, NY

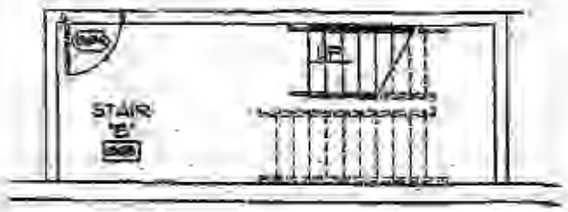
BUILDING SECTION

nf designs
architects & planners

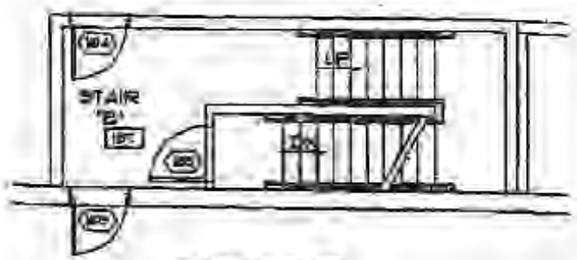
A-5.3



1 STAIR SECTION

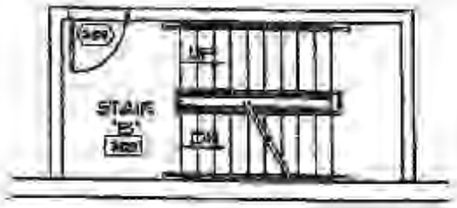


2 CELLAR FLOOR



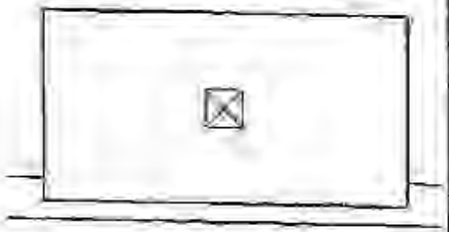
3 1ST FLOOR

4 2ND FLOOR

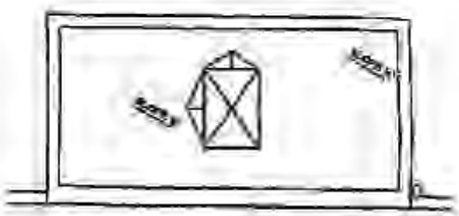


5 3RD FLOOR

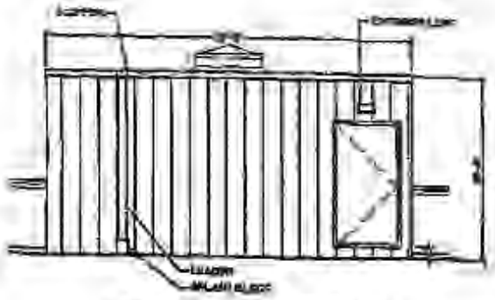
6 4TH FLOOR



7 ROOF

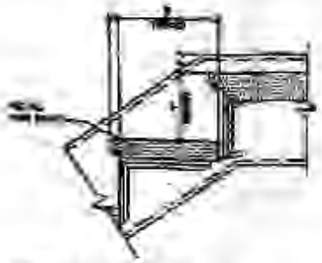


8 STAIR ROOF

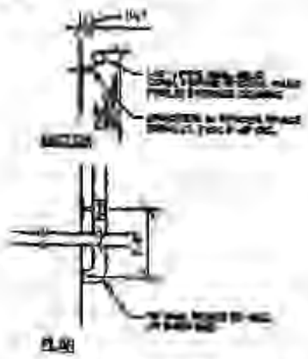


9 ROOF STAIR ELEV.

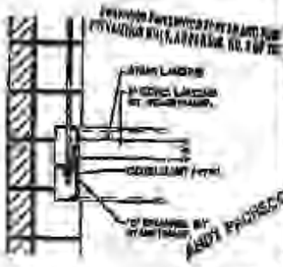
10 ROOF STAIR ELEV.



11 STAIR DETAIL



12 RAILING DETAILS



13 SYSTEMS DETAIL

APPROVED/ACCEPTED
WITH SELF CERTIFICATION
SEE CONDITIONS

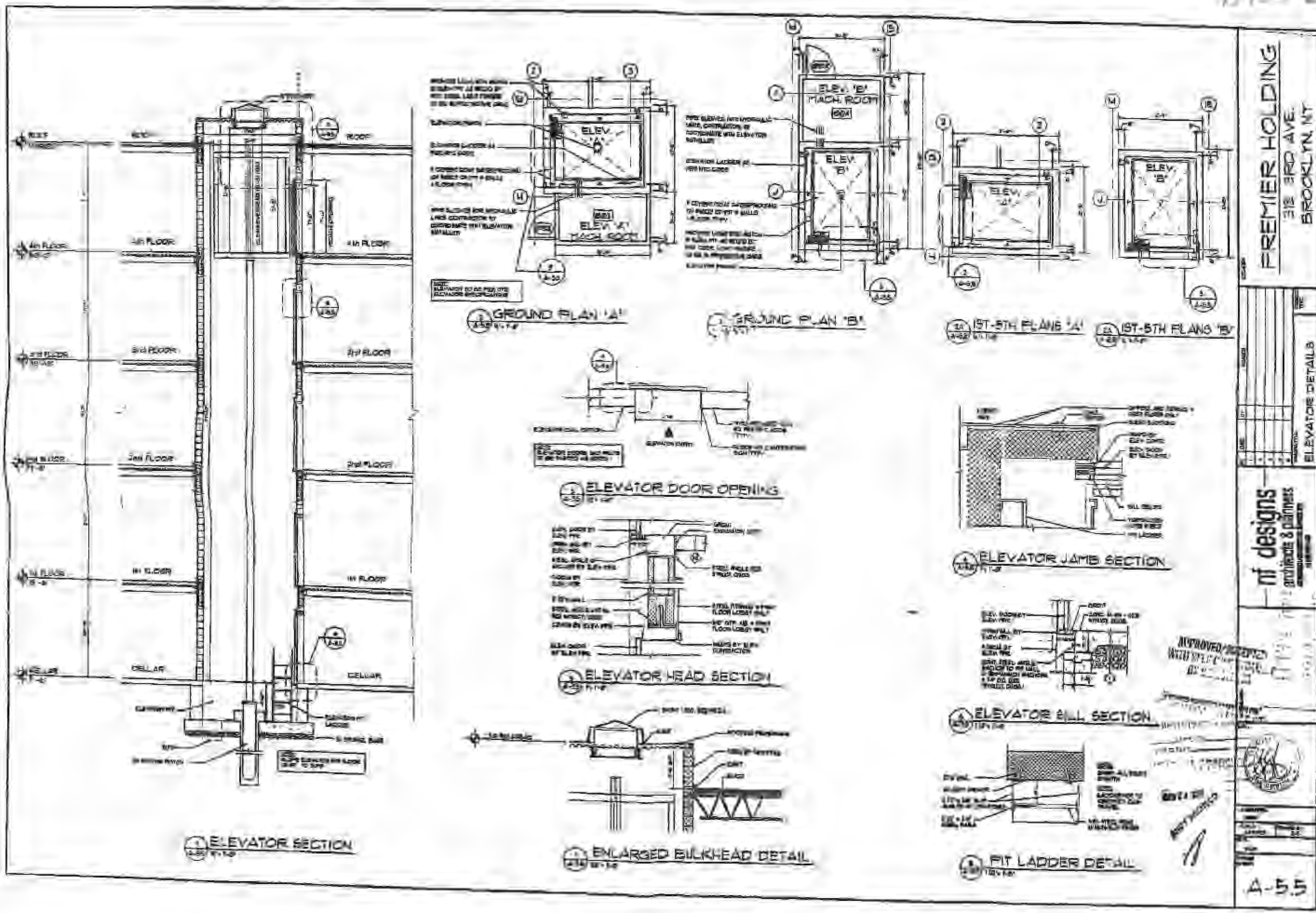
ORIGINAL APPROVED

PREMIER HOLDING
318 3RD AVE.
BROOKLYN, NY

STAIR DETAILS

rf designs
architects & planners

A-5.4



PREMIER HOLDING
318 3RD AVE.
BROOKLYN, NY
ELEVATOR DETAILS
nf designs
architects & planners
A-5.5
ROOF
4th FLOOR
3rd FLOOR
2nd FLOOR
1st FLOOR
CELLAR
ELEVATOR SECTION
ELEV. 'A'
ELEV. 'A' MACH. ROOM
GROUND PLAN 'A'
ELEV. 'B' MACH. ROOM
ELEV. 'B'
GROUND PLAN 'B'
1ST-5TH PLANS 'A'
1ST-5TH PLANS 'B'
ELEVATOR DOOR OPENING
ELEVATOR HEAD SECTION
ELEVATOR JAMB SECTION
ELEVATOR SILL SECTION
ENLARGED BULKHEAD DETAIL
PIT LADDER DETAIL

840 L-56

PREMIER HOLDING

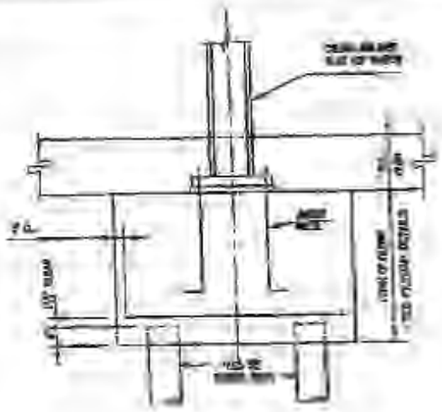
APPROVED/ACCEPTED
WITH SELF CERTIFICATION
OF CONDITIONS

FOUNDATION PLAN

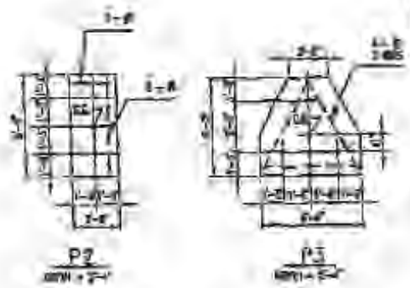
PART 1ST FLOOR FRAMING PLAN

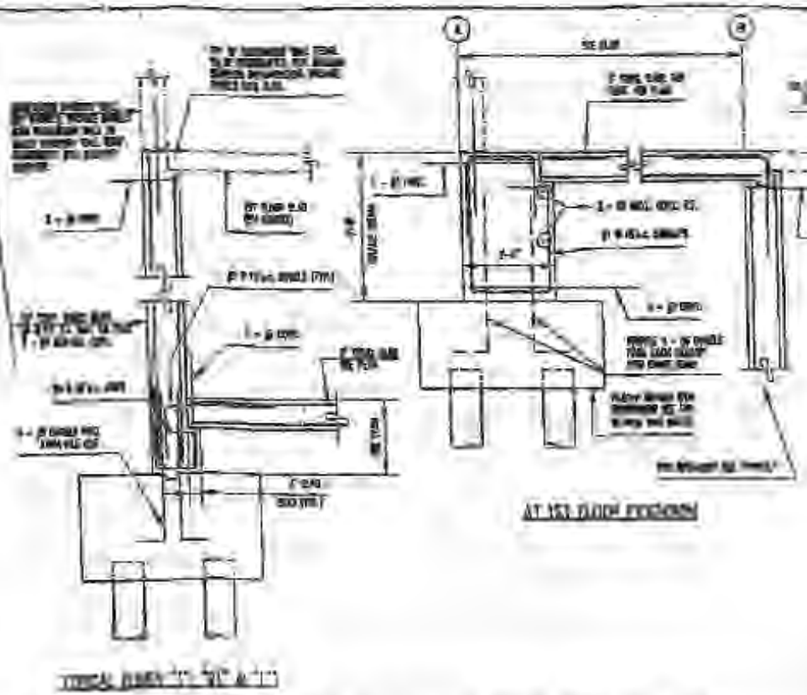
nf designs
architecture & planning

S-1

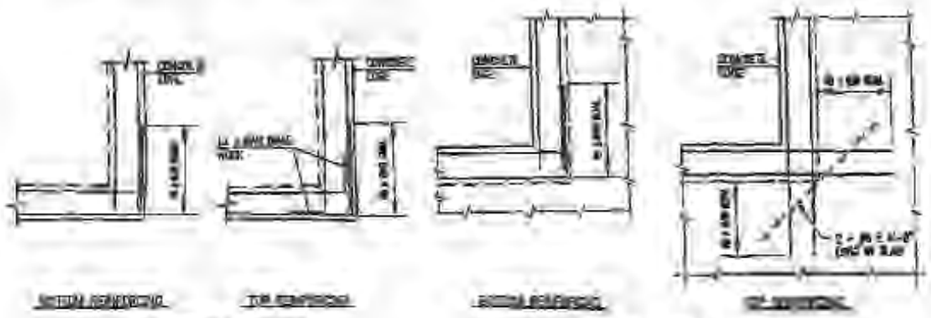


TYPICAL PILECAP SECTION





TYPICAL PERIMETER PILECAP AND GRADE BEAM SECTIONS

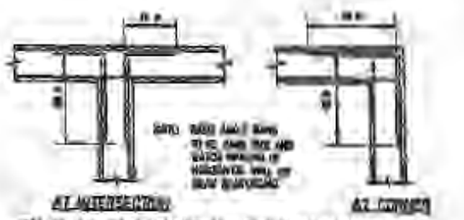


EXTERIOR CORNER

RE-ENTRANT CORNER

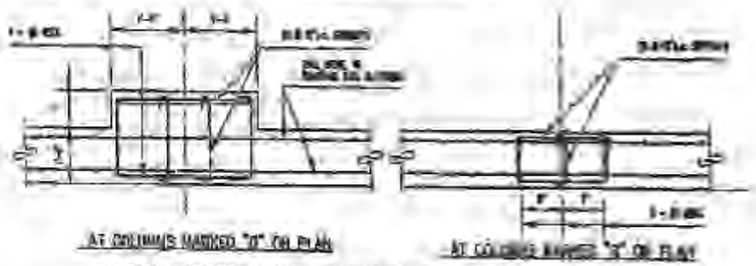
PLAN OF TYPICAL CONTINUOUS BEAM REINFORCING AT CORNERS

TYPICAL CONSTRUCTION JOINT DETAILS



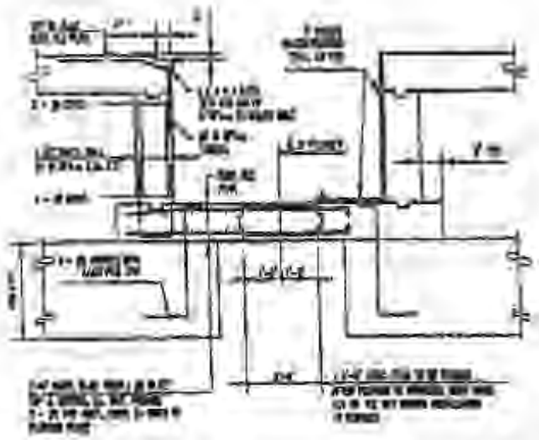
TYPICAL HORIZONTAL FOUNDATION WALL AND / OR GRADE BEAM REINFORCING DETAIL

TYPICAL CONTROL JOINT

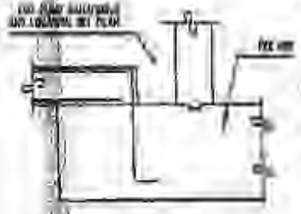


TYPICAL ADDITIONAL REINFORCING AT WIND COLUMNS

HIGH CHAIR DETAIL



SECTION AT ELEVATION PIT



AT SUMP PIT

FILE AND FOUNDATION NOTES:

1. THE EXCAVATION CONTRACTOR SHALL BE FAMILIAR WITH THE SOIL CONDITIONS AND THE SPECIFICATIONS, AND THE APPLICABLE LEGAL AND REGULATORY REQUIREMENTS.
2. ALL CONCRETE AND FOUNDATION WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NEW YORK CITY BUILDING CODE.
3. ALL TIMBER PILES SHALL CONFORM TO ASTM D25 EXCEPT PILES DRIVEN FROM FLOATING EQUIPMENT SHALL BE SPECIFICATION ASTM D25-67, AS PILES SHALL HAVE A MINIMUM OF TWO LAYERS OF HOT BITUMEN APPLIED TO THE BUTT END AFTER CUTTING OFF.
4. ALL TIMBER PILES SHALL BE DRIVEN WITH A MINIMUM OF TEN BLOWS PER INCH FOR THE LAST TEN INCHES OF PENETRATION. PILES SHALL BE DRIVEN TO A MINIMUM EMBEDMENT OF 10 FEET. MINIMUM DRIVING REQUIREMENTS AND MINIMUM EMBEDMENT SHALL CONFORM TO THOSE REQUIRED BY THE NEW YORK CITY BUILDING CODE. THE MINIMUM EMBEDMENT SHALL BE MEASURED FROM THE TOP OF THE PILE AFTER CUTTING OFF.
5. ALL PILES SHALL BE DRIVEN TO REFUSAL. A PROFESSIONAL ENGINEER EXPERIENCED IN PILE DRIVING SHALL BE PRESENT AT ALL TIMES DURING PILE DRIVING OPERATIONS.
6. PILES SHALL BE DRIVEN THROUGH FILL, ROCK, ETC. WITH PILING DRIVING EQUIPMENT CAPABLE OF EASILY DRIVING PILES INTO NATIVE SOIL.
7. DRIVING EQUIPMENT AND OPERATION SHALL BE AS PER SPECIFICATIONS AND REQUIREMENTS OF THE NEW YORK CITY BUILDING CODE. ANY VARIATIONS NECESSARY SHALL BE SUBMITTED AS SHOP DRAWINGS TO ENGINEER FOR APPROVAL BEFORE DRIVING.
8. ALL PILES SHALL BE CUT OFF AT ELEVATIONS SHOWN ON DRAWINGS AND SHALL NOT BE DRIVEN BELOW THE ELEVATIONS WITHOUT PERMISSION FROM THE ENGINEER.
9. ALL PILE DRIVING OPERATIONS SHALL BE SUPERVISED BY A LICENSED PROFESSIONAL ENGINEER OR REGISTERED ARCHITECT PROVIDING SATISFACTORY EVIDENCE THAT HE HAS HAD SUFFICIENT EXPERIENCE IN THE DESIGN AND SUPERVISION OF PILE DRIVING OPERATIONS TO QUALIFY HIM TO ASSUME RESPONSIBILITY FOR COMPLIANCE WITH THE NEW BUILDING CODE. THE ARCHITECT SHALL ACCEPT A CERTIFICATE SIGNED BY THE ENGINEER SUPERVISING PILE DRIVING OPERATIONS, TO BE FURNISHED TO THE OWNER'S REPRESENTATIVE, STATING THAT ALL PILES HAVE BEEN DRIVEN PROPERLY TO THE REQUIRED BEARING AND TO A LOAD NOT LESS THAN THAT SPECIFIED AND THAT ALL DRIVING REPORTS ARE ON FILE IN THE ENGINEER'S OFFICE. THIS CERTIFICATE SHALL BE FURNISHED BEFORE THE FINAL PAYMENT IS MADE TO THE CONTRACTOR FOR THE PILE DRIVING OPERATIONS.
10. PILE DRIVING EQUIPMENT SHALL COMPLY WITH SECTION 1910.1 OF THE NEW YORK CITY BUILDING CODE.
11. ANY CHANGE OR MODIFICATION OF LOAD OR ELEVATION OF FOOTINGS SHALL BE APPROVED BY THE ENGINEER.
12. PILE LOAD TESTING SHALL BE PERFORMED WHERE INDICATED.
13. ALL CONCRETE SHALL BE CONSTRUCTED ACCORDING TO THE REQUIREMENTS OF SECTION 1909.1 OF THE NEW YORK CITY BUILDING CODE. NO CONCRETE SHALL BE PLACED UNTIL THE REQUIREMENTS HAVE BEEN FULLY MET AND APPROVED BY SECTION 1909.1 OF THE NEW YORK CITY BUILDING CODE. ALL CONCRETE SHALL BE TESTED BY AN INDEPENDENT TESTING LABORATORY OF THE TYPE ENUMERATED IN SECTION 1909.1 OF THE NEW YORK CITY BUILDING CODE. THE LABORATORY SHALL BEAR THE SEAL OF THE ENGINEER LICENSED BY THE STATE OF NEW YORK AND SHALL SUBMIT ITS REPORTS TO THE ARCHITECT FOR REVIEW.
14. ALL REINFORCING BARS SHALL BE NEW BILLET STEEL, DEFORMED BARS CONFORMING WITH ALL THE REQUIREMENTS OF ASTM A615, GRADE 60. BARS SHALL BE BENT TO SHAPE COLD. ALL FABRICATION AND ERECTION OF REINFORCING SHALL CONFORM TO ACI 315.
15. ALL WELDED WIRE FABRIC REINFORCEMENT IN FOUNDATIONS SHALL BE SUPPORTED FOR CONCRETE PLACED AGAINST EARTH AND IN ALL OTHER LOCATIONS BEFORE CONCRETE PLACING. ALL REINFORCEMENT SHALL BE SECURELY TIED AT ALL INTERSECTIONS AND SPLICES WITH NO. 16 GAUGE ANNEALED WIRE. ALL REINFORCEMENT SHALL BE CLEAN OF ALL LOOSE SCALE, DIRT, OIL, GREASE, PAINT, ICE, OR OTHER FOREIGN MATERIAL THAT MAY REDUCE BOND. ALL REINFORCEMENT SHALL BE SECURELY HELD IN PLACE DURING THE PLACING OF CONCRETE. ALL REINFORCEMENT SHALL BE PLACED AS SHOWN ON THE DRAWINGS AND IN ACCORDANCE WITH ACI 315. ALL REINFORCEMENT SHALL BE INSPECTED BY THE ENGINEER BEFORE CONCRETE IS PLACED.
16. ALL CONSTRUCTION JOINTS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS. CONCRETE WALLS SHALL BE PLACED CONTINUOUSLY WITH ADJACENT FLOOR SLABS. WHERE ANY FOUNDATION WALL SHALL BE PLACED AT LEAST SEVEN DAYS BEFORE ANY ADJACENT WALL OR FLOOR SLAB, CONSTRUCTION JOINTS SHALL BE PROVIDED AS SHOWN ON THE DRAWINGS OR AS APPROVED BY THE ENGINEER AND ARCHITECT.

APPROVED/ACCEPTED WITH G.C.C. CONFIRMATION OF CONDITION

PREMIER HOLDING

nt designs architects & planners

FOUNDATION DETAILS & SECTIONS

S-2

A PROPOSED STORAGE FACILITY
FOR
PREMIER HOLDING FACILITY
3rd AVE.
BROOKLYN, NY

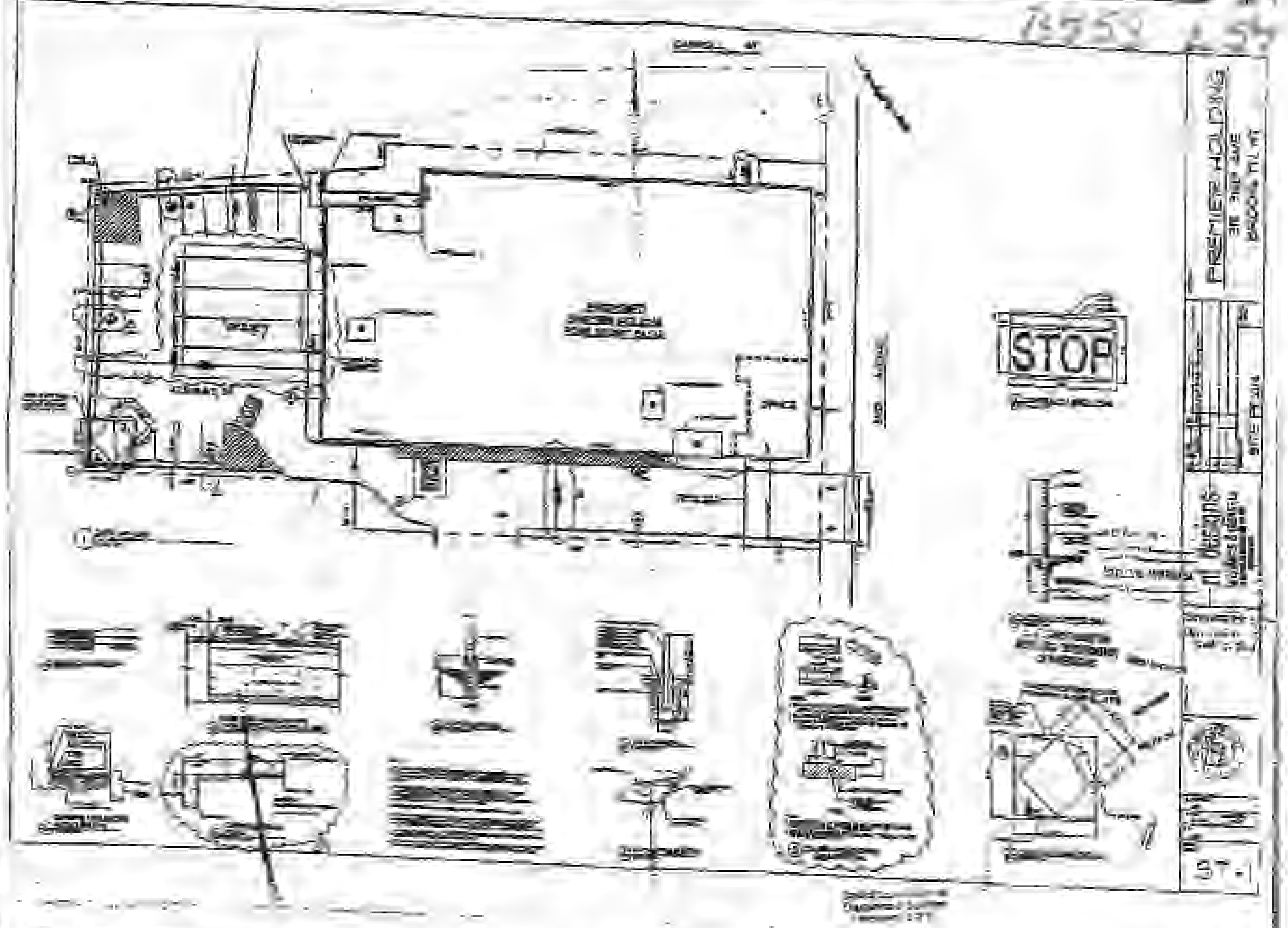
OWNER
PREMIER HOLDING COMPANY
... SUNRISE HIGHWAY ...
ROCKVILLE CENTRE NEW YORK ...
PHONE (516) ...

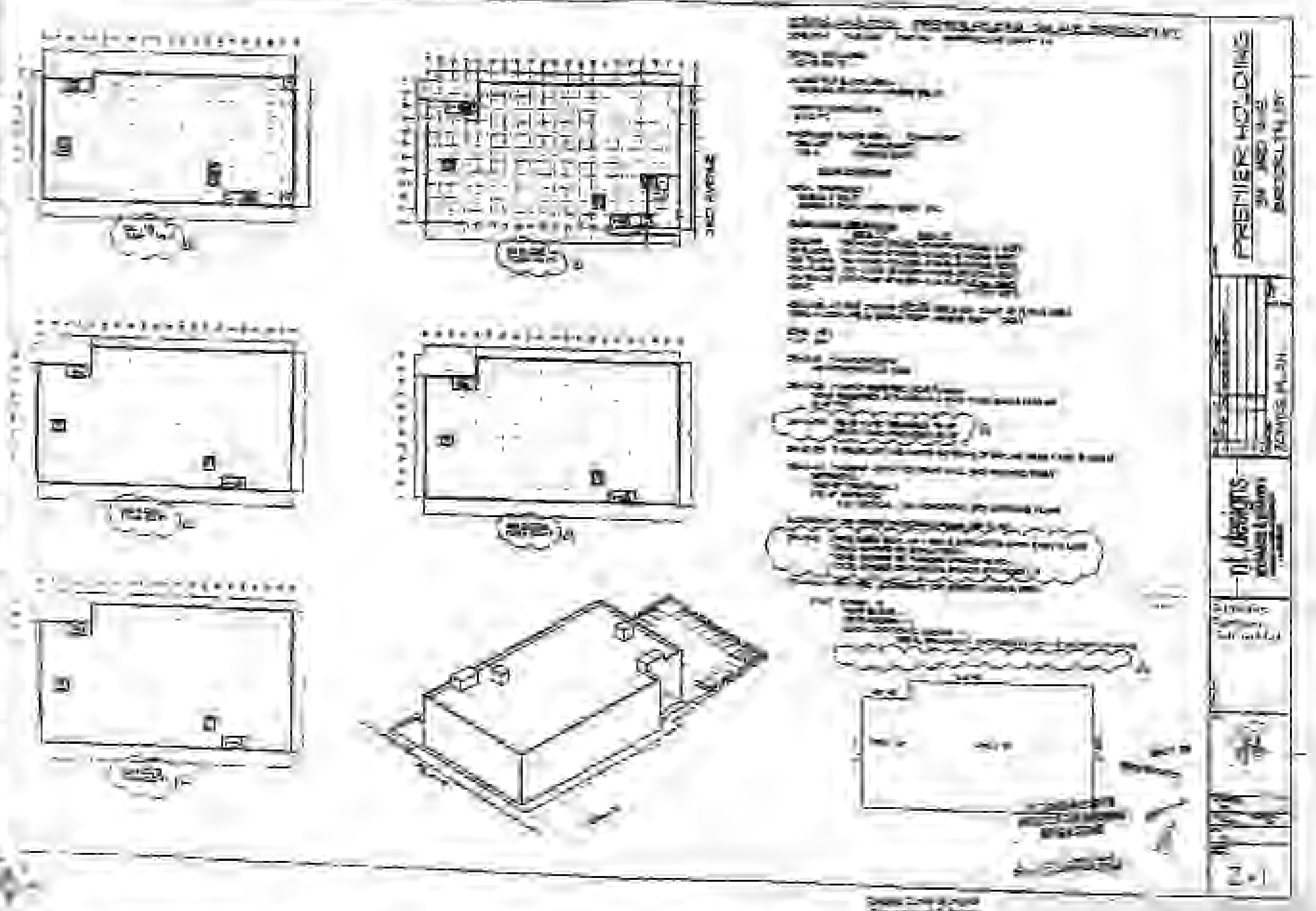
ARCHITECT
FRANK TRIOLO, ARCHITECT
... designs
441 ... LANE
OYSTER BAY, NY ...
PHONE (516) 624-7455

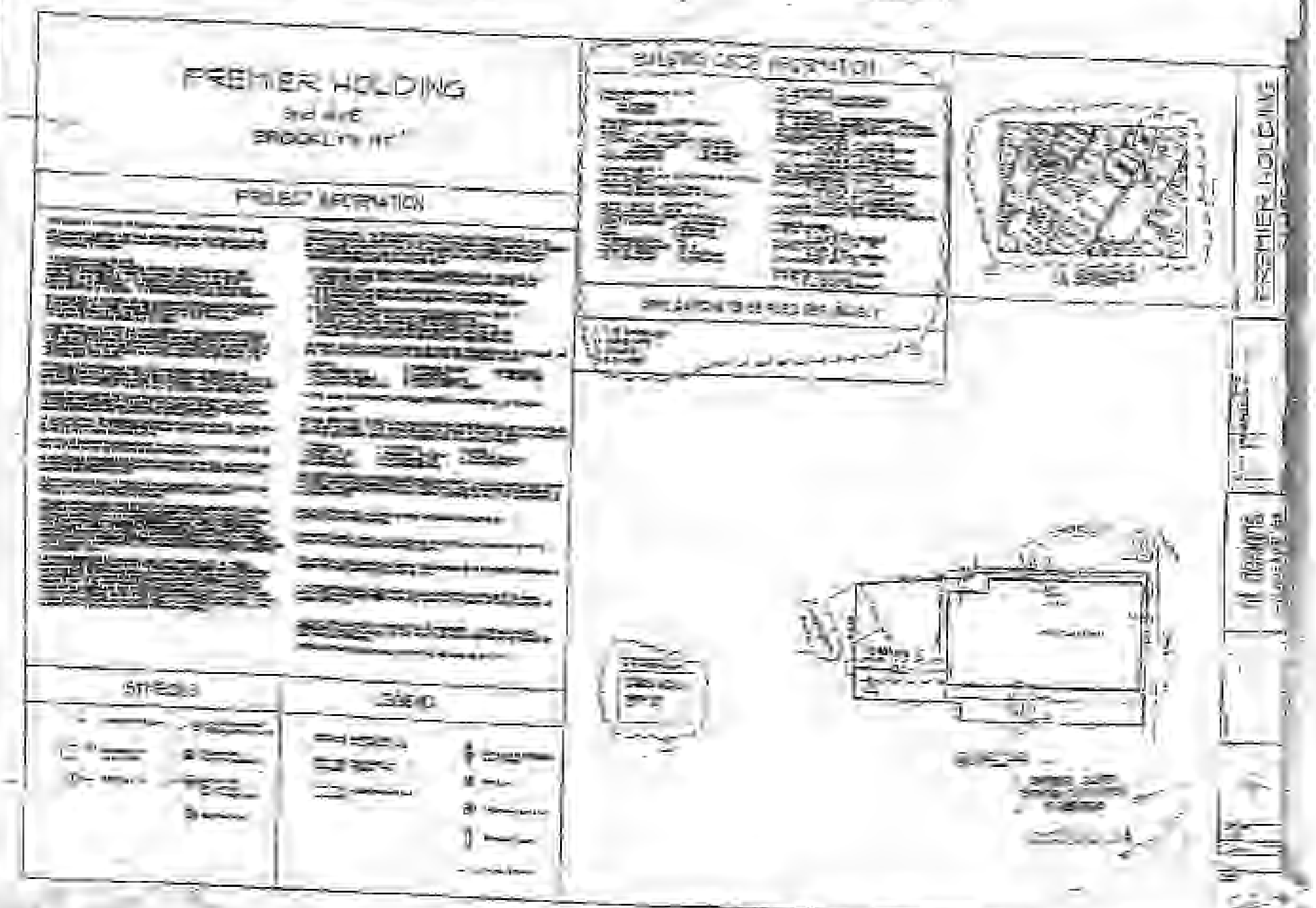
STRUCTURAL ENGINEER
XXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXX

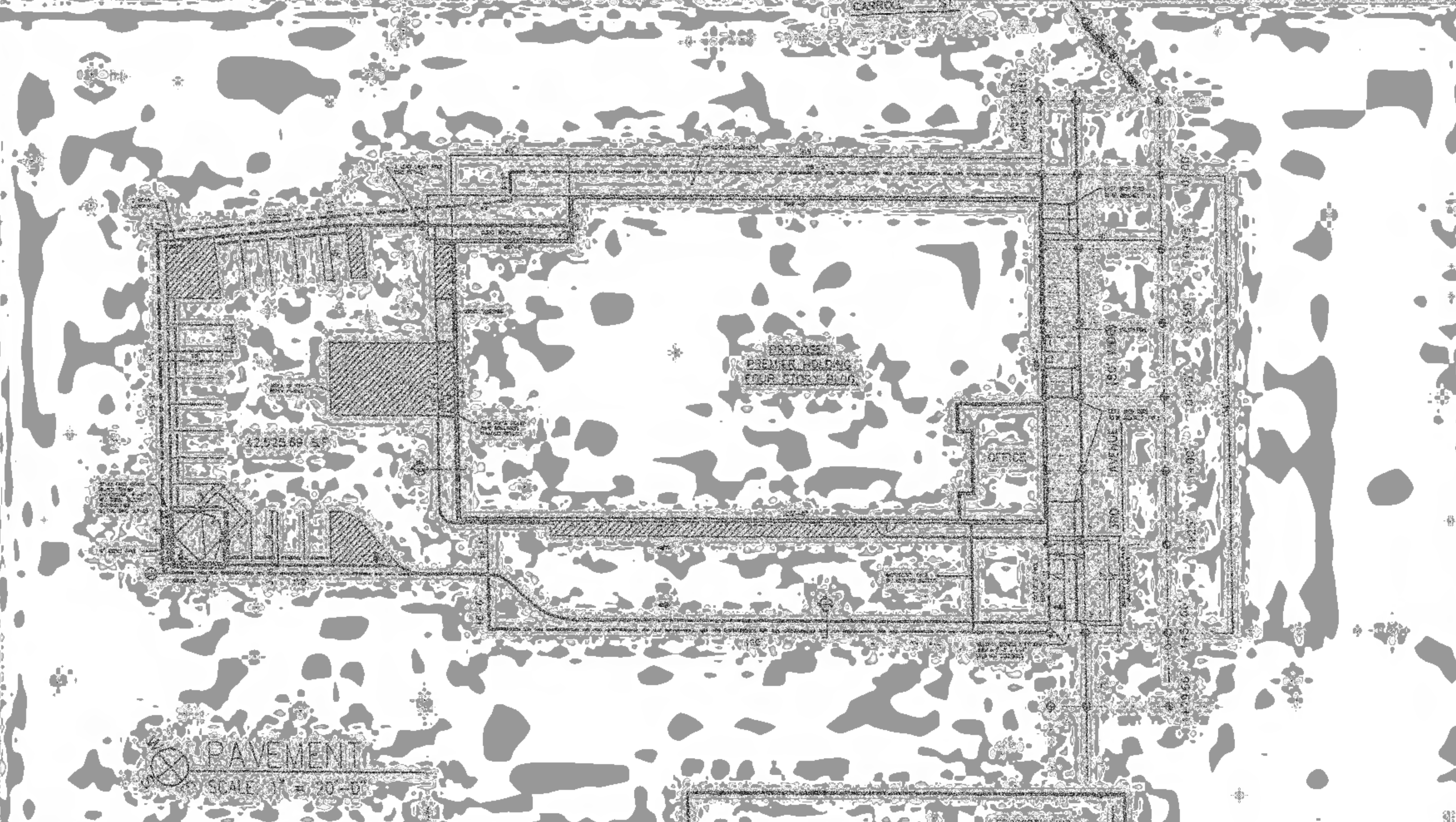
LIST OF DRAWINGS

[illegible]









LOCATION

3RD AVENUE
FINAL MAPPED WIDTH: 20 FT.

LIST OF ESTIMATED QUANTITIES

D.E.P. DRAINAGE NOTES

1. ALL NEW CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST N.Y.C. D.E.P. STANDARDS AND REQUIREMENTS. ALL NEW CATCH BASIN CONNECTIONS SHALL BE MADE TO EXISTING SEWERS AT MANHOLES AND SHALL CONSIST OF 12" DUCTILE IRON PIPE CLASS 56, WITH "PUSH-ON" JOINTS LAID ON 6" OF BROKEN STONE FOR THE ENTIRE WIDTH OF TRENCH AND FOR ONE-HALF OF THE PIPE DIAMETER. THE BROKEN STONE SHALL BE HARD UNWEATHERED STONE UNIFORMLY GRADED FROM 1/4" TO 3/4" IN DIAMETER, CONFORMING TO COMMERCIAL 1/4" TO 3/4" STONE.

2. ALL EXISTING NON-STANDARD BASINS WITHIN THE PROJECTED LIMITS SHALL BE REPLACED OR MODIFIED TO CONFORM WITH THE LATEST NEW YORK CITY DEPT. OF ENVIRONMENTAL PROTECTION STANDARDS AND REQUIREMENTS.

3. ALL EXISTING BASINS, INLETS AND DRAINAGE STRUCTURES TO BE ABANDONED SHALL BE BULKHEADED AND CUT DOWN TO [illegible] FEET BELOW SUBGRADE AND FILLED WITH COMPACTED CLEAN SAND. BASIN CONNECTIONS TO BE ABANDONED SHALL BE PLUGGED AT BOTH ENDS.

4. ALL DAMAGED MANHOLES CAUSED BY CONTRACTOR'S WORK SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER, AT NO COST TO THE CITY.

5. PRIOR TO INSTALLATION OF THE DRAINAGE FACILITIES PROPOSED UNDER THIS PLAN, PERMITS ARE TO BE OBTAINED FROM THE [illegible] OFFICE OF THE DEPT. OF ENVIRONMENTAL PROTECTION. CONSTRUCTION INSPECTION IS TO BE REQUESTED AT LEAST [illegible] HOURS IN ADVANCE FROM THE [illegible] DEPT. OF ENVIRONMENTAL PROTECTION (D.E.P.) DIVISION OF SEWER REGULATION AND CONTROL.

REVISED AS PER DOT COMMENTS

Borough: BROOKLYN | Sheet 1 of 2
DOB App. No.: 301519426 | DOT File No.: BNP 03-151

NEW YORK CITY
DEPARTMENT OF TRANSPORTATION

BUILDERS PAVEMENT PLAN

PROJECT DATA

Block: [illegible] | Lot: 51
Zoning: M1-1 | Zoning Map No.: [illegible]
Street Address: 3RD AVENUE, BROOKLYN, N.Y.
SPECIAL PLACE NAME: Premier Holding
Owner: [illegible]

Plan prepared by:

Name: M. DESIGNS
Street Address: [illegible] LANE
City/State/Zip: OYSTER BAY, N.Y. [illegible]
Phone No.: [illegible]

WAIVERS

DOT WAIVERS REQUIRED | APPROVAL

NOTES

GENERAL REQUIREMENTS

1) ALL DRAWINGS, MATERIALS, CONSTRUCTION METHODS AND WORKMANSHIP SHALL COMPLY WITH THE FOLLOWING PUBLICATIONS OF THE BUREAU OF HIGHWAYS: STANDARD SPECIFICATIONS, STANDARD DETAILS OF CONSTRUCTION, RULES OF THE BUREAU OF HIGHWAY OPERATIONS [illegible]
2) ALL NON-STANDARD MATERIALS AND CONSTRUCTION PROCEDURES SHALL BE SPECIFICALLY APPROVED IN WRITING BY THE DOT.
3) ANY WORK NOT COMPLYING WITH THE REQUIREMENTS OF THE DOT SHALL BE REMOVED AND REPLACED.
4) THIS PLAN SHALL BE VALID FOR THE ISSUANCE OF CONSTRUCTION PERMITS FOR A PERIOD OF ONE YEAR FROM THE DATE OF APPROVAL OR SELF-CERTIFICATION, AS APPLICABLE.
5) ALL SIDEWALK AND STREET AREAS CONSTRUCTED UNDER THIS PLAN SHALL REMAIN OPEN TO THE PUBLIC AT ALL TIMES.

ISSUANCE OF PERMITS

6) [illegible]
7) NO WORK ON DRAINAGE STRUCTURES SHALL BE DONE WITHOUT A PERMIT FROM THE BOROUGH OFFICE OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.
8) ANY VAULT WORK AT THE SITE SHALL BE DONE AS PER THE APPLICABLE RULES OF THE DOT AND THE DEPT. OF BUILDINGS.

CONSTRUCTION ACTIVITY

9) [illegible]
10) NO SIDEWALK SHALL BE CLOSED WITHOUT A PERMIT. [illegible]
11) THE SITE SHALL BE MAINTAINED IN A CLEAN AND SAFE CONDITION.

FINAL WORK

12) [illegible]
13) ALL PAVEMENT MARKINGS [illegible]
14) [illegible]
15) [illegible]
16) THE ROADWAY SHALL BE PAVED TO THE REQUIREMENTS OF THE DOT AND AS DIRECTED.

PROFESSIONAL CERTIFICATION

(Optional)

[illegible]

Signature | Date

DOT APPROVAL NOT REQUIRED

DOT APPROVAL

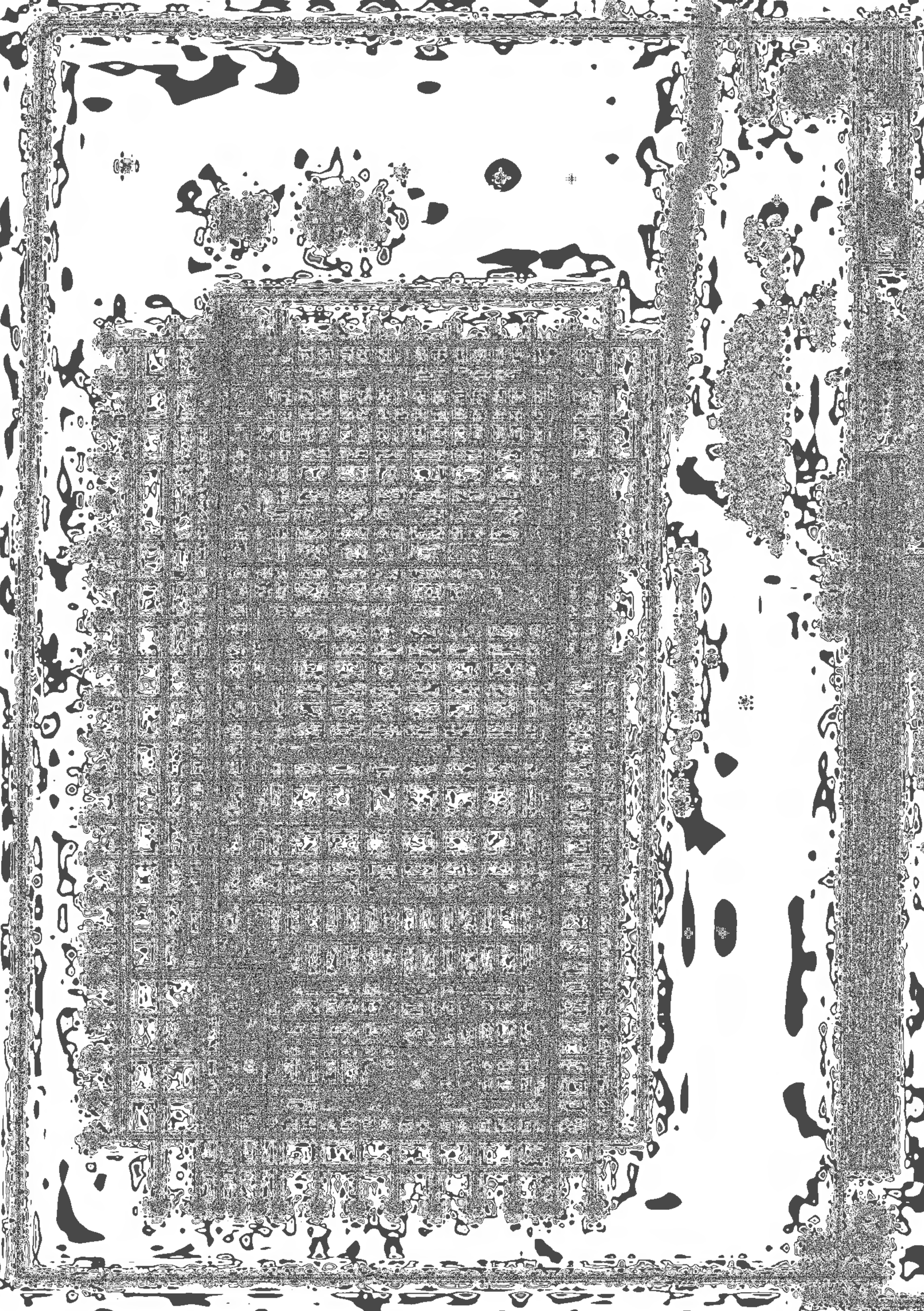
[illegible]

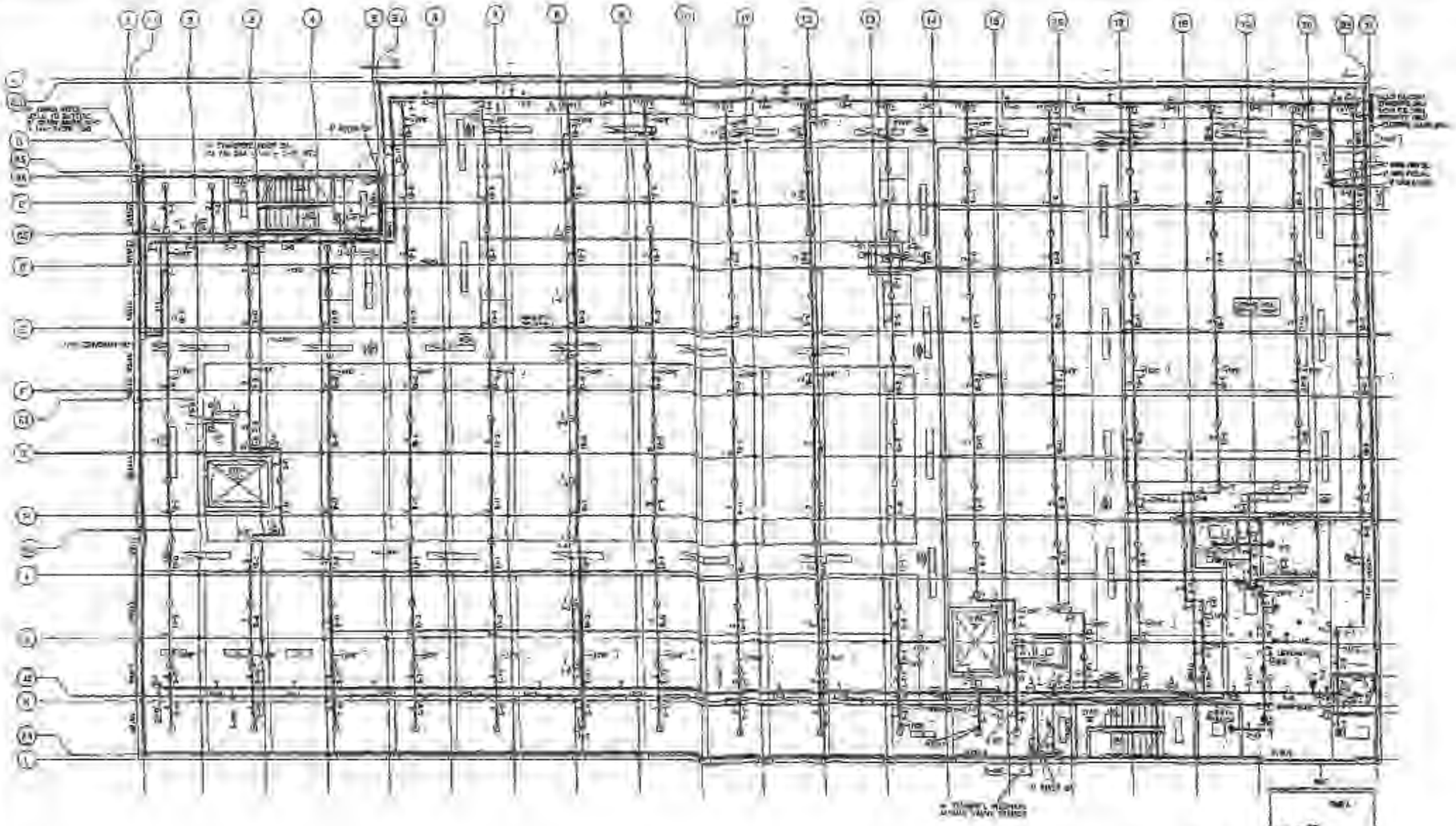
Plan Examiner

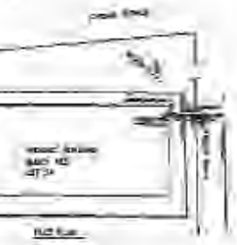
APR [illegible]

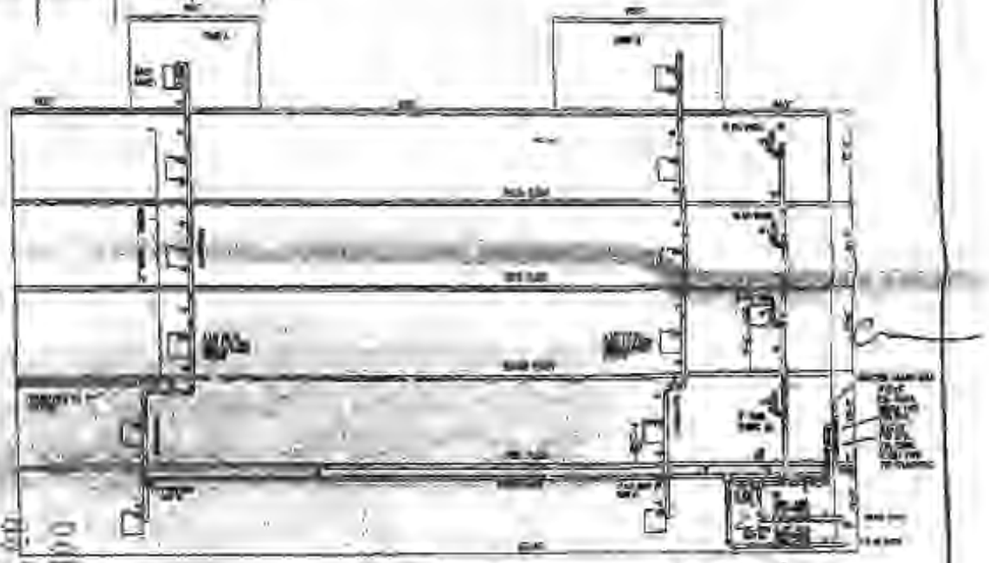
Date

SH. 1 OF 2



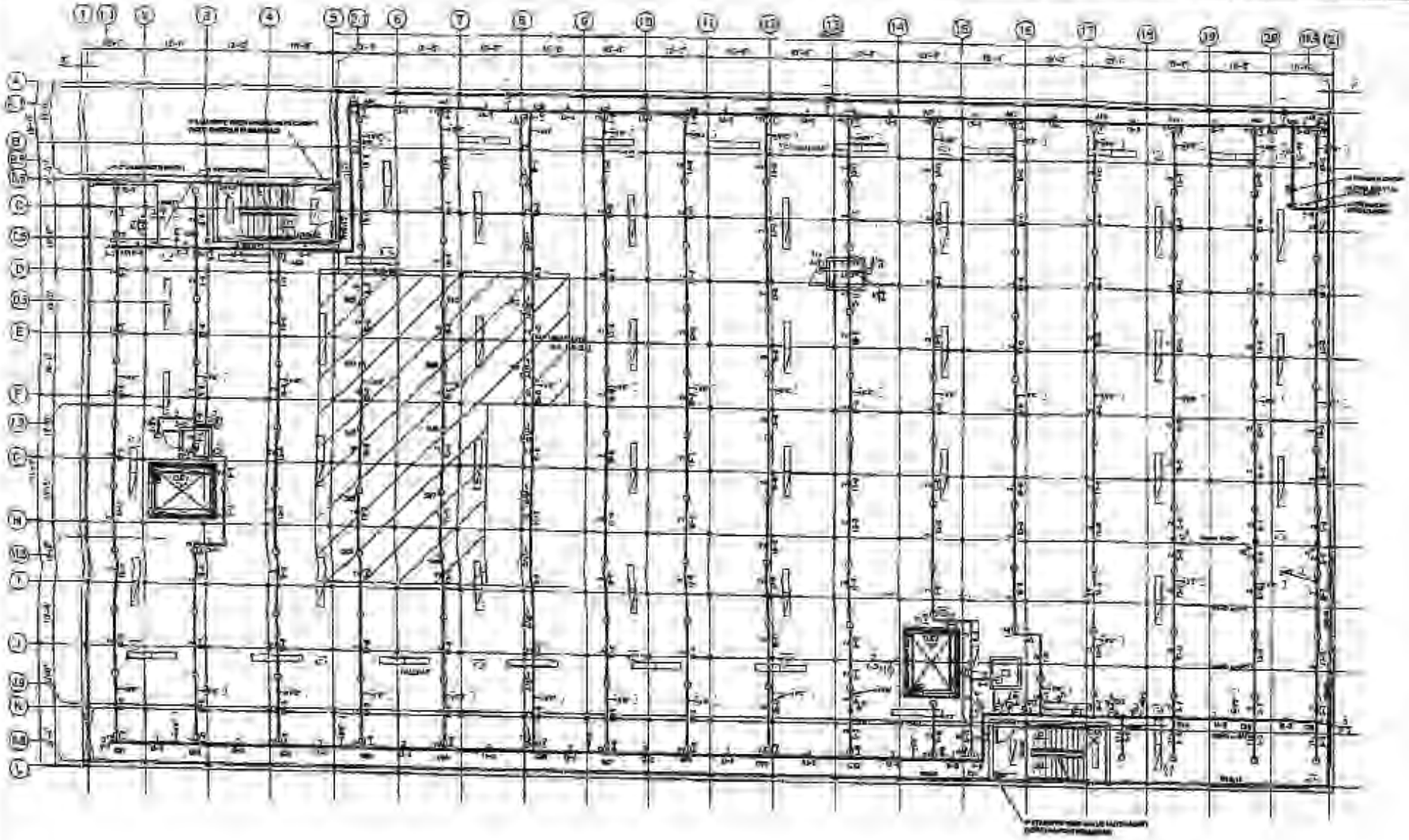


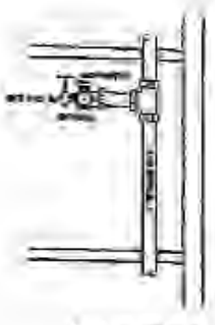


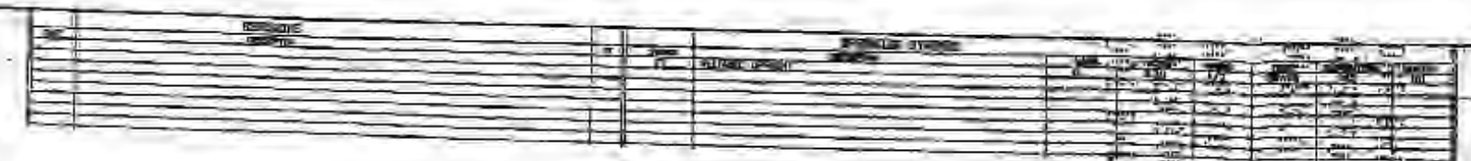


RISER DIAGRAM

A. A. F. FIRE PROTECTION CO.
29 CHESTNUT STREET



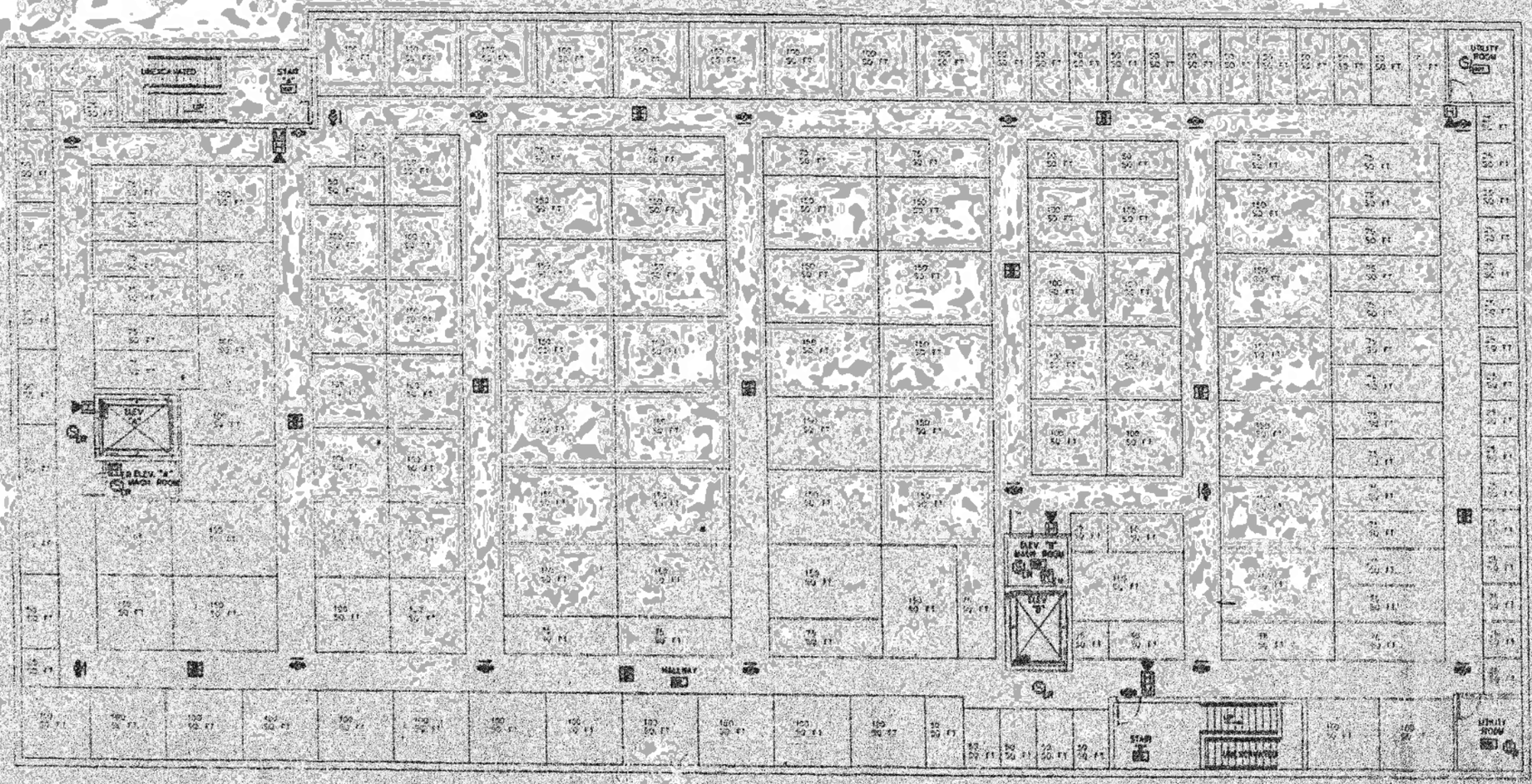




A & F FIRE PROTECTION CO
25 CHESTNUT STREET
WASSAPEQUA NEW YORK 11758

PREMIER STORAGE
317 THIRD AVENUE
BROOKLYN
NEW YORK

THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON, OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.



CELLAR FLOOR PLAN

SCALE: 1/4" = 1'-0"

Sal V. Tartaglione, Architect, P.C.

142 Mineola Avenue, Suite 2A

Roslyn Heights, New York 11577

516-621-7900 Fax: 516-625-8065

REVISION	DATE	STEP
1	6.3.03	ISSUED FOR FILING

PROJECT:

BROOKLN STORAGE

312 3RD AVENUE BROOKLYN, NY

INSTALLATION OF INTERIOR INDIVIDUALLY CODED FIRE ALARM SYSTEM

SUBJECT TO AUTHORITY HAVING JURISDICTION FINAL APPROVAL SUBJECT TO INSPECTION Approved Plans in Accordance to Buildings Dept. Bureau of Fire Prevention NYC Fire Department Subject to Letter of Date K-453-03

JUN 24 2003

APPROVAL SUBJECT TO INSPECTION

EXAMINED FOR COMPLIANCE WITH SUB CHAPTER 17 ARTICLE 5 BLDG CODE ONLY. APPLICANT IS RESPONSIBLE FOR COMPLIANCE WITH APPLICABLE BLDG CODE REFERENCE STANDARD.

ANDY PACHECO

DRAWING TITLE:

CELLAR FLOOR PLAN

SHEET No.

FA-1

THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

Sal V. Tartaglione, Architect P.C.
142 Mineola Avenue, Suite 3A
Roslyn Heights, New York 11577
516-621-7900 Fax 516-625-8065

PROJECT:

BROOKEN STORAGE

312 3RD AVENUE BROOKLYN, NY

INSTALLATION OF INTERIOR INDIVIDUALLY CODED FIRE ALARM SYSTEM

DRAWING TITLE:

FIRST FLOOR PLAN

SHEET No.

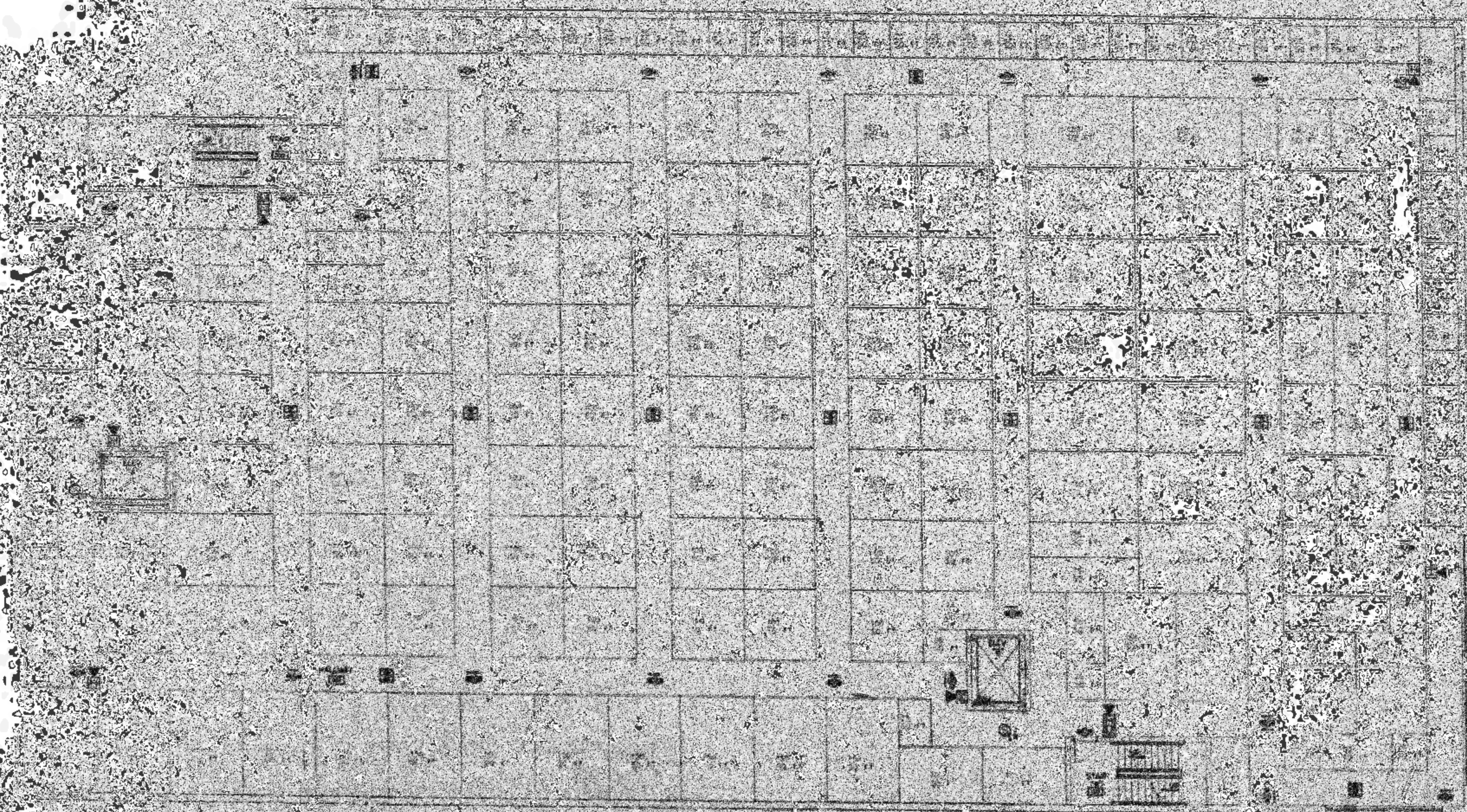
FA-2

EXAMINED FOR COMPLIANCE WITH SUB-CHAPTER 17 ARTICLE 3 BLDG CODE ONLY - APPLICANT IS RESPONSIBLE FOR COMPLIANCE WITH APPLICABLE BLDG CODE REFERENCE STANDARD.

JUN 26 2003

APPROVAL SUBJECT TO INSPECTION

B453 L54



SECOND FLOOR PLAN

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

Sal V. Tartaglione, Architect, P.C.

PROJECT:

BROOKLN STORAGE

312 3RD AVENUE
BROOKLYN, NY

INSTALLATION OF INTERIOR INDIVIDUALLY CODED FIRE ALARM SYSTEM

DRAWING TITLE:

SECOND FLOOR PLAN

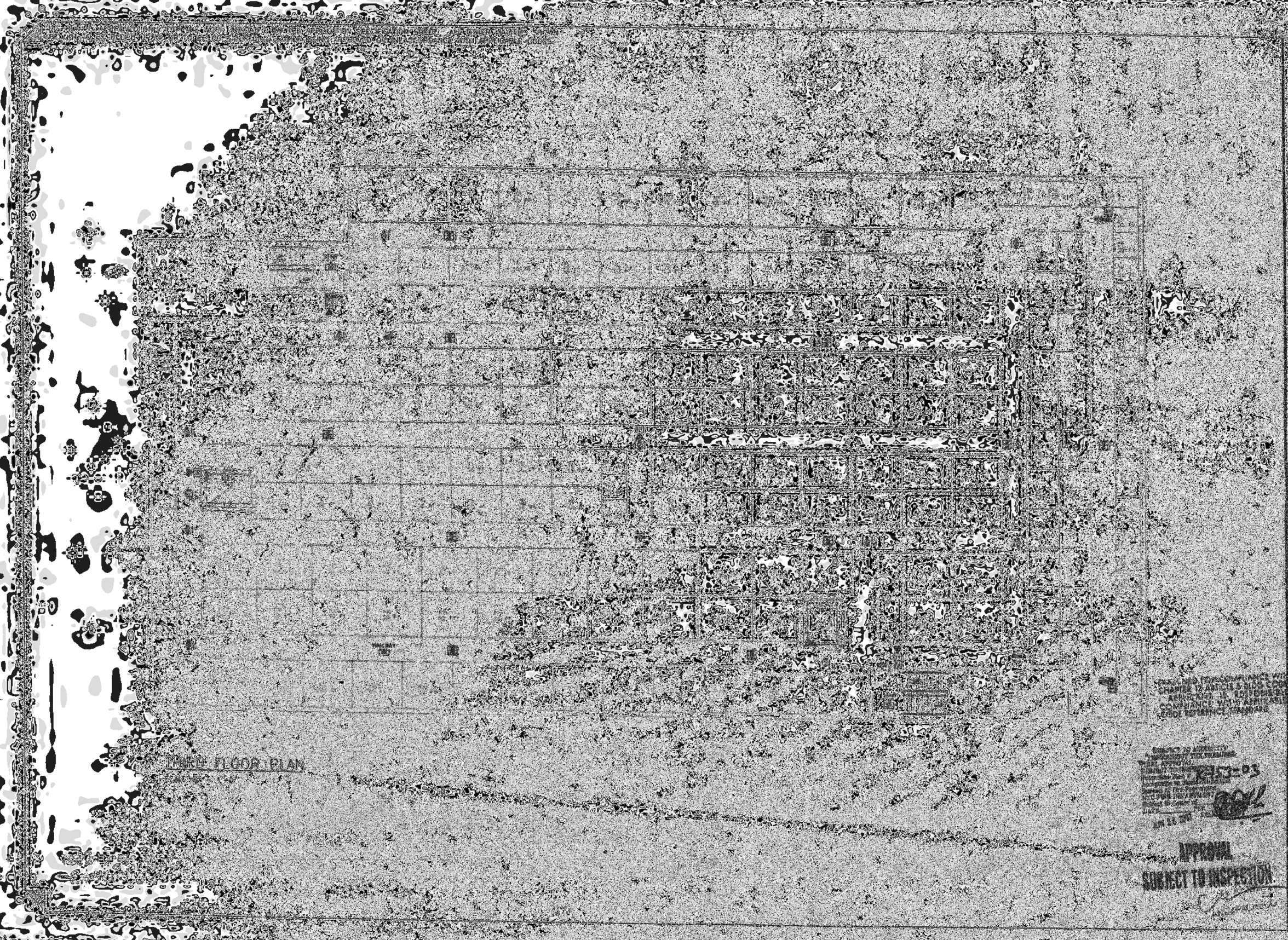
EXAMINED FOR COMPLIANCE WITH SUB CHAPTER 17 ARTICLE 5 BLDG CODE ONLY APPLICANT IS RESPONSIBLE FOR COMPLIANCE WITH APPLICABLE BLDG CODE REFERENCE STANDARD

SUBJECT TO AUTHORITY THROUGHOUT THE PROCESS
FINAL APPROVAL
SUBJECT TO [illegible]
Submitted Plan # [illegible]-153-03
[illegible]
DATE
JUN 24

APPROVAL
SUBJECT TO INSPECTION

SHEET No.

FA-3



Ref'd Drawings

PROJECT

BROOKLYN STORAGE

312 3RD AVENUE
BROOKLYN, NY

INSTALLATION OF INTERIOR INDIVIDUALLY CODED FIRE ALARM SYSTEM

DRAWING TITLE

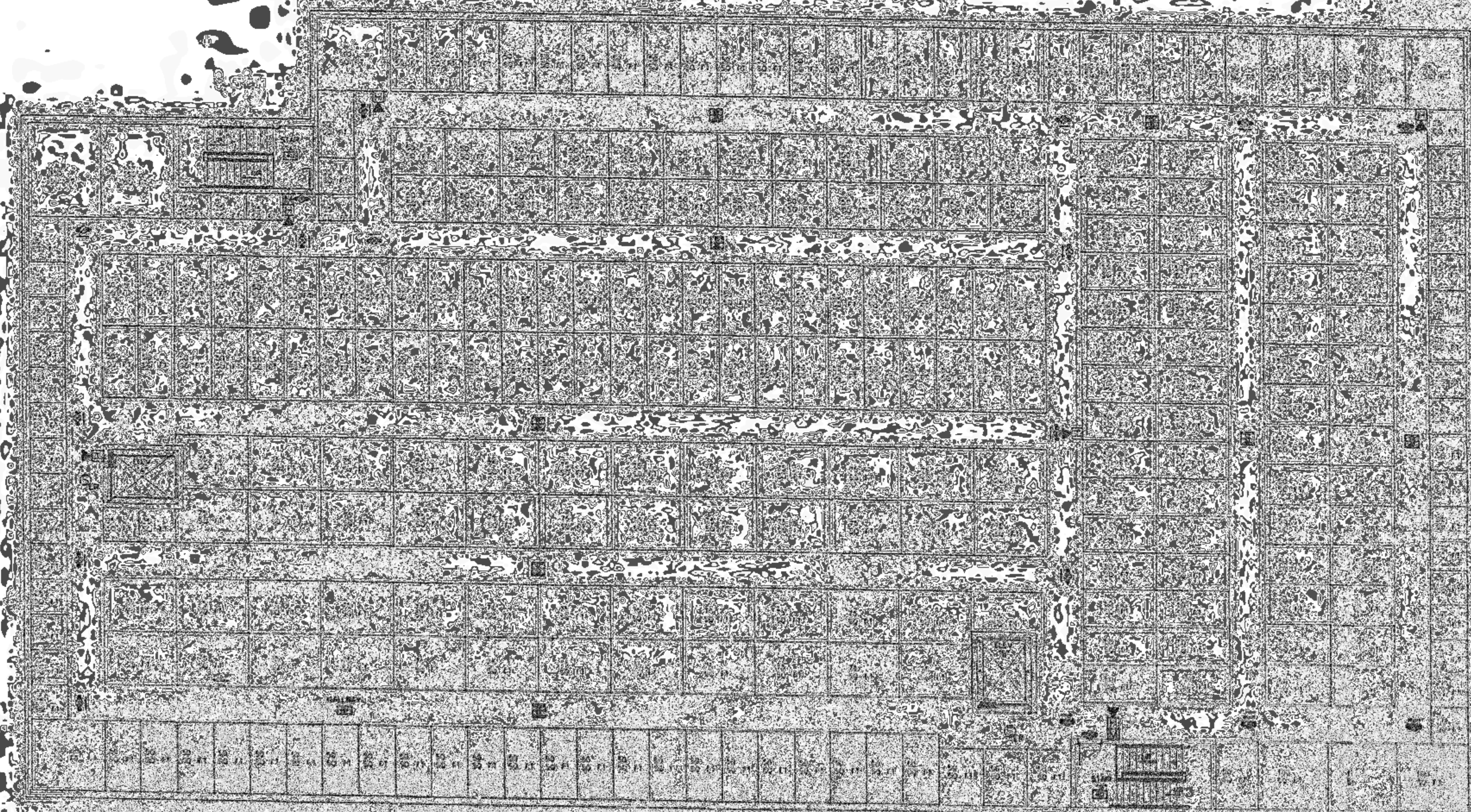
THIRD FLOOR PLAN

DRAWING NO.

FA-4

APPROVAL
SUBJECT TO INSPECTION

THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.



FOURTH FLOOR PLAN

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

EXAMINED FOR COMPLIANCE WITH SUB CHAPTER V ARTICLE 5 BLDG CODE. APPLICANT IS RESPONSIBLE FOR COMPLIANCE WITH APPLICABLE BLDG CODE REFERENCE STANDARD

SUBJECT TO ADHERENCE THROUGHOUT THE PREMISES

FINAL APPROVAL SUBJECT TO ...

K-153-03

JUN 25 ...

APPROVAL SUBJECT TO INSPECTION

Sal V. Tamaglione, Architect, P.C.

142 Mineola Avenue, Suite 3A

Roslyn Heights, New York 11577

516-621-7900 Fax 516-625-0165

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REVISION	DATE	NOTES
1	6/3/03	BUILDING FILING

PROJECT:

BROOKLN STORAGE

312 3RD AVENUE
BROOKLYN, NY

INSTALLATION OF INTERIOR INDIVIDUALLY CODED FIRE ALARM SYSTEM

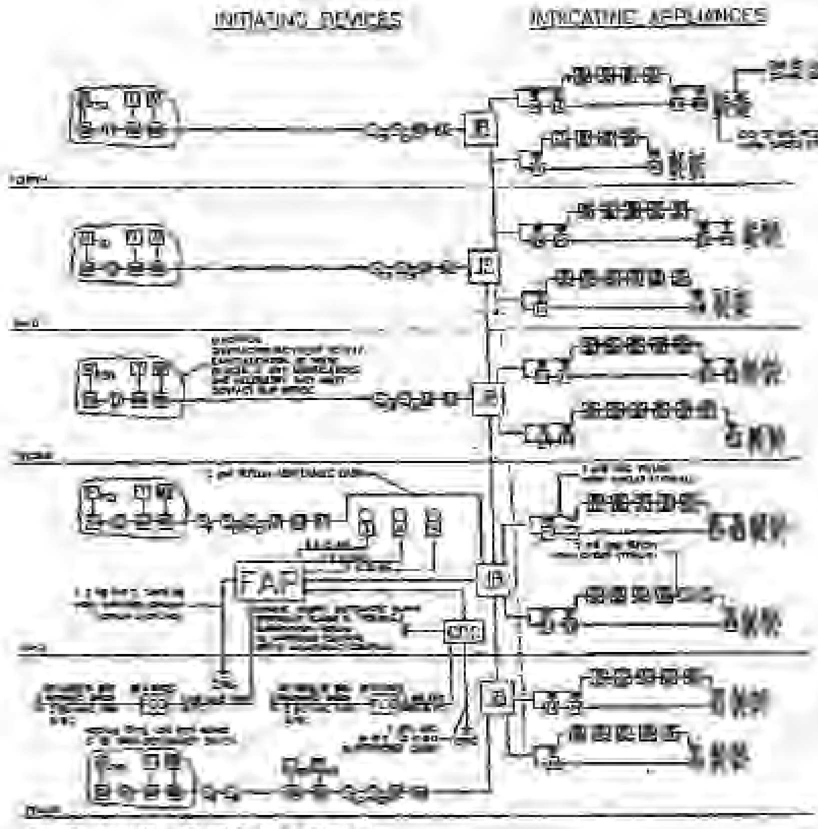
DRAWING TITLE:

FOURTH FLOOR PLAN

SHEET No.

FA-5

THIS PLAN IS APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.



FIRE ALARM RISER DIAGRAM

FIRE ALARM LEGEND

JB	JUNCTION BOX
FAP	FIRE ALARM PANEL
FCO	FUSE CUT-OUT
CO	CENTRAL OFFICE COMMUNICATOR
	CODED MANUAL PULL STATION
	IONIZATION SMOKE DETECTOR FOR ELEVATOR RECALL
	PHOTOELECTRIC TYPE (RFA) SMOKE DETECTOR
	WATERFLOW SWITCH
	SPRINKLER TAMPER SWITCH
	CONTROL MODULE
	MONITOR MODULE
	PHOTOELECTRIC TYPE DUCT SMOKE DETECTOR
	15/75 CANDELA SYNCHRONIZED STROBE LIGHT
	(15/75 CANDELA) STROBE LIGHT - CEILING MTD.
	SPRINKLER BELL - 10" VIBRATING BELL
	ALARM BELL - 6" VIBRATING BELL
	TROUBLE BELL - 6" VIBRATING BELL
	RELAY - FAN SHUT DOWN
	RELAY - ELEVATOR RECALL
	COMBINATION HORN/STROBE LIGHT (15/75 CANDELA) UNIT
	END OF LINE RESISTOR
	COLD WATER GROUND

GENERAL NOTES

1. Locations of all fire alarm equipment must be selected by an Architect, subject to the Building Department approval. No changes and/or modifications of the system are allowed without the [illegible] written approval. Contractor shall keep record of all such changes. [illegible]
2. Form A-15 [illegible] by the Licensed Electrical Contractor with the Bureau of Electrical Control [illegible]
3. No work shall be [illegible] plans are approved by the N.Y.C. Fire Department.
4. All fire alarm equipment shall be accepted by the New York City Board of Standards and Appeals or M.E.A. Division of the Department of Buildings [illegible] to installation.
5. All Fire Alarm Signal wiring shall be [illegible] Wiring shall be protected throughout by [illegible] rigid steel conduit. Aluminum threaded conduit may be acceptable [illegible] Flexible protection is not acceptable [illegible] connection to fire-alarm devices [illegible] all wiring shall be connected by soldering, approved terminal blocks or U.L. listed [illegible]
6. All work shall be done in accordance with Chapter 27 [illegible] of the N.Y.C. Building Code, Chapter 19 Fire Prevention Code and the N.Y.C. Electrical Code and all other applicable regulations.
7. All [illegible] shall be securely fastened in position. [illegible]
8. The centerline of all audible devices shall be located at least 8'-0" A.F.F. [illegible] the centerline of the unit shall be located 6" below the ceiling.
9. No [illegible] shall enter the top of the Fire Alarm Panel. [illegible]
10. All fire alarm panels shall be grounded by a [illegible] copper wire [illegible] connected to the building main cold water pipe [illegible] unless otherwise noted.

INSTALLATION AS PER TPPN (ART. 9.F.a.) # 2/03, 3/95 & 4/9[illegible]
EMT may be used in lieu of rigid threaded conduit (except power wiring and ground) if wiring is [illegible] approved [illegible] and it meets the following requirements:

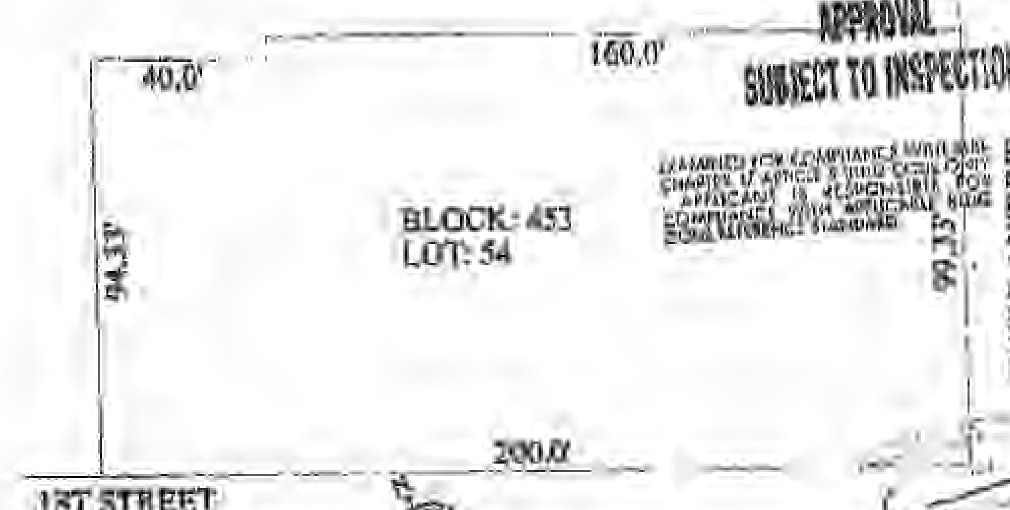
Min. temp. rating of 150 degrees Celsius
min. average insulation thickness of [illegible] mils
min. average jacket thickness of 25 mils
color of cable must be RED
cable shall be a type FPLP (plenum type)
cable shall be [illegible] marked externally that it meets [illegible]
wiring must have the following information [illegible]
Company name [illegible] temperature rating in Celsius
Type "FPLP" [illegible]
size (AWG) [illegible] "NYC cert. fire alarm wires"

SEQUENCE OF OPERATIONS

ACTIVATION OF DUCT SMOKE DETECTOR	ACTIVATION OF TAMPER SWITCH	ACTIVATION OF WATERFLOW SWITCH	ACTIVATION OF MANUAL PULL STATION	TROUBLE CONDITION AT PANEL	NOTES
					CENTRAL OFFICE COMPANY TO RECEIVE SEPARATE & DISTINCT SIGNALS (IF REQUIRED) a) MANUAL ALARM b) SPRINKLER ALARM c) AUTOMATIC ALARM (i.e., SMOKE & DUCT DETECTORS) d) TROUBLE & SUPERVISORY SIGNAL 10-1 CODE FOR WATERFLOW ALARM 10-2 CODE FOR SMOKE DETECTORS [illegible] CODE FOR MANUAL PULL STATION STROBE LIGHTS TO SHUT OFF AFTER 4 ROUNDS OF [illegible] CODE HVAC UNITS TO BE MANUALLY RESTARTED AFTER RESET OF FIRE ALARM SYSTEM
X	X	X	X		ACTIVATES HORNS THROUGHOUT THE BUILDING (4 ROUNDS)
	X			X	ACTIVATES 6" TROUBLE BELL
X			X		ACTIVATES 6" SMOKE ALARM BELL
X		X	X		ACTIVATES STROBE LIGHTS THROUGHOUT BUILDING
X		X	X		SHUTS OFF HVAC SYSTEM THROUGHOUT
X		X	X		SHUTS OFF SOUND SYSTEM AND SPECIAL EFFECTS LIGHTING
X	X	X	X	X	TRANSMIT SIGNAL APPROVED CENTRAL OFFICE STATION
		X			ACTIVATES 10" SPRINKLER ALARM BELL
	X	X	X	X	TRANSMIT SIGNAL (ALARM OR TROUBLE) TO CENTRAL OFFICE

DRAWING LEGEND

T - 1	TITLE SHEET (RISER DIAGRAM)
FA - 1	CELLAR FLOOR PLAN
FA - 2	FIRST FLOOR PLAN
FA - 3	SECOND FLOOR PLAN
FA - 4	THIRD FLOOR PLAN
FA - 5	FOURTH FLOOR PLAN



PLOT PLAN

APPROVAL
SUBJECT TO INSPECTION

EXAMINED FOR COMPLIANCE WITH [illegible] APPLICANT IS RESPONSIBLE FOR COMPLIANCE WITH APPLICABLE [illegible]

K353-03

S.M. Tartaglione, Architect, P.C.

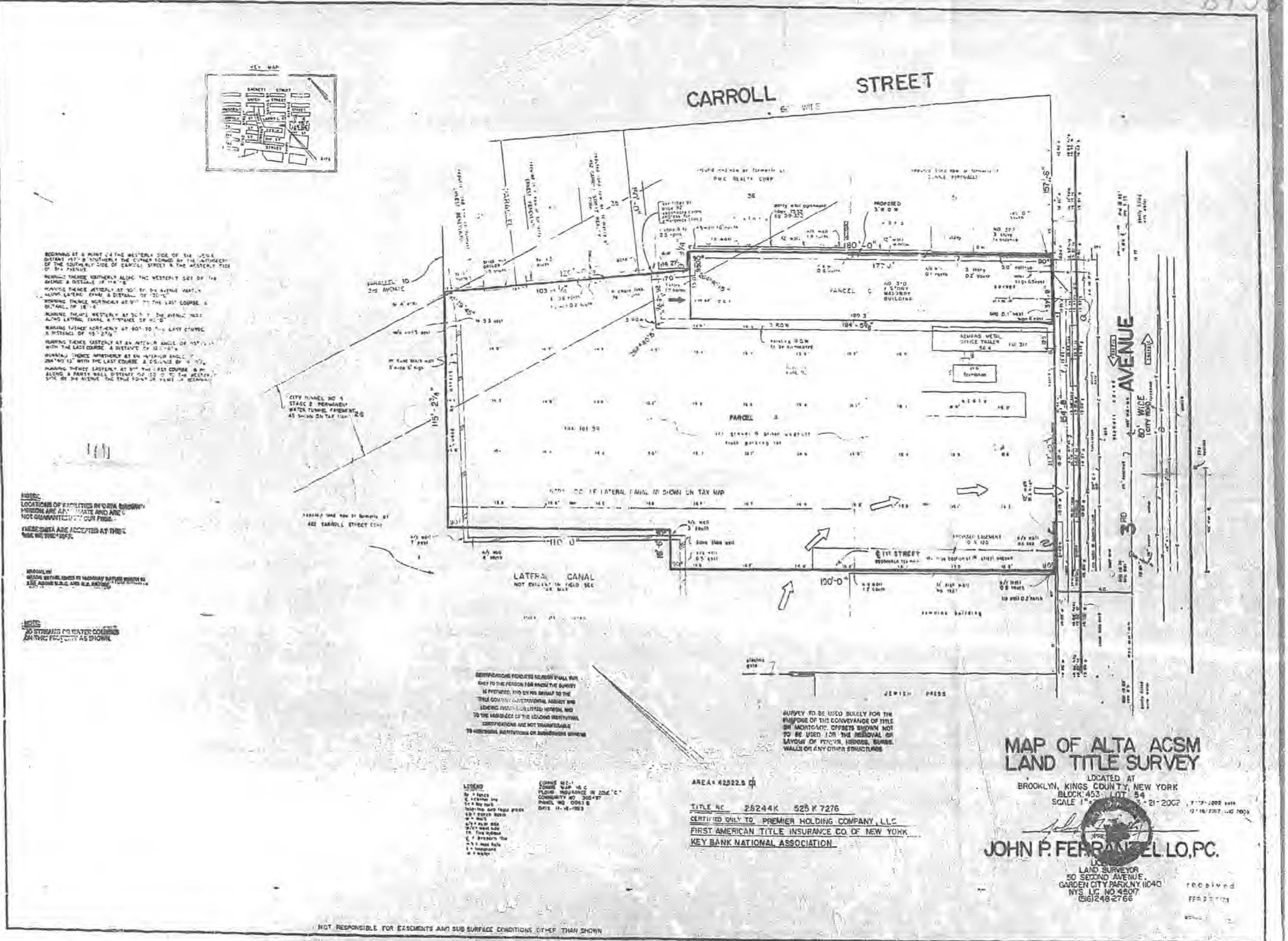
PROJECT:
BROOKLN STORAGE
312 3RD AVENUE
BROOKLYN, NY

INSTALLATION OF INTERIOR INDIVIDUALLY CODED FIRE ALARM SYSTEM

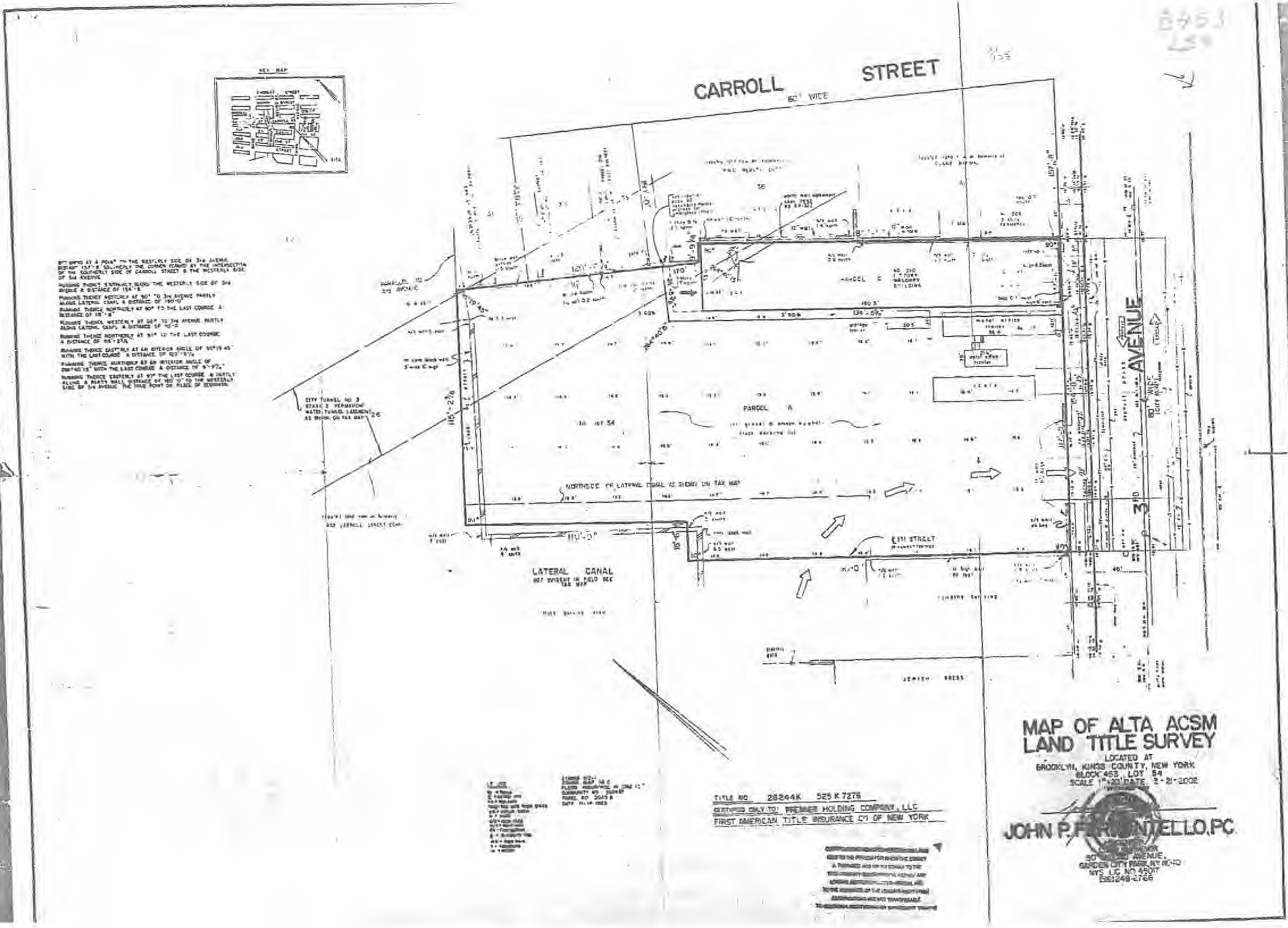
DRAWING TITLE:
NOTES, PLOT PLAN, RISER DIAGRAM, LEGEND

SHEET NO.
T-1

B453 L54



KEY MAP
CARROLL STREET
3RD AVENUE
80' WIDE (CITY ROAD)
PARCEL C
PARCEL A
PARALLEL
PARALLEL TO 3rd AVENUE
PROPOSED 3' R.O.W.
NO. 310 1 STORY MASONRY BUILDING
NO. 307 3 story residence
CITY TUNNEL NO 3 STAGE 2 PERMANENT WATER TUNNEL EASEMENT AS SHOWN ON TAX MAP
LATERAL CANAL NOT EVIDENT IN FIELD SEE TAX MAP
JEWISH PRESS
115'-2 7/8"
110'-0"
150'-0"
180'-0"
194'-5 5/8"
157'-8"
154'-8"
NOTE: NO STREAMS OR WATER COURSES ON THIS PROPERTY AS SHOWN
SURVEY TO BE USED SOLELY FOR THE PURPOSE OF THE CONVEYANCE OF TITLE OR MORTGAGE. OFFSETS SHOWN NOT TO BE USED FOR THE REMOVAL OR LAYOUT OF FENCES, HEDGES, BURBS, WALLS OR ANY OTHER STRUCTURES
TITLE NO 28244K 525 K 7276
CERTIFIED ONLY TO PREMIER HOLDING COMPANY, LLC
FIRST AMERICAN TITLE INSURANCE CO. OF NEW YORK
KEY BANK NATIONAL ASSOCIATION
MAP OF ALTA ACSM LAND TITLE SURVEY
LOCATED AT
BROOKLYN, KINGS COUNTY, NEW YORK
BLOCK: 453 LOT 54
LAND SURVEYOR
50 SECOND AVENUE,
GARDEN CITY PARK, NY 11040
NYS LIC NO 45017
(516)248-2766
NOT RESPONSIBLE FOR EASEMENTS AND SUB SURFACE CONDITIONS OTHER THAN SHOWN


CARROLL STREET
60' WIDE
PARCEL B
PARCEL A
NORTHSIDE OF LATERAL CANAL AS SHOWN ON TAX MAP
LATERAL CANAL
NOT EVIDENT IN FIELD SEE TAX MAP
3RD AVENUE
CITY TUNNEL NO. 3
STAGE 2 PERMANENT WATER TUNNEL EASEMENT AS SHOWN ON TAX MAP
MAP OF ALTA ACSM
LAND TITLE SURVEY
LOCATED AT
BROOKLYN, KINGS COUNTY, NEW YORK
BLOCK 453, LOT 54
TITLE NO. 28244K 525 K 7276
CERTIFIED ONLY TO: PREMIER HOLDING COMPANY, LLC
FIRST AMERICAN TITLE INSURANCE CO OF NEW YORK
JOHN P.
ELLO, P.C.
AVENUE,
GARDEN CITY PARK, NY
NYS LIC NO 45017
516 248-2766

SECTION D
BLOCK 967, LOT 1
175 SECOND STREET

5-23-967

Title No. 86-04 - 260568

LATERAL (60' WIDE)

535'-9"

FINAL MAP LINE - CITY OF N.Y.

CANAL

53'-0" NAIL 132'-0" NAIL 100'-0" 1 St. ST. MAK 6'-0" CUT MARK ON WALL

90° C.L. OF 1st ST. (NOT OPEN) 90° 30'-0" 20'-0" 30'-0" CUT 50'-0"

270° STK. 5'-0" MARK 225'-0" PARALLEL WITH 1st. ST. ON LINE 3 STY. BRICK COMMERCIAL

MARK BUS. 2.63W 70'-0" MARK 25.4'

PARALLEL WITH 1ST ST. 220'-0"

1'-1½" PIPE

CONC. BULKHEAD 4.40' WIDE

200'-0"

LOT 1

PARALLEL WITH 3rd AVE. 110'-0"

1 STY. BRICK COMMERCIAL

LOT 50

110'-0"

180'-0" BLDG. UNDER CONSTRUCTION

PARALLEL WITH 2nd AVE.

NOT INCLUDED

180'-0"

225'-0"

AVE.

162'-1 5/8"

90° 30'-0" 10'-0"

CENTER LINE OF 2nd ST.

30'-0" 12.00 EASEMENT 12.70 445'-0" FINAL MAP LINE - CITY OF N.Y. 445'-0"

90° 30'-0" 10'-0" 30'-0"

12 NAILS 0"

STK. 5'-0" NAIL

2nd

635'-9"

(60' WIDE)
(NOT OPEN)

ST.

3rd

9

UNAUTHORIZED ALTERATION OR ADDITION TO THIS SURVEY IS A VIOLATION OF SECTION 7209 OF THE NEW YORK STATE EDUCATION LAW.

COPIES OF THIS SURVEY MAP NOT BEARING THE LAND SURVEYOR'S INKED SEAL OR EMBOSSED SEAL SHALL NOT BE CONSIDERED TO BE A VALID TRUE COPY.

GUARANTEES OR CERTIFICATIONS INDICATED HEREON SHALL RUN ONLY TO THE PERSON FOR WHOM THE SURVEY IS PREPARED, AND ON HIS BEHALF TO THE TITLE COMPANY, GOVERNMENTAL AGENCY AND LENDING INSTITUTION LISTED HEREON, AND TO THE ASSIGNEES OF THE LENDING INSTITUTION CONSIDERED ON CERTIFICATIONS AND NOT TRANSFERABLE TO ADDITIONAL INSTITUTIONS OR SUBSEQUENT OWNERS.

Surveyed for HARRY KORENREICH

Surveyed AUG. 12, 1986

Surveyed

Surveyed

Surveyed

By Albert A. Bianco

Tax Sec. Tax Bl. 967

Lots 1, 50

Filed Map

Block Lots

BROOKLYN

KINGS Co.

Guaranteed To ABOVE, HOME ABSTRACT CORP.

LAND SURVEYOR ALBERT A. BIANCO No 31721 OF NEW YORK

ALBERT A. BIANCO

Professional Land Surveyor - City Surveyor

SURVEYS IN BROOKLYN - QUEENS - NASSAU - BRONX - STATEN ISLAND - FA. 7-6532

FAR ROCKAWAY, QUEENS, N.Y. INWOOD, NASSAU, N.Y.

B 967 / 21

LATERAL CANAL

535'-9"

LOT LINE

100'-0"

℄ 1ST ST.

30'-0"

EXISTG SECURITY WALL

50'-0"

LOT LINE

PROPOSED SECURITY WALL

225'-0"

LOT LINE

No Loading Berths being added or eliminated

3/23/87

LOT 1

220'-0"

LOT LINE

110'-0"

230'-0"

LOT LINE

445'-0"

EXISTING 8.40' WIDE CONC. BULKHEAD

EXISTING 10' SECURITY WALL

LOT LINE

260'-0"

3RD AVENUE

635'-9"

℄ 2ND ST.

2ND STREET.

PLAN

1/32" = 1'-0"

PRECAST CONC CAP

LOT LINE

SOLID L.BRG. CONC. BLOCKS. DUR-O-WAL REINF. EA. 2ND COURSE

10'-0"

FIN GRADE

PLAIN CONC. FOOTING

2'-0"

TYPICAL WALL SECTION

3/8" = 1'-0"

FOUNDATION NOTES.

1. All concrete shall be plain concrete from a pre-qualified mix developing a 28 day strength of 2000psi.
2. No plant supervision of the concrete batching shall be required as per Table 10-2.
3. No field supervision of concrete installation shall be required as the design stresses are less than 70% of allowable design stresses as per Table 10-2.
4. All footings shall rest on soil of Class 10-65 minimum. Subgrade shall be subject to controlled inspection. Forms 10F and 10E shall be filed prior to permit issuance and letter of completion, respectively.
5. Prior to the issuance of a letter of completion, Form 23A shall be filed with the Building Department.
6. Forms 10H and 10J shall be filed for the load bearing solid concrete blocks prior to the issuance of a letter of completion.
7. Forms 10C and 10D shall be filed with the Building Department and approved prior to the issuance of a letter of completion.

Examined for stated work only. No other factor considered.

ACCEPTABLE FOR PERMIT UNDER DIRECTIVE NO. 14/1975

MAR 26 1987

JOHN DI MICLIA

STATE OF NEW YORK PIERRE RICHARD FOSS LICENSED PROFESSIONAL ENGINEER 27512

BN 247/87

ADDRESS: 175 2ND STREET.
NWC 2ND ST. BROOKLYN, N.Y.
BLOCK: 967 LOT: 1
MAP: 16c ZONE: M2-1
C.B.: 6
LOT AREA: 39761.0 SQ. FT.

DATE	REVISIONS
	PROPOSED SECURITY WALL
	3RD AVE & 2ND ST. BROOKLYN N.Y.

PIERRE R. FOSS P.E.
CONSULTING ENGINEER
2260 HOWES ST., MERRICK, NEW YORK 115 6

DRAWING NO. SW1

DRAWN BY PRF | FILE NO. 8678 | DATE 3/23/87 | SHEET 1 OF 1

19072 F
2098.85
2875.25
3000
12715

39761.00

SECTION E
BLOCK 967, LOT 24
338 THIRD AVENUE

NYC Buildings

Certificate of Occupancy

CO Number: 320296899F

This certifies that the premises described herein conforms substantially to the approved plans and specifications and to the requirements of all applicable laws, rules and regulations for the uses and occupancies specified. No change of use or occupancy shall be made unless a new Certificate of Occupancy is issued. *This document or a copy shall be available for inspection at the building at all reasonable times.*

A.

Borough:	Brooklyn	**Block Number:**	00967	**Certificate Type:**	Final
Address:	338 3RD AVENUE	**Lot Number(s):**	24	**Effective Date:**	06/24/2014
Building Identification Number (BIN):	3020761	**Building Type:**	Altered		

This building is subject to this Building Code: Prior to 1968 Code

For zoning lot metes & bounds, please see BISWeb.

B.

Construction classification:	2-B	(2008 Code)	
Building Occupancy Group classification:	S-1	(2008 Code)	
Multiple Dwelling Law Classification:	None		
No. of stories: 4	**Height in feet:** 72		**No. of dwelling units:** 0

C. **Fire Protection Equipment:**
Sprinkler system

D. **Type and number of open spaces:**
Parking spaces (4), Parking (1200 square feet), Loading berths (4), Loading berths (2400 square feet)

E. **This Certificate is issued with the following legal limitations:**
None

Borough Comments: None

Borough Commissioner

Acting Commissioner

DOCUMENT CONTINUES ON NEXT PAGE

NYC Buildings

Certificate of Occupancy

CO Number: 320296899F

Permissible Use and Occupancy

All Building Code occupancy group designations below are 2008 designations.

Floor From	To	Maximum persons permitted	Live load lbs per sq. ft.	Building Code occupancy group	Dwelling or Rooming Units	Zoning use group	Description of use
CEL			OG	S-1			ACCESSORY USES
OS P			OG			1B	4 VEHICLE ACCESSORY PARKING SPACES & 4 LOADING BERTHS
001	001	40	200	S-1		16D	STORAGE, ACCESSORY OFFICE, 3 VEHICLE PARKING SPACES.
002	002	10	200	S-1		16D	STORAGE
003	003	10	200	S-1		16D	STORAGE
004	004	10	200	S-1		16D	STORAGE

GENERAL NOTE: SELF STORAGE FACILITY WITH 3 INTERIOR PARKING SPACES AND 4 EXTERIOR PARKING SPACES WITH 4 LOADING/UNLOADING BERTHS.

END OF SECTION

Borough Commissioner

Acting Commissioner

END OF DOCUMENT

NYC Buildings

Certificate of Occupancy

CO Number: 320296899T001

This certifies that the premises described herein conforms substantially to the approved plans and specifications and to the requirements of all applicable laws, rules and regulations for the uses and occupancies specified. No change of use or occupancy shall be made unless a new Certificate of Occupancy is issued. *This document or a copy shall be available for inspection at the building at all reasonable times.*

A.

Borough:	Brooklyn	**Block Number:**	00967	**Certificate Type:**	Temporary
Address:	338 3RD AVENUE	**Lot Number(s):**	24	**Effective Date:**	09/19/2013
Building Identification Number (BIN):	3020761			**Expiration Date:**	11/18/2013
		Building Type:	Altered		

This building is subject to this Building Code: Prior to 1968 Code

For zoning lot metes & bounds, please see BISWeb.

B.

Construction classification:	2-B	(2008 Code)	
Building Occupancy Group classification:	S-1	(2008 Code)	
Multiple Dwelling Law Classification:	None		
No. of stories: 4	**Height in feet:** 72		**No. of dwelling units:** 0

C. **Fire Protection Equipment:**
Sprinkler system

D. **Type and number of open spaces:**
Parking spaces (4), Parking (1200 square feet), Loading berths (4), Loading berths (2400 square feet)

E. **This Certificate is issued with the following legal limitations:**
None

Outstanding requirements for obtaining Final Certificate of Occupancy:

There are 15 outstanding requirements. Please refer to BISWeb for further detail.

Borough Comments:

AS PER J. GALLAGHER, TCO IS FOR ENTIRE BUILDING EXCEPT STORAGE UNITS 1013 AND 1014

Borough Commissioner

Commissioner

DOCUMENT CONTINUES ON NEXT PAGE

NYC Buildings

Certificate of Occupancy

CO Number: 320296899T001

Permissible Use and Occupancy

All Building Code occupancy group designations below are 2008 designations.

Floor From To	Maximum persons permitted	Live load lbs per sq. ft.	Building Code occupancy group	Dwelling or Rooming Units	Zoning use group	Description of use
CEL		OG	S-1			ACCESSORY USES
OS P		OG			1B	4 VEHICLE ACCESSORY PARKING SPACES AND 4 LOADING BERTHS
001	40	200	S-1		16D	STORAGE, ACCESSORY OFFICE, 3 VEHICLE PARKING SPACES.
002	10	200	S-1		16D	STORAGE
003	10	200	S-1		16D	STORAGE
004	10	200	S-1		16D	STORAGE

GENERAL NOTE: SELF STORAGE FACILITY WITH 3 INTERIOR PARKING SPACES AND 4 EXTERIOR PARKING SPACES WITH 4 LOADING/UNLOADING BERTHS.

END OF SECTION

Borough Commissioner

Commissioner

END OF DOCUMENT

NYC Buildings

Certificate of Occupancy

CO Number: 320296899T003

This certifies that the premises described herein conforms substantially to the approved plans and specifications and to the requirements of all applicable laws, rules and regulations for the uses and occupancies specified. No change of use or occupancy shall be made unless a new Certificate of Occupancy is issued. *This document or a copy shall be available for inspection at the building at all reasonable times.*

A.

Borough:	Brooklyn	**Block Number:**	00967	**Certificate Type:**	Temporary
Address:	338 3RD AVENUE	**Lot Number(s):**	24	**Effective Date:**	02/13/2014
Building Identification Number (BIN):	3020761	**Building Type:**	Altered	**Expiration Date:**	05/14/2014

This building is subject to this Building Code: Prior to 1968 Code

For zoning lot metes & bounds, please see BISWeb.

B.

Construction classification:	2-B	(2008 Code)	
Building Occupancy Group classification:	S-1	(2008 Code)	
Multiple Dwelling Law Classification:	None		
No. of stories: 4	**Height in feet:** 72		**No. of dwelling units:** 0

C. **Fire Protection Equipment:**
Sprinkler system

D. **Type and number of open spaces:**
Parking spaces (4), Parking (1200 square feet), Loading berths (4), Loading berths (2400 square feet)

E. **This Certificate is issued with the following legal limitations:**
None

Outstanding requirements for obtaining Final Certificate of Occupancy:

There are 9 outstanding requirements. Please refer to BISWeb for further detail.

Borough Comments: None

Borough Commissioner

Acting Commissioner

DOCUMENT CONTINUES ON NEXT PAGE

NYC Buildings

Certificate of Occupancy

CO Number: 320296899T003

Permissible Use and Occupancy

All Building Code occupancy group designations below are 2008 designations.

Floor From To	Maximum persons permitted	Live load lbs per sq. ft.	Building Code occupancy group	Dwelling or Rooming Units	Zoning use group	Description of use
CEL		OG	S-1			ACCESSORY USES
OS P		OG			1B	4 VEHICLE ACCESSORY PARKING SPACES & 4 LOADING BERTHS
001	40	200	S-1		16D	STORAGE, ACCESSORY OFFICE, 3 VEHICLE PARKING SPACES
002	10	200	S-1		16D	STORAGE
003	10	200	S-1		16D	STORAGE
004	10	200	S-1		16D	STORAGE

GENERAL NOTE: SELF STORAGE FACILITY WITH 3 INTERIOR PARKING SPACES AND 4 EXTERIOR PARKING SPACES WITH 4 LOADING/UNLOADING BERTHS.

END OF SECTION

Borough Commissioner

Acting Commissioner

END OF DOCUMENT

NYC Buildings

Certificate of Occupancy

CO Number: 320296899T004

This certifies that the premises described herein conforms substantially to the approved plans and specifications and to the requirements of all applicable laws, rules and regulations for the uses and occupancies specified. No change of use or occupancy shall be made unless a new Certificate of Occupancy is issued. *This document or a copy shall be available for inspection at the building at all reasonable times.*

A.

Borough: Brooklyn
Address: 338 3RD AVENUE
Building Identification Number (BIN): 3020761

Block Number: 00967
Lot Number(s): 24
Building Type: Altered

Certificate Type: Temporary
Effective Date: 05/20/2014
Expiration Date: 08/18/2014

This building is subject to this Building Code: Prior to 1968 Code

For zoning lot metes & bounds, please see BISWeb.

B.

Construction classification: 2-B (2008 Code)
Building Occupancy Group classification: S-1 (2008 Code)
Multiple Dwelling Law Classification: None
No. of stories: 4 **Height in feet:** 72 **No. of dwelling units:** 0

C.

Fire Protection Equipment:
Sprinkler system

D.

Type and number of open spaces:
Parking spaces (4), Parking (1200 square feet), Loading berths (4), Loading berths (2400 square feet)

E.

This Certificate is issued with the following legal limitations:
None

Outstanding requirements for obtaining Final Certificate of Occupancy:

There are 8 outstanding requirements. Please refer to BISWeb for further detail.

Borough Comments: None

Borough Commissioner

Acting Commissioner

DOCUMENT CONTINUES ON NEXT PAGE

NYC Buildings

Certificate of Occupancy

CO Number: 320296899T004

Permissible Use and Occupancy

All Building Code occupancy group designations below are 2008 designations.

Floor From To	Maximum persons permitted	Live load lbs per sq. ft.	Building Code occupancy group	Dwelling or Rooming Units	Zoning use group	Description of use
CEL		OG	S-1			ACCESSORY USES
OS P		OG			1B	4 VEHICLE ACCESSORY PARKING SPACES AND 4 LOADING BERTHS
001	40	200	S-1		16D	STORAGE, ACCESSORY OFFICE, 3 VEHICLE PARKING SPACES
002	10	200	S-1		16D	STORAGE
003	10	200	S-1		16D	STORAGE
004	10	200	S-1		16D	STORAGE

GENERAL NOTE: SELF STORAGE FACILITY WITH 3 INTERIOR PARKING SPACES AND 4 EXTERIOR PARKING SPACES WITH 4 LOADING/UNLOADING BERTHS.

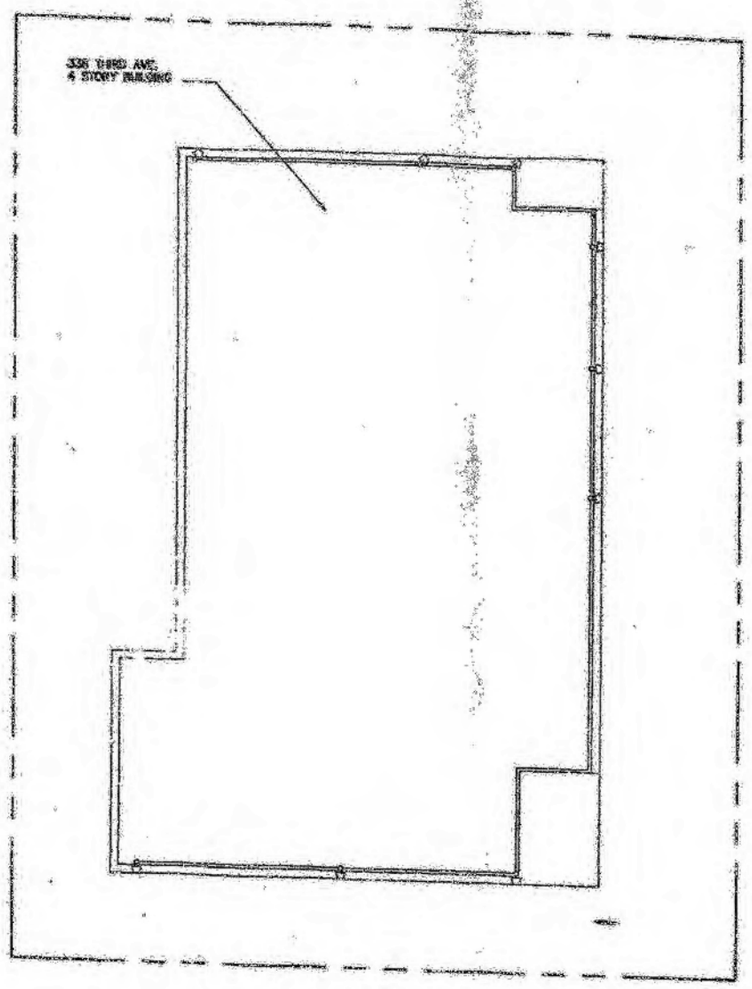
END OF SECTION

Borough Commissioner

Acting Commissioner

END OF DOCUMENT

B967, L24



PLOT PLAN
SCALE: 1" = 20'
(IN FEET)
1 inch = 20 ft.

ACCEPTABLE FOR PERMIT
UNDER DIRECTION NO. 74/0875
NOV 16 2000
ANDY PACHECO

THIS PLAN IS APPROVED ONLY FOR WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON, OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

Revisions	Drawn By	Chk'd By	Date
REVISED PER CPG COMMENTS	EKT	JPS	9/6/00

SITE ID# R208: PARK SLOPE
338 THIRD AVENUE BROOKLYN, NEW YORK

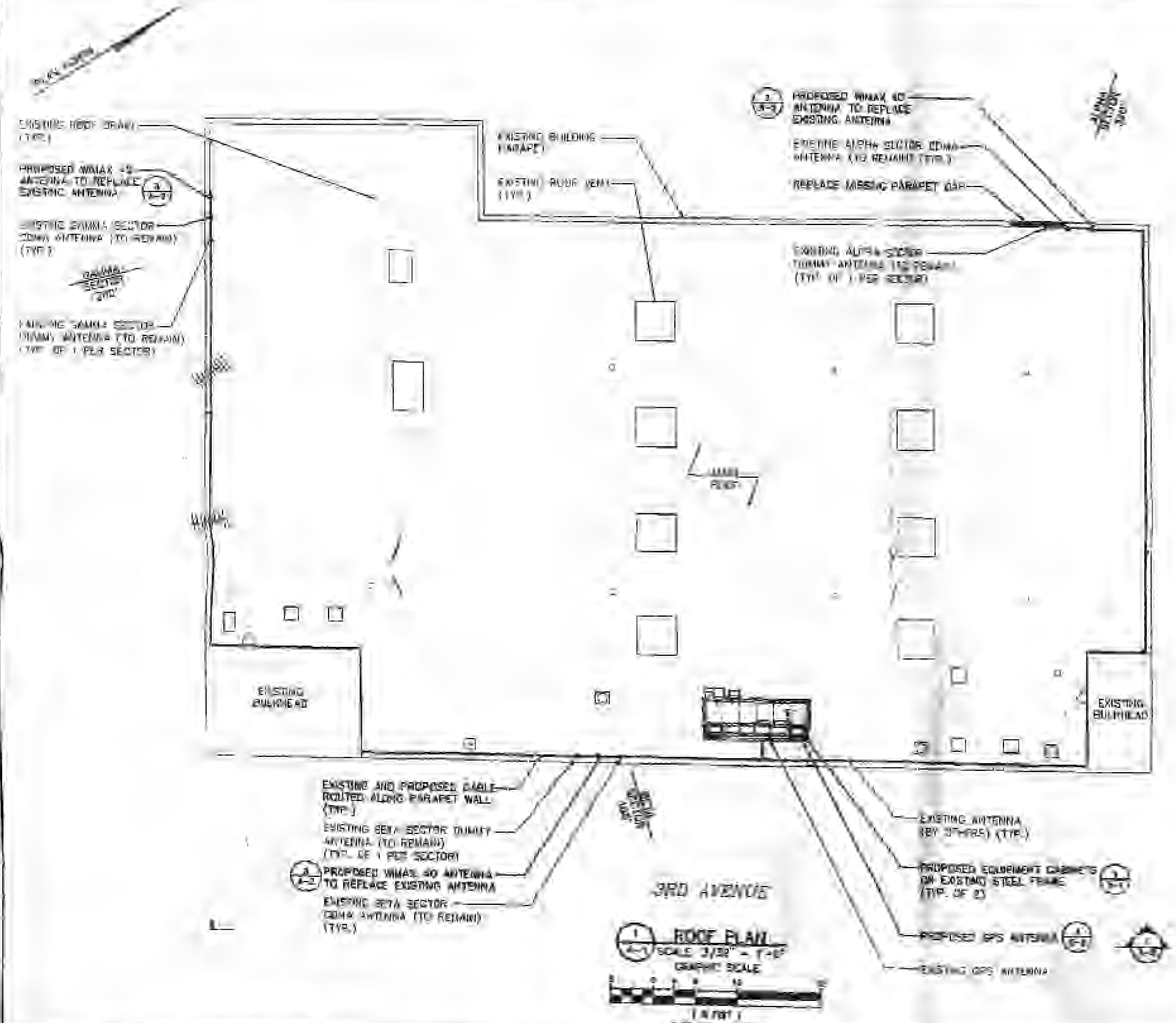
PLOT PLAN

AT&T WIRELESS SERVICES
333 CROSSWAYS PARK DRIVE
WOODBURY, NY 11797

CLOUGH, HARBOUR & ASSOCIATES LLP
ENGINEERS, SURVEYORS, PLANNERS
& LANDSCAPE ARCHITECTS
III WINNERS CIRCLE · ALBANY, NEW YORK · 12205
518-453-4500
CHA Project No. 1035.55.37

Designed By	Date	Drawn By	Date	Checked By	Date
RJT	9/8/00	RJT	9/8/00	JPS	9/8/00

Drawing No.
A-1



ROOF PLAN
SCALE: 3/32" = 1'-0"
GRAPHIC SCALE
(IN FEET)

GENERAL NOTES:

1. SUBJECT PROPERTY IS KNOWN AS BLOCK 967, LOT 24 AS SHOWN ON THE BROOKLYN TAX MAP AND IS SITUATED AT 338 3RD ST, BROOKLYN, NY 11215.
2. APPLICANT: NEXTEL COMMUNICATIONS
   ONE NORTH BROADWAY, 11TH FLOOR
   WHITE PLAINS, NEW YORK 10601
3. PROPERTY OWNER: THE JEWISH PRESS
   338 3RD AVE.
   BROOKLYN NY 11215
4. THE APPLICANT PROPOSES TO INSTALL A TELECOMMUNICATIONS FACILITY INCLUDING EQUIPMENT CABINETS TO THE EXISTING STEEL EQUIPMENT PLATFORM ON STEEL BEAMS ON THE EXISTING ROOF AND THE REPLACEMENT/INSTALLATION OF (3) ANTENNAS TO THE EXISTING BUILDING.
5. THE PROPOSED FACILITY IS NOT INTENDED FOR PERMANENT EMPLOYEE OCCUPANCY AND THEREFORE POTABLE WATER, SANITARY SEWERS, AND ADDITIONAL SITE PARKING ARE NOT REQUIRED.
6. THIS FACILITY SHALL BE VISITED ON THE AVERAGE OF ONCE A MONTH FOR MAINTENANCE AND SHALL BE MONITORED FROM A REMOTE FACILITY.
7. FINAL CONNECTION TO ELECTRICAL AND TELEPHONE UTILITIES TO BE COORDINATED WITH THE APPROPRIATE UTILITY COMPANY.
8. THIS SET OF PLANS HAS BEEN PREPARED FOR THE PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL CONDITIONS OF APPROVAL HAVE BEEN SATISFIED AND EACH OF THE DRAWINGS HAVE BEEN REVISED TO INDICATED "ISSUED FOR CONSTRUCTION."
9. ALL MATERIALS, WORKMANSHIP AND CONSTRUCTION FOR THE SITE IMPROVEMENTS SHOWN HEREON SHALL BE IN ACCORDANCE WITH:
   A. CURRENT PREVAILING MUNICIPAL AND/OR COUNTY SPECIFICATIONS, STANDARDS AND REQUIREMENTS.
   B. CURRENT PREVAILING UTILITY COMPANY AUTHORITY SPECIFICATIONS, STANDARDS AND REQUIREMENTS.
10. THE CONTRACTOR SHALL NOTIFY FRENCH & PARRELLO ASSOCIATES, P.A. IMMEDIATELY IF ANY FIELD-CONDITIONS ENCOUNTERED DIFFER FROM THOSE REPRESENTED HEREON, AND/OR IF SUCH CONDITIONS WOULD OR COULD RENDER THE DESIGNS SHOWN HEREON INAPPROPRIATE AND/OR INEFFECTIVE.
11. ALL INFORMATION SHOWN TAKEN FROM PLANS ENTITLED "ROOF PLAN" PREPARED BY FRENCH & PARRELLO, DATED 5/27/98 WITH REVISIONS THROUGH 1/29/09 AND INFORMATION TAKEN FROM 6/11/07 SITE VISIT BY FRENCH & PARRELLO ASSOCIATES P.A.
12. THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THIS SET OF PLANS HAS BEEN DETERMINED FROM FIELD MEASUREMENTS AND OR PLANS PROVIDED TO FRENCH AND PARRELLO ASSOCIATES. NO GUARANTEE IS MADE NOR SHOULD BE ASSUMED AS TO THE COMPLETENESS OR ACCURACY OF THE HORIZONTAL OR VERTICAL LOCATIONS. ALL PARTIES UTILIZING THIS INFORMATION SHALL FIELD VERIFY THE ACCURACY AND COMPLETENESS OF THE INFORMATION SHOWN PRIOR TO CONSTRUCTION ACTIVITIES.
13. THE CONSTRUCTION CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ALL CONSTRUCTION MEANS AND METHODS. THE CONSTRUCTION CONTRACTOR IS ALSO RESPONSIBLE FOR ALL JOB SITE SAFETY.
14. THERE IS NO DEFINED PARKING ON SITE, HOWEVER THERE IS EXISTING ON STREET PARKING FOR CELL TECHNICIAN'S VEHICLE.

SCHEDULE OF REVISIONS

NOTES:

1. THIS DOCUMENT HAS BEEN PREPARED FOR A 24"x 36" FORMAT. DO NOT SCALE THIS DOCUMENT IF PLOTTED ON ANY OTHER FORMAT.
2. IF THIS DOCUMENT DOES NOT CONTAIN THE RAISED SEAL OF THE UNDERSIGNED PROFESSIONAL, IT IS NOT AN VALID DOCUMENT AND NO LIABILITY IS ASSUMED FOR THE INFORMATION SHOWN HEREON.

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495

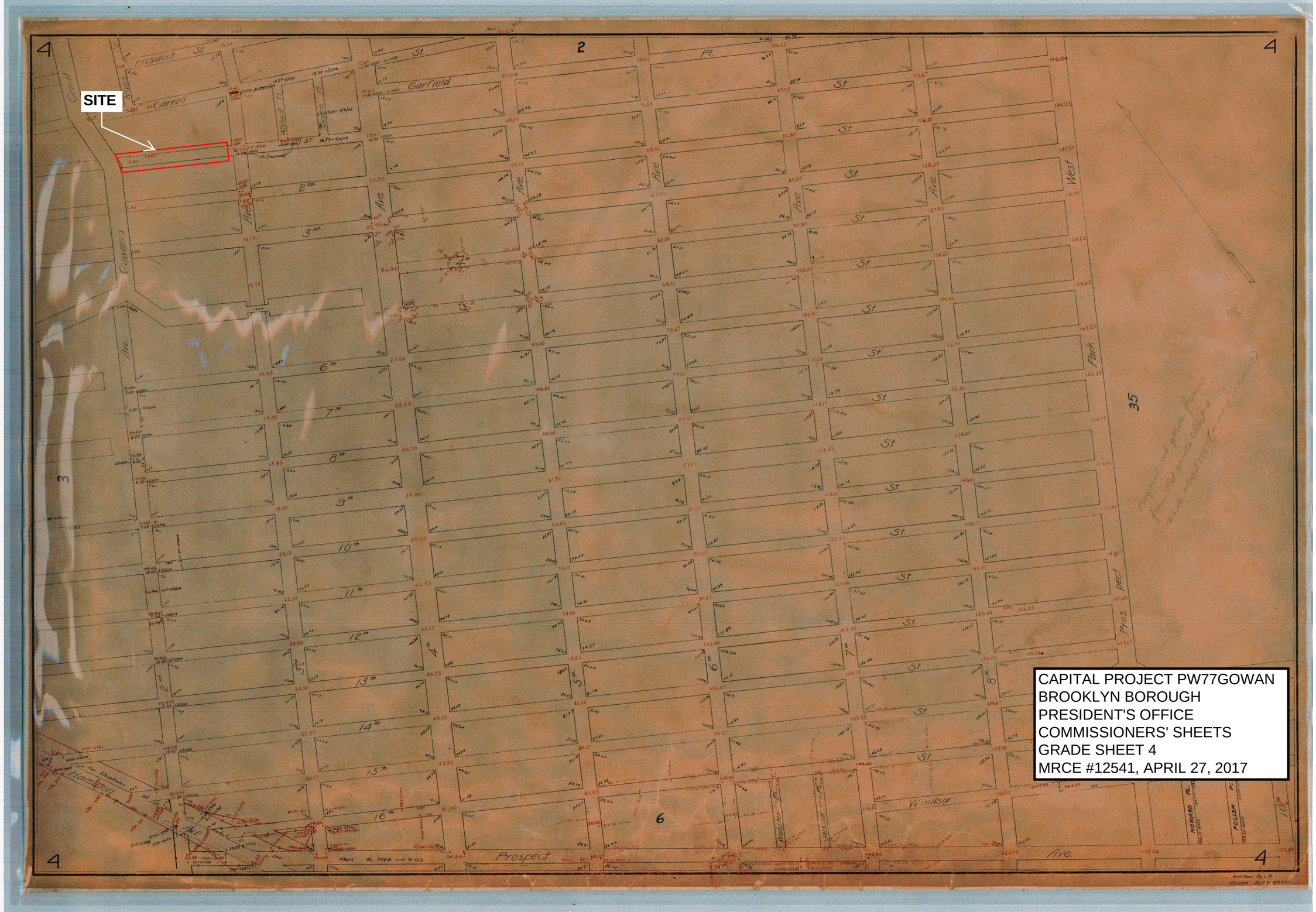
FRENCH & PARRELLO

DRAWING TITLE: ROOF PLAN AND NOTES

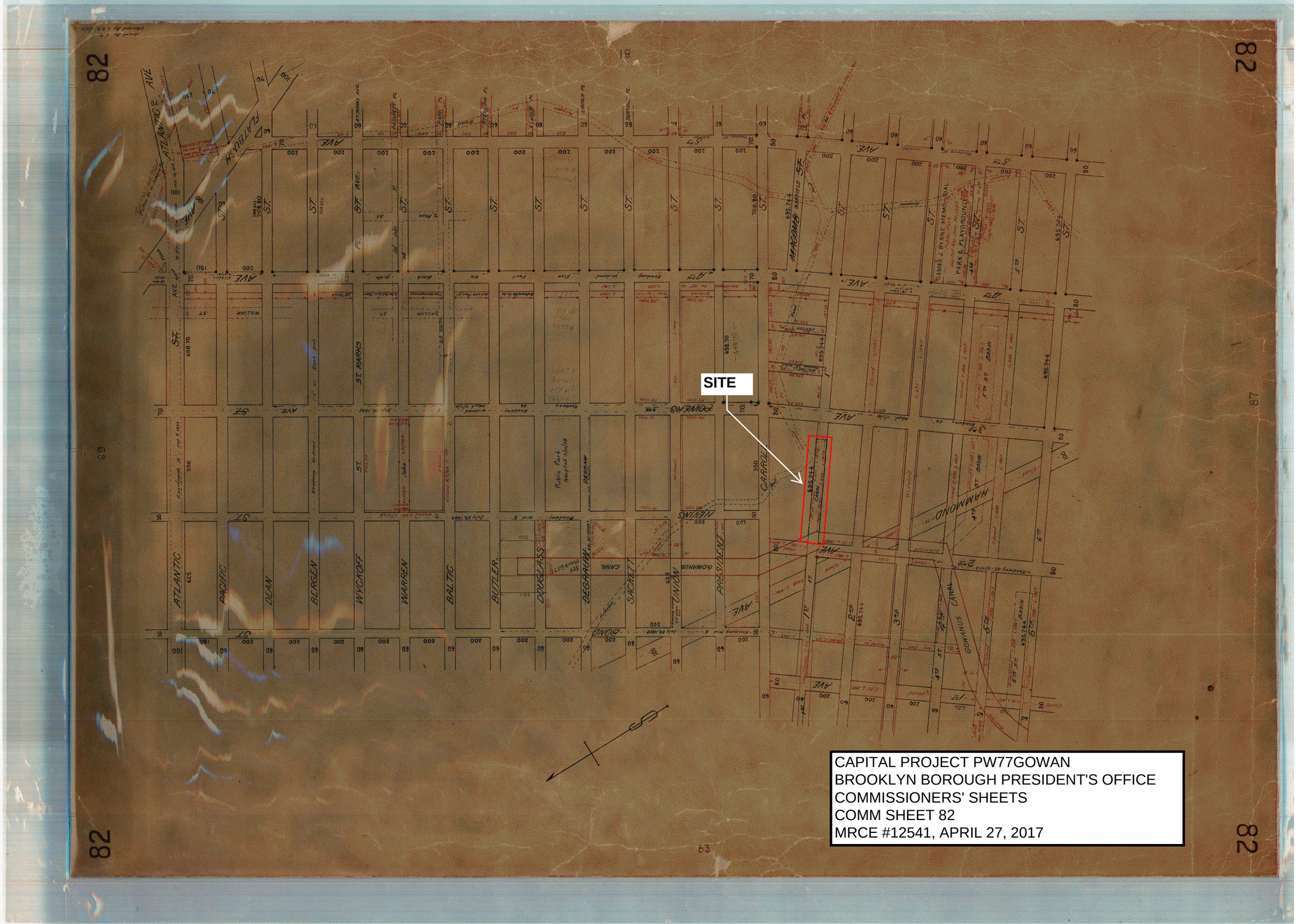
PROJECT: 338 3RD AVENUE
338 3RD AVENUE
BROOKLYN, NY 11215
KINGS COUNTY

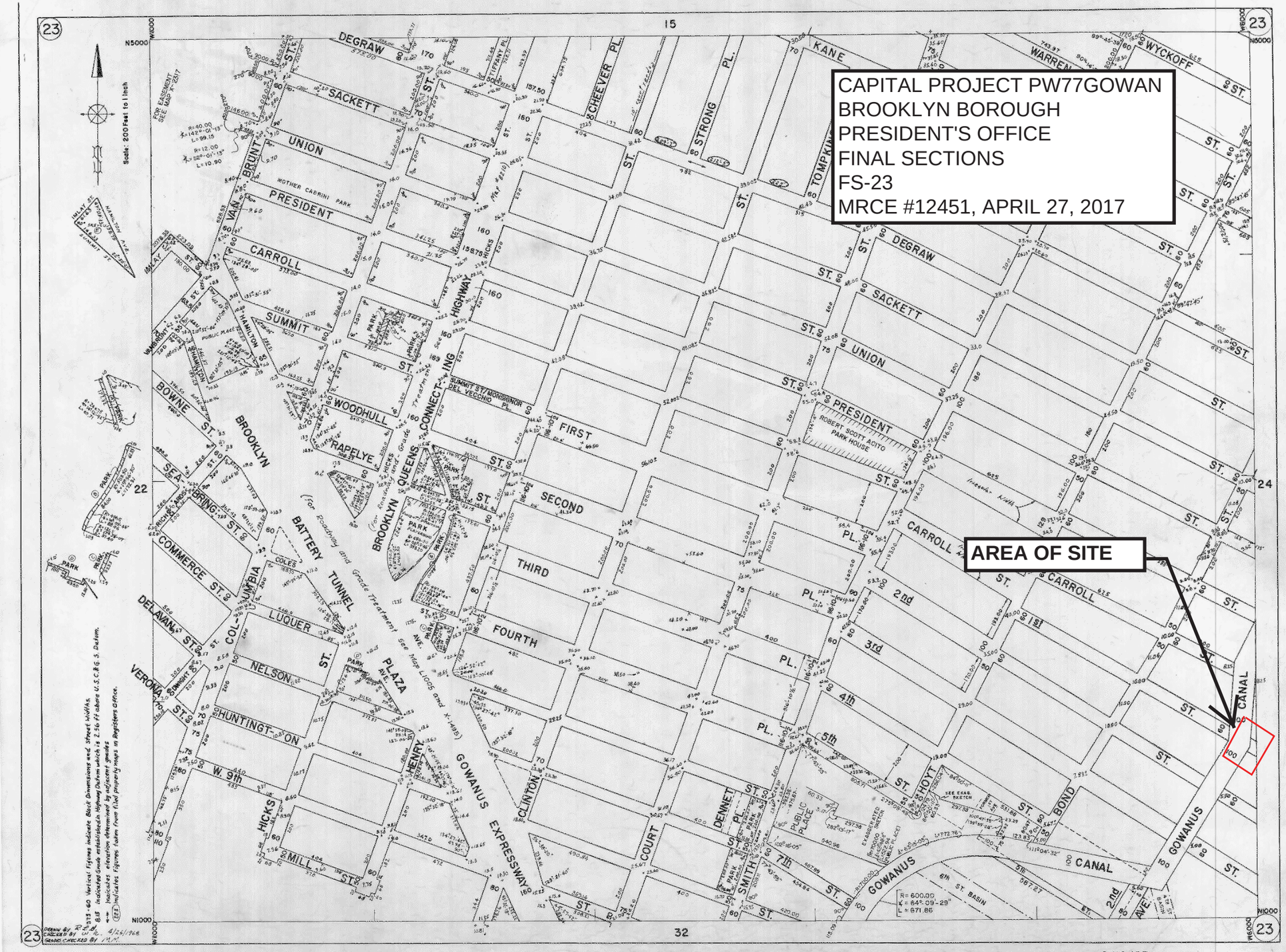
A-1

SECTION F
DOCUMENTATION FROM BROOKLYN BOROUGH PRESIDENT'S OFFICE
COMMISSIONERS' SHEETS AND FINAL SECTIONS



CAPITAL PROJECT PW77GOWAN
BROOKLYN BOROUGH
PRESIDENT'S OFFICE
COMMISSIONERS' SHEETS
GRADE SHEET 4
MRCE #12541, APRIL 27, 2017


SITE
CAPITAL PROJECT PW77GOWAN
BROOKLYN BOROUGH PRESIDENT'S OFFICE
COMMISSIONERS' SHEETS
COMM SHEET 82
MRCE #12541, APRIL 27, 2017



8/10/95

CAPITAL PROJECT PW77GOWAN
BROOKLYN BOROUGH PRESIDENT'S OFFICE
FINAL SECTIONS
FS-24
MRCE #12451, APRIL 27, 2017

AREA OF SITE

PRE-CONSTRUCTION CONDITION SURVEY REPORT
312 THIRD AVENUE, BROOKLYN, NEW YORK

PROJECT ID: PW77GOWAN
EXCAVATION & CAPPING OF FILLED
FIRST STREET TURNING BASIN, GOWANUS CANAL
BROOKLYN, NEW YORK

AKRF – KSE Joint Venture
440 Park Ave South, 7th Floor
New York, NY 10016

Mueser Rutledge Consulting Engineers
14 Penn Plaza, 225 West 34th Street
New York, New York 10122

November 30, 2017

MRCE
built on firm foundations

PARTNERS
Peter W. Deming
Roderic A. Ellman, Jr.
Francis J. Arland
David R. Good
Walter E. Kaeck

ASSOCIATE PARTNERS
Tony D. Canale
Jan Cermak
Sitotaw Y. Fantaye

SENIOR ASSOCIATES
Domenic D'Argenzio
Robert K. Radske
Ketan H. Trivedi
Hiren J. Shah
Alice Arana
Joel L. Volterra
Frederick C. Rhyner
Steven R. Lowe
Andrew R. Tognon
Gregg V. Piazza
James M. Tantalla
T. C. Michael Law

ASSOCIATES
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Peter L. Madarasz

TECHNICAL SPECIALISTS
David M. Cacoilo
Alfred H. Brand
James L. Kaufman
Hugh S. Lacy
Joel Moskowitz
George J. Tamaro
Elmer A. Richards

FINANCE DIRECTOR
Joseph N. Courtade

MARKETING DIRECTOR
Martha J. Huguet

November 30, 2017

AKRF – KSE Joint Venture
440 Park Ave South, 7th Floor
New York, NY 10016

Re: Pre-Construction Condition Survey
312 Third Avenue (Block 453, Lot 54)

Project ID: PW77GOWAN
Excavation & Capping of Filled First Street
Turning Basin, Gowanus Canal
Brooklyn, New York
MRCE File #12541

Greetings:

In accordance with the United States Environmental Protection Agency-approved 30% Field Activity Plan for Adjacent Buildings and Structures Research and Inspection, Mueser Rutledge Consulting Engineers (MRCE) is pleased to submit this pre-construction condition survey report for 312 Third Avenue (Block 453, Lot 54) adjacent to the proposed construction at the First Street Turning Basin. We have inspected the accessible exterior and interior areas of the associated building. This report provides a summary of our observations. Electronic image files of all photographs documenting existing conditions are provided separately in addition to this bound pdf report.

PROJECT SITE DESCRIPTION

The proposed construction at the First Street Turning Basin is bounded by the Gowanus Canal on the west and privately owned properties on the north, south, and east as shown in Figure SK-1. The anticipated construction activities include pile driving, pile drilling, excavation, and backfilling and compaction of soil.

EXHIBITS

Exhibits	Description
Figure SK-1	Condition Survey Location Map
Appendix A	Field Record Forms
Appendix B	Photographs

PRE-CONSTRUCTION CONDITION SURVEY

The pre-construction condition survey of the existing building at 312 Third Avenue was performed by MRCE's engineers Mr. Sanchit Arora and Mr. Howard Yang on August 9, 2017. The building includes a 4-story warehouse with one basement level below grade. The south façade of the building located at 312 Third Avenue is approximately 30 feet north of the north property line of the First Street Turning Basin. Access to the interior and roof of the building was provided by Mr. Steven

Moffat of Extra Space Storage, the current occupant. Examination of the visible building façades was performed from ground level.

MRCE engineers performed a pre-construction condition survey based on visual observations of the building. The pre-construction condition survey included a non-invasive, visual walkthrough by MRCE personnel and documentation of observed conditions, including visible defects and damage. Neither destructive nor non-destructive testing of any kind was performed. Contents such as furniture, inventory, storage items, interior partitions, suspended ceiling tiles or the like were not moved to evaluate or identify obscured existing conditions. Likewise, no cars, dumpsters or other items were moved in the parking and exterior access areas. The survey included all accessible areas including the basement, all four floors, roof, and exterior façade and parking areas of the building.

This report contains a written summary of the observed conditions, location plan, photographs, and corresponding field record forms. The inspection field record forms and photographs documenting the conditions observed at the time of our survey are provided in Appendices A and B, respectively. The field forms in Appendix A reference numbered photographs which correspond to the surveyed building areas. The photographs referenced on the field record survey forms are abbreviated from the full file name, such that IMG_0123.JPG is referred to as "0123" on the field forms.

GENERAL OBSERVATIONS

Table 1 below provides an index of photographs included in Appendix B by building location.

Table 1 - 312 3rd Avenue Photo Index

Building Component	Location	Photo Numbers (IMG_)
Exterior	Façades	6874-6916
	Pavement	6917-6918
Staircases	#1, Landings & Flights	6919-6959
	#2, Landings & Flights	6960-6997
Cellar	Storage Area	6648-6696
1st Floor	Reception/Office/Restrooms/Etc.	6723-6734
	Storage Area	6697-6722
2nd Floor	Storage Area	6735-6772
3rd Floor	Storage Area	6773-6809
4th Floor	Storage Area	6810-6869
Roof	4th Floor Roof	6870-6873

Our visual inspection documented floor cracking in the corridors of the storage areas of the 1st through 4th floors throughout as shown on the plans (Appendix A, sheets 13 through 18). In addition, water staining and damage to spray-on fireproofing, as well as general minor damage to finishes was noted throughout the building. On the exterior of the building, some cracks were noted in the facades on the ground floor. Principal observations photographed are noted in Table 2 below. Please refer to the inspection field forms and annotated sketches in Appendix A for a record of our observations.

A catch basin for storm water was observed on the south side of the building where noted on the ground floor plan. Utilities enter the building in the northeast and southeast corners of the building at the cellar level. No other above-ground or at grade evidence of buried utilities was observed within the property.

Table 2 - 312 3rd Avenue Principal Observations Photos

Building Component	Location	Photo # (IMG_)	Description
Exterior	Façades	6891, 6897, 6912, 6914-6	Cracks in CMUs
Cellar	Storage Area	6666, 6669, 6672-3, 6681, 6688-9	Water staining
		6650-3, 6668-9, 6677-9, 6685-6, 6695-6	Missing fireproofing
		6654-6, 6659-64, 6683,	Joint separations
1st Floor	Storage Area	6705, 6720	Water staining
		6700-4, 6707, 6713-4	Missing fireproofing
2nd Floor	Storage Area	6739-41, 6747, 6754-5, 6757, 6764-5	Water staining
		6743, 6749, 6754-5, 6759, 6762,	Missing fireproofing
3rd Floor	Storage Area	6775-7, 6781, 6783-5, 6789-92, 6794-6, 6798, 6801, 6803-4, 6806-8	Water staining
		6780, 6800	Missing fireproofing
4th Floor	Storage Area	6818-26, 6830-40, 6842, 6844-8, 6850-2, 6859-64, 6866-9	Water staining
		6813, 6827-8, 6853-4	Missing fireproofing
		6998-7005	Floor cracks
Stair #1	Northwest Corner of Building	6926, 6929-30, 6933, 6950	Water staining
		6928, 6936, 6940, 6942-3, 6946-7	Hairline cracks
		6927	Joint separation
Stair #2	Southeast Corner of Building	6962-3	Water staining
		6966, 6973-4, 6976-8, 6981, 6983-4, 6989, 6991-2	Hairline cracks
		6967-8, 6987-88, 6995-6	Joint separation

CLOSURE

This report documents existing conditions of the existing building at 312 Third Avenue at the time of our visit and prior to the construction at the First Street Turning Basin.

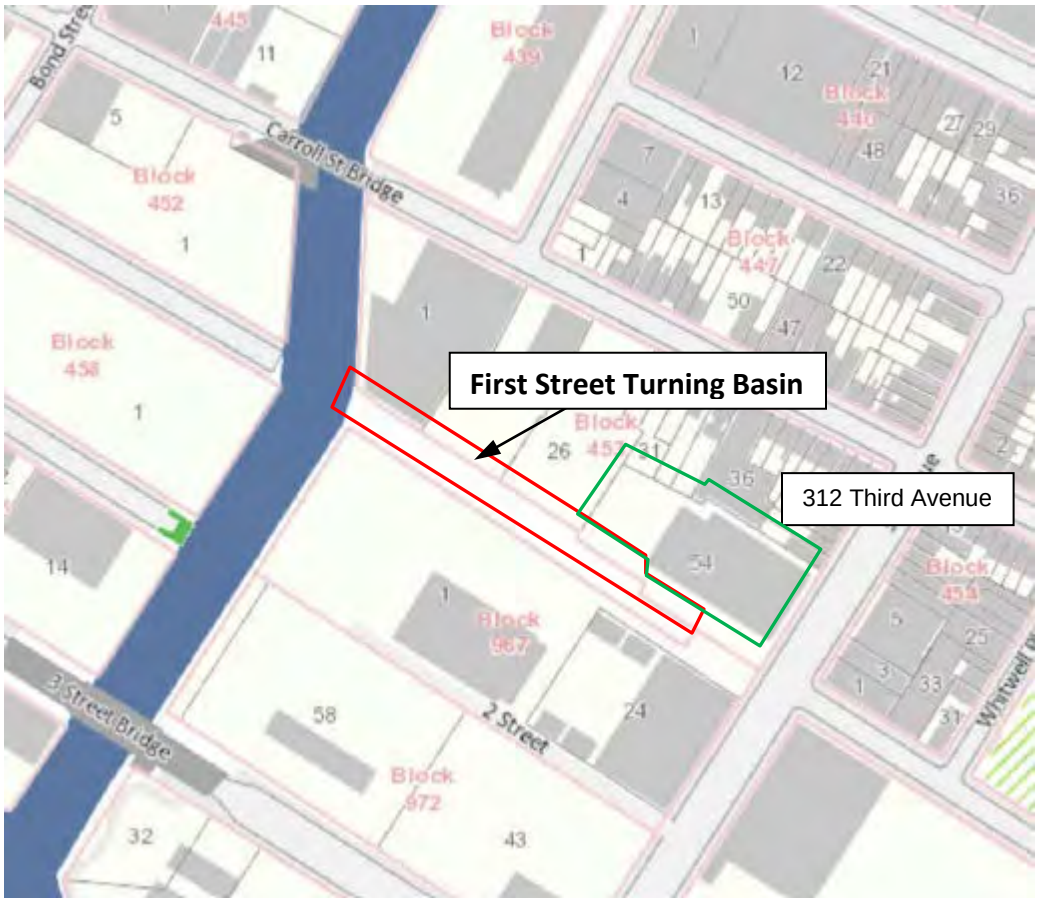
Very truly yours,

MUESER RUTLEDGE CONSULTING ENGINEERS

Sarah O. H. Johnson, P.E.

Domenic D'Argenzio, PE

EXHIBITS



N

Base plan from www.oasisnyc.net, April 27, 2017.

CAPITAL PROJECT PW77GOWAN
EXCAVATION & CAPPING OF FILLED FIRST STREET TURNING BASIN

BROOKLYN NEW YORK

NYC DEPT OF DESIGN & CONSTRUCTION

LONG ISLAND CITY NEW YORK

MUESER RUTLEDGE CONSULTING ENGINEERS

225 WEST 34TH STREET, NEW YORK, NY 10122

SCALE	MADE BY: SOHJ DATE: 10-04-17	FILE NO.
NA	CH'KD BY: DD DATE: 10-04-17	12541

CONDITION SURVEY LOCATION PLAN

PLATE NO. **SK-1**

APPENDIX A

Field Record Forms

MUESER RUTLEDGE CONSULTING ENGINEERS Date: 08/09/2017 Time of visit: 0800 am File No.: 12541

ADDRESS: 312 3rd Ave, Brooklyn, NY Recorder: SA Photographer: HY Camera No.:

Resident / Contact Name: No. of Units in Bldg: Sheet No. 1 Of 19

FIELD RECORD SURVEY FORM - BUILDING EXTERIOR

FRONT FACE: N (S) E W No. of floors above grade 4 No. of floors below grade 1

FRONT WALL MATERIALS: O Brick O Stone O CMU O Wood ● Concrete ● Steel O Other (Describe Below)

NO. OF WINDOWS PER FLOOR: (Below) Grade 0 1st 4 2nd 7 3rd 0

FRONT FACADE FEATURES: External Stairs O Yes ● No O Concrete O Steel O Masonry O Wood

Photo: ● Yes O No Porch/Balcony/Deck O Yes ● No O Concrete O Steel O Masonry O Wood

Photo No's. 6874~6877 O Cantilever O Supported

Driveway ● Yes O No O Concrete O Stone ● Asphalt O Other

Sidewalk: ● Yes O No ● Concrete O Stone O Asphalt O Other

OBSERVED DEFECTS: O None ● Cracks (List size, type, location) ● Other (Describe)

Comments: Ov. (6874), Chipping wall (6875), Chipped paint (6876), Dent in wall (6877),

O See Comment No.

Side FACE: N S E (W) No. of floors above grade 4 No. of floors below grade 1

SIDE WALL MATERIALS: O Brick O Stone O CMU O Wood ● Concrete ● Steel O Other (Describe Below)

NO. OF WINDOWS PER FLOOR: (Below) Grade 0 1st 4 2nd 4 3rd 0

SIDE FACADE FEATURES: External Stairs O Yes ● No O Concrete O Steel O Masonry O Wood

Photo: ● Yes O No Porch/Balcony/Deck O Yes ● No O Concrete O Steel O Masonry O Wood

Photo No's. 6878~6897 O Cantilever O Supported

Driveway ● Yes O No O Concrete O Stone ● Asphalt O Other

Sidewalk: ● Yes O No O Concrete O Stone ● Asphalt O Other

OBSERVED DEFECTS: O None ● Cracks (List size, type, location) ● Other (Describe)

Comments: Ov (6878, 6879), Drilled Holes in wall (6880), Dents on wall (6881, 6882), Paint chipping door (6883), wall chipping around door frame (6884), Paint chip (6885), Wall chip (6886), Dent shutter casing (6887~6890), Vrt crk wall (6891), Wall chipping (6892~6895), Paint chip (6896). O See Comment No. Crk wall (6897).

Side FACE: (N) S E W No. of floors above grade 4 No. of floors below grade 1

SIDE WALL MATERIALS: O Brick O Stone O CMU O Wood ● Concrete ● Steel O Other (Describe Below)

NO. OF WINDOWS PER FLOOR: (Below) Grade 0 1st 0 2nd 0 3rd 0

SIDE FACADE FEATURES: External Stairs O Yes ● No O Concrete O Steel O Masonry O Wood

Photo: ● Yes O No Porch/Balcony/Deck O Yes ● No O Concrete O Steel O Masonry O Wood

Photo No's. 6898~6918 O Cantilever O Supported

Driveway ● Yes O No O Concrete O Stone ● Asphalt O Other

Sidewalk: ● Yes O No O Concrete O Stone ● Asphalt O Other

OBSERVED DEFECTS: O None ● Cracks (List size, type, location) ● Other (Describe)

Comments: Ov (6898), Chipping wall (6899), Chipping wall around access door (6900, 6901), Wall chipping (6902), Chipping wall (6903, 6904), Crk on pavement*/Uneven pavement (ponding) (6917, 6918). Note: Dumpster in rear.

O See Comment No.

Rear FACE: N S (E) W No. of floors above grade 4 No. of floors below grade 1

REAR WALL MATERIALS: O Brick O Stone O CMU O Wood ● Concrete ● Steel O Other (Describe Below)

NO. OF WINDOWS PER FLOOR: (Below) Grade 0 1st 0 2nd 0 3rd 0

REAR FACADE FEATURES: External Stairs O Yes ● No O Concrete O Steel O Masonry O Wood

Photo: ● Yes O No Porch/Balcony/Deck O Yes ● No O Concrete O Steel O Masonry O Wood

Photo No's. 6905~6916 O Cantilever O Supported

Driveway ● Yes O No O Concrete O Stone ● Asphalt O Other

Sidewalk: ● Yes O No O Concrete O Stone ● Asphalt O Other

OBSERVED DEFECTS: O None ● Cracks (List size, type, location) ● Other (Describe)

Comments: Ov (6905~6908), Chipping paint (6909), Chipping wall (6910), Chipping wall at corner (6911), Step/ Vrt crk in wall (6912), Patched wall (6913), Vrt crk wall (6914, 6915), Dag crk wall (6916)

Note. Uneven pavement.

O See Comment No.

Abbreviations:	(F) Front	(Vrt) Vertical	(Hrz) Horizontal	(HL) Hairline
	(S) Side	(Dag) Diagonal	(Crk) Crack	(NOD) No Observable Defect
	(R) Rear	(Dmu) Decorative masonry unit	(Cmu) Conc. Masonry Unit	(CG) Potential Crack Cage Location

Rev Date 2012

MUESER RUTLEDGE CONSULTING ENGINEERS Date: 08/09/2017 Time of visit: 0800 am File No.: 12541

ADDRESS: 312 3rd Ave, Brooklyn, NY Recorder: SA Photographer: HY Camera No.:

Resident / Contact Name: No. of Units in Bldg: Sheet No. 2 Of 19

FIELD RECORD SURVEY FORM - BUILDING INTERIOR

Unit No.

Floor / Location: CELLAR Number of Windows

Room Use: STORAGE

Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other METAL DECK

Walls: O Drywall O Paneled O Plaster O Wallpaper ● Other CONCRETE

Photo(s): ● Yes O No Photo No's. 6648~6696

Floor: O Wood O Ceramic Tile O Other Tile O Other
● Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None O Cracks (List size, type, location) ● Other (Describe)

Comments: Ov.(6648), Ov(6649), Missing / Break in fireproofing (6650, 6651, 6652, 6653), Crk/Sep in wall (6654), Sep around elevator frame on wall (6655, 6656), Chipping paint (6657), Ov (6658), Crk/Sep around column with wall and missing fireproofing (6659~6664), Ov (6665), Water staining (6666), Ov. (6667), Missing FP (6668),

O See Comment No.

Floor / Location: Number of Windows

Room Use:

Ceiling: O Drywall O Suspended O Plaster O Wallpaper O Other

Walls: O Drywall O Paneled O Plaster O Wallpaper O Other

Photo(s): O Yes O No Photo No's.

Floor: O Wood O Ceramic Tile O Other Tile O Other
O Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None O Cracks (List size, type, location) O Other (Describe)

Comments: Water staining (6669), Ov. (6670), Ov (6671), Water staining (6672, 6673), Ov (6674), Chipped wall (6675, 6676), Missing FP column (6677~6679), Ov (6680), Water staining (6681), Ov (6682), Sep in wall (6683), Ov (6684), Missing FP beam (6685), Missing FP column (6686), Ov (6687), Water staining (6688),

O See Comment No.

Floor / Location: Number of Windows

Room Use:

Ceiling: O Drywall O Suspended O Plaster O Wallpaper O Other

Walls: O Drywall O Paneled O Plaster O Wallpaper O Other

Photo(s): O Yes O No Photo No's.

Floor: O Wood O Ceramic Tile O Other Tile O Other
O Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None O Cracks (List size, type, location) O Other (Describe)

Comments: Water staining (6689), Ov (6690), Hole in wall (6691), Ov (6692), Ov (6693), Hole in wall (6694), Missing FP (6695, 6696)

O See Comment No.

Floor / Location: 1ST FLOOR Number of Windows

Room Use: STORAGE

Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other METAL DECK

Walls: O Drywall O Paneled O Plaster O Wallpaper ● Other CONCRETE

Photo(s): ● Yes O No Photo No's. 6697~6722

Floor: O Wood O Ceramic Tile O Other Tile ● Other COMPOSITE FLOOR
O Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None ● Cracks (List size, type, location) ● Other (Describe)

Comments: Ov (6697), Ov (6698), Ov (6699), Missing FP (6700~6704), Water staining (6705), Ov (6706), Missing FP (6707), Ov (6708), Peeled paint (6709), Ov (6710), Ov (6711), Ov (6712), Missing FP Column (6713, 6714), Ov (6715), Ov (6716), Chipping paint (6717), Ov (6718), Ov (6719), Water staining (6720),

O See Comment No.

Abbreviations:	(F) Front	(Vrt) Vertical	(Hrz) Horizontal	(Bth) Bathroom	(HL) Hairline
	(S) Side	(Dag) Diagonal	(Crk) Crack	(Kit) Kitchen	(NOD) No Observable Defect
	(R) Rear	(Liv) Living Room	(Br) Bedroom	(Dr) Dining Room	(CG) Potential Crack Gage Location

MUESER RUTLEDGE CONSULTING ENGINEERS Date: 08/09/2017 Time of visit : 0800am File No.: 12541

ADDRESS: 312 3rd Ave, Brooklyn, NY Recorder: SA Photographer: HY Camera No.:

Resident / Contact Name: No. of Units in Bldg: Sheet No. 3 of 19

FIELD RECORD SURVEY FORM - BUILDING INTERIOR

Unit No.

Floor / Location: Number of Windows

Room Use:

Ceiling: O Drywall O Suspended O Plaster O Wallpaper O Other

Walls: O Drywall O Paneled O Plaster O Wallpaper O Other

Photo(s): O Yes O No Floor: O Wood O Ceramic Tile O Other Tile O Other

Photo No's. O Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None O Cracks (List size, type, location) O Other (Describe)

Comments: Ov(6721-6722), FLOOR CRACKS THROUGHOUT STORAGE AREA CORRIDORS - SEE LOCATIONS ON PLAN.

O See Comment No.

Floor / Location: 1st FLOOR Number of Windows 8

Room Use: RECEPTION

Ceiling: O Drywall ● Suspended O Plaster O Wallpaper O Other

Walls: ● Drywall O Paneled O Plaster O Wallpaper O Other

Photo(s): ● Yes O No Floor: O Wood O Ceramic Tile ● Other Tile O Other

Photo No's. 6723~6726 O Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None O Cracks (List size, type, location) ● Other (Describe)

Comments: Ov(6723), Hole in wall(6724), Sep. molding (6725), Sep wall(6726),

O See Comment No.

Floor / Location: 1st FLOOR Number of Windows 0

Room Use: BATHROOM 1

Ceiling: O Drywall ● Suspended O Plaster O Wallpaper O Other

Walls: ● Drywall O Paneled O Plaster O Wallpaper O Other

Photo(s): ● Yes O No Floor: O Wood O Ceramic Tile ● Other Tile O Other

Photo No's. 6727 O Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: ● None O Cracks (List size, type, location) O Other (Describe)

Comments: Ov(6727)

O See Comment No.

Floor / Location: 1st FLOOR Number of Windows 1

Room Use: OFFICE

Ceiling: O Drywall ● Suspended O Plaster O Wallpaper O Other

Walls: ● Drywall O Paneled O Plaster O Wallpaper O Other

Photo(s): ● Yes O No Floor: O Wood O Ceramic Tile O Other Tile O Other

Photo No's. 6728~6731 ● Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None O Cracks (List size, type, location) ● Other (Describe)

Comments: Ov(6728), Hole in suspended ceiling (6729, 6730), Panel missing: Note (6731)

O See Comment No.

Abbreviations:	(F) Front	(Vrt) Vertical	(Hrz) Horizontal	(Bth) Bathroom	(HL) Hairline
	(S) Side	(Diag) Diagonal	(Crk) Crack	(Kit) Kitchen	(NOD) No Observable Defect
	(R) Rear	(Liv) Living Room	(Br) Bedroom	(Dr) Dining Room	(CG) Potential Crack Gage Location

MUESER RUTLEDGE CONSULTING ENGINEERS Date: 08/09/2017 Time of visit: 0800am File No.: 12541

ADDRESS: 312 3rd Ave, Brooklyn, NY Recorder: SA Photographer: HY Camera No.:

Resident / Contact Name: No. of Units in Bldg: Sheet No. 4 Of 19

FIELD RECORD SURVEY FORM - BUILDING INTERIOR

Unit No.

Floor / Location: 1ST FLOOR Number of Windows 6

Room Use: BATHROOM 2

Ceiling: O Drywall ● Suspended O Plaster O Wallpaper O Other

Walls: ● Drywall O Paneled O Plaster O Wallpaper O Other

Photo(s): ● Yes O No Photo No's. 6732~6733

Floor: O Wood O Ceramic Tile ● Other Tile O Other
O Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: ● None O Cracks (List size, type, location) O Other (Describe)

Comments: Ov (6732, 6733)

O See Comment No.

Floor / Location: 1ST FLOOR Number of Windows 0

Room Use: CLOSET

Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other METAL DECK

Walls: ● Drywall O Paneled O Plaster O Wallpaper O Other

Photo(s): ● Yes O No Photo No's. 6734

Floor: O Wood O Ceramic Tile O Other Tile O Other
● Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: ● None O Cracks (List size, type, location) O Other (Describe)

Comments: Ov (6734)

O See Comment No.

Floor / Location: 2nd FLOOR Number of Windows 11

Room Use: STORAGE

Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other METAL DECK

Walls: O Drywall O Paneled O Plaster O Wallpaper ● Other CONCRETE

Photo(s): ● Yes O No Photo No's. 6735~6772

Floor: O Wood ● Concrete O Ceramic Tile O Other Tile O Other
O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None ● Cracks (List size, type, location) ● Other (Describe)

Comments: Ov (6735), Chipping wall (6736, 6737), Ov (6738), Water staining (6739-6741), Ov (6742), Missing FP (6743), Chipping wall (6744), Ov (6745), Ov (6746), Water staining (6747), Ov (6748), Missing FP (6749), Ov (6750), Ov (6751), Ov (6752), Ov (6753), Water staining/ missing FP (6754, 6755), Ov (6756),

O See Comment No.

Floor / Location: Number of Windows

Room Use:

Ceiling: O Drywall O Suspended O Plaster O Wallpaper O Other

Walls: O Drywall O Paneled O Plaster O Wallpaper O Other

Photo(s): ● Yes O No Photo No's.

Floor: O Wood O Ceramic Tile O Other Tile O Other
O Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None O Cracks (List size, type, location) O Other (Describe)

Comments: Water staining (6757), Ov (6758), Missing FP column (6759), Chipped wall (6760), Ov (6761), Missing FP (6762), Ov (6763), Water staining (6764, 6765) Ov (6766), Ov (6767), Crk susp ceiling (6768) Chipping wall (6769), Ov (6770), Missing susp ceiling panel (6771) Ov (6772). Floor cracks in storage area corridors as marked on plan

O See Comment No.

Abbreviations:	(F) Front	(Vrt) Vertical	(Hrz) Horizontal	(Bth) Bathroom	(HL) Hairline
	(S) Side	(Dag) Diagonal	(Crk) Crack	(Kit) Kitchen	(NOD) No Observable Defect
	(R) Rear	(Liv) Living Room	(Br) Bedroom	(Dr) Dining Room	(CG) Potential Crack Gage Location

MUESER RUTLEDGE CONSULTING ENGINEERS Date: 08/09/2017 Time of visit: 0800 am File No.: 1254

ADDRESS: 312 3rd Ave, Brooklyn, NY Recorder: SA Photographer: HY Camera No.:

Resident / Contact Name: No. of Units in Bldg: Sheet No. 5 Of 19

FIELD RECORD SURVEY FORM - BUILDING INTERIOR

Unit No.

Floor / Location: 3rd FLOOR Number of Windows

Room Use: STORAGE

Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other METAL DECK

Walls: O Drywall O Paneled O Plaster O Wallpaper ● Other CONCRETE

Photo(s): ● Yes O No Photo No's. 6773~6809

Floor: O Wood O Ceramic Tile O Other Tile O Other
● Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None ● Cracks (List size, type, location) ● Other (Describe)

Comments: Ov.(6773), Chipped wall(6774), Water staining (6775, 6776, 6777), Ov.(6778), Hole in wall(6779), Missing FP column (6780), Water staining(6781), Chipped wall/Sep (6782), Water staining (6783, 6784, 6785), Ov(6786), Ov(6787), Ov(6788), Water staining (6789, 6790, 6791, 6792),

O See Comment No.

Floor / Location: Number of Windows

Room Use:

Ceiling: O Drywall O Suspended O Plaster O Wallpaper O Other

Walls: O Drywall O Paneled O Plaster O Wallpaper O Other

Photo(s): O Yes O No Photo No's.

Floor: O Wood O Ceramic Tile O Other Tile O Other
O Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None O Cracks (List size, type, location) O Other (Describe)

Comments: Ov(6793), Water staining (6794, 6795, 6796) Ov(6797), Water staining (6798), Ov(6799), Missing FP column(6800), Water staining (6801), Ov(6802), Water staining (6803, 6804), Ov(6805), Water staining (6806, 6807, 6808), Ov(6809), FLOOR CRACKS IN STORAGE AREA CORRIDORS AS MARKED ON MAP

O See Comment No.

Floor / Location: Number of Windows

Room Use:

Ceiling: O Drywall O Suspended O Plaster O Wallpaper O Other

Walls: O Drywall O Paneled O Plaster O Wallpaper O Other

Photo(s): O Yes O No Photo No's.

Floor: O Wood O Ceramic Tile O Other Tile O Other
O Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None O Cracks (List size, type, location) O Other (Describe)

Comments:

O See Comment No.

Floor / Location: Number of Windows

Room Use:

Ceiling: O Drywall O Suspended O Plaster O Wallpaper O Other

Walls: O Drywall O Paneled O Plaster O Wallpaper O Other

Photo(s): O Yes O No Photo No's.

Floor: O Wood O Ceramic Tile O Other Tile O Other
O Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None O Cracks (List size, type, location) O Other (Describe)

Comments:

O See Comment No.

Abbreviations:	(F) Front	(Vrt) Vertical	(Hrz) Horizontal	(Bth) Bathroom	(HL) Hairline
	(S) Side	(Dag) Diagonal	(Crk) Crack	(Kit) Kitchen	(NOD) No Observable Defect
	(R) Rear	(Liv) Living Room	(Br) Bedroom	(Dr) Dining Room	(CG) Potential Crack Gage Location

MUESER RUTLEDGE CONSULTING ENGINEERS | Date: 08/09/2017 | Time of visit: 0800am | File No.: 12541

ADDRESS: 312 3rd Ave, Brooklyn, NY | Recorder: SA | Photographer: HY | Camera No.:

Resident / Contact Name: | No. of Units in Bldg: | Sheet No. 6 of 19

FIELD RECORD SURVEY FORM - BUILDING INTERIOR

Unit No.

Floor / Location: 4th FLOOR — Number of Windows

Room Use: STORAGE

Ceiling: ○ Drywall ○ Suspended ○ Plaster ○ Wallpaper ● Other METAL DECK

Walls: ○ Drywall ○ Paneled ○ Plaster ○ Wallpaper ● Other CONCRETE

Photo(s): ● Yes ○ No — Photo No's. 6810~6869

Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other ● Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ○ None ● Cracks (List size, type, location) ● Other (Describe)

Comments: Ov(6810), Chipped wall / Sep(6811, 6812), Missing FP Column(6813), Ov(6814), Ov(6815), Ov(6816), Ov(6817), Water staining(6818, 6819, 6820, 6821, 6822, 6823, 6824, 6825, 6826), Missing FP column(6827, 6828) Ov(6829), Water staining(6830~6840), Ov.(6841), Water staining(6842), Ov(6843),

○ See Comment No.

Floor / Location: — Number of Windows

Room Use:

Ceiling: ○ Drywall ○ Suspended ○ Plaster ○ Wallpaper ○ Other

Walls: ○ Drywall ○ Paneled ○ Plaster ○ Wallpaper ○ Other

Photo(s): ○ Yes ○ No — Photo No's.

Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other ○ Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ○ None ○ Cracks (List size, type, location) ○ Other (Describe)

Comments: Water staining(6844~6848), Ov(6849), Water staining(6850~6852), Missing FP on metal deck ceiling(6853~6854), Ov(6855), Chipping wall(6856), Ov(6857), Ov(6858), Water staining(6859~6864), Ov(6865), Water staining(6866~6869),

○ See Comment No.

Floor / Location: 4th FLOOR — Number of Windows

Room Use: STORAGE

Ceiling: ○ Drywall ○ Suspended ○ Plaster ○ Wallpaper ● Other METAL DECK

Walls: ○ Drywall ○ Paneled ○ Plaster ○ Wallpaper ● Other CONCRETE

Photo(s): ● Yes ○ No — Photo No's. 6998~7005

Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other ● Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ○ None ● Cracks (List size, type, location) ○ Other (Describe)

Comments: Crk floor(6998~7005), SEE ALSO AS MARKED ON PLAN

○ See Comment No.

Floor / Location: — Number of Windows

Room Use:

Ceiling: ○ Drywall ○ Suspended ○ Plaster ○ Wallpaper ○ Other

Walls: ○ Drywall ○ Paneled ○ Plaster ○ Wallpaper ○ Other

Photo(s): ○ Yes ○ No — Photo No's.

Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other ○ Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ○ None ○ Cracks (List size, type, location) ○ Other (Describe)

Comments:

○ See Comment No.

Abbreviations:					
	(F) Front	(Vrt) Vertical	(Hrz) Horizontal	(Bth) Bathroom	(HL) Hairline
	(S) Side	(Dag) Diagonal	(Crk) Crack	(Kit) Kitchen	(NOD) No Observable Defect
	(R) Rear	(Liv) Living Room	(Br) Bedroom	(Dr) Dining Room	(CG) Potential Crack Gage Location

MUESER RUTLEDGE CONSULTING ENGINEERS Date: 08/09/2017 Time of visit: 0800 am File No.: 12541

ADDRESS: 312 3rd Ave, Brooklyn, NY Recorder: SA Photographer: HT Camera No.:

Resident / Contact Name: No. of Units in Bldg: Sheet No. 7 of 19

FIELD RECORD SURVEY FORM - BUILDING INTERIOR STAIR 1 Unit No.

Floor / Location: CELLAR FLOOR Number of Windows

Room Use: STAIR 1 LANDING

Ceiling: ● Drywall ○ Suspended ○ Plaster ○ Wallpaper ○ Other

Walls: ● Drywall ○ Paneled ○ Plaster ○ Wallpaper ● Other CONCRETE

Photo(s): ● Yes ○ No Photo No's. 6919 ~ 6923

Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other ● Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ○ None ● Cracks (List size, type, location) ● Other (Describe)

Comments: Ov (6919, 6920), Chipping wall (6921), Hole in ceiling (6922, 6923),

○ See Comment No.

Floor / Location: CELLAR - 1ST FLOOR Number of Windows

Room Use: STAIR 1 FLIGHT

Ceiling: ● Drywall ○ Suspended ○ Plaster ○ Wallpaper ○ Other

Walls: ● Drywall ○ Paneled ○ Plaster ○ Wallpaper ○ Other

Photo(s): ● Yes ○ No Photo No's. 6924 ~ 6931

Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other ● Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ○ None ● Cracks (List size, type, location) ● Other (Describe)

Comments: Ov (6924, 6925), Water staining (6926), Sep. of stair/wall (6927), HL Diag. crk (6928), Wall chipping/staining (6929, 6930), Hole in wall (6931),

○ See Comment No.

Floor / Location: 1ST FLOOR Number of Windows

Room Use: STAIR 1 LANDING

Ceiling: ○ Drywall ○ Suspended ○ Plaster ○ Wallpaper ● Other METAL DECK

Walls: ● Drywall ○ Paneled ○ Plaster ○ Wallpaper ● Other CONCRETE

Photo(s): ● Yes ○ No Photo No's. 6932 ~ 6933

Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other ● Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ○ None ○ Cracks (List size, type, location) ● Other (Describe)

Comments: Ov (6932), Water staining (6933),

○ See Comment No.

Floor / Location: 1ST_2ND FLOOR Number of Windows

Room Use: STAIR 1 FLIGHT

Ceiling: ○ Drywall ○ Suspended ○ Plaster ○ Wallpaper ● Other STEEL

Walls: ● Drywall ○ Paneled ○ Plaster ○ Wallpaper ○ Other

Photo(s): ● Yes ○ No Photo No's. 6934 ~ 6936

Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other ● Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ○ None ● Cracks (List size, type, location) ○ Other (Describe)

Comments: Ov (6934, 6935), Small vrt HL crk on each step of this flight (6936)

○ See Comment No.

Abbreviations:	(F) Front	(Vrt) Vertical	(Hrz) Horizontal	(Bth) Bathroom	(HL) Hairline
	(S) Side	(Dag) Diagonal	(Crk) Crack	(Kit) Kitchen	(NOD) No Observable Defect
	(R) Rear	(Liv) Living Room	(Br) Bedroom	(Dr) Dining Room	(CG) Potential Crack Gage Location

MUESER RUTLEDGE CONSULTING ENGINEERS Date: 02/09/2017 Time of visit: 0800 am File No.: 1254

ADDRESS: 312 3rd Ave, Brooklyn, NY Recorder: SA Photographer: HY Camera No.:

Resident / Contact Name: No. of Units in Bldg: Sheet No. 8 Of 19

FIELD RECORD SURVEY FORM - BUILDING INTERIOR STAIR 1 Unit No.

Floor / Location: 2nd FLOOR — Number of Windows

Room Use: STAIR 1 LANDING
Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other METAL DECK
Walls: ● Drywall O Paneled O Plaster O Wallpaper ● Other METAL SHEET
Photo(s): ● Yes O No Floor: O Wood O Ceramic Tile O Other Tile O Other
Photo No's. 6937 ● Concrete O Rug O Wall to wall carpet
OBSERVED DEFECTS: ● None O Cracks (List size, type, location) O Other (Describe)

Comments: Ov (6937)

O See Comment No.

Floor / Location: 2nd - 3rd FLOOR — Number of Windows

Room Use: STAIR 1 FLIGHT
Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other Metal deck
Walls: ● Drywall O Paneled O Plaster O Wallpaper ● Other METAL SHEET
Photo(s): ● Yes O No Floor: O Wood O Ceramic Tile O Other Tile O Other
Photo No's. 6938~6940 ● Concrete O Rug O Wall to wall carpet
OBSERVED DEFECTS: O None ● Cracks (List size, type, location) O Other (Describe)

Comments: Ov (6938, 6939), Small Vrt. HL crk step (6940); typical for every step. Note.

O See Comment No.

Floor / Location: 3rd FLOOR — Number of Windows

Room Use: STAIR 1 LANDING
Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other
Walls: ● Drywall O Paneled O Plaster O Wallpaper ● Other
Photo(s): ● Yes O No Floor: O Wood O Ceramic Tile O Other Tile O Other
Photo No's. 6941~6943 ● Concrete O Rug O Wall to wall carpet
OBSERVED DEFECTS: O None ● Cracks (List size, type, location) O Other (Describe)

Comments: Ov (6941), Dag/Hrz crk floor (6942, 6943)

O See Comment No.

Floor / Location: 3rd - 4th FLOOR — Number of Windows

Room Use: STAIR 1 FLIGHT
Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other METAL DECK
Walls: ● Drywall O Paneled O Plaster O Wallpaper ● Other METAL SHEET
Photo(s): ● Yes O No Floor: O Wood O Ceramic Tile O Other Tile O Other
Photo No's. 6944~6948 ● Concrete O Rug O Wall to wall carpet
OBSERVED DEFECTS: O None ● Cracks (List size, type, location) O Other (Describe)

Comments: Ov (6944, 6945) Small vrt HL crk step (6946); typ, Vrt. crk on intermediate step (6947), chipping wall (6948),

O See Comment No.

Abbreviations:	(F) Front	(Vrt) Vertical	(Hrz) Horizontal	(Bth) Bathroom	(HL) Hairline
	(S) Side	(Dag) Diagonal	(Crk) Crack	(Kit) Kitchen	(NOD) No Observable Defect
	(R) Rear	(Liv) Living Room	(Br) Bedroom	(Dr) Dining Room	(CG) Potential Crack Gage Location

MUESER RUTLEDGE CONSULTING ENGINEERS Date: 08/09/2017 Time of visit: 0800 am File No.: 1254

ADDRESS: 312 3rd Ave, Brooklyn, NY Recorder: SA Photographer: HY Camera No.:

Resident / Contact Name: No. of Units in Bldg: Sheet No. 9 Of 19

FIELD RECORD SURVEY FORM - BUILDING INTERIOR STAIR 1 Unit No.

Floor / Location: 4th FLOOR — Number of Windows

Room Use: STAIR 1 LANDING

Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other METAL DECK

Walls: ● Drywall O Paneled O Plaster O Wallpaper ● Other METAL SHEET

Photo(s): ● Yes O No — Photo No's. 6949~6951

Floor: O Wood O Ceramic Tile O Other Tile O Other ____ ● Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None ● Cracks (List size, type, location) O Other (Describe)

Comments: Ov(6949), Water staining (6950), Chip paint (6951).

O See Comment No.

Floor / Location: 4th - ROOF — Number of Windows

Room Use: STAIR 1 FLIGHT

Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other METAL DECK

Walls: ● Drywall O Paneled O Plaster O Wallpaper ● Other METAL SHEET

Photo(s): ● Yes O No — Photo No's. 6952~6957

Floor: O Wood O Ceramic Tile O Other Tile O Other ____ ● Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None ● Cracks (List size, type, location) O Other (Describe)

Comments: Ov(6952 6953), Chipped wall(6954, 6956), Vrt crk on step typical (6957) on most steps

O See Comment No.

Floor / Location: ROOF — Number of Windows

Room Use: STAIR 1 LANDING

Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other METAL DECK

Walls: ● Drywall O Paneled O Plaster O Wallpaper ● Other METAL SHEET

Photo(s): ● Yes O No — Photo No's. 6959

Floor: O Wood O Ceramic Tile O Other Tile O Other ____ ● Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: ● None O Cracks (List size, type, location) O Other (Describe)

Comments:

O See Comment No.

Floor / Location: — Number of Windows

Room Use:

Ceiling: O Drywall O Suspended O Plaster O Wallpaper O Other ____

Walls: O Drywall O Paneled O Plaster O Wallpaper O Other ____

Photo(s): O Yes O No — Photo No's.

Floor: O Wood O Ceramic Tile O Other Tile O Other ____ O Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None O Cracks (List size, type, location) O Other (Describe)

Comments:

O See Comment No.

Abbreviations:	(F) Front	(Vrt) Vertical	(Hrz) Horizontal	(Bth) Bathroom	(HL) Hairline
	(S) Side	(Dag) Diagonal	(Crk) Crack	(Kit) Kitchen	(NOD) No Observable Defect
	(R) Rear	(Liv) Living Room	(Br) Bedroom	(Dr) Dining Room	(CG) Potential Crack Gage Location

MUESER RUTLEDGE CONSULTING ENGINEERS | Date: 08/09/2017 | Time of visit: 0800 am | File No.: 12541

ADDRESS: 312 3rd Ave, Brooklyn, NY | Recorder: SA | Photographer: HY | Camera No.:

Resident / Contact Name: | No. of Units in Bldg: | Sheet No. 10 of 19

FIELD RECORD SURVEY FORM - BUILDING INTERIOR STAIR 2 Unit No.

Floor / Location: CELLAR | Number of Windows

Room Use: STAIR 2 LANDING

Ceiling: ● Drywall ○ Suspended ○ Plaster ○ Wallpaper ○ Other

Walls: ● Drywall ○ Paneled ○ Plaster ○ Wallpaper ● Other CONCRETE

Photo(s): ● Yes ○ No | Photo No's. 6960 ~ 6963

Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other ● Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ○ None ● Cracks (List size, type, location) ○ Other (Describe)

Comments: Ov (6960, 6961), Water staining (6962, 6963),

○ See Comment No.

Floor / Location: CELLAR - 1ST FLOOR | Number of Windows

Room Use: STAIR 2 FLIGHT

Ceiling: ● Drywall ○ Suspended ○ Plaster ○ Wallpaper ○ Other

Walls: ● Drywall ○ Paneled ○ Plaster ○ Wallpaper ● Other CONCRETE

Photo(s): ● Yes ○ No | Photo No's. 6964 ~ 6969

Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other ● Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ○ None ● Cracks (List size, type, location) ○ Other (Describe)

Comments: Ov (6964, 6965), Vrt crk on each step, typ (6966), Sep floor/wall (6967, 6968), chipping wall (6969),

○ See Comment No.

Floor / Location: 1ST FLOOR | Number of Windows

Room Use: STAIR 2 LANDING

Ceiling: ○ Drywall ○ Suspended ○ Plaster ○ Wallpaper ● Other METAL DECK

Walls: ● Drywall ○ Paneled ○ Plaster ○ Wallpaper ● Other CONCRETE

Photo(s): ● Yes ○ No | Photo No's. 6970

Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other ● Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ● None ○ Cracks (List size, type, location) ○ Other (Describe)

Comments: Ov (6970)

○ See Comment No.

Floor / Location: 1ST - 2ND FLOOR | Number of Windows

Room Use: STAIR 2 FLIGHT

Ceiling: ○ Drywall ○ Suspended ○ Plaster ○ Wallpaper ● Other METAL DECK

Walls: ● Drywall ○ Paneled ○ Plaster ○ Wallpaper ○ Other

Photo(s): ● Yes ○ No | Photo No's. 6971 ~ 6974

Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other ● Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ○ None ● Cracks (List size, type, location) ○ Other (Describe)

Comments: Ov (6971, 6972), Vrt crk on intermediate step (6973), Vrt crks on each step (6974),

○ See Comment No.

Abbreviations:	(F) Front	(Vrt) Vertical	(Hrz) Horizontal	(Bth) Bathroom	(HL) Hairline
	(S) Side	(Dag) Diagonal	(Crk) Crack	(Kit) Kitchen	(NOD) No Observable Defect
	(R) Rear	(Liv) Living Room	(Br) Bedroom	(Dr) Dining Room	(CG) Potential Crack Gage Location

MUESER RUTLEDGE CONSULTING ENGINEERS | Date: 08/09/2017 | Time of visit: 0800 am | File No.: 12541

ADDRESS: 312 3rd Ave, Brooklyn, NY | Recorder: SA | Photographer: HY | Camera No.:

Resident / Contact Name: | No. of Units in Bldg: | Sheet No. 11 of 19

FIELD RECORD SURVEY FORM - BUILDING INTERIOR STAIR 2 Unit No.

Floor / Location: 2nd FLOOR — Number of Windows

Room Use: STAIR 2 LANDING

Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other METAL DECK

Walls: ● Drywall O Paneled O Plaster O Wallpaper ● Other METAL SHEET

Photo(s): ● Yes O No — Floor: O Wood O Ceramic Tile O Other Tile O Other

Photo No's. 6975~6978 — ● Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None ● Cracks (List size, type, location) O Other (Describe)

Comments: Dv (6975), Crk in floor (6976~6978)

O See Comment No.

Floor / Location: 2nd FLOOR - 3rd FLOOR — Number of Windows

Room Use: STAIR 2 FLIGHT

Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other METAL DECK

Walls: ● Drywall O Paneled O Plaster O Wallpaper ● Other METAL SHEET

Photo(s): ● Yes O No — Floor: O Wood O Ceramic Tile O Other Tile O Other

Photo No's. 6979~6981 — ● Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None ● Cracks (List size, type, location) O Other (Describe)

Comments: Dv (6979, 6980), Vrt crk on step (6981)

O See Comment No.

Floor / Location: 3rd FLOOR — Number of Windows

Room Use: STAIR 2 LANDING

Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other METAL DECK

Walls: ● Drywall O Paneled O Plaster O Wallpaper ● Other METAL SHEET

Photo(s): ● Yes O No — Floor: O Wood O Ceramic Tile O Other Tile O Other

Photo No's. 6982~6984 — ● Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None ● Cracks (List size, type, location) O Other (Describe)

Comments: Dv (6982), Crk in floor (6983, 6984)

O See Comment No.

Floor / Location: 3rd - 4th FLOOR — Number of Windows

Room Use: STAIR 2 FLIGHT

Ceiling: O Drywall O Suspended O Plaster O Wallpaper ● Other METAL DECK

Walls: ● Drywall O Paneled O Plaster O Wallpaper ● Other METAL SHEET

Photo(s): ● Yes O No — Floor: O Wood O Ceramic Tile O Other Tile O Other

Photo No's. 6985~6989 — ● Concrete O Rug O Wall to wall carpet

OBSERVED DEFECTS: O None ● Cracks (List size, type, location) ● Other (Describe)

Comments: Dv (6985, 6986), Sep. b/w floor and wall (6987, 6988), Vrt crk on step (6989)

O See Comment No.

Abbreviations:	(F) Front	(Vrt) Vertical	(Hrz) Horizontal	(Bth) Bathroom	(HL) Hairline
	(S) Side	(Dag) Diagonal	(Crk) Crack	(Kit) Kitchen	(NOD) No Observable Defect
	(R) Rear	(Liv) Living Room	(Br) Bedroom	(Dr) Dining Room	(CG) Potential Crack Gage Location

MUESER RUTLEDGE CONSULTING ENGINEERS Date: 08/09/2017 Time of visit: 0800 am File No.: 12541

ADDRESS: 312 3rd Ave, Brooklyn, NY Recorder: SA Photographer: HY Camera No.:

Resident / Contact Name: No. of Units in Bldg: Sheet No. 12 Of 19

FIELD RECORD SURVEY FORM - BUILDING INTERIOR STAIR 2 Unit No.

Floor / Location: 4th FLOOR — Number of Windows

Room Use: STAIR 2 LANDING — Ceiling: ○ Drywall ○ Suspended ○ Plaster ○ Wallpaper ● Other METAL DECK

Walls: ● Drywall ○ Paneled ○ Plaster ○ Wallpaper ● Other METAL SHEET

Photo(s): ● Yes ○ No — Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other

Photo No's. 6990 ~ 6992 — ● Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ○ None ● Cracks (List size, type, location) ○ Other (Describe)

Comments: Ov(6990), Crk on floor (6991, 6992)

○ See Comment No.

Floor / Location: 4th FLOOR – ROOF — Number of Windows

Room Use: STAIR 2 FLIGHT — Ceiling: ○ Drywall ○ Suspended ○ Plaster ○ Wallpaper ● Other METAL DECK

Walls: ● Drywall ○ Paneled ○ Plaster ○ Wallpaper ● Other METAL SHEET

Photo(s): ● Yes ○ No — Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other

Photo No's. 6993 ~ 6996 — ● Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ○ None ○ Cracks (List size, type, location) ● Other (Describe)

Comments: Ov (6993, 6994), Sep. blw floor and wall (6995, 6996)

○ See Comment No.

Floor / Location: ROOF — Number of Windows

Room Use: STAIR 2 LANDING — Ceiling: ○ Drywall ○ Suspended ○ Plaster ○ Wallpaper ● Other METAL DECK

Walls: ● Drywall ○ Paneled ○ Plaster ○ Wallpaper ● Other METAL SHEET

Photo(s): ● Yes ○ No — Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other

Photo No's. 6997 — ● Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ● None ○ Cracks (List size, type, location) ○ Other (Describe)

Comments: Ov(6997)

○ See Comment No.

Floor / Location: — Number of Windows

Room Use: — Ceiling: ○ Drywall ○ Suspended ○ Plaster ○ Wallpaper ○ Other

Walls: ○ Drywall ○ Paneled ○ Plaster ○ Wallpaper ○ Other

Photo(s): ○ Yes ○ No — Floor: ○ Wood ○ Ceramic Tile ○ Other Tile ○ Other

Photo No's. — ○ Concrete ○ Rug ○ Wall to wall carpet

OBSERVED DEFECTS: ○ None ○ Cracks (List size, type, location) ○ Other (Describe)

Comments:

○ See Comment No.

Abbreviations:	(F) Front	(Vrt) Vertical	(Hrz) Horizontal	(Bth) Bathroom	(HL) Hairline
	(S) Side	(Dag) Diagonal	(Crk) Crack	(Kit) Kitchen	(NOD) No Observable Defect
	(R) Rear	(Liv) Living Room	(Br) Bedroom	(Dr) Dining Room	(CG) Potential Crack Gage Location

MUESER RUTLEDGE CONSULTING ENGINEERS Date: 08/09/2017 Time of visit: 0800 am File No.: 12541

ADDRESS: 312 3rd Ave, Brooklyn, NY Recorder: SA Photographer: HY Camera No.:

Resident / Contact Name: No. of Units in Bldg: Sheet No. 13 Of 19

FIELD RECORD SURVEY FORM - BUILDING EXTERIOR

ROOF(S): Roof 4th Floor No. of floors Below roof: 4

ROOF MATERIALS: ○ Shingle ● Rolled ○ Tile ○ Slate ○ Metal ○ Other (Describe Below)

Photo: ● Yes ○ No **Mechanicals** ● Yes ○ No ● HVAC ○ Elev. ● Other (Describe) Solar Panels

Photo No's. 6870 ~ 6873 **Structures** ● Yes ○ No ● Stairwell Bulkhead ○ Water Tower

● Elevator Bulkhead ○ Other (Describe)

OBSERVED DEFECTS: ● None ○ Cracks (List size, type, location) ○ Mechnical/Structure (Describe)

○ Drainage/Ponding (Describe) ○ Other (Describe) ○ See Comment No.

COMMENTS

Ov. (6870 ~ 6873)

Abbreviations:	(F) Front	(Vrt) Vertical	(Hrz) Horizontal	(HL) Hairline
	(S) Side	(Dag) Diagonal	(Crk) Crack	(CG) Potential Crack Cage Location
	(R) Rear	(Dmu) Decorative masonry unit	(Cmu) Concrete Masonry Unit	

survey-exterior ms Rev Dec 2012

B 453 L 54

SHEET 14 OF 19

STAIR ①

STAIR ②

TRAVEL DISTANCE 82'-3"

TRAVEL DISTANCE 107'-3"

TRAVEL DISTANCE 107'-3"

HALLWAY

STAIR "A"

ELEV. "A" MACH. ROOM

ELEV. "B"

ELEV. "B" MACH. ROOM

UTILITY ROOM

APPROVED/ACCEPTED WITH SELF CERTIFICATION OF OBJECTIONS

"EXAMINED FOR ZONING COMPLIANCE AND FIRE PREVENTION ONLY, AS PER BOR. RES. 2 OF 1976"

APR 24 2003

ANDY PACHECO

DEPT. OF BUILDINGS — BOROUGH

APPL. NO.

FILED

EXAMINER

ORIGINAL APPROVED

LEGEND

- POURED CONC. WALL
- CONC. BLOCK WALL
- 2.5 PARTITION
- CONC. BLOCK WALL
- GWB PARTITION
- TRAVEL DISTANCE 100'-3"
- PARTITION TAG
- EXIT LIGHT
- DIRECTIONAL EXIT LIGHT
- EMERGENCY LIGHT

1 A-1.1 CELLAR PLAN 1/8"=1'-0"

PREMIER HOLDING

319 3RD AVE.

BROOKLYN, NY

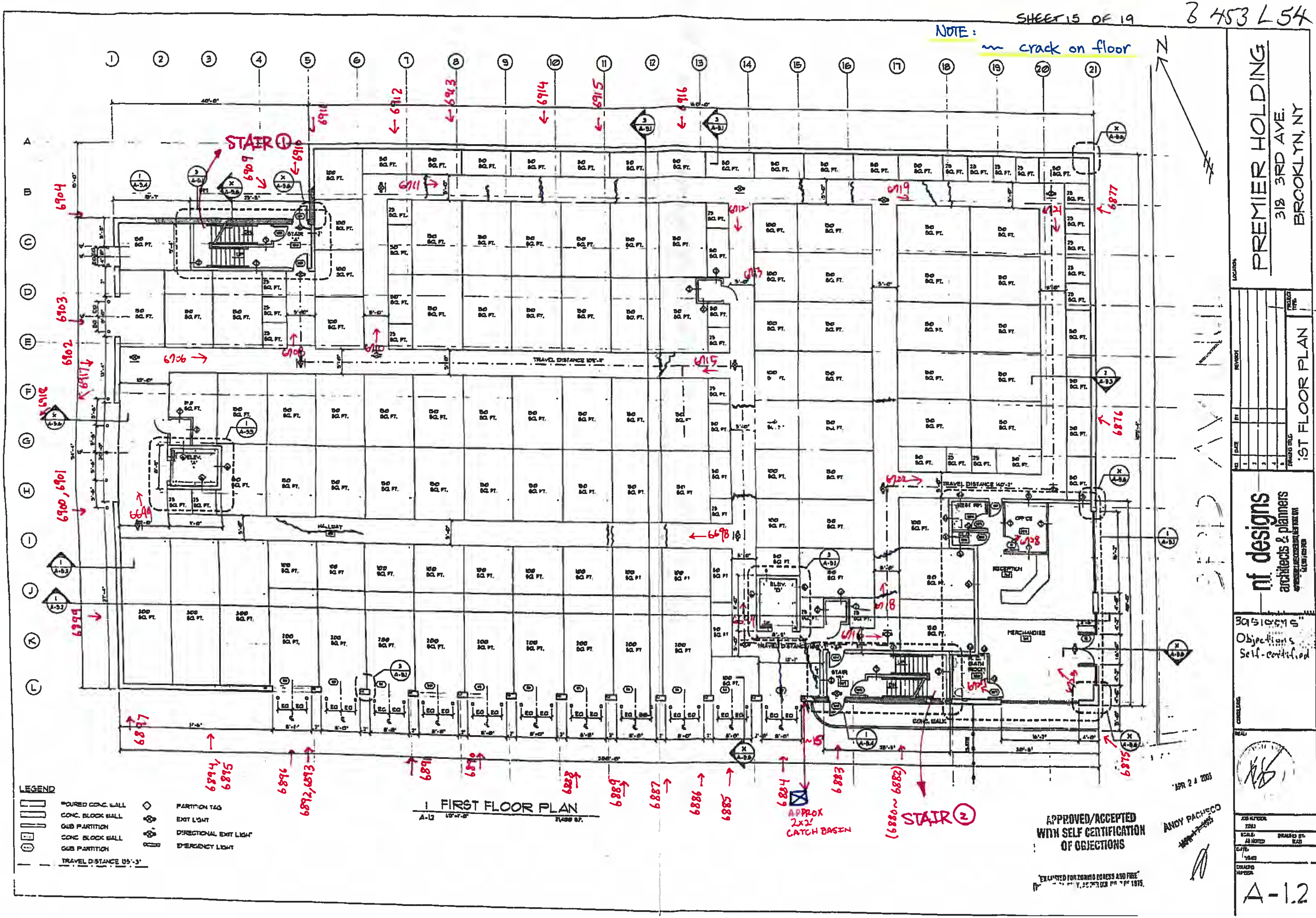
CELLAR PLAN

nf designs architects & planners

3015/03/45

Objections Self-certified

A-1.1


SHEET 15 OF 19
3 453 L 54
NOTE:
~~ crack on floor
N
PREMIER HOLDING
318 3RD AVE.
BROOKLYN, NY
1ST FLOOR PLAN
nf designs
architects & planners
STAIR ①
STAIR ②
APPROX 2x2' CATCH BASIN
TRAVEL DISTANCE 105'-3"
TRAVEL DISTANCE 140'-3"
HALLWAY
OFFICE
RECEPTION
MERCHANDISE
CONC. WALK
1 FIRST FLOOR PLAN
A-1.2
LEGEND
POURED CONC. WALL
CONC. BLOCK WALL
GUB PARTITION
CONC. BLOCK WALL
GUB PARTITION
TRAVEL DISTANCE 105'-3"
PARTITION TAG
EXIT LIGHT
DIRECTIONAL EXIT LIGHT
EMERGENCY LIGHT
APPROVED/ACCEPTED
WITH SELF CERTIFICATION
OF OBJECTIONS
APR 2 4 2003
ANDY PACHECO
Objections Self-certified
A-1.2

2453 454

NOTE:
~ crack on floor

STAIR ①

STAIR ②

SECOND FLOOR PLAN

LEGEND

- POURED CONC. WALL
- CONC. BLOCK WALL
- GWB PARTITION
- CONC. BLOCK WALL
- GWB PARTITION
- TRAVEL DISTANCE 135'-3"
- PARTITION TAG
- EXIT LIGHT
- DIRECTIONAL EXIT LIGHT
- EMERGENCY LIGHT

PREMIER HOLDING
318 3RD AVE.
BROOKLYN, NY

2ND FLOOR PLAN

nf designs
architects & planners

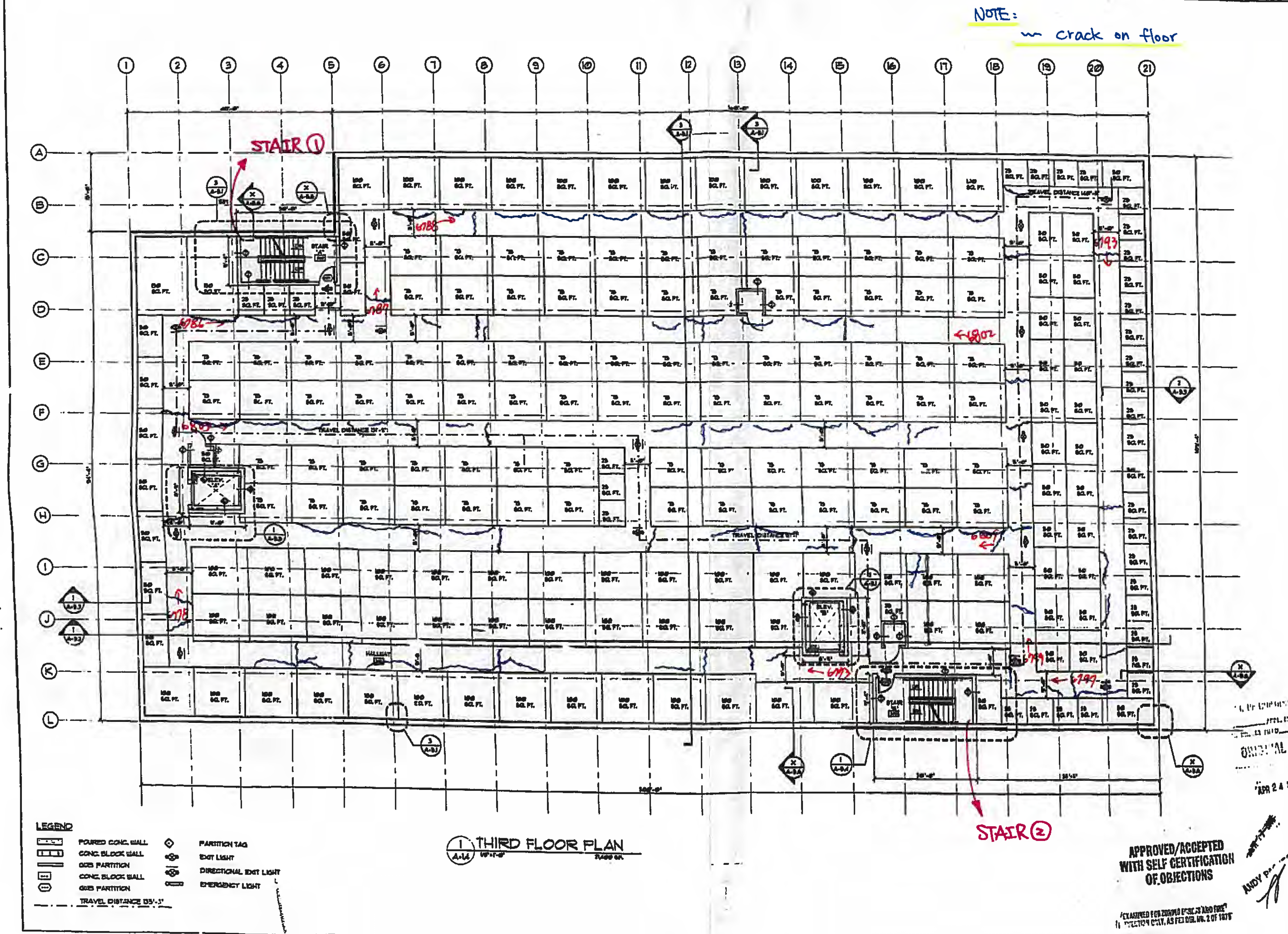
301580598
Objections
Self-certified

DEPT OF BUILDINGS - BROOKLYN
APPL. NO.
21 SHEETS FILED
ORIGINAL APPROVED
APR 24 2003

APPROVED/ACCEPTED
WITH SELF CERTIFICATION
OF OBJECTIONS
ANDY PACHECO

A-1.3

SHEET 17 OF 19 B483 L54



PREMIER HOLDING
318 3RD AVE.
BROOKLYN, NY

3RD FLOOR PLAN

nf designs
architects & planners

301510595
Objections: Self-certified

ORIGINAL APPROVED
APR 24 2003

APPROVED/ACCEPTED WITH SELF CERTIFICATION OF OBJECTIONS

EXAMINED FOR ZONING EXCESS AND FIRE PROTECTION ONLY, AS PER DIR. NO. 2 OF 1975

ANDY P...

A-1.4

B453 L54

SHEET 18 OF 19

NOTE:

~~ crack on floor

STAIR ①

STAIR ②

6998 6999 7000, 7001 7002 7003 7004 7005

6816 6817 6818 6819 6820 6821 6822 6823 6824 6825 6826 6827 6828 6829 6830 6831 6832 6833 6834 6835 6836 6837 6838 6839 6840 6841

TRAVEL DISTANCE 135'-3"

LEGEND

- POURED CONC. WALL
- CONC. BLOCK WALL
- GWB PARTITION
- CO. 2 BLOCK WALL
- GWB PARTITION
- TRAVEL DISTANCE 135'-3"
- PARTITION TAG
- EXIT LIGHT
- DIRECTIONAL EXIT LIGHT
- EMERGENCY LIGHT

1 A-1B FOURTH FLOOR PLAN

DEPT. OF BUILDINGS – BRANCH

APPL. NO.

ORIGINAL APPROVED

APR 24 2003

ANDY PACHECO

APPROVED/ACCEPTED WITH SELF CERTIFICATION OF OBJECTIONS

EXAMINED FOR ZONING AND FIRE PREVENTION ONLY, AS PER DOB NO. 2 OF 1938

PREMIER HOLDING

319 3RD AVE.

BROOKLYN, NY

4TH FLOOR PLAN

nf designs architects & planners

301519545

Objections self-certified

A-1.5

B453 L54

SHEET 19 OF 19

STAIR①

STAIR②

NOTE:
ROOFING TO BE SINGLE-PLY EPDM, 45 MIL
MECHANICALLY FASTENED ROOF MEMBRANE

LEGEND

POURED CONC. WALL
CONC. BLOCK WALL
GWB PARTITION
ROOM TAG
DOOR TAG
TRAVEL DISTANCE 135'-1"
PARTITION TAG
EXIT LIGHT
DIRECTIONAL EXIT LIGHT
EMERGENCY LIGHT

1 ROOF/STAIR BULKHEAD PLAN
A-1.6 1/8"=1'-0" 21,400 S.F.

2 PARAPET FLASHING

3 ROOF PORTAL DETAIL

4 PARAPET RAILING

5 SCUPPER DETAIL

PREMIER HOLDING
312/318 3RD AVE.
BROOKLYN, NY

ROOF PLAN

nf designs
architects & planners

APPROVED/ACCEPTED WITH SUBSEQUENT SUBMISSION OF OBJECTIONS

ANDY PACHECO

JAN 2020

A-1.6