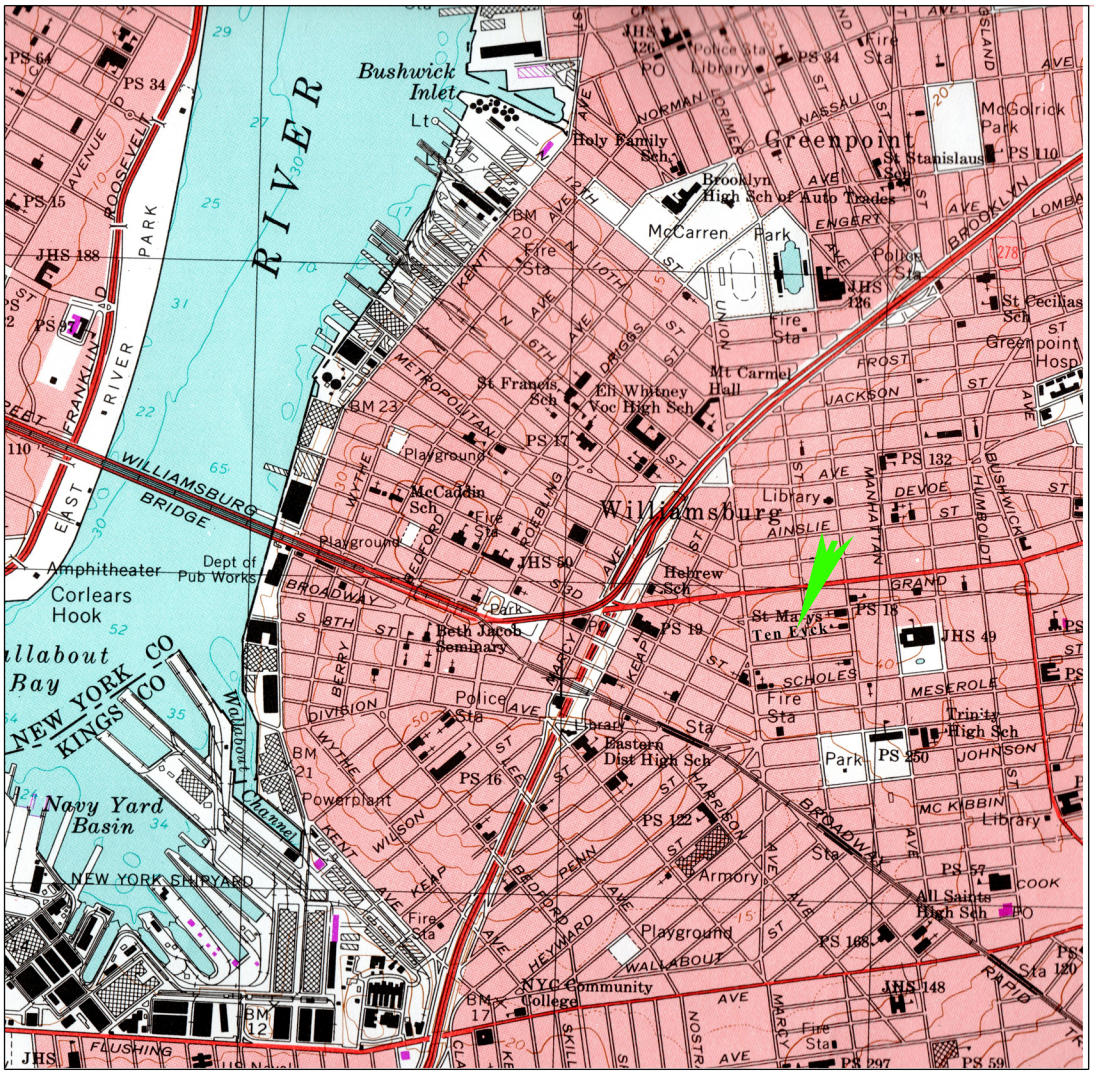
Report on Archaeological Monitoring
33 Ten Eyck Street, Williamsburg, Brooklyn
Block 2791, Lot 37



Prepared by: Celia J. Bergoffen, Ph.D. RPA

Prepared for: Yuco Real Estate Comapany Inc.

November 14, 2016

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Report on Archaeological Monitoring 33 Ten Eyck Street, Williamsburg, Brooklyn Block 2791, Lot 37

November 14, 2016

Introduction

The accidental discovery of four subterranean vaults during excavation of the vacant lot at 33 Ten Eyck Street (the "project site") necessitated the creation of a Phase IA Archaeological Assessment (the "Report") in order to investigate the historic significance of these structures and to make recommendations for the mitigation of the projected negative impacts of the proposed construction. The report, prepared by Celia J. Bergoffen, Ph.D., R.P.A., dated May 28, 2015, found that the vaults were previously used for cold-aging the lager beer produced by Sebastian Schnaderbeck in his "Schnaderbeck Brewery". Established by 1860, the brewery comprised both the former building on the project site and another, still extant, on the adjacent lot 18, fronting on Maujer Street (Fig. 2). Schnaderbeck's brewery was one of only four lager breweries established before 1860 in Williamsburg, making it one of the earliest in this district, which would become the center of lager beer production in New York City during the 1860s and 70s. Only one other surviving subterranean lager vault in Williamsburg was documented in the course of research for the Phase IA Archaeological Assessment (the former Nassau Brewing Company at 1042 Dean Street, block 1142, lot 40). The assessment therefore concluded, in view of these findings and the vaults' excellent state of preservation, that these structures vaults were historically significant. Furthermore, the LPC and SHPO, which reviewed the report, determined that the site is eligible for listing on the National Register of Historic Places for its association with German ethnic heritage and industry, and for the data it provides on the architecture of lager cellars. Map research conducted for the report noted that a building had stood on the site, over the vaults, from the time of Schnaderbeck's brewery until between 1982 and 1984, when it was demolished.

The development plan called for the filling of vaults 1, 2 and 3 with flowable concrete, leaving vault 4 in its original condition but without access from the surface. Since this plan entailed adverse effects to the architectural integrity and archaeological research potential of the vaults, it was agreed by all parties to the Memorandum of Agreement, executed on September 16, 2016, that the project sponsor would provide access to the vaults so that a Registered Professional Archaeologist could document them in

accordance with the standards of the Historic American Buildings Survey / Historic American Engineering Record ("HABS /HAER") prior to any construction work that would negatively impact the archaeological integrity of the site (Appendix A). This level of documentation was indicated because of the site's eligibility for listing on the National Register of Historic Places.

In order to provide the best possible conditions to document the architecture in accordance with the HABS/HAER standards of recordation, the MOA further stipulated that the project sponsor would remove the soil cover from the top of the three vaults proposed to be filled and built over, leaving the fourth, which will not be impacted by the proposed construction, buried. The excavation began on July 27, 2016 and was completed, together with the taking of measurements and photography for the HABS / HAER documentation, on September 7, 2016.

The present report is an account of the archaeological monitoring of the soil removal on the project site and a description and interpretation of the architectural features that were revealed.

For the photographic record, which will be submitted as part of the HABS / HAER documentation, Christopher D. Brazee took black and white and color photographs of both the vault interiors and the tops of the vaults. Further, we made a complete set of videos of the vault interiors, and hired Petr Heyl, Owner of NotADrone.com, to make a video of the top of the vaults using a drone. These videos will be used to create a 3D model of the architecture, using the structure from motion process and Agisoft PhotoScan software. The computer modelling will be completed by Matthias Kolbe, a surveyor and archaeologist based in Berlin. The videography on the interior of the vaults was conducted by Celia Bergoffen and Arnulf Hausleiter, Research Archaeologist at the German Archaeological Institute in Berlin, who was a Visiting Research Scholar at the Institute for the Study of the Ancient World at New York University during the academic year, 2015-2016. The black and white photographs, 3D models, archival quality inked drawings of the plans on Figs. 3 and 4, and a narrative elucidating this material will be submitted to SHPO separately, to fulfill the requirements of the HABS / HAER documentation.

Report on the archaeological monitoring

Archaeologists Celia J. Bergoffen Ph.D. RPA and Diane George RPA conducted the archaeological monitoring of the soil removal from the tops of the vault. The excavation, together with the measuring and drawing of the exposed structures, began on July 27, 2016, continued through August, and ended on September 7, 2016. Most of the work was done using a backhoe, with hand excavation used to clean the tops of the

structures in order both to clarify their construction and to prepare the site for photography.

At the beginning of the excavation, there was an earth ramp on the east side of the lot providing access to the site (Fig. 1). The rest of the lot had been dug out to a depth of approximately 6.0 to 8.0 feet below grade, except for a small area in the southwest of the lot, where an entrance to the vaults was first discovered, which was excavated to approximately 14.0 feet below grade. The circular opening in the crown of the southernmost vault, vault 1, was originally one of the chimney-vents on top of the vaults (see below). It was enlarged by the workmen to permit access, and covered by a ply wood, box-like structure.

In order to avoid possibly undermining the adjacent buildings on Maujer Street, and because there was no plan to fill vault 4 with concrete, leaving its future research potential intact, the MOA stipulated that only the soil over vaults 1, 2, and 3 should be removed, leaving vault 4 buried. Accordingly, in order to work back towards the ramp and the street, the excavation began at the southwest corner of the lot, approximately 20.0 to 24.0 feet south of the north lot line. Reddish-brown, silty sand mixed with demolition debris, including charred brick, iron, and plaster, indicated that the soil deposited above the vaults consisted of mixed fills.

It had previously been noted, on the interior of the vaults, that the ceiling of each vault was pierced roughly in the center by a circular opening, which we assumed was the base of a chimney.

Vault 3 chimney

On July 27th, the chimney on top of vault 3 was excavated, together with the soils over the vault (Figs. 5 and 6). The top of the vault 3 chimney was encountered approximately 6.0 feet below grade, 20.0 feet east of the west lot line and 64.0 feet north of the south lot line. The chimney was built of two concentric rings of whole and partial bricks laid in stretcher courses with copious amounts of mortar (Fig. 5). Some of the bricks appeared to be overfired, possibly clinkers, while the curvature of the structure was achieved by using broken bricks. The opening at the chimney's top was 11.0 inches in diameter, and the diameter, to the outer edge was 27.0 inches. The soils removed around the vault 3 chimney also contained demolition debris consisting of plaster, brick and granite fragments. The excavation of the vault 3 chimney was completed on August 5th. Its preserved height was 7.35 feet. The chimney's profile was bulbous or hourglass shaped: wider at the base and tapering to the top. At 3.0 feet below the top, the diameter was 27.7 inches (7.25 feet circumference). At the base, the diameter was 34.8 inches or 9.1 feet in circumference.

On July 27th, the location of the vault 2 chimney -- not preserved, except for a small section near the base and a short broken section balanced over it -- was noted on the surface by a slight depression at the approximate point where measurements on the vault's interior had indicated. This chimney was excavated on August 5th (Fig. 12).

While taking measurements inside the vaults, a fragment of a ceramic plate with the mark "Thomas Hu… Burslem", and a neckless beer bottle embossed, "WELZ & ZERWECK BREWERS BROOKLYN. N.Y." were noted. These finds were not kept.

Piers 1 and 2 (P1 and P2)

Following a three-day hiatus during which the workers removed a construction shed and building materials from the site, excavation resumed on August 2 at the northwest corner of the excavation trench. The reddish brown silty sand contained pebbles and small cobbles together with brick – some charred -- and plaster detritus, pieces of machinery, iron fragments and tar paper. In the course of clearing an approximately seven-foot strip north of the vault 3 chimney, the tops of two brick piers, piers 1 and 2, were encountered, approximately 23 feet south of the north lot line, the western one about 14.5 feet east, and eastern one 29.0 feet east, of the west lot line (Fig. 6). The piers were built in three sections diminishing in size from bottom to top, the lowest capped by a 3.0-inch-thick granite slab. The top section of the west pier, pier 1, of which 3.2 feet in height was preserved, measured 2.0 feet north-south by 1.3 feet east-west. It was centered east-west on the middle section, but set back 13.0 inches from the latter's south face, and 1.0 inch from its north face. The middle section, exposed on August 4th, was 5.7 feet high, and measured 3.2 feet north-south by 2.4 feet east-west. The bricks used in the piers measured 8.25 by 3.5 by 2.25 inches.

On August 3, excavation continued in the northwest of the lot and east of pier 2. The center of the dirt ramp leading to the rear of the lot was pulled back to the east side of the lot. On August 4, just enough soil was removed north of piers 1 and 2 to expose their north faces down to the top of the wall between vaults 3 and 4, on which they stood. The east face of the east pier, pier 2, was also completely excavated, next to the northeastern baulk of the excavation trench. The top section of pier 2, which was broken, measured 3.3 feet; the middle section, 6.0 feet, and the lowest, 4.0 feet. Some water had collected in the soil immediately above the vault roof, above the thick, waterproof layer of plaster covering the top of the vaults. Building debris, including tar paper, iron fragments and plastic were found in the soil above the vault roof, no doubt the detritus from the building that formerly stood above the vaults.

Most of the faces were built of a single row of stretchers laid on end, but in some instances, the pattern was interrupted by headers (Fig. 13). The solid cores were composed of bricks laid in groups of headers and stretchers. As in the chimneys, there were thick layers of mortar between the brick courses. The variety of bricklaying techniques used in the vaults' construction was especially evident in the interiors in the arches over the doorways and shaft openings, which were built of both voussoirs and stretchers, sometimes even half and half in the same arch (Report pp. 6-7). The variety of bricklaying patterns indicates the work of several different bricklayers with no imposition of a standard technique.

West wall

On August 5th, the earth over vault 3 was removed to the west lot line. The vault abuts the two-foot wide, west end wall. This mostly stone and mortar built wall continued above the vault's crown and was evidently the outer wall of the basement level of the building that stood on the lot until ca. 1982 (Fig. 9). The backhoe operator, Kenny Lin, told us that the soil above the west wall had previously been removed along its entire length in order to insert a concrete footing under the building on the adjacent lot. The soil over the west wall was removed in stages until it was completely exposed, and photographed, on August 18th. The stone wall was punctuated by rectangular sections of brick surrounding the shafts that opened near the floor of the vaults and just below the vault ceilings. These took up the full width of the wall (see further below).

On this day we also encountered a third pier, south of pier 1, and part of the vaults' east wall, at the northern edge of the excavation trench, over middle of vault 3.

Shaft features

The Report had noted that the west and east walls in each vault contained a vertical brick shaft, whose inner face was observed running floor to ceiling. Its bricks were laid between the stone courses. Each shaft had an arch-shaped opening at the bottom, just above the floor. There was also a second, window-like opening on each east and west wall in every vault. This rectangular feature was only partially blocked above. On the west wall of vault 3, its open, inner face was crossed by the curved roof of the vault, but in other vaults, the front top of the openings had a decorative brick border. The method of constructing these features was first revealed on August 5th, when the broken top of the west wall of vault 3 was uncovered (above). Both the chimney-like shaft on the south side of the west wall, and the window-like upper opening on the north side of the wall, were built of two rows of bricks, and both took up the full width of the outer walls. When, later in the excavation, more of the east wall was exposed, we learned that the

construction of these features was not consistent, with sometimes only one row of bricks enclosing the shaft, and these single rows built of bricks laid on end.

As the rest of the west wall of the vaults was exposed, the tops of other shafts and openings in vaults 2 and 1, appeared. We did not observe any openings on the faces of the brick shafts above the roofs of the vaults. We can only surmise that they continued further up through the walls to open on a higher level or story, or on the building's roof.

Concrete slabs over the west wall

One of the openings was however covered with a concrete slab that appears to be part of the same surface as found at the southern end of the west wall partly overlapping the south wall (Figs. 4 and 14). There was a layer of dirt below the latter slab, above the preserved base of the west and south walls. Plastic debris found in this layer indicates that it postdates the period of the vault's use as a lager cellar but it was not determined when the concrete was laid. Presumably it served as a basement floor in some later phase of the building that stood above the vaults. The southeast-northwest course of the east wall depicted on the 1868 Higginson's map and measured in the vaults' interior, is shown on all the maps through 1982, indicating that the exterior walls of the original building survived until the structure was finally destroyed.

Basement plan of the vaults (Fig. 3)

On August 9th, we determined that the thickness of the roof of vault 3, as measured from the top of the chimney opening, was 1.3 feet and the height of the vault, from the west side of the chimney opening to the floor, was approximately 13.9 feet. On this day we also took measurements on the vault interiors, including the length of each wall, the diagonal lengths between the northwest and southeast, and northeast and southwest corners of each vault, the heights of the openings of the shaft and "window" features in the west and east walls of each vault, and the width of the doorways. The different vault lengths had been previously noted and recorded on the plan, which appears in the Figs. 3 and 4 of the Report. But from the diagonal measurements, we realized that the east wall of the vaults ran diagonally southeast to northwest, as shown on the earliest map, the 1868 Higgison's, and was not stepped, as shown on the plan in the Report.

Earth removal from the site

At this point, we could not continue excavating without first removing the back dirt that had been piled up on the east side of the lot. August 10th was therefore spent in moving

the dirt off the site, by the truckload. This operation continued on August 11, 12 and 15. The last four truckloads of earth were removed from the site on August 19.

East wall

The north end of the east wall of the vaults, first discovered on August 5, was excavated on August 11. In the northern baulk of the excavation trench, we noted that the wall was preserved to approximately 13.0 feet, much higher than the between 2.6 to 4.1-foot-high section we were able to expose over the south side of vault 3. The east wall, like the west, was 1.9 feet thick. Soil was removed from the east side of this wall as well, providing a view of both faces (Fig. 10). The opening of the shaft in the east wall of vault 3 was lined with only one course of bricks on its interior (west) face, laid on edge. The rectangular opening measured 2.0 feet by 1.1 feet. Later on, on August 17th, we noted that clinkers and smaller stones had been used to fill the space between the wall's two stone faces. This was not the case in the west wall, where we were able to observe only two tightly packed rows of roughly dressed stone with no noticeable interstices. The openings for the shafts were also built differently, as already noted above.

As more of the east wall was exposed, moving southward, its southeast to northwest orientation became clearly visible.

Piers 3, 4 and 5 (P3, P4 and P5)

We continued the excavation of the third pier, found on August 5th, and discovered a fourth and a fifth pier (pier 4 and pier 5), roughly in line with pier 3, all standing on/over the wall between vault 2 and vault 3 (Figs. 7 and 8). The piers are almost exactly the same size, 3.0 by 3.0 feet and set 7.9 feet apart and from the east wall, but there are 8.5 feet between pier 3 and the west wall. Pier 5 was preserved to a height of 2.95 ft.

The east wall of the vaults also exposed further to the south, over the trough between vault 2 and vault 3. Between the east wall and pier 4, there was a notable quantity of brick and stone debris, including small and medium-sized cobbles, some roughly dressed. This was interpreted as having fallen from the east wall. There were also chunks brickwork possibly from the upper portions of the piers. The west wall was cleared further to the south. We began excavating the fill over vault 2 and found its chimney, broken in situ, the broken section having slid slightly north of its base (Fig. 12). The diameter was approximately 29.5 inches.

On August 15, we began removing the soil south of vault 2 and found the top of pier 6.

Excavation for the raker, backfilling of the west wall

The engineers had decided that a raker needed to be installed from the baulk below the sidewalk to the top of vault 1 and we therefore excavated the area where the concrete block supporting the raker would be built, approximately 20.0 feet east of the west property line, south of the opening to vault 1, and measuring approximately 7.6 feet north-south and 11.0 feet east-west. This section of the top of the vault was photographed prior to being covered by concrete.

August 16 and 17 were spent largely in photographing the piers. The frame for the concrete slab for the raker was built, and the rest of the area that had been dug out in this section was backfilled.

A further portion of the top of the east wall over vault 3 and between vault 3 and vault 2 was cleared, and excavation was begun at the southwest corner of the site, where we began to expose the vaults' south wall.

On August 18th, the west wall was backfilled in order to create a "safety" berm for the building on the adjacent lot.

Piers 6, 7 and 8 (P6, P7 and P8)

The top of pier 7, north of vault 1 was discovered, on August 18 and the south wall was exposed as far as the concreted section for the raker. Pier 6 (found on August 15), was preserved to a height of 4.38 feet, and pier 7, to a height of 4.58 feet.

On August 19, we removed the remaining soil covering the east end of vault 1 and vault 2 and encountered pier 8. The preserved height of pier 8 was 3.92 feet. Like piers 3, 4 and 5, discovered earlier, piers 6, 7, 8 were roughly in west-east alignment and stood on / over the wall between two vaults, in this case, between vault 1 and vault 2.

South wall

The south face of the vaults' south wall ran flush along the south lot line. This abutment wall may have been built against the south brick wall of vault 1, although we were not able to determine its exact structural relationship to the latter. The corresponding north wall of the complex was not exposed for fear of undermining the building on the

adjacent lot. Like the west and east perimeter walls, the south wall was 2.0 feet wide and built of roughly dressed stone.

Although there was also, in the interior of vault 1, a brick-capped opening in the stone base of its south face, no corresponding opening was observed on the top of the vault or top of the abutment / south wall. On the top of the vaults we observed that the space between the abutment wall and the haunch of the vault had been filled with large and small cobbles and covered with a thick layer of plaster (Fig. 11).

Summary of the results of the archaeological monitoring

Exposing the top of the structures clarified the construction and possible purpose of several enigmatic architectural features discussed in this report. This new information, together with detailed measurements made both inside and on top of the vaults, permitted the revision of some observations made in the Report, and the correction of the architect's plans, which were included in the Report as Figs. 3, 4, and 5. Still and video images were made of the tops of the vaults, including drone photography. These will be combined with the full video imaging of the interior to produce 3D models, which will be submitted as part of the HABS/HAER documentation.

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Fig. 12. View of the broken chimney on vault 2.

Fig. 13. View of pier 5 after demolition of the superstructure showing the bricklaying technique.

Fig. 14. View of the concrete slab covering at the corner of the west and south walls.

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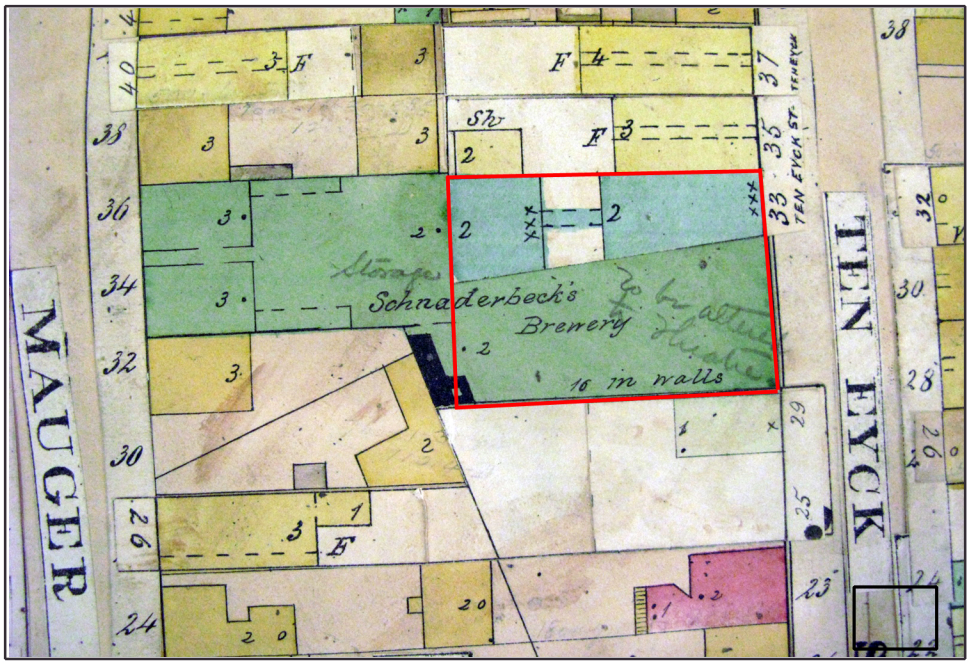


Fig. 2. 1868 Higginson's map of the project site showing the Schnaderbeck Brewery.

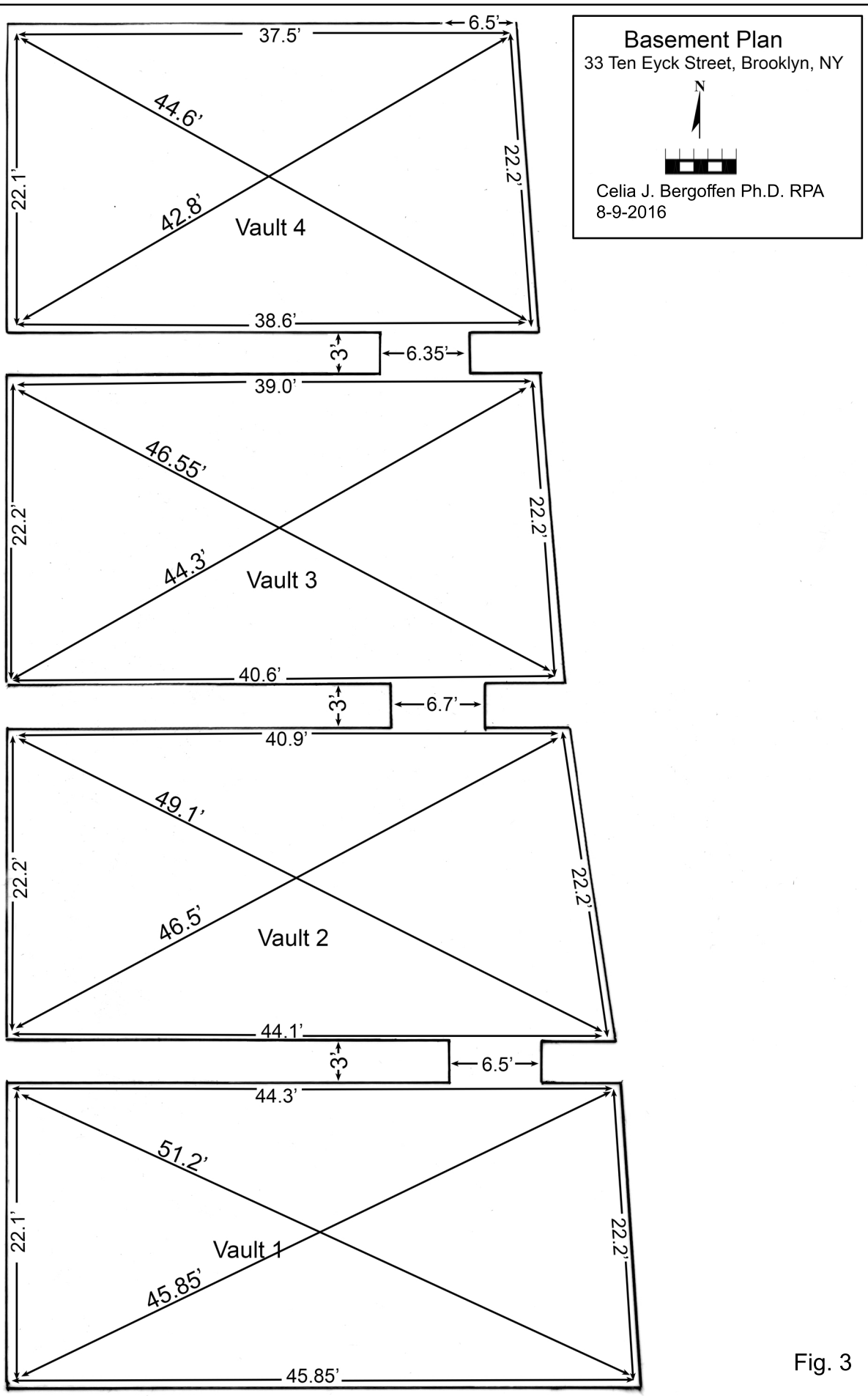
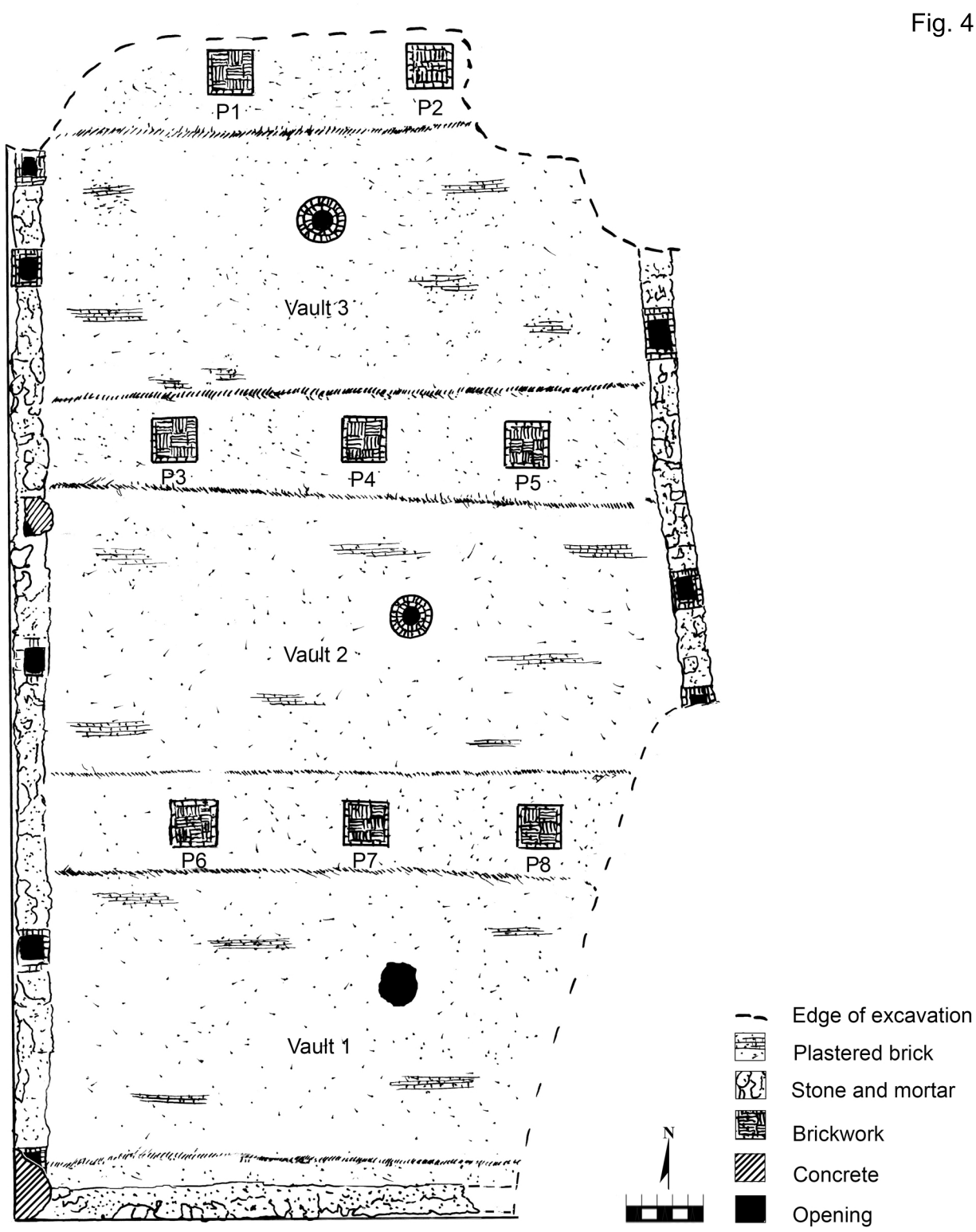

Basement Plan
33 Ten Eyck Street, Brooklyn, NY
N
Celia J. Bergoffen Ph.D. RPA
8-9-2016
6.5'
37.5'
44.6'
22.1'
22.2'
42.8'
Vault 4
38.6'
3'
6.35'
39.0'
46.55'
22.2'
22.2'
44.3'
Vault 3
40.6'
3'
6.7'
40.9'
49.1'
22.2'
22.2'
46.5'
Vault 2
44.1'
3'
6.5'
44.3'
51.2'
22.1'
22.2'
Vault 1
45.85'
45.85'

Fig. 3

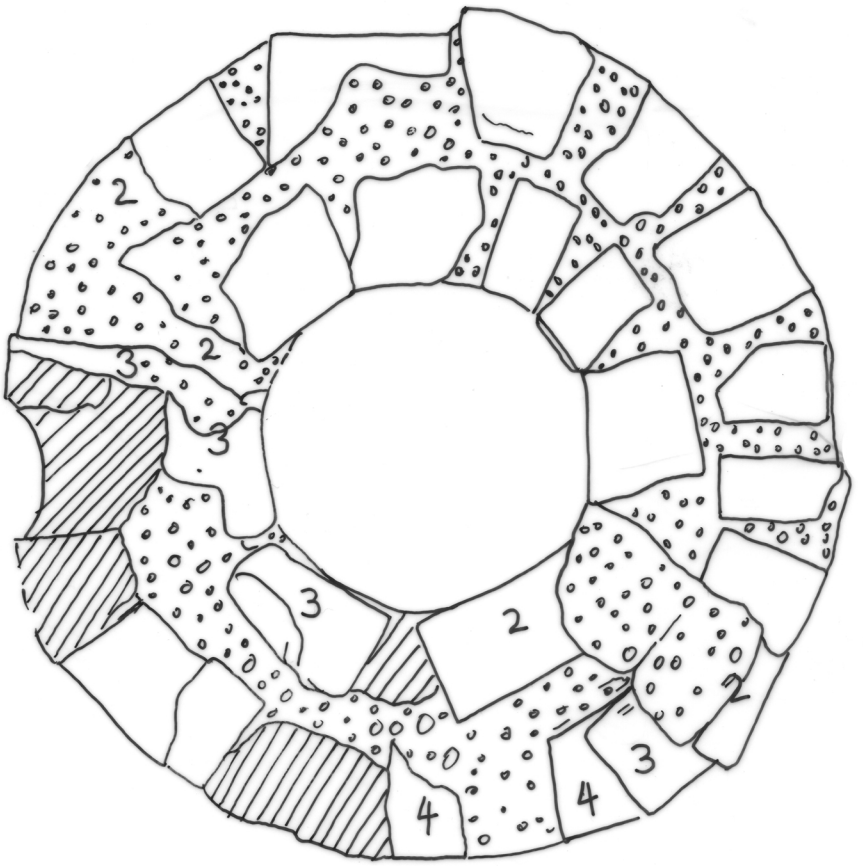
Fig. 4



Ground Plan -Top of the Vaults
33 Ten Eyck Street, Brooklyn, NY

Celia J. Bergoffen Ph.D. RPA
Diane George RPA
9-7-2016

Fig. 5



Top of Vault 3 Chimney

33 Ten Eyck Street, Brooklyn, NY

2 Brick with course number (top course 1 not marked)

Mortar

Damaged brick (edges indistinct)

N

Diane George RPA
7-27-2016

Fig. 6. View of pier 1, pier 2, and the chimney on vault 3 looking northeast.

Fig. 7. View of the top of the vaults at the end of excavation looking south.

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APPENDIX A

MEMORANDUM OF AGREEMENT
REGARDING THE PROPOSED CONSTRUCTION OF A NEW BUILDING LOCATED AT
33 TEN EYCK STREET, BROOKLYN, KINGS COUNTY, NY

MEMORANDUM OF AGREEMENT
REGARDING THE PROPOSED CONSTRUCTION OF A NEW BUILDING LOCATED AT
33 TEN EYCK STREET, BROOKLYN, KINGS COUNTY, NY

BETWEEN

THE CITY OF NEW YORK, ACTING BY AND THROUGH ITS DEPARTMENT OF HOUSING PRESERVATION AND DEVELOPMENT,

NEW YORK STATE HISTORIC PRESERVATION OFFICE,

NEW YORK CITY LANDMARKS PRESERVATION COMMISSION, AND

188 PARTNERS, LLC

Dated the 19th day of September, 2016

WHEREAS, construction financing, including City capital and private equity bond funding, as well as Federal assistance in the form of Project-based Section 8 vouchers and HOME Investment Partnership Program funding from the U.S. Department of Housing and Urban Development ("HUD"), was provided through The City of New York (the "City"), acting by and through its Department of Housing Preservation and Development ("HPD") and New York City Housing Development Corporation ("HDC") in June, 2014, in connection with the construction of a four-story, eighteen-unit affordable housing development (the "Proposed Project") on approximately 7,500 square feet of formerly City-owned property at 33 Ten Eyck Street (Block 2791, Lot 37 on the City's tax map) in the neighborhood of Williamsburg, Borough of Brooklyn, City and State of New York (the "Project Site") by 188 Partners, LLC ("Project Sponsor"); and

WHEREAS, the Project Site is part of an overall development described in a certain land disposition agreement between the City, Project Sponsor and HP Yuco Housing Development Fund Company, Inc. (the "HDFC") dated June 30, 2014 and recorded against the Project Site and certain additional real property described therein (collectively, the "Disposition Area" and such agreement, the "LDA") and the City conveyed the Project Site along with the remainder of the Disposition Area to the HDFC by deed dated June 30, 2014 and recorded against the Project Site as well as the remainder of the Disposition Area; and

WHEREAS, pursuant to a Declaration of Interest and Nominee Agreement by and between the HDFC and Project Sponsor dated June 30, 2014, the HDFC holds nominal title to the Project Site and the remainder of the Disposition Area and Project Sponsor holds beneficial title to the Project Site and the remainder of the Disposition Area; and

WHEREAS, HPD served as the Lead Agency and Responsible Entity (the "RE") for the Proposed Project's environmental reviews pursuant to City Environmental Quality Review ("CEQR") and HUD's environmental review regulations found at 24 CFR Part 58, respectively; and

WHEREAS, pursuant to 24 CFR Part 58, an Environment Assessment (an "EA") was conducted that included consultation with New York City Landmarks Preservation Commission ("LPC") and the New York State Historic Preservation Office ("SHPO"); and

WHEREAS, the EA and consultations determined that, in accordance with Section 106 of the National Historic Preservation Act of 1966 ("Section 106"), the Proposed Project would not result in impacts to architectural or archaeological resources and HPD therefore issued a Finding of No Significant Impact (a "FONSI") on May 30, 2014; and

WHEREAS, after the commencement of construction of the Proposed Project, Project Sponsor discovered previously unknown archaeological resources on the Project Site, beginning approximately 14 feet below grade and consisting of four joined subterranean vaults (the "Vaults", each individual vault hereinafter referred to as a "Vault"), in a satisfactory state of preservation, built of brick on mortared stone foundations with brick pavements and mortared stone end walls; and

WHEREAS, the Vaults are approximately 12 feet 8 inches high on the interior (measured from floor to ceiling), with two Vaults measuring 45 by 22 feet in floor area and the other two Vaults measuring 40 by 22 feet in floor area, each with a small opening in the crown, the southernmost Vault opening providing access to all but the fourth, northernmost Vault, which is largely filled with brick debris; and

WHEREAS, in view of the discovery of these archaeological resources, construction on the Project Site was suspended and consultation with SHPO and LPC reinitiated and, for the purposes of Section 106, the Area of Potential Effect (the "APE") was identified as the entire area of the Project Site; and

WHEREAS, the historic land use of the Project Site was researched by Celia J. Bergoffen Ph.D. R.P.A. ("Archaeologist") and set forth in the *Phase IA Archaeological Assessment, Block 2791, Lot 37, 33 Ten Eyck Street, Borough of Brooklyn, New York*; May 28, 2015, attached hereto as Appendix A and made a part hereof (the "Phase IA Archaeological Assessment"), according to the requirements of CEQR as well as the State Environmental Quality Review Act ("SEQRA"); and

WHEREAS, the Phase IA Archaeological Assessment found that the Vaults were previously used for cold-aging the lager beer that Sebastian Schnaderbeck produced in his "Schnaderbeck Brewery", established by 1860 on the Project Site as well as in the extant building on the adjacent Lot 18 on Maujer Street; and

WHEREAS, Schnaderbeck's brewery was one of only four lager breweries established before 1860 in Williamsburg, making it one of the earliest in this district, which would become the center of lager beer production in New York City during the 1860s and 70s; and

WHEREAS, only one other surviving, subterranean lager vault in Williamsburg was documented in the course of research for the Phase IA Archaeological Assessment; and

WHEREAS, the Phase IA Archaeological Assessment concluded, in view of these findings and the Schnaderbeck Brewery Vault's state of preservation, that these structures were historically significant; and

WHEREAS, LPC and SHPO reviewed the Phase IA Archaeological Assessment, concurred with its findings and recommendations, and SHPO assigned the site of the Schnaderbeck Brewery Vaults (the "Schnaderbeck Brewery Vaults Site") the Unique Site Number USN 04701.018779, and

WHEREAS, during consultations with SHPO and LPC, HPD determined that the discovery of the Schnaderbeck Brewery Vaults Site is eligible for listing on the National Register of Historic Places for its association with German ethnic heritage and industry and for its archaeological data; and

WHEREAS, the SHPO and LPC recommended that adverse effects to the architectural integrity and archaeological research potential of the Schnaderbeck Brewery Vaults Site should be mitigated; and

WHEREAS, in view of the findings and recommendations of the Phase IA Archaeological Assessment and consultations with SHPO and LPC, all parties involved in the review process concurred that appropriate measures should be developed and implemented to mitigate the Proposed Project's adverse effects on the Project Site; and

WHEREAS, due to the existence of the Vaults and the findings and recommendations of the Phase IA Archaeological Assessment and in consultation with SHPO and LPC, SHPO and LPC recommended that Project Sponsor revise and modify its original development plan for the Project Site in order to mitigate the Proposed Project's adverse effects on the Vaults as much as possible and to provide a stable foundation for the Proposed Project's four-story building; and

WHEREAS, Project Sponsor, at its sole cost and expense, assembled a team of engineers and consultants to create an alternative design and to estimate associated costs, and reviewed and discussed these with HPD's Division of Multifamily New Construction Finance and HPD's Chief Engineer; and

WHEREAS, in order to validate the alternative design and confirm required conditions, Project Sponsor conducted soils testing, core drilling, and additional selective excavation of the vault footings and walls positioned along the adjacent property, and determined that the Vaults could be left partially intact however there would be no further access to the Vaults upon commencement of the construction of the Proposed Project's foundation;

NOW, THEREFORE, HPD, SHPO, LPC and Project Sponsor have agreed that the Proposed Project shall be implemented as set forth herein in this Memorandum of Agreement (this "MOA"), as follows:

A. Revised Construction Plan

In order to preserve the Vaults to the greatest extent possible, a revised plan for the Proposed Project labeled "Scheme A", appended hereto as Appendix B and made a part hereof, shall be adopted and implemented.

The new building will be constructed directly on top of three of the Vault structures. In order to stabilize the Vault structures, it will be necessary to fill three of the four Vaults with a lightweight concrete material. Once the three Vaults have been filled there will be no further access to these Vaults, a series of reinforced concrete "grade" beams will be constructed on top of the Vault structures, with supporting concrete piers set directly on the Vault walls, to adequately distribute the building load across the Vaults. Then the building foundation will be constructed directly on top of the grade beams and piers.

The existing openings at the top of the Vaults will be filled with flowable concrete fill.

The construction and filling operations described above, while preserving the Vaults, are not reversible and the filled Vaults will become permanently inaccessible.

The fourth, northernmost Vault will not be filled with concrete but shall be left in its current "as is" condition; however, no means of access will be built and the interior of this Vault will therefore also become, effectively, inaccessible.

B. Investigation and Documentation

Prior to the Vaults being filled with flowable concrete fill and any construction of beams or piers being commenced, Project Sponsor shall provide the Archeologist access to the Vaults to document them in accordance with the standards of the Historic American Buildings Survey / Historic American Engineering Record ("HABS/HAER").

The scope of work for the HABS/HAER documentation will require approval by SHPO and LPC prior to the work being carried out. The final documentation will be submitted to HPD, SHPO, and LPC prior to any disturbance to the Vaults.

In order to comply with the foregoing access requirement, Project Sponsor will provide access to the Vaults in their current "as is" condition without the requirement for further excavation or work by Project Sponsor. However, Project Sponsor shall remove soil cover from the top of the three Vaults proposed to be filled and constructed over, as reasonably practical and economically viable using mechanical equipment, in order to expose the location where the concrete piers are to be set on top of the Vault walls, which shall provide access to the Archaeologist to allow for photographic documentation of the exterior of the Vaults to the extent they are exposed. In addition, Project Sponsor shall ensure that any debris or other obstructions located in the Vaults is moved as reasonably practical and economically viable, in order to provide adequate access to the Archaeologist and allow for photographic documentation of the interior spaces of all four Vaults. The level of effort required to provide access to the Archaeologist (removal of exterior soil cover and movement of any interior debris or other obstructions) shall be reviewed and agreed upon by HPD, SHPO, and LPC, in accordance with the terms of this MOA.

C. Archaeological Monitoring

Project Sponsor shall ensure that archaeological monitoring by the Archaeologist shall be conducted during the excavation activities required in connection with the construction of the concrete piers. The Archaeologist will be granted access to the excavated areas to record and collect samples if suitable materials, as determined by the Archaeologist, are uncovered. The Archaeologist shall prepare a comprehensive report draft presenting the results of the monitoring, which shall be submitted to HPD, SHPO, and LPC for review and comment. A final report, addressing agency comments will be submitted to HPD, SHPO, and LPC.

D. Submission of Project Sponsor's Testing Results

Project Sponsor shall provide copies to HPD, SHPO, LPC, and the Archaeologist of all boring logs and analyses, sketch plans, photographs and other relevant materials in Project Sponsor's possession obtained in the course of testing site conditions through soils testing, core drilling, and additional selective excavation of the Vault footings and walls positioned along the adjacent property.

E. Amendment to Land Disposition Agreement

The LDA shall be amended (an "Amended LDA"), the Amended LDA shall be recorded against the Project Site (along with the remainder of the Disposition Area described in the LDA) and shall provide, among other things, that subsequent to the completion of the Proposed Project on the Project Site, no owner of the Project Site shall undertake any further construction or development on the Project Site that would, in the opinion of SHPO, LPC and HPD, adversely affect the preservation of the Vaults in their then current condition. Any such owner must give written notice of any proposed further construction or development of the Project Site to SHPO, LPC and HPD prior to the commencement of such proposed construction or development, and each of SHPO, LPC and HPD must give its written consent thereto prior to the commencement of any such proposed activity by such owner.

F. Additional Inadvertent Resource Discoveries

If during construction activities additional sections of the known archaeological resources on the site, or previously unknown archaeological resources are discovered, all work in the immediate vicinity of the discovery will be halted and SHPO, LPC and HPD shall be promptly informed thereof. Work shall not resume in that area until an assessment of the discovery can be made and additional mitigation measures, as needed, are agreed upon and implemented and with the prior written consent of SHPO, LPC and HPD.

H. Term of Agreement

This MOA shall become effective after the date of the last signatory. This MOA and any amendments shall be binding upon the parties hereto, their successors and assigns.

I. Authorizing Signatures

188 PARTNERS, LLC, a New York limited liability company
By: 188 Partners Managers LLC, a New York limited liability company, its manager

By: _____
Name: Raymond H. Yu
Title: Manager, 188 Partners, LLC

DATE: _____

HP YUCO HOUSING DEVELOPMENT FUND COMPANY, INC.

By: _____
Name:
Title:

DATE: _____

AUTHORIZING SIGNATURES CONTINUE ON FOLLOWING PAGES

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188 PARTNERS, LLC, a New York limited liability company
By: 188 Partners Managers LLC, a New York limited liability company, its manager

By: _____
Name: Raymond H. Yu
Title: Manager, 188 Partners, LLC

DATE: _____

HP YUCO HOUSING DEVELOPMENT FUND COMPANY, INC.

By: _____
Name: DANIEL MARKS COHEN
Title: VICE PRESIDENT

DATE: _____

AUTHORIZING SIGNATURES CONTINUE ON FOLLOWING PAGES

THE CITY OF NEW YORK
BY: DEPARTMENT OF HOUSING PRESERVATION & DEVELOPMENT

By: _____

Eric Enderlin, Deputy Commissioner of Development
The City of New York, acting by and through its Department of Housing Preservation and Development

DATE: 9/16/16

APPROVED AS TO FORM
By: /s/ AMRITA BARTH
Acting Corporation Counsel

AUTHORIZING SIGNATURES CONTINUE ON FOLLOWING PAGES

NEW YORK STATE HISTORIC PRESERVATION OFFICE

By: Ruth Pierpont

Ruth Pierpont
Deputy Commissioner/Deputy State Historic Preservation Officer
Division for Historic Preservation
New York State Office of Parks, Recreation and Historic Preservation

DATE: 9/16/16

AUTHORIZING SIGNATURES CONTINUE ON FOLLOWING PAGES

NEW YORK CITY LANDMARKS PRESERVATION COMMISSION

By: _____
Meenakshi Srinivasan
Chair, New York City Landmarks Preservation Commission

DATE: 9/16/16

CONCURRING PARTY SIGNATURE ON FOLLOWING PAGE

CONCURRING PARTY:

NEW YORK CITY HOUSING DEVELOPMENT CORPORATION

By: _____

Anthony R. Richardson
Senior Vice President, New York City Housing Development Corporation

DATE: 09/15/2016

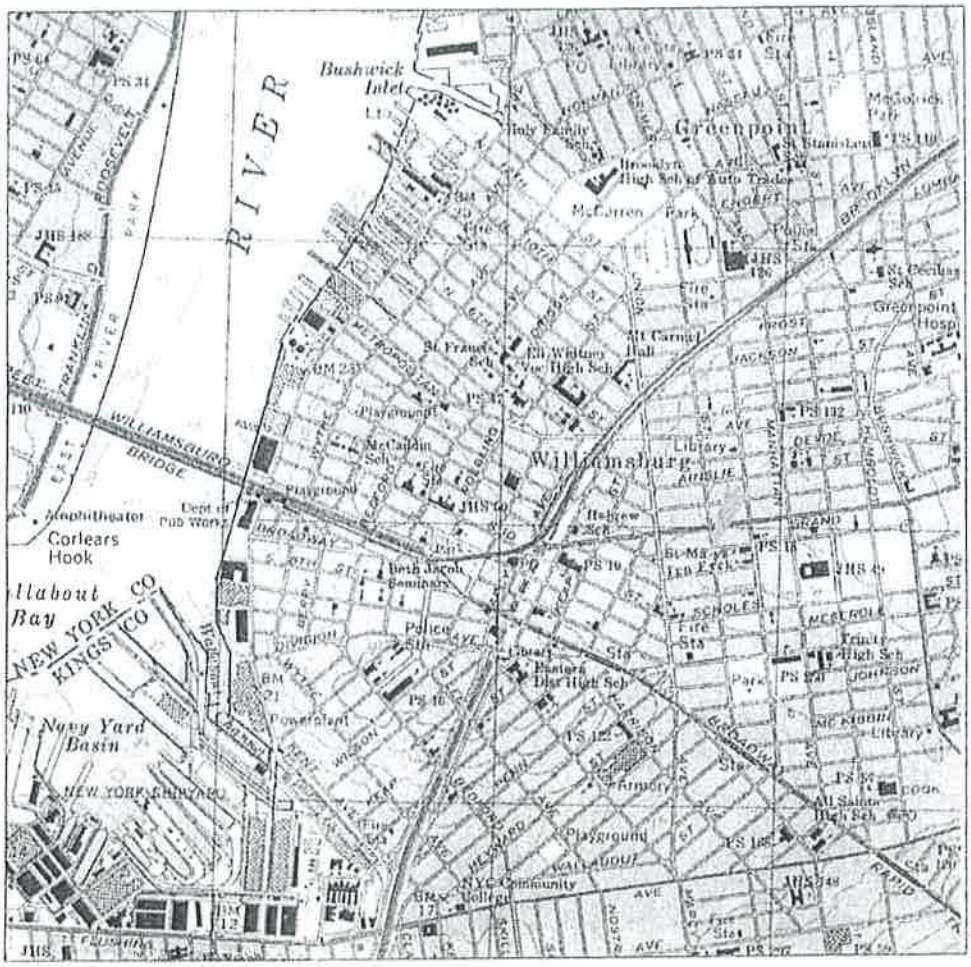
END OF AUTHORIZING AND CONCURRING SIGNATURES

APPENDIX A

Phase IA Archaeological Assessment

(following pages)

PHASE IA ARCHAEOLOGICAL ASSESSMENT
BLOCK 2791, LOT 37
33 TEN EYCK STREET
BOROUGH OF BROOKLYN, NEW YORK



Prepared by: Celia J. Bergoffen, Ph.D. RPA

Prepared for: Yuco Real Estate Comapany Inc.

May 28, 2015

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Cover - Detail of the USGS Brooklyn New York Quadrangle Map showing the location of the project site

Fig. 1. Section of the Tax Map of Block 2791 showing the location of the Project Site on lot 37. Source: New York City Department of Finance, 2015.

Fig. 2. 1868 Higginson's map showing the location of the project site. Source: *Higginson's Insurance Maps of the City of Brooklyn, Long Island,* New York: J.H. Higginson, 1868, vol. 4, pl. 82.

Fig. 3. Plan of the project site on block 2791, lot 37, showing the location of the subterranean vaults and the proposed building. Source: Bong Yu, PC-Engineer / Architect.

Fig. 4. Plan of the subterranean vaults on the project site. Source: Bong Yu, PC-Engineer / Architect

Fig. 5. East-west section (1) and north-south cross section (2) of the subterranean vaults on the project site. Source: Bong Yu, PC-Engineer / Architect.

Photograph 1. View of the project site looking south to Ten Eyck Street. Source: Celia J. Bergoffen Ph.D. R.P.A.

Photograph 2. View of the opening on top of Vault 1. Source: Celia J. Bergoffen Ph.D. R.P.A.

Photograph 3. View of the interior of Vault 1 looking west. Source: Celia J. Bergoffen Ph.D. R.P.A.

Photograph 4. Vault 1, view of the western opening on the south wall. Source: Celia J. Bergoffen Ph.D. R.P.A.

Photograph 5. Vault 1, view of the eastern opening on the south wall and part of the west wall. Source: Celia J. Bergoffen Ph.D. R.P.A.

Photograph 6. Vault 1, the east wall. Source: Celia J. Bergoffen Ph.D. R.P.A.

Photograph 7. Looking north through the arched passageway on the north wall of Vault 2. Source: Celia J. Bergoffen Ph.D. R.P.A.

Photograph 8. View of the west wall of Vault 2. Source: Celia J. Bergoffen Ph.D. R.P.A.

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Photograph 10. View of the west wall of Vault 3. Source: Celia J. Bergoffen Ph.D. R.P.A.

Photograph 11. View of the east wall of Vault 3. Source: Celia J. Bergoffen Ph.D. R.P.A.

Photograph 12. View of the north wall of Vault 3, the arched opening into Vault 4, and the east wall of Vault 3. Source: Celia J. Bergoffen Ph.D. R.P.A.

Photograph 13. View of the arched opening in the south wall of Vault 3, looking south into Vault 2. Source: Celia J. Bergoffen Ph.D. R.P.A.

MANAGEMENT SUMMARY

Involved State and Federal Agencies:	NYC HPD
Phase of Survey:	Phase IA Archaeological Assessment
Location:	Block 2791, lot 37 Williamsburg Kings County
Survey Area	100 feet wide by 75 feet deep
USGS 7.5 Minute Quadrangle Map	Brooklyn, New York
Report Author:	Celia J. Bergoffen Ph.D. R.P.A.
Date:	May 25, 2015

I. EXECUTIVE SUMMARY

This Phase IA archaeological assessment of the project site on block 2791, lot 37, falls outside the normal parameters for these studies for two reasons:

First, the Landmarks Preservation Commission did not flag the project site for potential archaeological sensitivity because in the past, a building covered the entire lot area and it was concluded that the construction would have destroyed any possible traces of prehistoric presence or any backyard features associated with 19th century occupation. Prior to the 1840s, the area was farmland. Consequently, the developer was not required to commission an archaeological assessment prior to undertaking excavation on the lot. The present archaeological assessment was undertaken because the developer discovered impressive subterranean architectural remains, consisting of four connected, vaulted chambers, and reached out to Celia J. Bergoffen, Ph.D. R.P.A. to make a determination whether or not the architecture was historically significant. Both the Landmarks Preservation Commission (LPC) and the New York City Department of Housing, Preservation & Development (NYC HPD) were contacted in order to discuss what further steps, pending the recommendations of this report, might be considered for mitigating the impact of the proposed construction on these architectural remains.

Secondly, this assessment is different from the standard Phase IA report because the site has already been partially explored during the course of backhoe excavation for the proposed construction. We already know a great deal about the historic architectural remains preserved on the site because the developer uncovered an entrance to the vaults, thereby permitting the Director of Archaeology of the Landmarks Preservation Commission, Amanda Sutphin, representatives from the NYC HPD, and Celia J. Bergoffen, author of the this report, to enter and examine their interiors.

The documentary research presented in the following report revealed that the vaults at 33 Ten Eyck were part of a lager brewery established by Sebastian Schnaderbeck, which included buildings covering both lot 37 and the adjacent lot 18 on Maujer Street. In the 1860s-70s, When Schnaderbeck was in business, Williamsburg was the center of lager production in New York City. The creation of deep cellars or "lagering caves" was necessary for the manufacture of lager, which requires aging at cold temperatures. Since Schnaderbeck's brewery was producing lager by 1860, the vaults must have been constructed before that date. Only three other lager breweries are documented in Williamsburg before 1860, making Schnaderbeck's one of the earliest lager producers in the district. Several dozen other brewery vaults must have been built in Williamsburg during the 1860s to 1870s, but only one other surviving, subterranean lager vault was documented in the course of the present research. This report therefore concludes that the lager vaults on block 2791, lot 37, are historically significant and should be preserved. Detailed conclusions and recommendations are presented in Section VI of this report.

II. DESCRIPTION OF THE PROJECT SITE AND PLANNED DEVELOPMENT

The project site is located on Block 2791, lot 37, corresponding to 33 Ten Eyck Street, in Williamsburg (Report cover; Fig. 1). This district is bounded north of North 7th Street by Greenpoint, on the east, by the Queens County line, and on the south by Flushing Avenue. The part of Williamsburg containing the project site is also sometimes called Southside. Although block 2791 is oriented roughly northeast - southwest, the directions in this report have been simplified to north for northeast, west for northwest, etc. Thus, block 2791 is bounded on the north by Maujer Street (formerly Remsen Street); south by Ten Eyck Street (formerly Wyckoff Street), East by Lorimer Street, and west by Union Avenue. Currently, the project site is vacant and partly excavated. Multi-family dwellings occupy the lots on either side of it.

The project site is one of three co-developed and financed by Yuco Real Estate Company, Inc. and the NYC HPD to create affordable housing for low-income families. The new four-story building proposed will contain eighteen dwelling units as well as indoor and outdoor recreational spaces for the tenants' use. Its footprint will extend the entire width of the street frontage on Ten Eyck Street and approximately fifty-two feet into the lot. There will be a full cellar level, completely below grade, with eight feet clear ceiling height, which will house mechanical and utility spaces, as required for support systems, as well as a laundry room and storage areas for building and tenant use.

The entire area of the 75 foot wide and 100 foot deep lot has been partially excavated by backhoe, in parts of the western side of the lot to depths of 12 feet. At this depth, subterranean brick and stone vaults were encountered and the work was suspended pending archaeological assessment and discussion with the Landmarks Preservation Commission of potential measures that might be implemented to mitigate negative impacts on these historic architectural features.

In the past twenty-five years, the project site block has undergone a dramatic transformation. The photographs included in Historical Perspective Inc.'s Phase IA Archaeological Assessment for the Maujer Street Community Development Plan show that in 1992, with the exception of the building adjoining the project site on the east, on lot 36, and the apartment building at the corner of Union Avenue, the entire north side of Ten Eyck Street on block 2791 was vacant (Historical Perspectives 1992, Photographs 2-4). In addition, many lots on the south side of Maujer Street were also empty, though the building adjoining the project site on the north, on lot 18, and with which it was connected in the 19th century, survived (Historical Perspectives 1992, Photographs 5 and 6). In 1992, Alexander Auto Parts and Atlas Knitwear Mills occupied the building on lot 18, these businesses reflecting the mixed residential, commercial and light industrial character of the neighborhood that still existed at the time. Today, multi-family dwellings stand on most of the formerly empty lots on block 2791. The building on lot 18 contains apartments. Generally, multiple family dwellings and retail establishments have replaced many of the project site area's old wholesalers and small manufactures.

III. DESCRIPTION OF THE VAULTS

The following description is based on the plans and sections of the vaults furnished by Bong Yu, PC-Engineer / Architect (Figs. 3, 4 and 5), and on this writer's two site visits on April 3 and April 21, 2015.

The four joined vaults, here numbered 1 to 4, south to north, are parallel to Ten Eyck Street and so oriented roughly west - east (Fig. 4). The east side of vault 4 was largely filled and blocked by bricks and was less readily accessible than the other three (Photograph12). The top and sides of the vaults are brick; the base and end walls of stone, and the floor is brick paved (Photographs 3 to 12). The end walls also contained brick features, which will be described below. The vaults are all approximately 22 feet wide, but of unequal lengths. Vaults 1 and 2 measure 45.0 feet in length while vaults 3 and 4 are 40.0 feet long. The brick vaults and their stone bases run up to and abut the stone end walls, which were built against the openings. The stones are roughly dressed and of unequal sizes and shapes, laid in more or less horizontal courses with a great deal of mortar. The bricks are mostly laid as stretches, interspersed here and there by sections of headers, in no discernable pattern.

The width of the perimeter walls could not be measured, but a penciled note on the 1868 Higginson's map records that the vaults' western wall, adjoining lot 141, was 16 inches (Fig. 2). Note that most of lot 141 was vacant at that time, with only a small brick building at the front of the property. The northern wall of the vaults continues under the north lot line. The three interior walls of the vaults are 3.0 feet thick. Each vault has a circular opening measuring 2.0 feet in diameter, presumably a vent, at the top center of the vault. The thickness of the crown of vault 1, at the vent opening, which is the current access point to the interior, is 1 foot 4 inches. The other wall thicknesses shown on the section drawing are estimated, including the thickness of the brick-paved floor.

The vaults are connected by 6 foot 10 inch wide, arched openings located near the eastern ends of the vaults' long walls. Note that the passageways only the passageways between vaults 2 and 3 are aligned, while that between vaults 1 and 2 is 1 foot 6 inches further east than the other two. A fourth opening, in the north wall of vault 4, is still further east than the other three and only 9 inches from the vault's east wall. It may have been an exit, but since it was completely blocked by brick detritus, this could not be verified. The arches are stilted, that is, slightly set back from the edge of the top of the stone wall on which they rest. Clearly, they were built to be sturdy rather than beautiful, but in a most irregular manner. The bricks in the arch on the south wall of vault 3, for instance, are laid as voussoirs on the left and corbelled on the right (Photograph 13)!

The base of the vaults, as noted, was built of roughly dressed stone blocks to a height varying between approximately 46.0 and 50.0 inches. Like the rectangular openings piercing the stone end walls (below), the openings in the south wall of vault 1 appear to have been cut into the stone wall (Photographs 4 and 5). The edges of the openings are uneven, with bricks used to fill the gaps. The cut or broken edges of the stones are especially noticeable on the sides of the eastern opening. Note also the brick "plugs' on the left (east) side of western opening. An arch composed of a double row of headers caps both openings. Three rows of stretchers fill the remaining gap between the stone wall ends above the arch in the eastern opening. Above this, built into the brick wall, is another arch, aligned with the lower one, and also composed of a double row of headers. The western opening needed only one row of stretchers to close the gap. It two has a second arch above it, built into the brick wall above a complete row of headers. The area below the arc is plugged with one and a half rows of headers. The double arches were undoubtedly built to relieve the weight of the vault wall over the openings.

All eight end-walls were similarly equipped with rectangular openings cut into the stone walls. In each case, one opening was located at the top of the wall, on the right, the other, on the left, at the floor. These openings were filled with bricks, and there were piles of bricks below and in front of the openings, where they had fallen or rolled in (Photographs 6, 8, 9, 10 and 11).

The upper openings were clearly cut from the upper edge of the stone walls as the diagonal arcs of the vaults cross the top of their frames. The jagged sides of all the openings, except the neatly cut one in the west wall of vault 3 were filled in with brick (Photograph 10). The opening in the west wall of vault 1 was partly capped by a single row of brick headers laid in a very shallow arch over the left top of the opening. Perhaps this was intended as a support for the adjacent stone, which sits on two unevenly laid bricks filling the gap beneath it. A double arch composed of headers elaborately caps the opening in the east wall of vault 3 (Photograph 14). Like the openings in the south wall

of vault 1, this was built between the brick-framed sides of the opening, which supported a wooden lintel. The narrow board that served this purpose was found on the floor directly below the opening.

The lower openings were similarly framed by bricks at the side, where necessary, and capped by a brick arch made of headers. In each case, between the top of the openings and the vault, the stone wall was removed and the ragged gap filled with bricks all the way to the top. Obviously, the openings in all the walls with their brick frames and arches, and the brick fillings in the stone end walls, represent a later building phase.

Aside from piles of bricks fallen in through the openings in the end walls, there were a few metal buckets and pans and a small amount of unidentifiable metal detritus.

IV. HISTORY OF THE PROJECT SITE LOT

The development of Williamsburg began at the turn of the 19th century when Richard M. Woodhul began running a horse ferry from Corlear's Hook at the foot of Grand Street in Manhattan to a landing place at present-day Metropolitan Avenue (formerly called the "Long Island Road"). Speculating that the area would soon be built up, Woodhull purchased land near the road to the ferry, the old "Bushwick Street", which he then renamed "Williamsburg" in honor of the town's first surveyor, U.S. engineer Colonel Williams (Williams was a grand-nephew of Benjamin Franklin; Armbruster 1942, 36). By 1812, when Thomas Morrell began running a second ferry to Manhattan from the foot of Grand Street the settlement, then known as "Yorkton", extended only four blocks north-south from North 2nd Avenue (Metropolitan Avenue) to South 1st Street.

In 1833, Williamsburg was still a sparsely built-up village with rows of houses along North 2nd Avenue (Metropolitan Avenue) and North 3rd Streets; along Kent Avenue south of Grand Street, and on the riverside between Grand and South 2nd Streets (Armbruster 1942, 4-5). The center and most densely populated section of Williamsburg at that time was the area of the 13th and 14th wards west of Union Avenue and the project site block, which was still undeveloped land. In the later 1830s, about five hundred houses were erected in Williamsburg and a further four hundred between 1843 and 1845, all west of the project site block's immediate area. In ca. 1840, there was a "country place" at Ten Eyck and Union Avenue, with "many trees" and a vegetable garden (Armbruster 1912, 38). The 1844-45 USGS map shows that the streets and blocks had been planned as far east as Manhattan Avenue, including the project site block, but later maps (below) indicate that they had not yet been developed. The built-up portion of Williamsburg, diagonally shaded on the 1844-45 USGS map, extended eastwards only as far as the line of Marcy Avenue approximately (the Brooklyn-Queens Expressway); south to South 9th Street and north to South 3rd or 2nd Street.

The 1852 Field map still does not show any building on the project site, most of which is contained in the irregularly shaped tract of J. Munson. The street was however, was opened in that year (Historical Perspectives 1992, 35). A small triangular section on the northeast side of the project site lot was the property of J.L. Graham. The eastern boundary of Munson's lot, running diagonally southeast to northwest, follows the old farm line, as shown on the 1880 Bromley map, which indicates that most of the project site was part of James Scholes' farm. The 1854 Higginson's map, representing the town in 1853, also does not indicate any development on the project site block. There must, however, have been at least one house near the project site by that date, on the north side of Ten Eyck, since the 1853 *Brooklyn Directory* lists the carpenter James McLaughlin residing at the corner of Wyckoff Street and Lorimer Avenue.

Certainly, the 1852 Field Map and 1854 Higginson's maps represent the end of an era. In 1852, the City of Williamsburgh was established and on January 1, 1855, Williamsburgh, Brooklyn and Bushwick were consolidated into the City of Brooklyn (Armbruster 1912, 38). The mid-1850s witnessed a dramatic increase in Williamsburg's population and its housing stock. The Williamsburg directory listings, first published in 1847, record an increase from 5300 residents in 1850 to 10,925 in 1854 (Armbruster 1942, 6). The population increase in the project site area is signaled by the splitting of the Third ward -- which included the large area east of Union Avenue as far as Bushwick Avenue -- into the 15th ward, on the north, and 16th ward, to the south, with Ten Eyck Street (then called Wyckoff Street), forming the boundary between the two. The project site block was thus at the southern edge of the 15th ward. By 1858, the Dripps map records that the 15th ward had been developed north and south of (and including) the project site block, and up to four blocks east, to present-day Graham Avenue. The first major period of development of the project site block, therefore, was between ca. 1852/3 and 1857/58.

Sebastian Schnaderbeck established his brewery on the project site lot before the end of 1859 (*Brooklyn Daily Eagle* 1860). In 1860-61, its addresses were listed as 9 Wyckoff and 30 Remsen (33 Ten Eyck Street and 34-36 Maujer Street, respectively; *Brooklyn Directory* 1860-61). Maps show the brewery building extending over both the project site and the adjacent lot 18, to the north, at 34-36 Maujer Street. The 1860-61 directory calls the business a "largerbeer brewery (sic)" named Schnaderbeck & Co., which also confirms that the vaulted cellar, necessary for the lager brewing process, had been built by that date (Ibid., and see Section V below). The earliest tax assessments of 1866 list a "beer cellar" on the project site owned by Wilhelm Ockert and S. Schnaderbeck, although Schnaderbeck was listed as the sole owner of the building on the Maujer Street side of the brewery. On the 1868 Higginson's map, the brewery building(s), running across the block from Ten Eyck Street to Maujer Street, are labeled

"Schnaderbeck's Brewery". The main brewery building, on Maujer Street, had a three-story section in the front, while most of the rest of this lot together with most of the project site were occupied by a two-story building. Both were built of brick. By 1868, a renovation was made to the eastern third of the brewery building on the project site, replacing whatever was there with two storage buildings on the front and rear of the lot, connected by a passageway. This "blue building" was glued onto the original map and unfortunately it is not possible to determine what was there previously, underneath the update (Fig. 2). By 1870, renovations had become necessary to provide the "old and extensive establishment" on Maujer Street with "the latest improvements" for lager production (*Brooklyn Daily Eagle* 1870). Perhaps this section was part of that upgrade.

The brewery went out of business ca. 1877, and in the 1876-1880 tax assessments for the two-story building on the project site there is a faint notation of "factory". The owner's name unfortunately is not legible, but he must had some considerable problems with the building because its value dropped by a third from 1879 to 1880, from $6,000 to $4,000, and a notation in the tax assessments records "in ruins 1880". However, Henry Hesse purchased the property in May 1881 together with the building on Maujer Street, and continued to operate a factory in the two-story building on the project site, which he presumable refurbished.

During Hesse's brief tenure and until 1884, the building on Maujer Street was still listed in the tax assessments as the "S. Schnaderbeck brewery" though by 1883, it was a "mere wreck" (*Brooklyn Daily Eagle* 1883, 9). The *Brooklyn Daily Eagle* informs us that the Salvation Army was using the building as its barracks (Ibid.). The tax assessments then noted, "Building in ruins 1884", and in the following year or two, its value fell from $13,000 to $6,000. Through all this, the footprint of the building remained unchanged: the same building appears on the 1886 Robinson map as on the 1868 Higginson's map, but without the "Brewery" notation.

The mysterious episode of the theater that was apparently never completed followed in the mid-1880s. There is a pencil notation on the Higginson map on the brewery building: "to be altered to Theater" (Fig. 2), and the August 2, 1884 issue of *The American Architect and Building News* records a "Building Patent" for 34 and 46 Maujer Street, with the note: "old Brewery altered to Theater: cost $10,000; owner, C.S. Gray, DeKalb Ave., cor. Fort Greene Pl." Mr. Charles Gray only purchased part of the building from Henry Hesse in November 1884, and by 1888, he and Henry Hesse were both out of it. Only the "framework of the parquet" floor had been laid. In the meantime, the vacant building was cannibalized for its fixtures and "gutted" (Sanborn 1887; *Brooklyn Daily Eagle* 1886). Work on the theater resumed in 1886, at a cost of $75,000, with completion of a three-tier performance space seating two thousand expected by October 1st of that year (*Brooklyn Daily Eagle* 1886). This is the last we hear of the project. At this low point in the brewery's history, its thirty-foot deep cellars were "left exposed and without safeguards" and a boy fell in and was "fatally injured" (ibid.) Was he small enough to fall through one of the ceiling vents in the vaults? In view of their solid construction, it is unlikely that he felt through a breached vault roof. Perhaps he fell down the same, thirty-foot deep shaft way where a worker had been killed some twenty-five years earlier (*Brooklyn Daily Eagle* 1860)?

In 1888, Henrietta Smadbeck purchased both the two-story "Factory" building on the project site and the three-story "Brewery" on Maujer Street, the latter still considered, in 1886, "one of the most substantially constructed buildings in the Eastern District" (*Brooklyn Daily Eagle* 1886). But in the same year, she sold the Maujer Street building to Edward Clark, who added a fourth story and turned the brewery into a "Congress Hall" (Tax assessments, Sanborn 1887). According to the 1898 Hyde map it was a "Church". The 1904 Sanborn indicates that the front portion of the building was then 4 stories and the rear, 3 stories. Clark was listed in the tax assessments for the Maujer Street property through the 1890s, but the 1899 Sanborn map, notes in pencil "Congress Hall (closed)". By the late 1890s, the building on the project site was wholly turned over to storage for the "Kings Co. Storage Warehouse" (Sanborn 1899, Belcher Hyde 1912). In 1904, a table manufacturer, probably the Gluck Bro's Table M'F'G named on the 1913 Sanborn, was slated to be installed on the first and second floors, leaving the third vacant (Sanborn 1904).

The 1904 Sanborn map and the 1912 Belcher Hyde map are the last to record a two-story building on Ten Eyck Street, the Sanborn map also noting the presence of a basement. At that time, the building was occupied by a "Paper Box Factory" on the second floor, leaving the first floor for storage (Sanborn 1904). All the subsequent Sanborn maps, from 1913 on, depict two one-story buildings on the project site, semi-detached, like their predecessors, now generously equipped with wire glass skylights. The 1913 and 1935 Sanborn maps also record a hydrant, in a separate room at the southeast corner of the building, and a 275-gallon boiler tank on the other side of the wall behind the hydrant. There is a WPA tax photograph of this undistinguished building, its plain facade dominated by

two large entryways suitable for a garage, which purpose it served from ca. 1913 until at least as late as 1935 (Sanborn 1913, Hyde 1929, Sanborn 1935). It was then occupied by a "Plumbing Fixture Assembly" (Sanborn 1950), and from ca. 1950 to at least the mid-1960s by a "Whol Gro" (Wholesale Grocer, Sanborn 1965). This firm, Dyber Oil Co. Inc., was a "Wholesale Food Establishment Warehouse" whose business was "wholesale groceries and packaging of edible oils" (Department of Buildings, Block and Lot file, Application for plumbing and Mechanical work #2201, 1950). The building was demolished between 1982 and 1984 (Sanborn 1982, Sanborn 1984). The building on lot 18, 34-36 Maujer Street, is now an apartment house.

V. SEBASTIAN SCHNADERBECK AND LAGER BREWING IN WILLIAMSBURG

The 1850s saw the fist major influx of German immigrants -- including naturally brewers and others connected with that business (Schlagel 1976, 18). In the late 1840s, German immigration lagged behind the Irish, who were fleeing the potato famine. But the number of Germans increased dramatically from 1851 on. Ernst (1949, Table 9) provides the following impressive figures (the percentages were calculated by this writer):

Year	1851	1852	1853	1854	1855	1856	1857	1858	Total 1847-1860
German immigrants	69,919	118,611	119,644	176,986	52,892	56,113	80,974	31,874	979,575
% of total U.S. immigration	24%	39%	42%	55%	39%	39%	44%	41%	37%

For comparison, Irish immigrants to the United States during this period accounted for 41% of the total.

Earlier in the 19th century, the Germans turned part of the Manhattan's Lower East Side into a "Klein Deutschland" ("Little Germany"), settling in the area that would struggle to house a burgeoning immigrant population throughout the 19th and early 20th centuries. Before the introduction of Croton water in 1842, one of Brooklyn's attractions for brewers was the availability of good water, the principal ingredient needed to make decent beer (Schlagel 1976, 9). Later, it was probably the availability of suitable housing and commercial space at advantageous prices that drew the Germans across the East River). Both the German immigration and the establishment of German-style breweries had a direct impact on the development of the project site, whose first recorded use was as a German lager brewery. The largest concentration of breweries -- between 1850 and 1880 some eleven businesses -- was immediately southeast of the project site along "Brewer's Row", which extended from Lorimer Street to Bushwick Place between Scholes and Meserole Streets (Anderson 1976, 15). In 1873, there were 30 breweries in Brooklyn (*Brooklyn Daily Eagle* 1873B).

Sebastian Schnaderbeck is first listed in the *New York City Directory* in 1847-48, making him among the German 'Forty-eighters", at least chronologically. The Forty-eighters were German intellectuals who participated in the 1848 revolution in Germany for a democratic, unified state. When the revolution failed, many of its supporters fled to the United States where their education and progressive views made many successful businessmen and community leaders. We don't know if Schnaderbeck was a political refugee, but during the Civil War, "Sebastian Schnaderbeck Esq." was a liberal, convention-attending Republican (*Brooklyn Daily Eagle* 1862). Otherwise, his career, politically and commercially, seems to have been respectable but not particularly distinguished. He started a wine import business at 13 Spruce Street, forming a partnership in 1849/50 with his neighbor, August Krager, a "liqor" (sic) merchant at 11 Spruce (Rode's *New York City Directory* 1850-51, *Doggett's New York City Partnership Directory* 1849 & 1850). The firm was called "Shnaderbeck & Co." (sic). Krager was an even older German-New Yorker, having first established a wine business at 102 Fulton Street already in 1845/46 (*New York City Directory* 1845-46). While Krager lived in Manhattan, Schnaderbeck settled in Williamsburg from the first, although his address, alas, was not recorded in the 1847-48 Directory (*Doggett's New York City Directory* 1847-48; *Rode's New York Business Directory* 1853-54). Schnaderbeck's earliest listed home address is 81 Second in 1855-56. When next we hear of him, in 1858-59, he is residing at 97 Union Avenue (corner of South First Street, as noted in most of the directory listings). Although workmen were sometimes accommodated in breweries at that time -- and partly paid in beer -- Schnaderbeck evidently did not live over his. Krager eventually moved to 49 South 1st Street in Williamsburg (Tax assessment 1865). He remained Schnaderbeck's partner until he died, on September 6, 1865, at the age of 61, after a long illness (Henry August Kraeger, *New York Herald* 1865). He was only about six years older than his partner.

As noted in the previous section, Schnaderbeck established his Williamsburg brewery before the end of 1859 (*Brooklyn Daily Eagle* 1860), and apparently closed the business at 11 Spruce Street ca. 1858-59, since this is the last year it was listed in the *New York City Directory*. His New York business must have been quite successful, since starting a brewery required a big investment both for the purchase or construction of brewery buildings and cellars as well as for acquiring equipment such as kettles, tubs, grinders, etc. (Ernst 1949, 91). In 1869, Schnaderbeck's brewery, including the property on both lots 18 and 37, was valued at $20,000 (Tax assessments). At this juncture, Schnaderbeck went back to Germany. The length of his absence was not determined, but he returned on the steamship Bavarian from Hamburg in June 1861 (*New York Times* 1861). His occupation on the ship's manifest was

listed as "Kaufmann" (businessman). Since Schnaderbeck was not listed on the ship's manifest as a "Braumeister" (brewer), and he and his partner's earlier businesses were as wine merchants, it is possible that neither had this training. Perhaps he brought a master brewer back from Germany with him. Brewers were highly skilled and highly paid, and there were "one or two cases" of brewers brought from Germany to oversee production in Williamsburg's breweries (*Brooklyn Daily Eagle* 1875). Was Charles Kroger, who came to New York on the same ship as Schnaderbeck and is named immediately after him on the passenger list, the same person who opened a lager brewery in Philadelphia in 1875, and did he begin his career in America at Schnaderbeck's (*New York Times* 1861, Rich 1903, 221)?

Schnaderbeck seems to have retired from the brewery ca. 1875, because his name no longer appears in the *Brooklyn Directory* (*Brooklyn Daily Eagle* 1886). Instead, his son August, also a brewer, but a mere stripling of 25 years old in 1875, is listed at the "lager" address on Maujer Street for two years, until 1877-78 (the new street name is first used in the 1871-72 *Brooklyn Directory*, New York State Census 1875).

Schnaderbeck's family history is somewhat tortuous. The "rootsweb" site of the Schnaderbeck clan and others lists his birth date as June 10, 1806 -- although the 1875 census records it as "about 1809". The website states that he was born in Upstadt Bie Bruchsal, in Baden German, and died in 1881, in Farmingdale. This genealogical site also lists a wife, Catherine, born "about 1810", married to Sebastian in 1835, and mother of Edward ("Ed") Schnaderbeck, born in 1839. In 1854, a second (?) wife, Sara H. Zachary, is listed as a grantor of property to Sebastian (Liber 659, page 330, May 1, 1854 - EBSCO Digital Archives). There were no other references to this person, also not in the rootsweb list. No wife is listed living with Sebastian in 1875, but there were two new children, neither recognized by the rootsweb site, both born in Kings County: August in 1850, and Harriet in 1852 (the 1875 New York State Census lists her age as 23). Ed had evidently moved out by that time. In 1900 he was living in Oyster Bay, Nassau, New York, where his younger (half?) brother had come to live with him (United States Census 1900). Ed continued the family business. "Schnaderbeck & Runge" (Richard Runge) liquors is listed in *Lain & Healy's Brooklyn & Long Island Business Directory* for 1897.

Two other bits of irrelevant but entertaining gossip concerning Schnaderbeck's private life were reported in the *Brooklyn Daily Eagle*. In January 1863, the servant girl managed to "mistake" arsenic for soda, put it in the pudding, and poisoned the family. Luckily, the doctor arrived in time to save the family (*Brooklyn Daily Eagle* 1863). Then in January 1873, an individual named only as "Miller", who was either staying or residing in Schnaderbeck's home, died in his bed. The coroner's initial determination was death by natural causes, "fatty accumulations around the heart" (*Brooklyn Daily Eagle* 1873A). But when a packet of strychnine, from a Newark apothecary according to the label, was found "in the bed he laid on", the cause of death was changed to suicide. Apparently, Schnaderbeck had known about the packet but "kept mum" as he said: "It was bad enough to have the old scoundrel die in my bed without having any more bother about him" (Ibid.). These two unfortunate incidents give us some insight, perhaps, into Schnaderbeck's character.

Schnaderbeck began brewing his lager when the business was still in its infancy. No doubt the Dutch and the English began building home breweries from the moment they set foot in the New World -- the earliest recorded brewery in Brooklyn dates ca. 1660 -- but lager beer was not introduced to the United States until 1840 (Rich 1903, 157, Schlagel 1976, 8). All beers are made with a fermented cereal, usually barley, and yeast, which produces the alcohol and the carbonation (carbon dioxide). The difference between lager and other beers is that the yeast for lager ferments at the bottom of the vat, instead of the top. This requires a particular type of yeast and deep cellars, where the brew could be aged at the required low temperature. Made in the winter and tapped in the summer, the refreshing "summer" or "lager" beer -- after the German word for "storehouse" -- was lighter in color and more effervescent than ale (Schlagel 1976, 6). Charles C. Wolf claimed that his Philadelphia brewery was the first to produce lager on a large scale but credited John Wagner with bringing the "first lager beer yeast to this country from a brewery in Bavaria in which he had been brew master" (in 1840, Rich 1903, 157). Another brewer, George Manger obtained some of Wagner's yeast and built a brewery in Philadelphia. His cellars, completed in 1845, were the first lager vaults in the United States, according to Wolf (Ibid.).

Two businessmen laid claim to being the first lager brewers in New York City. The Bavarian George Gillig, who brewed lager in 1844 in his brewery on Third Street between Avenues A and B, and the Prussian Frederick Schaefer -- an enduringly famous name in the beer business -- who began making lager at a similar, though unspecified date, in the early- to mid-1840s (Rich 1903, 158-159). At that time, the Schaefer Brewing Company was on 7th Avenue

in Manhattan between 16th and 17th Streets. Gillig apparently also owned a brewery in Williamsburg in the mid 1840s, but Rich (1903, 158) did not record its location.

The earliest lager beer breweries in Brooklyn were those of Nicolas Seitz, John Schneider and Samuel Liebmann (Schlagel 1976, 18). Seitz's brewery on 13th Street and 7th Avenue was founded in 1843 and began producing lager in 1850 (Rich 1903, 175-176). His son continued the business in the brewery on Maujer Street, a few blocks east of the project site. John Schneider's Congress Brewing Company, on Meserole Street, put out an impressive 5,000 barrels of lager in its first year, 1855. Samuel Liebmann's Sons began brewing lager in the same year as Schneider (Rich 1903, 176; Schlagel 1976, 18). Schnaderbeck, whose lager brewery was established before 1860, was therefore among the first in the business.

Widmann's description of breweries of his "second period", dated 1860-1880, corresponds roughly to the life of Schnaderbeck's business (Widmann 1912, 29). Like the main building of Schnaderbeck's brewery on Maujer Street, most breweries of this period had two to three stories. Unlike the breweries of the "pioneer days" before 1860, whose plants were an "unsightly conglomeration of one-story structures", those of the second period were more design-conscious, employing the services of expert brewery and brewery cellar engineers and architects (Ibid.). The advertisements of these builders may be found in trade journals such as *The American Brewers' Gazette, The American Brewer, The Brewers Journal and The Western Brewer: and Journal of the Barley, Malt and Hop Trades*, which published Widmann's paper. Widmann (Ibid.) makes particular mention of Stoll and Pfundt, in New York City, describing them as the "pioneer architects and engineers of breweries". We know that Stoll was indeed an inventor because he took out a patent in 1871 for an improved malt reservoir (*Brooklyn Daily Eagle* 1871). Stoll also advertised regularly in the trade journals. Unfortunately, it was not possible to link either of these brewery architects or the many others who advertised in the trade journals in the 1870s and later to Schnaderbeck's vaults, which must have been built in the 1850s. Widmann linked the new interest in the breweries' appearance with the increase in beer consumption, which he thought would have inspired the creation of "more pleasing and conspicuous" exteriors (Widmann 1912, 29).

Although the architectural history of the building still standing on Block 2671 lot 18 is not strictly speaking part of this assessment, the historic map research conducted for the project site suggests that, with the exception of the fourth story added in the 1890s, the facade of 34-36 Maujer Street may still be substantially the same as it was in the 1860s. The rear portion of the building, visible from Maujer Street, is three stories. There is no description of the brewery's interior -- now converted to apartments -- but we may infer that it had a Bierstube, as common in such establishments: a room with tables and chairs where people could sample the brewer's wares. Lager brewers frequently operated saloons to serve their local, neighborhood market because before refrigeration was introduced, lager quickly lost its carbonation once the keg was tapped: after one hour, it was "dead" (Schlagel 1976, 15, 17; *Brooklyn Daily Eagle* 1873B). If a brewer didn't operate his own tavern, he could supply nearby beer gardens and restaurants, groceries, hotels or boarding houses" (Ernst 1949, 91; Schlagel 1976, 15, 17). Schnaderbeck's tavern must have been a fairly large space as it was used for political meetings involving numbers of attendees. For instance, the delegates to the 8th Assembly District Republican Convention assembled in "Schnaderbeck's Hall" on September 17, 1874 (*Brooklyn Daily Eagle* 1874). In the '90s, as mentioned above, it served as a "Congress Hall".

There is equally no information about the original interior arrangements of the building that stood above the vaults, but it probably included an ice house. During the period from ca. 1860-1880, scientists and brewers experimented with different methods of refrigeration. The growth of the German population and the consequent increased demand for beer gave brewers a strong incentive to produce lager outside the winter months and improve the natural refrigeration of their subterranean cellars (Rich 1903, 70). One innovation, for instance, was to introduce cold air from the ice houses into the vaults "via shafts with regulating valves" (Schlagel 1976, 24). The " latest improvements" that Schnaderbeck provided to his "old and extensive establishment" may have included the modifications observed in the vaults consisting of brick opening cut in the top and bottom of its end walls (*Brooklyn Daily Eagle* 1870). These may have been intended to improve cold air circulation, in which case, the cold air would have been supplied from an ice house above the vaults.

To understand how the ice was used, and in what quantities it was needed, it is necessary to describe briefly the beer brewing processes. To make the wort, which would "feed" the yeast, barley was soaked in large vaults until it germinated. The mixture was then boiled to halt germination, allowed to cool and dry, and ground into meal. The meal was again mixed with warm water, which produced an enzyme called distase. Separating the meal from the

solution produced the wort, which was added to the brew kettles and boiled. The distase changed to dextrin and maltose. Other flavoring ingredients such as hops might be added to the brew kettles to create different flavorings. Yeast, added last, fed on the sugars and produced alcohol and carbon dioxide. The mixture was again allowed to cool, either in the wintry air or by passing the beer over pipes filled with ice water, and then sent to the fermenting tubs in a cold cellar (Rich 1903, 193). This description was partly based on an un-named reporter's story for the *Brooklyn Daily Eagle* about his visit to Henry Urban's Boulevard Brewery at the corner of Meserole Street and Bushwick Avenue (*Brooklyn Daily Eagle* 1875). The brewery, incidentally, ran an adjoining, family-style beer garden, where people sang and danced and "Tyrolese Yodlers performed". Guided by the German foreman, Charles Keller, the reporter observed the "immense" vaults with their "well bricked but damp floor" containing the fermenting tubs. This cellar was kept at 5 degrees Fahrenheit by packing ice around the floor, which used thousands of tons monthly. After fermenting for ten to twelve days in the tubs, the mixture was pumped to the ice house and placed in casks. The ice house was a brick building that also contained the wash house where the kegs were cleaned and stored. Below the ice house there were three levels of storage cellars, the lowest 54 feet underground.

The Boulevard Brewery's cellars were not even the deepest. The *Brooklyn Daily Eagle* (1870) reported that some breweries had cellars up to 80 feet deep. Cellars had become a "prime necessity" to stock the breweries' ever-expanding output: "...the demand for increased facilities to store larger quantities of the fluid is made year after year, and still the cry is for more" (Ibid.). Breweries had "as much or more space below the surface as above", and cellars were "attached to every brewery" (Ibid.)

The Huber Brewery, established in 1866 in a pre-existing facility formerly occupied by the Joerger brewery, had storage cellars that "[underlay] the entire place", comprising approximately 300,000 cubic feet (Schlagel 1976, 58). Its extensive former brewery building complex at 1 Bushwick Place, including a warehouse built in 1858, sold in March 2015 for $26 million (Mauer 2015). It is currently occupied by music rehearsal and recording spaces as well as a large beer hall and garden called "The Well". The bar's name may have been inspired by the artesian well that existed on the property, providing the pure water for Otto Huber's beer.

The premises of the former Nassau Brewing Company have extensive cellars that still exist and have been adapted for commercial use. Located at 1042 Dean Street (block 1142, lot 40), the former brewery complex includes an icehouse and brewery building as well as the lagering vaults. In addition to putting in new concrete floors and stainless steel floor drains for the Parish Hill Creamery's cheese-aging operation in the cellar, the brewery's owners, Benton Brown and Susan Boyle, have transformed the icehouse into green-focused lofts and the main building into a space for small manufacturing and businesses (*Cheese Reporter* 2014, Krommydas 2014). Photographs published in an online article about a beer-tasting event show vaults constructed quite differently from those on the project site (Ibid.) They are all-brick, without stone foundations or end walls, and their lower and shallower ceilings are supported by a series of broad arches resting on walls that project from the sides of the vault. Narrow wooden lintels surmount the rectangular openings between the vaults. An arch built into the wall above the opening provided extra support. Though similarly situated at the ends of the vaults' long walls, these doorways are different from the arched openings in the project site's vaults but similar in construction to the small opening cut into the top of the east wall of vault 3 (Photograph 11). The floors of the Nassau Brewing Company's vaults were also bricked but equipped, in addition, with channels for drainage, something not observed in the project site's vaults. Like the latter, there was no access to the cellars, so Brown and Boyle installed a new set of stairs (Krommydas 2014).

Schlagel (1976) lists a few other breweries established ca. 1860, contemporary with Schnaderbeck's brewery, and which must have had cellars, but it is not known whether the vaults still exist or in what condition. Further research on this topic, beyond the scope of the present assessment, should include a survey of all the sites of former breweries in Williamsburg that were in operation in the period ca. 1855-1880. It is an open question whether, given the depth and the number of cellars that purportedly existed in the district, other vaults like those on the project site may still be waiting underground to be rediscovered.

The proliferation of lager breweries in the 15th and 16th wards from the mid 1850s reflects not only the concentration of German lager-drinkers here but also the requirements of the manufacture (pure water, land for building the plants), and its dispensing to eager local markets. Conversely, the introduction of refrigeration would have permitted brewers to expand their markets and possibly driven smaller producers or those unable to keep up with technological improvements out of business. These may well have included some among the thirty or forty mostly small breweries that existed in 1875 but "[didn't] turn out beer at regular periods or in large quantities"

(*Brooklyn Daily Eagle* 1875). Although Schnaderbeck may have introduced more up-to-date methods of cooling his cellars, as suggested by the brick modifications in the cellars' stone end walls, these may not have been enough to keep up with the larger and more technologically advanced producers. In addition, as mentioned, the brewery business ate up a lot of capital. These factors, together with Schnaderbeck's retirement from the business and possibly, his son's inability to keep it up, may have led to the Brewery's demise ca. 1878.

VI. CONCLUSIONS AND RECOMMENDATIONS

Williamsburg was one of the main centers of lager beer production in the United States in the 1860s and 1870s, when Schnaderbeck's Brewery was in operation. Although his was not one of the larger operations, Schnaderbeck was among the first to set up shop in the district, in the late 1850s, which also makes his vaulted cellars one of the earliest. Several dozen brewery vaults must have existed in Williamsburg contemporary with Schnaderbeck's brewery, and a few are known to have been much more extensive. But the only other extant lager cellars known to this writer, belonging to the former Nassau Brewing Company, are quite different in construction from the vaults on the project site and neither the Nassau Brewing Company's vaults, nor any other lager cellars in the district have been properly documented. There is also no study regarding the construction of brewery vaults in Williamsburg or, for that matter in the rest of the city.

This documentary study therefore concludes that the vaults are historically and architecturally significant and recommends that they be preserved and made accessible. The most desirable scenario would be to adapt the space for suitable commercial uses such as those installed in the former Huber and Nassau Breweries described in Section V above. Reuse of the vaults would therefore be in sync with similar trends in the neighborhood's development and in keeping with the historically mixed commercial / light manufacturing / residential uses of Williamsburg since its inception.

In view of the lack of documentation of brewery vaults in Williamsburg and the rarity of brewery vaults in the excellent state of preservation of those on the project site, this report recommends:

1. The preparation of photographic documentation and detailed architectural drawings according to HABS / HAER standards and, when construction work on the project site is resumed:

2. Archaeological monitoring of excavations on the project site. Should additional subterranean structures or other objects connected with the former brewery be uncovered, construction work would cease and the discovery reported to the Landmarks Preservation Commission. New structures or other finds of archaeological significance would be drawn and photographed, as required, and a written description of these submitted to the LPC.

In the event that the vaults can not be preserved and made accessible this report recommends, as a further mitigation measure, the creation of an additional research report as an addendum to the present study, consisting of a survey both above and below ground, where possible, of the sites of former breweries in Williamsburg, and a detailed description of the adaptive re-uses or integration of any vaults, where preserved, in present-day structures.

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1913 *Insurance Maps of the Borough of Brooklyn,* vol. 3, pl. 37.

1935 *Insurance Maps of the Borough of Brooklyn,* vol. 3, pl. 37.

1950 *Insurance Maps of the Borough of Brooklyn,* vol. 3, pl. 37.

1965 *Insurance Maps of the Borough of Brooklyn,* vol. 3, pl. 37.

1979 *Insurance Maps of the Borough of Brooklyn,* vol. 3, pl. 37.

1980 *Insurance Maps of the Borough of Brooklyn,* vol. 3, pl. 37.

1981 *Insurance Maps of the Borough of Brooklyn,* vol. 3, pl. 37.

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Fig. 1. Section of the Tax Map of Block 2791 showing the location of the Project Site on lot 37. Source: New York City Department of Finance, 2015.

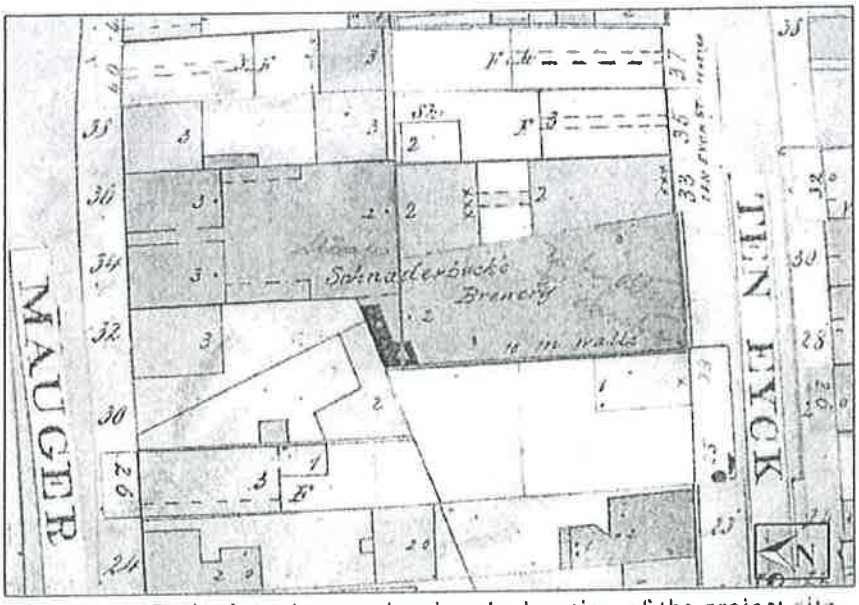


Fig. 2. 1868 Higginson's map showing the location of the project site. Source: *Higginson's Insurance Maps of the City of Brooklyn, Long Island*, New York: J.H. Higginson, 1868, vol. 4, pl. 82.

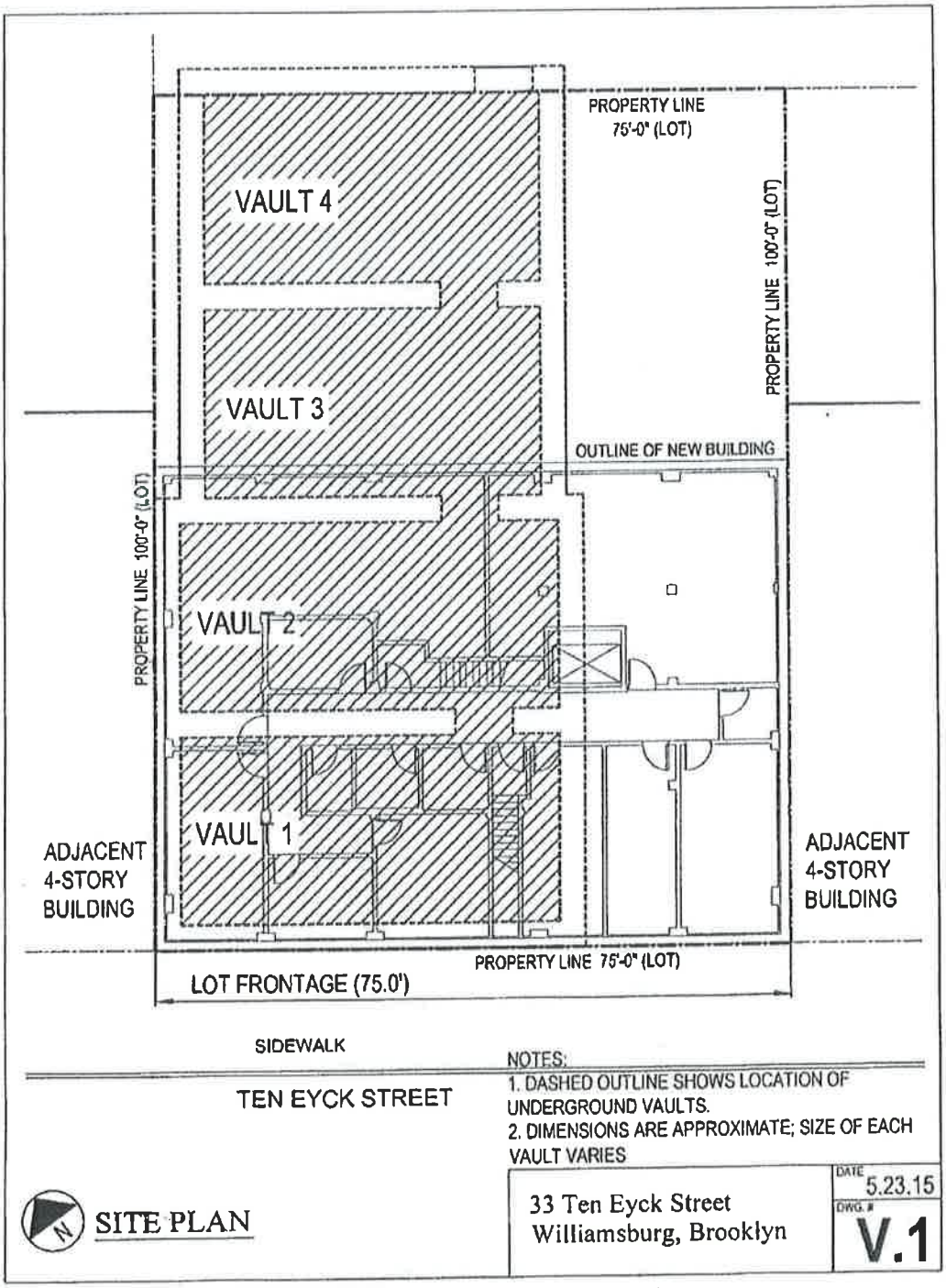


Fig. 3. Plan of the project site on block 2791, lot 37, showing the location of the subterranean vaults and the proposed building.
Source: Bong Yu, PC - Engineer / Architect

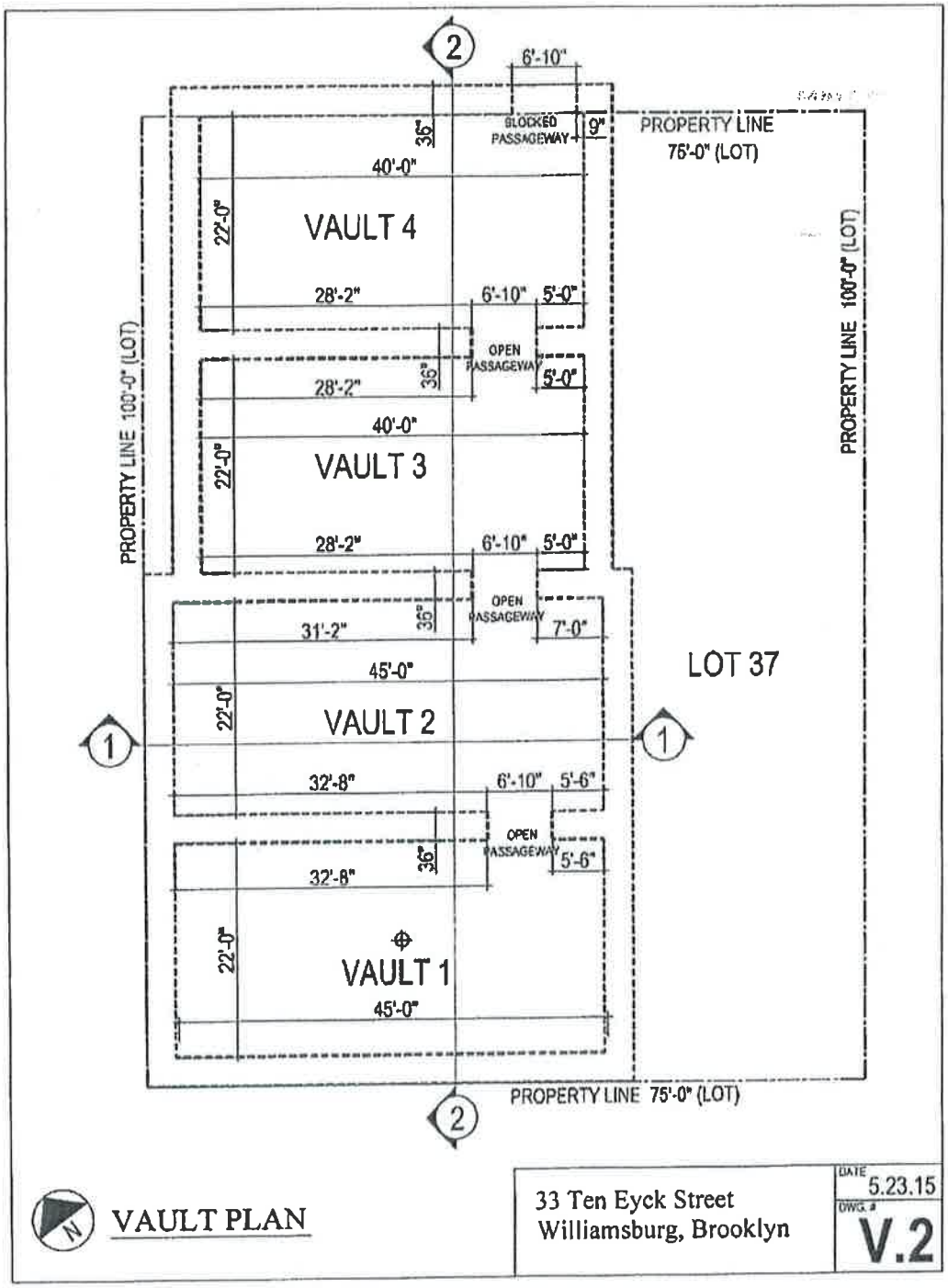


Fig. 4. Plan of the subterranean vaults on the project site.
Source: Bong Yu, PC - Engineer / Architect

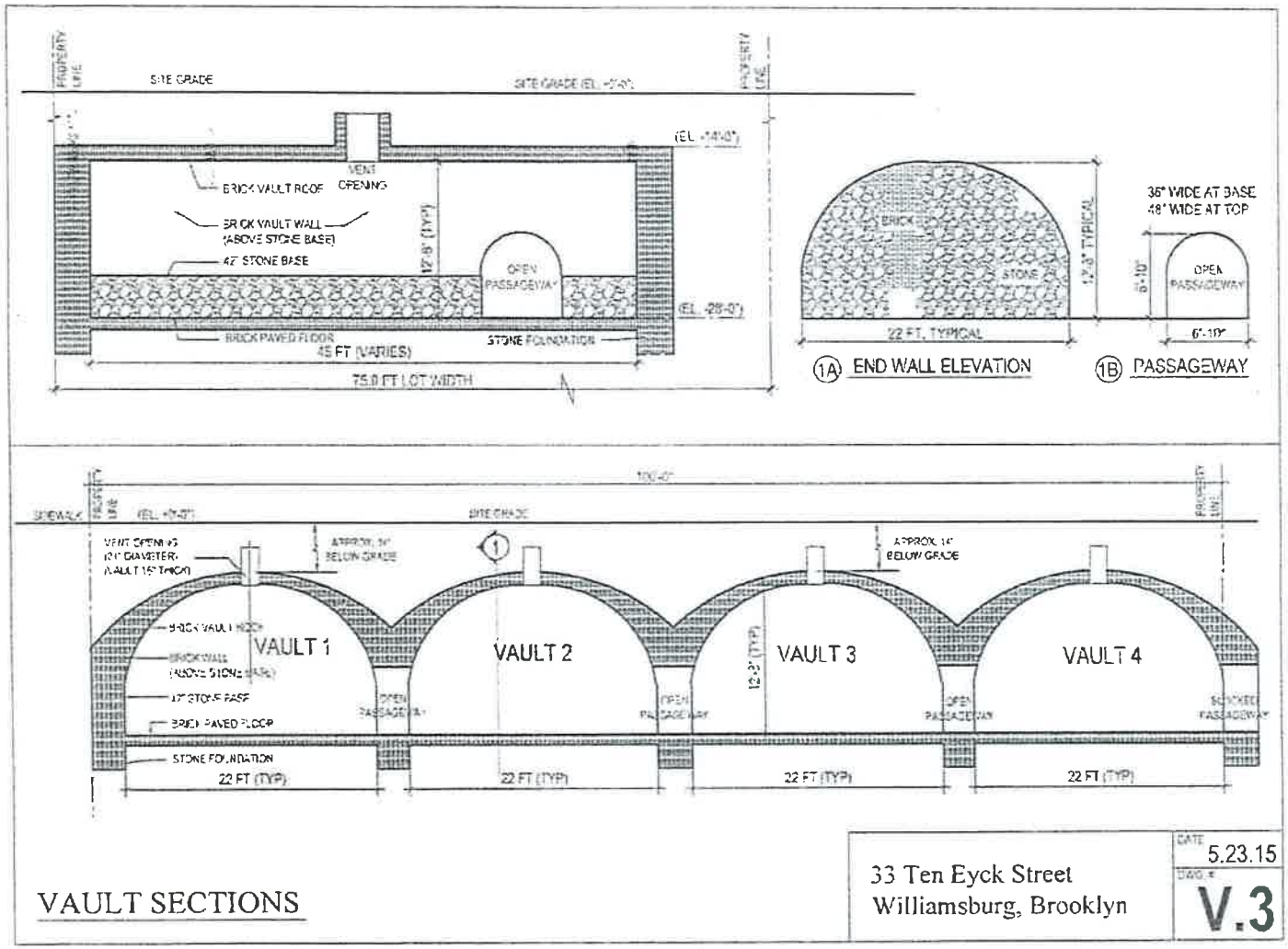
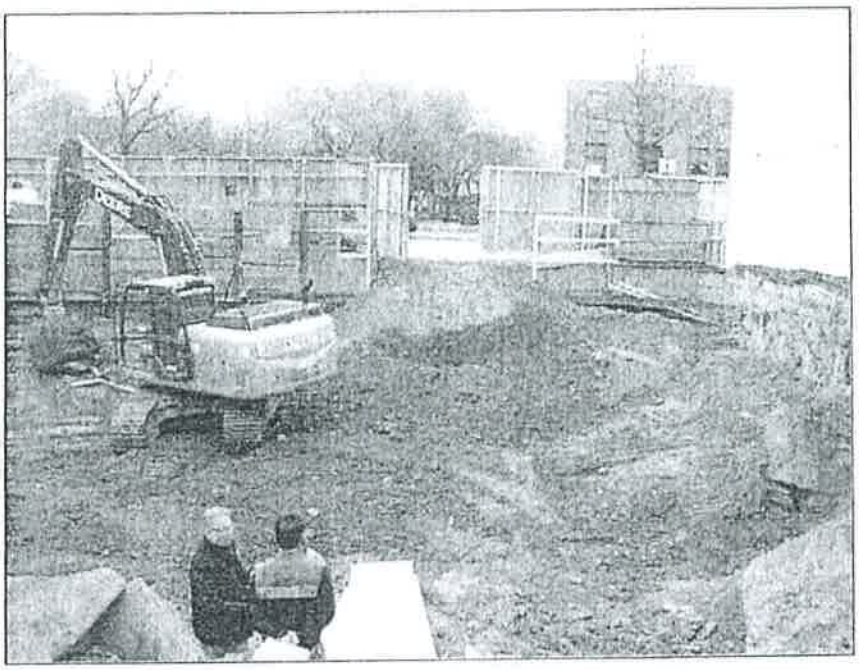
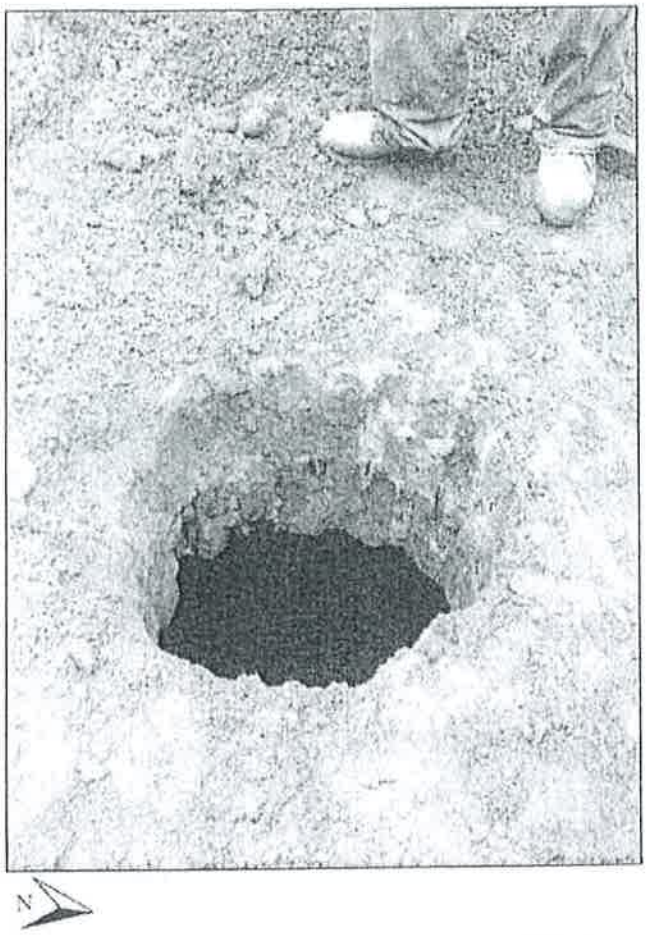


Fig. 5. East-west section (1) and north-south cross section (2) of the subterranean vaults on the project site.
Source: Bong Yu, PC - Engineer / Architect



Photograph 1. View of the project site looking south to Ten Eyck Street.
Source: Celia J. Bergoffen Ph.D. R.P.A.



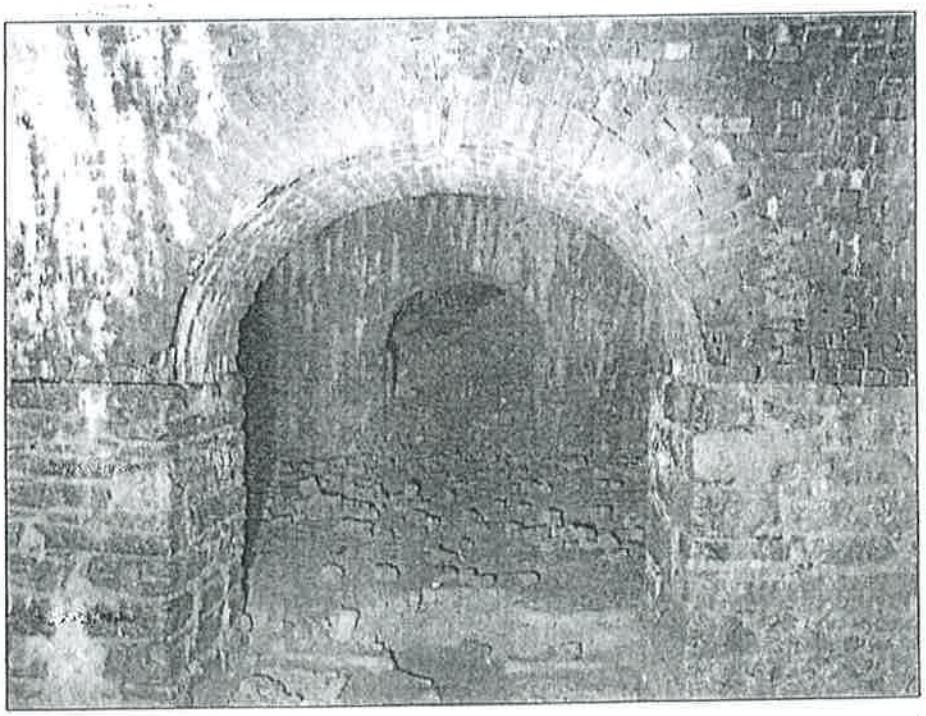
Photograph 2. View of the opening on top of Vault 1.
Source: Celia J. Bergoffen Ph.D. R.P.A.

Photograph 3. View of the interior of Vault 1 looking west

Photograph 4. Vault 1, view of the western opening on the south wall. Source: Celia J. Bergoffen Ph.D. R.P.A.

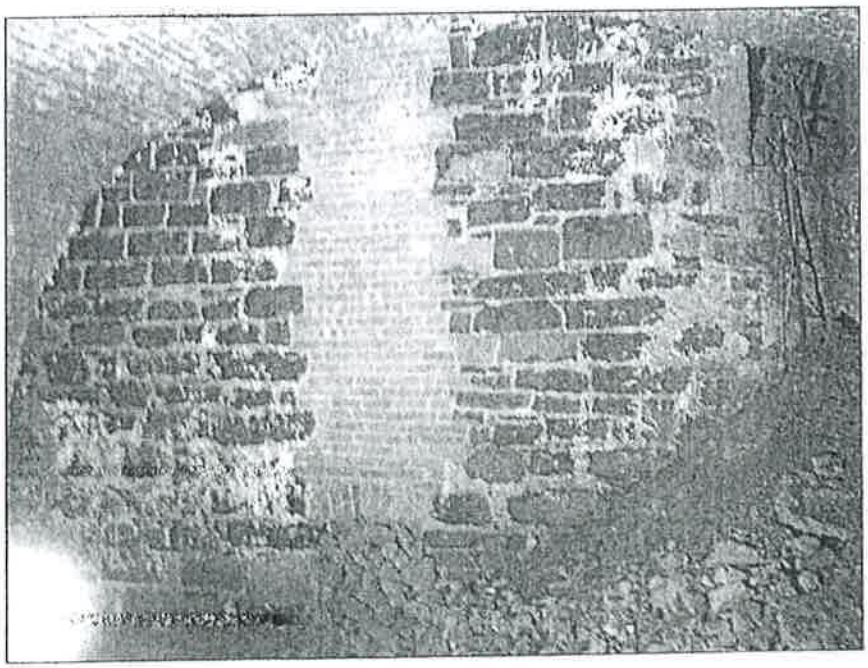
Photograph 5. Vault 1, view of the eastern opening on the south wall and part of the west wall. Source: Celia J. Bergoffen Ph.D. R.P.A.

Photograph 6. Vault 1 - the east wall. Source: Celia J. Bergoffen Ph.D. R.P.A.

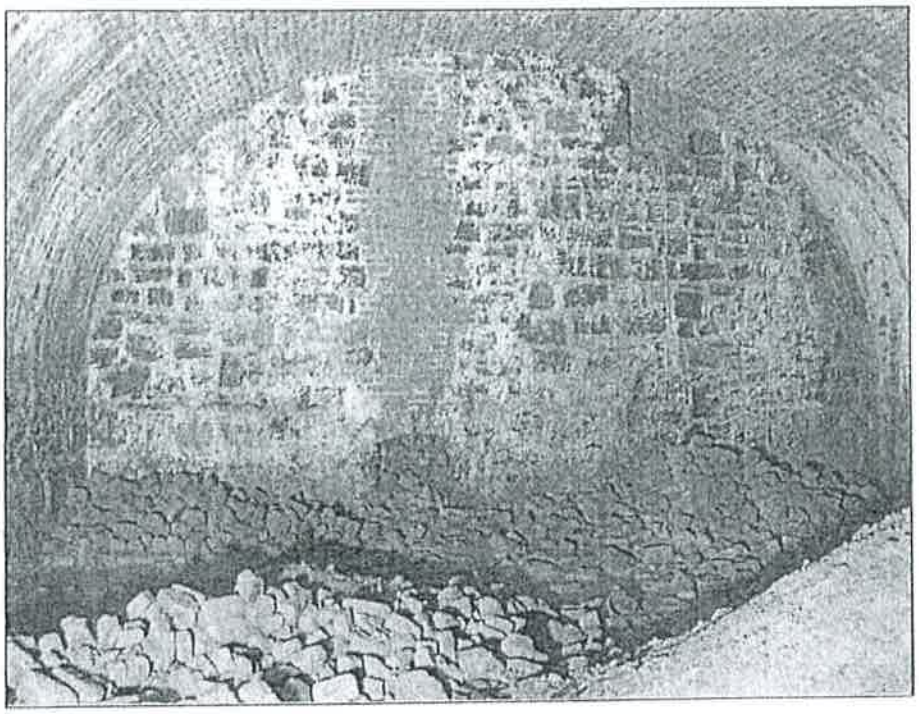


Photograph 7. Looking north through the arched passageway on the north wall of Vault 2. Source: Celia J. Bergoffen Ph.D. R.P.A.

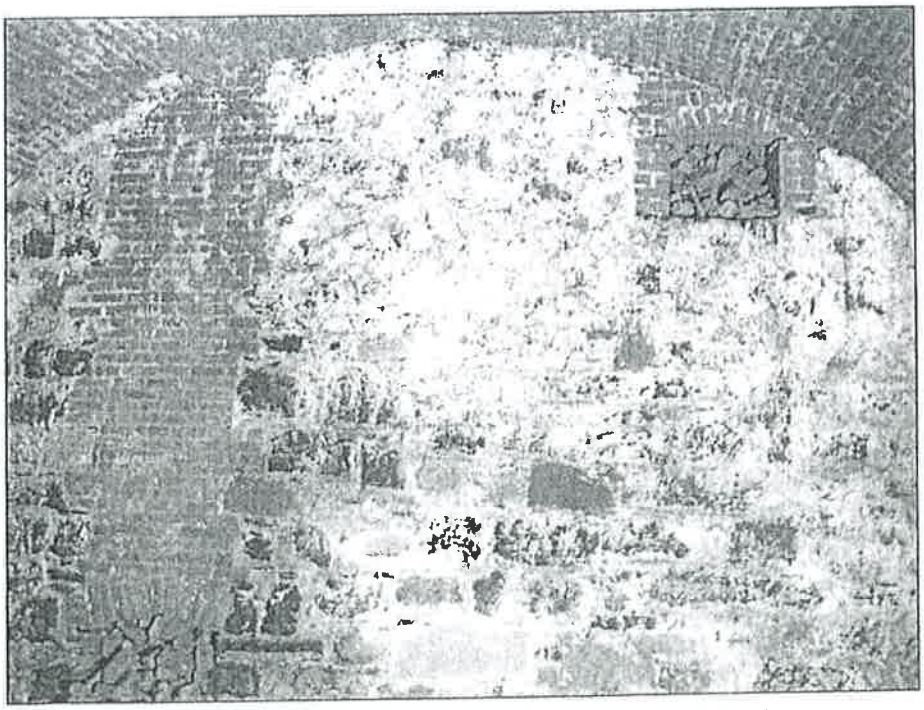
Photograph 8. View of the west wall of Vault 2. Source: Celia J. Bergoffen Ph.D. R.P.A.



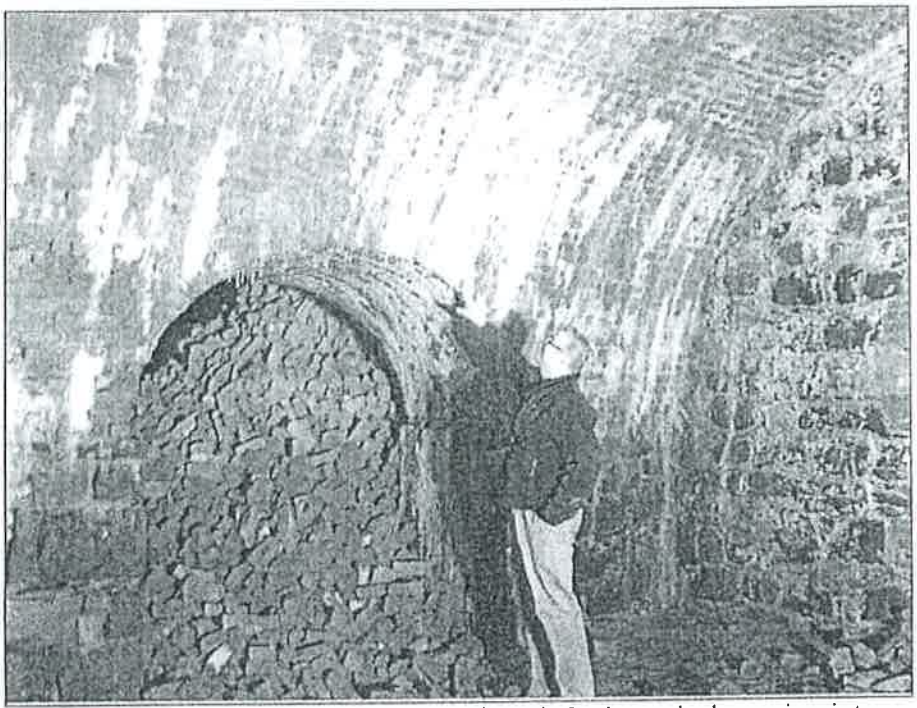
Photograph 9. View of the east wall of Vault 2. Source: Celia J. Bergoffen Ph.D. R.P.A.



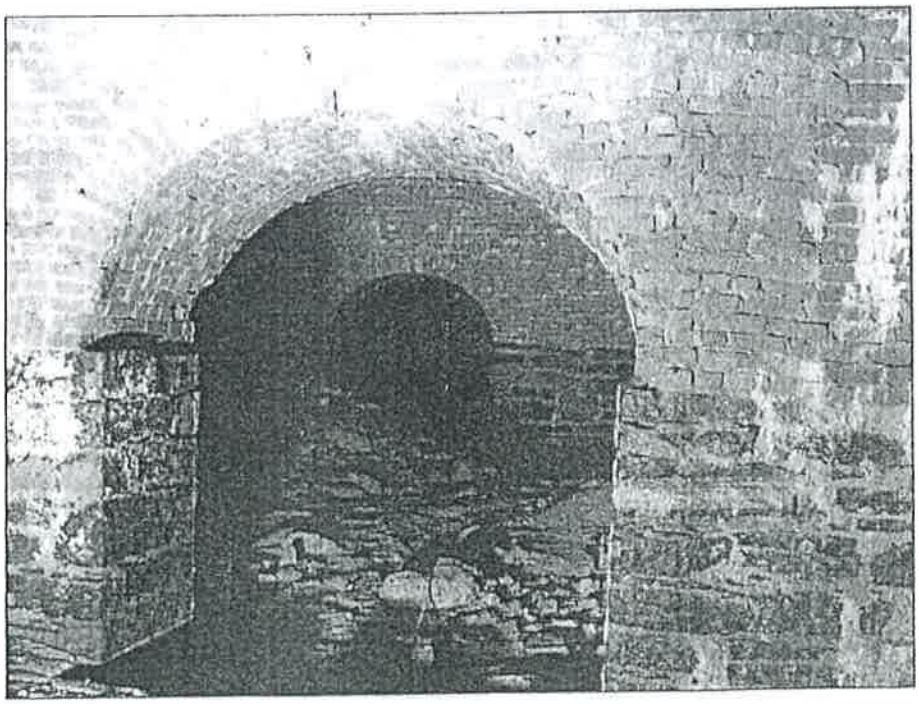
Photograph 10. View of the west wall of Vault 3. Source: Celia J. Bergoffen Ph.D. R.P.A.



Photograph 11. View of the east wall of Vault 3. Source: Celia J. Bergoffen Ph.D. R.P.A.



Photograph 12. View of the north wall of Vault 3, the arched opening into Vault 4, and the east wall of Vault 3. Source: Celia J. Bergoffen Ph.D. R.P.A.



Photograph 13. View of the arched opening in the south wall of Vault 3, looking south into Vault 2. Source: Celia J. Bergoffen Ph.D. R.P.A.

APPENDIX B

Scheme A

(following pages)

YUCO

February 24, 2016

33 Ten Eyck Street Vault Issue Summary

During excavation of the site, a series of underground vault structures was discovered down to a depth of approx. 30 feet below grade and extending approx. 50' x 100' across the property, and possibly onto adjacent site(s) as well. Upon discovery of the underground vault structures, Yuco Builders LLC ('Yuco') made a small opening to provide access into the vault spaces for review of conditions by Yuco, NYC Dept. of Housing Preservation and Development (HPD), NYC Housing Development Corporation (HDC), NYC Dept. of Buildings (DOB), NYC Landmarks Preservation Commission (LPC), as well as for financial institutions involved in this project. All further excavation of the site and all other construction activities were suspended, pending further study and agreement with HPD as to how best to proceed.

The size, condition and depth of the vault structures posed a challenging structural problem. Yuco assembled an experienced and well-qualified team of engineers and consultants to assist in investigating conditions and analyzing a range of structural options to provide a stable foundation for a new building above.

Yuco Team:
Bong Yu, PC – Project Engineer
Demerara Engineering PLLC, Soils Engineer
Severud Associates – Structural Engineer
VJ Associates – Cost estimator
Celia Berghoffen - Archeologist

The Yuco team developed various schemes for review and discussion including:
1) demolishing the vault structures and backfilling the site with engineered compacted soil,
2) constructing a large concrete 'mat' foundation on top of the vaults, and
3) revising the building structural system to align with the main walls of the vault structure.

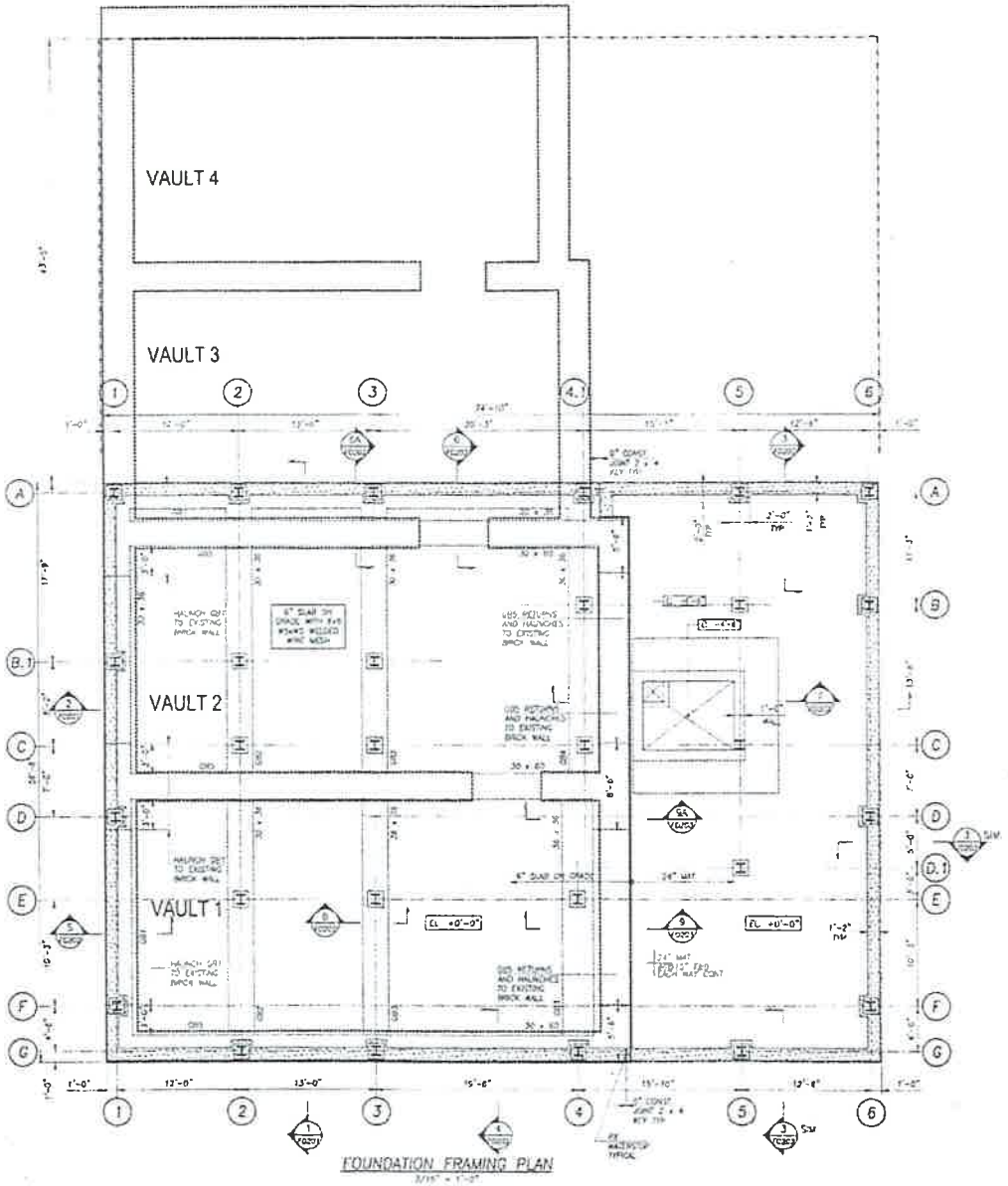
The preliminary schemes and associated cost estimates were reviewed and discussed with HPD's engineering team. The priority was established that the vault structures should be left intact to the greatest extent possible if determined to be feasible within engineering and financial parameters.

Based on the review and input from all parties, a 'hybrid' scheme was developed to construct a series of reinforced concrete 'grade' beams on top of the vault structures, with supporting concrete piers set directly on the vault walls. In order to validate the scheme and confirm required conditions, site testing was completed including soils testing, core drilling and additional selective excavation of the vault footings and walls positioned along the adjacent property. It was determined that the existing vault structures could be left generally intact, although 2 or 3 of the vaults would be filled with a lightweight concrete material, in order to properly stabilize the structure.

YUCO

Based on the additional information, Yuco's Engineering team further developed the final proposed structural scheme prepared by Severud Associates and attached as Scheme A, which accomplishes the structural solution utilizing the most efficient methods. The vault structures will be left mostly intact except for openings at the top of the vaults, and at least one of the spaces could be left intact for future historical preservation. VJ Associates reviewed the final scheme and produced an updated detailed cost estimate based on the proposed construction. The concrete grade beams were determined to be less costly than the earlier designed concrete 'mat' structure, and the method of construction being proposed would allow construction to proceed along a more expedient timeline while also allowing for the maximum possible preservation of the vaults.

Scheme A is the preferred scheme due to lower cost and faster completion schedule. Scheme B would require labor-intensive work to be completed at the interior of the vault structures, and would involve drilling into the vault walls.



FOUNDATION FRAMING PLAN

NOTES

1. ALL ELEVATIONS GIVEN THUS [...] ARE GIVEN IN RELATION TO DATUM [±0'-0"] = 29'-9" TOP OF SLAB IS SET AT DATUM ELEVATION UNLESS OTHERWISE NOTED
2. MAT SLABS SHALL BE REINFORCED POINTED WITH #6 @ 12" TOP & BOTTOM EACH WAY UNLESS OTHERWISE NOTED SEE PLAN FOR EXTENT AND THICKNESS
3. SOG SLAB ON GRADE SHALL BE 6" THICK REINFORCED WITH 6x6/WWF WELDED WIRE FABRIC UNLESS OTHERWISE NOTED
4. CONCRETE STRENGTH FOR SLABS AND MATS SHALL BE 5,000 PSI STONE CONCRETE UNLESS OTHERWISE NOTED
5. FOR SECTIONS SEE FD-201 THRU FD-203
6. FOR TYPICAL DETAILS SEE FD-301
7. FOR GENERAL NOTES SEE DRAWING S-001

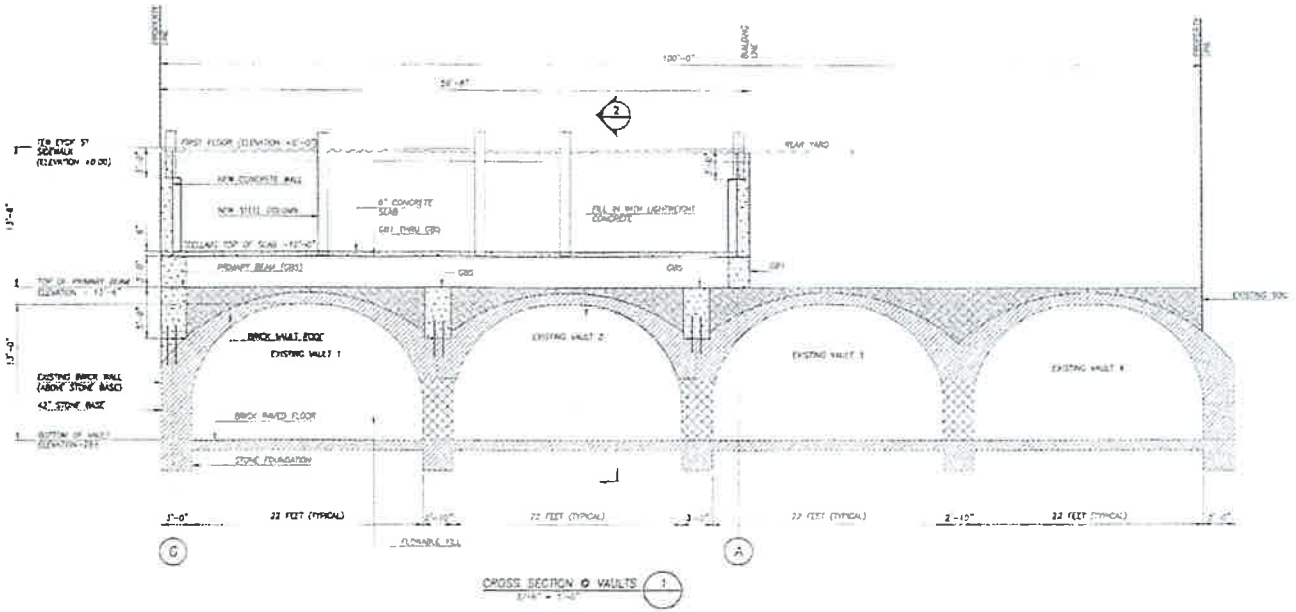
GRADE BEAM SCHEDULE

MARK	BEAM SIZE		LONGITUDINAL REINFORCEMENT		SHEAR REINFORCEMENT		
	WIDTH	DEPTH	BOTTOM BARS	TOP BARS	SIZE	TYPE	SPACING EACH END
GB1	24"	24"	6 #8	6 #8	3	□	10"
GB2	30"	24"	7 #8	7 #8	3	□	10"
GB3	24"	36"	10 #8	12 #11	3	□	7"
GB4	36"	36"	10 #10	10 #11	3	□	6"
GB5	30"	60"	9 #8	9 #8	3	□	10"

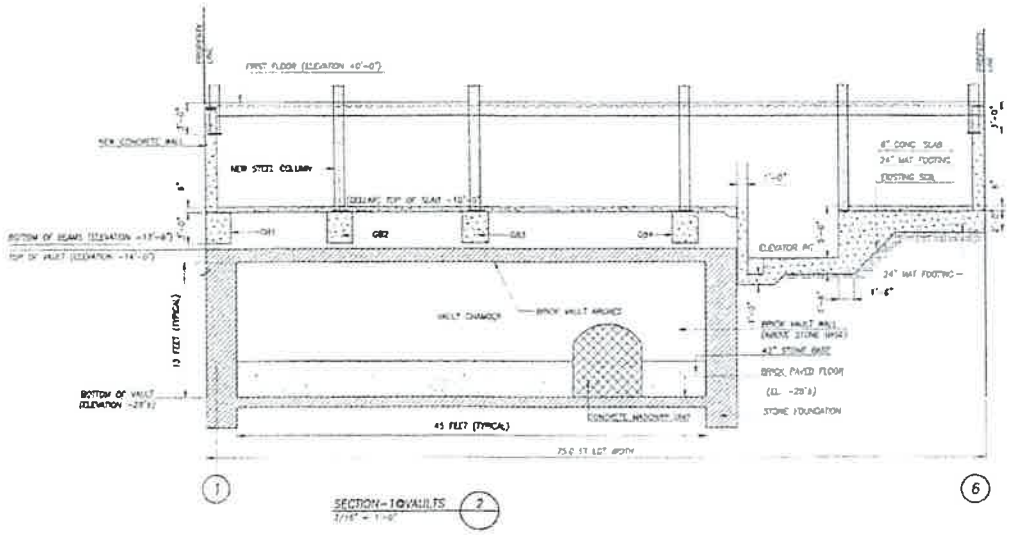
33 Ten Eyck Street
Williamsburg, Brooklyn

FOUNDATION FRAMING PLAN

F0-100.00



CROSS SECTION @ VAULTS 1



SECTION - 1@VAULTS 2

4-29-19 COORDINATION
5-21-19 SUBMITTAL TO HPD FOR REVIEW

168 Partners, LLC
200 Park Avenue, 11th Floor New York, New York 10166

BONG YU P.C. ENGINEER & ARCHITECT
200 Park Avenue, 11th Floor New York, New York 10166

YUCO BUILDERS LLC
200 Park Avenue, 11th Floor New York, New York 10166

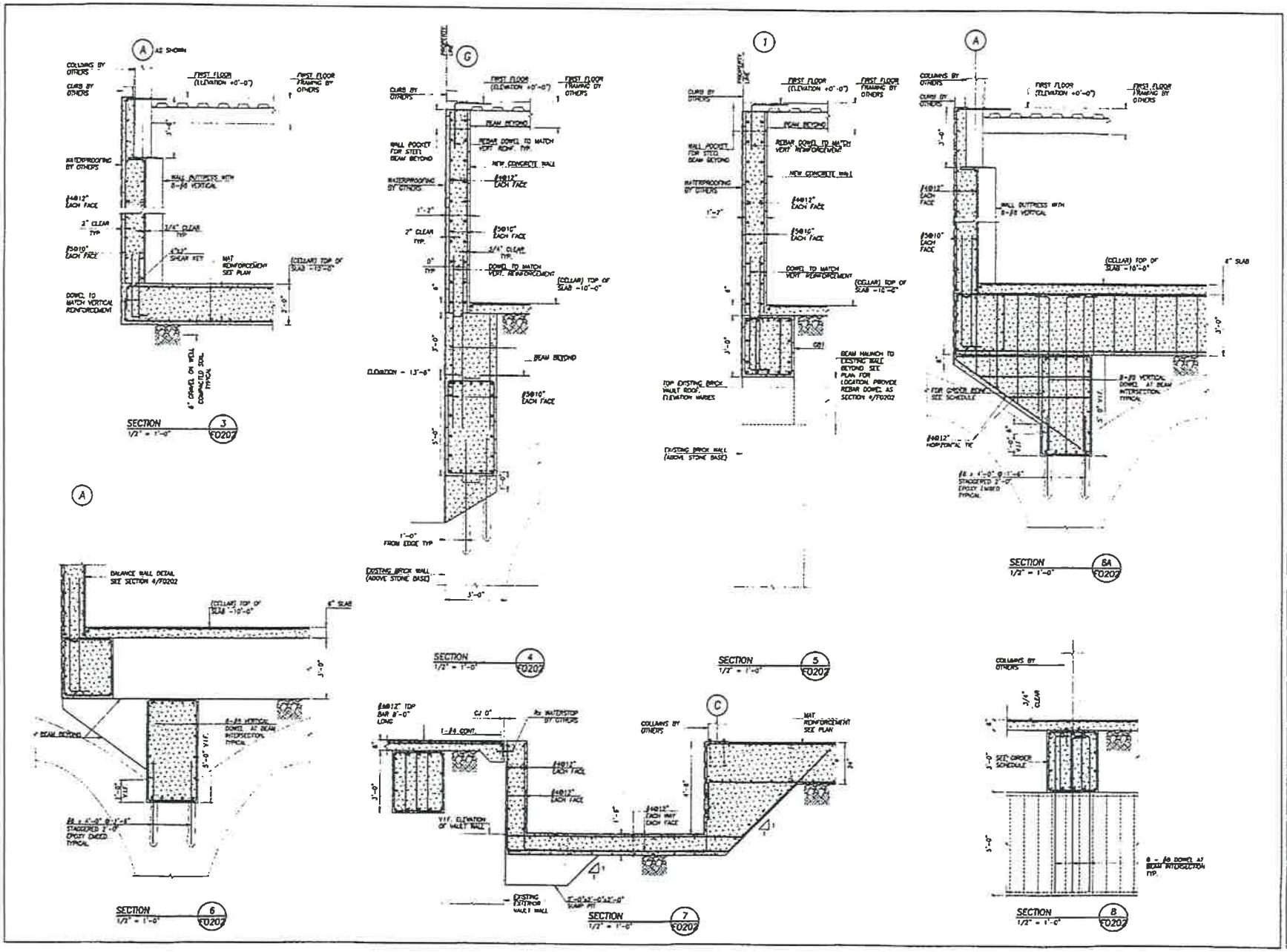
Severud Associates
CONSULTING ENGINEERS P.C.

33 Ten Eyck Street
Williamsburg, Brooklyn

SECTIONS I

SEP 2019
153.72
F0

F0-201.00



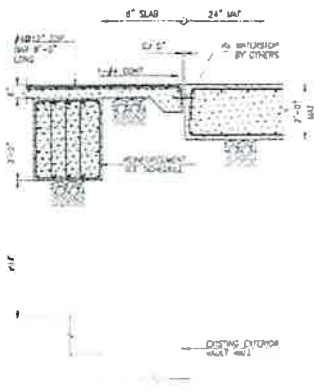
4.29.15 COORDINATION
6.10.15 HPD REVIEW MEETING
9.21.15 SUBMITTAL TO HPD FOR REVIEW

ISSUES

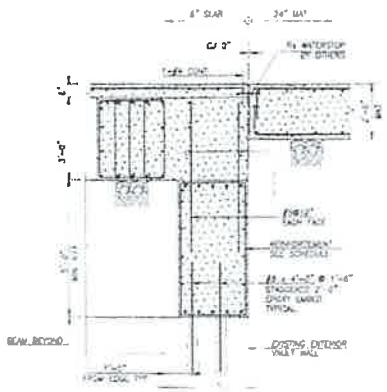
33 Ten Eyck Street
Williamsburg, Brooklyn

SECTIONS II

3.30.2015
15372
YF
FO
F0-202.00



SECTION 9 / FD203
1/2" = 1'-0"



SECTION 5A / FD203
1/2" = 1'-0"

4 29 16 COORDINATION
6 10 15 HPD REVIEW MEETING
5-21 15 SUBMITTAL TO HPD FOR REVIEW

168 Partners, LLC
200 Park Avenue, 11th Floor New York, New York 10166

BOND NY, P.C. ENGINEER & ARCHITECT
200 Park Avenue, 12th Floor New York, New York 10166

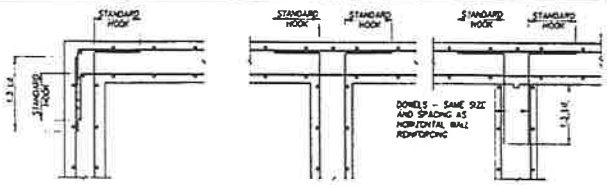
NUCO BUILDERS LLC
200 Park Avenue, 11th Floor New York, New York 10166

Severud Associates
CONSULTING ENGINEERS P.C.
675 Third Avenue, New York, New York 10017
Tel (212) 986-2700 www.severud.com

33 Ten Eyck Street
Williamsburg, Brooklyn

SECTIONS III

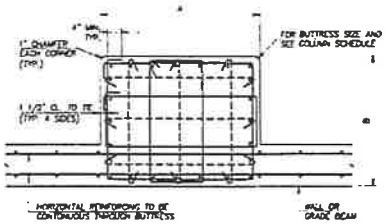
15372
F.O.
F0-203.00



NOTE

1 DEVELOPMENT LENGTH Ld TO BE DETERMINED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318, CHAPTER 12.

TYPICAL CONCRETE WALL CORNER AND INTERSECTION DETAILS



VERTICAL BAR DIAMETER	TIES	
	BAR SIZE	SPACING
#5	#3	12"
#6	#3	12"
#7	#3	14"
#8	#3	16"
#9	#3	18"
#10	#3	18"
#11 OR LARGER	#4	18"

SECTION

NOTES

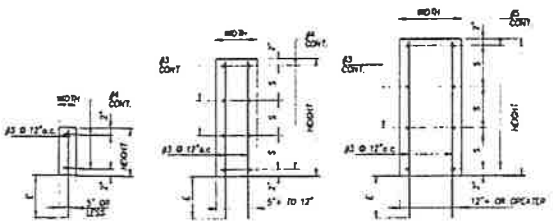
1 TIES SHALL BE ARRANGED SUCH THAT EVERY CORNER AND ALTERNATE LONGITUDINAL BAR SHALL HAVE LATERAL SUPPORT PROVIDED BY THE CORNER OF A TIE WITH AN INCLUDED ANGLE OF NOT MORE THAN 135 DEGREES. IF ANY BAR SHALL BE FARTHER THAN 6 INCHES CLEAR ON EACH SIDE ALONG THE TIE FROM A LATERALLY SUPPORTED BAR, LATERAL SUPPORT (SHOWN DOTTED) SHALL BE PROVIDED FOR THESE BARS

2 IF THE DIMENSION A OR B IS LESS THAN THE TIE SPACING SHOWN, THE SPACING SHALL BE DECREASED TO EQUAL A OR B WHICHEVER IS SMALLER

3 IF X IS LESS THAN Ld, INCREASE AREA OF DOWELS BY $\frac{Ld}{X}$

4 DEVELOPMENT LENGTH Ld TO BE DETERMINED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318, CHAPTER 12.

TYPICAL STEEL COLUMN BUTTRESS DETAIL



NOTES

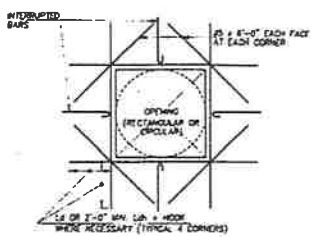
1 S SHALL NOT BE GREATER THAN 12".

2 THE HEIGHT OF CURBS SHALL NOT BE GREATER THAN 3 TIMES THE CURB WIDTH

3 E SHALL BE 1'-0" MIN OR HOOK

4 FOR CURB SIZE AND LOCATIONS, SEE ARCHITECTURAL DRAWINGS AND/OR MECHANICAL AND/OR OTHER CONTRACT DOCUMENTS.

TYPICAL CONCRETE CURB DETAIL



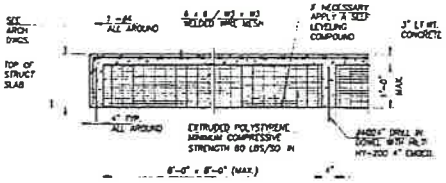
NOTES

1 HOOK ALL INTERRUPTED BARS

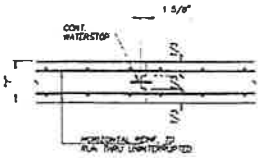
2 FOR EACH FACE SIDE OF REINFORCING BAR AREA INTERRUPTED BY OPENING SHALL BE PROVIDED EACH SIDE OF OPENING #5 MIN EACH SIDE IN EACH FACE.

3 DEVELOPMENT LENGTH Ld OR Lch TO BE DETERMINED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI318 CHAPTER 12.

TYPICAL DETAIL OF OPENING IN CONCRETE WALLS



TYPICAL "RAISED SLAB" DETAIL



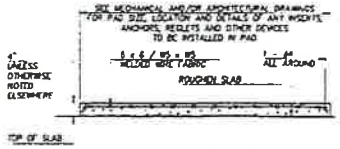
NOTES

1 UNLESS OTHERWISE NOTED ELSEWHERE, LOCATE JOINTS MIDWAY BETWEEN COLUMN CENTERLINES.

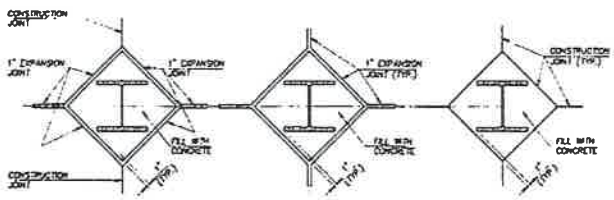
2 UNLESS OTHERWISE NOTED ELSEWHERE, SPACING OF JOINTS SHALL NOT EXCEED 60'-0".

3 ALLOW 7 (SEVEN) DAYS MINIMUM BETWEEN PLACING CONCRETE ADJACENT TO PREVIOUSLY CAST CONCRETE.

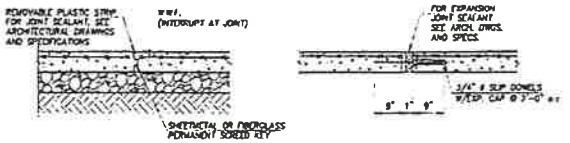
TYPICAL CONCRETE WALL CONSTRUCTION JOINT DETAIL



TYPICAL MECHANICAL PAD DETAIL



PLANS AT COLUMNS



NOTES

1 LOCATE SCREED KEYS ON COLUMN CENTERLINES IN EACH DIRECTION UNLESS OTHERWISE NOTED ELSEWHERE.

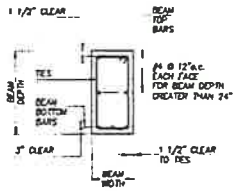
2 THE CONTRACTOR SHALL SUBMIT A DRAWING FOR THE ARCHITECTS REVIEW INDICATING THE LOCATION OF JOINTS AND THE SEQUENCE OF CASTINGS

NOTES

1 SEE PLAN FOR LOCATION OF EXPANSION JOINTS.

2 THE CONTRACTOR SHALL SUBMIT A DRAWING FOR THE ARCHITECTS REVIEW INDICATING THE LOCATION OF JOINTS AND THE SEQUENCE OF CASTINGS

TYPICAL SLAB ON GRADE JOINT DETAILS

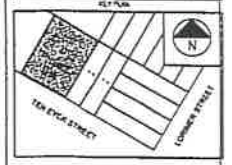


NOTES

1 FOR BEAM SIZE, AND REINFORCING, SEE BEAM SCHEDULE AND/OR SECTIONS.

2 ALL HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318, CHAPTER 7

TYPICAL CONCRETE BEAM SECTIONS



GENERAL NOTES

4.28.15 COORDINATION
5.12.15 100 REVIEW MEETING
5.21.15 SUBMITTAL TO HPD FOR REVIEW

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TYPICAL DETAILS

STATE OF NEW YORK

5.20.2015
13577
LF
FD

F0-301.00

G GENERAL

G.1 ALL WORK SHALL COMPLY WITH THE 2014 NYC BUILDING CODE.

G.2 THE STRUCTURAL CONSTRUCTION DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE SPECIFICATIONS AND THE ARCHITECTURAL AND MECHANICAL CONSTRUCTION DRAWINGS.

G.3 BEFORE PROCEEDING WITH ANY WORK, THE GENERAL CONTRACTOR OR CONSTRUCTION MANAGER SHALL VERIFY THAT ALL MAJOR DIMENSIONS (LOCATIONS OF CORE WALLS, COLUMNS, SLAB EDGES, ETC.) SHOWN ON STRUCTURAL DRAWINGS ARE THE SAME AS SHOWN ON ARCHITECTURAL DRAWINGS AND THAT EXISTING CONDITIONS ARE AS INDICATED. ANY VARIANCES SHALL BE BROUGHT TO THE ARCHITECT'S ATTENTION IN WRITING.

G.4 THE GENERAL CONTRACTOR OR CONSTRUCTION MANAGER SHALL COORDINATE THE LOCATION OF FRAMING AROUND ELEVATORS, STAIRS AND SHAFTS WITH THE ELEVATOR, STAIR MECHANICAL, ELECTRICAL AND PLUMBING CONTRACTORS.

G.5 THE GENERAL CONTRACTOR OR CONSTRUCTION MANAGER SHALL BE SOLELY RESPONSIBLE FOR COORDINATION BETWEEN TRADES INCLUDING BUT NOT LIMITED TO THE LOCATION OF SLOTS, TRENCHES AND SLEEVES AS REQUIRED FOR THE MECHANICAL OR OTHER TRADES AND THE PROVISION AND/OR INSTALLATION OF ANCHORS, INSERTS, HANGERS, ETC. AS REQUIRED FOR THE VARIOUS TRADES.

G.6 CONTROL OVER OR CHARGE OF AND RESPONSIBILITY FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES, OR FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK OF THE PROJECT ARE SOLELY THE GENERAL CONTRACTOR'S OR CONSTRUCTION MANAGER'S RESPONSIBILITY.

G.7 THE CONSTRUCTION MANAGER OR GENERAL CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ACTS OR OMISSIONS OF CONTRACTORS OR ANY OTHER PERSONS PERFORMING ANY OF THE WORK, OR FOR THE FAILURE OF ANY OF THEM TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONSTRUCTION CONTRACT.

G.8 THE GENERAL CONTRACTOR OR CONSTRUCTION MANAGER SHALL BE SOLELY AND FULLY RESPONSIBLE FOR THE SAFETY AND STABILITY OF EXISTING ADJACENT STRUCTURES INCLUDING BUT NOT LIMITED TO, BUILDINGS, SIDEWALKS, ROADWAYS AND UTILITIES AND FOR ANY METHODS REQUIRED TO ENSURE THAT SAFETY AND STABILITY.

G.9 THE GENERAL CONSTRUCTION, ERECTION AND MAINTENANCE OF TEMPORARY STRUCTURES OR APPLIANCES INCLUDING BUT NOT LIMITED TO, SUPPORT FOR AND STABILITY OF CRANES OR HOISTS OR LIFTS OR OTHER SIMILAR EQUIPMENT, TEMPORARY SHORING OR BRACING, SCAFFOLDING, RUNWAYS OR PLANKING, DEWATERING, LIMITING OR UNDERPINNING, CONSTRUCTION STORAGE OR STAGING AREAS, SIDEWALK BRIDGES OR CONSTRUCTION FENCES, TEMPORARY ENCLOSURES AT OPENINGS AT THE BUILDING PERIMETER OR ELSEWHERE, ETC., ARE SOLELY THE RESPONSIBILITY OF THE GENERAL CONTRACTOR OR CONSTRUCTION MANAGER AND/OR CONTRACTORS AND/OR CONSULTANTS HIRED BY THE GENERAL CONTRACTOR OR...

G.10 THE GENERAL CONTRACTOR OR CONSTRUCTION MANAGER SHALL MAKE NO DEVIATION FROM CONTRACT DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF THE ARCHITECT.

G.11 THE GENERAL CONTRACTOR OR CONSTRUCTION MANAGER SHALL REPORT TO THE ARCHITECT ANY MISTAKES, ANY DISCREPANCIES, AMBIGUITIES OR CONTRADICTIONS IN THE CONSTRUCTION DOCUMENTS.

G.12 THE GENERAL CONTRACTOR OR CONSTRUCTION MANAGER SHALL BE RESPONSIBLE FOR NOTIFYING THE ENGINEER RESPONSIBLE FOR CONTROLLED OR SPECIAL INSPECTIONS, IN A TIMELY MANNER, WHEN WORK IS READY FOR INSPECTION.

S STRUCTURAL INSPECTIONS

S.1 ALL PROGRESS INSPECTIONS SHALL CONFORM TO CHAPTER 1 OF THE NEW YORK CITY BUILDING CODE. ALL SPECIAL INSPECTIONS SHALL CONFORM TO CHAPTER 17 OF THE NEW YORK CITY BUILDING CODE.

S.2 THE FOLLOWING PROGRESS INSPECTIONS ARE REQUIRED:

A. FOOTING AND FOUNDATION

S.3 THE FOLLOWING SPECIAL INSPECTIONS ARE REQUIRED:

A. S. CONCRETE - CAST-IN-PLACE
B. CONCRETE SAMPLING AND TESTING, TYP.)
C. CONCRETE DESIGN MIX, TYP.)

S.4 SPECIAL INSPECTIONS SHALL BE CONTINUOUS EXCEPT WHERE PERIODIC SPECIAL INSPECTION ARE SPECIFICALLY PERMITTED BY THE BUILDING CODE.

S.5 ALL SPECIAL INSPECTIONS SHALL BE PERFORMED BY SPECIAL INSPECTORS AND AGENCIES QUALIFIED BY THE CITY OF NEW YORK AND ACCEPTABLE TO THE ENGINEER OF RECORD.

S.6 ALL WORK FOR WHICH SPECIAL INSPECTION IS REQUIRED SHALL REMAIN ACCESSIBLE AND EXPOSED UNTIL APPROVED BY THE SPECIAL INSPECTOR.

S.7 ALL SPECIAL INSPECTORS SHALL BRING ANY DISCREPANCIES TO THE ATTENTION OF THE OWNER AND ENGINEER OF RECORD.

S.8 ALL SPECIAL INSPECTORS SHALL FURNISH INSPECTION REPORTS TO THE OWNER AND TO THE ENGINEER OF RECORD.

C CAST-IN-PLACE CONCRETE

C.1 ALL CONCRETE WORK SHALL CONFORM TO THE NEW YORK BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE.

C.2 CONCRETE

C.2A UNLESS OTHERWISE NOTED, ALL CONCRETE SHALL BE NORMAL WEIGHT (STONE) CONCRETE HAVING A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 5,000 PSI AT 28 DAYS.

C.2B LIGHTWEIGHT CONCRETE SHALL HAVE A MAXIMUM DRY WEIGHT OF 115 PCF AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 3,500 PSI AT 28 DAYS.

C.3 REINFORCING

A. BAR REINFORCING SHALL BE DEFORMED BARS OF NEW BILLET STEEL CONFORMING TO ASTM A 615, GRADE 60.

B. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 82 AND A 185.

C.4 ADMIXTURES

C.4A ALL CONCRETE EXPOSED TO THE WEATHER IN THE FINISHED BUILDING AND ALL "LIGHTWEIGHT" CONCRETE SHALL BE AIR-ENTRAINED.

C.4B ALL STONE CONCRETE FOR SLABS ON GRADE AND LIGHTWEIGHT CONCRETE OR METAL DECK SHALL CONTAIN A HIGH RANGE WATER REDUCING ADMIXTURE (SUPERPLASTICIZER).

C.5 DEVELOPMENT LENGTHS OF REINFORCING (LD OR LDH) SHALL BE DETERMINED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318, CHAPTER 12.

C.6 ALL HORIZONTAL BARS IN WALLS AND BEAMS AND BARS MARKED CONT. (CONTINUOUS) SHALL BE LAPPED A DISTANCE OF 40 BAR DIAMETERS AND AT CORNERS UNLESS OTHERWISE NOTED. LAP CONTINUOUS TOP BARS AT CENTER BETWEEN SUPPORTS AND BOTTOM BARS AT SUPPORTS. HOOK ALL TOP BARS AT NON-CONTINUOUS ENDS.

C.7 ALL LENGTHS OF HOOKED BARS INDICATED ON DRAWINGS DO NOT INCLUDE EXTENSION FOR HOOK.

C.8 ALL DETAILS OF BENDS AND HOOKS SHALL BE DETERMINED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318, CHAPTER 7.

C.9 ALL REINFORCING SHALL BE HELD RIGIDLY AND ACCURATELY IN PLACE, AND PROTECTED AGAINST DISPLACEMENT BEFORE AND DURING CASTING. IF NECESSARY, ADDITIONAL BARS AND/OR STIRRUPS SHALL BE PROVIDED TO FURNISH SUPPORT FOR ALL REINFORCING.

C.10 MINIMUM CLEARANCES FROM FACES OF CONCRETE TO REINFORCEMENT IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318, CHAPTER 7 IN THE FIRST PARAGRAPH OF 7.7.1, THE WORD "MINIMUM" SHALL BE REPLACED WITH THE WORD "CLEAR."

C.11 PROVIDE SHRINKAGE AND TEMPERATURE REINFORCEMENT FOR ALL STRUCTURAL SLABS WHERE THE FLEXURAL REINFORCING EXTENDS IN ONE DIRECTION ONLY, IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318, CHAPTER 7.

C.12 PRIOR TO THE START OF WORK, THE CONCRETE CONTRACTOR SHALL COORDINATE AND DETERMINE WITH THE GENERAL CONTRACTOR OR THE CONSTRUCTION MANAGER ALL DIMENSIONS AND LOCATIONS OF SLAB DEPRESSIONS, FLOOR DRAIN OPENINGS, SLOPES, CONCRETE CURBS, PADS AND EQUIPMENT BASES AND OTHER SIMILAR ITEMS. THE PROVISION OF THESE ITEMS SHALL BE PART OF THE CONCRETE CONSTRUCTION WORK.

C.13 THE CONCRETE CONTRACTOR SHALL INSTALL IN THE FORMS ALL SLOTS, SLEEVES, REGLETS, ANCHOR BOLTS, HANGERS, MASONRY ANCHORS, ETC. REQUIRED BY OTHER TRADES AND SHALL COORDINATE WITH THE GENERAL CONTRACTOR OR CONSTRUCTION MANAGER FOR COMPLETENESS AND LOCATION BEFORE CONCRETE IS CAST.

C.14 ALL PIPES OR CONDUITS ARE TO BE PLACED IN SLABS. THE GENERAL CONTRACTOR OR CONSTRUCTION MANAGER, PRIOR TO THE START OF WORK, SHALL SUBMIT TO THE ARCHITECT FOR APPROVAL DRAWINGS SHOWING THE SIZE, LOCATION (VERTICALLY AND HORIZONTALLY) AND SPACING OF PIPES AND/OR CONDUITS.

C.15 ALL HORIZONTAL PIPES OR CONDUITS PLACED IN SLABS SHOULD BE OF A SIZE NOT EXCEEDING ONE-THIRD (1/3) THE SLAB THICKNESS AND SHOULD NOT BE SPACED CLOSER THAN 3 DIAMETERS ON CENTER AND SHALL NOT BE PLACED IN THE INTERSECTION OF COLUMN STRIPS FOR FLAT SLABS.

C.16 ALUMINUM CONDUITS OR PIPES SHALL NOT BE PLACED IN CONCRETE.

C.17 ALL BEAMS AND SLABS SHALL BE CAST MONOLITHICALLY, AND THE SLABS FINISHED AS REQUIRED BY THE SPECIFICATIONS.

C.18 FINISH CONSTRUCTION JOINTS USING APPROVED BULKHEADS MAY BE MADE AT MID-SPAN OF BEAM OR SLAB SHALL HAVING A STOP IN CONCRETE WORK IS NECESSARY. FOR ADDITIONAL REINFORCING AT CONSTRUCTION JOINTS, SEE TYPICAL DETAILS.

C.19 HORIZONTAL CONSTRUCTION JOINTS SHALL BE PERMITTED IN SLABS IN MID JOISTS AND WALLS ONLY - AND AS SHOWN.

C.20 STEEL BEAMS SUPPORTING METAL DECK AND CONCRETE FILL ARE CAPABLE OF SUPPORTING THE WET WEIGHT OF CONCRETE FILL WITHOUT THE USE OF TEMPORARY SHORTS WITH THE METAL DECK IS WELDED TO THE BEAMS TO PROVIDE LATERAL BRACING. HOWEVER, UNSHORED BEAMS AND DECK WILL DEFLECT WHILE CONCRETE IS BEING CAST. IF CONCRETE IS CAST WITHOUT BEAM AND DECK SHORING, PROVIDE ADDITIONAL CONCRETE AS REQUIRED TO MAINTAIN PROPER FINISHED ELEVATIONS. IF SHORES ARE USED, CAMBER BEAMS UPWARD TO COMPENSATE FOR DEFLECTION WHEN SHORES ARE REMOVED.

C.21 ALL PLUMBING SLOTS AROUND BUILDING SHALL BE FILLED WITH CONCRETE TO THE SAME DEPTH AS FLOOR SLAB AFTER PIPING IS INSTALLED.

C.22 SLABS ON GRADE SHALL BE CAST OVER A 6" LAYER OF COMPACTED POROUS FILL, UNLESS OTHERWISE SHOWN. THICKNESS OF THE SLAB IS SHOWN ON PLANS. PROVIDE 6" x 6" - W2.9 x W2.9 WELDED FABRIC PLACED 1" FROM TOP OF SLAB IN ALL SLABS ON GRADE, UNLESS OTHERWISE NOTED ELSEWHERE. SLABS SHALL BE CAST IN ALTERNATE PANELS NOT EXCEEDING 40 FEET IN ANY LENGTH OR WIDTH.

C.23 ALL CONCRETE ROOFINGS, FILLS AND PROTECTION SLABS SHALL BE REINFORCED WITH 6" x 6" - W2.9 x W2.9 WELDED WIRE FABRIC PLACED 1" BELOW THE TOP OF FINISHED CONCRETE.

C.24 CONCRETE PADS AND EQUIPMENT BASES SHALL BE REINFORCED WITH 6" x 6" - W2.9 x W2.9 WELDED WIRE FABRIC PLACED 1" FROM THE TOP OF PAD, UNLESS OTHERWISE NOTED ELSEWHERE. FOR LOCATIONS, SIZES AND THICKNESSES, SEE ARCHITECTURAL, AND/OR STRUCTURAL AND/OR MECHANICAL DRAWINGS.

C.25 FOR TREATMENT OF EXPOSED CONCRETE, SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

C.26 CHAMFER EDGES OF EXPOSED CONCRETE COLUMNS AND BEAMS, PROVIDE REGLETS AND DRIPS AS SHOWN ON THE ARCHITECTURAL DRAWINGS AND IN THE SPECIFICATIONS.

C.27 CURING OF CONCRETE SHALL START AS SOON AS THE FINISH WILL NOT BE MARRED THEREBY. IT SHALL NOT BE PERMISSIBLE TO DELAY THE CURING UNTIL THE MORNING AFTER THE CONCRETE IS CAST.

SD SHOP DRAWINGS - STRUCTURAL

SD.1 THE GENERAL CONTRACTOR OR CONSTRUCTION MANAGER SHALL SUBMIT STRUCTURAL SHOP DRAWINGS TO THE ARCHITECT AND THE DE OR EOR AND REVIEWED AND NOTED ON THESE SUBMITTALS THAT THEY ARE IN CONFORMANCE WITH CONTRACT REQUIREMENTS. THE STRUCTURAL ENGINEER UPON RECEIPT OF THESE SUBMITTALS FROM THE ARCHITECT, WILL REVIEW AND APPROVE OR TAKE OTHER APPROPRIATE ACTION UPON AND RETURN TO THE ARCHITECT FOR FINAL DISPOSITION.

SD.2 CHANGES OR NON-CONFORMANCE TO CONTRACT REQUIREMENTS SHALL BE FLAGGED ON SUBMITTALS.

SD.3 SUBMITTALS SHALL NOT BE USED AS A SUBSTITUTE FOR REQUESTS FOR OR APPROVALS OF CLARIFICATIONS OR OTHER CHANGES OR PROCEDURES REQUIRED BY THE CONSTRUCTION CONTRACT.

SD.4 PRIOR TO SUBMITTING SHOP DRAWINGS, THE GENERAL CONTRACTOR OR CONSTRUCTION MANAGER SHALL SUBMIT A SHOP DRAWING SUBMITTAL SCHEDULE FOR THE APPROVAL OF THE STRUCTURAL ENGINEER AND THE ARCHITECT. THE SCHEDULE SHALL INCLUDE THE DATES WHEN DRAWINGS ARE TO BE SUBMITTED TO THE ARCHITECT AND THE NUMBER OF DRAWINGS AND TYPE OF DETAILS (PLANS, SCHEDULES, BEAMS, COLUMNS, ETC.) THAT WILL BE SUBMITTED ON EACH.

SD.5 THE STRUCTURAL ENGINEER'S REVIEW OF, APPROVAL OF, OR OTHER ACTION UPON THE SHOP DRAWINGS IS ONLY FOR THE LIMITED PURPOSE OF CHECKING FOR CONFORMANCE WITH THE DESIGN INTENT AND THE INFORMATION EXPRESSED IN CONTRACT DOCUMENTS PREPARED BY THE STRUCTURAL ENGINEER.

SD.6 THE STRUCTURAL ENGINEER'S REVIEWS SHALL NOT INCLUDE THE ACCURACY OR COMPLETENESS OF DETAILS SUCH AS MEANS, SEQUENCES, FABRICATION OR ERECTION PROCESS, CONSTRUCTION MEANS OR METHODS, COORDINATION OF THE WORK WITH OTHER TRADES OR CONSTRUCTION SAFETY PRECAUTIONS, ALL OF WHICH ARE THE SOLE RESPONSIBILITY OF THE CONSTRUCTION MANAGER OR GENERAL CONTRACTOR.

SD.7 THE STRUCTURAL ENGINEER'S REVIEW OF A SPECIFIC ITEM SHALL NOT EXTEND TO A REVIEW OF AN ASSEMBLY OF WHICH THE ITEM IS A COMPONENT.

SD.8 THE STRUCTURAL ENGINEER WILL NOT REVIEW SUBMISSIONS WHICH ARE PARTIALLY COMPLETE.

SD.9 NO WORK MAY COMMENCE UNTIL ALL RELEVANT SHOP DRAWINGS HAVE BEEN REVIEWED AND FINAL "APPROVAL WITH NO EXCEPTIONS" HAS BEEN GRANTED BY THE ARCHITECT.

SD.10 THE USE OF THE "REQUEST FOR INFORMATION (RFI) PROCESS IS STRICTLY A FORM OF COMMUNICATION BETWEEN CM/GC AND THE DESIGN TEAM AND IS SOLE PURPOSE IS TO RESOLVE MINOR ISSUES AND SHALL NOT BE USED TO PRE-PRELIMINARY SHOP DRAWINGS.

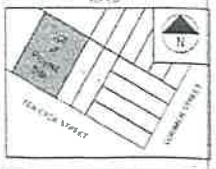
SD.11 STRUCTURAL STEEL SHOP DRAWINGS SHALL NOT BE SUBMITTED UNTIL ERECTION PLANS AND TYPICAL CONNECTION DETAIL DRAWINGS (GENERALLY REFERRED TO AS JOB STANDARDS), HAVE BEEN REVIEWED AND APPROVED BY THE STRUCTURAL ENGINEER AND ARCHITECT.

SD.12 IF THE STRUCTURAL ENGINEER OF RECORD SO REQUESTS, THE CONSTRUCTION MANAGER AND/OR THE GENERAL CONTRACTOR SHALL SUBMIT CALCULATIONS FOR ANY OR ALL CONNECTIONS OR JOB STANDARDS SHOWN ON SHOP DRAWINGS. THESE CALCULATIONS SHALL BE SIGNED AND SEALED BY THE PROFESSIONAL ENGINEER SUPERVISING THE PREPARATION OF SHOP DRAWINGS.

SD.13 SHOP DRAWINGS FOR CONCRETE WORK SHALL BE PREPARED UNDER THE SUPERVISION OF AN EXPERIENCED DETAILER (OR CONCRETE CONTRACTOR) WHO HAS A THOROUGH WORKING KNOWLEDGE OF THE REQUIREMENTS, SUGGESTIONS, EXAMPLES AND COMMENTARIES OF ACI 318- BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 315-DETAILS AND DETAILING OF CONCRETE REINFORCEMENT AND THE CONCRETE REINFORCING STEEL INSTITUTE (CRSI) MANUAL OF STANDARD PRACTICE.

SD.14 SHOP DRAWINGS FOR CONCRETE WORK SHALL INCLUDE BUT NOT BE LIMITED TO, BENDING DETAILS, LOCATION AND LENGTH OF ALL LAPS AND WELDS, AND NUMBERING LOCATION OF ALL REINFORCEMENT (BARS AND WELDED WIRE FABRIC AND PRESTRESSED) INCLUDING THE REINFORCEMENT IN SLABS CAST ON GRADE.

THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ARCHITECT BEFORE ANY WORK IS DONE. THE DRAWINGS ARE DESIGNED TO BE USED FOR CONSTRUCTION PURPOSES ONLY. SCALING OF THE DRAWINGS IS NOT RECOMMENDED.



4.20.16	COORDINATION
5.10.16	HPD REVIEW MEETING
5.27.16	SUBMITTAL TO HPD FOR REVIEW

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GENERAL NOTES

5.20.2016
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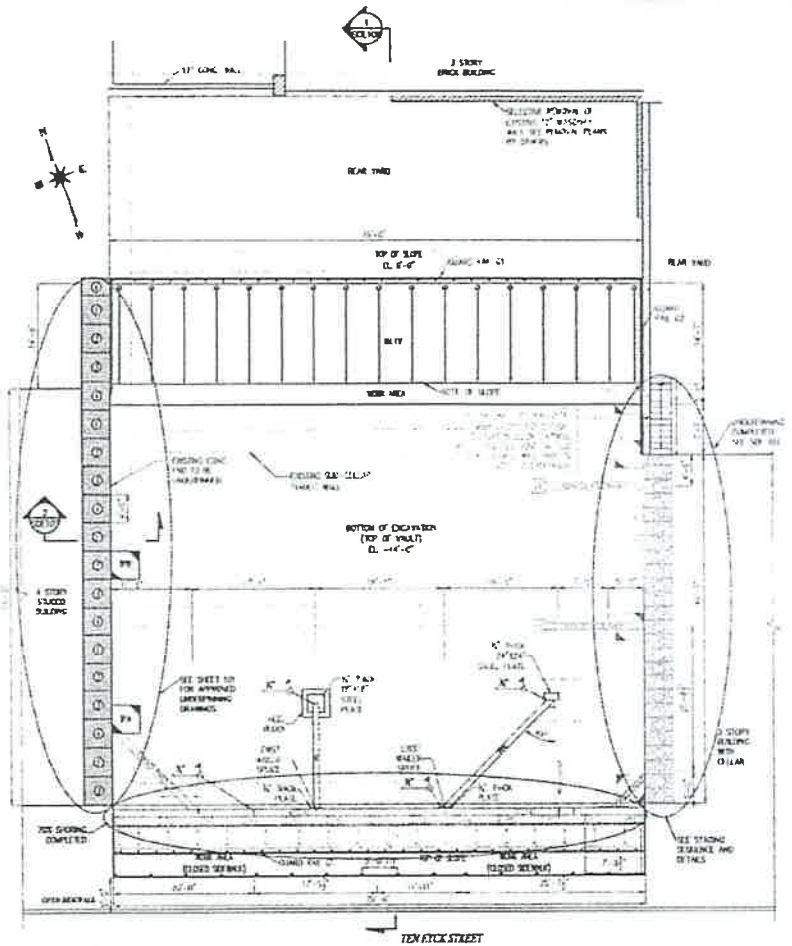
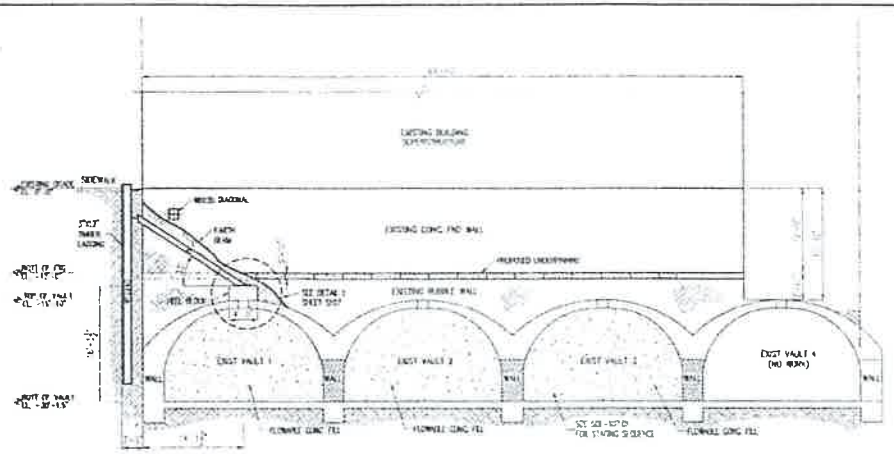


1 STAGE 1 EXCAVATION PLAN
SCALE 1/4"=1'-0"



2 SECTION 1 NORTH WALL, BAKER SUPPORT
SCALE 1/4"=1'-0"

A. SHORING NOTES

1. SHORING SHALL BE PERFORMED AS INDICATED ON THE DOCUMENTS SO THAT THE CONTRACTOR ASSURES THAT ADEQUATE SUPPORT IS MAINTAINED ADJACENT TO AND UNDER THE EXISTING FOOTING AND BY THE NEW FOUNDATION.

2. PROTECTION FOR SIDES OF EXCAVATION SHALL COMPLY WITH SECT SECTION 19, SECTION 4.1 OF NYC BLDG. CODE.

GROUTING EQUIPMENT

(a). THE MECHANICAL OR CENTRIFUGAL SYSTEM FOR BLENDING GROUT.

(b). GROUT PUMPS USED FOR PLACEMENT OF GROUT SHALL BE CAPABLE OF DEVELOPING A MINIMUM OF 400 PSI AT THE PUMP AND 200 PSI AT THE PACKER OR PIPE. ANY GROUT PUMP SHALL BE A POSITIVE DISPLACEMENT PISTON PUMP OR APPROVED EQUAL. THE GROUT PUMP SHALL HAVE THE CAPACITY TO PUMPING AT A RATE OF 1 GALLON PER MINUTE OR MORE AT THE MINIMUM PRESSURE GIVEN ABOVE. A FLOW VALVE OR EQUIVALENT SYSTEM SHALL BE PROVIDED IN THE LINE TO THE GROUT PIPE. GROUT PUMPS SHALL BE CAPABLE OF PUMPING A PLASTIC MIX.

(c). GROUT HOSES SHALL HAVE A MINIMUM INSIDE DIAMETER OF 1-1/2" INCHES AND SHALL BE CAPABLE OF WITHSTANDING TWO TIMES THE RATED PUMP OUTPUT PRESSURE WITHOUT BURSTING.

(d). COUPLINGS AND CONNECTIONS TO FINISH THE GROUT PUMP AND THE PACKER OR PIPE SHALL BE.

(e). PACKERS SHALL BE PROVIDED TO SEAL AND TO CLEAN THE GROUT PIPE TO THE HOLES BEING GROUTED. PACKERS SHALL BE CAPABLE OF RESISTING 1 1/2 TIMES THE MAXIMUM PRESSURE OF THE GROUT PUMP WITHOUT LEAKING OR BLOWING OUT. PACKERS MAY BE OMITTED IF A TIGHT SEAL CAN BE OBTAINED WITHOUT THEIR USE.

(f). PRESSURE GAGES FOR MEASURING THE GROUT PRESSURE SHALL BE PROVIDED. ONE GAGE SHALL BE PROVIDED AT THE PUMP POSITION WHERE IT CAN BE READ BY THE PUMP OPERATOR. TWO GAGE SHALL HAVE A RANGE OF NOT LESS THAN 600 psi AND BE MARKED IN THE GROUT LINE SHOWN TO FELT OF THE PACKER OR PIPE. THIS GAGE SHALL HAVE A RANGE OF NOT LESS THAN 300 psi AND BE MARKED IN INCREMENTS OF NOT GREATER THAN 5 psi.

(g). CHECK SHALL BE AIR PRETESTED AND SUITABLE FOR USE IN MONITORING GROUT PRESSURES. A MINIMUM OF TWO SPARE GAGES SHALL BE AVAILABLE AT THE SITE AT THE START OF EACH DAY'S GROUTING OPERATIONS. GAGES THAT ARE BROKEN OR PROVIDE ERRATIC OR OUT-OF-RANGE READINGS, AS DETERMINED BY THE ENGINEER SHALL BE REPLACED.

GROUT PLACEMENT

(a). INSTALL A 3" DIA. INJECTION PIPE IN THE CASING AND FILL THE SPACE OF THE CASING WITH GROUT UNTIL A GOOD CLEAN GROUT RETURN IS NOTED. GROUT PIPE SHALL EXTEND FROM 1' MIN TO 12" MAX FROM THE BACK OF LAGGING AND ORIENT THE EXISTING BUILDING

B. GENERAL

1. DESIGN AND CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE NEW YORK CITY BUILDING CODE AND ANY RELEVANT FEDERAL, STATE AND LOCAL LAWS AND ORDINANCES.

2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND CONDITIONS AT THE SITE IN THE FIELD AND REPORT ANY DISCREPANCIES OR CHANGED CONDITIONS TO THE OWNER/ENGINEER BEFORE THE START OF ANY WORK. NO WORK SHALL BEGIN UNTIL WRITTEN PERMISSION IS GIVEN BY THE ENGINEER OR ARCHITECT. ANY WORK PERFORMED BY THE CONTRACTOR BEYOND THE LIMITS OF CHANGED CONDITIONS, THAT ARE DISCOVERED BY THE CONTRACTOR.

3. CONTRACTORS LAY-DOWN AND STORAGE SHALL BE IN AREAS THAT ARE AS DESIGNATED BY THE OWNER.

C. CONCRETE DESIGN

1. ALL CONCRETE SHALL BE NORMAL WEIGHT CONCRETE, U.O.N., AND COMPLY WITH ACI 318 BUILDING CODE AND THE CURRENT NEW YORK CITY BUILDING CODE. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS U.O.N.

2. ALL CONCRETE SHALL BE AIR ENTRAINED.

3. ALL REINFORCED CONCRETE MEMBERS HAVE BEEN DESIGNED USING FACTORED LOADS AND FORCES IN ACCORDANCE WITH THE PROVISIONS OF THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318) AND AS MODIFIED BY THE NEW YORK CITY BUILDING CODE.

4. ALL CONCRETE WORK - MIXES, INSPECTIONS, AND FORMWORK - SHALL CONFORM WITH ALL REQUIREMENTS OF NEW YORK CITY BUILDING CODE, LATEST EDITION, AS FOLLOWS:
   a) PRELIMINARY TESTS.
   b) INSPECTION REQUIREMENTS.
   c) INSPECTION OF MATERIALS AND ASSEMBLIES.
   d) INSPECTION OF METHODS OF CONSTRUCTION.
   e) ON SITE INSPECTIONS.
   f) CONCRETE FORMWORK.

5. ROUGHENED SURFACE, AT INTERFACE OF SEPARATE CONCRETE POURS (VERTICAL JOINTS) SHALL BE PREPARED AS FOLLOWS:
   a) ROUGHEN SURFACE TO A FULL AMPLITUDE OF APPROXIMATELY 1" WITH STIFF BRUSH AFTER INITIAL SET.
   b) BEFORE PLACING FRESH CONCRETE, CLEAN SURFACE AND REMOVE LAITANCE WITH WIRE BRUSH.

6. NO HORIZONTAL CONSTRUCTION JOINTS WILL BE ALLOWED IN FOUNDATION WALLS AND GRADE BEAMS.

D. PROTECTION OF ADJACENT PROPERTIES

1. THE GENERAL CONTRACTOR AND ITS SHORING AND EXCAVATION SUB-CONTRACTORS SHALL BE RESPONSIBLE FOR THE PROTECTION OF ANY AND ALL ADJACENT BUILDINGS AND STRUCTURES ENCOUNTERED DURING THE SUPPORT OF EXCAVATION WORK, WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.

2. FOR PROTECTION OF ADJACENT STRUCTURES CONTRACTOR SHALL PERFORM HORIZONTAL AND VERTICAL ALIGNMENT SURVEY SO AS TO BASELINE THE EXISTING HORIZONTAL AND VERTICAL ALIGNMENT OF EXISTING ADJACENT STRUCTURES. BASELINE SURVEY SHALL BE PERFORMED PRIOR TO THE START OF ANY WORK AND BENCHMARKS IN SUPPORT OF CONTROLS MONITORING BY THE SHORING SUBCONTRACTOR SHALL BE ESTABLISHED.

3. DURING CONSTRUCTION, THE CONTRACTOR SHALL PERIODICALLY MONITOR ADJACENT BUILDINGS LOCATED WITHIN 50 FEET USING OPTICAL SURVEY TECHNIQUES AND THE PRE-CONSTRUCTION BENCHMARKS DESCRIBED IN NOTE 2 ABOVE, TO MONITOR POTENTIAL MOVEMENT OF ADJACENT BUILDINGS AND EXPOSURES.

4. SHOULD VERTICAL AND/OR HORIZONTAL MOVEMENT OF ANY ADJACENT BUILDINGS OR STRUCTURE BE DETECTED DURING CONSTRUCTION, THE CONTRACTOR SHALL CEASE ALL WORK, SHORE AND BRACE ADJACENT BUILDINGS AND/OR STRUCTURES AS NECESSARY TO PREVENT THE OCCURRENCE OF ANY FURTHERMENT DAMAGE. SHORING AND BRACING SHALL BE AS DIRECTED BY THE ENGINEER OF RECORD.

5. PRIOR TO THE START OF ANY WORK, THE SUPPORT OF EXCAVATION/SHORING SUBCONTRACTOR SHALL ADD CLIMBARA ENGINEERING, PLLC AS AN ADDITIONAL NAMED INSURED ON A CERTIFICATE HOLDER POLICY ON ITS GENERAL COMMERCIAL LIABILITY INSURANCE POLICY.

6. THE SHORING SUBCONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS CLIMBARA ENGINEERING, PLLC AND RLCD CORP. FOR ANY CLAIM, SUIT, ACTION AND COST OF EVERY KIND WHATSOEVER ARISING OUT OF OR RESULTING FROM THE SUPPORT OF EXCAVATION CONSTRUCTION SHOWN ON THESE PLANS. SUCH INDEMNIFICATION SHALL NOT BE PROVIDED FOR ANY/ALL CLAIMS, SUITS, ACTIONS AND COSTS ARISING FROM CLIMBARA ENGINEERING, PLLC TOP PROFESSIONAL ENGINEERING LIABILITY AND CHANGES/ERRORS, FAILURE OF ITEM ANY INTENTIONAL NEGLIGENCE FROM CLIMBARA ENGINEERING, PLLC DURING THE COURSE OF ANY ACTIVITIES THAT ARE PERFORMED PURSUANT TO THE PLANS SEE NOS. SEE TOP AND SEE YOU.

7. THE SHORING SUBCONTRACTOR SHALL GIVE AT LEAST 24 HOURS NOTIFICATION TO THE STRUCTURAL ENGINEER OF RECORD OR TO ANY OTHER PROTECTION AGENCY SELECTED BY THE OWNER/CHEMICAL CONTRACTOR FOR PERFORMING SPECIAL AND PROGRESS INSPECTIONS, PRIOR TO THE START OF ANY SEGMENT OF EXCAVATION WORK.

SCHEDULE			
DESIGNATION	DESCRIPTION	SIZE	DIMENSIONS
[illegible]	DIAGONAL BRACING	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

TEST PIT SUMMARY

TEST PIT A REVEALED BOTTOM OF EXISTING RC FOOTING AT 12'-0" BELOW GRADE AND IN EXCELLENT CONDITION WITH 12" DEEP CONC. PIPES REQUIRED.

TEST PIT B REVEALED BOTTOM OF EXISTING RC FOOTING AT 12'-0" BELOW GRADE AND IN EXCELLENT CONDITION WITH 12" DEEP CONC. PIPES WITHIN 33 TEN EYCK STREET SITE. A 3'-0" HIGH RUBBLE FOUNDATION WALL IN FAIR CONDITION IS RUNNING ALONG THE WEST PROPERTY LINE IN THE SUBJECT SITE. THE RUBBLE WALL ALONG 33 TEN EYCK STREET LOT LINE SHOULD BE INSPECTED FOR STABILITY AND IS/MAY BE REINFORCED TO ACCOMMODATE THE PROPOSED FOUNDATION OR SELECTIVELY REMOVED.

UNDERPINNING SCHEDULE

EXISTING FOOTINGS MATERIAL	MAX WIDTH OF EXCAVATION (W)
CONCRETE	4'-0"
MASONRY	3'-0"
RUBBLE	2'-0"

LEGEND

CONCRETE MASONRY UNIT (CMU) WALLS TO BE FILLED SOLID WITH MORTAR

CONCRETE

EARTH

SHEET JOINT

STRUCTURAL DRAWING LIST	
GENERAL NOTES, PLAN AND SECTION	S0[illegible]
DETAILS, BASES, SCHEDULE AND SEQUENCE	S1[illegible]

THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ENGINEER. DO NOT SCALE THE DRAWING. THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION PURPOSES UNTIL SIGNED BY THE CONSULTANTS.

KEY PLAN

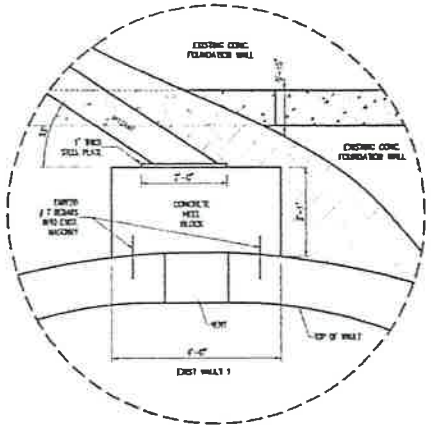
APPLICATION INFORMATION

Application filed in conjunction with NB Application #320262748

Scope of Work
- SHORING
- UNDERPINNING
- SITE CLEARING & EXCAVATION

009 JOB #

NO.	DATE	DESCRIPTION
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

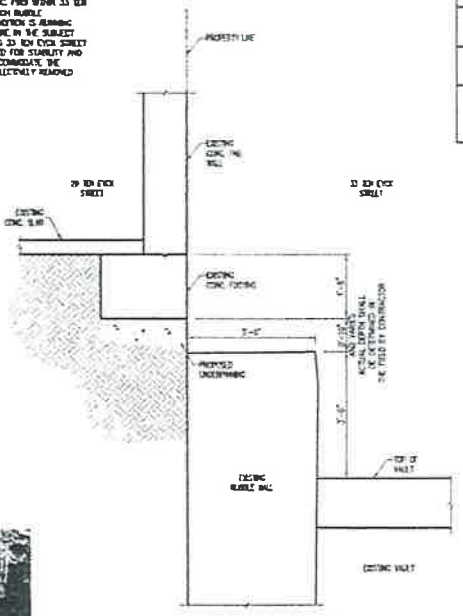


RAKER ANCHOR DETAIL

TEST PIT SUMMARY

TEST PIT A REVEALED BOTTOM OF EXISTING RC FOOTING AT 12'-0" BELOW GRADE AND IN EXCELLENT CONDITION WITH NO DEEP CONC. PINS REQUIRED.

TEST PIT B REVEALED BOTTOM OF EXISTING RC FOOTING AT 11'-0" BELOW GRADE, AND IN EXCELLENT CONDITION WITH NO DEEP CONC. PINS WITHIN 33 TEN EYCK STREET SITE. A 3'-0" THICK RUBBLE FOUNDATION WALL IN FAIR CONDITION IS ALIGNING ALONG THE WEST PROPERTY LINE IN THE SUBJECT SITE. THIS RUBBLE WALL ALONG 33 TEN EYCK STREET LOT LINE SHOULD BE INSPECTED FOR STABILITY AND EITHER BE REINFORCED TO ACCOMMODATE THE PROPOSED FOUNDATION OR SELECTIVELY REMOVED



WEST LOTLINE DETAIL

LOADING SELECTION TABLE

SOIL TYPE	DEPOSED WALL HEIGHT (FT.)	MINIMUM THICKNESS OF ROUGH CUT LAGGING FOR CLEAR SPANS OF:					
		5 FT.	6 FT.	7 FT.	8 FT.	9 FT.	10 FT.
A	0-25	2-INCHES	3-INCHES	3-INCHES	3-INCHES	4-INCHES	4-INCHES
	>25-40	3-INCHES	3-INCHES	3-INCHES	4-INCHES	4-INCHES	5-INCHES
B	0-25	3-INCHES		3-INCHES	4-INCHES	4-INCHES	5-INCHES
	>25-40	3-INCHES	3-INCHES	4-INCHES	4-INCHES	5-INCHES	5-INCHES
C	0-15	3-INCHES	3-INCHES	4-INCHES	5-INCHES		
	>15-25	3-INCHES	4-INCHES	5-INCHES	6-INCHES		
	>25-35	4-INCHES	5-INCHES	6-INCHES			

STAGING SEQUENCE FOR EXCAVATION & UNDERPINNING OF PROPOSED BUILDING

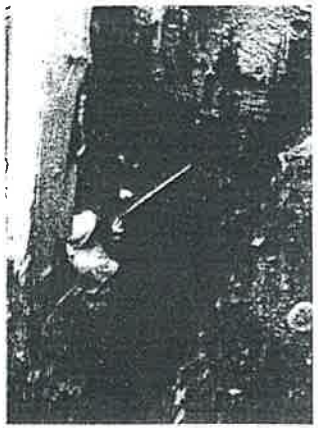
STAGE 1 : EXCAVATION AND UNDERPINNING WEST CONC. WALL

1. EXCAVATE SITE DOWN 4'-0" FROM GRADE
2. UNDERPIN ADJACENT CONCRETE FOOTING ALONG WEST PROPERTY LINE
3. INSTALL REMAINING SOLDIER PILE AT THE SOUTH (FRONT) OF THE SITE
4. REINFORCE WALER SPLICE LOCATIONS WITH ADEQUATE SHIM AND WELD
5. EXCAVATE APPROACH PIT TO UNDERPIN WEST EXTERIOR CONCRETE WALL APPROACH PITS WITH DEPTHS OF 24" SHALL UTILIZE REGULAR PIT UNDERPINNING AND DEPTH WITH <10" WOULD USE NON SHRINK GROUT WITH GRAVEL AS THE REPLACEMENT MATERIAL
6. BUILD BRACED TIMBER APPROACH PIT
7. UNDERPIN CONC. FOOTING
8. DRY PACK JOINT BETWEEN FOOTING AND RC PIN
9. POUR 3000 PSI CONCRETE SLAB WITH REQUIRED REINFORCEMENT

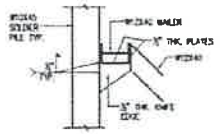
STAGE 2 : RAKER AND MICE BLOCK CONSTRUCTION ON TOP OF VAULT

1. LEAVE APPROPRIATE AMOUNT OF SOIL (BERM) TO PROVIDE RAKER (SOLDIER FOOTING) TEMPORARY BRACING
2. SAW CUT AND REMOVE 6 SQUARE HOLES (2'X2') ON TOP OF ALL 3 VAULTS
3. MOLD AND FRAME C-CHANNEL AROUND ALL 2'X2' HOLE OPENING TO PREVENT CLAY# AFTER SPOKING UP EACH HOLE ("C" CHANNEL SIZE BASED ON FIELD MEASUREMENT)
4. FILL GAPS BETWEEN "C" CHANNEL AND BRICKS WITH NON SHRINK GROUT
5. INSTALL FLOWABLE CONCRETE WITH PUMP AND 4 INDIVIDUAL VIBRATORS AND 20 FOOT SHAFT CORE USING ALL HOLES TO PROVIDE EVEN FILLING FOR THE 1ST STAGE, APPROXIMATELY 3 FEET IN DEPTH FOR ALL 3 VAULTS
6. AFTER 1ST STAGE DRY AND COMPLETE (APPROX. 24 HOURS), INSTALL FLOWABLE CONCRETE WITH PUMP AND 4 INDIVIDUAL VIBRATORS AND 20 FEET SHAFT CORE USING HOLES TO PROVIDE EVEN FILLING FOR THE 2ND STAGE, APPROX. 3 FEET IN DEPTH FOR ALL 3 VAULTS
7. AFTER 2ND STAGE DRY AND COMPLETE (APPROX 24 HOURS), INSTALL FLOWABLE CONCRETE WITH PUMP AND 4 INDIVIDUAL VIBRATORS AND 20 FOOT SHAFT CORE USING HOLES TO PROVIDE EVEN FILLING FOR THE 3RD STAGE, APPROX 3 FEET IN DEPTH FOR ALL 3 VAULTS
8. AFTER 3RD STAGE DRY AND COMPLETE (APPROX 24 HOURS), EXPOSE LARGER OPENING WITH EXCAVATOR /W BREAKER TO PROVIDE EASIER VISUAL AND WORKING SPACE TO TOP OFF THE REMAINING USING PUMP AND 4 INDIVIDUAL VIBRATORS AND 20 FEET SHAFT CORE (LIKELY FOR MORE FILLING TO ~11 FEET (DEPEND ON THE FIELD CONDITIONS AND REMAINING CAPITY)
9. MANUALLY CHIP OUT ALL EXISTING MUD SLAB ON TOP OF VAULT STRUCTURE WALL TO EXPOSE EXISTING BRICK VAULT PERIMETER.
10. INSTALL MAT SLAB TO ALL NEW CONCRETE GRADE BEAM AREAS.
11. DEMOLISH ALL STEEL BRACING.
12. INSTALL ALL CONCRETE GRADE BEAMS AND FOOTINGS.
13. INSTALL CONCRETE FOUNDATION WALL (NORTH, SOUTH AND WEST) AND COLUMN ON TOP OF VAULT AREA.
14. BACKFILL BETWEEN NORTH WALL AND BACKYARD
15. BACKFILL BETWEEN SOUTH WALL AND SIDEWALK WITH EXISTING SITE SOIL.
16. WATERPROOF NORTH AND SOUTH FOUNDATION WALL
17. FULLY EXCAVATE REMAINING SOIL TO INSTALL MAT FOUNDATION FOOTING.
18. INSTALL 6 TO 12 INCH BLUE STONE TO STABILIZE SOIL CONDITION FOR INSTALLATION OF MAT FOUNDATION FOOTING AND ELEVATOR PIT (DEPTH OF BLUE STONE TO BE DETERMINED BY SOIL CONDITION ON SITE).
19. INSTALL ALL REMAINING FOUNDATION WALLS AND COLUMNS
20. BACKFILL
21. INSTALL CONCRETE MAT FOOTING, CONCRETE ELEVATOR PIT FOOTING AND WALL, CONCRETE STRAP BEAM, CONCRETE SPREAD FOOTING AND CONCRETE WALLS AND COLUMNS (APPROX. ADDED TO 450CY).

TEST PIT A



TEST PIT B



WALER SUPPORT DETAIL

THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ENGINEER. DO NOT SCALE THE DRAWING. THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION PURPOSES UNTIL SIGNED BY THE CONSULTANTS.

APPLICATION INFORMATION

Application filed in conjunction with NB Application #320262740

Scope of Work
- SHORING
- UNDERPINNING
- SITE CLEARING & EXCAVATION

DOB JOB #

1	11-08-2019	BUILDING ADDITION	
2	04-30-2020	UNDERPINNING ADDITION	
3	05-06-2020	SHORING SYSTEM UNDERPINNING INSTALLATION	
4	07-08-2020	SHORING SYSTEM UNDERPINNING SHEET SEQUENCE UPDATE	
5	08-14-2020	SHORING UPDATE	
6	09-04-2020	SHORING UPDATE	
7	09-08-2020	SHORING UPDATE	
8	09-09-2020	SHORING UPDATE	
9	09-09-2020	SHORING UPDATE	
10	09-09-2020	SHORING UPDATE	
11	11-09-2020	ISSUED FOR CONSTRUCTION	
No.	DATE	DESCRIPTION	

ISSUED

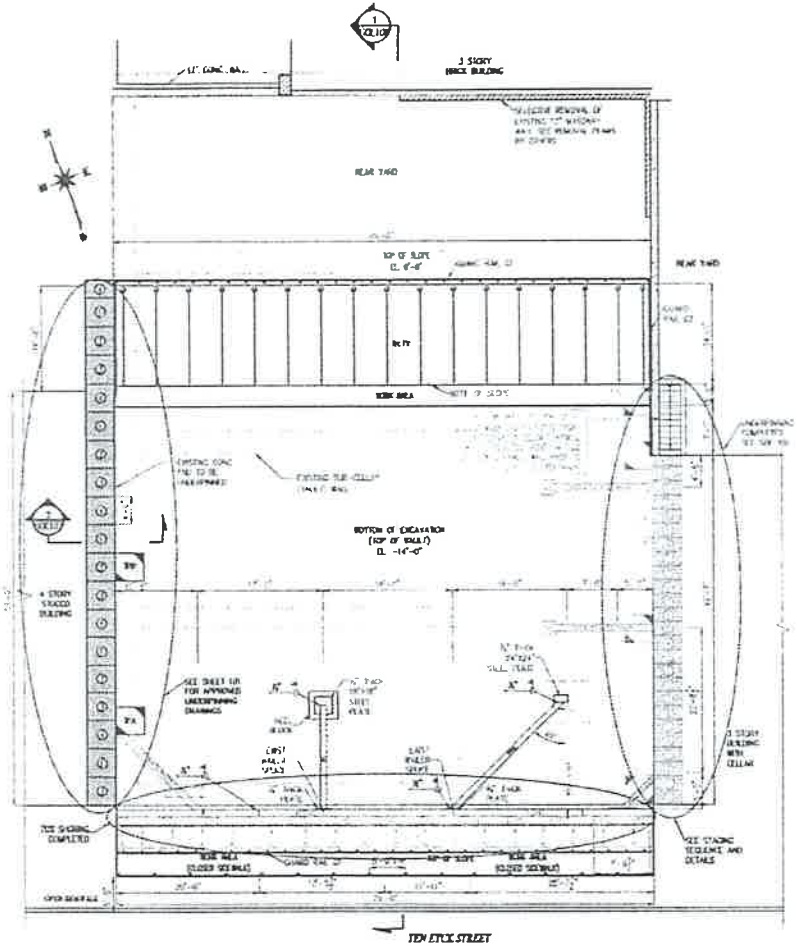
188 PARTNERS, LLC
200 Park Avenue, 11th Floor
New York, New York 10166

DEMERARA ENGINEERING, PLLC

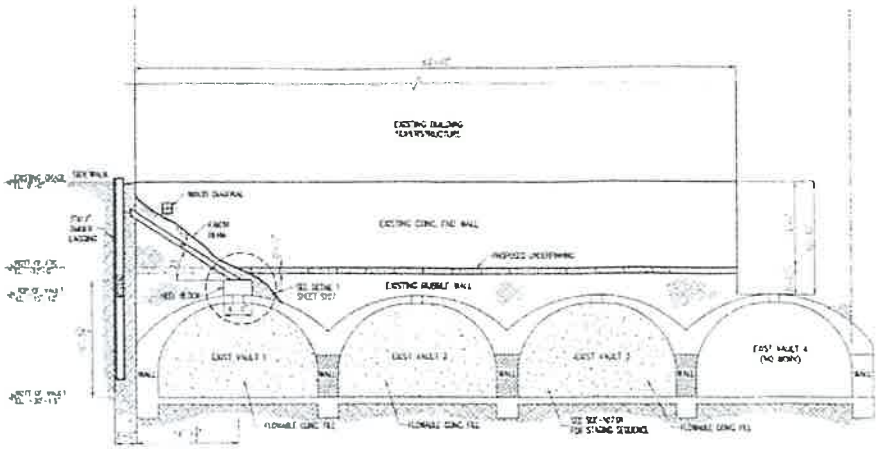
YUCO BUILDERS, LLC
200 Park Avenue, 11th Floor
New York, New York 10166

33 Ten Eyck Street
Williamsburg, Brooklyn

GROUND MODIFICATION SOIL REINFORCEMENT



1 STAGE F EXCAVATION PLAN



1 SECTION F NORTH WALL RAKER SUPPORT

A. SHORING NOTES

1. SHORING SHALL BE PERFORMED AS INDICATED ON THE DOCUMENTS SO THAT THE CONTRACTOR ASSURES THAT ADEQUATE SUPPORT IS MAINTAINED ADJACENT TO AND UNDER THE EXISTING FOOTING AND BY THE NEW FOUNDATION.
2. PROTECTION FOR USES OF EXCAVATION SHALL COMPLY WITH SECTION PR SECTION 61 OF NYC BLDG. CODE

EXISTING LOADBEARING

(a). USE MECHANICAL OR CLAY/GRAVEL SYSTEM FOR BLENDING GROUT

(b). GROUT PUMPS USED FOR PLACEMENT OF GROUT SHALL BE CAPABLE OF DEVELOPING A MINIMUM OF 400 PSI AT THE PUMP AND 200 PSI AT THE PACKER OR PIPE. THE GROUT PUMP SHALL BE A POSITIVE DISPLACEMENT PISTON PUMP OR APPROVED EQUAL. THE GROUT PUMP SHALL HAVE THE CAPACITY OF PUMPING AT A RATE OF 1 GALLON PER MINUTE OR MORE, AT THE MINIMUM PRESSURE GIVEN ABOVE. A FLOW VALVE OF EQUIVALENT SYSTEM SHALL BE PROVIDED IN THE LINE TO THE GROUT PIPE. GROUT PUMPS SHALL BE CAPABLE OF PUMPING A PLASTIC MIX.

(c). GROUT HOSES SHALL HAVE A MINIMUM INSIDE DIAMETER OF 1-1/2" INCHES AND SHALL BE CAPABLE OF WITHSTANDING TWO TIMES THE RATED PUMP OUTPUT PRESSURE WITHOUT BURSTING

(d). COUPLINGS AND CONNECTIONS BETWEEN THE GROUT PUMP AND THE PACKER OR PIPE SHALL BE

(e). PACKERS SHALL BE PROVIDED TO SEAL AND SECURE THE GROUT PIPE TO THE HOLES BEING GROUTED. PACKERS SHALL BE CAPABLE OF RESISTING 1-1/2 TIMES THE MAXIMUM PRESSURE OF THE GROUT PUMP WITHOUT LEAKING OR BLOWING OUT. PACKERS MAY BE OMITTED IF A TIGHT SEAL CAN BE OBTAINED WITHOUT THEIR USE.

(f). PRESSURE GAGES FOR MEASURING THE GROUT PRESSURE SHALL BE PROVIDED. ONE GAGE SHALL BE PROVIDED AT THE PUMP POSITION WHERE IT CAN BE READ BY THE PUMP OPERATOR. THIS GAGE SHALL HAVE A RANGE OF NOT LESS THAN 400 psi AND BE MARKED IN THE GROUT LINE WITHIN 10 FEET OF THE PACKER OR PIPE. THIS GAGE SHALL HAVE A RANGE OF NOT LESS THAN 200 psi AND BE MARKED IN INCREMENTS OF NOT GREATER THAN 5 psi.

(g). GAGES SHALL BE AIR PROTECTED AND SUITABLE FOR USE IN MONITORING GROUT PRESSURES. A MINIMUM OF TWO SPARE GAGES SHALL BE AVAILABLE AT THE SITE AT THE START OF EACH DAY'S GROUTING OPERATIONS. GAGES THAT ARE BROKEN OR PROVIDE ERRATIC OR QUESTIONABLE READINGS, AS DETERMINED BY THE ENGINEER SHALL BE REPLACED.

GROUT INJECTION

(a). INSTALL A 3" DIA. INJECTION PIPE IN THE EASING AND FILL THE SPACE OF THE CASING WITH GROUT MIX. A SOLID CLEAN GROUT MIXTURE IS NOTED. GROUT PIPE SHALL EXTEND FROM 4' MIN TO 12' MAX FROM THE BACK OF LAGGING AND UNDER THE EXISTING BUILDING

B. GENERAL

1. DESIGN AND CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE NEW YORK CITY BUILDING CODE AND ANY RELEVANT FEDERAL, STATE AND LOCAL LAWS AND ORDINANCES.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND CONDITIONS THAT EXIST IN THE FIELD AND REPORT ANY DISCREPANCIES OR CHANGED CONDITIONS TO THE OWNER/ENGINEER BEFORE THE START OF ANY WORK. NO WORK SHALL BE DONE UNTIL WRITTEN PERMISSION IS GIVEN BY THE ENGINEER OF RECORD IS PROVIDED WITH THE WORK AFFECTED BY THE DISCREPANCIES OR CHANGED CONDITIONS, THAT ARE OVERLOOKED BY THE CONTRACTOR
3. CONTRACTORS LAY-DOWN AND STORAGE SHALL BE IN AREAS THAT ARE AS DESIGNATED BY THE OWNER.

C. CONCRETE DESIGN

1. ALL CONCRETE SHALL BE NORMAL WEIGHT CONTROLLED CONCRETE, U.O.N., AND STRICTLY WITH A.C.I. BUILDING CODE AND THE CURRENT NEW YORK CITY BUILDING CODE. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS U.O.N.
2. ALL CONCRETE SHALL BE AIR ENTRAINED
3. ALL REINFORCED CONCRETE MEMBERS HAVE BEEN DESIGNED USING FACTORED LOADS AND FORCES IN ACCORDANCE WITH THE PROVISIONS OF THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318) AND AS MODIFIED BY THE NEW YORK CITY BUILDING CODE.
4. ALL CONCRETE WORK – MIXES, INSPECTIONS, AND FORMWORK – SHALL CONFORM WITH ALL REQUIREMENTS OF NEW YORK CITY BUILDING CODE, LATEST EDITION, AS FOLLOWS.
   a) PRELIMINARY TESTS
   b) INSPECTION REQUIREMENTS
   c) INSPECTION OF MATERIALS AND AGGREGATES
   d) INSPECTION OF METHODS OF CONSTRUCTION
   e) ON SITE INSPECTIONS
   f) CONCRETE FORMWORK
5. ROUGHENED SURFACES AT INTERFACE OF SEPARATE CONCRETE POURS (VERTICAL JOINTS) SHALL BE PREPARED AS FOLLOWS.
   a) ROUGHEN SURFACE TO A FULL AMPLITUDE OF APPROXIMATELY ¼" WITH STIFF BROOM AFTER INITIAL SET
   b) BEFORE PLACING FRESH CONCRETE, CLEAN SURFACE AND REMOVE LAITANCE WITH WIRE BRUSH
6. NO HORIZONTAL CONSTRUCTION JOINTS WILL BE ALLOWED IN FOUNDATION WALLS AND GRADE BEAMS.

D. PROTECTION OF ADJACENT PROPERTIES

1. THE GENERAL CONTRACTOR AND ITS SHORING AND FOUNDATION SUB-CONTRACTORS SHALL BE RESPONSIBLE FOR THE PROTECTION OF ANY AND ALL ADJACENT BUILDINGS AND STRUCTURES ENCOUNTERED DURING THE SUPPORT OF EXCAVATION WORK, WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
2. FOR PROTECTION OF ADJACENT STRUCTURES CONTRACTOR SHALL PERFORM HORIZONTAL AND VERTICAL ALIGNMENT SURVEY SO AS TO BASELINE THE EXISTING HORIZONTAL AND VERTICAL ALIGNMENT OF EXISTING ADJACENT STRUCTURES. BASELINE SURVEY SHALL BE PERFORMED PRIOR TO THE START OF ANY WORK AND BENCHMARKS IN SUPPORT OF CONTINUOUS MONITORING BY THE SHORING SUBCONTRACTOR SHALL BE ESTABLISHED
3. DURING CONSTRUCTION, THE CONTRACTOR SHALL PERIODICALLY MONITOR ADJACENT BUILDINGS LOCATED WITHIN 90 FEET, USING OPTICAL SURVEY TECHNIQUES AND THE PRE-CONSTRUCTION BENCHMARKS DESCRIBED IN NOTE 2 ABOVE, TO MONITOR POTENTIAL MOVEMENT OF ADJACENT BUILDINGS AND STRUCTURES.
4. SPECIFIED VERTICAL AND/OR HORIZONTAL MOVEMENT OF ANY ADJACENT BUILDINGS OR STRUCTURE BE DETECTED DURING CONSTRUCTION, THE CONTRACTOR SHALL CEASE ALL WORK, SHORE AND BRACE ADJACENT BUILDINGS AND/OR STRUCTURES AS NECESSARY TO PREVENT THE OCCURRENCE OF ANY PERMANENT DAMAGE. SHORING AND BRACING SHALL BE AS DIRECTED BY THE ENGINEER OF RECORD.
5. PRIOR TO THE START OF ANY WORK, THE SUPPORT OF EXCAVATION/SHORING SUBCONTRACTOR SHALL ADD DEMARA ENGINEERING, PLLC AS AN ADDITIONAL NAMED INSURED AND A CERTIFICATE HOLDER TO/FOR ITS GENERAL COMMERCIAL LIABILITY INSURANCE POLICY
6. THE SHORING SUBCONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS DEMARA ENGINEERING, PLLC AND YUCO CONSTRUCTION, LLC FROM ANY CLAIM, SUIT, ACTION AND COST OF EVERY NAME AND DESCRIPTION, ARISING OUT OF OR RESULTING FROM THE SUPPORT OF EXCAVATION CONSTRUCTION SHOWN ON THESE PLANS. SUCH INDEMNIFICATION SHALL NOT BE PROVIDED FOR ANY/ALL CLAIMS, SUITS, ACTIONS AND COSTS ARISING FROM DEMARA ENGINEERING, PLLC ITS PROFESSIONAL ENGINEERING EMPLOYEES AND CONSULTANTS, UNLESS, OR FOR ANY INTENTIONAL MISCONDUCT PERFORMED BY DEMARA ENGINEERING, PLLC DURING THE COURSE OF ANY ACTIVITIES THAT ARE CONDUCTED PURSUANT TO THE PLANS SEE SHT. SOE-101 AND SOE-102
7. THE SHORING SUBCONTRACTOR SHALL GIVE AT LEAST 24 HOURS NOTIFICATION TO THE STRUCTURAL ENGINEER OF RECORD OR TO ANY OTHER INSPECTION AGENCY SELECTED BY THE OWNER/GENERAL CONTRACTOR FOR PERFORMING SPECIAL AND PROGRESS INSPECTIONS, PRIOR TO THE START OF ANY SUPPORT OF EXCAVATION WORK.

SCHEDULE			
DESIGNATION	DESCRIPTION	SIZE	DIMENSIONS
RP2	DIAGONAL BRACING	WF6	27'-0" TOTAL LENGTH
P1	RAKER	W12x40	14'-0" TOTAL LENGTH

TEST PIT 1 SUMMARY

TEST PIT A REVEALED BOTTOM OF EXISTING RC FOOTING AT 13'-0" BELOW GRADE AND IN EXCELLENT CONDITION WITH 10" DEEP CONC. PIPS WITHIN 33 TEN EYCK STREET SITE. A 3'-0" HIGH RUBBLE FOUNDATION WALL IN FAIR CONDITION IS RUNNING ALONG THE WEST PROPERTY LINE IN THE SUBJECT SITE. THE RUBBLE WALL ALONG 33 TEN EYCK STREET LOT LINE SHOULD BE INSPECTED FOR STABILITY AND EITHER BE REINFORCED TO ACCOMMODATE THE PROPOSED FOUNDATION OR SUBSEQUENTLY REMOVED.

UNDERPINNING SCHEDULE

EXISTING FOOTINGS MATERIAL	MAX WIDTH OF EXCAVATION UNITS
CONCRETE	6'-0"
MASONRY	3'-0"
RUBBLE	2'-0"

LEGEND

CONCRETE MASONRY UNIT (CMU) WALLS TO BE FILLED SOLID WITH MORTAR

CONCRETE

EARTH

TIMBER JOIST

STRUCTURAL DRAWING LIST	
GENERAL NOTES, PLAN AND SECTION	SOE-100.00
DETAILS, IMAGES, SCHEDULE AND SEQUENCE	SOE-102.00

DOB JOB #

NO.	DATE	DESCRIPTION
1	10-01-2021	INITIAL SUBMITTAL
2	10-15-2021	UNDERPINNING ADDITION
3	10-29-2021	UNDERPINNING ADDITION
4	11-12-2021	SHORE SPACE
5	11-26-2021	SHORE SPACE
6	12-10-2021	SHORE SPACE
7	12-24-2021	SHORE SPACE
8	01-07-2022	SHORE SPACE
9	01-21-2022	SHORE SPACE
10	02-04-2022	SHORE SPACE
11	02-18-2022	SHORE SPACE
12	03-04-2022	SHORE SPACE
13	03-18-2022	SHORE SPACE
14	04-01-2022	SHORE SPACE
15	04-15-2022	SHORE SPACE
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39	03-17-2023	SHORE SPACE
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66	03-29-2024	SHORE SPACE
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70	05-24-2024	SHORE SPACE
71	06-07-2024	SHORE SPACE
72	06-21-2024	SHORE SPACE
73	07-05-2024	SHORE SPACE
74	07-19-2024	SHORE SPACE
75	08-02-2024	SHORE SPACE
76	08-16-2024	SHORE SPACE
77	08-30-2024	SHORE SPACE
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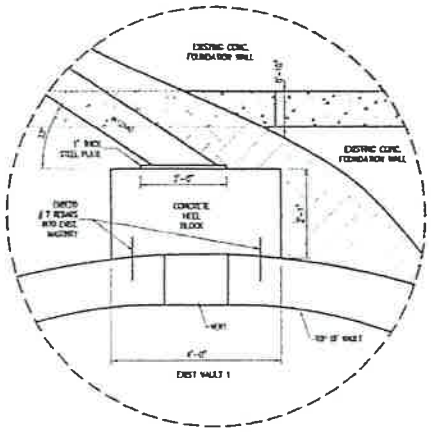
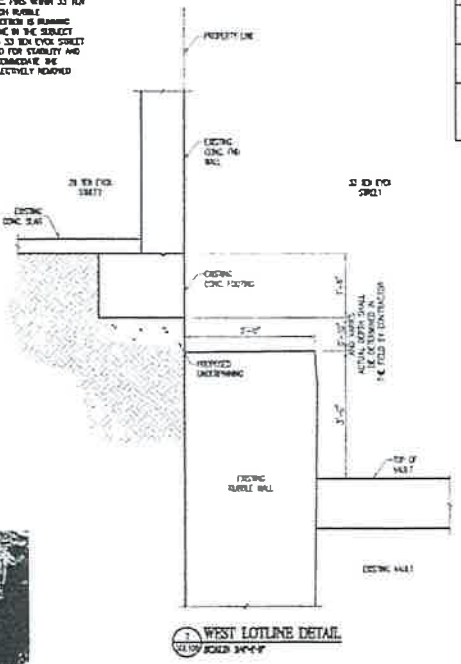


1 RAKER ANCHOR DETAIL
SCALE: 3/4"=1'-0"

TEST PIT SUMMARY

TEST PIT A REVEALED BOTTOM OF EXISTING RC FOOTING AT 12'-0" BELOW GRADE AND IN EXCELLENT CONDITION WITH 10" DEEP CONC. PIPS RECORDED.

TEST PIT B REVEALED BOTTOM OF EXISTING RC FOOTING AT 12'-0" BELOW GRADE AND IN EXCELLENT CONDITION WITH 10" DEEP CONC. PIPS WITHIN 33 TEN EYCK STREET SITE. A 3'-0" HIGH RUBBLE FOUNDATION WALL IN FAIR CONDITION IS RUNNING ALONG THE WEST PROPERTY LINE IN THE SUBJECT SITE. THE RUBBLE WALL ALONG 33 TEN EYCK STREET LOT LINE SHOULD BE INSPECTED FOR STABILITY AND SHOULD BE REINFORCED TO ACCOMMODATE THE PROPOSED FOUNDATION OR SELECTIVELY REMOVED



1 WEST LOTLINE DETAIL
SCALE: 3/4"=1'-0"

LADING SELECTION TABLE

SOIL TYPE	EXPOSED WALL HEIGHT HEIGHT (FT.)	MINIMUM THICKNESS OF NOMINAL CUT LAGGING FOR CLEAR SPANS OF:					
		5 FT.	6 FT.	7 FT.	8 FT.	9 FT.	10 FT.
A	0-25	2"-INCHES	3"-INCHES	3"-INCHES	3"-INCHES	4"-INCHES	4"-INCHES
	>25-40	3"-INCHES	3"-INCHES	3"-INCHES	4"-INCHES	4"-INCHES	5"-INCHES
B	0-25	3"-INCHES		3"-INCHES	4"-INCHES	4"-INCHES	5"-INCHES
	>25-40	3"-INCHES	3"-INCHES	4"-INCHES	4"-INCHES	5"-INCHES	5"-INCHES
C	0-15	3"-INCHES	3"-INCHES	4"-INCHES	5"-INCHES		
	>15-25	3"-INCHES	4"-INCHES	5"-INCHES	6"-INCHES		
	>25-35	4"-INCHES	5"-INCHES	6"-INCHES			

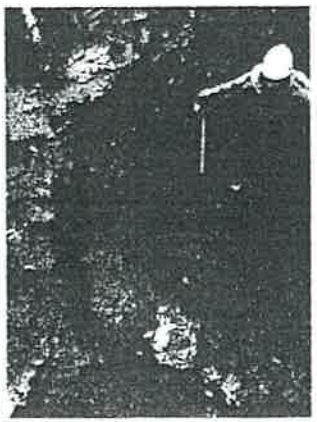
STAGING SEQUENCE FOR EXCAVATION & UNDERPINNING OF EXISTING BUILDING

STAGE 1 : EXCAVATION AND UNDERPINNING WEST CONC. WALL

1. EXCAVATE SITE DOWN 6'-0" FROM GRADE.
2. UNDERPIN ADJACENT CONCRETE FOOTING ALONG WEST PROPERTY LINE
3. INSTALL REMAINING SOLDIER PILE AT THE SOUTH (FRONT) OF THE SITE
4. REINFORCE WALER SPLICE LOCATIONS WITH ADEQUATE SHIM AND WELD
5. EXCAVATE APPROACH PIT TO UNDERPIN WEST EXTERIOR CONCRETE WALL APPROACH PITS WITH DEPTHS OF 3'-0" SHALL UTILIZE REGULAR PIT UNDERPINNING AND DEPTH WITH <3'-0" WOULD USE NON SHRINK GROUT WITH GRAVEL AS THE REPLACEMENT MATERIAL
6. INSTALL BRACED TIMBER APPROACH PIT
7. UNDERPIN CONC. FOOTING
8. DRY PACK JOINT BETWEEN FOOTING AND PC PIN
9. POUR 3000 PSI CONCRETE SLAB WITH #5 CROSS REINFORCEMENT

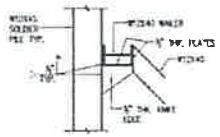
STAGE 2 : RAKER AND HEEL BLOCK CONSTRUCTION ON TOP OF VAULT

1. LEAVE APPROPRIATE AMOUNT OF SOIL (BERM) TO PROVIDE WALER (SOLDIER LOCKING) TEMPORARY BRACING
2. SAW CUT AND REMOVE 6 SQUARE HOLES (2'X2') ON TOP OF ALL 3 VAULTS
3. WELD AND FRAME C-CHANNEL AROUND ALL 2'X2' HOLE OPENING TO PREVENT CLOSE AFTER OPENING UP EACH HOLE ("C" CHANNEL SIZE BASED ON FIELD MEASUREMENT).
4. FILL GAPS BETWEEN "C" CHANNEL AND BRICKS WITH NON SHRINK GROUT
5. INSTALL FLOWABLE CONCRETE WITH BLOOM PUMP AND 4 INDIVIDUAL VIBRATORS AND 20 FOOT SHAFT CORE USING ALL HOLES TO PROVIDE EVEN FILLING FOR THE 1ST STAGE, APPROXIMATELY 3 FEET IN DEPTH FOR ALL 3 VAULTS
6. AFTER 1ST STAGE DRY AND COMPLETE (APPROX. 24 HOURS), INSTALL FLOWABLE CONCRETE WITH BLOOM PUMP AND 4 INDIVIDUAL VIBRATORS AND 20 FEET SHAFT CORE USING HOLES TO PROVIDE EVEN FILLING FOR THE 2ND STAGE, APPROX. 3 FEET IN DEPTH FOR ALL 3 VAULTS.
7. AFTER 2ND STAGE DRY AND COMPLETE (APPROX. 24 HOURS), INSTALL FLOWABLE CONCRETE WITH BLOOM PUMP AND 4 INDIVIDUAL VIBRATORS AND 20 FOOT SHAFT CORE USING HOLES TO PROVIDE EVEN FILLING FOR THE 3RD STAGE, APPROX. 3 FEET IN DEPTH FOR ALL 3 VAULTS.
8. AFTER 3RD STAGE DRY AND COMPLETE (APPROX. 24 HOURS), EXPOSE LARGER OPENING WITH EXCAVATOR /W BREAKER TO PROVIDE EASIER VISUAL AND WORKING SPACE TO POP OFF THE REMAINING USING BLOOM PUMP AND 4 INDIVIDUAL VIBRATORS AND 20 FEET SHAFT CORE CAVITY FOR ROCK FILLING TO ~15 FEET (DEPEND ON THE FIELD CONDITIONS AND REMAINING CAVITY)
9. MANUALLY CHIP OUT ALL EXISTING MUD SLAB ON TOP OF VAULT STRUCTURE WALL TO EXPOSE EXISTING BRICK VAULT PROFILE.
10. INSTALL MAT SLAB TO ALL NEW CONCRETE GRADE BEAM AREAS.
11. DEMOLISH ALL STEEL BRACING
12. INSTALL ALL CONCRETE GRADE BEAMS AND FOOTINGS.
13. INSTALL CONCRETE FOUNDATION WALL (NORTH, SOUTH AND WEST) AND COLUMN ON TOP OF VAULT AREA.
14. BACKFILL BETWEEN NORTH WALL AND BACKYARD.
15. BACKFILL BETWEEN SOUTH WALL AND SIDEWALK WITH EXISTING SITE SOIL.
16. WATERPROOF NORTH AND SOUTH FOUNDATION WALL
17. FULLY EXCAVATE REMAINING SOIL TO INSTALL MAT FOUNDATION FOOTING
18. INSTALL 6 TO 12 INCH BLUE STONE TO STABILIZE SOIL CONDITION FOR INSTALLATION OF MAT FOUNDATION FOOTING AND ELEVATOR PIT (DEPTH OF BLUE STONE TO BE DETERMINED BY SOIL CONDITION ON SITE)
19. INSTALL ALL REMAINING FOUNDATION WALLS AND COLUMNS
20. BACKFILL
21. INSTALL CONCRETE MAT FOOTING, CONCRETE ELEVATOR PIT FOOTING AND WALL, CONCRETE STRAP BEAM, CONCRETE SPREAD FOOTING AND CONCRETE WALLS AND COLUMNS (APPROX. 400CY TO 450CY)



TEST PIT A

TEST PIT B



WALER SUPPORT DETAIL
SCALE: 1/2"=1'-0"

THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ENGINEER. DO NOT SCALE THE DRAWING. THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION PURPOSES UNTIL SIGNED BY THE CONSULTANTS.

APPLICATION INFORMATION

Application filed in conjunction with NB Application #320262741

Scope of Work:
- SHORING
- UNDERPINNING
- SITE CLEARING & EXCAVATION

DOB JOB #

A	11-08-2021	SHORING ALLOWANCE
B	01-06-2022	UNDERPINNING CLARIFICATION
C	01-06-2022	SECOND STAGE UNDERPINNING BODY CLARIFICATION
D	01-06-2022	SECOND STAGE UNDERPINNING PLATES INCLUDED UPDATE
E	02-01-2022	SHORING UPDATE
F	02-01-2022	RAKER ANCHOR UPDATE
G	03-01-2022	SHORING UPDATE
H	03-01-2022	RAKER UPDATE
I	04-01-2022	ISSUED FOR CONSTRUCTION
No.	DATE	DESCRIPTION

ISSUED

TEN PARTNERS, LLC
200 Park Avenue, 11th Floor
New York, New York 10166

DEMERARA ENGINEERING, PLLC

YUCO BUILDERS, LLC
200 Park Avenue, 11th Floor
New York, New York 10166

33 Ten Eyck Street
Williamsburg, Brooklyn

GROUND MODIFICATION SOE REINFORCEMENT