

SUGAR HILL PROJECT

MANHATTAN, NEW YORK

Remedial Action Report

NYC VCP Number: 12CBCP031M

OER Project Number: 11RH-N124M

Restrictive Declaration

CEQR Number 10DCP031M

Sugar Hill Rezoning

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REMEDIAL ACTION REPORT

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LIST OF ACRONYMS

Acronym	Definition
CAMP	Community Air Monitoring Plan
DER-10	NYS DEC Division of Environmental Remediation Technical Guidance Manual 10
EC	Engineering Control
HASP	Health and Safety Plan
IC	Institutional Control
NYC VCP	New York City Voluntary Cleanup Program
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York City Department of Health and Mental Hygiene
NYC OER	New York City Office of Environmental Remediation
ORC	Oxygen Release Compound
PID	Photoionization Detector
QA/QC	Quality Assurance/Quality Control
QEP	Qualified Environmental Professional
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan
SCG	Standards, Criteria and Guidance
SCO	Soil Cleanup Objective
SMMP	Soil/Materials Management Plan
SMP	Site Management Plan
SVOCs	Semi-Volatile Organic Compounds
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

CERTIFICATION

I, Gilbert Gedeon, am currently a registered professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the Sugar Hill Project Site (NYC BCP Site No. 12CBC031M).

I, Joseph Cangiano, am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the Sugar Hill Site (NYC BCP Site No. 12CBC031M).

I certify that the OER-approved Remedial Action Work Plan dated December 15, 2011 and Stipulations in a letter dated February 2, 2012 were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

Gilbert Gedeon

Name

075399

PE License Number

Signature

6/11/14

Date



Joseph Cangiano

QEP Name

QEP Signature

6/11/14

Date

EXECUTIVE SUMMARY

Site Location and Prior Usage

The Site is located in the Sugar Hill section of Manhattan, New York and is identified as Block number 2069 and Lot(s) number(s) 21 on the New York City Tax Map. Figure 2 is a Site location map. The Site is 0.50-acres (21,685-square feet) and is bounded by West 155th Street and a park to the north, a DEP building and six-story residence to the south, a gasoline station and St. Nicholas Place to the east. The Site was previously used as a parking garage and contained a two-story building with a cellar. The building encompassed the entire lot.

Summary of Redevelopment Plan

The Site was redeveloped into an approximate 169,333-square foot 13-story mixed-use building with 124 residential units constructed on Lot 21. The residential units are located on floors 3 through 13. A Children's Museum, Day Care Center and not-for-profit offices are located on the lower floors. The building also has a below-grade accessory parking garage capable of accommodating up to 114 parking spaces. The residential units comprise 121,483 square feet (sf.), and all of the units are affordable housing units for low income tenants. The Children's Museum encompasses part of the first and second floors and measures 16,234 sf. The Day Care Center is also located on the second floor and measures 9,838 sf. The not-for-profit Offices are located on the first floor and measure approximately 4,343 sf. Accessory offices for residential use are provided on the 9th floor of the building and measure 4,465 sf. The redevelopment activities included the excavation of all soils to bedrock. The estimated amount of soil removed and disposed of off-site was 4,918.5 tons (3,279 cubic yards [yd³]) and the amount of bedrock removed and disposed of off-site was 1,395 tons (930 yd³). The depth of excavation was as follows: 27 feet in the northeast corner, 9 feet in the northwest corner, 9 feet in the southeast corner, and 33 feet in the southwest corner. The former on-Site parking garage building was demolished to facilitate the construction of the new Site building.

The remedial activities described in this RAR were implemented independently of the proposed redevelopment plan.

Summary of Past Uses of Site

Based on a Fire Insurance Maps review, the site was depicted with a garage and dwelling from 1909. The existing building was built in 1929 and the structural outlay had remained unchanged till present day.

Summary of Environmental Findings

1. Elevation of the property ranges from 133.5 (northwest corner) to 108 feet (southwest corner).
2. Geotechnical investigation (Tectonic, May 2010) reported depth to groundwater ranging from 3.5 feet below ground surface (bgs) in the northern portion of the basement to 5.2 feet bgs in the southeastern portion of basement.
3. Presumed groundwater flow is generally from west to east beneath the Site.
4. Depth to bedrock is very shallow and generally from 1 to 3 feet below the surface of the building slab through most of the site and ranges from approximately 1 foot bgs in the western portion of the basement to 9 to 14 feet bgs in the southeastern portion of the basement.
5. The stratigraphy of the site, from the surface down, consists of brown coarse to fine sand with trace gravel with minor amounts of debris including brick and concrete in some locations, underlain by a thin veneer of weathered rock and competent bedrock.
6. Possible environmental conditions identified during the Phase 1 consisting of buried gasoline tanks were investigated using two geophysical methods and soil borings. Geophysical methods did not reveal anomalies indicative of USTs and soil borings showed bedrock at a depth of 1 foot below the building slab in this area. Based on these results, tanks were not believed to be present on this site.
7. Soil/fill samples collected during the Phase II ESI showed semi-volatile organic compounds (SVOCs) detected at concentrations exceeding NYSDEC Subpart 375-6: Remedial Program Track 1 Unrestricted Use Soil Cleanup Objectives (SCOs) and Track 2 Restricted Use-Protection of Public Health-Residential (Restricted-Residential) SCOs. SVOC consist of PAH compounds and are found in two of eight samples and exceed Track 2 SCOs in only one shallow sample and thus were the only exceedence of Track 2 SCOs in this soil sampling program. The presence of SVOCs is believed to be

associated with fill material. Soil samples from this property detected no pesticides or PCBs in any sample. Only one VOC, toluene, was observed in one soil sample at very low concentrations and well below Track 1 Unrestricted Use SCOs. Most heavy metals were below Track 1 SCOs, however, five metals (copper, lead, mercury, nickel and zinc) exceeded Track 1 in no more than two soil samples each. No metals exceeded Track 2 Restricted Residential SCOs. Overall, soil results showed a relatively clean property with no evidence of a soil staining, grossly contaminated soil or any contaminant source area and exhibited only minor evidence of historical fill material. Though originally planned, relatively few deep soil samples were collected because of the presence of competent rock below 1-3 feet depths.

8. Groundwater sampling was performed in March 2012 and samples were analyzed for several parameters including Volatile Organic Compounds (VOCs), Semi-volatile Organic Compounds (SVOCs), metals (total and dissolved), pesticides, and Polychlorinated Biphenyls (PCBs). Results of the groundwater sampling analysis revealed no pesticides or PCBs detected and no VOCs detected above Groundwater Quality Standards (GQS). Highest VOCs were below 10 ppb and were for acetone and methylene chloride and were both also identified in laboratory blank samples, suggesting a lab artifact origin. One SVOC was detected in one sample (7 ppb) marginally above applicable GQS (5 ppb). The compound is a common plasticizer and was also identified in a field equipment blank, suggesting a field sampling equipment origin. Dissolved exceedances for sodium, magnesium, and selenium were likely attributable to road salt and naturally occurring lithological constituents and not indicative of an environmental condition originating on the site.
9. A sub-soil gas survey was conducted in March 2012 to determine potential concentrations of VOCs in sub-slab soil gas. The sub-slab soil gas sampling program was performed in accordance with appropriate regulatory guidance and requirements. Four (4) sub-slab test points were installed and sampled. The four (4) samples were analyzed for VOCs by United States Environmental Protection Agency (USEPA) Method TO-15. Overall soil gas concentrations were low. Results indicated the detection of 15 VOCs in one or more soil gas samples, with highest concentrations found for acetone (180 ug/m³) while all other results were below 10 ug/m³. Acetone is a common lab reagent and was identified in lab blanks for other media. PCE was found in 3 of 4 samples, with a maximum concentration of 3.4 ug/m³, well below the guidance value of 100. TCE, carbon tetrachloride and 1,1,1-TCA were not detected. No VOCs were detected above NYS DOH guidance levels.

Three AOCs were identified for this site and include:

1. AOC in the Northwest corner for suspected 275-gallon lube oil tank;
2. AOC in the middle of the site for former/suspected gasoline tanks;

3. AOC in the Southeast corner for observed concrete staining;

Summary of the Remedial Action

A general summary of the timing of the Remedial Action is as follows:

- A Pre-Application Meeting was held on September 22, 2011.
- A Remedial Investigation (RI) was performed and a Remedial Investigation Report was prepared in December, 2011.
- A Remedial Action Work Plan (RAWP) was prepared in December, 2011.
- An Application Fact Sheet was released announcing a 30-day public comment period on the RAWP was released on December 14, 2011.
- The RAWP and Stipulation List dated February 15, 2012 was approved by the New York City Office of Environmental Remediation on February 24, 2012.
- A Pre-Construction Meeting was held on March 23, 2012.
- A Fact Sheet providing notice of the start of the Remedial Action was issued on March 26, 2012.
- Remedial Action was begun in August, 2012 and completed in November, 2012.

The following Remedial Actions were completed in this program:

1. Prepared a Community Protection Statement and implemented a Citizen Participation Plan.
2. Performed a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Established Track 1 Soil Cleanup Objectives (SCO's). Achieved Track 1 SCOs during this remedial action.
4. Soil/fill was excavated to bedrock across the site and bedrock was excavated to a depth of 5 feet throughout the majority of the site. The excavation depth ranged from 9 feet in the Northwest and Southeast corners of the property to 33 feet in the Southwest corner. A total of approximately 3,279 cubic yards (4,918 tons) of fill material and 930 cubic yards of bedrock (1,390 tons) was excavated from the site for off-site disposal. Soil/fill was disposed at the following facility:

- a. 6,300 tons (contaminated non-hazardous soil/fill/rock) was disposed of at the Secaucus Brownsfield Redevelopment, LLC, Malanka Landfill Facility in Secaucus, New Jersey.
5. Removed four (4) 550-gallon gasoline underground storage tanks and remediated petroleum contaminated soil/fill in compliance with applicable laws and regulations.
6. All excavated soil/fill material was screened during intrusive work for indications of contamination by visual means, odor, and monitoring with a photoionization detector (PID).
7. Sampled and analyzed excavated media as required by disposal facilities. Appropriately segregated excavated media onsite prior to disposal.
8. Transported and disposed all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and the RAWP.
9. As part of development, constructed an engineered Composite Cover System consisting of approximately 6 inches of $\frac{3}{4}$ clean stone placed on top exposed bedrock overlain by the vapor barrier system underlain by a reinforced concrete slab poured over the entire property footprint.
10. As part of development, installed a Vapor Barrier System that consisted of the placement of 15 mil Stego Wrap Class A Vapor retarder on the entire foot print of the site including support columns. All seams were overlapped a minimum of 6 inches and sealed with a Stego Tape, all penetrations were sealed with a combination of Stego Wrap and Stego Tape. The contractor for construction of the Vapor Barrier System was Time Square Construction.
11. Imported approximately 600 tons of clean stone material for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
12. Performed all activities required for the Remedial Action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
13. Submitted a Sustainability Report.

14. Submitted an RAR that describes the Remedial Action; certifies that the remedial requirements defined in the RAWP have been achieved; defines the Site boundaries; and lists any changes from this RAWP.

1.0 REMEDIAL ACTION REPORT

The Remedial Actions were performed pursuant to the OER-approved RAWP in a manner that has rendered the property protective of public health and the environment consistent with its intended use. This RAR describes the remedial action performed under the RAWP. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 SITE BACKGROUND

Broadway Housing Development Fund Company has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 400-414 West 155th Street, New York, NY 10032 in the Sugar Hill section of Manhattan, New York. The boundary of the property subject to this Remedial Action is shown in Figure 1 and include, in their entirety, Manhattan Block 2069 and Lot 21.

1.2 SITE LOCATION AND PRIOR USAGE

The Site is located in the Sugar Hill section of Manhattan, New York and is identified as Block number 2069 and Lot number 21 on the New York City Tax Map. Figure 2 is a Site location map. The Site is 0.50-acres (21,685-square feet) and is bounded by West 155th Street and a park to the north, a DEP building and six-story residence to the south, a gasoline station and St. Nicholas Place to the east. The Site was previously used as a parking garage and contained a two-story building with a cellar. The building encompassed the entire lot.

1.3 REDEVELOPMENT PLAN

An approximate 169,333-square foot 13-story mixed-use building with 124 residential units was constructed on Lot 21. The building includes 124 residential units located on floors 3 through 13, a Children's Museum and a Day Care Center, along with

non-for-profit offices on the lower floors, as well as a below-grade accessory parking garage being able to accommodate up to 114 parking spaces. The residential units comprise 121,483 square feet (sf), and all of the units are affordable housing units for low income tenants. The Children's Museum is spread out over the first and second floor and measures 16,234 sf, the Day Care Center measures 9,838 sf. and is located on the second floor. The 4,343 sf non-for-profit Offices are located on the first floor. Accessory offices to the residential use will be provided on the 9th floor of the building measuring 4,465 sf. The proposed redevelopment activities included the excavation of all soils to bedrock. The estimated amount of soil removed and disposed of off-site was 4,918.5 tons (3,279 cubic yards [yd³]) and the amount of bedrock removed and disposed of off-site was 1,395 tons (930 yd³). The depth of excavation was as follows: 27 feet in the northeast corner, 9 feet in the northwest corner, 9 feet in the southeast corner, and 33 feet in the southwest corner. The former on-Site parking garage building was demolished to facilitate the construction of the proposed Site building.

Layout of the proposed site development is presented in Figure 3.

The remedial activities described in this RAR were implemented independently of the proposed redevelopment plan.

1.4 DESCRIPTION OF SURROUNDING PROPERTY

The surrounding adjacent properties to the north consists of a 3-story public school, a 2-story store, a vacant lot and a park; to the east consists of gasoline station and St. Nicholas Place; to the south consists of a former garage/DEP building and six-story residence; and a former garage/DEP building, a parking lot, St. Nicholas Avenue and low-rise residences. The general character of the neighborhood is primarily residential, commercial, retail, and institutional buildings, recreational properties and parks.

1.5 REMEDIAL INVESTIGATION / PHASE II ENVIRONMENTAL SITE INVESTIGATION

An investigation was performed and the results are documented in a companion document called “*Phase II Environmental Site Investigation, 414 West 155th Street, Block 2069, Lot 21, New York, New York 10032, DEP Project #10DCP031M / 10DEPTECH074M,*”, dated November 18th, 2010 (Phase II ESI).

1. Elevation of the property ranges from 133.5 (northwest corner) to 108 feet (southwest corner).
2. Geotechnical investigation (Tectonic, May 2010) reported depth to groundwater ranging from 3.5 feet below ground surface (bgs) in the northern portion of the basement to 5.2 feet bgs in the southeastern portion of basement.
3. Presumed groundwater flow is generally from west to east beneath the Site.
4. Depth to bedrock is very shallow and generally from 1 to 3 feet below the surface of the building slab through most of the site and ranges from approximately 1 foot bgs in the western portion of the basement to 9 to 14 feet bgs in the southeastern portion of the basement.
5. The stratigraphy of the site, from the surface down, consists of brown coarse to fine sand with trace gravel with minor amounts of debris including brick and concrete in some locations, underlain by a thin veneer of weathered rock and competent bedrock.
6. Possible environmental conditions identified during the Phase 1 consisting of buried gasoline tanks were investigated using two geophysical methods and soil borings. Geophysical methods did not reveal anomalies indicative of USTs and soil borings showed bedrock at a depth of 1 foot below the building slab in this area. Based on these results, tanks were not believed to be present on this site.
7. Soil/fill samples collected during the Phase II ESI showed semi-volatile organic compounds (SVOCs) detected at concentrations exceeding NYSDEC Subpart 375-6: Remedial Program Track 1 Unrestricted Use Soil Cleanup Objectives (SCOs) and Track 2 Restricted Use-Protection of Public Health-Residential (Restricted-Residential) SCOs. SVOC consist of PAH compounds and are found in two of eight samples and exceed Track 2 SCOs in only one shallow sample and thus were the only exceedence of Track 2 SCOs in this soil sampling program. The presence of SVOCs is believed to be associated with fill material. Soil samples from this property detected no pesticides or PCBs in any sample. Only one VOC, toluene, was observed in one soil sample at very low concentrations and well below Track 1 Unrestricted Use SCOs. Most heavy metals were below Track 1 SCOs, however, five metals (copper, lead, mercury, nickel and zinc) exceeded Track 1 in no more than two soil samples each. No metals exceeded

- Track 2 Restricted Residential SCOs. Overall, soil results showed a relatively clean property with no evidence of a soil staining, grossly contaminated soil or any contaminant source area and exhibited only minor evidence of historical fill material. The Phase II soil sampling results are presented in Appendix 2. Though originally planned, relatively few deep soil samples were collected because of the presence of competent rock below 1-3 feet depths. Additional waste characterization soil sampling was conducted in April of 2012. The waste characterization sampling results are presented in Appendix 5 “Material Sampling Letter Report”.
8. Groundwater sampling was performed in March 2012 and samples were analyzed for several parameters including Volatile Organic Compounds (VOCs), Semi-volatile Organic Compounds (SVOCs), metals (total and dissolved), pesticides, and Polychlorinated Biphenyls (PCBs). Results of the groundwater sampling analysis revealed no pesticides or PCBs detected and no VOCs detected above Groundwater Quality Standards (GQS). Highest VOCs were below 10 ppb and were for acetone and methylene chloride and were both also identified in laboratory blank samples, suggesting a lab artifact origin. One SVOC was detected in one sample (7 ppb) marginally above GQS (5 ppb). The compound is a common plasticizer and was also identified in a field equipment blank, suggesting a field sampling equipment origin. Dissolved exceedances for sodium, magnesium, and selenium were likely attributable to road salt and naturally occurring lithological constituents and not indicative of an environmental condition originating on the site.
 9. A sub-soil gas survey was conducted in March 2012 to determine potential concentrations of VOCs in sub-slab soil gas. The sub-slab soil gas sampling program was performed in accordance with appropriate regulatory guidance and requirements. Four (4) sub-slab test points were installed and sampled. The four (4) samples were analyzed for VOCs by United States Environmental Protection Agency (USEPA) Method TO-15. Overall soil gas concentrations were low. Results indicated the detection of 15 VOCs in one or more soil gas samples, with highest concentrations found for acetone (180 ug/m³) while all other results were below 10 ug/m³. Acetone is a common lab reagent and was identified in lab blanks for other media. PCE was found in 3 of 4 samples, with a maximum concentration of 3.4 ug/m³, well below the guidance value of 100. TCE, carbon tetrachloride and 1,1,1-TCA were not detected. No VOCs were detected above NYS DOH guidance levels.
 10. Information from the approved Phase II ESI was presented in the December 2011 Remedial Investigation Report (RIR).

2.0 DESCRIPTION OF REMEDIAL ACTIONS

The Remedial Action was performed pursuant to the OER-approved RAWP in a manner that has rendered the property protective of public health and the environment consistent with its intended use. This RAR describes the remedial action performed under the RAWP. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

The remedial action was evaluated in an alternatives analysis and was determined to be protective of human health and the environment, compliant with standards, criteria, and guidelines (SCGs), effective in the short-term, effective in the long-term, capable of attaining appropriate levels of reduction of toxicity, mobility, or volume of contaminated material, implementable, cost effective, acceptable to the community, consistent with land uses, and sustainable.

A general summary of the Remedial Action is as follows:

- A Pre-Application Meeting was held on September 22, 2011.
- A Remedial Investigation (RI) was performed and a Remedial Investigation Report was prepared in December, 2011.
- A Remedial Action Work Plan (RAWP) was prepared in December, 2011.
- An Application Fact Sheet was released announcing a 30-day public comment period on the RAWP was released on December 14, 2011 .
- The RAWP and Stipulation List dated February 15, 2012 was approved by the New York City Office of Environmental Remediation on February 24, 2012.
- A Pre-Construction Meeting was held on March 23, 2012.
- A Fact Sheet providing notice of the start of the Remedial Action was issued on March 26, 2012.
- Remedial Action was begun in August, 2012 and completed in November, 2012.

The following Remedial Actions were completed in this program:

1. Prepared a Community Protection Statement and implemented a Citizen Participation Plan.
2. Performed a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Established Track 1 Soil Cleanup Objectives (SCO's). Achieved Track 1 SCOs during this remedial action.
4. Soil/fill was excavated to bedrock across the site and bedrock was excavated to a depth of 5 feet throughout the majority of the site. The excavation depth ranged from 9 feet in the Northwest and Southeast corners of the property to 33 feet in the Southwest corner. A total of approximately 3,279 cubic yards (4,918 tons) of fill material and 930 cubic yards of bedrock (1,390 tons) was excavated from the site for off-site disposal. Soil/fill was disposed at the following facility:
 - b. 6,300 tons (contaminated non-hazardous soil/fill/rock) was disposed of at the Secaucus Brownfield Redevelopment, LLC, Malanka Landfill Facility in Secaucus, New Jersey.
5. Removed four (4) 550-gallon gasoline underground storage tanks and remediated petroleum contaminated soil/fill in compliance with applicable laws and regulations.
6. All excavated soil/fill material was screened during intrusive work for indications of contamination by visual means, odor, and monitoring with a photoionization detector (PID).
7. Sampled and analyzed excavated media as required by disposal facilities. Appropriately segregated excavated media onsite prior to disposal.
8. Transported and disposed all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and the RAWP.
9. As part of development, constructed an engineered Composite Cover System consisting of approximately 6 inches of $\frac{3}{4}$ clean stone placed on top exposed

bedrock overlain by the vapor barrier system underlain by a reinforced concrete slab poured over the entire property footprint.

10. As part of development, installed a Vapor Barrier System that consisted of the placement of 15 mil Stego Wrap Class A Vapor retarder on the entire footprint of the site including support columns. All seams were overlapped a minimum of 6 inches and sealed with a Stego Tape, all penetrations were sealed with a combination of Stego Wrap and Stego Tape. The contractor for construction of the Vapor Barrier System was Time Square Construction.
11. Imported approximately 600 tons of clean stone material for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
12. Performed all activities required for the Remedial Action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
13. Submitted a Sustainability Report.
14. Submitted an RAR that describes the Remedial Action; certifies that the remedial requirements defined in the RAWP have been achieved; defines the Site boundaries; and lists any changes from this RAWP.

3.0 COMPLIANCE WITH REMEDIAL ACTION WORK PLAN

3.1 HEALTH & SAFETY PLAN

The remedial construction activities performed under this program were in compliance with the Health and Safety Plan and applicable laws and regulations. The Site Safety Coordinator was Joseph Albino of Homeland Security.

3.2 COMMUNITY AIR MONITORING PLAN

The Community Air Monitoring Plan provided for the collection and analysis of air samples during remedial construction activities to ensure proper protections were employed to protect workers and the neighboring community. Monitoring was performed in compliance with the Community Air Monitoring Plan in the approved RAWP.

3.3 SOIL/MATERIALS MANAGEMENT PLAN

The Soil/Materials Management Plan provided detailed plans for managing all soil/materials that were disturbed at the Site, including excavation, handling, storage, transport and disposal. It also included a series of controls to assure effective, nuisance free remedial activity in compliance with applicable laws and regulations. Remedial construction activities performed under this program were in compliance with the SMMP in the approved RAWP.

3.4 STORM-WATER POLLUTION PREVENTION

Storm water pollution prevention included physical methods and processes to control and/or divert surface water flows and to limit the potential for erosion and migration of Site soils, via wind or water. Remedial construction activities performed under this program were in full compliance with methods and processes defined in the RAWP for storm water prevention and applicable laws and regulations.

3.5 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

There were no deviations from the Remedial Action Work Plan.

4.0 REMEDIAL PROGRAM

4.1 PROJECT ORGANIZATION

Principal personnel who participated in the remedial action include Messrs. Matthew Mankovich, Senior Project Manager of ATC, Jed A. Myers, Ph.D., Senior Project Manager, and John Mascioli, M.S., Project Manager of ATC. The aforementioned personnel provided oversight and consultation regarding the remedial action. Messrs. Robert Harrington, CIH, Senior Project Manager of ATC and Michael Donovan, CIH, Senior Project Manager of ATC provided consultation regarding the CAMP. Messrs. Keith Da Rocha performed air and particulate monitoring during construction phase. The Professional Engineer (PE) for this project was Mr. Gilbert Gedeon, P.E., Division Manager of ATC.

4.2 SITE CONTROLS

Site Preparation

Various activities were performed to prepare the Site prior to mobilization including the following:

- Mobilization;
- Grubbing, fencing, truck wash construction, stabilized construction entrance;
- Erosion and sedimentation controls;
- Utility marker layouts and easement layouts; and
- Acquisition of agency approvals and permits.

Mobilization

Mobilizations were conducted as necessary for each phase of work at the Site. This included field person orientation, equipment mobilization (including all sampling equipment needed for the field investigation), marking and staking sampling locations and utility mark-outs. In addition, field team orientation meetings were held as necessary to familiarize file personnel with the general operations at the Site, health and safety

requirements, and to review field procedures. In addition, an OER Project Notice was erected at the project entrance and was in place during all phases of the Remedial Action.

Grubbing, Fencing, Truck Wash Construction & Stabilized Construction Entrance

Other site preparation initial activities included the performance of grubbing as necessary, installation of fencing around the Site to restrict access, establishment of a stabilized construction entrance.

Erosion and Sediment Controls

Appropriate soil erosion and sediment controls were installed at the Site as necessary to prevent the migration of on-Site soils from the Site. Silt fencing and truck inspection station also served to control and restrict the off-Site movement of soil and sediment from the Site.

Utility Marker Layouts and Easement Layouts

The presence of utilities and easements was thoroughly investigated prior to the performance of invasive activities such as excavation and drilling. The One-Call System was utilized for utility mark-out, and several safety procedures were implemented such as maintaining safe distances from overhead power lines and drill rig masts.

Acquisition of Agency Approvals and Permits

Necessary city agency approvals and permits were secured prior to mobilizing to the Site.

Soil Screening

Soil screening techniques including visual observations, olfactory senses and the use of a photoionization detector (PID) were employed throughout the duration of the project. Potentially contaminated soils, if encountered were segregated and staged separately on-site pending waste classification sampling and analysis. The results of the soil screening activities indicated no visibly contaminated, or soils with elevated PID readings were encountered during the soil excavation phase.

Stockpile Management

Excavated soils were removed from the site as quickly as possible in an effort to eliminate the potential migration of soils from the site. When required, excavated soils were stockpiled on a minimum of 2 layers of 8-mil plastic sheeting and stockpiled only in the designated stockpile areas of the site. Soil stockpiles were covered at all times with heavy tarps and anchored appropriately. The stockpiles were inspected routinely for ripped tarps and loose anchors which were replaced promptly.

Truck Inspection

A truck inspection station was set-up close to the Site exit so that trucks leaving the Site could be examined for evidence of contaminated soil on the undercarriage, body, and wheels. Every truck was routed through the designated truck wash area for inspection prior to leaving. Any loose dirt, dust and debris were removed from the truck body and tires to avoid the tracking of unwanted materials from the site. A truck log was completed daily identifying the arrival and departure time of each vehicle.

Site Security

Site access was controlled by gated entrances to the fenced property. A security guard maintained a daily sign log to record visitors to the site.

Nuisance Controls

Dust and odor controls were implemented throughout the duration of the remedial activities at the site. Odor controls included limiting the areas of open excavations, shrouding open excavations with tarps and other covers and the use of foam, if necessary. Dust control measures were implemented during invasive work conducted at the site. Dust control measures included the use of dedicated water sprayers for roadways, open excavations and stockpiles. Other measures included maintaining stockpile tarps and anchors and the placement of gravel or recycled concrete aggregate on roadways to provide a dust free surface. All complaints from citizens were promptly reported to OER as well as reported on the daily reports.

Reporting

All daily and monthly reports are included in Appendix number 1. Digital photographs of the Remedial Action are included as part of the daily reports in Appendix number 1.

4.3 MATERIALS EXCAVATION AND REMOVAL

Soil/fill was excavated to bedrock across the site and bedrock was excavated to a depth of 5 feet throughout the majority of the property. The excavation depths were approximately 9 feet in the Northwest and Southeast corners of the property, to 27 feet in the Northeast corner and to 33 feet in the Southwest corner of the property. A total volume of approximately 3,279 cubic yards (4,918 tons) of fill material and 930 cubic yards of bedrock (1,390 tons) was excavated from the site for off-site disposal. Excavated soil was temporarily stockpiled in the pre-determined stockpile area pending loading and off-site disposition. An ATC technician performed air and particulate perimeter monitoring and maintained strict adherence to the site specific Health and Safety Plan through-out the duration of the remediation activities. All transport vehicles entering the site were inspected for proper permits. All transport vehicles leaving the site were routed to the truck washing area and cleaned of loose dirt and debris. A map showing the location where excavations were performed is shown in Figure 4.

End Point Sample Results

Since all fill material was removed to the bedrock across the entire site footprint no endpoint sampling was required.

UST Removals

The remedial actions also included the removal four (4) 550-gallon gasoline underground storage tanks (USTs) discovered during the soil excavation activities. The USTs were of steel construction and measured 3.5 feet in diameter and 7.5 feet in length with a 550 gallon capacity. The USTs were removed from the ground on August 10, 2012, and temporarily staged on-site pending cleaning in preparation for recycling. No

visible evidence of contamination was observed during the UST removals. Documentation from Action Remediation, Inc. (Certificate #62365598), dated September 7, 2102 states that the four (4) USTs were pumped and cleaned of all products and bottom sludge, made vapor free, and removed as per New York City rules and regulations. The USTs were cleaned by Clean Venture, Inc., (CVI) of Elizabeth, New Jersey. Prior to tank entry and cleaning, CVI completed confined space entry permits. The residual tank bottoms and tank cleaning waste materials were transported to the Cycle Chem facility (EPA ID No. NJD002200046) in Elizabeth, New Jersey, for disposal as a gasoline waste. Locations of the four (4) former USTs on the Site are depicted in Figure 13 and the UST Closure documentation is included in Appendix 6.

4.4 MATERIALS DISPOSAL

All soils and bedrock material excavated from the site was managed as regulated material based upon the Phase II sampling data and the additional material sampling conducted in April 2012. This data was provided to several waste disposal facilities and approved for disposal by Secaucus Brownfields Redevelopment LLC., at the Malanka Landfill Facility in Secaucus, New Jersey. The soil removal phase of the project commenced in June of 2012 and was completed in November 2012.

The material type, quantity and disposal location of material removed and disposed off-Site are presented in Table 1.

Letters from Broadway Housing Development Fund Company to disposal facility providing materials type, source and data, and acceptance letters from disposal facility stating it is approved to accept above materials are attached in Appendix number 2. Manifests are included in Appendix number 3. Characterization sample results are presented in Table number 2.

4.5 BACKFILL IMPORT

Approximately 600 cubic yards of clean stone was imported to the site from New York Sand and Stone, LLC located at 63 flushing Avenue in Brooklyn, New York. A copy of the Testing Report from Universal Testing and Inspection Services is included as Appendix 4. The clean stone was placed across the entire excavation boundary below the concrete slab and vapor barrier. Backfill material quantity and source data are presented in Table 2.

A map showing backfill placement locations at the Site is shown in Figure number 6.

5.0 ENGINEERING CONTROLS

A Track 1 Remedial Action was achieved and Engineering Controls are not required. However, as part of construction, several protective systems were installed. These are:

Composite Cover System/Vapor Barrier System

As part of development, constructed an engineered Composite Cover System consisting of approximately 6 inches of $\frac{3}{4}$ clean stone placed on top exposed bedrock overlain by the vapor barrier system underlain by a reinforced concrete slab poured over the entire property footprint.

Vapor Barrier System

As part of development, a Vapor Barrier System was built on the Site. This Vapor Barrier System consists of the placement of 15 mil Stego Wrap Class A Vapor barrier manufactured by Stego Industries, LLC. The vapor barrier was installed beneath the concrete slab of the cellar, parking garage and along the subsurface walls of both the cellar and parking garage. Seams and penetrations were sealed with Stego Tape or other authorized Stego accessories. The installation was performed by Time Square Construction in accordance with ASTM E1643-10 and the manufacturers' specification.

Figure 5 depicts the general layout of the vapor barrier and figures 7 through 12 depict the vapor barrier system detail. Photographs of installation of the Vapor Barrier System are included in Appendix 1.

6.0 INSTITUTIONAL CONTROLS

A Track 1 Remedial Action was achieved in the Remedial Action and Engineering Controls and Institutional Controls are not required.

7.0 SITE MANAGEMENT PLAN

A Track 1 Remedial Action was achieved and Site Management is not required.

8.0 SUSTAINABILITY REPORT

This Remedial Action Report provides for sustainable remediation and redevelopment through a variety of means that are defined in this Sustainability Report.

Reduced Energy Consumption and Promotion of Greater Energy Efficiency.

Reduced energy consumption lowers greenhouse gas emissions, improves local air quality, lessens in-city power generation requirements, can lower traffic congestion, and provides substantial cost savings.

During the course of the project, the staging of trucks was carefully coordinated to minimize demurrage time which resulted in reduced emissions from the idling trucks.

Recontamination Control. Recontamination after cleanup and redevelopment is completed undermines the value of work performed, may result in a property that is less protective of public health or the environment, and may necessitate additional cleanup work later that could impede future redevelopment. Recontamination can arise from future releases that occur within the property or by influx of existing contamination from off-Site.

In order to eliminate or minimize the potential for recontamination of the Site, as part of the redevelopment, an extensive waterproofing/vapor barrier system was installed beneath the entire building slab (169,333-square foot 13-story) mixed-use building. Specifically, a concrete slab was installed across the entire Site (21,780 square-feet or approximately 0.5 acres) coupled with the installation of a vapor/waterproofing membrane (a 15-mil vapor barrier, Stego® Wrap Vapor Barrier, manufactured by Stego

Industries, LLC) was installed beneath the concrete foundation and foundation wall surfaces. In addition, the redevelopment design incorporated the installation and operation of a ventilated parking garage according to NYC Building Code at the base level of the new building.

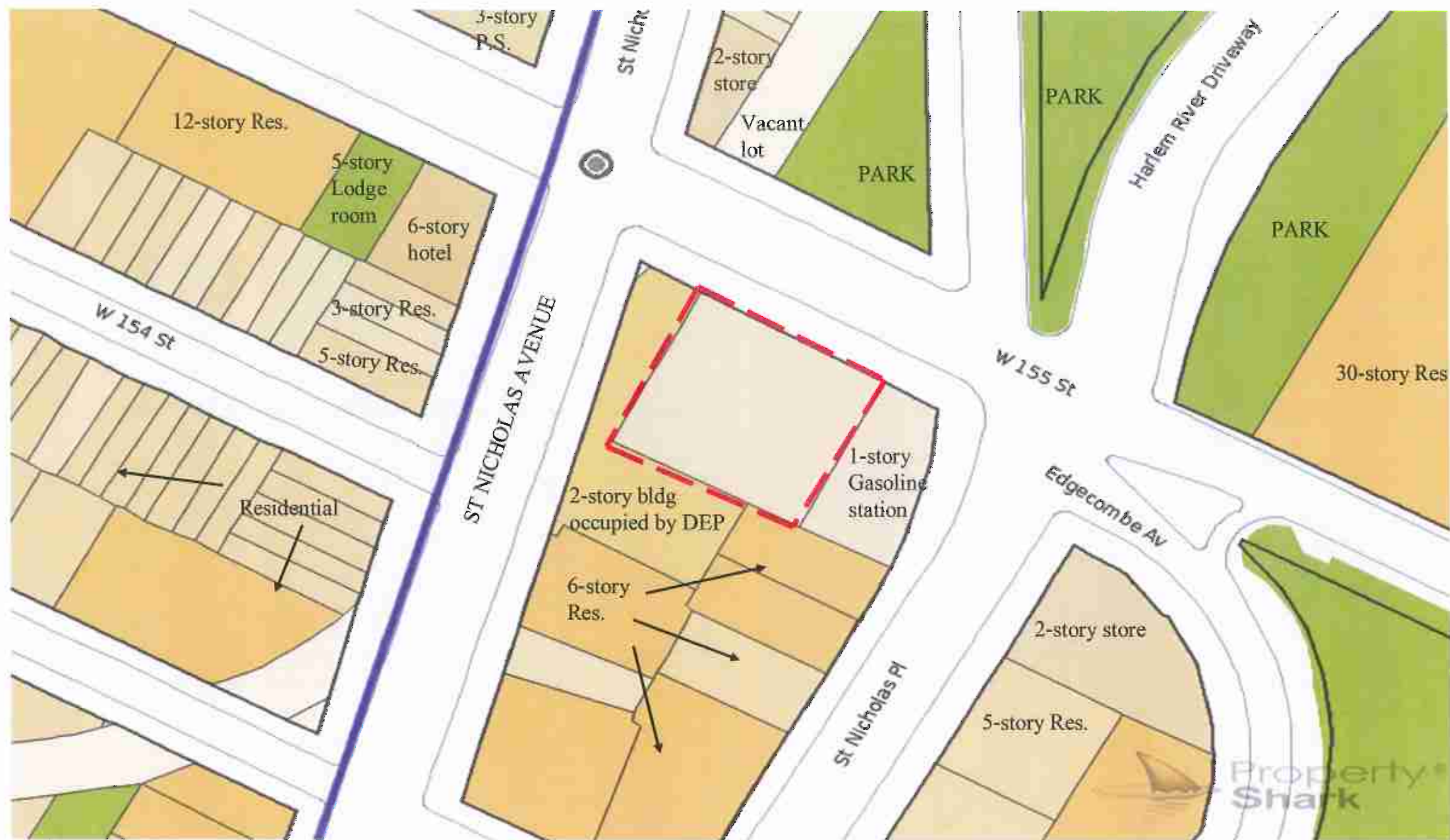
In summary, the area of the Site that utilizes recontamination controls under this plan is 100% of the Site or 21,780 sf.

Paperless Brownfield Cleanup Program. The Sugar Hill Redevelopment Project is a participant in OER's Paperless Voluntary Cleanup Program. Under this program, submission of electronic documents replaced submission of hard copies for the review of project documents, communications and milestone reports. A best estimate of the mass (pounds) of paper saved under this plan is estimated to be approximately 25 pounds of paper

Low-Energy Project Management Program. The Sugar Hill Redevelopment Project participated in OER's low-energy project management program. Under this program, whenever possible, meetings were held using remote communication technologies, such as videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation. A gross estimate of the number of miles of personal transportation that was conserved in this process is approximately 300 miles of transportation.


Trees and Plantings. Trees and other plantings provide habitat and add to NYC's environmental quality in a wide variety of ways. Native plant species and native habitat provide optimal support to local fauna, promote local biodiversity, and require less maintenance.

FIGURES



CLIENT:
Broadway Housing Development Fund
 583 RIVERSIDE DRIVE, 7TH FLOOR
 NEW YORK, NY 10031

SITE ADDRESS:
SUGER HILL PROJECT
 400-414 WEST 155TH STREET
 NEW YORK, NY 10032

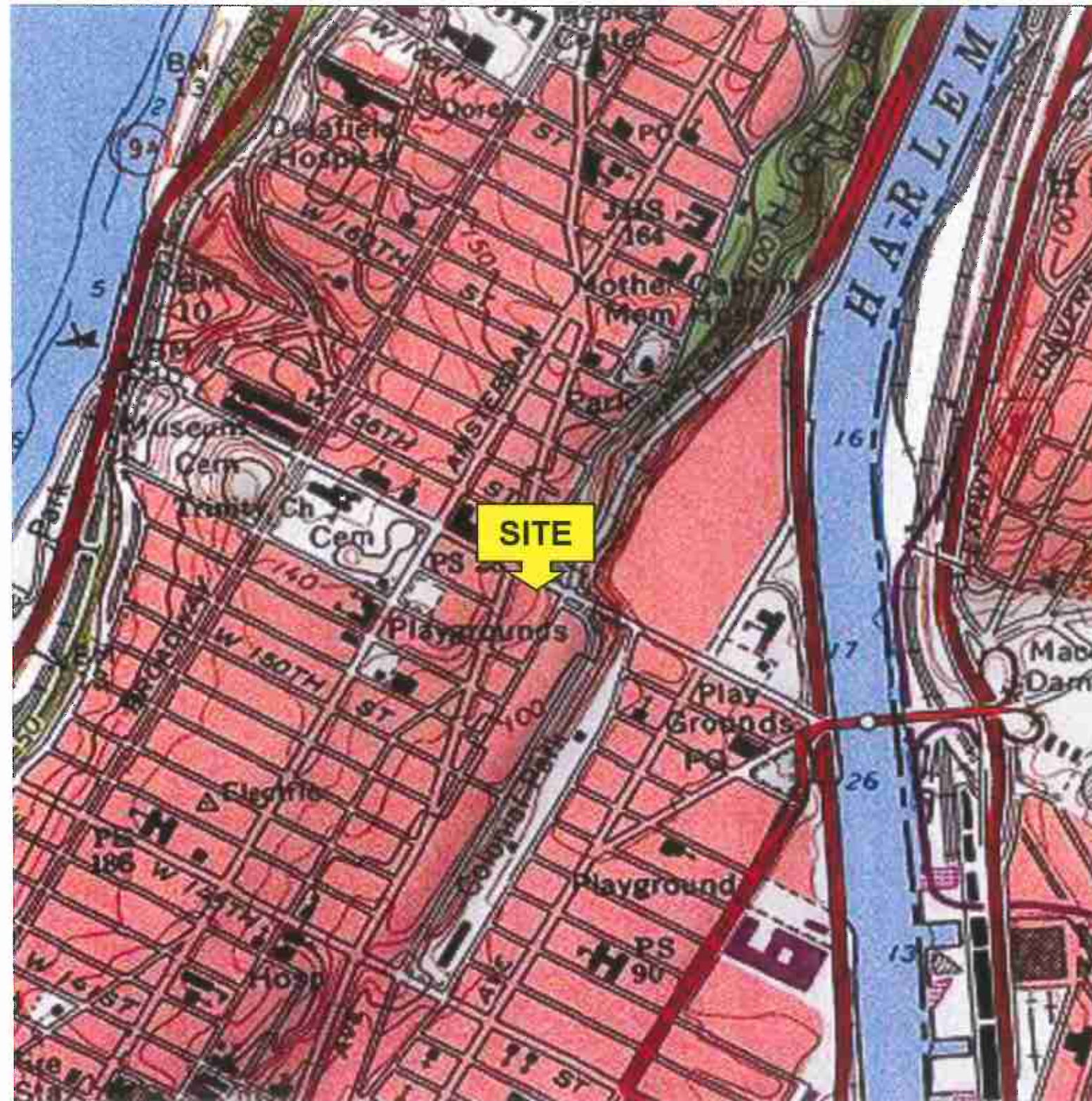
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ATC**
 Shaping the Future
 104 EAST 25TH STREET, 10TH FLOOR
 NEW YORK, NY 10010
 TEL: (212) 353-8280 FAX: (212) 353-8306

DRAWING BY: M. SVERDEL
 INSPECTED BY: M. MANKOVICH
 DESIGNED BY: M. MANKOVICH
 CHECKED BY:

DRAWING TITLE:
SITE BOUNDARY MAP

SCALE: NOT TO SCALE
 ATC PROJECT: # 15.26789.0012


DRAWING NO. **FIG-1**
 OF
 DATE: 05.05.14
 REVISION No. 0
 REVISION DATE



0 400 800
SCALE IN FEET

CLIENT:
Broadway Housing Development Fund
583 RIVERSIDE DRIVE, 7TH FLOOR
NEW YORK, NY 10031

SITE ADDRESS:
SUGER HILL PROJECT
400-414 WEST 155TH STREET
NEW YORK, NY 10032

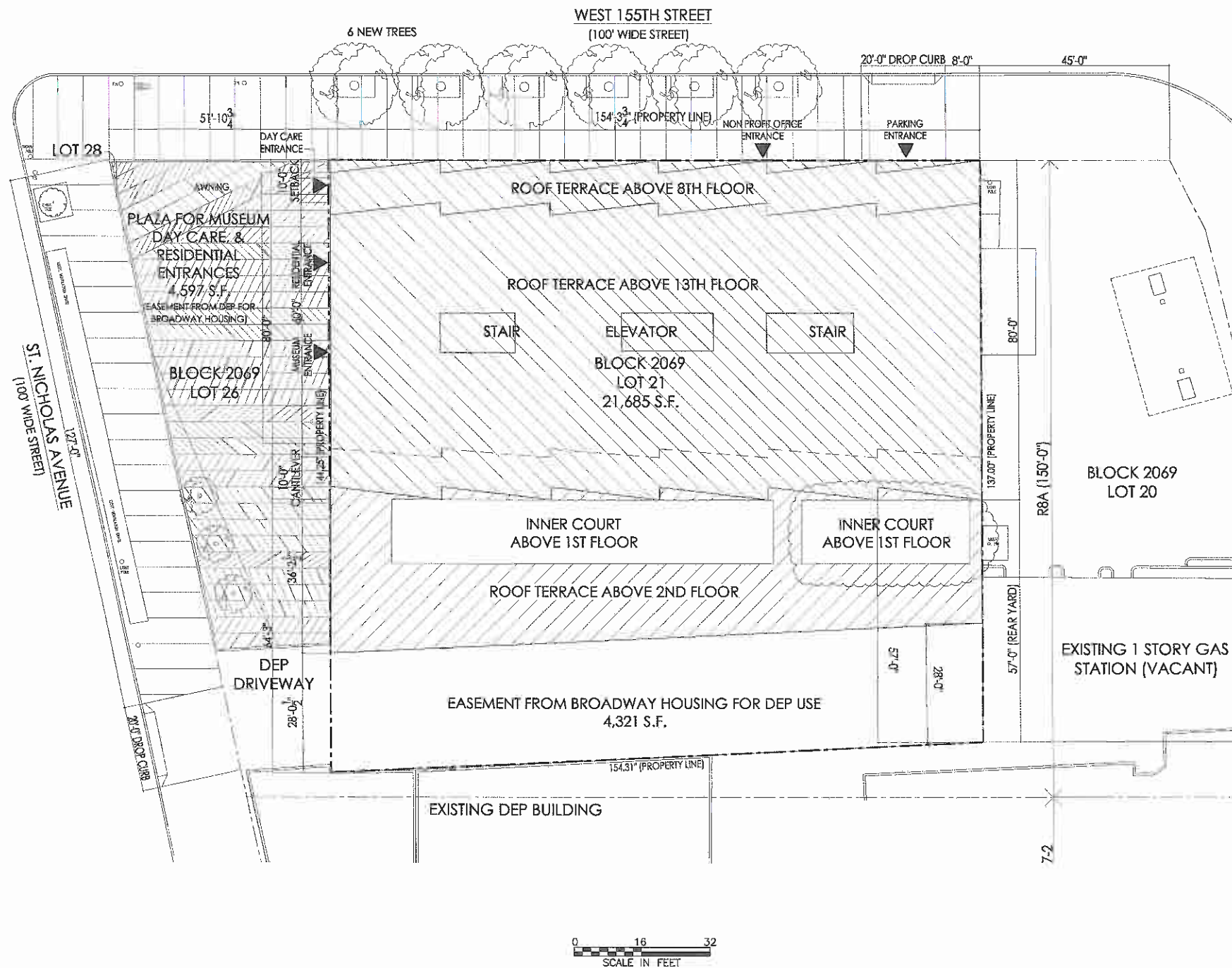
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INSPECTED BY: M. MANKOVICH
DESIGNED BY: M. MANKOVICH
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DRAWING TITLE:
SITE LOCATION MAP

SCALE
SEE SCALE BAR
ATC PROJECT: # 15.26789.0012

DRAWING NO.
FIG-2
SHEET OF
DATE 05.05.14
REVISION No. 0
REVISION DATE



CLIENT:
Broadway Housing Development Fund
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 NEW YORK, NY 10031

SITE ADDRESS:
SUGER HILL PROJECT
 400-414 WEST 155TH STREET
 NEW YORK, NY 10032

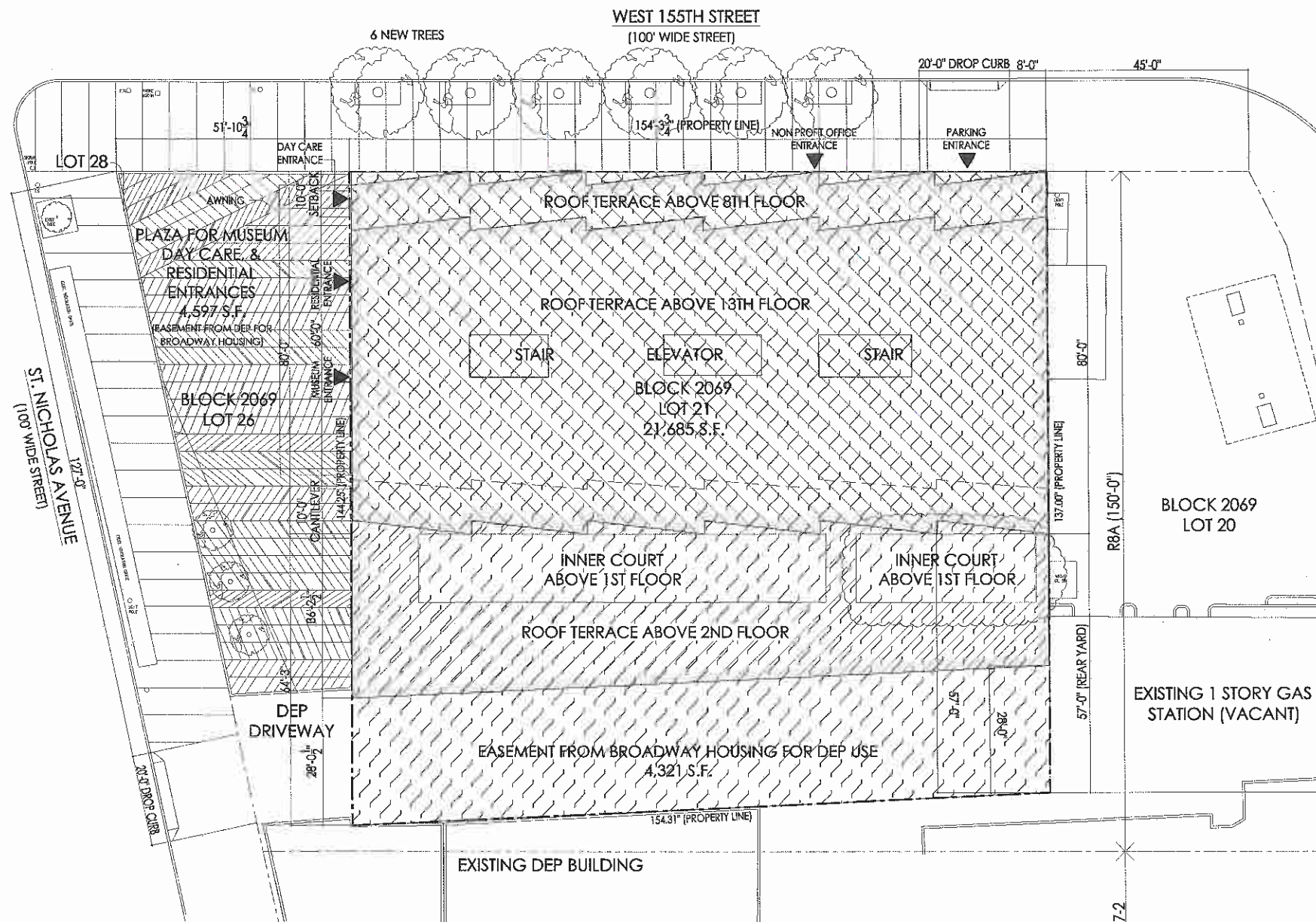
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 DESIGNED BY: M. MANKOVICH
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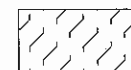
DRAWING TITLE:
REDEVELOPMENT PLAN

SCALE: SEE SCALE BAR
 ATC PROJECT: # 15.26789.0012

DRAWING NO.
FIG-3
 SHEET: 01
 DATE: 05.05.14
 REVISION No. 0
 REVISION DATE



LEGEND



EXCAVATION AREA

CLIENT:
Broadway Housing Development Fund
 583 RIVERSIDE DRIVE, 7TH FLOOR
 NEW YORK, NY 10031

SITE ADDRESS:
SUGER HILL PROJECT
 400-414 WEST 155TH STREET
 NEW YORK, NY 10032

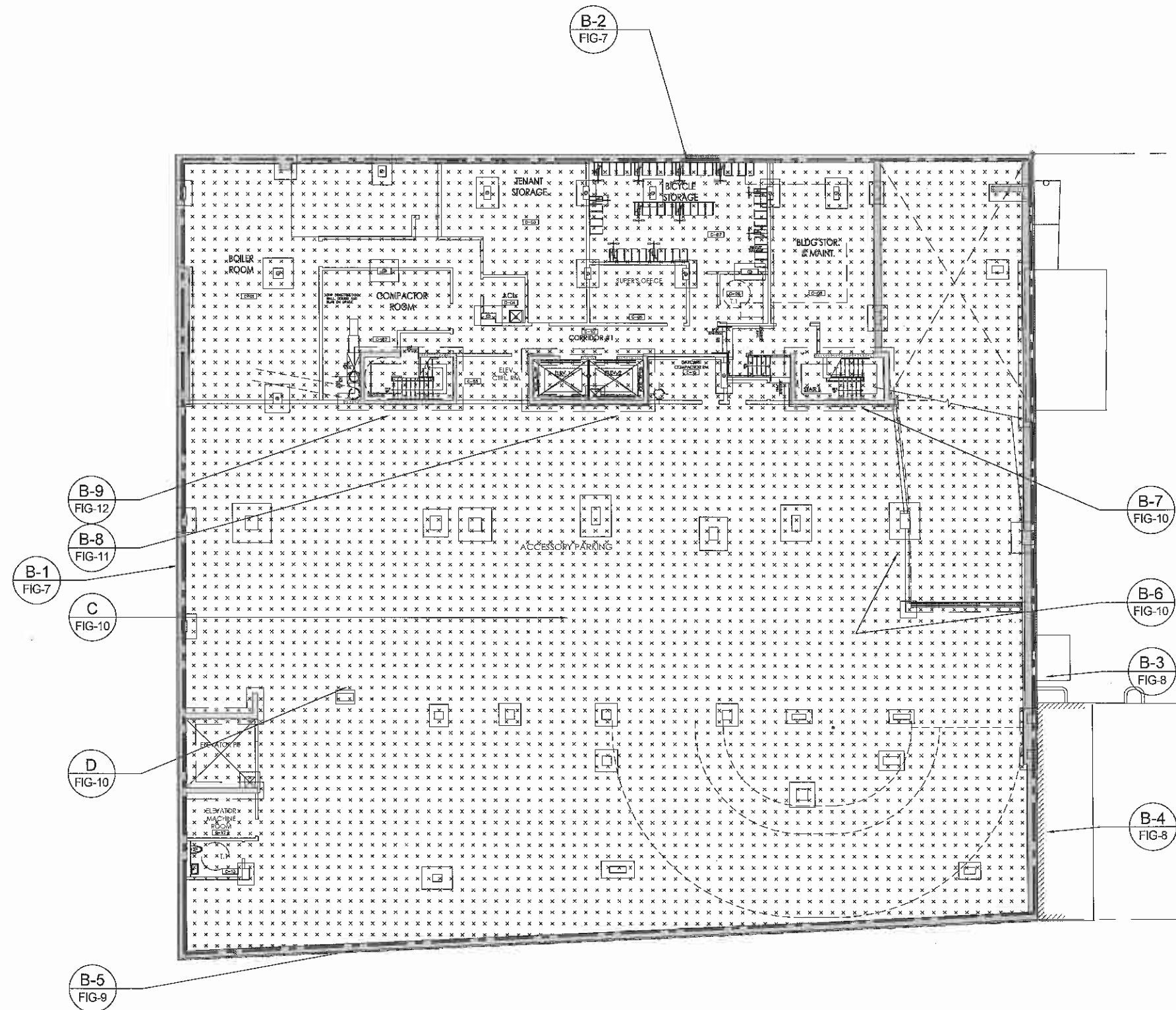
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DRAWING BY: M. SVERDEL
 INSPECTED BY: M. MANKOVICH
 DESIGNED BY: M. MANKOVICH
 CHECKED BY:

DRAWING TITLE:
EXCAVATION AREA

SCALE: SEE SCALE BAR
 ATC PROJECT: # 15.26789.0012

DRAWING NO.
FIG-4
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 DATE: 05.05.14
 REVISION No. 0
 REVISION DATE



LEGEND


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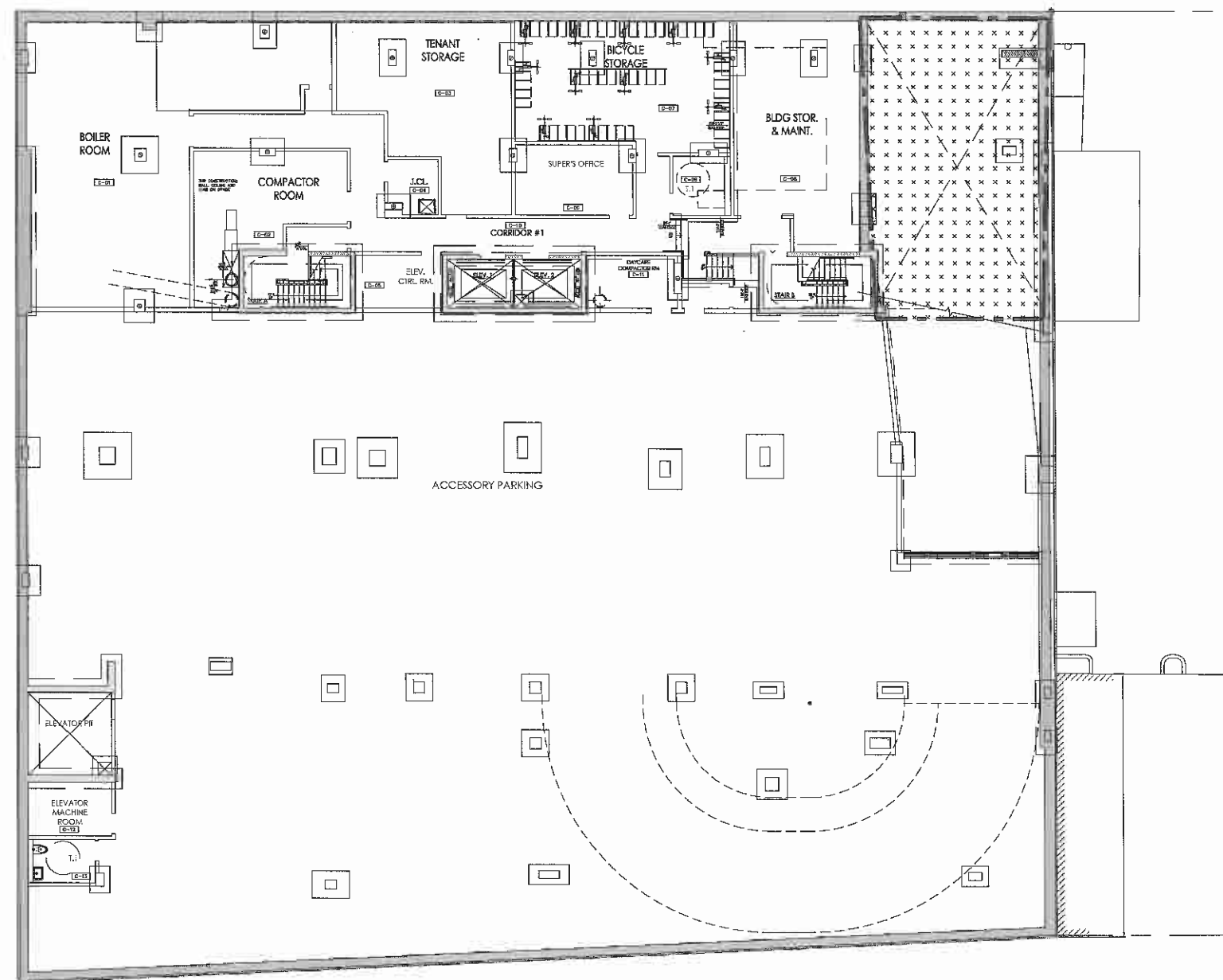
VAPOR BARRIER BENEATH
CONCRETE SLAB

B - #
FIG - #

DETAIL B - #
SYMBOL FOR DETAIL
CALL-OUT
FIGURE #

FOUNDATION PLAN

CLIENT:	SITE ADDRESS:	<div><div>Cardno ATC</div><div>Shaping the Future</div><div>104 EAST 25TH STREET, 10th FLOOR NEW YORK, NY 10010</div><div>TEL: (212) 353-8280 FAX: (212) 353-8306</div></div>	DRAWING BY:	DRAWING TITLE:		DRAWING NO. <div>FIG-5</div>		
Broadway Housing Development Fund 583 RIVERSIDE DRIVE, 7TH FLOOR NEW YORK, NY 10031	SUGER HILL PROJECT 400-414 WEST 155TH STREET NEW YORK, NY 10032		INSPECTED BY:	VAPOR BARRIER SYSTEM GENERAL LAYOUT FOUNDATION PLAN			OF	
			DESIGNED BY:			DATE: 05.05.14		
			CHECKED BY:			SCALE	ATC PROJECT: # 15.26789.0012	REVISION No. 0
						N.T.S.	REVISION DATE	




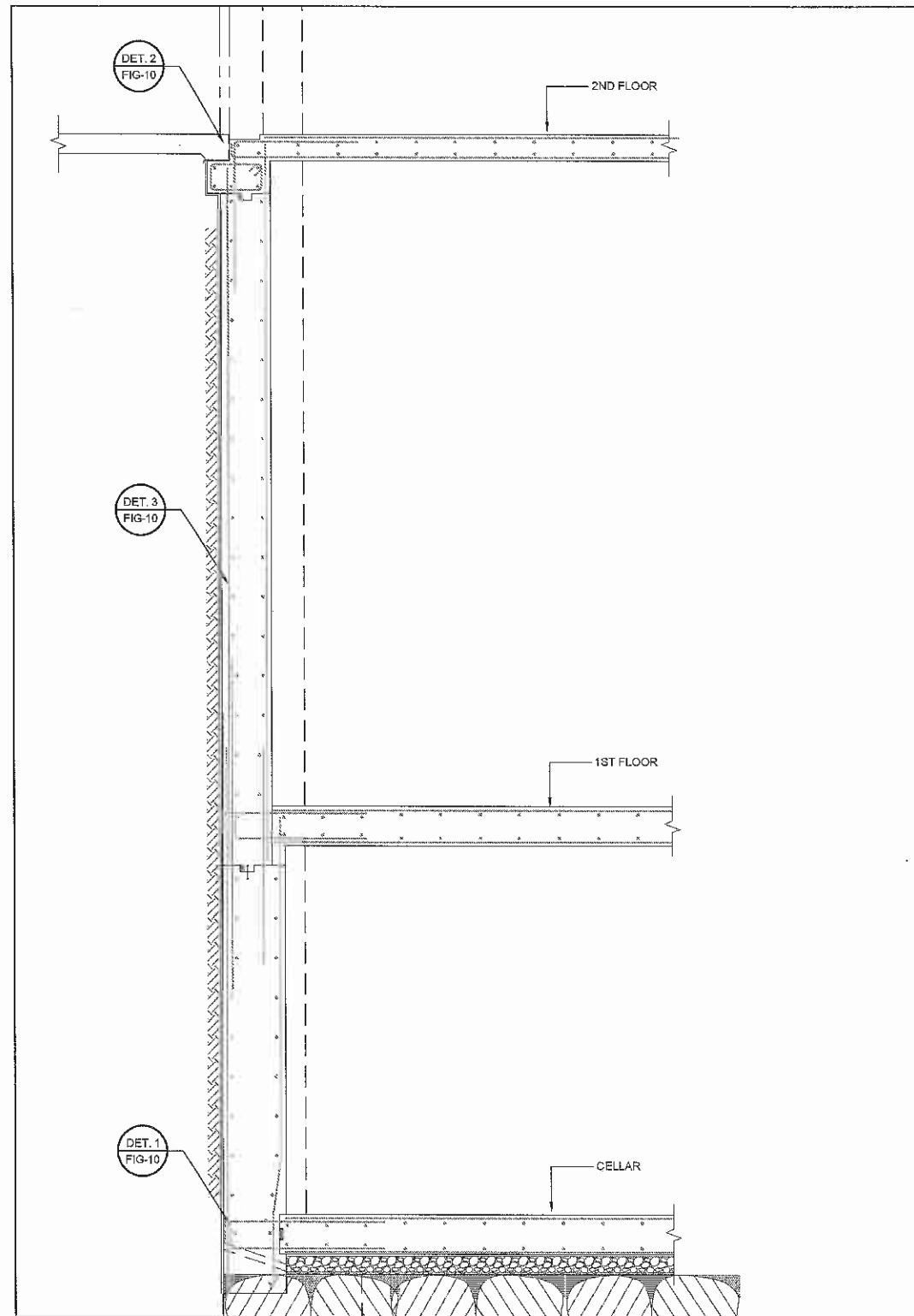
LEGEND

X X X

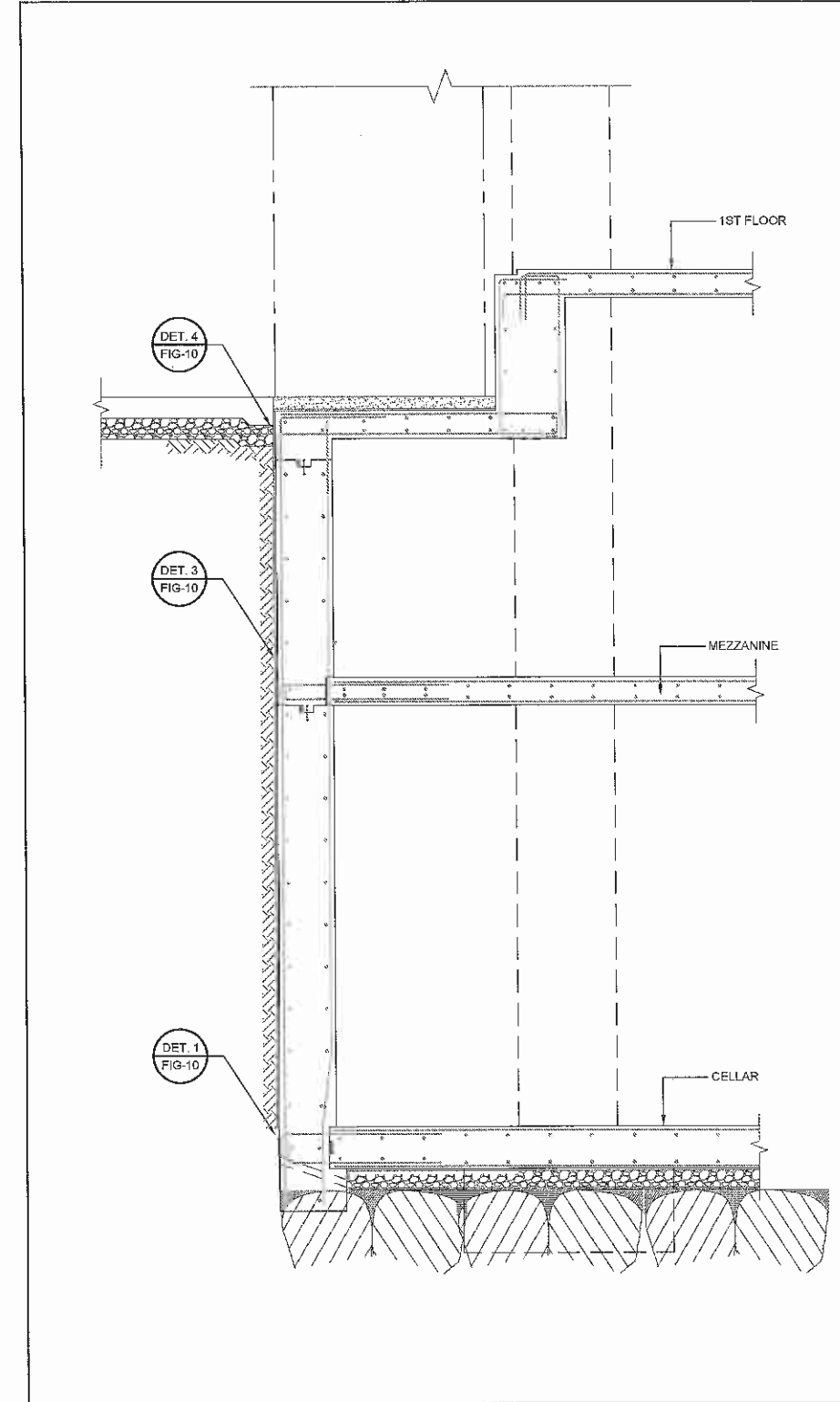
BACK FILL PLACEMENT AREA

FOUNDATION PLAN

CLIENT: Broadway Housing Development Fund 583 RIVERSIDE DRIVE, 7TH FLOOR NEW YORK, NY 10031	SITE ADDRESS: SUGER HILL PROJECT 400-414 WEST 155TH STREET NEW YORK, NY 10032	<div style="text-align: center;">  Cardno ATC Shaping the Future 104 EAST 25th STREET, 10th FLOOR NEW YORK, NY 10010 TEL: (212) 353-8280 FAX: (212) 353-8306 </div>	DRAWING BY: M. SVERDEL INSPECTED BY: J. MYERS DESIGNED BY: J. MYERS CHECKED BY:	DRAWING TITLE: BACK FILL PLACEMENT AREA SCALE: N.T.S. ATC PROJECT: # 15.26789.0012	DRAWING NO. FIG-6 SHEET OF DATE: 05.05.14 REVISION No. 0 REVISION DATE



DETAIL B-1
EXTERIOR FOOTING STEGO WRAP
BELOW GRADE INSTALLATION



DETAIL B-2
EXTERIOR FOOTING STEGO WRAP
BELOW GRADE INSTALLATION

SYMBOLS	
	-DETAIL #
	-FIGURE #

CLIENT:
Broadway Housing Development Fund
583 RIVERSIDE DRIVE, 7TH FLOOR
NEW YORK, NY 10031

SITE ADDRESS:
SUGER HILL PROJECT
400-414 WEST 155TH STREET
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INSPECTED BY: **J. MYERS**
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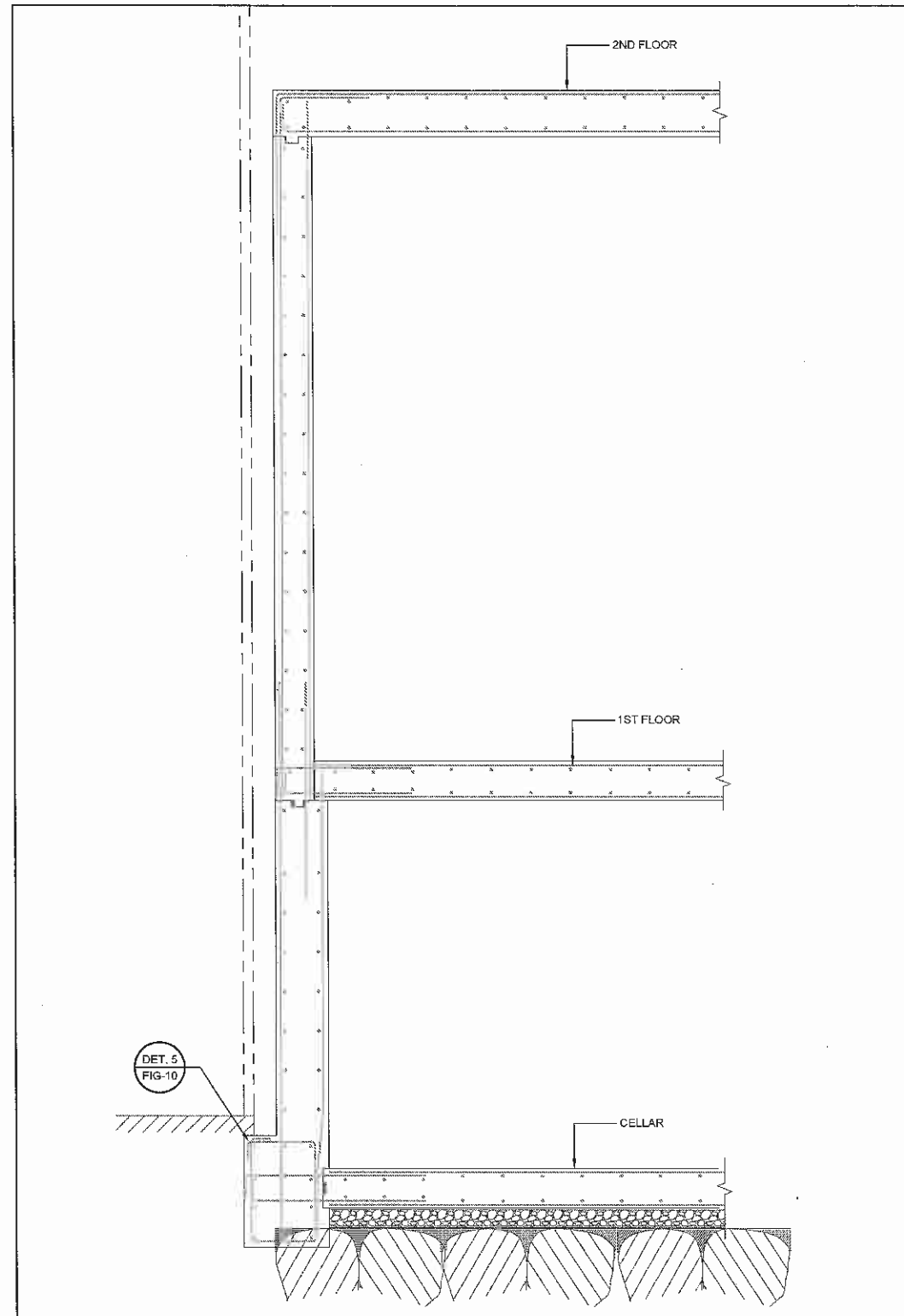
DRAWING TITLE:
VAPOR BARRIER SYSTEM DETAILS

SCALE
SEE SCALE BAR

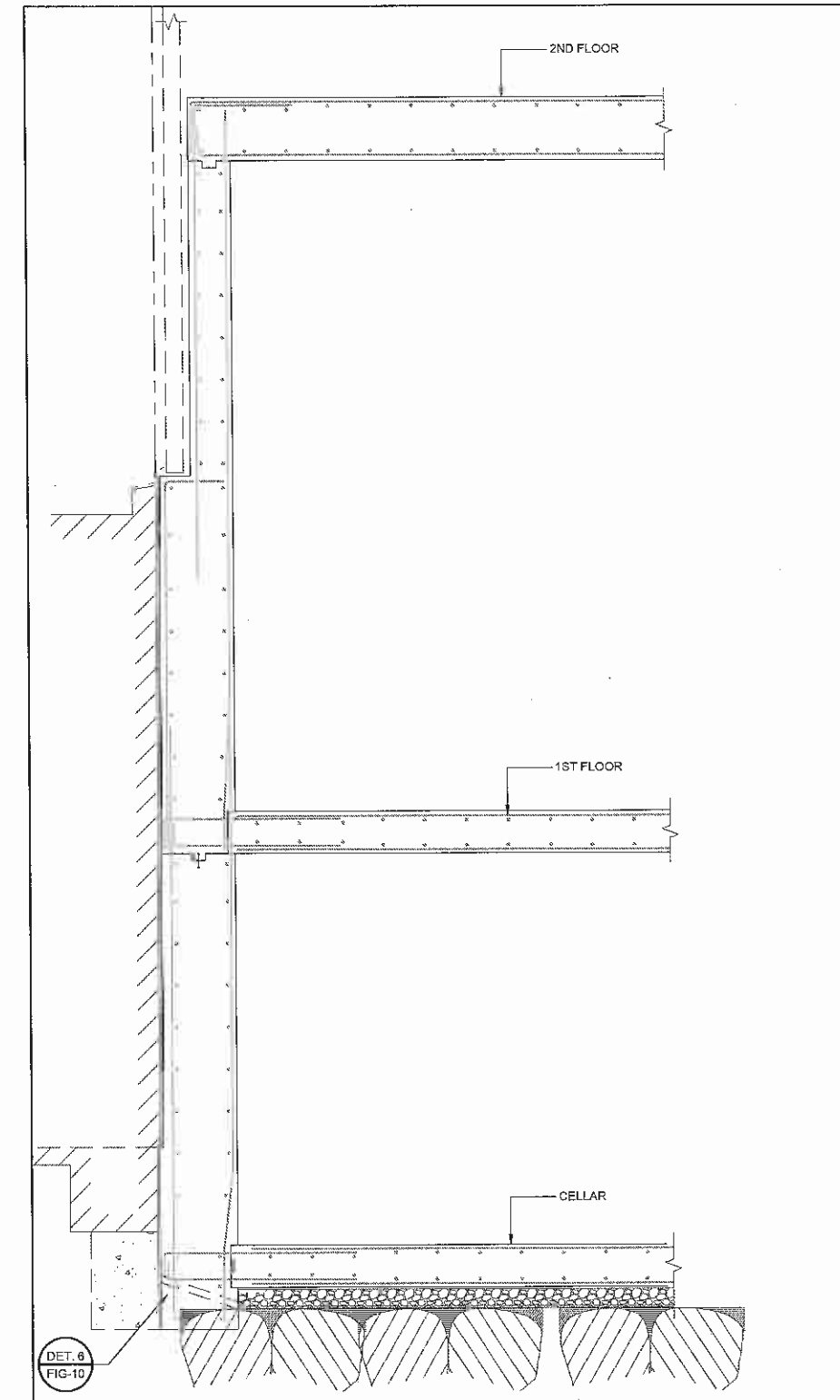
ATC PROJECT: # 15.26789.0007

DRAWING NO.
FIG-7
SHEET OF
DATE: 04.26.11
REVISION No. 1
REVISION DATE 08.10.12

MACAD20002011\26789\0007



DETAIL B-3
EXTERIOR FOOTING STEGO WRAP
BELOW GRADE INSTALLATION



DETAIL B-4
EXTERIOR FOOTING STEGO WRAP
BELOW GRADE INSTALLATION

SYMBOLS	
	-DETAIL #
	-FIGURE #

CLIENT:
Broadway Housing Development Fund
583 RIVERSIDE DRIVE, 7TH FLOOR
NEW YORK, NY 10031

SITE ADDRESS:
SUGER HILL PROJECT
400-414 WEST 155TH STREET
NEW YORK, NY 10032

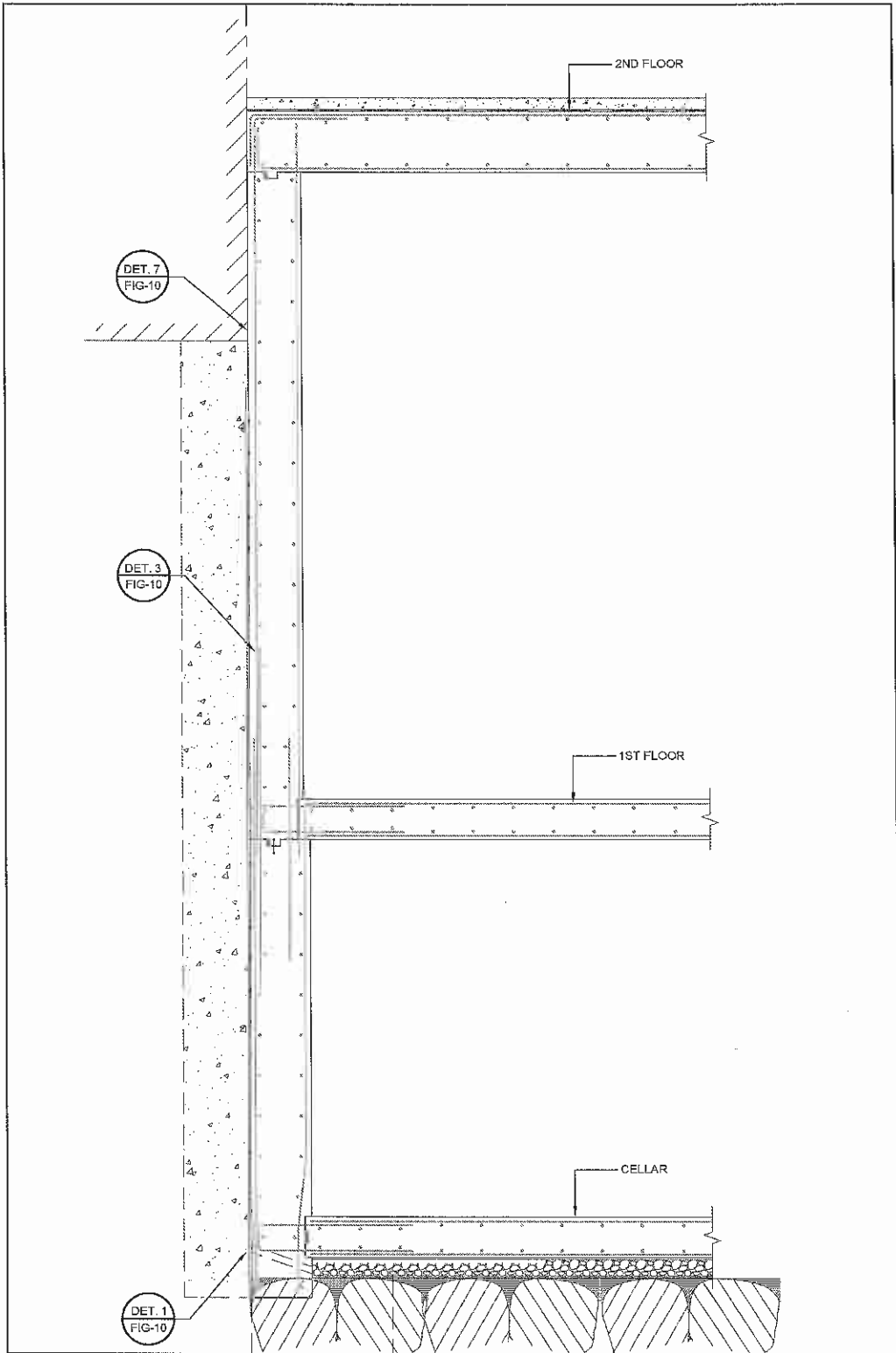
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INSPECTED BY: **J. MYERS**
DESIGNED BY: **J. MYERS**
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DRAWING TITLE:
VAPOR BARRIER SYSTEM DETAILS

SCALE: SEE SCALE BAR
ATC PROJECT: # 15.26789.0007

DRAWING NO. **FIG-8**
SHT. OF
DATE: 04.26.11
REVISION No. 1
REVISION DATE 08.10.12



DETAIL B-5
EXTERIOR FOOTING STEGO WRAP
BELOW GRADE INSTALLATION

SYMBOLS	
DET. 2 FIG-10	-DETAIL # -FIGURE #

CLIENT:
Broadway Housing Development Fund
583 RIVERSIDE DRIVE, 7TH FLOOR
NEW YORK, NY 10031

SITE ADDRESS:
SUGER HILL PROJECT
400-414 WEST 155TH STREET
NEW YORK, NY 10032

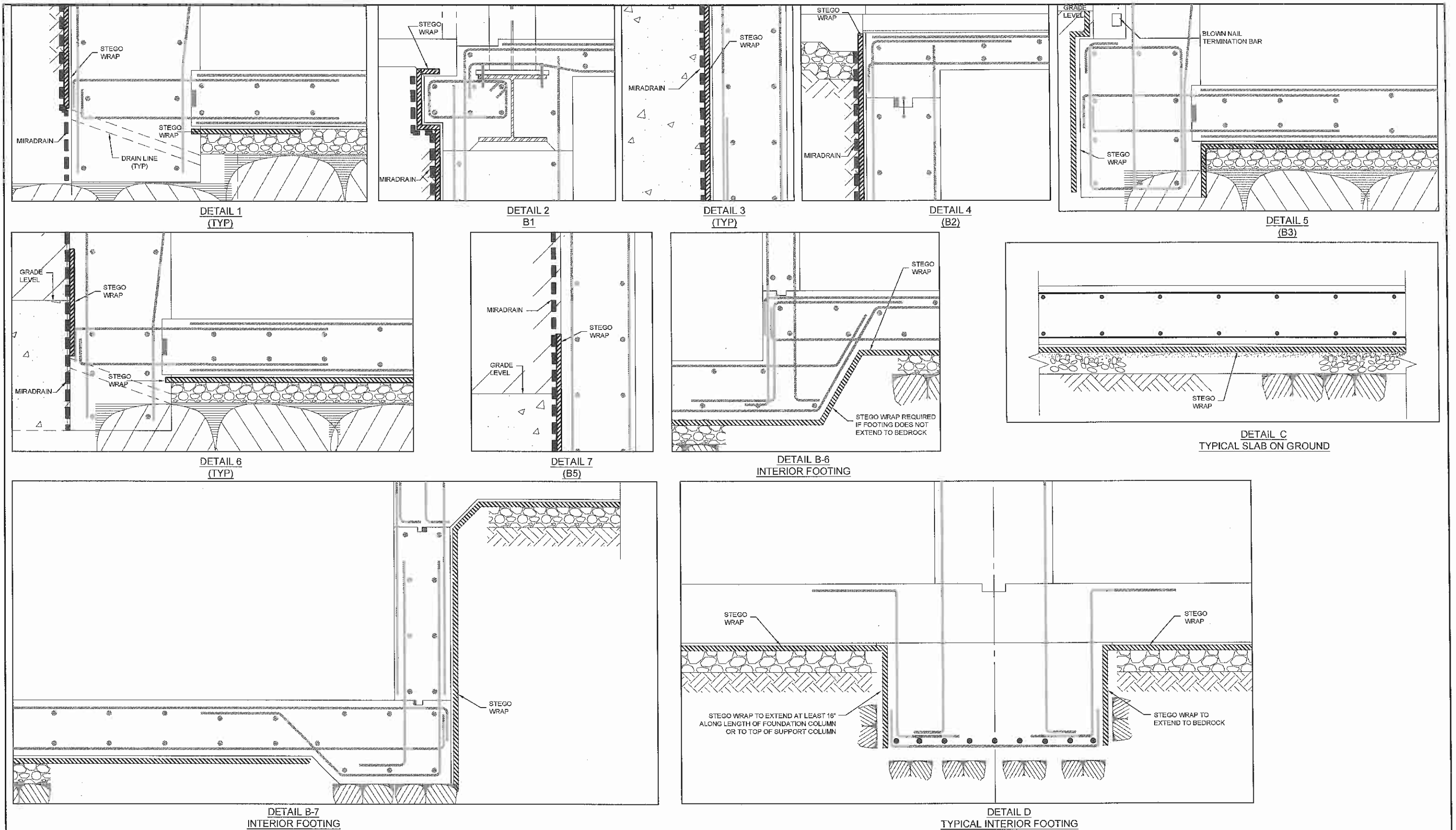

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DESIGNED BY: J. MYERS
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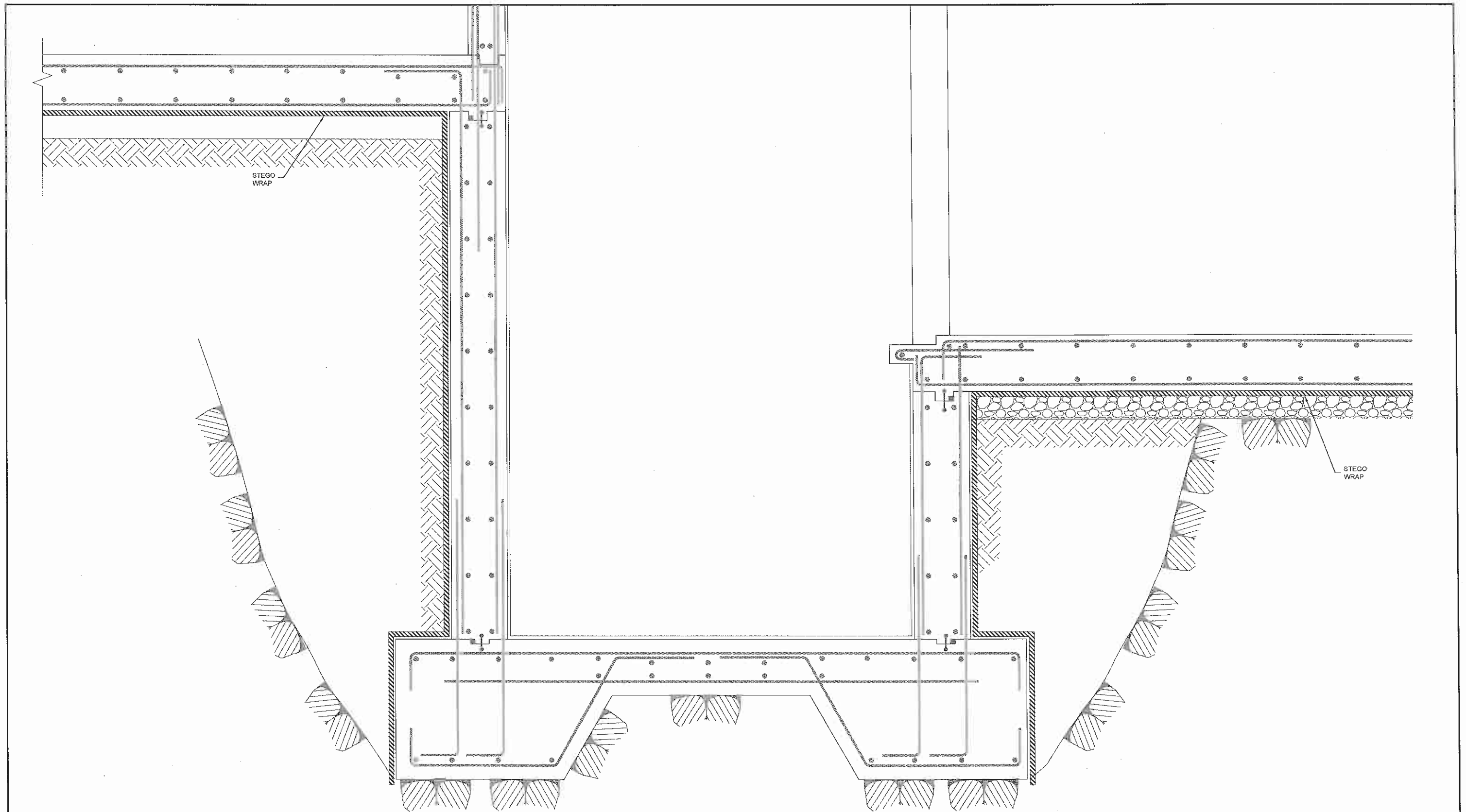
DRAWING TITLE:
VAPOR BARRIER SYSTEM DETAILS

DRAWING NO.
FIG-9
SHT. OF
DATE: 04.26.11
REVISION No. 1
REVISION DATE 08.10.12


SCALE
SEE SCALE BAR
ATC PROJECT: # 15.26789.0007

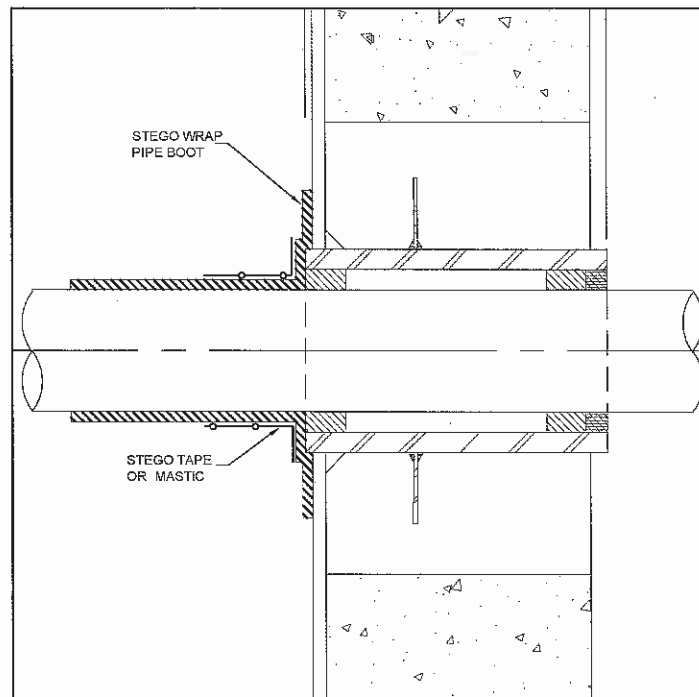


<p>CLIENT:</p> <p>Broadway Housing Development Fund</p> <p>583 RIVERSIDE DRIVE, 7TH FLOOR NEW YORK, NY 10031</p>	<p>SITE ADDRESS:</p> <p>SUGER HILL PROJECT 400-414 WEST 155TH STREET NEW YORK, NY 10032</p>	<p></p> <p>Shaping the Future 104 EAST 25th STREET, 10th FLOOR NEW YORK, NY 10010 TEL: (212) 353-8280 FAX: (212) 353-8306</p>	<p>DRAWING BY: M. SVERDEL INSPECTED BY: J. MYERS DESIGNED BY: J. MYERS CHECKED BY:</p>	<p>DRAWING TITLE:</p> <p>VAPOR BARRIER SYSTEM DETAILS</p> <p>SCALE: SEE SCALE BAR</p> <p>ATC PROJECT: # 15.26789.0007</p>	<p>DRAWING NO. FIG-10 SHT. OF DATE: 04.26.11 REVISION No. 1 REVISION DATE 08.10.12</p>
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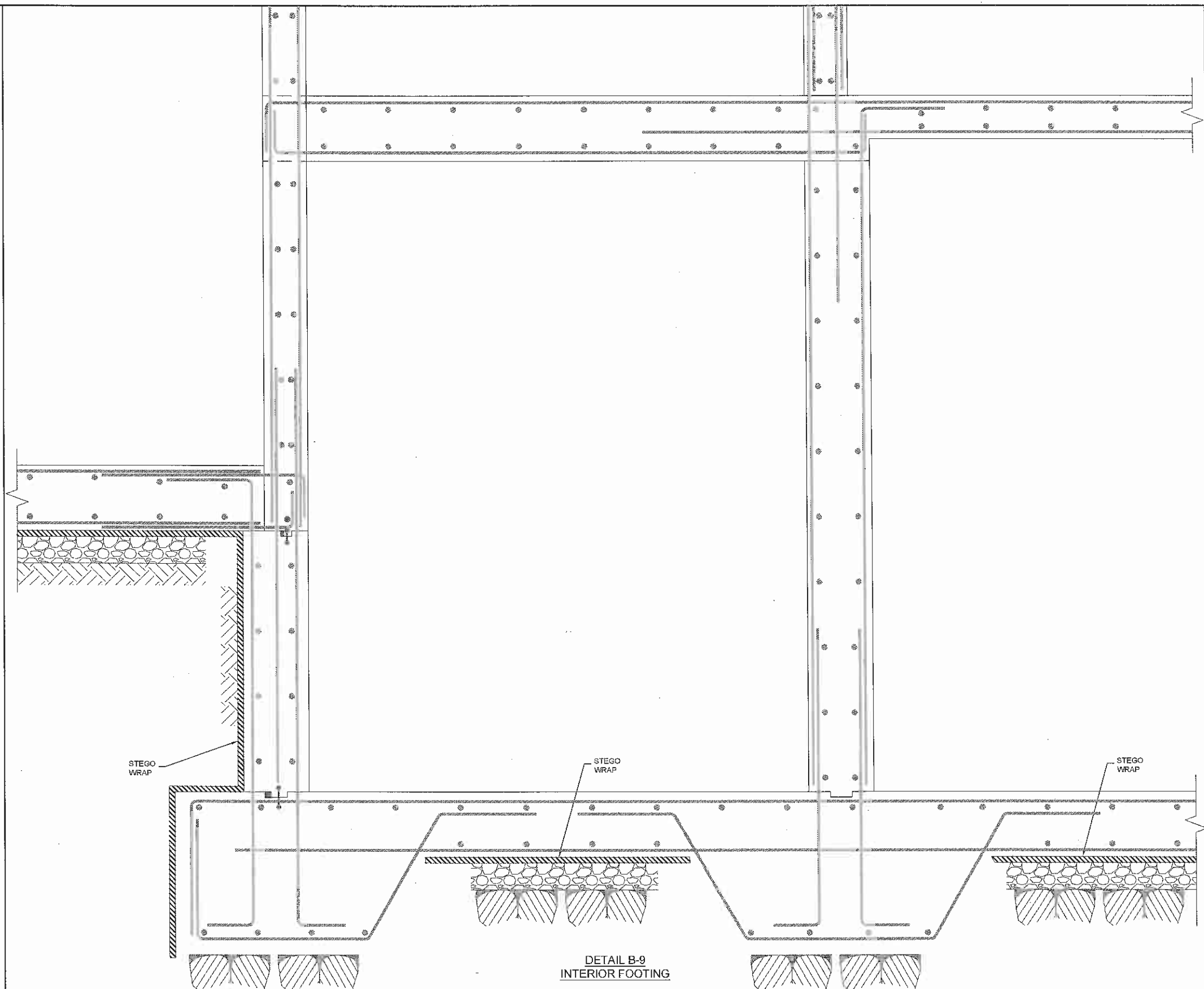


DETAIL B-8
ELEVATOR SHAFT

<p>CLIENT:</p> <p>Broadway Housing Development Fund</p> <p>583 RIVERSIDE DRIVE, 7TH FLOOR NEW YORK, NY 10031</p>	<p>SITE ADDRESS:</p> <p>SUGER HILL PROJECT 400-414 WEST 155TH STREET NEW YORK, NY 10032</p>	<p> Cardno ATC</p> <p>Shaping the Future 104 EAST 25th STREET, 10th FLOOR NEW YORK, NY 10010 TEL: (212) 353-8280 FAX: (212) 353-8306</p>	<p>DRAWING BY: M. SVERDEL</p> <p>INSPECTED BY: J. MYERS</p> <p>DESIGNED BY: J. MYERS</p> <p>CHECKED BY:</p>	<p>DRAWING TITLE:</p> <p>VAPOR BARRIER SYSTEM DETAILS</p> <p>SCALE: SEE SCALE BAR</p> <p>ATC PROJECT: # 15.26789.0007</p>	<p>DRAWING NO. FIG-11</p> <p>SHT. OF</p> <p>DATE: 04.26.11</p> <p>REVISION No. 1</p> <p>REVISION DATE 08.10.12</p>
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TYPICAL PIPE /UTILITY PENETRATION SEALING



DETAIL B-9
INTERIOR FOOTING

CLIENT:
Broadway Housing Development Fund
583 RIVERSIDE DRIVE, 7TH FLOOR
NEW YORK, NY 10031

SITE ADDRESS:
SUGER HILL PROJECT
400-414 WEST 155TH STREET
NEW YORK, NY 10032

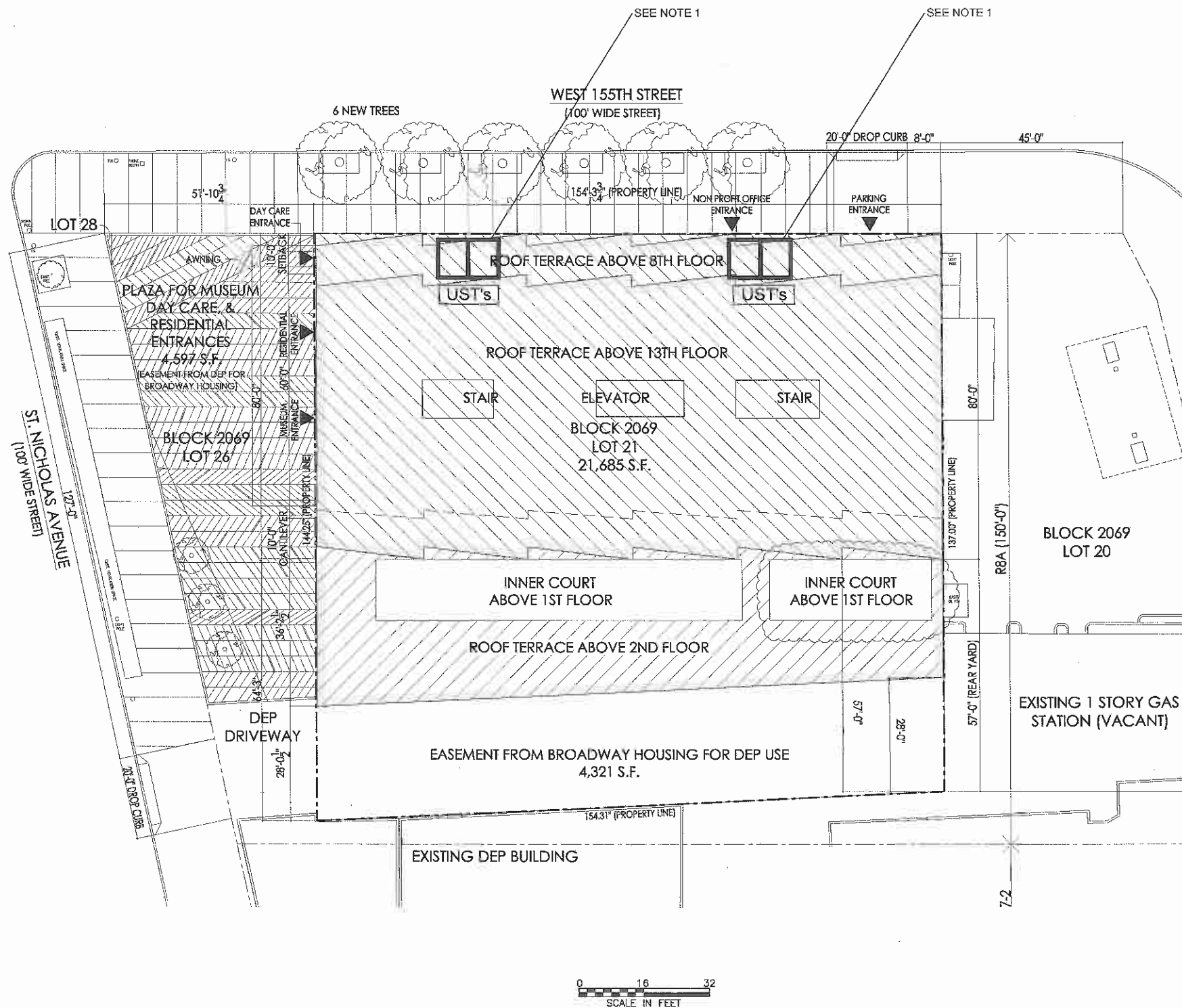
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NEW YORK, NY 10010
TEL: (212) 353-8280 FAX: (212) 353-8306

DRAWING BY: **M. SVERDEL**
INSPECTED BY: **J. MYERS**
DESIGNED BY: **J. MYERS**
CHECKED BY:

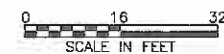
DRAWING TITLE:
VAPOR BARRIER SYSTEM DETAILS

SCALE
SEE SCALE BAR
ATC PROJECT: # 15.26789.0007

DRAWING NO.
FIG-12
SIT. OF
DATE **04.26.11**
REVISION No. **1**
REVISION DATE **08.10.12**



NOTES
 1. FORMER UST LOCATIONS ARE APPROXIMATE



CLIENT:
Broadway Housing Development Fund
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 NEW YORK, NY 10031

SITE ADDRESS:
SUGER HILL PROJECT
 400-414 WEST 155TH STREET
 NEW YORK, NY 10032

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 NEW YORK, NY 10010
 TEL: (212) 353-8280 FAX: (212) 353-8306

DRAWING BY: M. SVERDEL
 INSPECTED BY: M. MANKOVICH
 DESIGNED BY: M. MANKOVICH
 CHECKED BY:

DRAWING TITLE:
FORMER UST LOCATION MAP

SCALE:
 SEE SCALE BAR

ATC PROJECT: # 15.26789.0012

DRAWING NO.
FIG-13

SHI: 01
 DATE: 05.05.14
 REVISION No. 0
 REVISION DATE

TABLES

TABLE 1
MATERIAL DISPOSAL TABLE
BROADWAY HOUSING DEVELOPMENT FUND PROJECT
NEW YORK, NEW YORK

Disposal Location/Address	Type of Material	Quantity
Malanka Landfill Secaucus, NJ	Non-Hazardous Soil/fill	4,918 tons
Malanka Landfill Secaucus, NJ	Non-Hazardous Bedrock	1,390 tons

TABLE 2
BACKFILL MATERIAL TABLE
BROADWAY HOUSING DEVELOPMENT FUND PROJECT
NEW YORK, NEW YORK

Backfill Type	Material Source	Quantity
Aggregate Base ¾ inch Clean Stone	New York Sand and Stone, LLC	600 tons